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# **Pharmacist-Initiated Interventions in Travel Health**

Volume II

**Thesis submitted by:**

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In partial fulfilment of the requirements of the Degree of Doctor of Public Health in the College of Public Health, Medical and Veterinary Sciences within the Division of Tropical Health and Medicine at James Cook University.

April 2015



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## **Appendix 1: JCU HREC and Pharmacy Guild of Australia Approvals**

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The Pharmacy Guild of Australia

## Survey Approval Program

Survey Certificate No. 755

This is to certify that the documentation for the following survey has been presented for examination and that the Guild encourages member participation

CONDUCTED BY:

JAMES COOK UNIVERSITY

FOR (CLIENT):

JAMES COOK UNIVERSITY

PERIOD OF FIELD WORK:

MAY – JUNE 2009

METHOD OF SURVEY:

MAIL

STATES/AREAS TO BE COVERED:

NATIONAL

RATING:

A1

PURPOSE OF SURVEY:

To assess the involvement of pharmacists in the provision of travel health services and their knowledge and understanding of common travel-related health issues.

Signature of Approving Officer:

Date: 06 May 2009

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## **Appendix 2: Appendices Specific to Chapter 2**

### Appendix 2.1: Interview schedule (Airport study)

## Section A: Demographic/Predictor data Traveller No: (consecutive number)

- 1

6. Destination

a. Where are you travelling to? Destination(s): \_\_\_\_\_

b. Type of region (circle): Capital city  
Other Metropolitan Area  
Rural/Remote  
Multiple destinations

c. Length of stay in each destination (days): \_\_\_\_\_

d. Reason for travel: Tourism/holiday  
Business/work  
Visiting relatives  
Education  
Religious reason  
Other(state) \_\_\_\_\_

e. Time taken to plan the journey: \_\_\_\_\_ weeks (from initial decision to actual date of travel)

f. How many trips overseas have you made in the last 3 years 1, 2, 3, 4, 5, >5.

g. Destinations? \_\_\_\_\_

7. Do you have travel health insurance? Y / N

8. History of previous travel-related illness (in the last 3 years)?

a. Have you had previous health problems (however minor) whilst overseas? Y / N

b. If Yes, how severe was the condition and how did you treat them?

Illness	Severity (Scale 1-5 - 1 minor, 5 very severe)					Treatment
	1	2	3	4	5	
	1	2	3	4	5	
	1	2	3	4	5	
	1	2	3	4	5	
	1	2	3	4	5	
	1	2	3	4	5	
	1	2	3	4	5	
	1	2	3	4	5	
	1	2	3	4	5	

### **Section B: Obtaining Travel-related Health Advice**

9. Did you seek/obtain travel health advice before travelling? Y (go to Q9a then Q10) / N (go to Q13)

a. If Yes, When did you seek travel-related health advice? \_\_\_\_\_ weeks before travelling

10. Sources of travel-related health advice

a. If answer to Q9 was Yes, what sources of info were used (tick all that apply)?

Books  
Internet  
Travel clinic  
GP  
Comm Pharmacy  
Travel agent  
Family/Friends  
Magazines  
Others (state) \_\_\_\_\_

b. Why did you use these sources of information? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

11. If you did not use a community pharmacist as a source of information – why not?

Time constraints	Opening hours of pharmacy
Getting to pharmacy	Limited range of services from pharmacy
Cost	Did not know they offered this service
Other (state)	_____

\_\_\_\_\_  
\_\_\_\_\_

12. What travel advice did you receive? (tick all that apply):

Safe food and water consumption  
Use of insect repellents/bite prevention  
Malaria prophylaxis  
Vaccinations/immunisations  
Prevention of sunburn/skin cancer  
Safe sex/use of condoms etc  
Altitude sickness  
Treatment/prevention of other conditions (state) \_\_\_\_\_  
Other areas (state) \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

13. If the answer to Q9 was No, Why did you not obtain travel health advice before travelling?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### **Section C: Vaccinations/Immunisations**

14. I am going to list some common vaccinations recommended for some countries. Can you tell me if you know you've been definitely immunised with these vaccines or have definitely not been immunised (or are not sure) and if you obtained these vaccinations specifically for this journey.

Vaccination	Immunised? (tick)			Immunised specifically for this journey (tick)
	Yes	No	Do not know	
Diphtheria				
Tetanus				
Polio (polio)				
Tuberculosis (TB or BCG)				
Hepatitis A				
Hepatitis B				
Influenza				
Japanese B encephalitis				
Meningococcal A and C (Bacterial meningitis)				
Rabies				
Tick borne encephalitis				
Typhoid				
Yellow Fever				

Have you had any other vaccinations (please state)

### **Section D: Travel-related Health Risks**

We would like to ask questions relating to some common travel-related health risks:

#### **15. Travel-related diarrhoea**

a. Have you had diarrhoea whilst travelling before? Y / N

b. How is diarrhoea transmitted (tick)?

Food and water contamination

Other (state) \_\_\_\_\_

c. How does the risk of diarrhoea at (destination) compare with Australia?(tick) Same

Lower

Higher

Don't know

d. What will you do to prevent diarrhoea while travelling?

e. How will you treat diarrhoea if it occurs?



16. Hepatitis A

- a. How is Hepatitis A transmitted (tick)?      Food and water contamination  
Other (state) \_\_\_\_\_
- b. How does the risk of Hepatitis A at (destination) compare with Australia?(tick)      Same  
Lower  
Higher  
Don't know
- c. What would you do to prevent hepatitis A while travelling?  
\_\_\_\_\_  
\_\_\_\_\_

17. Hepatitis B

- a. How is Hepatitis B transmitted?      Sexual and blood transfer  
Other (state) \_\_\_\_\_
- b. How does the risk of Hepatitis B at (destination) compare with Australia?(tick)      Same  
Lower  
Higher  
Don't know
- c. What would you do to prevent hepatitis B while travelling?  
\_\_\_\_\_  
\_\_\_\_\_

18. Jet lag

- a. Have you suffered from jet lag before whilst travelling?      Y / N
- b. Do you take medicines to prevent or treat it?      Y / N  
(if so, what) \_\_\_\_\_
- c. What other measures do you take to prevent or treat it? \_\_\_\_\_

19. Travel Sickness

- a. Have you suffered from travel sickness before whilst travelling?      Y / N
- b. Do you take medicines to prevent or treat it?      Y / N  
(if so, what) \_\_\_\_\_
- c. What other measures do you take to prevent or treat it? \_\_\_\_\_

20. Malaria

- a. Do you know if malaria is a problem at your destination?      Y / N
- b. If Yes, How does the risk of malaria at (destination) compare with Australia?(tick)      Same  
Lower  
Higher  
Don't know

c. If yes, malaria is a problem at destination, what measures will you take to prevent malaria?

Insect repellants

Mosquito nets

Chemoprophylaxis (state) \_\_\_\_\_

Other (state) \_\_\_\_\_

d. If taking medicines to prevent malaria,

When did you start taking them? \_\_\_\_\_ days before travel

When will you stop taking them? \_\_\_\_\_ days after return

e. If yes, malaria is a problem at destination, but not taking chemoprophylaxis, why are you not taking medicines to prevent malaria?

Side effects

Will purchase at destination

Other reason (state) \_\_\_\_\_

21. Skin cancer/Sun burn

a. How does the risk of skin cancer at (destination) compare with Australia?

Same

Lower

Higher

Don't know

b. Do you try to protect your skin from sun burn or skin cancer? Y / N

If so how? \_\_\_\_\_

c. Do you use sun block on a regular basis? Y / N

If Yes, what SPF? \_\_\_\_\_

and how often do you apply/reapply it? \_\_\_\_\_

22. DVT/"Economy Class Syndrome"

a. Have you heard of DVT/"Economy Class Syndrome"? Y/N

b. What causes thrombosis or economy class syndrome? \_\_\_\_\_

c. Are you taking any measures to prevent DVT/Economy Class Syndrome? Y/N

If Yes, what/why \_\_\_\_\_ If No, why \_\_\_\_\_

23. What do you think are the major health risks associated with travel to your destination? For each risk identified discuss whether the traveller feels that the risk is the same, higher or lower than in Australia. How does the traveller think that the risk is transmitted or caused? How they intend to prevent/reduce the risk and how they would treat it if it occurred:

Health Risk (as stated by the traveller)	Transmission/cause	Risk is the same, higher or lower than Australia (or don't know)	How can the risk be prevented or reduced	How would they treat the problem if it occurred

### **Section E: Medications**

#### **24. Travel-related diseases**

Are you taking any medicines with you to treat travel-related diseases (diseases that you don't have now but may get whilst overseas)?

Drug	Tick (if carrying)	Name of medicine	Reason for carrying it (in traveller's own words)
Antidiarrhoeals			
Antacids/indigestion remedies			
Analgesics/pain killers			
Cough/cold remedies			
Antihistamines			
Sunscreens			
Antibiotics			

Others (if so, state medicine and reason)

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1<sup>st</sup> Aid Kit (if so, what does it contain)

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Do you have any chronic diseases? If so, what medications are you taking for these conditions:

### Medication Interview Checklist

26. Approximately how many weeks supply of these medicines are you taking with you? 1 / 2 / 3 / 4 / 5 / \_\_\_\_\_
27. Are the prescription medicines labeled by a Pharmacist? Y / N
28. Do you have a doctor's letter or prescriptions with you? Y / N
29. What will you do if you run out or lose your medications?

## Appendix 2.2: Participant information leaflet (Airport study)



## JAMES COOK UNIVERSITY

TOWNSVILLE Queensland 4811 Australia Telephone: (07) 4781 4111

### INFORMATION SHEET

#### **An airport study to assess the knowledge of health risks, pharmaceutical risks and precautions taken by international travellers from North Queensland**

You are invited to take part in a research project investigating the level of knowledge of travellers about the health risks at their destination, whether travellers obtain health advice before travelling and where they obtain that advice. The project will also investigate what precautions travellers take to prevent travel-related disease and what medicines they take regularly and what medicines they would consider taking to treat travel-related illnesses if they occur. The study is being conducted by Ian Heslop and will contribute to his doctoral thesis in the Doctor of Public Health program at James Cook University.

If you are happy to be involved in the study, you will be invited to be interviewed. The interview, with your consent, will be audio-taped, and should only take between 10 and 30 minutes of your time. The interview will be conducted here at Cairns International Airport.

Taking part in this study is completely voluntary and you can stop taking part in the study at any time without explanation or prejudice. You may also withdraw any unprocessed data from the study.

Your responses and contact details will be strictly confidential. The data from the study will be used in research publications and a doctoral thesis. You will not be identified in any way in these publications.

If you have any questions about the study, please contact Ian Heslop or Prof Richard Speare or Prof Beverley Glass

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*If you have any concerns regarding the ethical conduct of the study, please contact Tina Langford, Ethics Officer, Research Office, James Cook University, Townsville, Qld, 4811. Phone: 4781 4342, [Tina.Langford@jcu.edu.au](mailto:Tina.Langford@jcu.edu.au)*

### Appendix 2.3: PCI Assessment checklist (Airport study)

**Section F: Pharmaceutical Care Issues (PCI) Assessment**  
**To be performed after the interview**

**Traveller No.**

**Checklist**

Pharmaceutical risk factors and/or Pharmaceutical care issues:

1. Age (>61 years of age) 1.Yes 2.No

2. No. of regular medications: \_\_\_\_\_

3. Taking meds with a critical dose or route (i.e. drugs with NTI) 1.Yes 2.No

Number of Medicines with NTI: \_\_\_\_\_

Drugs: \_\_\_\_\_

**4. Check for PCIs**

**Key to PCIs**

0	None	9	Duplication of therapy
1	Inappropriate dosage regimen (dose, freq, formulation)	10	Untreated indications (from patient history)
2	Inappropriate duration of therapy (Repeat Rx no longer reqd)	11	Patient education required (meds not secD)
3	Potential drug-disease interaction (Contraindications)	12	Travel-related PCIs
4	Potential drug-drug interaction	13	Others
5	Potential adverse drug reaction		
6	Monitoring required		
7	Potential or actual compliance problems		
8	Discrepancy between prescribed dose and dose used		

**5. Check**

a. Is traveller going to a malarial area (CDC/Smart traveller)? 1.Yes 2.No

b. If yes, is traveller taking appropriate chemoprophylaxis (PCI 12f or PCI 12g (Port Moresby))? 1.Yes 2.No

c. Does traveller have sufficient supplies with them (PCI 12c)? 1.Yes 2.No

d. Is traveller taking any new medications? (i.e. regular (non-antimalarial meds) started less than 1 month before travelling) (PCI 12a) (Bracket if an antimalarial) 1.Yes 2.No

e. Any medications with potential storage issues whilst travelling? (PCI 12b) 1.Yes 2.No

f. Any medications that may be illegal at destination (PCI 12e) 1.Yes 2.No

g. If yes to f), which medicines \_\_\_\_\_

h. Does traveller have Drs letter or documentation re:meds for customs? 1.Yes 2.No

i. Taking meds that increase risk of travel-related disease (e.g. DVT, Sunburn (Doxycycline with no precautions) or T.diarrhoea (PPIs)) (PCI 12h) 1.Yes 2.No

j. Traveller taking a medicine or has a chronic disease on which common travel-related health issues (e.g. severe travellers' diarrhoea) could have a major impact (PCI 12i) 1. Yes 2. No



PCI Class	Number	Detail of PCI
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		

## Appendix 2.4: Published article arising from chapter 2

Heslop IM, Bellingan M, Speare R, Glass BD. Pharmaceutical Care Model to Assess the Medication-related Risks of Travel. *International Journal of Clinical Pharmacy*. 2014; 36(6): 1196-1204.

## Pharmaceutical care model to assess the medication-related risks of travel

Ian M. Heslop · Michelle Bellingan ·  
Richard Speare · Beverley D. Glass

Received: 21 March 2014 / Accepted: 16 September 2014 / Published online: 1 October 2014  
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**Abstract** *Background* People are at greater risk of health problems when travelling and a significant number of travel-related health problems are associated with the effects of travel on pre-existing chronic diseases. Medications play a key role in the management of these conditions. However, there is a notable lack of research evaluating the potential medication-related risks associated with travel. *Objective* To apply a systematic pharmaceutical care model developed to evaluate potential pharmaceutical risks (PPRs) and pharmaceutical care issues (PCIs) in travellers. *Setting* Adult travellers leaving Cairns International Airport, Australia, for an international destination. *Method* A cross-sectional survey using semi-structured interviews, including a systematic medication history, followed by the application of a pharmaceutical care model to evaluate each participant for PPRs and PCIs. *Main outcome measure* Evaluation of standard clinical and travel-related PPRs and PCIs. *Results* Medications for chronic diseases were being taken by 47.7 % of the 218 travellers interviewed. Although 75.2 % of participants presented with no PPRs, a total of 274 PCIs were identified across 61.5 % of the participants, with an average of 2.04 PCIs per participant. The most prevalent PCIs related to the inadequate precautions taken by some travellers visiting malaria-endemic regions. Although 91 participants recognised that they were travelling to malaria-endemic regions, 65.9 % of

these participants were not using malarial chemoprophylaxis, and only 16.5 % were using chemoprophylaxis that fully complied with standard recommendations. The second most prevalent PCI was the need for 18.8 % of participants to be educated about their medications. Other PCIs identified have the potential to increase the risk of acute, travel-related conditions, and complicate the care of travellers, if they inadvertently became unwell while overseas. *Conclusion* PPRs and PCIs were not identified in all participants. However, the impact of many of the identified medication-related issues could be substantial to the traveller. This study represents the novel application of a pharmaceutical care model to identify potential PPRs and PCIs in travellers that may not be identified by other pre-travel risk assessment methods.

**Keywords** Australia · Chronic disease · Medication-related risks · Pharmaceutical care issues (PCIs) · Potential pharmaceutical risks (PPRs) · Travel health

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### **Appendix 3: Appendices Specific to Chapter 3**

Appendix 3.1: Survey instrument – postal format (Pharmacist study)



## **SURVEY**

### **A survey to assess the involvement of Australian Pharmacists in the provision of travel health services and their knowledge and understanding of common travel-related health issues**

Instructions: This survey consists of a series of multiple choice questions divided into four sections. Follow the instructions for each section. All answers are confidential. This is a postal version of an electronic survey sent to all PSA members in the PSA electronic newsletters in April 2009. Do not complete this postal survey if you have already completed and submitted the electronic survey.

#### **Section A: Demographic information about respondents**

This section will tell us some information about yourself, but you will not be identifiable from the information you give. For questions 1-8 chose the most appropriate answer that describes yourself.

**1. What is your gender? (Tick ONE answer)**

- ☐ Male
- ☐ Female

**2. What is your current age? (Tick ONE answer)**

- ☐ 20-30 years
- ☐ 31-40 years
- ☐ 41-50 years
- ☐ 51-60 years
- ☐ 61-70 years
- ☐ 71 years or greater

**3. How many years have you been registered as a pharmacist? (Tick ONE answer)**

- ☐ 0-10 years
- ☐ 11-20 years
- ☐ 21-30 years
- ☐ 31-40 years
- ☐ 41-50 years
- ☐ 51 years or greater

Continued Overleaf

1

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**4. In which state or territory do you reside?** (Tick ONE answer)

- ☐ Australian Capital Territory
- ☐ New South Wales
- ☐ Northern Territory
- ☐ Queensland
- ☐ South Australia
- ☐ Tasmania
- ☐ Victoria
- ☐ Western Australia
- ☐ Overseas

**5. Which of the following best describes the area in which you live?** (Tick ONE answer)

- ☐ State or Territory capital
- ☐ Regional metropolitan area (population >75,000)
- ☐ Rural or remote area

**6. How are you employed?** (Tick ONE answer)

- ☐ Full time
- ☐ Part time
- ☐ Retired
- ☐ Currently not practising as a pharmacist

**7. What is your current field of practice?** (Tick ONE answer)

- ☐ Undergraduate student
- ☐ Preregistration pharmacist
- ☐ Community pharmacist (employee)
- ☐ Community pharmacist (manager or owner)
- ☐ Hospital pharmacist
- ☐ Defence Force
- ☐ Academia
- ☐ Pharmaceutical industry
- ☐ Other

**8. What is your highest level of education?** (Tick ONE answer)

- ☐ PhC qualification
- ☐ Bachelor degree
- ☐ Bachelor degree with Honours
- ☐ Postgraduate certificate or diploma
- ☐ Masters degree
- ☐ Doctorate

Continued Overleaf

2

Pharmacist Postal Survey / I.Heslop May 2009

**Section B: Current travel health services delivered by pharmacists.**

This section will give us some information about whether you provide travel health services.  
For questions 9-23 Choose the most appropriate answer

**9. In your current employment, do you provide travel-related health advice or services?**  
(Tick ONE answer)

- ☐ Yes (Continue answering the questions in sequence)
- ☐ No (If you choose No, Go to question 24 (Section C))

**10. Approximately, how many travellers do you advise on travel-related health issues each week?** (Tick ONE answer)

- ☐ 1-2 travellers per week (or less)
- ☐ 3-5 travellers per week
- ☐ 6-10 travellers per week
- ☐ 11-15 travellers per week
- ☐ Greater than 15 travellers per week

**11. Approximately, how much time do you spend in total advising travellers on travel-related health issues each week?** (Tick ONE answer)

- ☐ Less than 1 hour per week
- ☐ 1-2 hours per week
- ☐ 3-5 hours per week
- ☐ 6-10 hours per week
- ☐ Greater than 10 hours per week

**12. Do you advise more travellers of a particular gender and if so which?** (Tick ONE answer)

- ☐ Male
- ☐ Female
- ☐ Equal numbers of male and female travellers

**13. What age group of travellers do you commonly advise on travel-related health issues?** (Select the TWO commonest age groups of travellers that you advise)

- ☐ 18-30 years
- ☐ 31-40 years
- ☐ 41-50 years
- ☐ 51-65 years
- ☐ Greater than 65 years of age

Continued Overleaf

3

Pharmacist Postal Survey / I.Heslop May 2009

**14. What are the commonest destinations for the travellers that you advise on travel-related health issues?** (Select up to FOUR of the destinations below)

- ☐ Western Europe (e.g. UK, France, Germany, Spain, Italy etc)
- ☐ Eastern and Central Europe (e.g. Poland, Czech Rep, Hungary, Russia etc)
- ☐ Middle East (e.g. Israel, Saudi Arabia, Syria, Iraq, Iran etc)
- ☐ North Africa (e.g. Egypt, Algeria, Morocco etc)
- ☐ Central Africa (e.g. Kenya, Rwanda, Uganda etc)
- ☐ Southern Africa (e.g. South Africa, Zimbabwe, Botswana etc)
- ☐ North America (e.g. USA, Canada)
- ☐ Central America (e.g. Mexico, Panama, Caribbean Islands etc)
- ☐ South America (e.g. Brazil, Peru, Argentina etc)
- ☐ South East Asia (e.g. Indonesia, Malaysia, Thailand, Vietnam etc)
- ☐ South Asia (e.g. India, Pakistan, Sri Lanka etc)
- ☐ North Asia (e.g. China, Korea, Japan etc)
- ☐ Oceania (e.g. New Zealand, South Pacific Islands etc)

**15. Do the travellers you advise travel alone or in groups?**  
(Select the TWO commonest types of travellers that you advise)

- ☐ Travelling alone
- ☐ Couples
- ☐ In groups of three or more adults
- ☐ Travelling with children

**16. What are the most common reasons for travel for the travellers that you advise on travel-related health issues?** (Select the THREE commonest types of travellers that you advise)

- ☐ Holiday-makers or tourists
- ☐ Business travellers or overseas workers
- ☐ Migrants or long-term travellers
- ☐ People travelling for religious purposes (e.g. pilgrimages etc)
- ☐ People visiting relatives overseas

**17. Before advising the traveller, how do you initially assess the traveller?**  
(Select the most appropriate response)

- ☐ No formal assessment, only answer the questions raised by the traveller
- ☐ Interview the traveller about their travel itinerary and answer the questions raised by the traveller
- ☐ Interview the traveller regarding their current state of health, medical history and medications and answer the questions raised by the traveller
- ☐ Interview the traveller regarding their current state of health, medical history, medications and their travel itinerary and answer the questions raised by the traveller
- ☐ Get the traveller to complete a pre-interview questionnaire; then formally interview the traveller regarding their current health, medical history, medications; review their travel itinerary for risks; answer the questions raised by the traveller

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**18. What advice do you give travellers?**

Using the scale (1- Never advise, 2 – Rarely advise, 3 – Occasionally advise, 4 – Frequently advise, 5 - Always advise) rate the following topics as to how commonly you advise the traveller about these issues.

	Never advise 1	2	3	4	Always advise 5
Vaccinations needed for the traveller's destination	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The need for antimalarial chemoprophylaxis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prevention of mosquito and other insect bites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The need for early diagnosis and treatment of malaria	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Safe food and water consumption	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Methods of water purification	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Treatment of diarrhoeal diseases	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Risk and prevention of deep vein thrombosis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prevention and management of jet lag	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Risk and prevention of accidents whilst overseas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**18. What advice do you give travellers? (Continued)**

	Never advise 1	2	3	4	Always advise 5
Dealing with pre-existing conditions (e.g. diabetes) whilst travelling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Travelling with medicines for chronic conditions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Altering dosage of medicines when travelling through multiple time zones	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Risk and prevention of sexually transmitted diseases	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Need for travel medical insurance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How to obtain medical care whilst overseas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tropical diseases at their destination	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prevention and treatment of acute mountain sickness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prevention and treatment of diving-related illnesses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Health issues of travelling whilst pregnant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**18. What advice do you give travellers? (Continued)**

	Never advise 1	2	3	4	Always advise 5
Health issues of travelling with children	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Safe alcohol and drug consumption whilst overseas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Travelling with a medical or first aid kit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The recommended contents of a first aid kit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Issues regarding personal safety and crime prevention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Current disease outbreaks at their destination	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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19. In what form do you give your advice to the traveller? (Tick ONE answer)

- ☐ Verbal advice only  
☐ Written advice only  
☐ A combination of verbal and written advice

20. Do you ever advise travellers via the telephone?

- ☐ Yes  
☐ No

21. Do you ever advise travellers via e-mail?

- ☐ Yes  
☐ No

22. What information sources do you use in the provision of travel-related health advice?

(Using the scale (1- Never use, 2 – Rarely use, 3 – Occasionally use, 4 – Frequently use, 5 - Always use) rate the following resources on their usefulness)

	Never use 1	2	3	4	Always use 5
Therapeutic Guidelines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Australian Medicines Handbook (AMH)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Australian Immunisation Handbook	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Travel Bugs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
MIMS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical Advisory Service for Travellers Abroad (MASTA)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Centers for Disease Control and Prevention (CDC)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Travax	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
World Health Organization (WHO)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Australian Pharmacist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

22. What information sources do you use in the provision of travel-related health advice? (Continued)

	Never use 1	2	3	4	Always use 5
Australian Journal of Pharmacy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Journal of Pharmacy Practice and Research	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Pharmaceutical Journal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hospital Pharmacist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical Journal of Australia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Australian Family Physician	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Current Therapeutics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Journal of Travel Medicine	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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**23. Are travellers willing to pay for this service? (Tick ONE answer)**

- ☐ Yes
- ☐ No
- ☐ Do not know

**Section C: Future travel health services delivered by pharmacists, barriers to enhanced services and training needs.**

This section is designed to tell us some information about potential barriers to pharmacists being more involved in the provision of travel health advice. For questions 24-29 Choose the most appropriate answer.

**24. We are interested in your views regarding the current and future role of pharmacists with regard to travel health.**

(Read the following statements and using the 5-point scale select as appropriate (1-strongly disagree, 2 – disagree, 3 – neutral (neither agree or disagree), 4- agree, 5-strongly agree))

	Strongly disagree	1	2	3	4	Strongly agree
Travellers want pharmacists to offer travel health services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pharmacists cannot offer adequate travel health services as they cannot administer vaccines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pharmacists cannot offer adequate travel health services as they cannot supply S4 medications without prescription	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Offering travel health services would cause antipathy with the medical profession	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Travel health is not an appropriate role for pharmacists	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The most appropriate role for pharmacists in travel health is to check the appropriateness of medicines prescribed for the traveller	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The pharmacist has a role advising travellers who would not normally visit a doctor before travelling on travel-related health issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The pharmacist has a role advising travellers whether to seek medical advice before visiting certain destinations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The pharmacist can adequately advise the traveller on items to place in a first aid kit when travelling to remote destinations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The pharmacist has a role in advising travellers on the prevention and treatment of travel-related health issues not covered by the doctor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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**25. We are interested in your views regarding possible barriers that would limit or slow the development of role of pharmacists with regard to travel health.**

(Read the following statements and using the 5-point scale select as appropriate (1-strongly disagree, 2 – disagree, 3 – neutral (neither agree or disagree), 4- agree, 5-strongly agree))

	Strongly disagree	1	2	3	4	5	Strongly agree
The average community pharmacist would not have enough time to provide quality travel health services	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
My pharmacy has inadequate staffing levels to provide quality travel health services	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Pharmacy assistants could advise travellers on travel-related health issues	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Travellers do not want pharmacies to offer travel health services	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Travel health services would not be profitable for pharmacies	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
I am not interested in providing travel health services	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Pharmacists are inadequately trained to provide travel health services	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
The inability to supply S4 medicines without prescription would make travel health services unviable from pharmacies	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Perceived antipathy from other health professionals would stop me developing travel health services	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

**26. Have you had any formal training in travel medicine? (Tick ONE answer)**

- ☐ Yes
- ☐ No

**27. What qualifications have you received in travel medicine?**

(State qualification) \_\_\_\_\_

**28. What training should pharmacists require to offer travel health services?**

(Tick ONE answer)

- ☐ None
- ☐ Accreditation from a Pharmacy Professional body
- ☐ Accreditation from a Travel Medicine Professional body
- ☐ University post graduate qualification specific to travel medicine
- ☐ University subject as part of a post graduate pharmacy qualification

**29. If you were participating in a training or accreditation course in travel health, how would you like to study the course?**

(Tick ONE answer)

- ☐ Face to face teaching in block mode
- ☐ Distance education via the internet
- ☐ Combination of distance education and block mode

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**Section D: Assessment of knowledge of pharmacists with regard to a selection of travel-related health issues**

In this section, we are trying to ascertain the current level of knowledge of a sample of pharmacists about some common and some less common travel health issues. It is important that you do not do any additional research before or whilst answering these questions.

**30. What is the most common cause of mortality for travellers to developing countries?**  
(Tick ONE answer)

- ☐ Malaria
- ☐ Typhoid
- ☐ HIV
- ☐ Motor vehicle accident
- ☐ Cholera
- ☐ Myocardial infarction
- ☐ Yellow fever

**31. What are the FOUR most common travel-related health problems experienced by travellers from Australia to a developing country?**

(Select the FOUR most common problems from the list below)

- ☐ Meningococcal meningitis
- ☐ Cholera
- ☐ Typhoid
- ☐ Motion sickness
- ☐ Hepatitis A
- ☐ HIV
- ☐ Rabies
- ☐ Gonorrhoea
- ☐ Schistosomiasis
- ☐ Jet lag
- ☐ Malaria
- ☐ Acute respiratory tract infection
- ☐ Diarrhoea
- ☐ Polio
- ☐ Hepatitis B
- ☐ Yellow fever
- ☐ Trypanosomiasis

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**32. Yellow fever is prevalent in which of the following countries?**

(Choose all that apply)

- ☐ Brazil
- ☐ Kenya
- ☐ India
- ☐ Thailand
- ☐ Japan

**33. Malaria is prevalent in which of the following countries?**

(Choose all that apply)

- ☐ Brazil
- ☐ Kenya
- ☐ India
- ☐ Thailand
- ☐ Japan

**34. Typhoid is prevalent in which of the following countries?**

(Choose all that apply)

- ☐ Brazil
- ☐ Kenya
- ☐ India
- ☐ Thailand
- ☐ Japan

**35. What is the commonest cause of Traveller's Diarrhoea?**

(Tick ONE answer)

- ☐ Salmonella spp
- ☐ Giardia intestinalis
- ☐ Campylobacter pylori
- ☐ Enterotoxigenic E.coli (ETEC)
- ☐ A rotavirus

**36. With regard to the prevention of traveller's diarrhoea which of the following statements is incorrect?**

(Tick ONE answer)

- ☐ When cooking poultry, travellers should buy fresh, clean meat and soak in salted water before rinsing under running water and drying before cooking
- ☐ Be aware that raw seafood can transmit diseases such as typhoid fever, infectious hepatitis and dysentery
- ☐ Eating raw seafood in north east Thailand may result in opisthorchiasis, trypanosomiasis and paragonimiasis
- ☐ Before eating vegetables they can be soaked in Milton or potassium permanganate and rinsed in clean water
- ☐ Newer oral cholera vaccines such as Dukoral offer some protection against ETEC-induced diarrhoea for up to 3 months after administration

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37. Jeff is a 26-year old mountaineer trekking in the Himalayas for 1 month. He develops diarrhoea and has had four loose bowel motions in the last 24 hours with nausea, abdominal cramps and faecal urgency. His doctor has supplied some medicines including Gastrolyte® tablets, Loperamide 2mg capsules, Norfloxacin 400mg tablets and Doxycycline 100mg tablets. Which of the following statements best summarises how you would recommend he treats his diarrhoea?

(Tick ONE answer)

- ☐ No active treatment, just maintain hydration using Gastrolyte and allow the diarrhoea to take its course
- ☐ Start treatment immediately with Loperamide whilst drinking plenty of fluids
- ☐ Start treatment immediately with one dose of Norfloxacin 800mg plus Loperamide whilst drinking plenty of fluids
- ☐ Start treatment immediately with one dose of Norfloxacin 800mg whilst drinking plenty of fluids
- ☐ Start treatment immediately with one dose of Doxycycline 200mg plus Loperamide whilst drinking plenty of fluids

38. Before leaving Australia for the Himalayas, Jeff asked his pharmacist for some recommendations on which items to carry in a first aid kit in his rucksack. Below is a list of common items included in some commercial kits. From the list below, select the FIVE most important items that you think Jeff should carry.

(Tick FIVE answers)

- ☐ Mercury thermometer
- ☐ Sharps kit (containing sterile needles and syringes)
- ☐ Insect repellent
- ☐ Paracetamol or aspirin tablets
- ☐ Throat lozenges
- ☐ Small range of bandages, dressings and tapes
- ☐ Iodine solution
- ☐ Antiseptic cream
- ☐ Oral rehydration
- ☐ Appropriate antimalarials
- ☐ Antidiarrhoeal agent
- ☐ Broad spectrum antibiotic
- ☐ Metoclopramide tablets
- ☐ Sleeping tablets
- ☐ Antihistamine tablets
- ☐ Norfloxacin tablets
- ☐ Sunscreen
- ☐ Salbutamol inhaler

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**39. Jenny Smith is a 30-year old woman who is planning to go on safari in Kenya for 4 weeks. Which of the following vaccinations would be recommended?**

(Choose all that apply)

- ☐ Typhoid
- ☐ Rabies
- ☐ Meningococcal meningitis
- ☐ Cholera
- ☐ Hepatitis A
- ☐ Hepatitis B
- ☐ Japanese B encephalitis
- ☐ Tick borne encephalitis
- ☐ Polio
- ☐ Tetanus
- ☐ Malaria
- ☐ Yellow fever
- ☐ Dengue fever
- ☐ Schistosomiasis
- ☐ Diphtheria

**40. Regarding common vaccinations, which of the following statements is incorrect?**

(Tick ONE answer)

- ☐ Hepatitis A vaccine and immunoglobulin may be administered simultaneously if a traveller present for immunisation the day before travelling
- ☐ Polio vaccination only has an effective life of 3 years and therefore boosters are recommended for travellers to destinations where polio is endemic
- ☐ Yellow fever vaccination is a legal requirement for travellers to many parts of tropical Africa
- ☐ Japanese encephalitis vaccine can cause delayed anaphylactic reactions and therefore vaccinees should be observed for 30 mins after vaccination and should remain close to medical care for up to 10 days
- ☐ Rabies vaccine is often in limited supply

**41. Regarding the prevention of malaria, which of the following statements is incorrect?** (Tick ONE answer)

- ☐ Oral vitamin B1 is not effective in decreasing the number of mosquito bites
- ☐ The ideal mosquito repellent should contain 20-30% DEET (Diethyltoluamide)
- ☐ When needing to apply sunscreen and mosquito repellent together it is better to apply the repellent first and wait 20 minutes before applying the sunscreen
- ☐ Travellers should wear covered shoes and loose fitting long trousers and long-sleeved, light coloured clothing between dusk and dawn in malarial areas
- ☐ Ideally travellers should sleep in air conditioned or well-screened rooms or under treated mosquito nets

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42. Alannah is a 22 year-old primary school teacher who is travelling to Thailand to work in a primary school in a small village near the border with Myanmar (Burma). She has no chronic conditions apart from occasional bouts of hayfever and thrush and her only regular medication is an oral contraceptive (Trifeme®). What would be the most appropriate agent for her to take for malarial chemoprophylaxis? (Tick ONE answer)

- ☐ Atovaquone/proguanil (Malarone)
- ☐ Doxycycline
- ☐ Mefloquine (Lariam)
- ☐ Chloroquine
- ☐ Artemisin/lumefantrine (Riamet)

43. Jet lag is a common problem for long-haul passengers. Which of the following statements is incorrect? (Tick ONE answer)

- ☐ Common aggravating factors for jet lag include travelling west, dehydration and excessive alcohol consumption on the plane
- ☐ Daily doses of melatonin between 0.5mg and 5mg are equally effective
- ☐ Melatonin doses above 5mg daily are no more effective than 5mg
- ☐ Travellers should avoid sleep deprivation during the flight
- ☐ Travellers should drink plenty of fluid during the flight but avoid caffeine-containing drinks

44. Jayne is a 35-year old woman bitten by a dog whilst visiting a temple in Cambodia. The dog appears to be behaving normally but the dog's teeth punctured her skin. What would be the best course of action for Jayne to take? (Tick ONE answer)

- ☐ Vigorously wash the area with soap and water and then apply povidone iodine and seek urgent medical attention to get the urgent administration of Rabies vaccine
- ☐ Vigorously wash the area with soap and water and then apply povidone iodine and seek urgent medical attention to get the urgent administration of Rabies vaccine and Rabies immunoglobulin
- ☐ Vigorously wash the area with soap and water and then apply 70% alcohol and povidone iodine and seek urgent medical attention to get the urgent administration of Rabies vaccine
- ☐ Wash the area with soap and water only
- ☐ No action is required

**Thank you for completing this survey. Please return it to James Cook University using the stamped addressed envelope supplied.**

**If you wish to participate in a draw to win an iPod Nano, please complete the slip provided and return it in the stamped addressed envelope with your completed survey. On receipt, the receptionist at the School of Pharmacy & Molecular Sciences, who is not involved in the study, will separate the slip and survey and hand the completed surveys to the investigator. This will ensure both your anonymity and maintain the blinding of the investigator.**

### Appendix 3.2: Participant information sheet (Pharmacist study e-survey)



## JAMES COOK UNIVERSITY

TOWNSVILLE Queensland 4811 Australia Telephone: (07) 4781 4111

### INFORMATION SHEET

#### **An electronic survey to assess the involvement of Australian Pharmacists in the provision of travel health services and their knowledge and understanding of common travel-related health issues**

You are invited to take part in a research project investigating the involvement of Australian Pharmacists in the provision of travel health services, the limitations of their current roles and any perceived barriers to further enhanced roles. Using scenarios, the study will also investigate the current level of knowledge of pharmacists about some common travel-related health issues and their training needs for future roles. The study is being conducted by Ian Heslop and will contribute to his doctoral thesis in the Doctor of Public Health program at James Cook University

If you are happy to be involved in the study, click on the link below which will take you to an online survey. The survey should take no more than 10-15 minutes to complete. The survey has a multiple choice question (MCQ) format, for each question select the most appropriate response(s). The scenarios are intended to evaluate the current knowledge and understanding of a number of common travel-related health issues. Therefore, we would like pharmacists to complete the survey without doing any research before answering the questions.

Taking part in this study is completely voluntary, anonymous and confidential. You can stop taking part in the study at any time without explanation or prejudice. You may also withdraw any unprocessed data from the study.

Your responses will be strictly confidential. The data will be collated by the PSA, de-identified and then forwarded to the investigator for analysis. The data from the study will be used in research publications and the investigator's Doctoral thesis. You will not be identified in any way in these publications.

If you wish to participate in a prize draw to win one of two iPods, you may leave your contact details. To maintain anonymity these details are separated from your survey responses and will be used in the draw but will not be given to the investigator

If you have any questions about the study, please contact Ian Heslop or Prof Richard Speare or Prof Beverley Glass.

Thank you for your help

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[beverley.glass@jcu.edu.au](mailto:beverley.glass@jcu.edu.au)

*If you have any concerns regarding the ethical conduct of the study, please contact Tina Langford, Ethics Officer, Research Office, James Cook University, Townsville, Qld, 4811. Phone: 4781 4342.  
[Tina.Langford@jcu.edu.au](mailto:Tina.Langford@jcu.edu.au)*

### Appendix 3.3: Participant information sheet (Pharmacist study postal survey)



## JAMES COOK UNIVERSITY

TOWNSVILLE Queensland 4811 Australia Telephone: (07) 4781 4111

### INFORMATION SHEET

#### **A survey to assess the involvement of Australian Pharmacists in the provision of travel health services and their knowledge and understanding of common travel-related health issues**

You are invited to take part in a research project investigating the involvement of Australian Pharmacists in the provision of travel health services, the limitations of their current roles and any perceived barriers to further enhanced roles. Using scenarios, the study will also investigate the current level of knowledge of pharmacists about some common travel-related health issues and their training needs for future roles. The study is being conducted by Ian Heslop and will contribute to his doctoral thesis in the Doctor of Public Health program at James Cook University

If you are happy to be involved in the study, please complete the enclosed survey and return it to James Cook University in the enclosed stamped addressed envelope. The survey should take no more than 10-15 minutes to complete. The survey has a multiple choice question (MCQ) format, for each question select the most appropriate response(s). The scenarios are intended to evaluate the current knowledge and understanding of a number of common travel-related health issues. Therefore, we would like pharmacists to complete the survey without doing any research before or whilst answering the questions.

Taking part in this study is completely voluntary, anonymous and confidential. You can stop taking part in the study at any time without explanation or prejudice. You may also withdraw any unprocessed data from the study.

Your responses will be strictly confidential. The data from the study will be used in research publications and the investigator's Doctoral thesis. You will not be identified in any way in these publications.

If you wish to participate in a prize draw to win one of two iPods, complete and return the enclosed slip. Please note: To maintain your anonymity the envelope will be opened by the Receptionist at the School of Pharmacy and the slip separated from the completed survey before it is given to the investigator.

If you have any questions about the study, please contact Ian Heslop or Prof Richard Speare or Prof Beverley Glass.

Thank you for your help

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#### Appendix 3.4: Entry form for postal draw (Pharmacist study)



A survey to assess the involvement of Australian Pharmacists in the provision of travel health services and their knowledge and understanding of common travel-related health issues

### iPod Nano Draw

Thank you for completing the survey. If you wish to participate in a draw to win an iPod Nano, please write your details in the spaces below and return this slip in the stamped addressed envelope with your completed survey. On receipt, the receptionist at the School of Pharmacy & Molecular Sciences, who is not involved in the study, will separate slip and survey and hand the completed surveys to the investigator. This will ensure both your anonymity and maintain the blinding of the investigator.

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Post Code: \_\_\_\_\_

### Appendix 3.5: PSA Essential CPE: Travel Health

Heslop I. Essential CPE: Travel Health June 2009. Melbourne: Pharmaceutical Society of Australia, 2009. (ISBN 978-0-646-51329-4)





# Travel Health

ESSENTIAL CPE



Continuing Education  
from the Pharmaceutical  
Society of Australia

  
Pharmaceutical  
Society of Australia

JUNE  
2009



# Learning objectives

After completing this *Essential CPE* module and assessment, the pharmacist should be able to:

- Recognise the reasons behind the recent growth in international travel and discuss the incidence of common travel-related health issues
- Explain the essentials of a pre-travel assessment for a traveller
- Respond to travellers' questions regarding common travel-related health issues such as sun safety, medical kits for travellers, air travel and deep vein thrombosis
- Advise travellers on the prevention and self-management of travellers' diarrhoea
- Discuss chemoprophylaxis and bite avoidance to reduce the risk of malaria in travellers, and to be aware of the clinical signs of malaria in a returning traveller
- Discuss the clinical features and treatments of a range of infectious diseases and vaccine-preventable diseases to which travellers may be exposed
- Advise on the precautions required when travelling with a chronic disease such as diabetes
- Advise a traveller about common measures that should be followed when taking medicines overseas
- Describe the precautions needed when purchasing medicines overseas
- Identify the key risks involved with travelling when pregnant.

## Competencies

Pharmacists can self-assess their abilities against the competency standards relevant to their role to determine areas in which further development is needed.

This *Travel Health Essential CPE* module addresses the following competencies:

**Functional area 3: *Promote and contribute to optimal use of medicines***

- Unit 1: Participate in therapeutic decision making
- Unit 2: Provide ongoing pharmaceutical management (Elements 1 & 2)

**Functional area 4: *Dispense medicines***

- Unit 2: Evaluate prescribed medicines
- Unit 3: Supply prescribed medicines (Element 3)

**Functional area 6: *Provide primary health care***

- Unit 1: Assess primary health care needs
- Unit 2: Address primary health care needs of patients (Elements 1, 2, 4, 5 & 6)
- Unit 3: Promote good health in the community (Elements 1, 2 & 3)

**Functional area 7: *Provide medicines and health information and education***

- Unit 3: Disseminate information (Elements 2 & 3).



## How to earn credit points

This activity has been accredited by the Pharmaceutical Society of Australia as a Group 2 activity for 6 points. Accreditation number: CP090002. PSA is authorised by the Australian Pharmacy Council to accredit providers of CPD activities for pharmacists that may be used as supporting evidence of continuing competence.

To obtain points, carefully read through the module, complete the assessment sheet, and submit it to PSA (Vic Branch) - see page 48 for details. Credit points are allocated to members who achieve 80% of questions correct.

**Submitting answers online provides immediate feedback: Visit [www.psa.org.au](http://www.psa.org.au)**

If posting your assessment, please photocopy your assessment sheet for your own records. Should you require your assessment sheet to be returned to you, please enclose a stamped, self-addressed envelope.

Submission is encouraged within 8 weeks of receipt; however will be accepted up to May 2011.



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# Introduction

*The range of health risks faced by travellers is both wide and varied. Travel health services and providers need to consider a wide range of issues and cannot focus only on what vaccinations (if any) and what malarial chemoprophylaxis is required for a particular destination. Therefore health professionals offering pre- and post-travel health advice need to be adequately trained in a range of areas including both tropical and travel medicine. This Essential CPE module is only an introduction to the specialty of travel health. It will discuss the incidence of travel-related disease, general travel advice and the management of simple travel-related disorders. Other areas discussed include the prevention and treatment of important infections to which travellers may be exposed, and travelling with chronic medical conditions. Pharmacists wishing to offer travel health services may wish to do further study in the area.*

Travel medicine is a recognised medical specialty that has grown and developed in recent years and is occasionally called 'emporiatrics' in some countries.<sup>1</sup> Every year a large proportion of the Australian population travels overseas, and people are becoming increasingly more adventurous in their choice of destination. Whilst overseas, many travellers experience minor health problems such as diarrhoea but a significant number of travellers also either suffer from complications due to these minor health problems, or have to deal with much more serious health problems. Factors that may influence the risk of travel-related health problems include the presence or increased incidence of disease at their destination, the hazards of travel or travel-related activities, or the lack or poor quality of health care at their destination. Overseas travellers may also be at greater risk of accidents, acute health problems (such as myocardial infarction), and/or exacerbations of pre-existing medical conditions. Finally, long term travellers may also face psychological problems and culture shock as they try to adapt to a new culture or environment.<sup>1</sup>

## What is travel health?

The terms travel medicine and travel health are often used synonymously<sup>1</sup> and it is often defined as:

*'that aspect of public health medicine which seeks to prevent illnesses and injuries occurring to travellers going abroad and manages problems arising in travellers coming back or coming from abroad. It is also concerned about the impact of tourism on health and advocates for improved health and safety services for tourists'<sup>2</sup>*

Increasingly, issues relating to migrant and refugee health are also discussed under the umbrella term 'travel health'.<sup>2</sup>

## The rapid growth in travel and tourism

Until 50 years ago, international tourism was relatively uncommon,<sup>3</sup> but since the 1960s annual trends worldwide have shown increasing numbers of people travelling overseas.<sup>3,4</sup> This is due to a variety of factors (Table 1), but mainly due to improvements in the availability, efficiency and cost of transport.<sup>1,4</sup> The United Nations World Tourism Organization (UNWTO) reported that in 2006 there were nearly 850 million international tourist arrivals worldwide, an increase of over 5.4% from the previous year,<sup>4</sup> and it has been estimated that over two million Australians travel overseas each year.<sup>2</sup> Although in the short term, some reduction in the number of international travellers may be expected due to the recent worldwide economic downturn, long term forecasts still suggest further increases in international arrivals in the future, with some estimates suggesting that annual international arrivals will be in excess of one billion by 2015<sup>5</sup> and 1.6 billion by 2020.<sup>4</sup>

## Destinations

Europe is still the world's leading tourist destination.<sup>4</sup> Reasons for this are the close proximity of the European countries to each other, the ease of air and land transport between the countries, the level of development of the





**Table 1: Reasons for the rise in international tourism and travel over the last 50 years**

- Improvement in world economies (especially in developing countries)
- Relative decrease in transportation costs
- Development of tourist economies and infrastructure (especially in developing countries)
- Increase in leisure time and disposable income
- An ageing population with a larger disposable income
- Globalisation and increased business travel
- Increasing numbers of students studying in and visiting overseas destinations
- Increasing numbers of migrants returning to visit their country of origin
- Improvements in political stability in areas of the world
- Increased interest in foreign cultures and ecologies and greater access to information via the Internet
- Increased marketing of travel
- Increases in publication and media interest in travel (and adventure travel in particular).

(Adapted from Treadwell)

tourism industry in Europe and the popularity of the European destinations to tourists from non-European countries such as Canada, the USA and Australia.<sup>3</sup> Recent studies show that international tourists are increasingly travelling to more exotic or higher risk locations such as Africa (in particular sub-Saharan Africa) and Asia.<sup>4</sup> In 2006, Africa was the leading region for tourism growth, with an annual increase in international arrivals of 9%, nearly twice the global average. The Asia/Pacific region was the next best performing region, but within this region, Oceania performed relatively poorly, with growth figures of only 0.9% for Australia and 1.8% for New Zealand. Australia's relatively poor performance was due mainly to a large decline in the number of visitors from Japan and increases in both oil prices and air fares.<sup>4</sup> It must also be noted that Australians tend to visit exotic locations more frequently than travellers from other countries, with 9% of Australian tourists visiting Africa and 13% visiting southern Asia.<sup>3</sup>

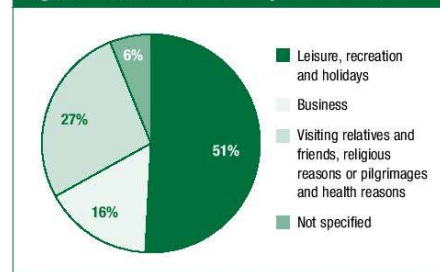
Although many travellers visit relatively 'safe' destinations such as Europe, it must be understood that all travel has some inherent risk. Thus, travel health services should not just focus on travellers to exotic and tropical destinations but provide a range of services to all travellers.

## Types of tourism

Figure 1 shows that the majority of international tourists (51%) travel for pleasure, leisure, recreation or for a holiday.<sup>3,4</sup> Most tourists travel to industrialised countries, or if they do visit developing countries they tend to either stay in resorts, close to resorts, or go on organised tours.<sup>3</sup> Increasingly, more travellers are interested in more

adventurous holidays or more adventurous activities whilst on holiday.<sup>3</sup> This trend is not only seen in younger travellers, but is now also evident in older travellers. This is important as many travellers often take greater risks whilst overseas, and older travellers may be at greater inherent risk due to their age or the presence of age-related risk factors.<sup>3</sup>

**Figure 1: Inbound tourism by reason of visit**



(Source: UNWTO 2007)

In 2006, only 16% of international arrivals were travelling either for business or to attend conferences,<sup>4</sup> but the sector is steadily growing.<sup>3</sup> In many cases these travellers have lower health risks than other types of tourists, but it is believed that economic globalisation and the expansion of developing economies will increase the number of business travellers to higher risk destinations.<sup>3</sup>

Over a quarter of tourists travel either to visit relatives, or are travelling for religious or health reasons,<sup>4</sup> and this is a significant group of travellers for countries such as Australia with relatively large migrant populations. Many family groups, often including children born in Australia, visit their native country regularly to visit relatives. If staying with relatives, they may be at a higher risk of some travel-related illnesses because they will be living in close proximity with the local population. This group of travellers often poses a challenge to travel-health professionals as they may not accept all pre-travel recommendations, and they often assume a level of inherent immunity to some diseases as they were born in that country. Unfortunately, this is not always the case. Increasingly, groups of travellers leave Australia to complete religious pilgrimages such as to Mecca for the Hajj or Umrah. Depending on their destination, pilgrims may require specific vaccinations prior to travel or face higher risk of certain conditions at their destination. Finally, another relatively new group of travellers are those travelling for medical treatments or procedures that are either unavailable or more expensive in their country of origin. This may be combined with a holiday or period of recuperation at their destination prior to their return.<sup>4</sup>

## Economics of international tourism

Tourism represents a significant and growing portion of the world's economy (US\$733 billion in 2006).<sup>4</sup> Visitor expenditure on accommodation, food, local travel and entertainment is an important contribution to the economy of many countries, with over 75 countries earning more than US\$1 billion in receipts from international tourism.<sup>4</sup> Europe receives over 50% of international tourism receipts followed by the Asia/Pacific region (21%), Americas (21%), Middle East (4%) and Africa (3%).<sup>4</sup>

**Table 2: Factors influencing travel health risk**

- Destination
  - Industrialised country versus developing country
  - Capital city or highly developed resort versus small rural village or remote area
- Endemicity of disease in the area visited
- Season of travel
  - Wet season versus dry season
  - Summer versus winter
- Duration of stay abroad
- Purpose of travel
  - Tourism
  - Business
  - Visiting friends and relatives
  - Working in rural areas
  - Military or disaster relief work
- Travel characteristics
  - Expected hygiene standard
- Higher risk activities such as:
  - Diving
  - Mountaineering
  - Base jumping
  - Canyoning and rafting etc.
- Traveller characteristics
  - Age
  - Behaviours
  - Preventative measures taken
  - Pre-existing conditions
  - Immune versus non-immune or immunocompromised.

(Adapted from Steffen et al<sup>5</sup>)

## Incidence of health problems for travellers

Travellers are at greater risk of disease or death compared to people who stay at home<sup>6</sup> and travel health risk varies according to a variety of factors (Table 2). But key factors are the behaviours of and preventative measures taken by the visitor, the duration of stay and the level of endemicity of the disease in the area visited.<sup>6</sup> Between 65–75% of

travellers to developing countries have a health problem whilst overseas, but the majority of these health problems are not serious, with less than 10% of travellers visiting a doctor or being confined to bed either during their travels or shortly after their return.<sup>6</sup> Less than 1% of travellers are hospitalised whilst overseas, and on average only one traveller per 100,000 dies whilst abroad.<sup>6</sup> Table 3 summarises some of the health risks of international travel.<sup>7</sup>

**Table 3: The risks of international travel**

### Of 100,000 travellers to the developing world for one month:

- 50,000 will develop some sort of health problem during their trip
- 8,000 will see a doctor
- 5,000 will be so ill they will have to stay in bed
- 1,100 will be incapacitated in their work either abroad or returning home
- 300 will be admitted to hospital (either during their trip or on their return)
- 50 will have to be evacuated by air
- 1 will die.

(Adapted from Spira<sup>7</sup>)

## Causes of mortality in travellers

Mortality rates among travellers vary depending on factors such as the destination and the actual activities carried out by the traveller whilst overseas. For example, the mortality rate for trekkers in Nepal is approximately 15 times higher than the average rate of mortality for other types of travellers.<sup>8</sup> Although travel health has a major focus on the prevention and treatment of infectious diseases, only 1–3% of cases of deaths reported in travellers is attributable to an infectious disease.<sup>1,2</sup> The leading causes of death for travellers overseas are usually accidents, injuries or cardiovascular events.<sup>1,2,6</sup> Accidents are common among tourists, as travellers often take risks that they would not normally take at home.

Fatal accidents tend to be mostly motor vehicle accidents (MVAs) and the rate of MVAs involving tourists is often many times that of the local population.<sup>9</sup> Many fatal MVAs involving tourists are motorcycle accidents, and contributing factors may include that wearing safety helmets is not a legal requirement in some countries or that safety helmets may be of a poor quality, and again, tourists often take risks that they would not take at home.<sup>9</sup> Alcohol is also a contributory factor in many MVAs involving tourists. Additionally, travellers from countries that normally drive on the opposite side of the road are 2.5 times more likely to have accidents than travellers from countries that normally drive on the same side of the road





in the country they are visiting.<sup>2,8</sup>

Drowning is also a frequent cause of death in travellers and again, the consumption of alcohol is often a contributory factor.<sup>6</sup> The incidence of kidnapping and murder is increasing but is usually restricted to employees of international or non-governmental organisations.<sup>6</sup> Although more likely to be reported in the media, death due to assault, terrorism or animal attack is relatively uncommon.<sup>6</sup> Malaria is the most frequent cause of death due to an infectious disease in travellers.<sup>6</sup> Approximately 10,000 cases of malaria are imported into industrialised nations by travellers per year and fatalities are usually due to *Plasmodium falciparum* with a case fatality rate of between 0% and 3.6%.<sup>9</sup>

### Causes of morbidity in travellers

The most commonly reported health problem in travellers is diarrhoea, with reports of between 25-90% of travellers experiencing symptoms in the first two weeks of going overseas.<sup>6</sup> Therefore, pre-travel advice regarding the prevention and self-treatment of diarrhoeal diseases is a priority for most travellers.<sup>6</sup> The prevention and management of travellers' diarrhoea is discussed later in the module. The risk of diarrhoea varies depending on the level of hygiene in the country being visited. It has been noted that visitors from high risk countries often experience lower rates of diarrhoea when travelling as some level of immunity may develop.<sup>6</sup>

Malaria and other tropical diseases are a concern when travelling to endemic areas, particularly if the disease affects travellers who then return to countries where clinical expertise and knowledge of the disease is minimal.<sup>2</sup> More travellers are contracting malaria each year as the numbers of visitors to endemic areas increases and as resistance to standard chemoprophylactic regimes increases. Approximately 700 reported cases of malaria are imported into Australia each year, mainly from Papua New Guinea and the Solomon Islands.<sup>2</sup> Fortunately, only 25% of cases are potentially fatal infections caused by *P.falciparum*.<sup>2</sup> Appropriate pre-travel advice, the need for chemoprophylaxis and appropriate assessments of returning travellers presenting with fever is an important role for travel health professionals.<sup>2</sup>

Sexually transmitted infections (STIs) are frequently reported in travellers and preventative measures should be considered by travellers who may be at risk of an STI.<sup>2,6</sup> It is known that casual sex is practised by 4-19% of travellers whilst abroad and nearly 50% do not use condoms.<sup>6</sup> STIs are most commonly reported in young adults travelling without a regular partner and who have frequent sexual partners whilst at home.<sup>6,9</sup> Alcohol or recreational drug use may increase the risk of STIs<sup>6,9</sup> and 'sex tourists' would be at most risk of STIs whilst

overseas.<sup>8</sup> It is estimated that 14-25% of cases of gonorrhoea and syphilis diagnosed in Europe are imported from abroad<sup>6</sup> and that in the UK the risk of acquiring HIV is considered to be 300 times greater whilst abroad compared to the risk of acquiring HIV in the UK.<sup>6</sup> A study of German sex tourists to Thailand showed that only 30-40% regularly used condoms as they thought of their contacts more as 'intimate friends' not as prostitutes.<sup>8</sup> But it must be remembered that the prevalence of HIV and other STIs in prostitutes exceeds 50% in some countries.<sup>6</sup> Travellers may benefit from advice about safer sex, condom use, emergency contraception and hepatitis B vaccination.<sup>9</sup>

As well as diarrhoea, the common cold is one of the most common health problems reported in short term international travellers with an incidence of about 13%. Although generally considered a mild infection, 40% of cases reported being incapacitated for an average of 2.6 days which may have a significant effect on a short holiday or business trip.<sup>6</sup> Influenza is the most common vaccine-preventable condition with an incidence of 1% in travellers. Other significant infectious diseases to be considered in travellers include the vaccine-preventable conditions and diseases such as dengue, schistosomiasis, legionella, leishmaniasis and trypanosomiasis.<sup>6</sup> Some will be discussed later in the module.

Non-infective health issues for travellers may include anxiety, motion sickness, jet lag and in-flight emergencies. Stress and anxiety can be caused by travel itself, but may also be due to a fear of flying.<sup>6</sup> Flight or airport delays can exacerbate the stress of travel for some travellers.<sup>6</sup> Motion sickness is a common problem and tends to be reported more by passengers on boats and small vessels in rough seas, and is reported in up to 80% of passengers in some studies.<sup>6</sup> The incidence of motion sickness appears to be lower in air travellers but is still commonly reported.<sup>6</sup> In-flight emergencies can occur in one per 11,000 passengers and are generally gastrointestinal, cardiac, neurological, vasovagal or respiratory in nature.<sup>6</sup>

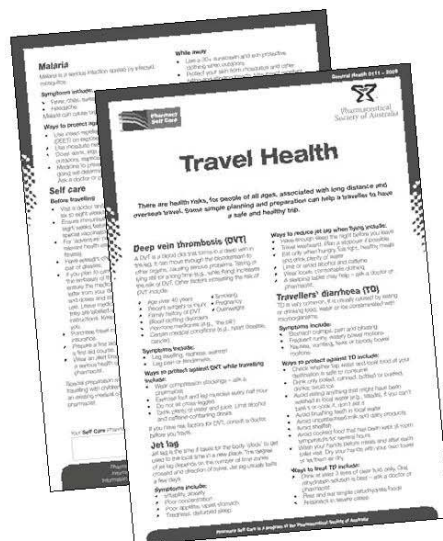
Finally, travellers with pre-existing, chronic conditions may experience some exacerbation of their problems whilst overseas. For example, travellers with gastrointestinal problems such as diarrhoea or constipation may experience a worsening of their condition, whereas travellers from temperate countries with some dermatological conditions or degenerative joint pain may experience an improvement in their condition whilst holidaying in a warm, sunny climate.<sup>6</sup> Elderly travellers may also be at risk of falls whilst travelling, whereas sport injuries such as strains, sprains and fractures are common in younger travellers.<sup>6</sup>

## Sources of travel health information

Health professionals tend to supply the traveller with four key services:<sup>1</sup>

1. Pre-travel advice
2. Prescriptions and/or recommendations for medicines or medical supplies to take with them overseas
3. Vaccinations
4. The review and assessment of problems in the returned traveller.

Travellers may seek advice from a variety of sources such as their GP, Travel Clinic, Community Pharmacist, Travel Agent and increasingly, travel guides and the internet. Studies have shown that the advice given by all of these sources can be variable and a risk is that the traveller seeking advice from a range of sources obtains conflicting advice.<sup>1,2,7</sup> For health professionals providing travel health advice it is important that reliable and up to date information resources are used to obtain accurate information on the potential risks, current disease trends and disease outbreaks at destinations.<sup>1,2,7</sup> Some examples are listed in Table 4. Many internet sites and information resources reflect American, British or European guidelines so it is important to remember that they may not always reflect current Australian practice.



**Table 4: Some recommended sources of travel health information<sup>1,2,7</sup>**

### Government bodies

- Australian Department of Foreign Affairs and Trade (DFAT)
  - Travel advisories and bulletins
  - [www.smarttraveller.gov.au](http://www.smarttraveller.gov.au)
  - [www.dfat.gov.au](http://www.dfat.gov.au)
- World Health Organization (WHO)
  - [www.who.int/ith](http://www.who.int/ith)
- Centers for Disease Control (CDC)
  - [www.cdc.gov/travel/index.htm](http://www.cdc.gov/travel/index.htm)
- US Department of State
  - State department travel warnings and consular information
  - [www.travel.state.gov](http://www.travel.state.gov)
- UK Dept of Health
  - [www.doh.gov.uk/traveladvice](http://www.doh.gov.uk/traveladvice)

### Professional societies

- International Society of Travel Medicine
  - [www.istm.org](http://www.istm.org)
- Australasian College of Tropical Medicine
  - [www.tropmed.org](http://www.tropmed.org)
- Royal Society of Tropical Medicine and Hygiene
  - [www.rstmh.org](http://www.rstmh.org)
- American Society of Tropical Medicine and Hygiene
  - [www.astmh.org](http://www.astmh.org)

### Commercial sites

- MASTA
  - [www.masta.edu.au](http://www.masta.edu.au)
- TRAVAX
  - [www.travax.scot.nhs.uk](http://www.travax.scot.nhs.uk)

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- Steffen R, DuPont H, Wilder-Smith A. A manual of travel medicine and health, 2nd ed. BC Decker, 2003.
- CDC. Health Information for International Travel 2008 (<http://www.cdc.gov/travel/content/yellowBook.aspx>).
- Sansom L (editor). Australian pharmaceutical formulary and handbook, 21st ed. Canberra: Pharmaceutical Society of Australia, 2009.

### Consumer self care information

- Travel health Pharmacy Self Care (PSC) Fact Card. Canberra: PSA, 2009 Feb.





# Preparing the traveller



It is important that travel health advice is up to date, individualised and timely.<sup>2</sup> As some vaccinations must be given several weeks before travelling to be effective, it is important that the traveller leaves enough time to visit their travel health adviser before their journey so that all appropriate interventions can be completed prior to travel.<sup>2</sup> It may be necessary to perform pre-travel consultations over more than one visit. This is because some vaccination schedules require multiple doses, but also the traveller may require a great deal of information. It would be better to give this information over multiple visits to help with understanding. This also allows for some reinforcement when a large volume of information is given.<sup>2,7</sup>

When preparing travellers for their journey Spira<sup>7</sup> recommends that the health professional carries out the following:

1. Assess the traveller's baseline health
2. Review the travel itinerary
3. Decide which vaccinations (and other medical interventions) are required
4. Educate the traveller about disease prevention and health maintenance.

Table 5 summarises Spira's key recommendations regarding what should be included in the pre-travel consultation.

## Health assessment of the traveller

The traveller should be given a thorough health assessment as part of the pre-travel consultation, with the aim of assessing the traveller's current health status and to identify any underlying health problems that may worsen or lead to other medical problems whilst overseas.<sup>7</sup> This is especially important if the traveller intends to visit countries where health services may be limited. Important considerations are the patient's current and past medical history, current medications, history of allergic reactions (either drug or environmental), the possibility of pregnancy

and the traveller's age.<sup>7</sup> The traveller should be assessed for possible contraindications to vaccines or medications that may be required for or during the journey.<sup>7</sup>

## Review of the traveller's itinerary

It is important that the traveller's itinerary is reviewed with regard to the dates of departure and return and what stopovers, if any, are planned in the journey.<sup>7</sup> The traveller should be questioned about their plans during their stopovers, for example a traveller transiting in an international airport or staying overnight in a capital city would be at a relatively low risk of travel-related health problems, but their risk may increase if they intended to stay several days or intended to visit rural or agricultural areas during their visit. The type and style of travel is also important. Are they visiting a rural or urban destination? Is the traveller staying in budget accommodation or luxury accommodation? Is the traveller travelling alone or in a group? What is the purpose of the travel, business or tourism? What activities are intended during the traveller's journey overseas?<sup>7</sup> The season in which the traveller is travelling may also be important as some conditions may be more prevalent in either the wet or dry season, or in winter or summer.<sup>7</sup> It is also important to check for recent disease outbreaks at the travellers destination.<sup>7</sup> Government and WHO websites are useful sources of information in this regard as they are regularly updated.

## Immunisations

Vaccinations and immunisations will be discussed in more detail later in the module, but when choosing vaccines for a traveller they are often divided into the following categories:<sup>7,10,11</sup>

- Required vaccines – Vaccines that are mandated by the WHO or governments for travellers visiting or returning from certain countries,<sup>7,10,11</sup> e.g. Yellow fever vaccine.
- Routine vaccines – Vaccines considered for all travellers. These include the standard 'childhood' vaccines included in the national immunisation



Table 5: Approach to pre-travel visit			
1. Traveller's baseline health assessment	<b>Assess:</b> <ul style="list-style-type: none"> <li>• State of current health</li> <li>• Medical history</li> <li>• Underlying conditions</li> <li>• Current medications</li> <li>• History of allergy (drug or environmental)</li> <li>• Pregnancy.</li> </ul>		
2. Review of travel itinerary	<b>Consider:</b> <ul style="list-style-type: none"> <li>• Dates of travel</li> <li>• Destinations</li> <li>• Stopovers (and length of stopover)</li> <li>• Seasons and climates</li> <li>• Type and style of travel</li> <li>• Environments to be visited.</li> </ul>		
3. Which vaccinations are required?	<b>Consider:</b> <ul style="list-style-type: none"> <li>• Routine vaccinations               <ul style="list-style-type: none"> <li>- Has traveller had all standard vaccinations?</li> <li>- Are any boosters required?</li> </ul> </li> <li>• Required vaccinations               <ul style="list-style-type: none"> <li>- Are any vaccinations legally required for entry into the destination(s)?</li> </ul> </li> <li>• Recommended vaccinations               <ul style="list-style-type: none"> <li>- What vaccinations are recommended based on the risk of exposure at their destination(s) and the travellers current immune status?</li> </ul> </li> </ul> <b>Also consider:</b> <ul style="list-style-type: none"> <li>• History of adverse events</li> <li>• Administration of the vaccine</li> <li>• Whether there is an adequate period of observation post-vaccination?</li> </ul>		
4. Health education	a. Obligatory counselling	<b>Consider:</b> <ul style="list-style-type: none"> <li>• Insect precautions</li> <li>• Malaria chemoprophylaxis</li> <li>• Food and water precautions</li> <li>• Travellers' diarrhoea and self-management</li> <li>• Current disease outbreaks at destination(s)</li> <li>• Environmental risks of water-borne disease</li> <li>• Vector-borne disease</li> <li>• Climate and jet lag</li> <li>• Trauma from MVA or animals</li> <li>• General health and routine illness</li> <li>• Clothing and footwear</li> <li>• Travel-specific medications               <ul style="list-style-type: none"> <li>- Self-treatment, prophylaxis, risk of adverse events</li> </ul> </li> <li>• Routine medications</li> <li>• Sexual activity</li> <li>• First aid kits</li> <li>• Local medical care at destination</li> <li>• When post-travel assessment is required</li> <li>• Travel health insurance</li> <li>• Crime and safety at destination(s).</li> </ul>	
	b. Optional counselling (based on risk or trip)	<b>Consider environmental risks from:</b> <ul style="list-style-type: none"> <li>• Altitude</li> <li>• Marine and diving-associated diseases</li> <li>• Heat or cold</li> <li>• Motion sickness</li> <li>• Adventure or expedition health risks</li> <li>• Region-specific pathogens</li> <li>• Parasites</li> <li>• Zoonoses.</li> </ul>	<b>Consider specific health advice for:</b> <ul style="list-style-type: none"> <li>• Pregnant women</li> <li>• Elderly travellers</li> <li>• People travelling with children</li> <li>• Immunocompromised travellers.</li> </ul>

(Adapted from Spira<sup>2</sup>)



guidelines in the *Australian Immunisation Handbook*.<sup>12</sup> Boosters for tetanus, diphtheria, pertussis and in some cases polio, should be considered.<sup>7,10,11</sup> Influenza and pneumococcal vaccines should be considered for travellers over 65 years of age<sup>7,10,11</sup> and *Haemophilus influenzae* type B (HIB) is recommended for travellers under five years of age.<sup>7,10,11</sup>

- Recommended vaccines – Vaccines considered for travellers based on the risk of exposure and their current immune status.<sup>7</sup> Vaccines in this category include hepatitis A, hepatitis B, rabies, typhoid fever, meningococcal meningitis and Japanese B encephalitis. The decision to vaccinate will depend mainly on the destination (or sometimes the region of a country) being visited and what activities the traveller intends to do at their destination.<sup>11</sup> For example, polio boosters may be required for visitors to countries where polio is still prevalent, such as India or Pakistan, or hepatitis A vaccine may be required if the traveller is visiting a developing country.<sup>11</sup> Travellers who may come into contact with blood products, such as health care workers or medical students, may also require hepatitis B vaccine.<sup>11</sup> When deciding to vaccinate, other factors for consideration include the severity and consequences of the disease and the availability of adequate healthcare at the destination. For example, the risk of rabies for most tourists is low in comparison to other vaccine-preventable disorders, but the disease is invariably fatal once symptoms become apparent.<sup>10</sup> Due to the issue of cost, the availability of rabies vaccine and rabies immunoglobulin is poor in many countries in which the prevalence of rabies is high. Therefore vaccination may be indicated for travellers

visiting rabies-endemic areas that may come into contact with rabies such as travellers to India or Africa and agricultural workers and veterinarians.<sup>10</sup>

## Counselling and education of the traveller

The main aims of pre-travel consultation are the prevention of travel-related illness in the traveller, and to educate the traveller on the best way to manage illness should it occur during their journey.<sup>7</sup> The consultation must be long enough to adequately educate the traveller on how to remain healthy on their journey, but also how and when to self-medicate and how, when and where to obtain medical care should the traveller become ill during their journey.<sup>7</sup> The consultation may be supported with educational materials such as brochures, leaflets and videos but there has to be some personal interaction between the health professional and traveller so that the traveller's questions can be answered.<sup>7</sup> This is preferably and generally face to face, although some travel clinics do offer telemedicine advice services.<sup>13</sup> To provide adequate advice to travellers, it is important that the health professionals (mostly doctors and nurses) are adequately trained and up to date.<sup>7</sup> The information that is given to travellers must be individualised to meet the traveller's needs, but may be categorised into obligatory and optional information depending on the itinerary of the journey, health risk, type of travel and also the traveller's wish to learn.<sup>7</sup> Table 5 summarises the main topics to be discussed in the pre-travel consultation and we will examine some of these areas in more detail in the remainder of this module.





# General travel advice

## Sun safety

The damaging effects of sun overexposure is not only an issue for travel health but is also a serious health concern for all Australians. The three bandwidths of ultraviolet (UV) radiation that have harmful effects on the skin are UVA (320-400 nm), UVB (290-320 nm) and UVC (200-290 nm).<sup>1,14,15</sup> Most UVC is filtered by the ozone layer and about 80% of UV radiation reaching the earth's surface is in the UVA range and 20% in the UVB range.<sup>1</sup> Sunburn is caused mainly by UVB whereas both UVA and UVB are involved in tanning, photoageing and the development of skin cancers.<sup>1,14</sup> A variety of factors may alter the intensity of the sun (and therefore exposure to UV radiation) and these are summarised in Table 6.

### Sunburn

Sunburn is an acute inflammatory response to UV radiation resulting in hot, red, painful and swollen skin.<sup>1,15</sup> There are two phases to the reaction. Firstly, the immediate response to sun overexposure is the development of a pink colouration that quickly disappears. About six hours later, a delayed reaction follows, with the development of a more intense redness of the skin, which then becomes hot, sore and slightly swollen. This may be accompanied with systemic symptoms such as shivering, fever and nausea.<sup>1,15</sup> If the sunburn is severe, skin blistering can occur and it may be life threatening if a large body surface area is affected.<sup>1,15</sup> Cooling lotions and simple analgesics such as paracetamol may be used to treat mild sunburn.<sup>1,15</sup> Non-steroidal anti-inflammatory drugs (NSAIDs) may be used to reduce erythema.<sup>1,15</sup>

### Suntan

Suntanning is a response of the skin to protect itself from UV radiation and again, it is a two stage process.<sup>1,15</sup> Firstly, UVA radiation oxidises melanin in the skin producing a brown colour which lasts less than an hour.<sup>1,15</sup> The true tan develops with longer exposure to UVB which stimulates the melanocytes in the epidermal basal layer to produce more melanin and to stimulate skin thickening.<sup>1,15</sup> The problem for health professionals is that many travellers are still keen to develop a tan whilst on holiday even

though they are fully aware of the risks.<sup>1,15</sup> Therefore, the effects of photoageing and risks of skin cancers should be highlighted to the traveller and the appropriate use of sun block.<sup>1,15</sup>

## Drug-induced photosensitivity reactions

Several drugs can potentially cause photosensitivity reactions. Medicines carried by travellers with the potential of causing photosensitivity reactions include some antibiotics and the NSAIDs.<sup>1</sup> Doxycycline, which is a commonly used antimalarial agent, sulphonamides such as pyrimethamine-sulfadoxine (*Fansidar*) and the fluoroquinolones have all been reported to cause photosensitivity reactions, as have the NSAIDs, which are commonly used by travellers.<sup>1</sup>

### Prickly heat (Miliaria rubra)

Although not directly due to sun exposure, prickly heat or heat rash is a common complaint for travellers in hot and humid areas. It is caused by a blockage of the sweat glands which results in the leakage of sweat into the epidermal tissues causing inflammation.<sup>1</sup> The sweat glands are blocked by keratin plugs which are produced by prolonged exposure of the skin to sweat.<sup>1</sup> Prickly heat is prevented by keeping susceptible areas (neck, face, groin etc) as clean and as dry as possible and wearing light, loose-fitting clothing. Calamine lotion or hydrocortisone 1% cream will give some relief.<sup>1</sup>

## General measures to avoid the harmful effects of the sun

Table 7 summarises common recommendations for travellers to avoid harm from the sun. Unfortunately, although these recommendations are well publicised, it is recognised that the general public does not follow such guidelines as well as they should.<sup>1</sup> Many travellers use sunscreens as their sole method of sun protection, and many wrongly believe that using sunscreen allows them to expose themselves to the sun for longer periods. Also, few people apply sunscreens correctly.<sup>1</sup> It is now recommended that travellers should not use sunscreens below SPF8 and should use at least SPF15 or ideally higher.<sup>1</sup> Sunscreen should be applied 30 minutes before





exposure and reapplied every two hours and possibly more frequently depending on rate of sweating, abrasion and/or getting in and out of water.<sup>1</sup> The effectiveness of sunscreens also diminishes when exposed to heat and on

storage, and so travellers should replace their sunscreens regularly (at least annually).<sup>1</sup>

**Table 6: Factors affecting UV radiation from the sun**

Factor	Description	Precaution
1. The angle of the sun	The higher the angle of the sun over the horizon, the smaller the distance that the UV radiation must travel and the less radiation is absorbed by the atmosphere. At noon in midsummer the sun is overhead.	Avoid the sun at least 2 hours either side of midday. The risks are lower after 4.30pm.
2. The tropics	The sun is more intense at the equator.	Take extra care in tropical regions.
3. Altitude	There is a 4% increase in burning effect from UV light for every 300m rise in altitude.	Take extra care at all times at altitude.
4. Cloud cover	Cloud cover may scatter UV light but does not necessarily absorb UV.	Still apply sunscreens etc even when it is cool and cloudy.
5. Reflection of UV radiation	UV radiation is reflected from snow, ice, water and light coloured sand.	Even in shaded areas the traveller may not get adequate protection.
6. Penetration of UV radiation	UV radiation penetrates water and some wet clothing. Some items of clothing are more easily penetrated by UV radiation than others.	Wearing a white T-shirt while swimming may not give adequate protection. Wear dark closely woven materials.
7. Wind	The wind may contribute to the skin damage caused by the sun.	Skiers, mountaineers and sailors (and other groups) should use sun protection.

(Adapted from Goodyer<sup>1,10</sup>)

**Table 7: General measures to avoid harm from the sun**

Advice	Comment
1. Avoid the sun when it is at its strongest.	The sun is at its strongest about 3-4 hours either side of midday.
2. Avoid direct sun exposure by sitting in the shade as much as possible.	Be aware of reflected sunlight and take precautions.
3. Wear appropriate clothing.	Closely woven clothing generally gives better protection.
4. Wear a wide brimmed hat.	Protects the face, ears and back of the neck.
5. Apply high-factor sunscreen to exposed skin regularly before going out into the sun and on a regular basis whilst out in the sun.	It is important that the traveller does not rely solely on sunscreen for their protection whilst in the sun and they should not use sunscreen to increase their overall exposure. Special attention should be given to sensitive areas such as the soles of feet, backs of legs etc.
6. Take extra care if there is a history of skin cancer.	Extra care should be taken if the traveller has precancerous lesions.

(Adapted from Goodyer<sup>1</sup>)



## Medical kit and first aid supplies for travellers

The carrying of a suitable first aid kit, and the ability of the traveller to use it correctly, are important factors in the successful self-management of a range of travel-related health issues. Pharmacists can have an important role in the provision of medical kits and supplies for travellers.<sup>1,3,16-18</sup> However, travellers leaving Australia have very varied health care needs. These range from business travellers visiting relatively 'low risk' destinations (i.e. destinations with few health risks and excellent health facilities), through to more adventurous travellers on expeditions to remote 'high risk' destinations (i.e. destinations with many health risks and poor health facilities and/or large distances separating the traveller from those facilities). There are a wide range of commercially available medical kits for travellers, and when selecting a kit (or designing a kit) for an individual traveller, several factors need to be considered including:<sup>1,11,19</sup>

- Itinerary – The availability and quality of health care at the destination and the activities that the traveller is planning (and the inherent risks of those activities such as scuba-diving and climbing) will have a major influence on the range of medical items carried by travellers.
- Size of the group
- Size of the kit compared to the amount of available space – This is very important for backpackers or people on trekking holidays who have limited space in their packs. However, it is also becoming increasingly important for general tourists, as airlines become stricter at enforcing baggage weight limits due to increases in the price of aviation fuel and competitive pressure to reduce fares.
- Chronic diseases and regular medicines – Travellers with pre-existing conditions must ensure that they have sufficient medicines for at least the length of the trip and perhaps some in reserve in case of unexpected changes in itinerary. It is better to split their medicines into at least two caches and not have all of their medicines stored in one piece of luggage, just in case this bag is lost during their journey. In an attempt to save space, travellers may not take items that they only use occasionally at home (e.g. medicines such as salbutamol inhalers and antihistamines). However, these items may be required whilst travelling and it may be difficult to obtain them whilst overseas. Travellers also need a contingency plan on how to obtain further supplies at their destination if their medicines are lost or stolen in transit.
- Packaging and stability – The packaging of medicines is an important consideration as it protects the

medicine from environmental stresses during transport. However it is also important for identification purposes when passing through Customs. Medicines are best blister packed and kept in their original outside packaging or box and placed in a resealable plastic bag. Stability is a concern, particularly in the hot and humid conditions of the tropics or when carrying sensitive medicines. Few stability studies have been done on the effects of extremes of temperature and humidity 'in the field' on medicines. But it is generally assumed that insufficient degradation would occur with solid dosage forms on short trips (although the replacement of unused items may need to be considered if kits are repeatedly taken out into the field and returned to storage unused).

- Legal and ethical issues – The legal status of different medicines differs greatly between countries and although there have been few reports of problems with medicines of Schedules 2 to 4, travellers are recommended to keep medicines appropriately packaged and labelled, carry a doctor's letter or copies of prescriptions and not to carry excessive quantities with them.

A small number of review articles and texts make recommendations on what medical supplies should be carried by travellers, some more extensive than others.<sup>1,7,11,19-21</sup> These recommendations are summarised in Table 8. Generally most reviewers divide the contents of the kit into three main areas: first aid supplies, over the counter (OTC) medicines (i.e. Australian S2 and S3 medicines) and prescription items (i.e. mainly Australian S4 medicines, but occasionally S8 (controlled drugs)).<sup>1,7,11,19-21</sup> Medical kits are also commonly categorised based on traveller-type, with common categories being:<sup>1</sup>

- Tourists on short holidays (who may require a basic first aid kit, some simple OTC products and their own medications for chronic conditions)
- Tourists to developing countries with endemic malaria (who may require more extensive first aid supplies, chronic medications, antimalarials but few other prescription products)
- Travellers on long trips to developing countries (who may require larger kits with more prescription items)
- Expeditions to remote areas (who require fully comprehensive kits with a wide range of medical supplies).

As shown in Table 8, although there is a great deal of commonality between the references, the recommendations do vary depending on the traveller's destination, author's preference and a variety of other factors. There are only a small number of studies that review the contents of medical kits for travellers, and discuss the usefulness of the items carried i.e. which items are commonly used and which items are never used by



**Table 8: Summary of recommendations of items for inclusion into medical kits for travellers**

Goodyer <sup>1,23</sup>	Gherardin <sup>21</sup>	Mills <sup>11</sup>	Leggat and Heydon <sup>22</sup>	Spira <sup>7</sup>
<p><b>First aid items (most travellers):</b> Antiseptic, plasters.</p> <p><b>First aid items (Tropical, long-term or special activities/holidays):</b> Crepe bandage, foot blister plaster, hydrocolloid dressings, iodine-based antiseptic, NA dressing, sterile kit, steristrips, surgical tape.</p> <p><b>OTC items (most travellers):</b> Analgesics, antipyretics, loperamide, rehydration sachets, soothing/moisturising cream (e.g. calamine).</p> <p><b>OTC items (other possible items):</b> Antacids, antifungal creams and powders, antihistamine tablets, hydrocortisone cream, laxatives, treatments for motion sickness.</p> <p><b>Prescription items:</b> Adrenaline. Antibiotics. Antibiotic creams or powders. Antibiotic eye ointment. Standby treatment for malaria. Remedy for AMS. Strong analgesics. Treatments for chronic or recurrent conditions.</p>	<p><b>All travellers:</b> Items to treat cuts, scratches, burns, strains, splinters. Paracetamol. Repellent. Consider condoms.</p> <p><b>Additional for western countries:</b> Antinauseant, broad spectrum antibiotic for respiratory infections, antacid, pseudoephedrine/antihistamine, minor sedative, laxative.</p> <p><b>Additional items for less developed countries (gastro kit):</b> Rehydration solution, loperamide, tinidazole, norfloxacin (or azithromycin for children).</p> <p><b>Additional for comprehensive kit:</b> Sterile needles and syringes, alcohol swabs, antihistamines, antifungal and antibiotic cream.</p>	<p><b>All travellers:</b> Regular medicines, digital thermometer, vaccination certificate, travel insurance, spare pair of glasses.</p> <p><b>To avoid mosquito borne disease:</b> Repellent (30% DEET), long sleeved light clothing, permethrin treated clothes, coils and knock down spray, malaria tablets, malaria test kit if visiting remote area.</p> <p><b>Water safety:</b> Water purification tablets.</p> <p><b>Prevent sun damage:</b> Sun block, sunglasses and hat.</p> <p><b>Treat stomach problems:</b> Loperamide, norfloxacin, tinidazole, metoclopramide or prochlorperazine, rehydration sachets.</p> <p><b>Treat wounds or skin infections:</b> Dressings, antiseptic, antibiotics for wound infections (cephalexin), antifungal cream or powder, blister management, cold sore treatment.</p> <p><b>For aches and pains:</b> Paracetamol, NSAIDs.</p> <p><b>For coughs, colds, sinus:</b> Nasal decongestant, throat lozenges, antibiotic (roxithromycin), antiviral (oseltamivir).</p> <p><b>Allergies:</b> Antihistamines, sting gel, steroid cream.</p> <p><b>Eye problems:</b> Antibiotic eye ointment.</p> <p><b>Ear problems:</b> Aqua-ear, Sofradex.</p> <p><b>Medical equipment:</b> Sterile needles and syringes, emergency dental kit, scissors, tweezers, splinter probe.</p> <p><b>Altitude:</b> Acetazolamide, Ginkgo.</p> <p><b>Cruises/boats:</b> Motion sickness prevention.</p>	<p>Own medications. Aspirin or paracetamol. Throat lozenges. Adhesive dressings, bandages, tape. Iodine solution. Antiseptic cream. Eye wash, eye drops for eye irrigation. Insect repellent (DEET). Contact insecticide (permethrin). Glucose-electrolyte mixture. Sunscreen. Antihistamines. Medication for tinea or thrush. Antimalarials. Diarrhoea kit (loperamide, norfloxacin, tinidazole). Broad spectrum antibiotic. Metoclopramide. Sleeping tablet. Beta 2 receptor agonist. NSAID. Acetazolamide. Needles, syringes. Thermometer. Instructions for use.</p> <p><b>Medical equipment:</b> Cannulae. Sutures. Dressings. Scalpel handle and blades. Gloves, face masks. Personal data sheet.</p>	<p><b>Antibiotics for general infections:</b> Dicloxacillin or cephalixin (for skin), erythromycin or amoxicillin-clavulanate (respiratory), ciprofloxacin (diarrhoea, UTI), clotrimazole or tolnaftate (fungal infections).</p> <p><b>Malaria prophylaxis</b></p> <p><b>Pain or injury:</b> Aspirin or non-steroidal anti-inflammatories (e.g. ibuprofen), paracetamol, narcotic analgesics such as paracetamol with codeine.</p> <p><b>Decongestant:</b> Loratadine, pseudoephedrine.</p> <p><b>Gastrointestinal</b></p> <p><b>Antidiarrhoeal:</b> loperamide or diphenoxylate/atropine.</p> <p><b>Antinausea:</b> metoclopramide, or prochlorperazine.</p> <p><b>Allergic reaction:</b> Epinephrine. Antihistamine: diphenhydramine or hydroxyzine. Calamine, caladryl, or cortisone creams are useful for the itch.</p> <p><b>Personal medications</b></p> <p><b>Wound care dressings and bandages:</b> Safety pins, scissors, tweezers/forceps for removing splinters and ticks. Steristrips. Antibiotic ointment. Irrigation fluid. Towelettes for cleaning hands before and after working with wounds.</p> <p><b>Medical essentials:</b> Oral rehydration salts. Thermometer. Sunscreen: SPF 30 or 50. Lip screen. Water purification system. Moleskin to avoid pressure blisters. Sealed package of syringes and needles. Dental kit. First-aid booklet. Flashlight with fresh batteries. Chemical lightstick.</p> <p><b>Special considerations:</b> Medications and equipment for high altitude, jungle, desert, marine environments, children, pregnancy, etc. Extra pair of prescription eye glasses.</p>





Table 9: Deacon and McCulloch's proposed standard medical kit specification <sup>22</sup>	
Custom pack	Waterproof pack with medical logo
Pack instructions	Instructions for pack contents
SOS phone number	International SOS medical contact
Analgesia	Paracetamol tabs (12)
Antiseptic	<i>Savlon</i> (chlorhexidine and cetrimide) cream (15 g)
First aid	Selection of wound dressings
Indigestion	<i>Actal</i> (aloxitol sodium; general properties similar to aluminium hydroxide) tabs (12)
Insect cream	<i>Autan</i> (picaridin)
Water purifier	<i>Puritabs</i> (sodium dichloroisocyanurate) (48)
Antibiotic	Doxycycline 100 mg tabs (8)
Antimalarial	Appropriate supply if required
Constipation	Senna tabs (12)
Diarrhoea	Loperamide (16) and <i>Dioralyte</i> (rehydration salts)
Insomnia	Temazepam 10 mg (7)
Travel sickness	Cinnarizine (an antihistamine) 15 mg (15)
Medical aids	Small supply of needles and syringes

travellers. Deacon and McCulloch<sup>22</sup> surveyed occupational physicians of the Food Industry Medical Officers Group to review the contents of medical kits issued to business travellers. They found that many business travellers were issued with an in-house medical kit with supplies and instructions for the self-treatment of travel-related ailments such as motion-sickness, diarrhoea, indigestion, headache and insomnia.<sup>22</sup> They also found that the majority of kits contain a supply of needles, syringes and IV cannulae, and antimalarials were supplied if required.<sup>22</sup> About 50% of the kits contained antibiotics for the self-treatment of infections. They noted that few of the kits contained emergency contact numbers for the traveller.<sup>22</sup> Recommendations for the contents of a standard medical kit were made, which are summarised in Table 9.<sup>22</sup>

In 2002, Harper and colleagues reviewed the *Coca-Cola* travel health kit.<sup>23</sup> This was a travel health kit supplied to employees of *Coca-Cola Limited* when travelling overseas. The review was carried out to see if the kit met the current needs of the employees. Table 10 summarises the contents of the *Coca-Cola Company Medical Kit*. The employees were also surveyed to determine which items were considered most useful or were most used.<sup>23</sup> They found that the most useful items were the analgesics and gastrointestinal remedies whereas items requiring a medical practitioner such as needles and syringes were deemed the least useful by the employees.<sup>23</sup> Other findings were that employees had a lack of understanding about

what some of the items were for, and it was thought that this may be due to the fact that the items were generic brands that were not recognised by the employees.<sup>23</sup> Prior to the survey there had been discussion within the company that two kits should be supplied, one for developed destinations and another for developing countries; this was not supported by the results of the survey.<sup>23</sup> It was thought that less commonly used items could be removed and added to individualised packs for business travellers going to destinations where a lack of sterile supplies is an issue.<sup>23</sup> Employees recommended the addition of throat lozenges and multivitamins.<sup>23</sup> Finally the authors noted that employees rarely used the sunscreen in the medical kit, which caused concern as many travellers spent a great deal of time at tropical destinations.<sup>23</sup> The authors felt that this either demonstrated an underusage of sunscreen (a worrying trend), or a lack of exposure to the outdoors during business travel.<sup>23</sup>

Finally, Goodyer and Gibbs examined the medical supplies taken to developing countries by a group of travellers from the UK.<sup>24</sup> They surveyed 299 travellers (127 returned the questionnaires) travelling from the UK to destinations in South America, Asia, Africa or the Middle East for two weeks or longer. Volunteers were given a postal questionnaire to complete and return on their arrival back to the UK. They were asked what items had been taken with them, what items were used and what items were purchased whilst overseas.<sup>24</sup> They found that





analgesics and remedies for diarrhoea were the most commonly used items but that many wound dressings were not used.<sup>24</sup> The most commonly used analgesics were paracetamol, aspirin or ibuprofen.<sup>24</sup> Sixteen per cent of respondents required antibiotics, with 40% of these travellers purchasing them overseas, the most commonly used antibiotic was ciprofloxacin for travellers' diarrhoea followed by amoxicillin.<sup>24</sup> Fifty-one per cent of respondents carried water purification tablets and of these 52% actually used the tablets which contrasts with the Coca-Cola study and reflects the difference between backpackers and corporate travellers.<sup>24</sup> A point of concern for Goodyer and Gibbs was that 20% of the group who were at risk of malaria did not use insect repellent during their journey.<sup>24</sup>

The studies show that travellers need to take a selection of commonly used items (such as analgesics and diarrhoeal remedies) and additional items that although they may not be commonly used, may be important if required. Therefore, it is necessary to review and

individualise requirements for each individual traveller based on factors such as the itinerary of the journey and the ease of access and quality of health care services at the traveller's destination.

## Air travel and deep vein thrombosis

Travellers who take long-haul flights may be at risk of developing a deep vein thrombosis (DVT) which in turn can lead to the development of a potentially life-threatening pulmonary embolism (PE).<sup>1,25,26</sup> A lack of mobility for long periods, combined with the cramped conditions in the cabin (especially for economy class passengers) are believed to be the major causative factors, which led to the term 'economy class syndrome' being used in the lay media.<sup>1</sup> But the risk is not isolated to long distance air travel, as travellers may experience similar conditions with other modes of transport such as interstate coach journeys.<sup>1</sup> Contributory factors for air travellers may include the effect of a lower partial pressure of oxygen in the cabin at altitude and its effect on coagulation, and the consumption of alcohol or caffeine which may contribute towards dehydration and a sluggish circulation.<sup>1</sup> Some studies have suggested that the relationship between DVT and long-haul flights is not clear cut, whereas others have demonstrated a strong association.<sup>27</sup> The current consensus is that the conditions posed by long-haul flights represent an increased risk of DVT which may have a greater effect when combined with additional risk factors for venous thromboembolism.<sup>1,27</sup> Table 11 lists possible risk factors for DVT in travellers, but essentially any factor that contributes to poor mobility may increase the risk.<sup>1</sup>

**Table 10: Summary of the contents of the Coca-Cola Company Medical Kit 2002<sup>28</sup>**

Category	Items
Analgesics	Ibuprofen Acetaminophen (paracetamol) Aspirin
Antihistamines/ decongestants	Benadryl (diphenhydramine) Chlorpheniramine Pseudoephedrine
Wound care	Adhesive bandages Band-aids Cover strips Gauze pads
Topical ointments and creams	Hydrocortisone cream Topical antibiotics ointment Unburn sunburn gel
Gastrointestinal medications	Antacid Diamode Diotame
Doctor/nurse items	Injection site non-lock #2N1197 IV catheter IV start pack Syringes Lidocaine (lignocaine) Sutures Latex gloves
Miscellaneous items	Water purification tablets Thermometer Insect repellent Sunscreen

**Table 11: Possible risk factors for deep vein thrombosis (DVT) in travellers<sup>11,50</sup>**

- Previous history of DVT or PE
- Flights greater than 12 hours
- Older age groups (greater than 50 years of age)
- Overweight or obese people
- Being very tall in height
- Smoking
- Reduced mobility
- Dehydration
- Trauma
- Recent surgery
- Pregnancy or recent child birth
- Medications (combined oral contraceptives and hormone replacement therapy, using hypnotics during the flight)
- Chronic diseases (heart disease, malignancy, heart disease, ulcerative colitis, varicose veins)
- Hypercoagulability.



**Table 12: Recommendations for the prevention of travel-related DVT**

Class	Recommendation
1. All passengers	<ul style="list-style-type: none"> <li>Avoid excessive alcohol and caffeine. Drink plenty of other fluids.</li> <li>Move around as much as possible and exercise calf muscles every half hour by flexing and rotating ankles for a few minutes.</li> </ul>
2. Extra precautions for those at <b>minor</b> risk with one or more of: <ul style="list-style-type: none"> <li>40 years and older</li> <li>Very tall/short</li> <li>Previous leg swelling</li> <li>Recent minor leg injury or minor surgery</li> <li>Extensive varicose veins.</li> </ul>	<ul style="list-style-type: none"> <li>Avoid caffeine, alcohol or hypnotics.</li> <li>Take only short naps unless in a normal sleeping position.</li> <li>Avoid leg discomfort and crossing legs.</li> <li>Consider support stockings.</li> </ul>
3. Extra precautions for those at <b>moderate</b> risk with one or more of: <ul style="list-style-type: none"> <li>Recent heart disease</li> <li>Pregnant or hormonal medication</li> <li>Recent major leg injury or surgery</li> <li>Family history of DVT.</li> </ul>	<p>As for minor risk plus:</p> <ul style="list-style-type: none"> <li>Seek medical advice concerning potential risks, need for support stockings and other measures.</li> </ul>
4. Extra precautions for those at <b>substantial</b> risk with one or more of: <ul style="list-style-type: none"> <li>Previous or current DVT</li> <li>Known clotting tendency</li> <li>Recent major surgery or stroke</li> <li>Current malignant disease or chemotherapy</li> <li>Paralysed lower limb.</li> </ul>	<ul style="list-style-type: none"> <li>Consider postponing flight and take medical advice.</li> <li>Use all of the above recommendations and low molecular weight heparin (LMWH) instead of aspirin.</li> </ul>

(Adapted from Goodyer)

Ideally passengers should endeavour to move around as much as they can during the flight, which may not always be possible and so passengers should be strongly encouraged to do regular leg exercises in their seated position.<sup>1</sup> There appears to be no benefit in travelling in business or first class seating in an attempt to reduce the risk of DVT, as passengers in these sections will still spend a large part of the flight sitting and relatively immobile.<sup>1</sup> Table 12 summarises the main recommendations for the prevention of travel-related DVT.<sup>1</sup> Key measures and strategies are maintaining adequate hydration by drinking water and soft drinks and avoiding alcohol and caffeine-containing drinks because of their diuretic effect.<sup>1,11</sup> Travellers frequently ask pharmacists about the use of aspirin to prevent DVT on long haul flights. There is a great deal of evidence for the benefits of low dose aspirin to prevent arterial thrombosis, but little evidence of benefit in venous thrombosis and the side effects may be greater than the benefits in some travellers. The use of knee length compression stockings providing at least 20 mmHg compression at the ankle is recommended for moderate risk travellers.<sup>25</sup> High risk passengers (i.e. passengers with multiple risk factors or previous history of DVT) should administer low molecular weight heparin (LMWH) immediately before departure.<sup>1,11,25</sup>

## Jet lag

'Jet lag' is a term used to describe symptoms associated with the psychological and physiological desynchronisation of crossing several time zones.<sup>26</sup> Symptoms can include difficulty sleeping, fatigue, confusion, irritability, digestive problems, joint stiffness and headache.<sup>26</sup> Usually a shift in time zone of three to four hours is required to upset the body's circadian rhythm and cause jet lag.<sup>26</sup> Several factors have been identified that aggravate jet lag including:<sup>1,26</sup>

- Direction of travel – Jet lag is worse when travelling eastwards rather than westwards
- Age – Older people appear to suffer more from jet lag than younger people
- Number of time zones crossed – The greater the number of time zones crossed the greater the disturbance on sleep and activity patterns
- Napping – Unplanned napping at your destination reinforces the sleep cues from the departure time zone and slows the adjustment to the new time zone
- Previous bad travel experiences
- Sleep deprivation prior to journey



- Dehydration and excessive alcohol consumption on the aircraft
- Stress
- Poor diet and overeating on the aircraft.

### Melatonin

Melatonin has been trialed in New Zealand to reduce the effects of jet lag caused by long-haul flights but its use remains controversial.<sup>1,26</sup> Results from trials show some benefits, but the results are not consistent. A Cochrane review concluded there is enough evidence to support the use of short acting preparations of melatonin to relieve jet lag if taken at bedtime at the destination country, particularly after an eastward flight.<sup>1,26</sup> Melatonin should be avoided in epileptics and those taking warfarin.<sup>1</sup>

### Measures taken before departure to relieve jet lag

Travellers should try to be well rested prior to the journey and if possible, to choose flights that have transits during the flight to try and arrive at their destination at normal sleeping times.<sup>26</sup> They should try to plan the journey so that they do not launch into critical tasks immediately on arrival.<sup>26</sup>

### Measures taken during the flight to relieve jet lag

Travellers should avoid sleep deprivation during the flight and set their watches to the time at their destination and plan sleep during the journey in relation to that time.<sup>26</sup> It is important to drink plenty of fluid during the flight and avoid alcohol and caffeine containing drinks.<sup>26</sup> Use of an hypnotic such as temazepam may help with sleep deprivation but may cause other problems as the traveller may not be fully alert during an emergency. Its use may also increase risk of DVT.<sup>26</sup>

### Measures taken on arrival to relieve jet lag

Travellers should adopt the eating and sleeping pattern of the local time zone on arrival at their destination but avoid continued sleep deprivation.<sup>26</sup> The use of a sleeping tablet may be beneficial for the first few nights after arrival.<sup>26</sup>

## Motion sickness

Motion sickness can occur on all forms of transport and is an all encompassing term to describe all forms of travel sickness, whether it is air sickness, sea sickness or car sickness.<sup>28</sup> It is relatively unusual on large aircraft; it is more common on smaller aircraft (as they are affected more by turbulence) and in small boats, and even large cruise liners if the weather is poor.<sup>28</sup>

Motion sickness is a condition characterised by nausea, vomiting, pallor and sweating when the traveller is exposed to real or apparent motion stimuli. Its development tends to follow a common sequence of events.<sup>28</sup> Initially the

traveller will experience epigastric discomfort or 'stomach awareness', followed by nausea and facial pallor, and then the traveller will begin to sweat.<sup>28</sup> The 'avalanche phenomenon' then follows with increased salivation, a feeling of body warmth, light-headedness and feelings of apathy.<sup>28</sup> The traveller will then vomit, although some travellers will continue to be nauseated for quite some time.<sup>28</sup> The symptoms of motion sickness can vary from mild nausea to life-threatening dehydration caused by excessive vomiting.<sup>1</sup>

The cause of motion sickness is not fully understood, one theory is the 'neuronal mismatch' theory, in which it is believed that the brain has developed a particular internal model to control posture and balance against normal locomotor activity. With some atypical sustained movement the signals from the senses do not match this internal model, and so the symptoms of motion sickness are experienced.<sup>1,28</sup> It is estimated that about 5% of individuals suffer badly from motion sickness and another 5% have mild symptoms. Certain factors have been identified that may predispose the traveller to motion sickness and these are listed in Table 13.<sup>1</sup>

### Management of motion sickness

Common strategies used to alleviate the symptoms of motion sickness include:<sup>1</sup>

- On board a ship it is best to stay on deck and for the traveller to keep their eyes focussed on the horizon. This provides a fixed point of reference for the senses. Below decks, it is best for the traveller to lie down with their eyes closed and facing towards the centre of the ship.
- Less turbulence is experienced when seated over the wings in aircraft. Therefore, sufferers of motion sickness should attempt to be seated in that area of the cabin.
- In cars, motion sickness is common with children sitting in the back of the car for safety reasons. Using booster chairs to allow the child to look out of the windows helps, as does taking bends slowly and using less powerful acceleration.

Pharmacists are often asked to recommend prophylactic OTC medications. Common agents recommended include hyoscine hydrobromide, promethazine, dimenhydrinate.<sup>1,29</sup> They are more effective if given before travel and before the motion sickness has developed. Hyoscine is probably more effective than the sedating antihistamines, but may not be as well tolerated.<sup>29</sup> The mechanism of action of these agents is unclear, and it may be due to their anticholinergic effect inhibiting cholinergic input to the vomiting centre of the brain.<sup>1</sup> Of course, their anticholinergic effects are also the cause of their side effect profile.<sup>1</sup> Dopamine antagonists such as metoclopramide



**Table 13: Predisposing factors for motion sickness**

Factor	Comment
1. Gender	More common in women than men, also greater around menstruation and during pregnancy.
2. Age	Rare in children less than 2 years of age. Between 2-12 years it is common (maximal at the age of 12 years) and then incidence declines between the ages of 12-21 years.
3. Mental state	Fatigue, sleep deprivation and anxiety may all predispose the traveller for motion sickness.
4. Race	People of Chinese ethnicity appear to be more prone to motion sickness than people of European origin.
5. Physical fitness	Aerobic fitness increases the risk of motion sickness.
6. Primary provocative agent	Ships – vertical oscillations at 0.2 Hz. Cars/aircraft – linear acceleration and cornering and banking.
7. Secondary provocative agents	Unpleasant smells, the sight or smell of food and the sound or sight of others vomiting. Alcohol is best avoided as it affects the vestibular apparatus.

(Adapted from Goodyer<sup>1</sup>)

or domperidone are generally ineffective in motion sickness.<sup>1</sup> With regard to other methods of preventing motion sickness, wrist bands that apply pressure on the P6 acupuncture point have been found to be ineffective, although small devices worn on the wrist that electrically stimulate the P6 acupuncture point may provide some benefit.<sup>1</sup> Ginger tablets or powder have been found to be as effective as other remedies such as hyoscine, but studies are small.<sup>1</sup>

## Altitude sickness

As people are becoming more adventurous in their choice of holiday destination, more tourists and adventure travellers are visiting destinations at high altitude. The classification of high altitude is being at an altitude of 1,500 to 3,500m above sea level, very high altitude as being between 3,500m to 5,500m above sea level, and extreme altitude as being greater than 5,500m above sea level. At these altitudes the traveller faces the following problems:<sup>30</sup>

- As the traveller climbs higher, there is a progressive fall in barometric pressure. At 2,500m the atmospheric pressure is about three quarters of the value at sea level and at 5,500m the atmospheric pressure is half of the value at sea level.<sup>30</sup>
- With a fall in barometric pressure, there is an associated fall in the partial pressure of oxygen.<sup>30</sup>
- The environmental temperature drops on average by about 6.5°C for every 1,000m of elevation. This combined with hypoxia increases the risk of both cold injuries and altitude problems.<sup>30</sup>

- With altitude the penetration of UV light increases about 4% for every 300m of elevation, increasing the risk of sunburn and snow-blindness and on repeated exposure, skin cancer.<sup>30</sup>

## Acclimatisation

Acclimatisation begins as soon as the traveller reaches high altitude and it is the body's response to the reduced partial pressure of oxygen.<sup>1,30,33</sup> The climber feels breathless and will hyperventilate in response to the reduced partial pressure of oxygen in the alveoli, and may also experience palpitations and tachycardia.<sup>30</sup> These symptoms worsen on exercise but are relieved with oxygen.<sup>30</sup> After this initial period of hyperventilation, the climber's respiratory rate will usually return to normal unless acute mountain sickness develops.<sup>30</sup> Cough is also common at altitude due to the breathing of cold, dry air.<sup>30</sup> Early tachycardia will also settle quickly unless the climber attempts strenuous exercise before the acclimatisation process is fully complete, in which case a prolonged tachycardia with ectopic beats may develop.<sup>30</sup>

## Acute mountain sickness (AMS) (Puna or Soroche)

AMS is a syndrome that can develop between six to 96 hours after arriving at high altitude.<sup>30</sup> It is caused by the development of metabolic alkalosis and a redistribution of body water within the patient.<sup>30</sup> Initially the patient experiences between two and five days of severe symptoms. This may then be followed by a second phase of milder symptoms, which may be prolonged in some patients.<sup>30</sup> Symptoms include headache with one or more of the following symptoms: anorexia, nausea, vomiting, fatigue or weakness, dizziness, lightheadedness or difficulty sleeping.<sup>30</sup> It is believed that the syndrome



is due to mild cerebral swelling with imbalances in ADH and aldosterone secretion.<sup>30</sup> AMS is more common in younger people than older people and occurs in 25% of adults ascending rapidly from sea level to 2,000m.<sup>30</sup> It is not related to either physical fitness, the weight of baggage carried, gender or whether the climber has had recent respiratory infections.<sup>30</sup> A slow rate of ascent is an important strategy in the prevention of AMS and it is suggested that for every 1,000m climbed over 3,000m, two night's acclimatisation is recommended.<sup>1</sup> Another commonly used strategy is 'climb high but sleep low' where climbers will return to lower ground to sleep at night (below 2,800m if possible).<sup>1,31</sup> Alcohol, hypnotics, narcotic analgesics and respiratory depressants should also be avoided and a low salt, high carbohydrate diet may be useful.<sup>1,31</sup> If a climber develops AMS they should descend to a lower altitude.<sup>1,31</sup> When initial symptoms of benign AMS develop, the climber should rest and wait for symptoms to resolve, but if pulmonary or cerebral symptoms are evident (i.e. the climber is progressing to HAPE or HACE (see below)) then a rapid descent is required.<sup>1</sup> Ibuprofen may be used to alleviate an AMS-induced headache.<sup>1</sup>

### High altitude pulmonary oedema (HAPE)

HAPE is a specific variant of AMS and is the most common cause of fatality due to high altitude.<sup>30</sup> The incidence of HAPE varies with the rate of ascent, altitude reached, temperature, physical exertion and use of hypnotics.<sup>30</sup> Younger people, especially athletic males appear more prone, and it tends to occur within two to four days of ascent to altitudes greater than 2,500m.<sup>30</sup> Starting strenuous physical activity quickly on arrival at altitude appears to be a common factor in many cases of HAPE.<sup>30</sup> Severe pulmonary oedema develops and pulmonary hypertension is always present.<sup>30</sup> Symptoms would include dyspnoea, cough, weakness, chest tightness or congestion, tachypnoea, tachycardia, cyanosis and crackles in at least one lung field.<sup>30</sup> Only descent will reduce the oedema, and so early diagnosis is important but rest, oxygen and diuretics may be used whilst the descent is arranged.<sup>30</sup>

### High altitude cerebral oedema (HACE)

HACE is the most extreme or 'end stage' form of AMS and is usually recognised when a person with AMS or HAPE develops signs of encephalopathy, including changes in mental state and/or ataxia.<sup>30,33</sup> HACE rarely occurs without HAPE and the condition has a high risk of mortality.<sup>30,33</sup> HACE is caused by an increase in cerebral blood flow and increased permeability of the blood-brain barrier and it is believed to be due to damage of the endothelial cells of cerebral arterioles.<sup>30</sup> Raised intracranial pressure (RICP) is present causing headaches which are worse at night and early morning and when stooping or coughing.<sup>30</sup> Neurological changes occur such as malaise, confusion and impaired

consciousness and severe oedema may cause cerebral thrombosis or microinfarction.<sup>30</sup> Rapid descent and oxygen therapy is essential, and any climber who has suffered from HACE should never again ascend above 1,500m.<sup>30</sup>

### Prophylaxis and treatment of mild altitude sickness

AMS is a treatable condition and symptoms resolve rapidly with descent, although the more malignant forms (HAPE and HACE) progress rapidly and are associated with significant mortality.<sup>30</sup> An in depth discussion of the prevention and management of AMS is out of the scope of this module, but the carbonic anhydrase inhibitor acetazolamide has been advocated for the first few days at altitude as prophylaxis.<sup>30</sup> It reduces the level of metabolic alkalosis and it has been shown to reduce the incidence of AMS.<sup>30</sup> Dexamethasone has been shown to be as effective as acetazolamide in reducing the incidence of AMS.<sup>30</sup> With regard to the treatment of AMS, nifedipine has been used in severe cases of HAPE as a pulmonary artery vasodilator but it appears to have little effect on the other symptoms of AMS and so is currently only used in the emergency management of HAPE whilst descent is being arranged.<sup>30</sup>

### Hazards with diving

Scuba diving is a relatively safe sport. Minor health problems associated with diving include:<sup>30</sup>

- Mild toxæmia associated with marine infections in cuts
- Otitis externa (swimmer's ear) and sinusitis due to multiple dives
- Aural barotraumas.

All of these ailments are preventable. A few weeks before diving, divers should practise their equalisation manoeuvres to improve the tone of their eustachian tubes, thus reducing the risk of aural barotraumas.<sup>30</sup> After each dive, all cuts and grazes should have povidone iodine solution applied to them and their external ear canal dried with acetic acid in isopropyl alcohol ear drops.<sup>30</sup>

Decompression illness (DCI) or 'the bends' is an infrequent complication of diving, and over half of those affected have exceeded the depth/time recommendations of their dive tables.<sup>30</sup> DCI is caused by nitrogen bubbles coming out of solution in their tissues. If a recreational diver develops any neurological symptoms after diving they must be referred to a facility experienced in the management of diving problems.<sup>30</sup> Divers should not fly or ascend to more than 300m for at least 24 hours after their last dive.<sup>30</sup>

### Hot climates and dehydration

In hot, wet climates such as the tropics, the traveller experiences high humidity with little variation in ambient temperature from day to night.<sup>1</sup> But in hot, dry climates





such as in a desert, the level of humidity is low and the temperature drops at night.<sup>1</sup> Travellers from temperate regions to hot climates such as these need time for their body's thermoregulatory systems to adjust to their new environment.<sup>1</sup> Failure to acclimatise appropriately results in heat stroke or heat exhaustion.<sup>1</sup>

### Heat stroke and heat exhaustion

Heat stroke and heat exhaustion occur when there is a breakdown of the body's thermoregulatory mechanisms.<sup>1</sup> Heat stroke occurs when the body's sweating and other thermoregulatory mechanisms stop functioning and the patient's body temperature rapidly rises to above 40°C.<sup>1</sup> The patient will appear hot and flushed, but will be hardly sweating.<sup>1</sup> They may complain of headache and will become confused. Delirium and seizures follow and ultimately death (in 25% of cases) within hours if attempts are not made to cool the body.<sup>1</sup> Heat exhaustion has a lower mortality rate and may be caused by dehydration or salt deficiency.<sup>1</sup>

### Prevention and treatment of heat-induced illness

Acclimatisation to hot climates is essential, and not only involves exposure to the hot environment but also involves maintaining some level of exercise (however the level of exercise must not be too great in the early stages).<sup>1</sup> Once acclimatised, less sodium is secreted in the sweat of an individual, this results in a rise in serum osmolality. This rise in serum osmolality means that thirst is more readily stimulated and the individual will drink at the appropriate time to prevent dehydration.<sup>1</sup> Therefore until the person is acclimatised there is a risk that simply drinking when thirsty will be insufficient to prevent dehydration in the individual.<sup>1</sup>

Care should be taken in using medications that may affect sweating and thermoregulation, including diuretics (which cause sodium and water loss), phenothiazines (suppress sweating), tricyclic antidepressants (increase heat production), anticholinergics and beta blockers.<sup>1</sup> It is important that travellers drink adequate quantities of water, and not rely on alcoholic beverages, to avoid dehydration and ensure an adequate salt intake (usually by just adding extra salt to food; salt tablets are generally not required and cause gastrointestinal upset).<sup>1</sup>

Heat exhaustion is treated with rehydration therapy and, if not comatose, about 500 mL of water should be given every 15 minutes until urine flow returns to normal.<sup>1</sup> For salt deficiency-induced problems, the body's salt reserves must be replenished relatively quickly. In all cases hospital admission is recommended.<sup>1</sup>

With heat stroke the patient should be cooled whilst being transferred to hospital. They should be sheltered from the sun and all clothing removed and covered in a wet sheet and if available, place ice packs in the groin and axillae.<sup>1</sup> Fluid replacement is also required.

## Cold climates and hypothermia

It is not possible to acclimatise to cold climates. People exposed to very cold climates must endeavour to maintain good nutrition and physical fitness.<sup>1</sup> Dehydration can be a concern when undertaking physical activity over a prolonged period of time in cold environments and travellers should also take great care to prevent hypothermia, especially with children who have a relatively large body surface area to body mass ratio.<sup>1</sup> Travellers should wear appropriate clothing at all times.<sup>1</sup>

### Trench foot

Trench foot occurs when the feet are in prolonged contact with cold water over a period of days or weeks.<sup>1</sup> This results in microvascular damage and the foot becomes numb, swollen and can be painful.<sup>1</sup>

### Chilblains

Chilblains develop on the toes due to reduced microvascular circulation after contact with the cold.<sup>1</sup> Small red nodules appear about 12 hours after rewarming which may be itchy and painful.<sup>1</sup>

### Frostbite

This is a serious condition where ischaemia occurs due to cold and vasoconstriction.<sup>1</sup> The tissue will appear white and frozen with blue/black patches.<sup>1</sup> The affected part should be warmed to allow blood to recirculate, but great care is required because if the area is refrozen then the tissue damage will be further extended.<sup>1</sup> Therefore, sometimes thawing of the frozen tissues is delayed until it is certain that the victim will not be re-exposed to cold.<sup>1</sup> Thawing is performed by immersion in water at 40°C, this can be painful and so narcotic analgesics may be required.<sup>1</sup> Ultimately, amputation may be required.<sup>1</sup>

### Hypothermia

Hypothermia occurs when the core body temperature of the patient drops below 35°C and it can be life-threatening.<sup>1</sup> The definition of mild hypothermia is a core body temperature above 32°C, and at this level, the body is still capable of using the mechanisms of shivering and peripheral vasoconstriction to maintain body temperature.<sup>1</sup> But below this temperature, the patient becomes increasingly drowsy, shivering stops and eventually coma and a life-threatening cardiac arrhythmia result.<sup>1</sup> In mild hypothermia, wet clothing should be removed and the patient insulated with whatever material is available.<sup>1</sup> Then warm, sweetened, uncaffeinated drinks should be given and the patient transferred to a warm environment.<sup>1</sup> For severe hypothermia, reducing heat loss is even more critical and identifying vital signs may be difficult.<sup>1</sup> Alcohol should not be given as it is a peripheral vasodilator which diverts heat from the body core, lowering the core temperature even further.<sup>1</sup>



# Infectious diseases



## Travellers' diarrhoea

As mentioned previously, diarrhoea is the most common travel-related health problem reported in travellers from industrialised nations to developing countries, with reports of between 25-90% of travellers experiencing symptoms in the first two weeks of being overseas.<sup>1,6</sup> In most travellers it is a relatively short, self-limiting problem that resolves within three to five days,<sup>1,24</sup> but it may still have implications to the traveller as up to 25% of affected travellers have to alter their plans interrupting their holiday or business activities.<sup>34</sup>

### Definition

Diarrhoea is a symptom not a disease.<sup>35</sup> Travellers' diarrhoea (TD) is often defined as at least three loose or watery stools in a 24 hour period with or without one or more symptoms of abdominal pain, nausea, vomiting, fever, cramps, blood or mucus in the stools or faecal urgency.<sup>1,34,36</sup> The enteric symptoms (cramps, pain and urgency) are relatively common, whereas the incidence of fever and blood in the stools is relatively low.<sup>1</sup>

### Aetiology

Some cases of TD do have non-infective causes such as a change in diet or gut flora or increased alcohol consumption.<sup>1,24</sup> Nevertheless, because studies have shown response rates of 90% or higher with the use of antimicrobials, it is assumed that the majority of cases of TD are infective in origin. This is despite the fact that in many cases a pathogen will not be isolated in the patient's stool samples, which is assumed to be due to samples not being routinely tested for the full range of all possible causative organisms.<sup>1</sup> The pathogenic causes of TD depend on the destination and season,<sup>34,35</sup> but the most common identifiable causative organism is enterotoxigenic *E. coli* (ETEC). Other common pathogens include enteroinvasive *E. coli* (EIEC), enteropathogenic *E. coli*, enteroaggregative *E. coli* (EAEC), *Shigella* spp, nontyphoidal *Salmonella* spp and *Campylobacter jejuni*.<sup>35</sup> The most common viral causes are Norovirus and

Rotavirus.<sup>34</sup> Norovirus, in particular, has been associated with some large outbreaks of diarrhoea on cruise liners and holiday resorts.<sup>34</sup> Parasites such as *Giardia intestinalis* and *Entamoeba histolytica* are less common causes of TD, and diarrhoea caused by *Vibrio cholerae* is very rare in travellers.<sup>34,37</sup> *Giardia* may be suspected as the causative organism if the patient has a diarrhoeal illness that lasts for more than 10 days, or if the illness occurs after the travellers return and the diarrhoea is associated with weight loss.<sup>34</sup> Table 14 shows the incidence of some of the most common causes of TD, their approximate incubation times and average duration of illness. As mentioned previously in the module, certain risk factors for TD have been identified (Table 15) and risk groups include people below the age of 30 years, adventure travellers and travellers with pre-existing gastrointestinal disorders such as Crohn's disease (as an episode of TD may exacerbate the patient's condition).<sup>35</sup>

### Implications of travellers' diarrhoea

Most cases of TD will resolve without treatment over a short period, but about 10% of cases persist for more than a week, and about 2% of cases persist for more than a month.<sup>34</sup> About 25% of travellers will have to alter their travel plans and about 5% of cases will need medical care.<sup>34</sup> Young children and infants are particularly prone to dehydration and the elderly and immunocompromised are at greater risk of complications.<sup>1,34</sup> Depending on the causative organism, some serious complications can occur, including haemolytic uraemic syndrome if the organism produces shiga toxin, and Guillain Barre syndrome if *Campylobacter* is the causative organism.<sup>34</sup>

### Prevention of travellers' diarrhoea

The main strategies for the prevention of TD focus on the traveller taking appropriate precautions with food and water.<sup>1,24,25,28</sup> Sampling the local cuisine is one of the pleasures of travel but unfortunately, as the ingestion of contaminated food and water is the major cause of TD, some care is required. It is not always the type of food which is hazardous for the traveller, but more the methods of cooking and storage.<sup>1</sup> Although we have a greater



Table 14: Causes and incubation times of travellers' diarrhoea			
Pathogen	% of cases of TD	Usual incubation period	Average duration of illness
<b>Bacteria</b>			
Enterotoxigenic <i>E. coli</i> (ETEC)	50-75		
Enterotoxigenic <i>E. coli</i> (ETEC)	10-45	12 hrs – 3 days	5 days
Enterobacteriaceae <i>E. coli</i> (EPEC)	5-35		
<i>Campylobacter</i>	5-25	1-7 days	1-7 days
<i>Salmonella</i>	0-15	6-48 hrs	3-4 days
<i>Shigella</i>	0-15	1-3 days	3 days
<i>Vibrio cholerae</i>	Rare	1-3 days	1-7 days
Others	0-5		
<b>Viruses</b>			
Noroviruses	0-10	18-48 hrs	24-48 hrs
Rotavirus	10-25	<48 hrs	5 days
<b>Parasites</b>			
<i>Giardia intestinalis</i>	0-5	12-15 days	weeks to months
<i>Cryptosporidium</i> spp	0-5	5-10 days	2 weeks (to months)
<i>Entamoeba histolytica</i>	<1	4-6 weeks	months
<b>Acute food poisoning</b>	0-5		
<b>No pathogen identified</b>	10-50		

(Adapted from Hill<sup>34</sup> and Leggat and Goldsmid<sup>35</sup>)

Table 15: Risk factors for travellers' diarrhoea
Adventurous behaviour
Particular destinations
Season
Length of stay
Lack of travel experience
Consumption of unclean water or food
Medication with H2 receptor blockers or proton pump inhibitors.

(Adapted from Leggat and Goldsmid<sup>35,37</sup>)

understanding of the causes of TD it has been noted that the incidence of TD has not decreased significantly in recent years, and that the education of, and the following of, hygiene advice by travellers has not demonstrated a reduced risk of TD.<sup>1,34</sup> This may suggest to some travellers that following dietary precautions is unnecessary. However, it is believed that this trend is not due to the advice being ineffective, but is more likely to be due to travellers failing to fully follow dietary advice, as they are often more interested in trying local foods and drinks rather than reducing their disease risk.<sup>1,39</sup>

### General principles of food hygiene

Some common advice quoted in various references<sup>1,34,35,37,39</sup> includes:

- Initially, it may be best for the traveller to stick with their usual diet and be careful of what and where they eat, and then gradually introduce local spices, fruit and food into their diet.<sup>35</sup>
- Where possible, prepare food personally rather than eating in hotels and restaurants.<sup>1</sup> The quality of the restaurant may have little effect. This may be because the better presentation of food in high class restaurants may involve greater handling of the food with a corresponding greater risk of contamination.<sup>1</sup> Sampling food from street vendors is best avoided unless the food is served hot and immediately after cooking.<sup>34,35</sup>
- Wherever you eat, select food that is well cooked, freshly prepared and served hot.<sup>1,35</sup>
- Avoid raw foods or food that has to be reheated. Eating raw meat or raw seafood is extremely risky.<sup>1,35</sup>
- Dry foods are generally safer than moist foods. Bacteria on moist foods if left exposed in a warm environment, will rapidly multiply.<sup>34</sup>





**Table 16: High-risk and low-risk food in high-risk regions, tropical and semi-tropical regions**

High-risk food and beverages	Low-risk food and beverages
<ul style="list-style-type: none"> <li>Moist foods served at room temperature (e.g. salads)</li> <li>Fruit that cannot be or is not usually peeled or have very thin skins (e.g. berries, tomatoes)</li> <li>Ground grown leafy greens, vegetables and fruit</li> <li>Milk from a questionable source or unpasteurised milk, cheese, ice cream or other dairy products</li> <li>Items served in buffet tins without an effective heating source below</li> <li>Hot sauces on a table top</li> <li>Cold sauces and toppings</li> <li>Tap water, ice cubes or bottled water without a seal</li> <li>Food from street vendors (unless freshly prepared and served piping hot)</li> <li>Raw or undercooked meats, fish and seafood.</li> </ul>	<ul style="list-style-type: none"> <li>Any food or drink (e.g. coffee or tea) served steaming hot (&gt;59°C)</li> <li>Dry food (e.g. breads without spreads or butter)</li> <li>Dry food (pasta and rice – but once cooked must be eaten immediately)</li> <li>Fruits that can be peeled</li> <li>Foods with a high sugar content (e.g. jams, honey)</li> <li>Foods that are self-washed or self-prepared</li> <li>Canned foods</li> <li>Bottled carbonated drinks</li> <li>Sealed and untampered bottled water.</li> </ul>

(Adapted from Hill & Ryan and DuPont<sup>1,35</sup>)

- Raw fruit and vegetables must be washed thoroughly and soaked. Avoid fruit and vegetables that cannot be peeled.<sup>1,35</sup>
- Consider the risk of infection from contaminated cutlery or crockery. In extreme cases, some travellers even carry their own eating utensils or clean suspect utensils with alcohol swabs.<sup>1,35</sup>
- Maintain good personal hygiene such as regular handwashing, even if staying in extreme conditions.<sup>1</sup>
- Local foods may often be safer in restaurants than westernised foods as staff may be unfamiliar with western cooking methods. Also there may be less demand and so food not maintained at correct temperatures once cooked.<sup>1</sup>

Table 16 lists foods identified either as high or low risk for causing TD. Ideally travellers should avoid high-risk items. Unfortunately studies have shown that up to 98% of travellers abandon these dietary precautions within 72 hours of leaving home.<sup>35</sup>

#### General water precautions

Tap water is hazardous in many countries including both developing and some developed countries. Commonly recommended precautions include:<sup>1,35</sup>

- If suspect, tap water should be avoided, as should ice cubes, ice blocks and milk products.
- Although chlorinated, swimming pool water is not sterile and should not be drunk.
- Bottled water is generally considered safe, but only drink bottled water from bottles with intact seals and that do not appear to have been tampered with.

In some countries it is common for street vendors to refill bottles with tap water or water from other sources. The traveller should use bottled water to clean their teeth.

- Soft drinks, carbonated water, wine and bottled beers are generally considered safe, but the traveller should ensure that the bottle or can is opened at their table.
- Hot drinks are usually safe.
- Travellers should be cautious with fruit juices and cordials as they may have been prepared with contaminated water.

Water may be treated and disinfected by boiling for three to five minutes, or by the use of chlorine, iodine or filtration.<sup>1,35</sup> The boiling of water is probably the most common method of water disinfection used by travellers, and if the water is boiled for an appropriate time, most enteropathogens will be destroyed.<sup>1,35</sup> For climbers and other adventure travellers it must be remembered that water boils at a lower temperature at altitude, although this effect will not be significant if the water is boiled for a longer time.<sup>1,35</sup> Water may also be disinfected by adding four drops of iodine tincture per litre and then allowing the water to stand for 30 minutes.<sup>1,35</sup> The water may need to be filtered prior to treatment and the method should be avoided if the traveller is pregnant, has thyroid disease or is allergic to iodine. However, it must be remembered that iodine treatment does not remove *Cryptosporidium* oocysts and also leaves an unpleasant taste in the water.<sup>1,35</sup> Chlorine is also commonly used for water treatment, either in liquid form or in commercially-available water purification tablets, but is less effective than iodine.<sup>1,35</sup> As with iodine, the water may need to be filtered



prior to treatment<sup>1,35</sup> and *Giardia* and *Cryptosporidium* cysts are resistant to chlorine.<sup>1,35</sup> Again, chlorine may leave an unpleasant taste in the water. A wide range of filters and water purifiers are commercially available. Many use multistage systems containing filters and resins containing iodine and they vary in portability. Generally they are more expensive than other methods of water disinfection and require regular maintenance and replacement.<sup>1,35</sup>

### Vaccination

Some strains of ETEC produce a heat labile enterotoxin which is similar to cholera toxin produced by *Vibrio cholerae*.<sup>34</sup> Therefore, newer cholera vaccines such as *Dukoral* have been used to prevent TD caused by ETEC. However only 50% of ETEC strains express this enterotoxin and studies suggest that the use of oral killed cholera vaccine would only prevent 1-7% of people from developing TD. Additionally, the beneficial effects also appear to be short lived.<sup>34</sup>

### Chemoprophylaxis

Using antibiotics for the prophylaxis of TD is rarely considered in clinical practice, unless the traveller has an underlying condition that may increase the risk of severe and/or complicated diarrhoea.<sup>40</sup> It is not recommended for healthy travellers.<sup>40</sup> On the rare occasions that antibiotic chemoprophylaxis is indicated, sulfonamides and tetracyclines are no longer recommended due to the presence of widespread resistance; a fluoroquinolone would be the drug of choice.<sup>34,40</sup> Australian guidelines recommend either norfloxacin (400 mg daily) or ciprofloxacin (500 mg daily) for no more than three weeks.<sup>40</sup> The use of azithromycin may be considered in areas such as south and south east Asia where strains of *Campylobacter* are resistant to the fluoroquinolones.<sup>34</sup> Rifaximin, a poorly absorbed form of rifamycin, is available in other countries and is recommended as an alternative choice when *E.coli* predominates, but should not be used if invasive pathogens such as *Salmonella*, *Campylobacter* and *Shigella* are likely.<sup>34</sup> However for most travellers antibiotic prophylaxis is not recommended because of the risk of adverse reactions, predisposition to other infections such as vaginal candidiasis or pseudomembranous colitis, potential development of bacterial antibiotic resistance, cost and lack of data on their safety and efficacy in prolonged courses.<sup>34</sup> In clinical practice, most travel health doctors would prefer to give high-risk travellers antibiotics for self treatment rather than antibiotic chemoprophylaxis. The use of non-antibiotic prophylaxis is discussed in some papers. Bismuth subsalicylate (*Pepto-bismol*) is occasionally used by American travellers and has been reported to reduce the risk of TD by 60%,<sup>34</sup> but *Pepto-bismol* is not available in Australia, and side effects are common at the effective dosages.<sup>34</sup> Probiotics may have a small effect, reducing the risk of TD by 15%.<sup>34</sup>

## Treatment of travellers' diarrhoea

The main goals of treatment are to:<sup>34</sup>

- Avoid dehydration
- Reduce the severity and duration of symptoms
- Prevent interruption of planned activities.

### Hydration and diet

Hydration is an important intervention for all forms of diarrhoea and may be all that is required for mild disease.<sup>34</sup> It is particularly important in infants and young children, the elderly and those with chronic debilitating conditions that are at greater risk of complications.<sup>34</sup> The use of oral rehydration solution (ORS) in the very young and elderly is well-established, but there is some evidence to suggest that they are unnecessary when managing TD in otherwise healthy adults, and maintaining hydration with sugary drinks and eating salt crackers may be all that is required in this group.<sup>1</sup> Adventure travellers may benefit from carrying electrolyte sachets as suitable drinks and foods may not be available. They can also prepare their own solution by mixing half a teaspoon of salt and eight level teaspoons of sugar in one litre of potable water.

### Symptomatic treatment

Loperamide is the preferred ant motility agent due to its side effect profile.<sup>34</sup> It should not be given to young children and those with diarrhoea and fever, or when there is gross blood in the stools.<sup>34</sup>

### Antibiotic treatment

Antibiotic therapy has been proven to be effective in the treatment of TD and most studies show that a single dose or a three day course will improve the condition within 20-36 hours and will shorten the duration of the diarrhoea by one to two days compared to placebo.<sup>34</sup> Side effects from antibiotic therapy are generally mild. How antibiotics are used in the treatment of TD varies; some clinicians recommend prompt self-treatment of TD for travellers with moderate to severe diarrhoea, whereas others recommend a more cautious approach in the treatment of the condition as it is often self-limiting.<sup>34</sup> Fluoroquinolones are effective for TD unless resistant *Campylobacter* is present and if so, azithromycin may be used.<sup>34</sup> Azithromycin may also be useful if the traveller is pregnant or is a young child.<sup>34</sup> Current Australian guidelines recommend a single dose of azithromycin (1 g) or norfloxacin (800 mg).<sup>40</sup> If symptoms do not improve after the single dose, or if fever or bloody stools are present, then a two to three day course is recommended of azithromycin (500 mg daily) or norfloxacin (400 mg twice-daily) or ciprofloxacin (500





mg twice-daily).<sup>40</sup> As mentioned above, rifaximin is used overseas to treat TD caused by non-invasive organisms.

### Combination therapy

There is no internationally accepted consensus on the place of antibiotics in the treatment of TD.<sup>1</sup> The majority of international travellers do not travel with a course of antibiotics for self-administration should TD occur, and these travellers should follow standard diarrhoea management recommendations for fluid replacement if their symptoms are mild, and combine fluid replacement with a short course of loperamide if they have moderate diarrhoea.<sup>1</sup> If symptoms are severe, or if there is blood in their stools, fever is present or if the diarrhoea persists for more than five days, then the travellers should seek medical attention.<sup>1</sup>

For travellers on longer trips to developing countries, or areas with poor sanitation, or where medical help may not be available, or if the traveller is visiting very remote areas, the traveller may be supplied with antibiotics and educated on how to use them appropriately.<sup>1</sup> Many Australian travel health physicians would offer these travellers a three-day course of ciprofloxacin (500 mg twice-daily) or azithromycin (500 mg daily) to take for self-treatment if required. The traveller would be instructed to use fluid replacement and loperamide if symptoms are mild.<sup>1</sup> Whereas if the symptoms were moderate to severe, the traveller would be instructed to commence self-treatment with fluid replacement, loperamide and the antibiotics. Some travel health clinicians would also consider giving the patient a course of tinidazole (2 g as a single dose) to take with them overseas to be used if the diarrhoea persists for several days.

### Diarrhoea in the returned traveller

Diarrhoea is one of the most common symptoms in returning travellers, affecting about 13% of travellers who return ill from overseas,<sup>34</sup> and needs careful evaluation. If fever or gross blood in the stools is not present, the patient may be treated symptomatically and observed.<sup>34</sup> However, if the traveller appears unwell or the diarrhoea is persistent, the traveller should be referred and the diarrhoea investigated. To identify the actual causative organism multiple stool samples may need to be sent for culture.<sup>40</sup> Serology tests may also be required to help identify amoebiasis, schistosomiasis or strongyloidiasis.<sup>40</sup> Non-infective causes should also be considered as conditions such as irritable bowel syndrome are known to have been precipitated by travel.<sup>40</sup> If no clear diagnosis is identified then empirical therapy for giardiasis may be considered.<sup>40</sup>

## Case discussion 1

*Edna Everest is a 34-year-old climber who is visiting Nepal with two friends for a two month trekking holiday in the Himalayas. She will fly from Sydney to New Dehli (where she will overnight in a 4 star hotel) and then to Kathmandu where she will stay for four days in a backpacker hostel before taking a bus journey to the starting point of her trek. Whilst trekking she will either camp in a tent or, if local accommodation is available, will stay in local villages. She takes Nexium 20 mg daily for GORD, Microgynon 20 and is prone to vaginal candidiasis. What advice would you give Edna and her friends to reduce the risk of travellers' diarrhoea or to treat it should it occur?*

### Issues to consider

- Is Edna at high risk of travellers' diarrhoea?
  - Her risk would be relatively high as she is travelling to very remote areas in a developing country and she will be staying with the local population and eating the local cuisine. Esomeprazole will also increase her risk of diarrhoea.
- What dietary advice would you recommend?
  - She will be flying on a variety of aircraft, through a number of airports and will stay in a variety of different types of accommodation. Therefore she will need comprehensive education on dietary risks and how to reduce them.
- What advice would you give the party regarding their drinking water?
  - As she is trekking in very remote areas, she will need a method of disinfecting water. Each method has both advantages and disadvantages and it may be best to have at least two options. The method chosen must also be portable.
- How should diarrhoea be treated by the members of the party should it occur?
  - The party will be travelling to a remote area, possibly hundreds of miles away from medical care and in a rugged area where air evacuation may be difficult and dependent on weather, terrain and the availability of helicopter or aircraft. Therefore, it is important that the travellers are appropriately equipped with a medical kit containing (for TD) ORS tablets, loperamide, azithromycin (or norfloxacin or ciprofloxacin), and tinidazole (or metronidazole); a doctor will need to be consulted for a prescription for the antibiotics. They will need appropriate education and written instructions on how to use these agents.
- Edna will also need information on the effect (if any) of the antibiotics (if used) on her oral contraceptive and the risk of candidiasis. It may be prudent to include a treatment for vaginal thrush in the medical kit if it is a common occurrence for Edna after antibiotic therapy.



## Vaccines and vaccine-preventable diseases

Travellers often see vaccinations as the most important, and sometimes the only, health care intervention they require before travelling.<sup>1</sup> Also, the need to find out if vaccinations are required for their journey is often the main, if only, reason why many travellers seek health advice before travelling,<sup>1</sup> and if they consider their destination to be safe (i.e. not requiring pre-travel vaccinations) they will probably not seek any pre-travel health advice.

The incidence of many vaccine-preventable diseases in travellers is actually quite low. Table 17 gives the morbidity and mortality of vaccine-preventable diseases in 1,000,000 non-immune travellers visiting developing countries. However, the low incidence of some of these diseases is not a valid reason for non-immunisation, because if contracted many of these illnesses have

serious consequences.<sup>1,10</sup> Influenza and hepatitis A are the most common of the vaccine-preventable diseases in travellers and Table 17 shows that hepatitis A is much more prevalent in travellers than typhoid or cholera. Yet, whereas many travellers would consider specifically visiting a health professional to ask about the need for typhoid or cholera vaccinations for their journey, few would consider it necessary to specifically ask about the need for influenza or hepatitis A vaccination.<sup>10</sup>

As discussed earlier in the module, vaccinations may be divided into three categories: required, routine and recommended.<sup>11</sup> The national immunisation program for routine vaccinations is listed in the *Australian Immunisation Handbook*.<sup>12</sup> It is important that all travellers are up to date with their standard vaccinations and travellers may require 'boosters' for 'childhood' vaccinations as well as the standard travel vaccines before travelling.<sup>10</sup> Increasingly, many travellers from westernised countries such as Australia have not received all of the standard childhood

**Table 17: Morbidity and mortality of vaccine-preventable diseases in one million non-immune travellers visiting developing countries**

Infection	Incidence per month	Case fatality rate (%)	Mortality rate per month
Hepatitis A	3000-6000	0.1	3-6
Hepatitis B	800-2400	2	16-48
Typhoid fever (India/Africa)	30 (300)	1 (1)	0.3 (3)
Polio - Symptomatic - Asymptomatic	4 20-1000	20 -	0.8 -
Cholera	3	2	0.06

(Adapted from Leggat, Goldsmid & Speare<sup>13</sup>)

**Table 18: Approximate lifespan of common vaccinations**

Chickenpox	Life	Meningitis C	Life
Cholera/ETEC ( <i>Dukoral</i> )	2 years/3 months	Pneumonia	5 years
Flu vaccine	1 year	Polio (primary course and booster)	Life
Hepatitis A	Life	Tetanus	5-10 years
Hepatitis A Ig 2mls/5mls	3/6 months	Tuberculosis (BCG)	Life
Hepatitis B	Life	Typhoid ( <i>Typhim Vi</i> )	2-3 years
Japanese B encephalitis	1-3 years	Typhoid capsules ( <i>Vivotif</i> ) x 4	5 years
Measles, mumps, rubella	Life	Yellow fever	10 years
Meningitis ACWY	3 years		

(Adapted from Mills<sup>14</sup> and Leggat, Goldsmid & Speare<sup>15</sup>)



vaccinations, which is a cause of concern as travellers are increasingly visiting countries in which diseases such as polio, measles and rubella are still prevalent. It is important that an immunisation plan is established for the individual traveller, taking into account any legal requirements for the country being visited, but also factors such as:

- The traveller's immune status, medical history and history of allergy
- What destinations will be visited? What is the 'remoteness' of the locations?
- How long is the traveller staying at the destination and what is the type of travel?
- The traveller's age
- How long is it from the initial consultation until the time of departure
- What activities is the traveller intending to do at their destination? i.e. will they be working and if so as what etc.

It must also be remembered that many travel-specific vaccinations have a limited life span and so travellers may require boosters if they travel infrequently. Table 18 lists the approximate lifespan of some common vaccinations.

Standard travel vaccines considered include those for influenza, typhoid, polio, hepatitis A, meningococcal, rabies, hepatitis B, yellow fever, Japanese B encephalitis, and cholera.

### Influenza vaccination

Influenza is the most common vaccine-preventable disease in travellers, with an incidence of 1%. Therefore, influenza vaccination is recommended for travellers who may be at increased risk of the complications of influenza infection, including the elderly and those with chronic diseases such as chronic cardiac and respiratory diseases.<sup>12</sup> Influenza vaccination would also be recommended for tourists travelling in large groups or on cruise ships, where travellers would be closely confined for days or weeks and at risk of influenza, which may be acquired either before departure or from travel to areas where influenza is circulating.<sup>12</sup> Influenza vaccines normally contain three recommended strains representing recent circulating viruses determined annually by the Australian Influenza Vaccine Committee.<sup>12</sup> A factor determining the effectiveness of the influenza vaccine is the similarity between the virus strains in the vaccine and those circulating in the community.<sup>12</sup> However, the influenza season in the northern to southern hemispheres does not coincide and so different strains may be prevalent in different areas which may influence the protection offered by an Australian influenza vaccine administered in the southern autumn when the travellers visits a northern hemisphere country in the northern autumn/winter.<sup>12</sup>

## Swine influenza (H1N1)

Visit [www.psa.org.au](http://www.psa.org.au) under *What's New* for an update on the current situation regarding swine influenza and information to help pharmacists with public enquiries.

### Typhoid vaccines

*Salmonella typhi* is the causative organism for typhoid fever and humans are the sole reservoir of infection.<sup>12</sup> The organism is shed in the faeces of acutely ill patients or chronic asymptomatic carriers and the infection is transmitted by the consumption of faecally-contaminated food and water.<sup>12,42</sup> Common sources of infection include shellfish from sewage-polluted beds, and the eating of raw fruit and vegetables that have been fertilised with night soil.<sup>42</sup> Generally the risk of typhoid is low for travellers, except in parts of north and west Africa, most southeast Asian countries, the Indian subcontinent and in some south Pacific countries, including Papua New Guinea.<sup>12,41,42</sup> In countries such as Australia, typhoid is a travel-related condition and travellers to the Indian subcontinent to visit friends and relatives are at greater risk than other travellers.<sup>12</sup> There are 50-80 cases of typhoid fever reported in Australia each year.<sup>12</sup> Infection results in a systemic illness of varying severity.<sup>42</sup> Severe illness results in fever, malaise, anorexia, constipation and insomnia. Without treatment the disease progresses and can be fatal.<sup>10,42</sup> Between 2-5% of those who contract typhoid fever become chronic carriers.<sup>42</sup> Typhoid vaccine is generally recommended for all travellers over two years of age visiting endemic areas and where food hygiene may be suboptimal and the treatment of drinking water is inadequate.<sup>12</sup> Vaccination should be completed at least two weeks before travel.<sup>12</sup> Vaccination would be strongly recommended for travellers to endemic areas who are visiting friends and relatives.<sup>12</sup> There are currently two types of typhoid vaccine available: oral live attenuated typhoid vaccine (*Vivotif Oral*) and purified Vi capsular polysaccharide vaccine (*Typherox*, *Typhim Vi*). *Vivaxim*, which is a combination of both typhoid and hepatitis A is also available.<sup>12</sup>

The vaccination schedule of the oral vaccine is one capsule every second day i.e. on days one, three and five.<sup>10,12</sup> The capsules must be swallowed whole and not chewed (as the organisms are destroyed by gastric acid) and are best taken at bedtime, as they must be taken on an empty stomach with a cold or lukewarm drink and the traveller should not eat for one hour afterwards.<sup>10,12</sup> The oral vaccine must not be given with antibiotics or drugs that may be active against *Salmonellae*, and if possible antibiotics should be delayed for three days after the last dose of the vaccine.<sup>12</sup> However, the oral vaccine may be given concurrently with mefloquine or with *Malarone* or yellow fever vaccine.<sup>12</sup> Compliance with the vaccination schedule may be an issue with some travellers and also



contact, aerosol transmission and respiratory droplets from the nose and pharynx of infected persons.<sup>12,42</sup>

There are at least 13 serogroups of *Neisseria meningitidis* and most cases are caused by subgroups A, B and less commonly by groups Y and W135.<sup>12,42</sup> Epidemics in developing countries in Africa and Asia are usually caused by serogroup A, whereas serogroup B is a major cause of sporadic meningococcal disease in developed countries.<sup>12,42</sup> Serogroup C has a more cyclic pattern with increased incidence, and is occasionally associated with clusters of cases in schools and universities etc.<sup>12</sup>

Most infections do not cause clinical disease and the infected person may become an asymptomatic carrier of the bacteria.<sup>42</sup> If the clinical disease becomes evident, it has a rapid onset with intense headache, fever, nausea, vomiting, photophobia and stiff neck, and even with good health care facilities the disease is fatal in 5-10% of cases.<sup>42</sup> The case fatality rate amongst travellers exceeds 20%.<sup>41</sup>

Vaccination should be considered for travellers to countries where outbreaks of meningococcal disease are known, these include the 'Meningitis belt', a band of countries across sub-Saharan Africa from Senegal to Ethiopia where often large outbreaks of meningitis occur during the dry season (November to June), and pilgrims to Mecca for the Hajj and Umrah.<sup>7,41,42</sup> Vaccination is a requirement for all pilgrims by the Saudi Arabian government. In temperate countries most cases occur in the winter months.<sup>42</sup>

The vaccine protects against meningitis and septicaemia due to *Neisseria meningitidis* and some types of meningococci.<sup>10</sup> There are two forms of the vaccine: tetravalent meningococcal polysaccharide vaccine (4vMenPV) which is effective against serotypes A, C, Y and W<sub>135</sub> and less effective against serotype C in young children, and meningococcal C conjugate vaccine (MenCCV) which is effective against serotype C.<sup>10,12</sup> Since 2003, the Australian government has provided free MenCCV to children and it was added to the national immunisation program.<sup>12</sup> 4vMenPV (*Mencevax ACWY*, *Menomune*) is recommended for travellers intending to visit areas of the world where epidemics of group A, Y and W135 are frequent and pilgrims attending the Hajj.<sup>12</sup> A single dose is given at least two weeks before travelling.<sup>10</sup> Revaccination may be required three to five years later if visiting another endemic area as antibody levels decline rapidly over two to three years.<sup>12</sup> Side effects include possibly a slight discomfort and local reaction at the injection site but significant general adverse effects are rare.<sup>10,12</sup>

### Rabies vaccine

Rabies is caused by a rhabdovirus of the genus *Lyssavirus*,<sup>42</sup> it is a zoonotic disease affecting a wide range of animals.<sup>42</sup> The virus is present in the saliva of the infected animal and is transferred to humans

via bites and scratches.<sup>42</sup> Unless treated, rabies is invariably a fatal disease that causes a severe acute viral encephalomyelitis.<sup>42</sup> Initial symptoms experienced by the patient include a sense of apprehension, headache, fever, malaise and sensory changes around the animal bite.<sup>42</sup> Excitability, hallucinations and aerophobia are common.<sup>42</sup> Within a few days these symptoms progress rapidly and hydrophobia, delirium, convulsions and then ultimately death occurs, either suddenly from cardiac or respiratory arrest, or the patient eventually lapses into a coma.<sup>12,42</sup>

Rabies is prevalent in rural areas of Africa, Asia, Europe, North and South America. The risk is particularly high in Asia where 90% of all rabies deaths are reported.<sup>41</sup> Some countries have been declared rabies-free including New Zealand, the Pacific Islands, the Scandinavian countries, UK, Eire, Iceland and Switzerland.<sup>41</sup> Australia is also classified as rabies-free, although Australian bat lyssavirus (ABL) is in the same family and produces very similar clinical features to rabies.

Although rabies in travellers is rare, cases are invariably fatal, and therefore travellers (especially children) visiting endemic areas need to be warned of the risk and the need to avoid close contact with wild or domestic animals.<sup>12</sup> Travellers must also be given advice about pre-travel/pre-exposure vaccination and what to do should they be bitten or scratched by an animal whilst abroad.<sup>12</sup>

There are two rabies vaccines available, *Merieux Inactivated Rabies Vaccine* and *Rabipur Inactivated Rabies Virus Vaccine*, but both are interchangeable, and human rabies immunoglobulin (HRIG) (*Imogam Rabies*) is also available.<sup>12</sup> Rabies vaccine is safe and effective when used for pre-exposure prophylaxis, and pre-exposure prophylaxis simplifies the management of a possible exposure to rabies because fewer doses of post-exposure vaccine are required and HRIG is not required.<sup>12</sup> This is an important point of discussion between travel health professionals and travellers as HRIG can be incredibly difficult to obtain in many developing countries.<sup>12</sup> Pre-exposure vaccination is recommended for people working with mammals in endemic areas and expatriates and travellers staying in endemic areas for prolonged periods i.e. greater than one month (although one month is an arbitrary period, as rabies has occurred in travellers visiting endemic areas for shorter periods).<sup>12</sup> Three 1 mL IM doses of rabies vaccine should be injected into the deltoid muscle at days 0, 7 and 28 (although the third dose can be given at day 21).<sup>12</sup> Reduced rabies neutralising antibody titres may occur if injected into sites other than the deltoid, and it must never be injected into the buttock as failure of pre-exposure prophylaxis has been reported by this route.<sup>12</sup>

All travellers should seek medical advice after animal bites or scratches in an endemic area and the need for post-exposure treatment considered.<sup>12</sup> If bitten or scratched,



the traveller should immediately and thoroughly wash the wounds with soap and water and apply a viricidal agent such as povidone iodine.<sup>12</sup> Following wound management the subsequent post exposure treatment consists of five doses of 1 mL of rabies vaccine (on days 0, 3, 7, 14 and 28 or 30) and the use of HRIG.<sup>12</sup> A single dose of HRIG is infiltrated around the wound at the same time as the first dose of rabies vaccine to give localised anti-rabies antibody protection.<sup>12</sup> A dose of 20 IU/kg is recommended, and as much of the dose as possible is infiltrated around the wound with the remainder being injected intramuscularly at a site away from the injection site of the rabies vaccine.<sup>12</sup> Travellers who have completed the recommended pre-exposure prophylactic regimen require a modified post-exposure regimen: only two doses of 1 mL rabies vaccine are required IM on days 0 and 3 and HRIG is not required.<sup>12</sup>

Booster doses of rabies vaccine are recommended for immunised people who have an ongoing risk of rabies exposure.<sup>12</sup> Antibody titres may be measured and if immunity is inadequate booster doses may be administered, alternatively booster doses may be administered every two years without measuring antibody titres.<sup>12</sup> Sanofi Pasteur recommend a booster of *Merieux* vaccine 12 months after the initial pre-exposure prophylactic regime, and some clinicians do this to extend the protection offered by the initial course.<sup>12</sup>

For some patients the use of IM rabies may be too expensive and the use of intradermal (ID) rabies vaccination (0.1 mL on days 0, 7 and 28) may be considered.<sup>12</sup> The use of ID rabies vaccination is not recommended, as antibody titres are lower and wane more rapidly and Australian vaccines are not licensed for ID administration.<sup>12</sup> Therefore, the practitioner would take full legal responsibility and the ID route should not be used by inexperienced practitioners.<sup>12</sup>

### Hepatitis B vaccine

Hepatitis B virus (HBV) is transmitted by contact with infected body fluids either by sexual contact, transfusion of contaminated blood (or blood products) or by the use of contaminated needles and syringes.<sup>42</sup> Other ways in which hepatitis B may be potentially transmitted include body piercing, tattooing and acupuncture.<sup>42</sup> Hepatitis B has a worldwide distribution but its prevalence varies from country to country and is relatively low (less than 2% of the general population) in north America, north and western Europe, Australia and New Zealand and higher in Africa, Asia, central and eastern Europe, south and central America.<sup>42</sup>

In many patients, the symptoms are mild and are often unnoticed or the patient is asymptomatic. If clinical symptoms develop there is a gradual onset of anorexia, abdominal discomfort, nausea, vomiting, arthralgia, rash

followed by jaundice.<sup>42</sup> About 1% of cases are fatal.<sup>42</sup> Chronic HBV infection if it occurs can result in cirrhosis and/or liver cancer.<sup>42</sup>

The risk of HBV infection for travellers is minimal if vaccinated<sup>42</sup> and HBV infection appears to be more of a problem for expatriates living closely with the local population and travellers not taking adequate precautions.<sup>42</sup> Studies show that 10-15% of travellers voluntarily or involuntarily expose themselves to blood and body fluids while abroad in high risk countries.<sup>42</sup> However hepatitis B vaccination should be recommended for all travellers to high risk areas, whatever their activities, as there is always the risk of accident or medical emergency that may require surgery and blood transfusion or sexual contact with the local population.<sup>42</sup>

The standard schedule of administration of hepatitis B vaccine is three doses at day 0, at one month and at six to 12 months,<sup>42</sup> but accelerated regimes can be used if the traveller is travelling within one month of beginning the course. In accelerated regimes doses are administered (to adults) at days 0, 7 and 21.<sup>12,29</sup> If accelerated regimes are used a fourth dose at 12 months is recommended.<sup>12,29</sup> After the primary course it is important that antibody titres are measured in patients who are at high risk of occupational exposure to ensure immunity.<sup>29</sup>

Hepatitis B vaccine is very safe; transient local reactions are common but anaphylaxis is extremely rare.<sup>42</sup>

### Yellow fever vaccine

Yellow fever is a viral haemorrhagic fever endemic to the tropical central belt of Africa and to central and south America (including some Caribbean nations such as Trinidad and Tobago).<sup>12,42</sup> The number of reported outbreaks of the disease has increased since the 1980s and a current concern is the possible introduction of the disease to areas of the world such as Asia, which has both suitable vectors and primate hosts, but is currently not an endemic area for the disease.<sup>42</sup>

The causative virus is an arbovirus of the *Flavivirus* genus.<sup>42</sup> In urban and rural areas it is transmitted to humans via the bite of the *Aedes aegypti* mosquito (the same vector as dengue fever).<sup>42</sup> Unlike the malaria-carrying *Anopheles* mosquito, *Aedes aegypti* bites in the daytime.<sup>42</sup> In jungle areas, monkeys are the main reservoir of infection.<sup>42</sup>

Some infections may be asymptomatic, but the majority develop into an acute, two-phase illness. Initially the patient experiences fever, headache, chills, muscular pain, anorexia, nausea, vomiting and bradycardia.<sup>42</sup> After a few days, 15% of patients then enter a second phase with resurgence of their fever, jaundice, abdominal pain and haemorrhagia.<sup>42</sup> Fifty per cent of these patients will die 10 to 14 days after the onset of symptoms.<sup>42</sup> All travellers to





endemic areas are at risk of yellow fever, but especially travellers who either visit rural forest and jungle areas or urban areas during an outbreak of the disease.<sup>42</sup> The risk of infection can be reduced by taking appropriate precautions to prevent mosquito bites during the daytime as well as at night (See Malaria).<sup>42</sup>

Yellow fever vaccine (*Stamaril*) is a live attenuated virus vaccine and gives long, possibly life-long immunity, although it is a requirement to be revaccinated after 10 years.<sup>12</sup> Yellow fever is considered endemic in 32 African and 11 central and south American countries and the vaccine is recommended for all travellers aged nine months or older travelling or living in any country in West Africa or living or travelling outside urban areas in any other endemic country.<sup>12</sup> Many countries outside the endemic region require evidence of vaccination for travellers arriving from endemic countries.<sup>12</sup> All travellers older than one year of age arriving into Australia within six days of leaving a yellow fever endemic country must have a valid International Certificate of Vaccination against Yellow Fever, and those who do not are placed under quarantine surveillance until six days have passed from leaving the endemic country.<sup>12</sup>

In Australia, yellow fever vaccine can only be administered by approved Yellow Fever Vaccination centres. As with all live vaccines, yellow fever vaccine should not be given to pregnant women unless there is a risk of exposure to the virus.<sup>12</sup> Ideally, pregnant women should not travel to yellow fever endemic areas, but women who insist on travelling should be vaccinated as there is little evidence of risk to themselves and very low risk (if any) to the foetus.<sup>12</sup> The risk of adverse effects of yellow fever vaccine is greater in travellers aged over 60 years, and travellers in this age group should be only given yellow fever vaccine if they are travelling to an endemic area and if they have been advised of the risk of complications, although the risks are low.<sup>12</sup>

Most adverse events following yellow fever vaccination are mild, with reports of headaches, myalgia and low grade fever and there are a small number of reports of immediate allergic reactions.<sup>12</sup> More serious adverse reactions include vaccine-associated neurotropic effects and there have been 25 cases of meningoencephalitis following yellow fever vaccination.<sup>12</sup> Fifteen of these cases were in the 1950s in infants and resulted in recommendations not to vaccinate infants, the remaining cases occurred in adults and although very rare, the risk appears greater in those aged over 60 years.<sup>12</sup> The second serious reaction associated with yellow fever vaccination is vaccine-associated viscerotropic effects, which is a rare but often fatal complication resulting in multiorgan failure.<sup>12</sup> The exact incidence of this reaction is unknown but is estimated to occur in one in 400,000 doses of vaccine and is again more prevalent in older vaccines.<sup>12</sup>

### Japanese B encephalitis vaccine

Until recently, Japanese encephalitis presented a difficult conundrum for travel health practitioners. It is a disease that is widespread in Asia, but has a low incidence amongst travellers.<sup>43</sup> However, if contracted, it may cause death or disability in up to two-thirds of affected patients. Recommendations regarding vaccination were then complicated by some safety concerns about the then available vaccine.<sup>43</sup> Due to these issues, travel health practitioners were reported to fall into one of two camps: those that placed more importance on the severity of the disease and recommend vaccination, and those that placed more importance on the low occurrence of the disease in travellers and so rarely recommend vaccination.<sup>43</sup>

Japanese encephalitis is caused by a *Flavivirus* that is transmitted by mosquitoes of the genus *Culex*.<sup>42</sup> The virus also affects pigs and wild birds which act as a reservoir of infection.<sup>42</sup> It is endemic to many countries in Asia and occasionally occurs in north Queensland.<sup>42</sup>

The severity of symptoms can vary from a febrile headache and aseptic meningitis in mild cases, to a rapidly progressing headache, high fever and meningeal symptoms in severe cases, of which 50% are fatal.<sup>42</sup> Fifty per cent of survivors have permanent neuropsychiatric problems.<sup>43</sup> The risk for travellers is remarkably low (no more than one case per year is diagnosed in civilian travellers), although longer term visitors to rural and agricultural regions may be at greater risk.<sup>42</sup>

Until recently, the Japanese encephalitis vaccine available in Australia was an inactivated mouse brain-derived vaccine manufactured in Japan.<sup>12</sup> After administration of the vaccine, local reactions and minor systemic reactions were common and serious neurological reactions had been reported.<sup>12</sup> Delayed hypersensitivity reactions had also been reported, especially in patients with a history of previous allergic reactions.<sup>12</sup>

Recently, a new vaccine (*Ixiaro*) has been developed, which is an inactivated virus manufactured in cultured Vero cells.<sup>44</sup> The vaccine has been recently licensed in Australia and gives good seroconversion rates with low incidence of side effects. Two doses are administered at days 0 and 28 and most side effects reported to date are mild, including tenderness at the injection site, headache, myalgia and 'flu-like' symptoms.<sup>44</sup> Japanese encephalitis vaccine is recommended for travellers spending one month or more in rural areas of Asia and should be considered for travellers spending shorter periods in these areas, especially during the wet season and/or if they will be spending a great deal of time outdoors and/or their accommodation is not mosquito proof.<sup>12</sup> Vaccination is also recommended for travellers spending a year or more in Asian countries (except Singapore), even in urban areas or spending a month or more in Papua New Guinea.<sup>12</sup>



## Case discussion 2

*Tony Melville is a 24-year-old soccer fan planning to visit South Africa to support the Socceroos in their bid to win the 2010 FIFA World Cup. He is travelling in a small group with two friends and they hope to see games in Johannesburg, Pretoria, Durban and Nelspruit. From Nelspruit they intend to go on a four-day safari in Kruger National Park. Whilst in South Africa they will be staying in 3-4 star hotels in the major cities but will be staying with old friends from university whilst in Nelspruit before and after their safari. What health advice and vaccinations would you recommend for Tony and his friends?*

### Issues to consider

Apart from the four-day safari Tony and his friends are staying in urban areas in a well developed country and so are at low risk of many travel-related diseases but some issues that need to be discussed with Tony include:

- Vaccinations
  - Routine vaccinations – ensure Tony is up to date with all routine vaccinations such as measles/mumps/rubella (MMR), diphtheria/pertussis/tetanus (DPT) and polio.
  - Hepatitis A and B vaccination – vaccination is recommended for South Africa as there is a high risk of both hepatitis A and B and it is recommended that all unvaccinated people travelling to such countries are vaccinated especially people who may be exposed to blood, body fluids or have sexual contact with the local population or be exposed through medical treatment.
  - Typhoid vaccination is recommended for all unvaccinated people travelling to southern Africa, especially if visiting smaller cities, villages or rural areas and staying with friends and relatives.
  - There has been a recent outbreak of cholera in Zimbabwe and so cholera may be a concern for Tony and his friends. Cholera vaccine is not recommended or required for visitors to South Africa and the risks will be very low. Therefore it may be a point of discussion between Tony and his Travel Health professional but most would not recommend it unless he is at high risk of diarrhoea or the consequences of diarrhoea would be severe due to other co-morbidities.
  - Rabies vaccine is recommended for travellers who will spend a great deal of time outdoors in rural areas and who are doing activities that may put them at risk such as camping, hiking, cycling. Again, this would be a point of discussion between Tony and his Travel Health professional who would assess the risk of rabies and the need for vaccination.
- Malaria (see later in the module)
  - In South Africa there is a risk of malaria in low-land areas of the north eastern provinces including Mpumalanga, Limpopo and north-eastern KwaZulu Natal. Nelspruit is in Mpumalanga and there is a definite risk in the Kruger National Park.
  - Chloroquine-resistance is common in the malarial areas of South Africa.
- Other disease risks in southern Africa include:
  - HIV/AIDS is a major health issue in many southern African countries and travellers need to be aware of the risk and take appropriate precautions.
  - In rural areas of many southern African countries travellers need to be aware of the risks of dengue, filariasis, leishmaniasis, onchocerciasis, African tick bite fever and schistosomiasis. Therefore, whilst on safari they should take precautions to prevent insect bites and avoid swimming in fresh water (schistosomiasis – see later in the module).
- What medicines to take with them
  - Advice regarding personal security and safety.
  - Advice regarding travel health insurance.
  - What to do when they return should they experience untoward symptoms such as fever or flu-like symptoms, diarrhoea or have experienced animal bites or scratches whilst overseas etc.



## Cholera vaccine

Cholera is caused by the ingestion of food or water contaminated with the faeces or vomit of infected people.<sup>42</sup> The causative organism for cholera is *Vibrio cholerae* and it is an acute enteric disease of varying severity.<sup>42</sup> Many cases are asymptomatic or mild with diarrhoea being the sole symptom.<sup>42</sup> Some cases are severe with rapid onset of profuse diarrhoea and vomiting resulting in rapid and severe dehydration. In very severe cases, death can occur in hours due to circulatory collapse resulting from dehydration.<sup>42</sup> Many developing countries in Africa and Asia are blighted with cholera, but for most travellers the risk is low even in endemic countries if simple precautions are taken to avoid contaminated food and water (see Travellers' diarrhoea).<sup>42</sup> The risk increases greatly for humanitarian and refugee workers.

Cholera vaccine is no longer required as a condition of entry to any country and is only recommended for travellers at high risk for the condition.<sup>42</sup> *Dukoral* is an inactivated oral vaccine consisting of a 3 mL liquid vaccine dose vial and a buffer sachet.<sup>42</sup> For adults and children over six years, *Dukoral* is administered orally after dissolving the buffer granules in 150 mL of water and adding the vaccine to the solution (for children below the age of six years, see the manufacturer's or *Australian Immunisation Handbook* recommendations).<sup>42</sup> Two doses are required, given a minimum of one week (and up to six weeks) apart.<sup>42</sup> The course must be restarted if the second dose is not given within six weeks of the first dose.<sup>42</sup> As the vaccine is acid labile, food and drink must be avoided one hour before and after administration of the vaccine.<sup>42</sup> It may be given at the same time as other travel vaccines, with the exception of oral typhoid vaccine as the buffer may affect the transit of the capsules of the oral typhoid vaccine through the gastrointestinal tract (therefore doses of oral typhoid vaccine and *Dukoral* must be separated by at least eight hours).<sup>42</sup>

Despite the incidence of cholera in many countries, cholera vaccine is not recommended to all travellers to endemic areas as the efficacy of the vaccine is not 100% and there is a low relative risk to most travellers.<sup>42</sup> Careful selection of food and water is more important.<sup>42</sup> However, immunisation should be considered for people at increased risk of diarrhoeal diseases.<sup>42</sup>

## Diseases transmitted through food and water

Significant and important infections for travellers transmitted through the contamination of food and water include travellers' diarrhoea, typhoid, hepatitis A and cholera. The causes, prevention and treatment of

travellers' diarrhoea is discussed above, as are the general principles of food hygiene, the selection and preparation of appropriate foods and general water precautions that should be taken by all travellers. The section of the module discussing vaccines and vaccine preventable diseases briefly discusses the causes, areas of risk and prevention of typhoid, cholera and hepatitis.

## Malaria

Malaria is one of the most significant diseases worldwide affecting about three million people each year, with approximately one to two million fatalities.<sup>45</sup> It is prevalent in tropical and subtropical regions, and the risk of re-emergence in areas previously considered malaria-free is a major cause of concern.<sup>45</sup> A number of factors have been implicated for this re-emergence including global warming, drug resistance of the *Plasmodium* parasite, insecticide resistance of the vector and the migration of people from endemic to non-endemic areas.<sup>45</sup> There are five *Plasmodium* species that affect humans (*P.falciparum*, *P.vivax*, *P.ovale*, *P.knowlesi* and *P.malariae*) with *P.falciparum* being the most important as it can cause a severe, rapidly progressive and often fatal form of the disease.<sup>45</sup>

### Forms of malaria

Malaria is usually categorised into two classes: the potentially fatal variant caused by *P. falciparum* and the less dangerous and more benign variants caused by *P.vivax*, *P.malariae*, *P.knowlesi* and *P.ovale*.<sup>1,45</sup> *P.falciparum* predominates in sub-Saharan Africa, parts of South America and Asia and is mainly resistant to chloroquine. *P.vivax* is found in more temperate regions. *P.ovale* is found mainly in sub-Saharan Africa with another focus in south east Asia.<sup>1,45</sup> Chloroquine resistance is now emerging in *P.vivax*, *P.ovale* and *P.malariae*.<sup>1,45</sup>

An important aspect of *falciparum* malaria is that the local population in endemic areas can develop semi-immunity to the condition and therefore life-threatening *falciparum* malaria in healthy local adults in the area may be rare.<sup>1</sup> However, mortality in children below the age of five years is still often high as immunity may not have developed in this age group.<sup>1</sup> This could mean that adult travellers may receive sub-optimal treatment in some endemic areas as they may not be used to treating non-immune patients.<sup>1</sup>

A key risk group are migrants residing in non-endemic areas (such as Australia) who then return to their native country to visit relatives in endemic areas (such as PNG). These travellers tend not to take adequate prophylactic measures in the mistaken belief that they still possess some immunity.<sup>1</sup> The risk of malaria is often lower in urban and coastal areas and is absent above 2,000m. Malaria is particularly dangerous in pregnant travellers.<sup>1</sup>





## Pathophysiology and life cycle

In brief summary, the female *Anopheles* mosquito is the insect vector for malaria.<sup>1</sup> To develop its eggs and reproduce, it requires the protein from a blood meal and bites a human host to draw blood.<sup>1</sup> In order to transmit malaria, the mosquito must have picked up the sexual stage of the malarial parasite (gametocytes) from an infected human, these then mature inside the mosquito to form asexual sporozoites.<sup>1</sup> When the mosquito bites another human, the sporozoites are injected into the human's blood stream to infect the human host.<sup>1</sup> The sporozoites then pass around the blood stream until they reach the liver where they infect the hepatocytes.<sup>1</sup> Once inside the hepatocytes, the sporozoites develop and multiply (extraerythrocytic schizogony) and thousands of merozoites are then released from the hepatocytes which in turn infect red blood cells (RBCs).<sup>1</sup> Inside the RBC, the merozoite develops into a trophozoite and after further multiplication is termed a schizont (erythrocytic schizogony).<sup>1</sup> The schizonts then form eight to 24 merozoites which are released to invade further RBCs and perpetuate the cycle.<sup>1</sup> Some merozoites form sexual gametocytes and if taken up in another mosquito bite, may then be transferred to another human.<sup>1</sup> The symptoms of malaria are due to the invasion and rupture of RBCs. *P.vivax* and *P.ovale* may also remain dormant in the liver cells as hypnozoites.<sup>1</sup>

## Clinical presentation

Early symptoms of malaria are often described as 'flu-like'. Attacks occur in three phases: coldness with rigors, feeling hot and flushed and then intense sweating as the attack resolves.<sup>1</sup> With the benign forms of malaria, fevers may be experienced in a synchronised way, whereas with falciparum malaria, the fevers are often irregular with coma and death occurring within as little as 24 hours after the development of initial symptoms.<sup>1</sup> However, the cyclical nature of fevers (if present) cannot be used to clinically distinguish between variants of the disease. As well as fever, other symptoms include myalgia, arthralgia, diarrhoea, headache, nausea, vomiting and malaise.<sup>1</sup>

With the benign forms of malaria there are few serious complications although anaemia will develop if the disease is not treated. However with falciparum malaria in non-immune travellers, there is a high risk of complications.<sup>1</sup> In falciparum malaria, the surface of the RBCs is altered and they adhere to the walls of blood vessels which can lead to cerebral malaria.<sup>1</sup> Other complications include thrombocytopenia, renal insufficiency, hypoglycaemia and splenomegaly.<sup>1</sup>

## Chemoprophylaxis

Chemoprophylaxis is the use of medications before, during and after the exposure period with the aim of preventing

or suppressing symptoms of malaria caused by blood-stage parasites.<sup>46</sup> This may be combined with terminal prophylaxis or anti-relapse therapy at the end of the exposure period to prevent relapses or delayed-onset of clinical symptoms caused by hypnozoites.<sup>46</sup> The choice of chemoprophylactic regimen is based on a variety of factors including:<sup>46</sup>

- The destination (country and area to be visited, time of year, rural or urban, accommodation, activities at destination and style of travel)
- Presence of contraindications (age, pregnancy, previous experience with antimalarials, medical history (neuropsychiatric illness, seizures etc.))
- Presence of resistant *P.falciparum* or resistance to standard chemoprophylactic agents in the area to be visited
- The tolerability of the regime.

Resistance of *P.falciparum* to chloroquine has been confirmed in most areas and mefloquine-resistance has been reported on the borders of Thailand with Myanmar (Burma) and Cambodia.<sup>46</sup> Table 19 summarises some of the properties of commonly-used chemoprophylactic agents for malaria.

Compliance with the chemoprophylactic regime is an important issue as the traveller may be required to take the medication long term and even minor side effects in this situation can have major effects on compliance. Chemoprophylaxis must be commenced before the traveller enters the endemic area, continued whilst they are in the area and for a fixed time afterwards. Atovaquone/proguanil (*Malarone*) is taken daily, and should be commenced one to two days before entering the malarial area and continued for seven days after leaving the area. Likewise, doxycycline is also taken daily, and must be started one to two days before entering the malarial area, but continued for four weeks after leaving the endemic area. Mefloquine is taken weekly and ideally, therapy should be started one to two weeks before entering the malarial area so that the traveller may be assessed for any rare untoward effects before their departure. Therapy would be continued for four weeks after leaving the malarial area.<sup>46</sup>

Infants and children are also at risk of malaria and should also be given chemoprophylaxis. *Malarone* is available in a paediatric strength tablet and mefloquine may be used in children greater than three months of age. Doxycycline has been used in children who are at least eight years of age.<sup>46</sup>

As mentioned previously, malaria in pregnant women can be more severe than in non-pregnant women and can increase the risks of abortion and stillbirth. Ideally, pregnant women should not travel to malarial areas. However, if travel cannot be deferred chemoprophylaxis is essential,



Table 19: Summary of the properties of key chemoprophylactic agents for malaria					
Agent	Usual regimen	Mode of action	Major side effects	Current use	Cautions
Chloroquine	300 mg base per week.	Suppresses blood parasites.	Fatal cardiac arrhythmia in overdose, nausea and vomiting, chronic retinopathy, itching, tinnitus, dizziness.	Malaria suppression and treatment. Resistance widespread with <i>P.falciparum</i> but still useful with <i>P.vivax</i> .	Do not use in epileptics, use with caution with warfarin. Appears safe in pregnancy and breastfeeding.
Doxycycline	100 mg daily.	Suppresses blood parasites.	Gastrointestinal upset, sun sensitisation, thrush.	Prophylaxis in areas with chloroquine and/or mefloquine resistance.	Do not use in pregnancy, children under the age of 8 years, women with recurrent vaginal thrush. Use with caution in women using oral contraceptives and in patients known or believed to suffer from oesophagitis.
Mefloquine	250 mg once weekly.	Suppresses blood parasites.	Dizziness, dysphoria, psychosis, seizures.	Prophylaxis for travellers to most malarial areas, except parts of SE Asia where resistance is present.	Use with extreme care with beta blockers and calcium channel blockers. Avoid concomitant use with similar antimalarials. Do not use in people with neurological or psychiatric disease or in certain occupational groups.
Atovaquone (250 mg) and proguanil (100 mg)	One tablet daily.	Acts against blood schizonts and also liver stages. Synergistic effect.	Generally mild and of limited duration; rash, abdominal pain, nausea, vomiting, diarrhoea, anorexia, headache, dizziness, myalgia, insomnia.	Prophylaxis of malaria. Treatment of uncomplicated falciparum malaria.	Watch for resistance.

(Adapted from Durrheim et al<sup>45</sup>)

although options are limited. Chloroquine has no untoward effects on the foetus at doses recommended for malarial prophylaxis and mefloquine may be used in the second and third trimesters.<sup>46</sup>

The need for terminal prophylaxis must be considered with chemoprophylaxis for all travellers to malaria endemic areas. As mentioned the parasites of *P. ovale*

and *P. vivax* may persist in the liver as hypnozoites, which can cause relapse for up to four years after leaving a malarial area. Presumptive anti-relapse therapy with primaquine is administered for 14 days after the traveller has left the malarial area usually for the last two weeks of post-exposure prophylaxis or immediately after the chemoprophylaxis is completed.<sup>46</sup>



## Case discussion 2

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### Issues to consider

Apart from the four-day safari Tony and his friends are staying in urban areas in a well developed country and so are at low risk of many travel-related diseases but some issues that need to be discussed with Tony include:

- Vaccinations
  - Routine vaccinations – ensure Tony is up to date with all routine vaccinations such as measles/mumps/rubella (MMR), diphtheria/pertussis/tetanus (DPT) and polio.
  - Hepatitis A and B vaccination – vaccination is recommended for South Africa as there is a high risk of both hepatitis A and B and it is recommended that all unvaccinated people travelling to such countries are vaccinated especially people who may be exposed to blood, body fluids or have sexual contact with the local population or be exposed through medical treatment.
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  - Rabies vaccine is recommended for travellers who will spend a great deal of time outdoors in rural areas and who are doing activities that may put them at risk such as camping, hiking, cycling. Again, this would be a point of discussion between Tony and his Travel Health professional who would assess the risk of rabies and the need for vaccination.
- Malaria (see later in the module)
  - In South Africa there is a risk of malaria in low-land areas of the north eastern provinces including Mpumalanga, Limpopo and north-eastern KwaZulu Natal. Nelspruit is in Mpumalanga and there is a definite risk in the Kruger National Park.
  - Chloroquine-resistance is common in the malarial areas of South Africa.
- Other disease risks in southern Africa include:
  - HIV/AIDS is a major health issue in many southern African countries and travellers need to be aware of the risk and take appropriate precautions.
  - In rural areas of many southern African countries travellers need to be aware of the risks of dengue, filariasis, leishmaniasis, onchocerciasis, African tick bite fever and schistosomiasis. Therefore, whilst on safari they should take precautions to prevent insect bites and avoid swimming in fresh water (schistosomiasis – see later in the module).
- What medicines to take with them
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  - What to do when they return should they experience untoward symptoms such as fever or flu-like symptoms, diarrhoea or have experienced animal bites or scratches whilst overseas etc.





## Cholera vaccine

Cholera is caused by the ingestion of food or water contaminated with the faeces or vomit of infected people.<sup>42</sup> The causative organism for cholera is *Vibrio cholerae* and it is an acute enteric disease of varying severity.<sup>42</sup> Many cases are asymptomatic or mild with diarrhoea being the sole symptom.<sup>42</sup> Some cases are severe with rapid onset of profuse diarrhoea and vomiting resulting in rapid and severe dehydration. In very severe cases, death can occur in hours due to circulatory collapse resulting from dehydration.<sup>42</sup> Many developing countries in Africa and Asia are blighted with cholera, but for most travellers the risk is low even in endemic countries if simple precautions are taken to avoid contaminated food and water (see Travellers' diarrhoea).<sup>42</sup> The risk increases greatly for humanitarian and refugee workers.

Cholera vaccine is no longer required as a condition of entry to any country and is only recommended for travellers at high risk for the condition.<sup>42</sup> *Dukoral* is an inactivated oral vaccine consisting of a 3 mL liquid vaccine dose vial and a buffer sachet.<sup>42</sup> For adults and children over six years, *Dukoral* is administered orally after dissolving the buffer granules in 150 mL of water and adding the vaccine to the solution (for children below the age of six years, see the manufacturer's or *Australian Immunisation Handbook* recommendations).<sup>42</sup> Two doses are required, given a minimum of one week (and up to six weeks) apart.<sup>42</sup> The course must be restarted if the second dose is not given within six weeks of the first dose.<sup>42</sup> As the vaccine is acid labile, food and drink must be avoided one hour before and after administration of the vaccine.<sup>42</sup> It may be given at the same time as other travel vaccines, with the exception of oral typhoid vaccine as the buffer may affect the transit of the capsules of the oral typhoid vaccine through the gastrointestinal tract (therefore doses of oral typhoid vaccine and *Dukoral* must be separated by at least eight hours).<sup>42</sup>

Despite the incidence of cholera in many countries, cholera vaccine is not recommended to all travellers to endemic areas as the efficacy of the vaccine is not 100% and there is a low relative risk to most travellers.<sup>42</sup> Careful selection of food and water is more important.<sup>42</sup> However, immunisation should be considered for people at increased risk of diarrhoeal diseases.<sup>42</sup>

## Diseases transmitted through food and water

Significant and important infections for travellers transmitted through the contamination of food and water include travellers' diarrhoea, typhoid, hepatitis A and cholera. The causes, prevention and treatment of

travellers' diarrhoea is discussed above, as are the general principles of food hygiene, the selection and preparation of appropriate foods and general water precautions that should be taken by all travellers. The section of the module discussing vaccines and vaccine preventable diseases briefly discusses the causes, areas of risk and prevention of typhoid, cholera and hepatitis.

## Malaria

Malaria is one of the most significant diseases worldwide affecting about three million people each year, with approximately one to two million fatalities.<sup>45</sup> It is prevalent in tropical and subtropical regions, and the risk of re-emergence in areas previously considered malaria-free is a major cause of concern.<sup>45</sup> A number of factors have been implicated for this re-emergence including global warming, drug resistance of the *Plasmodium* parasite, insecticide resistance of the vector and the migration of people from endemic to non-endemic areas.<sup>45</sup> There are five *Plasmodium* species that affect humans (*P.falciparum*, *P.vivax*, *P.ovale*, *P.knowlesi* and *P.malariae*) with *P.falciparum* being the most important as it can cause a severe, rapidly progressive and often fatal form of the disease.<sup>45</sup>

### Forms of malaria

Malaria is usually categorised into two classes: the potentially fatal variant caused by *P. falciparum* and the less dangerous and more benign variants caused by *P.vivax*, *P.malariae*, *P.knowlesi* and *P.ovale*.<sup>1,45</sup> *P.falciparum* predominates in sub-Saharan Africa, parts of South America and Asia and is mainly resistant to chloroquine. *P.vivax* is found in more temperate regions. *P.ovale* is found mainly in sub-Saharan Africa with another focus in south east Asia.<sup>1,45</sup> Chloroquine resistance is now emerging in *P.vivax*, *P.ovale* and *P.malariae*.<sup>1,45</sup>

An important aspect of *falciparum* malaria is that the local population in endemic areas can develop semi-immunity to the condition and therefore life-threatening *falciparum* malaria in healthy local adults in the area may be rare.<sup>1</sup> However, mortality in children below the age of five years is still often high as immunity may not have developed in this age group.<sup>1</sup> This could mean that adult travellers may receive sub-optimal treatment in some endemic areas as they may not be used to treating non-immune patients.<sup>1</sup>

A key risk group are migrants residing in non-endemic areas (such as Australia) who then return to their native country to visit relatives in endemic areas (such as PNG). These travellers tend not to take adequate prophylactic measures in the mistaken belief that they still possess some immunity.<sup>1</sup> The risk of malaria is often lower in urban and coastal areas and is absent above 2,000m. Malaria is particularly dangerous in pregnant travellers.<sup>1</sup>



## Pathophysiology and life cycle

In brief summary, the female *Anopheles* mosquito is the insect vector for malaria.<sup>1</sup> To develop its eggs and reproduce, it requires the protein from a blood meal and bites a human host to draw blood.<sup>1</sup> In order to transmit malaria, the mosquito must have picked up the sexual stage of the malarial parasite (gametocytes) from an infected human, these then mature inside the mosquito to form asexual sporozoites.<sup>1</sup> When the mosquito bites another human, the sporozoites are injected into the human's blood stream to infect the human host.<sup>1</sup> The sporozoites then pass around the blood stream until they reach the liver where they infect the hepatocytes.<sup>1</sup> Once inside the hepatocytes, the sporozoites develop and multiply (extraerythrocytic schizogony) and thousands of merozoites are then released from the hepatocytes which in turn infect red blood cells (RBCs).<sup>1</sup> Inside the RBC, the merozoite develops into a trophozoite and after further multiplication is termed a schizont (erythrocytic schizogony).<sup>1</sup> The schizonts then form eight to 24 merozoites which are released to invade further RBCs and perpetuate the cycle.<sup>1</sup> Some merozoites form sexual gametocytes and if taken up in another mosquito bite, may then be transferred to another human.<sup>1</sup> The symptoms of malaria are due to the invasion and rupture of RBCs. *P.vivax* and *P.ovale* may also remain dormant in the liver cells as hypnozoites.<sup>1</sup>

## Clinical presentation

Early symptoms of malaria are often described as 'flu-like'. Attacks occur in three phases: coldness with rigors, feeling hot and flushed and then intense sweating as the attack resolves.<sup>1</sup> With the benign forms of malaria, fevers may be experienced in a synchronised way, whereas with falciparum malaria, the fevers are often irregular with coma and death occurring within as little as 24 hours after the development of initial symptoms.<sup>1</sup> However, the cyclical nature of fevers (if present) cannot be used to clinically distinguish between variants of the disease. As well as fever, other symptoms include myalgia, arthralgia, diarrhoea, headache, nausea, vomiting and malaise.<sup>1</sup>

With the benign forms of malaria there are few serious complications although anaemia will develop if the disease is not treated. However with falciparum malaria in non-immune travellers, there is a high risk of complications.<sup>1</sup> In falciparum malaria, the surface of the RBCs is altered and they adhere to the walls of blood vessels which can lead to cerebral malaria.<sup>1</sup> Other complications include thrombocytopenia, renal insufficiency, hypoglycaemia and splenomegaly.<sup>1</sup>

## Chemoprophylaxis

Chemoprophylaxis is the use of medications before, during and after the exposure period with the aim of preventing

or suppressing symptoms of malaria caused by blood-stage parasites.<sup>46</sup> This may be combined with terminal prophylaxis or anti-relapse therapy at the end of the exposure period to prevent relapses or delayed-onset of clinical symptoms caused by hypnozoites.<sup>46</sup> The choice of chemoprophylactic regimen is based on a variety of factors including:<sup>46</sup>

- The destination (country and area to be visited, time of year, rural or urban, accommodation, activities at destination and style of travel)
- Presence of contraindications (age, pregnancy, previous experience with antimalarials, medical history (neuropsychiatric illness, seizures etc.))
- Presence of resistant *P.falciparum* or resistance to standard chemoprophylactic agents in the area to be visited
- The tolerability of the regime.

Resistance of *P.falciparum* to chloroquine has been confirmed in most areas and mefloquine-resistance has been reported on the borders of Thailand with Myanmar (Burma) and Cambodia.<sup>46</sup> Table 19 summarises some of the properties of commonly-used chemoprophylactic agents for malaria.

Compliance with the chemoprophylactic regime is an important issue as the traveller may be required to take the medication long term and even minor side effects in this situation can have major effects on compliance. Chemoprophylaxis must be commenced before the traveller enters the endemic area, continued whilst they are in the area and for a fixed time afterwards. Atovaquone/proguanil (*Malarone*) is taken daily, and should be commenced one to two days before entering the malarial area and continued for seven days after leaving the area. Likewise, doxycycline is also taken daily, and must be started one to two days before entering the malarial area, but continued for four weeks after leaving the endemic area. Mefloquine is taken weekly and ideally, therapy should be started one to two weeks before entering the malarial area so that the traveller may be assessed for any rare untoward effects before their departure. Therapy would be continued for four weeks after leaving the malarial area.<sup>46</sup>

Infants and children are also at risk of malaria and should also be given chemoprophylaxis. *Malarone* is available in a paediatric strength tablet and mefloquine may be used in children greater than three months of age. Doxycycline has been used in children who are at least eight years of age.<sup>46</sup>

As mentioned previously, malaria in pregnant women can be more severe than in non-pregnant women and can increase the risks of abortion and stillbirth. Ideally, pregnant women should not travel to malarial areas. However, if travel cannot be deferred chemoprophylaxis is essential,



Table 19: Summary of the properties of key chemoprophylactic agents for malaria					
Agent	Usual regimen	Mode of action	Major side effects	Current use	Cautions
Chloroquine	300 mg base per week.	Suppresses blood parasites.	Fatal cardiac arrhythmia in overdose, nausea and vomiting, chronic retinopathy, itching, tinnitus, dizziness.	Malaria suppression and treatment. Resistance widespread with <i>P.falciparum</i> but still useful with <i>P.vivax</i> .	Do not use in epileptics, use with caution with warfarin. Appears safe in pregnancy and breastfeeding.
Doxycycline	100 mg daily.	Suppresses blood parasites.	Gastrointestinal upset, sun sensitisation, thrush.	Prophylaxis in areas with chloroquine and/or mefloquine resistance.	Do not use in pregnancy, children under the age of 8 years, women with recurrent vaginal thrush. Use with caution in women using oral contraceptives and in patients known or believed to suffer from oesophagitis.
Mefloquine	250 mg once weekly.	Suppresses blood parasites.	Dizziness, dysphoria, psychosis, seizures.	Prophylaxis for travellers to most malarial areas, except parts of SE Asia where resistance is present.	Use with extreme care with beta blockers and calcium channel blockers. Avoid concomitant use with similar antimalarials. Do not use in people with neurological or psychiatric disease or in certain occupational groups.
Atovaquone (250 mg) and proguanil (100 mg)	One tablet daily.	Acts against blood schizonts and also liver stages. Synergistic effect.	Generally mild and of limited duration; rash, abdominal pain, nausea, vomiting, diarrhoea, anorexia, headache, dizziness, myalgia, insomnia.	Prophylaxis of malaria. Treatment of uncomplicated falciparum malaria.	Watch for resistance.

(Adapted from Durrheim et al<sup>45</sup>)

although options are limited. Chloroquine has no untoward effects on the foetus at doses recommended for malarial prophylaxis and mefloquine may be used in the second and third trimesters.<sup>46</sup>

The need for terminal prophylaxis must be considered with chemoprophylaxis for all travellers to malaria endemic areas. As mentioned the parasites of *P. ovale*

and *P. vivax* may persist in the liver as hypnozoites, which can cause relapse for up to four years after leaving a malarial area. Presumptive anti-relapse therapy with primaquine is administered for 14 days after the traveller has left the malarial area usually for the last two weeks of post-exposure prophylaxis or immediately after the chemoprophylaxis is completed.<sup>46</sup>





All travellers to malarial areas must be aware that chemoprophylaxis is not totally effective in preventing malaria and that all travellers should also follow standard recommendations to avoid mosquito bites (see below).

### Standby treatment

Standby treatment (SBT) may be prescribed for some adventure travellers to take with them on expedition so that if they develop symptoms such as fever and malaria is suspected, and they are over 24 hours from medical care, they may be able to start treatment while trying to find medical attention.<sup>1</sup> Therefore, SBT may be considered for travellers to remote areas who are not taking chemoprophylaxis because they are visiting a low risk area, or for use where prophylaxis has failed due to the presence of resistant organisms or poor compliance.<sup>1</sup> If SBT is supplied, the traveller must be appropriately counselled and educated on its use, and it must be reinforced to the patient that even though they have started therapy that they must still not delay seeking medical advice.<sup>1</sup>

Mefloquine or atovaquone/proguanil should generally not be used as SBT if it was being used as the prophylactic agent,<sup>1</sup> in case of failure of chemoprophylaxis. In practice, it may still be effective if poor compliance was the cause of prophylactic failure and if the traveller has nothing else to use, but ideally a different agent should be supplied for SBT. Co-artemether (*Riamet*) is a useful agent for SBT.<sup>1</sup>

### Management of malaria in the returned traveller

It is important that if a traveller returns from a malarial area with early symptoms of malaria that they are immediately identified, the diagnosis is quickly confirmed, and treatment is started as soon as possible. Initially many patients with malaria will present with non-specific flu-like symptoms, which can rapidly progress and can be ultimately fatal. Initially, it is important to establish when and for how long the patient was last in a malaria-endemic area. If the patient presents in a community pharmacy, it is important that the person is immediately and appropriately referred so that the diagnosis can be confirmed and appropriate treatment started as soon as possible.

### Bite avoidance

As mentioned above, chemoprophylaxis is not 100% effective and therefore all travellers to the tropics need to be aware of recommended methods for avoiding insect bites in order to reduce the risks of insect borne diseases.<sup>1</sup> Recommended methods to prevent mosquito bites include:<sup>1</sup>

- Apply insect repellents to the skin (see below)
- Apply insecticides to clothing
- Use knockdown sprays, insecticide-impregnated mats or mosquito coils to clear rooms of mosquitoes
- Avoid night time exposure for *Anopheles* mosquitoes and daytime exposure for *Aedes* mosquitoes
- Cover up arms and legs, wear light colours and thicker materials
- Sleep under insecticide-impregnated mosquito nets
- Sleep away from stagnant water that could harbour mosquitoes
- Be extra cautious during the wet season
- Do not use perfumes or aftershave lotion.

### Insect repellents

Three insect repellents are currently recommended by the US Centers for Disease Control (CDC): diethyl toluamide (DEET), picaridin and para-menthane-3,8-diol (PMD).<sup>47</sup>

Since 1957, DEET has been the most widely marketed insect repellent and is still considered to be the gold standard repellent against which others are compared.<sup>48</sup> DEET has proven efficacy against a wide range of insects and a good safety profile.<sup>48</sup> The duration of action of DEET containing preparations is proportional to the DEET concentration, although a plateau is seen at 50% after which concentrations above 50% have a similar duration of action.<sup>48</sup> It is estimated that a 23.8% DEET preparation has a duration of action of about five hours.<sup>48</sup> Most DEET containing preparations sold in Australia contain less than 20% DEET, as in very rare situations, higher concentrations have caused adverse effects.<sup>48</sup> These include skin reactions and rare reports of encephalopathy, but the actual number of reports is very low in comparison to the actual number of times DEET containing preparations have been applied.<sup>1,48</sup> The main concerns are the use of DEET preparations in children and in pregnancy and it may be prudent to use them more carefully in these situations and perhaps use a lower strength preparation.<sup>1</sup> Another disadvantage of DEET is that it can damage plastic products such as watch faces and sunglasses.<sup>48</sup>

In response to the safety concerns with DEET, other repellents and natural products have been developed and tested, but generally have been found to be not as effective as DEET,<sup>48</sup> with the exceptions of picaridin and PMD. PMD is the main active ingredient of an extract of lemon eucalyptus and is present in *Mosiguard*. It is the most effective of the natural agents and in tests is as effective as some DEET-containing preparations.<sup>48</sup>

Most alternatives to topical insect repellents, such as the use of garlic and thiamine (vitamin B<sub>3</sub>) and small devices that emit sound, are not effective.<sup>48</sup>



### Case discussion 3

*Ruth is a 25-year-old school teacher who will be moving to Cambodia for six months to work in a small village close to the Thai border. She is curious about the risk of malaria in the area and requests your advice about reducing the risk of malaria if there is a high risk. What would you advise?*

#### Issues to consider

- There are reports of both chloroquine and mefloquine resistance in Cambodia, especially in regions close to Thailand
- Doxycycline or atovaquone/proguanil are recommended, which would be the preferred options
- She would need advice on mosquito bite prevention as chemoprophylaxis is not 100% effective
- Would SBT be beneficial in this situation?
- Also need to consider vaccination requirements and other travel-related health advice.

## Non-malarial diseases transmitted by mosquitoes and other insects

As previously discussed, malaria, yellow fever and Japanese encephalitis are tropical diseases transmitted by the mosquito vector. Other diseases transmitted by this vector include dengue fever, chikungunya/Ross River fever, and leishmaniasis.

### Dengue fever

Dengue is caused by a flavivirus and is transmitted by the mosquito *Aedes aegypti*.<sup>42</sup> The disease exists in three main clinical forms.

In the first clinical form, dengue fever appears as an acute febrile illness with a sudden onset followed by the development of generalised symptoms and sometimes a macular rash.<sup>42</sup> The fever may appear in two separate waves and severe muscle pains develop, and so it is colloquially called 'breakbone fever'.<sup>42</sup> Most patients recover after a few days.

A second form is dengue haemorrhagic fever. This again has a pattern of an acute onset of fever, but is followed by thrombocytopenia and haemorrhagic symptoms.<sup>42</sup>

Finally, the third form is dengue shock syndrome, which develops in a small number of patients. In dengue shock

syndrome, severe hypotension develops requiring medical treatment to reverse hypovolaemia (without treatment 40-50% of cases are fatal; with timely treatment, 1% of cases are fatal).<sup>42</sup>

Dengue is widespread in tropical and subtropical areas of south America and south and south east Asia and parts of Oceania and Australia. Travellers are at risk when visiting endemic areas and should take precautions to reduce the risk of mosquito bites.<sup>42</sup> Dengue haemorrhagic fever and dengue shock syndrome are more common in patients who have a second dengue infection from a different subtype of the dengue virus.

### Chikungunya/Ross River fever

Chikungunya is endemic to Africa and Asia whereas Ross River fever is found in Australia.<sup>1</sup> Both lead to the development of a severe polyarthritis, fever and rash. The arthritis can last many months but there are usually no long term complications.<sup>1</sup>

### Leishmaniasis

Leishmaniasis is caused by a protozoan parasite, *Leishmania*. Dogs and rodents act as a host for the organism and it is transmitted to humans by sand fly bites.<sup>42</sup> There are two clinical forms: cutaneous and mucosal leishmaniasis (espundia) which causes skin sores and chronic ulcers of the mucosae, and visceral leishmaniasis (kala-azar) which affects the bone marrow, spleen and lymph nodes and is fatal if untreated.<sup>42</sup>

The risk to travellers is generally low unless they visit forested areas in endemic countries. It is endemic to many tropical and subtropical regions throughout the world. Over 90% of visceral leishmaniasis occurs in Bangladesh, Brazil, India, Nepal and Sudan. Over 90% of cutaneous leishmaniasis occurs in Afghanistan, Algeria, Brazil, Iran, Saudi Arabia and Syria.<sup>42</sup>

## Diseases transmitted through contact and the environment

Travellers may be exposed to diseases that can be acquired by direct contact with the environment, other individuals or animals. Table 20 lists some of the more important diseases and their distribution, their causative organisms and how they are acquired. This section will briefly summarise key issues relating to some examples.

### Schistosomiasis

Schistosomiasis or bilharzia is caused by parasitic blood flukes.<sup>1,42</sup> The life cycle of the worm involves both human and water snail hosts. Eggs of the worm are passed into freshwater from the faeces and urine of infected people, and larvae develop which then pass into the snail where



Table 20: Diseases that may be transmitted by person to person contact or from the environment			
Condition	Causative organism	How contracted	Distribution
Schistosomiasis	<i>Schistosoma haematobium</i> <i>S.mansoni</i> <i>S.japonicum</i>	Swimming in fresh water.	Africa, Asia, South America.
Leptospirosis	<i>Leptospira interrogans</i>	Contact with water contaminated with rodent urine on skin or skin abrasions.	Worldwide, more common in tropical areas.
Hepatitis B	DNA <i>hepadnavirus</i>	Sexual.	Worldwide.
Hepatitis C	RNA flavivirus	Contaminated surgical instruments, blood products.	Worldwide.
Rabies	Rhabdoviridae	Bite or scratch from infected mammals.	Most countries.
Anthrax	<i>Bacillus anthracis</i>	Infected animals, soil.	Many developing countries.
Tuberculosis	<i>Mycobacterium tuberculosis</i>	Close contact with infected people.	Many countries.
Legionnaires' disease	<i>Legionella pneumophila</i>	Droplet infection with contaminated water.	Worldwide.
Hantavirus	Bunyaviridae	Rodents.	The Americas.
Cutaneous larva migrans	<i>Ancylostoma braziliense</i> <i>A. caninum</i>	Through the skin.	
Hookworm	<i>Ancylostoma duodenale</i> <i>Necator americanus</i>	Through the skin.	Various.
Strongyloides	<i>Strongyloides stercoralis</i>	Through the skin.	
Whipworm	<i>Trichuris trichiura</i>	Ingestion.	
Roundworms	<i>Ascaris lumbricoides</i>	Ingestion.	
Tapeworm	<i>Taenia solium</i> , <i>Taenia saginata</i>	Ingestion.	
Leprosy	<i>Mycobacterium leprae</i>	Close personal contact.	Tropics.
Buruli ulcer / Bairnsdale ulcer	<i>Mycobacterium ulcerans</i>	Soil.	Africa, Australia.
Melioidosis	<i>Burkholderia pseudomallei</i>	Soil, water.	South-East Asia, Northern Australia.
Ebola	Ebolavirus	Contact with body fluids.	Africa.
Lassa	Arenaviral	Contact with body fluids.	Africa.

(Adapted from Goodyer<sup>1</sup> and WHO<sup>2</sup>)

they multiply and are released back into the water as free-swimming cercariae.<sup>1,42</sup> The cercariae then penetrate the skin of human bathers and mature inside the human host. The mature worms then make their way to the bladder (*S.haematobium*) or the intestine (*S.japonicum* and *S.mansoni*), where the worms lay eggs in the veins of the organ causing localised tissue damage and inflammation which can then lead to bleeding and chronic anaemia.<sup>1,42</sup>

Swimmers may initially notice some skin irritation when they leave the water and some may subsequently develop a fever. If they have had a previous exposure to the disease, they may also develop a rash when the cercariae penetrate the skin. Otherwise, it may be several months or longer before symptoms become evident, and many cases may be asymptomatic. Schistosomiasis is prevalent in Africa and some parts of South America and Asia.<sup>1,42</sup>





All tourists to endemic areas should be warned not to swim or bathe in fresh water. Drying the skin with a towel after swimming, as opposed to drying in the sun, may prevent some larvae from penetrating the skin, but this is not an effective method of prevention as larval penetration of the skin only takes 10 seconds. Applying a DEET preparation may also prevent cercariae from penetrating the skin.<sup>1,42</sup>

Diagnosis is confirmed by the identification of species-specific eggs in the patient's stool, urine or biopsy samples.<sup>40</sup> Serology tests may also be used. Praziquantel is the standard treatment, but the dose used varies according to the causative species.

### Leptospirosis

Leptospirosis or Weil's disease is a potential danger for travellers trekking in remote areas.<sup>1,42</sup> The disease is carried by rodents and transmitted to humans if they come into contact (through breaks in their skin or mucous membranes) with water contaminated with rodent urine.<sup>1,42</sup> In humans, a severe fever and liver or renal damage may result, and the disease may be fatal in up to 30% of patients.<sup>1,42</sup> Mild forms of the disease may not require treatment, but treatment should be started early in the more severe forms.<sup>40</sup> Doxycycline, benzylpenicillin, ceftriaxone or cefotaxime may be used to treat the condition.<sup>40</sup>

## Sexually transmitted infections

As mentioned earlier in the module, sexually transmitted infections (STIs) are often acquired during travel.<sup>9</sup> They most often occur in young adults, travelling without a regular partner and among people who have a high number of sexual partners whilst at home.<sup>9</sup> Alcohol and occasional drug use may increase the risk of infection.<sup>9</sup> HIV is an STI of particular concern and the risk of HIV and other STIs is highest when having unprotected sex with local partners in countries with a high prevalence of STIs.<sup>9</sup> The risk of HIV infection is highest in Africa followed by southern Asia.<sup>9</sup>

There is a strong link between travel and casual sex, and travellers may be divided into various risk groupings related to their risk of STIs and their sexual behaviours.<sup>49</sup> The first risk group are travellers who travel solely for the purpose of having sex. The term 'sex tourists' is thought of as being a misleading name for this group of travellers, as many other travellers display similar behaviours to the archetypal sex tourist.<sup>49</sup> The second risk group are travellers who travel as part of their occupation, for example, the military, seamen and long distance truck drivers. Finally, the third risk group are 'ordinary tourists', as several reports have also shown high levels of risk-

taking behaviour amongst this group of travellers whilst overseas.<sup>8,49</sup> Several studies have shown that travellers have significant sexual activity whilst abroad, and that the sexual activity is often unprotected, and often involves sex workers in whom the prevalence of STIs can be high (often as high as 50% for gonorrhoea, 32% for syphilis and 25% for *Chlamydia*).<sup>49</sup> There are recognised risk factors for the increased risk of STI acquisition. Ignorance of the issue is a major risk factor, which highlights the role and need of health promotion and education. However it has been noted that knowledge of the issue does not always translate to appropriate behaviour in certain social circumstances.<sup>49</sup> Other behaviours promoting acquisition of STIs include:<sup>49</sup>

- Frequently changing partners or having concurrent partners
- Having sex with casual partners or sex workers
- A previous STI in the last 12 months
- Being HIV positive
- Injecting drugs
- Men who have sex with other men
- Anal sex
- Using vaginal drying agents
- Exchanging sex for money, goods, favours or drugs.

Current primary prevention campaigns aimed at reducing the acquisition of STIs by travellers tend to focus on activities that can lead to unsafe behaviour such as avoiding sexual contact, practising safe sex and limiting intoxication with alcohol.<sup>49</sup> However, more innovative methods need to be used to deliver these health messages, as studies have shown that although the knowledge of STIs among travellers is increasing, the level of knowledge has little to do with actual behaviour in practise.<sup>49</sup> Individual travellers should be encouraged to seek advice before travel and health professionals should emphasise that when celibacy or sexual monogamy cannot be practised, or safer sex (non-penetrative options such as masturbation) is not preferable, that condoms are a reasonable alternative.<sup>49</sup> Specific preventative measures that should be promoted include hepatitis A and B vaccination, encouragement to carry and use male and female condoms, discouraging the sharing of injecting equipment and being careful about obtaining tattoos and skin piercings in unconventional circumstances.<sup>49</sup> Secondary preventative measures involve the promotion of health care-seeking behaviours after risky behaviour, this would include a health screen when returning home if casual sex or risky behaviour has occurred overseas.<sup>49</sup>





# Travelling with medical conditions

## Travelling with chronic conditions

Travel and in particular air travel, is now an integral part of everyday life, and with the changing demographics of Australian society, it can be assumed that increasing numbers of people with pre-existing medical conditions and disabilities are travelling.<sup>50,51</sup> The roles of the travel health adviser with travellers with special needs or pre-existing conditions are to:

- Assess the traveller with regard to acute or chronic medical conditions that may be compromised by travel
- Advise the traveller about potential hazards
- Provide advice regarding adequate health insurance
- Give advice regarding the availability of appropriate health care overseas if required
- Provide a letter summarising the traveller's condition and required medications
- Help organise any specific treatment required during travel.

Several physical and physiological stresses may impact on the traveller during air travel, and some may cause adverse effects in travellers who have disabilities or have chronic conditions.<sup>50</sup> The atmosphere inside the cabin of the aircraft is generally hypoxic, hypobaric and has low humidity.<sup>50</sup> When these effects are combined with a reduced ability to move, the traveller possibly being dehydrated, and the effects of travelling through different time zones, it means that some travellers may be at risk of adverse events.<sup>50</sup>

For modern aircraft the normal cruising altitude is about 7,000-15,000m and the pressure inside the cabin is pressurised, but not to the same atmospheric pressure as sea level but to the equivalent of an altitude of about 2,500m.<sup>50</sup> Due to the laws of physics, the difference between cabin pressure and atmospheric pressure at sea level has two key effects. Firstly, a quantity of gas occupying a volume of one litre at sea level will occupy about 1.4 litres at 2,500m, which is the reason why

travellers' ears 'pop' on take off and landing, but it may have consequences in travellers with medical conditions that predispose them to having pockets of trapped gas such as emphysema.<sup>50</sup> Secondly, Dalton's law states that the partial pressure of a gas is in direct proportion to its percentage volume. Therefore as the atmospheric pressure drops with altitude there is also a corresponding drop in the partial pressure of oxygen resulting in a relatively hypoxic environment in the cabin of the aircraft. For most healthy travellers this will not be an issue, but it may be problematic for some travellers with chronic medical conditions.<sup>50</sup>

There are few absolute medical contraindications to air travel and some of these are listed in Table 21.<sup>51</sup> Patients with chronic or pre-existing medical conditions that need to be reviewed to assess whether it is safe to travel include respiratory and cardiac disease, chronic anaemia, pregnancy, ENT problems, limb and skull fractures, recent gastrointestinal surgery, infectious diseases and diabetes.<sup>50</sup>

### Respiratory disease

As mentioned above the pressurised cabin of an aircraft is a relatively hypoxic environment and hypoxia may be a major problem during air travel for passengers who have cardiac and/or respiratory compromise.<sup>50</sup> Particularly patients with chronic obstructive pulmonary disease (COPD), where arterial  $pO_2$  may drop to less than <sup>50</sup> mmHg.<sup>50</sup> The normal reflex response to hypoxia would include hyperventilation and an increase in tidal volume.<sup>50</sup> In patients with pre-existing pulmonary disease there is a blunting of the response to hypoxia.<sup>50</sup> Also, due to the expansion of air at altitude, travellers with emphysema are at risk of barotrauma and pneumothorax.<sup>50</sup>

Travellers with COPD must be thoroughly assessed before air travel. If the patient has good exercise tolerance at sea level with no marked increase in shortness of breath on walking 50m or climbing 15 stairs then they will not require more detailed investigation.<sup>50</sup> However if the traveller is severely impaired then oxygen therapy will be required during the flight.<sup>50</sup> Airlines are under no obligation to provide in-flight oxygen other than for emergencies, although most will do so if it is organised well in advance.<sup>50</sup>



**Table 21: Medical contraindications to air travel**

1. Absolute contraindications	<ul style="list-style-type: none"> <li>• Pneumothorax or pneumomediastinum</li> <li>• Thoracic, cardiac, abdominal or middle ear surgery within the previous 3 weeks</li> <li>• Acute myocardial infarction, uncontrolled angina, congestive heart failure or dysrhythmia within 4 weeks</li> <li>• Cerebrovascular infarction within 2 weeks.</li> </ul>
2. Relative contraindications	<ul style="list-style-type: none"> <li>• Respiratory tract infection</li> <li>• Cyanosis or dyspnoea at rest or with exercise</li> <li>• Active uncontrolled bronchospasm</li> <li>• Inadequate pulmonary function.</li> </ul>

(Adapted from Mileno et al<sup>53</sup>)

## Cardiovascular disease

Patients with ischaemic heart disease are at increased risk of ischaemia due to increased cardiac output at altitude, hypoxia and the increased stress of travel.<sup>50</sup> Therefore most airlines recommend that patients avoid flying for four weeks after a myocardial infarction.<sup>50</sup>

## Diabetes

Overseas travel poses problems for diabetics in relation to insulin storage, air transport across time zones altering the timing of insulin doses, travel insurance and immunisation.<sup>52-54</sup> Forward planning and taking simple precautions can reduce the risk of many problems.<sup>52,53</sup>

Immunisations and travel insurance requirements will be same as other travellers but there will be fewer insurance options as the traveller has a pre-existing condition and insurance will probably be more expensive.<sup>54</sup>

Insulin can be safely stored at room temperature for a month but will denature if frozen, and therefore should be carried in hand luggage that will be taken with the traveller into the cabin of the aircraft, and not the hold where it may freeze.<sup>52,54</sup> It is not imperative to keep insulin in a refrigerator in hot climates but it should be kept in a cool, shaded place.<sup>54</sup> The traveller should also monitor the insulin for signs of physical changes: soluble insulin may become cloudy and insulin suspensions may become granular, and if they do, they should be discarded.<sup>54</sup> The traveller should take sufficient insulin for the journey with plenty of overage, they also need to take a range of other supplies including blood glucose meters, spare batteries, syringes, needles, pens, lancets, letter from their doctor, test strips and reagents, glucose-containing foods for hypoglycaemic episodes and glucagon.<sup>52-54</sup> Changes to the traveller's insulin regimen whilst flying depends on the regimen and the number of time zones being crossed.<sup>54</sup> When travelling north-south, no changes in their insulin regimen are required.<sup>50</sup> But if travelling east-west or west-east, then the day will get longer or shorter respectively and changes to their insulin regimen may be required.<sup>52</sup>

Generally, if less than five time zones are crossed, then no changes to the insulin regimen are required.<sup>52</sup> Patients should monitor their blood glucose frequently whilst travelling, at least every four to six hours, and they should also be advised to keep well hydrated with non-alcoholic drinks during their journey.<sup>52</sup> Using the examples provided by Chandran and Edelman,<sup>52</sup> Case discussion 4 demonstrates how insulin doses may be altered when flying east or west if crossing more than five time zones.

For patients with type 2 diabetes the timing of oral medications is not as critical as that of insulin.<sup>52</sup> If taking metformin twice-daily, it may be better to skip a dose and have slight hyperglycaemia for six to eight hours rather than take two doses very close together and risk hypoglycaemia.<sup>52</sup>

## Travelling with medicines

When taking medicines abroad, the following points must be considered:

- Keep medicines away from children<sup>11</sup>
  - Advise travellers to keep all medicines away from children either locked away in the safe in their hotel room or in a locked suitcase as only a few antimalarial tablets could kill a young child.
- Carry written instructions and a letter of authorisation<sup>11</sup>
  - Any medication taken overseas should have a covering letter from their doctor. Misunderstandings in Customs can be prevented by having medicines appropriately packaged and labelled, and by the traveller having a letter of authority or their repeat prescriptions with them.
- Packaging<sup>1</sup>
  - Loose tablets are likely to become pulverised if carried in a rucksack. Also, gelatin capsules may be affected by high humidity in tropic climates. Therefore, where possible, take solid dosage forms packaged in blister packs.





## Case discussion 4

Chandran and Edelman<sup>22</sup> use the following scenarios to demonstrate how insulin doses may be altered when flying east or west through several time zones.

### 1. Advice for travelling east across five or more time zones

*In this example, the traveller is flying east from Los Angeles to London. The flight departs from Los Angeles at 8.45pm (4.45am London time) and arrives in London at 3.15pm (7.15am Los Angeles time). Total flight time is 10.5 hours.*

The traveller taking this flight uses the following insulin regimen:

Isophane insulin 16 IU before breakfast and 10 IU before dinner

Soluble insulin 10 IU before breakfast and 10 IU before dinner

During the flight he will be served dinner (after take off), a mid-flight snack and breakfast (before landing).

How would his insulin regimen be altered?

- Before departure he would take his usual dose of 10 IU isophane insulin and 10 IU soluble insulin. Keeping his watch set to Los Angeles time during the flight, 11–12 hours later he would take half of his usual isophane insulin dose (8 IU) plus the full normal dose of regular insulin followed by a meal (breakfast).
- Due to the long flight, extra doses of short acting insulin may be needed for extra meals or snacks consumed at times not similar to the traveller's normal routine (e.g. dinner and the mid-flight snack).
- That evening in London (just before dinner (London time)) the remaining half of the usual isophane dose (8 IU) plus the full dose of soluble insulin (10 IU) is taken. Therefore the traveller's isophane dose is not altered but was split to help him adjust to the change in time zone. The next morning in London, on local London time, the traveller's pre-travel regimen is resumed.

### 2. Advice for travelling west across five or more time zones

*In this example, the traveller is flying west from New York to Honolulu. The flight departs New York at 11.40am (6.40am Honolulu time) and arrives in Honolulu at 5.40pm (10.40pm New York time). The total flight time is 11 hours.*

The traveller taking this flight again uses the following insulin regimen:

Isophane insulin 16 IU before breakfast and 10 IU before dinner

Soluble insulin 10 IU before breakfast and 10 IU before dinner

How would his insulin regimen be altered?

- He would take his usual morning dose of both isophane (16 IU) and soluble (10 IU) insulin before departure. Again, keeping his watch set at New York time at about the time of his usual evening meal (about 10 hours after his morning doses of insulin) he would take half of his usual evening dose of isophane insulin (5 IU) and the full dose of soluble insulin (10 IU) followed by a meal or snack.
- That evening at dinner in Honolulu he would take the remaining 5 IU of the isophane insulin plus the regular 10 IU of soluble insulin.

(adapted from Chandran and Edelman<sup>22</sup>)





- Where weight and room in baggage is limited, there is a temptation to take blister packs out of their outer cardboard packaging this means that all identifying labels are lost. Advise patients to place tablets in the outer box inside a resealable plastic bag or a Tupperware-type box.
- Keep all medicines cool.
- Pack your medicines in at least two caches in case baggage is lost in transit.
- Legal issues<sup>1</sup>
  - The legal status of certain medicines varies between countries and although there are few reports of travellers having difficulties other than with controlled drugs, occasionally travellers do have problems crossing borders with medicines.
- Quantities
  - Travellers should have an adequate supply of their regular medication plus some overage in case there is some issue that delays their return to Australia.
  - They must also carry an adequate supply of medicines that may be used infrequently at home, but may be required on their journey (for example salbutamol inhalers or antihistamines etc.).

## Purchasing medicines overseas

There are many reasons why travellers attempt to purchase medicines overseas. Reasons include an attempt to save space in their luggage, to save money (as they may assume that medicines are cheaper overseas), because they have lost or forgotten their regular medicines, to treat an unexpected travel-related condition or increasingly to usurp the pricing arrangement of pharmaceuticals in their own country. However there are some important considerations for travellers attempting to purchase medicines overseas, these include:

- Communication issues  
Travellers may have difficulty explaining their requirements to foreign health professionals and may also receive inadequate written or verbal information about the medicines in return.<sup>1,19</sup>
- Identification  
Subsidiary manufacturers may produce pharmaceuticals under licence but products may have a different appearance, contain different excipients (which could affect bioavailability) and often different drug names are used depending on the pharmacopoeia followed in that country.<sup>1,19</sup>
- Availability  
The availability of medicines differs between countries depending on whether the medicine is licensed in that country, and also in the different regions of a country based on local formularies or prescribing policies.<sup>1,19</sup>

- Quality

Travellers purchasing medicines overseas need to be aware of the problem of counterfeit pharmaceuticals. This is a worldwide problem, not just isolated to developing countries as increasingly counterfeit medicines are also being found in the pharmaceutical supply chains of more developed countries.<sup>56-57</sup> Many counterfeit medicines are outside pharmacopoeial limits, or may contain excipients that may be harmful or may have altered bioavailability, and therefore result in altered therapeutic response. Travellers need to be aware of this issue.<sup>1,19</sup>

## Pregnancy and travel

Pregnancy is not a contraindication to travel and many healthy women travel during pregnancy, although there is a slight increase in the incidence of premature labour.<sup>50</sup> With a normal pregnancy there is no cause for concern with air travel, although most international carriers only allow pregnant women to travel for the first 35 weeks of their pregnancy and require a doctor's letter estimating the date of delivery and fitness to travel after 36 weeks.<sup>50</sup>

### Hazards of air travel during pregnancy

The risk of DVT is exacerbated during pregnancy and the hazard of hypoxia is worsened if the woman is also anaemic.<sup>50</sup> The pregnant traveller must perform in-flight exercises and walk in the cabin 15 minutes of every hour, drink plenty of fluid and request a bulkhead or aisle seat if possible to reduce DVT risk.<sup>50</sup>

### Vaccinations during pregnancy

As a general rule, live vaccines should be avoided during pregnancy. Generally, inactivated vaccines are safe but the risk of febrile or anaphylactic reactions must be considered during the first trimester.<sup>50</sup>

### Travellers' diarrhoea during pregnancy

TD is a problem for pregnant women and if it occurs, care should be taken to ensure adequate hydration.<sup>50</sup> Water should be boiled and iodine for water disinfection avoided.<sup>50</sup> Metronidazole, quinolones, sulphonamides and tetracyclines should be avoided.<sup>50</sup>

### Malaria and pregnancy

As discussed earlier, malaria is a major concern in pregnancy and ideally, pregnant women should avoid visiting malarial areas (especially areas with a high prevalence of *P.falciparum* malaria). However, if travel cannot be delayed, then chemoprophylaxis is required. As mentioned before chloroquine is thought to be safe (although resistance is now common) and mefloquine may be used in the second and third trimesters.<sup>50</sup>





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## PSA's CPD&PI Program

The achievement of optimal health outcomes is influenced by both the competence of the professional delivering the health service and the quality of the system through which that service is delivered. Thus, PSA has developed the Continuing Professional Development (CPD) and Practice Improvement (PI) Program so pharmacists can address both of these aspects.

The CPD component recognises continuing education and other activities intended to enhance the knowledge, skills and attributes associated with maintaining or enhancing professional competence.

The PI component encompasses quality assurance or quality improvement activities directed at enhancing the processes or systems through which pharmacists deliver professional services.

Overall, the Program recognises a wide range of learning experiences, with credit points allocated to activities based on the potential of the activity to impact on behaviour change and improve clinical practice, rather than just the quantity of the activity undertaken. The achievement of a specified number of credit points is an indicator of the pharmacist's commitment to their ongoing professional development and practice improvement.

Online tools are available free to members to guide and support them in developing a personal learning plan: identifying where improvement is needed, planning how to achieve improvement, taking action, and evaluating the outcomes.

For further information on PSA's CPD&PI Program, education and practice support activities, or membership of PSA, visit [www.psa.org.au](http://www.psa.org.au) or contact the following:

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## **Appendix 4: Appendices Specific to Chapter 4**

### Appendix 4.1: Survey instrument (Medical practitioner study)



Study Number (To be assigned on return to JCU)

MP



### Medical Practitioner Survey

(Project: A review and evaluation of a travel health advisory service operated from a community pharmacy in North Queensland)

#### (CONFIDENTIAL)

We would like you to give us your views about the current and future roles of pharmacists in the area of travel health. If you are willing to take part in the study, please complete this questionnaire and return it to James Cook University in the stamped addressed envelope provided. The questionnaire will only take approximately 10 minutes to complete. Taking part in this study is completely voluntary, if you do not wish to participate simply do not return the questionnaire. If you wish to be included in a draw to win an Apple iPod please also add your contact details to the last page. So that your responses will remain anonymous, this page will be separated from your completed survey before it is given to the researcher.

At the beginning of the survey there are some questions about yourself and your current medical practice. You will not be identified from your answers to these questions, but they will give us some general background information about the medical practitioners taking part in the survey. The later questions ask your views on the current and future role of pharmacists in the area of travel health.

1. What is your gender? (Tick appropriate answer)

- ☐ Male
- ☐ Female

2. What is your age? (Tick appropriate answer)

- ☐ 30 years or younger
- ☐ Between 31 and 40 years
- ☐ Between 41 and 50 years
- ☐ Between 51 and 60 years
- ☐ Between 61 and 70 years
- ☐ Older than 71 years
- ☐ Prefer not to say

3. In which region of Queensland do you practice? (Tick appropriate answer)

- ☐ Brisbane or South East Queensland
- ☐ Southern Queensland
- ☐ Central Queensland
- ☐ North or Far North Queensland

4. Approximately what is the population in the town or city where you practice? (Tick appropriate answer)

- ☐ Greater than 250,000 people
- ☐ 200,000 to 250,000 people
- ☐ 150,000 to 200,000 people
- ☐ 100,000 to 150,000 people
- ☐ 50,000 to 100,000 people
- ☐ Less than 50,000 people

5. In your medical practice, how many patients do you advise about travel-related health issues each week? (Tick appropriate answer)

- ☐ None – I do not offer any travel-related health services
- ☐ 0 – 3 patients per week
- ☐ 3 – 5 patients per week
- ☐ 6 – 10 patients per week
- ☐ 11 – 15 patients per week
- ☐ Greater than 15 patients per week

7. What are the commonest destinations for the travellers that you advise on travel-related health issues? (Select up to FOUR of the destinations below)

- ☐ None – I do not offer any travel-related health services
- ☐ Western Europe (e.g. UK, France, Germany, Italy, Spain etc)
- ☐ Eastern and Central Europe (e.g. Poland, Czech Rep, Hungary, Russia etc)
- ☐ Middle East (e.g. Israel, Saudi Arabia, Syria, Iraq, Iran etc)
- ☐ North Africa (e.g. Egypt, Algeria, Morocco etc)
- ☐ Central Africa (e.g. Kenya, Rwanda, Uganda etc)
- ☐ Southern Africa (e.g. South Africa, Zimbabwe, Botswana etc)
- ☐ North America (e.g. USA, Canada)
- ☐ Central America (e.g. Mexico, Panama, Caribbean Islands etc)
- ☐ South America (e.g. Brazil, Peru, Argentina etc)
- ☐ South East Asia (e.g. Indonesia, Malaysia, Thailand, Vietnam etc)
- ☐ South Asia (e.g. India, Pakistan, Sri Lanka etc)
- ☐ North Asia (e.g. China, Korea, Japan etc)
- ☐ Oceania (e.g. New Zealand, South Pacific Islands etc)

8. Read the following statements about the current and future roles of pharmacists in the area of travel health, and using the attached scale (1 - Strongly agree, 2 - Agree, 3 - Neither agree nor disagree, 4 - Disagree and 5 - Strongly disagree), rate each statement as to whether you agree or disagree with the statement.

Statement	Tick appropriate box				
	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
a) Pharmacies should not provide travel health services. It is not an appropriate role for pharmacists.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
b) Many international travellers leaving Australia do not obtain travel-related health advice before their journey.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
c) Most travellers who want travel-related health advice before their journey will visit their GP to obtain advice.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
d) Currently not many travellers seek travel-related health advice from pharmacists.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
e) Travellers would be confident in visiting a pharmacist for travel-related health advice.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
f) Pharmacists currently have adequate training to provide travel health services.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
g) Only pharmacists with specialist training and/or a specialist certificate or diploma in travel health should provide travel health services.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
h) Patient confidentiality could be an issue if travel health advice was available from community pharmacies.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
i) Pharmacists are capable of advising travellers about the prevention and treatment of common travel-related health conditions such as diarrhoea, travel sickness and jet lag.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree

9. Read the following statements about the current and future roles of pharmacists in the area of travel health, and using the attached scale (1 - Strongly agree, 2 - Agree, 3 - Neither agree nor disagree, 4 - Disagree and 5 - Strongly disagree), rate each statement as to whether you agree or disagree with the statement.

Statement	Tick appropriate box				
	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
a) Pharmacists are capable of advising travellers about which medicines and medical supplies they should take with them in a first aid kit when they travel.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
b) Pharmacists are capable of advising travellers about the prevention and treatment of mosquito bites and insect-borne diseases such as malaria and dengue fever.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
c) Pharmacists would be able to assess travellers before they travel and identify travellers who require vaccinations, antimalarial medicines or more specialist advice, and refer these travellers to their doctor for more specialist treatment.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
d) People should be able to get influenza vaccinations at their community pharmacy.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
e) Travellers should be able to get appropriate travel vaccinations at their community pharmacy.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
f) Travellers should be able to buy antimalarial chemoprophylaxis over the counter in pharmacies.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
g) Pharmacists should be able to prescribe appropriate antibiotics for travellers to remote areas to use if they get infections.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
h) Pharmacists should only be able to supply medicines to travellers on the authority of a doctor's prescription.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
i) The advice given to a traveller by a pharmacist may contradict the advice given to the traveller by their doctor.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree

10. A pilot travel health advisory service is currently being tested in a community pharmacy. The service provides basic travel-related health advice to low risk travellers who would not normally visit their GP before their journey. The service will also identify any high risk travellers or those requiring vaccinations, antimalarial drugs or specialist medical advice and they will be referred to their medical practitioner. Read the following statements about this travel health advisory service, and using the attached scale (1 - Strongly agree, 2 - Agree, 3 - Neither agree nor disagree, 4 - Disagree and 5 - Strongly disagree), rate each statement as to whether you agree or disagree with the statement.

Statement	Tick appropriate box				
	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
a) This service is useful because it targets travellers who would not normally visit their doctor before their journey, and so will increase the overall number of travellers receiving travel-related health advice before their journey	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
b) This service will identify travellers who need vaccinations and will refer them to their doctor. This will increase the number of travellers who visit their doctor for vaccinations.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
c) I would be happy to have a pharmacist refer a traveller who needs vaccinations or more specialist advice to my surgery.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
d) This service would be useful to doctors, as it will reduce their workload.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
e) The service and advice offered by pharmacists will not be to the same standard as those offered by general practitioners or travel medicine clinics.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
f) This service would help reduce the risk of Australians suffering health problems while they are overseas	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
g) This service would be more convenient for travellers than visiting their GP.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
h) Some doctors say that low risk travellers are more profitable than the more complicated cases. They say that they rely on the low risk travellers to help subsidise the longer consultations of the more complicated cases. Therefore, if pharmacists provided services to low risk travellers it may make it uneconomical for doctors to offer travel health services and doctors may stop offering these services.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

**Please return the completed questionnaire to James Cook University in the stamped addressed envelope provided.**





### Medical Practitioner Survey

(Project: A review and evaluation of a travel health advisory service operated from a community pharmacy in North Queensland)

### Prize Draw

Thank you for completing the attached survey. If you wish to participate in a prize draw to win one of two Apple iPods then please complete your details below.

**Please note:** So that your answers to the survey will remain anonymous, this slip will be separated from the completed survey before the survey is given to the researcher at James Cook University.

The prize winners will be notified by post in September 2010.

Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Post Code: \_\_\_\_\_

## Appendix 4.2: Survey instrument (Travel agent study)

Study Number (To be assigned on return to JCU)

TA



### Travel Agent Survey

(Project: A review and evaluation of a travel health advisory service operated from a community pharmacy in North Queensland)

#### (CONFIDENTIAL)

We would like you to give us your views about the current and future roles of pharmacists in the area of travel health. If you are willing to take part in the study, please complete this questionnaire and return it to James Cook University in the stamped addressed envelope provided. The questionnaire will only take approximately 10 minutes to complete. Taking part in this study is completely voluntary, if you do not wish to participate simply do not return the questionnaire. If you wish to be included in a draw to win an Apple iPod please also add your contact details to the last page. So that your responses will remain anonymous, this page will be separated from your completed survey before it is given to the researcher.

At the beginning of the survey there are some questions about yourself and your travel agency. You will not be identified from your answers to these questions, but they will give us some general background information about the travel agents taking part in the survey. The later questions ask your views on the current and future role of pharmacists in the area of travel health.

1. What is your gender? (Tick appropriate answer)

- ☐ Male
- ☐ Female

2. What is your age? (Tick appropriate answer)

- ☐ 20 years or younger
- ☐ Between 21 and 30 years
- ☐ Between 31 and 40 years
- ☐ Between 41 and 50 years
- ☐ Between 51 and 60 years
- ☐ Between 61 and 70 years
- ☐ Older than 71 years
- ☐ Prefer not to say

3. In which region of Queensland is your travel agency? (Tick appropriate answer)

- ☐ Brisbane or South East Queensland
- ☐ Southern Queensland
- ☐ Central Queensland
- ☐ North or Far North Queensland

4. Approximately what is the population in the town or city where your travel agency is located? (Tick appropriate answer)

- ☐ Greater than 250,000 people
- ☐ 200,000 to 250,000 people
- ☐ 150,000 to 200,000 people
- ☐ 100,000 to 150,000 people
- ☐ 50,000 to 100,000 people
- ☐ Less than 50,000 people

5. In your travel agency, approximately how many people ask you about travel-related health issues each week? (Tick appropriate answer)

- ☐ None – I do not get asked about travel-related health issues
- ☐ 1 – 3 people per week
- ☐ 3 – 5 people per week
- ☐ 6 – 10 people per week
- ☐ 11 – 15 people per week
- ☐ Greater than 15 people per week

7. What are the commonest destinations for the people who ask you about travel-related health issues? (Select up to FOUR of the destinations below)

- ☐ None – I do not get asked about travel-related health issues
- ☐ Western Europe (e.g. UK, France, Germany, Italy, Spain etc)
- ☐ Eastern and Central Europe (e.g. Poland, Czech Rep, Hungary, Russia etc)
- ☐ Middle East (e.g. Israel, Saudi Arabia, Syria, Iraq, Iran etc)
- ☐ North Africa (e.g. Egypt, Algeria, Morocco etc)
- ☐ Central Africa (e.g. Kenya, Rwanda, Uganda etc)
- ☐ Southern Africa (e.g. South Africa, Zimbabwe, Botswana etc)
- ☐ North America (e.g. USA, Canada)
- ☐ Central America (e.g. Mexico, Panama, Caribbean Islands etc)
- ☐ South America (e.g. Brazil, Peru, Argentina etc)
- ☐ South East Asia (e.g. Indonesia, Malaysia, Thailand, Vietnam etc)
- ☐ South Asia (e.g. India, Pakistan, Sri Lanka etc)
- ☐ North Asia (e.g. China, Korea, Japan etc)
- ☐ Oceania (e.g. New Zealand, South Pacific Islands etc)

8. Read the following statements about the current and future roles of pharmacists in the area of travel health, and using the attached scale (1 - Strongly agree, 2 - Agree, 3 - Neither agree nor disagree, 4 - Disagree and 5 - Strongly disagree), rate each statement as to whether you agree or disagree with the statement.

Statement	Tick appropriate box				
	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
a) Pharmacies should not provide travel health services. It is not an appropriate role for pharmacists.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
b) Many international travellers leaving Australia do not obtain travel-related health advice before their journey.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
c) Most travellers who want travel-related health advice before their journey will visit their GP to obtain advice.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
d) Currently not many travellers seek travel-related health advice from pharmacists.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
e) Travellers would be confident in visiting a pharmacist for travel-related health advice.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
f) Pharmacists currently have adequate training to provide travel health services.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
g) Only pharmacists with specialist training and/or a specialist certificate or diploma in travel health should provide travel health services.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
h) Patient confidentiality could be an issue if travel health advice was available from community pharmacies.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
i) Pharmacists are capable of advising travellers about the prevention and treatment of common travel-related health conditions such as diarrhoea, travel sickness and jet lag.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree

9. Read the following statements about the current and future roles of pharmacists in the area of travel health, and using the attached scale (1 - Strongly agree, 2 - Agree, 3 - Neither agree nor disagree, 4 - Disagree and 5 - Strongly disagree), rate each statement as to whether you agree or disagree with the statement.

Statement	Tick appropriate box				
	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
a) Pharmacists are capable of advising travellers about which medicines and medical supplies they should take with them in a first aid kit when they travel.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
b) Pharmacists are capable of advising travellers about the prevention and treatment of mosquito bites and diseases carried by insects, such as malaria and dengue fever.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
c) Pharmacists would be able to assess travellers before they travel and identify travellers who should be seen by a doctor for more specialist treatment.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
d) People should be able to get influenza vaccinations at their community pharmacy.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
e) Travellers should be able to get appropriate travel vaccinations at their community pharmacy.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
f) Travellers should be able to buy medicines to prevent malaria over the counter (without a prescription) in pharmacies.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
g) Pharmacists should be able to prescribe appropriate antibiotics for travellers to remote areas to use if they get infections.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
h) Pharmacists should only be able to supply medicines to travellers only if they have a doctor's prescription.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
i) The advice given to a traveller by a pharmacist may contradict the advice given to the traveller by their doctor.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree



10. A pilot travel health advisory service is currently being tested in a community pharmacy. The service provides basic travel-related health advice to low risk travellers who would not normally visit their GP before their journey. The service will also identify any high risk travellers or those requiring vaccinations, antimalarial drugs or specialist medical advice and they will be referred to their medical practitioner. Read the following statements about this travel health advisory service, and using the attached scale (1 - Strongly agree, 2 - Agree, 3 - Neither agree nor disagree, 4 - Disagree and 5 - Strongly disagree), rate each statement as to whether you agree or disagree with the statement.

Statement	Tick appropriate box				
	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
a) This service is useful because it targets travellers who would not normally visit their doctor before their journey, and so will increase the overall number of travellers receiving travel-related health advice before their journey	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
b) This service will identify travellers who need vaccinations and will refer them to their doctor. This will increase the number of travellers who visit their doctor for vaccinations.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
c) Doctors would be happy to have a pharmacist refer a traveller who needs vaccinations or more specialist advice to them.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
d) This service would be useful to doctors, as it will reduce their workload.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
e) The service and advice offered by pharmacists will not be to the same standard as those offered by general practitioners or travel medicine clinics.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
f) This service would help reduce the risk of Australians suffering health problems while they are overseas	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
g) This service would be more convenient for travellers than visiting their GP.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree

[illegible]

**Please return the completed questionnaire to James Cook University in the stamped addressed envelope provided.**



### Travel Agent Survey

(Project: A review and evaluation of a travel health advisory service operated from a community pharmacy in North Queensland)

### Prize Draw

Thank you for completing the attached survey. If you wish to participate in a prize draw to win one of two Apple iPods then please complete your details below.

**Please note:** So that your answers to the survey will remain anonymous, this slip will be separated from the completed survey before the survey is given to the researcher at James Cook University.

The prize winners will be notified by post in September 2010.

Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Post Code: \_\_\_\_\_

#### Appendix 4.4: Differences between the rating statements in the Medical Practitioner and Travel Agent surveys

Appendix 4.3 Differences between the rating statements in the Medical Practitioner and Travel Agent surveys

Question and statement number	Medical Practitioner Survey	Travel Agent Survey
Q 9 Statement c	Pharmacists would be able to assess travellers before they travel and identify travellers who require vaccinations, antimalarial medicines or more specialist advice, and refer these travellers to their doctor for more specialist treatment.	Pharmacists would be able to assess travellers before they travel and identify travellers who should be seen by a doctor for more specialist treatment.
Q 9 Statement f	Travellers should be able to buy antimalarial chemoprophylaxis over the counter in pharmacies	Travellers should be able to buy medicines to prevent malaria over the counter (without a prescription) in pharmacies.
Q 9 Statement h	Pharmacists should only be able to supply medicines to travellers on the authority of a doctor's prescription	Pharmacists should only be able to supply medicines to travellers only if they have a doctor's prescription.
Q 10 Statement c	I would be happy to have a pharmacist refer a traveller who needs vaccinations or more specialist advice to my surgery	Doctors would be happy to have a pharmacist refer a traveller who needs vaccinations or more specialist advice to them
Q 10 Statement h	Some doctors say that low risk travellers are more profitable than the more complicated cases. They say that they rely on the low risk travellers to help subsidise the longer consultations of the more complicated cases. Therefore, if pharmacists provided services to low risk travellers it may make it uneconomical for doctors to offer travel health services and doctors may stop offering these services	Statement not included in the Travel Agent Survey.

#### Appendix 4.4: Participant information leaflet (Medical practitioner study)



## INFORMATION SHEET

### **A review and evaluation of a travel health advisory service operated from a community pharmacy in North Queensland. Medical Practitioner Survey**

Every year many people travel away from home, and whilst they are away, many travellers place themselves at risk of accidents or health problems. Yet many travellers do not get any health advice before travelling. You are invited to take part in a research project that will review a travel health advisory service that is being run from a community pharmacy. The advisory service is designed to offer advice to travellers to low-risk destinations who would not normally obtain travel-related health advice from any other source before they travel. We would like you to complete a questionnaire and give your views on the current and future roles of pharmacists in the area of travel health. The study is being conducted by Ian Heslop and will contribute to his doctoral thesis in the Doctor of Public Health program at James Cook University.

If you agree to be involved in the study, we would like you to complete the attached questionnaire. The questionnaire should only take approximately 10 to 15 minutes of your time and asks you to give your opinion on the current roles of pharmacists in the area of travel health and give your opinions about a suggested model of care for pharmacists. When you have completed the questionnaire please return it to James Cook University in the stamped addressed envelope provided.

Taking part in this study is completely voluntary, simply do not return the questionnaire if you do not wish to participate.

Your responses and contact details will be strictly confidential. The data from the study will be used in research publications, the investigator's Doctoral thesis and reports to the School of Pharmacy & Molecular Sciences, James Cook University. You will not be identified in any way in these publications.

If you wish to participate in a prize draw to win an Apple iPod, complete your contact details at the end of the questionnaire. Please note: To maintain your anonymity the envelope will be opened by an Administration Officer of the School of Pharmacy & Molecular Sciences at James Cook University and your contact details will be separated from the completed questionnaire before it is given to the investigator. If you win the Apple iPod it will be sent to your postal address.

If you have any questions about the study, please contact Ian Heslop, Prof Beverley Glass, Dr Michelle Bellingan or Prof Richard Speare.

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*If you have any concerns regarding the ethical conduct of the study, please contact:*  
*Tina Langford, Ethics Officer, Research Office, James Cook University,*  
*Townsville, Qld, 4811. Phone: 4781 4342, [Tina.Langford@jcu.edu.au](mailto:Tina.Langford@jcu.edu.au)*

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#### Appendix 4.5: Participant information leaflet (Travel agent study)

## INFORMATION SHEET

### **A review and evaluation of a travel health advisory service operated from a community pharmacy in North Queensland. Travel Agent Survey**

Every year many people travel away from home and whilst they are away, many travellers place themselves at risk of accidents or health problems. Yet many travellers do not get any health advice before travelling. You are invited to take part in a research project that will review a travel health advisory service that is being run from a community pharmacy. The advisory service is designed to offer advice to travellers to low-risk destinations who would not normally obtain travel-related health advice from any other source before they travel. We would like you to complete a questionnaire and give your views on the current and future roles of pharmacists in the area of travel health. The study is being conducted by Ian Heslop and will contribute to his doctoral thesis in the Doctor of Public Health program at James Cook University.

If you agree to be involved in the study, we would like you to complete the attached questionnaire. The questionnaire should only take approximately 10 to 15 minutes of your time and asks you to give your opinion on the current roles of pharmacists in the area of travel health and give your opinions about a suggested model of care for pharmacists. When you have completed the questionnaire please return it to James Cook University in the stamped addressed envelope provided.

Taking part in this study is completely voluntary, simply do not return the questionnaire if you do not wish to participate.

Your responses and contact details will be strictly confidential. The data from the study will be used in research publications, the investigator's Doctoral thesis and reports to the School of Pharmacy & Molecular Sciences, James Cook University. You will not be identified in any way in these publications.

If you wish to participate in a prize draw to win an Apple iPod, complete your contact details at the end of the questionnaire. Please note: To maintain your anonymity the envelope will be opened by an Administration Officer of the School of Pharmacy & Molecular Sciences at James Cook University and your contact details will be separated from the completed questionnaire before it is given to the investigator. If you win the Apple iPod it will be sent to your postal address.

If you have any questions about the study, please contact Ian Heslop, Prof Beverley Glass, Dr Michelle Bellingan or Prof Richard Speare.

**Principal Investigator:**  
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[michelle.bellingan@jcu.edu.au](mailto:michelle.bellingan@jcu.edu.au)  
[richard.speare@jcu.edu.au](mailto:richard.speare@jcu.edu.au)

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## **Appendix 5: Appendices Specific to Chapter 5**

Appendix 5.1: Participant information leaflet (Elective study)

## INFORMATION SHEET

### **A comparison of team-based learning and online learning in a level 4 BPharm elective subject (PC4104:03 Pharmacy Project (Travel Health))**

You are invited to take part in a research project to evaluate the teaching methods used in the level 4 Bachelor of Pharmacy elective subject PC4104:03 Pharmacy Project (Travel Health). The research project will compare the two teaching methods used in this subject. It will find out which of the two teaching methods is preferred by students, and the reasons why the students preferred that particular teaching method. The study is being conducted by Ian Heslop and will contribute to his doctoral thesis in the Doctor of Public Health program at James Cook University.

If you agree to be involved in this study, in addition to the standard on-course assessment required for the completion of this subject, you will be invited to complete two questionnaires during the course of the subject and participate in a focus group at the end of the subject. The questionnaires should only take 10-15 minutes to complete and will ask questions about which teaching method you preferred and why and what improvements you would suggest for the subject. The focus group, with your consent, will be audio-taped, and should only take approximately half an hour of your time. The focus group will be conducted in the School of Pharmacy & Molecular Sciences at James Cook University and participants will discuss any issues that students have raised or suggestions that have been made in the questionnaires.

Taking part in this study is completely voluntary and you can stop taking part in the study at any time without explanation or prejudice. You may also withdraw any unprocessed data from the study. Non-participation or withdrawal from this study will not influence your assessment or the final grade awarded in this subject.

Participation or non-participation in the project will not affect the final assessment mark that you receive in the subject as you will be exposed to both teaching methods whether you participate or do not participate in the subject. Also the taught component of the subject does not compose the major portion of the assessment in the subject.

Your responses will be strictly confidential. The data from the study may be used in research publications, the investigator's doctoral thesis and reports to the School of Pharmacy & Molecular Sciences, James Cook University. You will not be identified in any way in these publications.

If you have any questions about the study, please contact Ian Heslop, Prof Beverley Glass, Dr Michelle Bellingan or Prof Richard Speare.

**Principal Investigator:**  
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[richard.speare@jcu.edu.au](mailto:richard.speare@jcu.edu.au)

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Townsville, Qld, 4811. Phone: 4781 4342, [Tina.Langford@jcu.edu.au](mailto:Tina.Langford@jcu.edu.au)

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## Appendix 5.2: Participant consent form (Elective study)



**INFORMED CONSENT FORM**

PRINCIPAL INVESTIGATOR	<b>Ian Heslop</b>
PROJECT TITLE:	<b>A comparison of team-based learning and online learning in a level 4 BPharm elective subject (PC4104:03 Pharmacy Project (Travel Health))</b>
SCHOOL	<b>Pharmacy &amp; Molecular Sciences</b>

I understand the aims of this research study are to evaluate the teaching methods used in the level 4 Bachelor of Pharmacy elective subject PC4104:03 Pharmacy Project (Travel Health). I understand that the research project will compare the two teaching methods used in this subject and find out which teaching method is preferred by students, and why they prefer that particular teaching method. I consent to participate in this project, the details of which have been explained to me, and I have been provided with a written information sheet to keep.

In addition to the standard assessments required for the completion of the subject, I understand that my participation will involve the completion of three questionnaires and my involvement in a focus group. I agree that the researcher may use the results as described in the information sheet.

I acknowledge that:

- taking part in this study is voluntary and I am aware that I can stop taking part in it at any time without explanation or prejudice and to withdraw any unprocessed data I have provided. I also understand that participation or non-participation will not affect my assessment marks in this subject.
- that any information I give will be kept strictly confidential and that no names will be used to identify me with this study without my approval;
- confidentiality cannot be assured in focus groups.

*(Please tick to indicate consent)*

**I consent to complete the questionnaires**

<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
--------------------------	-----	--------------------------	----

**I consent to participate in a focus group**

<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
--------------------------	-----	--------------------------	----

**I consent for the focus group to be audio taped**

<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
--------------------------	-----	--------------------------	----

**Name:** *(printed)*

**Signature:**

**Date:**

### Appendix 5.3: Pre-subject questionnaire (Elective Study)

Pre-Subject Questionnaire

**Section A: Student perceptions of Team-based learning (TBL)**

We are interested in your initial perceptions of Team-based Learning (TBL). Read the following statements and using the attached scale (1 - Strongly agree, 2 - Agree, 3 - Neither agree nor disagree, 4 - Disagree and 5 - Strongly disagree) rate each statement as to whether you agree or disagree with the statement.

Statement	Tick appropriate box				
	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
a) I am interested by the idea of team-based learning (TBL)					
b) Team-based learning (TBL) will be easy					
c) I think I will enjoy team-based learning (TBL)					
d) Team-based learning (TBL) will be a good way of learning about Travel Health					
e) Having to attend team-based learning (TBL) sessions will be inconvenient					
f) Team-based learning (TBL) will take more time than traditional lectures					
g) I will learn more with team-based learning (TBL) than with traditional lectures					
h) I will get more feedback from my lecturers with team-based learning (TBL) than with traditional lectures					

**Section B: Student perceptions of Web-based learning (WBL)**

We are interested in your initial perceptions of Web-based Learning (WBL). Read the following statements and using the attached scale (1 - Strongly agree, 2 - Agree, 3 - Neither agree nor disagree, 4 - Disagree and 5 - Strongly disagree) rate each statement as to whether you agree or disagree with the statement.

Statement	Tick appropriate box				
	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
a) I am interested by the idea of Web-based learning (WBL)	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
b) Web-based learning (WBL) will be easy	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
c) I think I will enjoy web-based learning (WBL)	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
d) Web-based learning (WBL) will be a good way of learning about Travel Health	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
e) Web-based learning (WBL) will be inconvenient	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
f) Web-based learning (WBL) will take more time than traditional lectures	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
g) I will learn more with web-based learning (WBL) than with traditional lectures	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
h) I will get more feedback from my lecturers with web-based learning (WBL) than with traditional lectures	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree

**Section C: Will Team-based learning (TBL) or Web-based learning (WBL) be the better method of learning?**

We are interested in your initial perceptions of which teaching method you think will be the better method, either Team-based Learning (TBL) or Web-based learning (WBL). Below is a list of teaching aims for the subject, using the attached scale (1 – TBL Far Superior, 2 – TBL Superior, 3 – Both methods equal, 4 – WBL Superior and 5 – WBL Far Superior) rate which method will be the better method for each particular teaching aim

Teaching Aim	Tick appropriate box				
	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
a) Teaching method encourages self-directed learning	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
b) Student obtains feedback from academic staff	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
c) Student obtains feedback from fellow students	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
d) Student is able to monitor their own progress in the subject	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
e) Student obtains peer-review from fellow students	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
f) Student receives high quality learning	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
g) Student receives learning at an appropriate level	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
h) Teaching method enhances the student's ability to solve clinical problems	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior

**Section C: Will Team-based learning (TBL) or Web-based learning (WBL) be the better method of learning? (Continued)**

We are interested in your initial perceptions of which teaching method you think will be the better method, either Team-based Learning (TBL) or Web-based learning (WBL). Below is a list of teaching aims for the subject, using the attached scale (1 – TBL Far Superior, 2 – TBL Superior, 3 – Both methods equal, 4 – WBL Superior and 5 – WBL Far Superior) rate which method will be the better method for each particular teaching aim

Teaching Aim	Tick appropriate box				
	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
i) Teaching method encourages student participation in the subject	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
j) Teaching method encourages student engagement with the material being taught	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
k) Teaching method better prepares the student for clinical practice	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
l) Teaching method promotes active learning	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
m) Student learns to think critically	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
n) Teaching method does not increase the workload of academic staff	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
o) Teaching method does not increase the workload of the students for the same outcome as traditional teaching methods	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
p) Teaching method enhances student satisfaction with the subject material	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior



**Section C: Will Team-based learning (TBL) or Web-based learning (WBL) be the better method of learning? (Continued)**

We are interested in your initial perceptions of which teaching method you think will be the better method, either Team-based Learning (TBL) or Web-based learning (WBL). Below is a list of teaching aims for the subject, using the attached scale (1 – TBL Far Superior, 2 – TBL Superior, 3 – Both methods equal, 4 – WBL Superior and 5 – WBL Far Superior) rate which method will be the better method for each particular teaching aim

Teaching Aim	Tick appropriate box				
	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
q) Teaching method increases the student's level of interest in the subject material					
r) Teaching method stimulates student to obtain more information about the subject material					
s) Teaching method is the most effective teaching method available					
t) Teaching method aids the development of the student's communication skills					

#### Section D: Additional Questions

a) What do you think will be the main advantages of the two teaching methods? (Write your comments below)

Team-based Learning (TBL)

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Web-based Learning (WBL)

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b) What are the main disadvantages of the two teaching methods? (Write your comments below)

Team-based Learning (TBL)

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Web-based Learning (WBL)

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c) Which of the following methods would currently be your preferred method of learning? (Tick the appropriate box)

- ☐ Traditional lectures and tutorials
- ☐ Team-based Learning
- ☐ Web-based Learning

**Thank you for taking the time to complete this survey, your input is appreciated**

**Ian Heslop**

**Principal Investigator**

#### Appendix 5.4: Post-subject questionnaire (Elective study)

**Post-Subject Questionnaire**

**Section A: Student perceptions of Team-based learning (TBL)**

Now you have completed the subject we are interested in your perceptions of Team-based Learning (TBL). Read the following statements and using the attached scale (1 - Strongly agree, 2 - Agree, 3 - Neither agree nor disagree, 4 - Disagree and 5 - Strongly disagree) rate each statement as to whether you agree or disagree with the statement.

Statement	Tick appropriate box				
	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
a) I found the team-based learning (TBL) sessions too easy	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
b) I found the team-based learning (TBL) sessions too challenging	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
c) I enjoyed the team-based learning (TBL) sessions	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
d) I found that team-based learning (TBL) is a good way of learning about Travel Health	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
e) The team-based learning (TBL) was an inconvenient way to learn	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
f) Team-based learning (TBL) took more time than traditional lectures	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
g) I learnt more with team-based learning (TBL) than with traditional lectures	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
h) I got more feedback from my lecturers with team-based learning (TBL) than with traditional lectures	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree

# **Section A: Student perceptions of Team-based learning (TBL) (Continued)**

Now you have completed the subject we are interested in your perceptions of Team-based Learning (TBL). Read the following statements and using the attached scale (1 - Strongly agree, 2 - Agree, 3 - Neither agree nor disagree, 4 – Disagree and 5 – Strongly disagree) rate each statement as to whether you agree or disagree with the statement.

Statement	Tick appropriate box				
	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
i) I found the IRAT and TRAT tests gave useful feedback					
j) I found the IRAT and TRAT tests were too easy					
k) I consider team-based learning (TBL) to be an effective learning style for myself					
l) Working in a group helped the learning process					
m) I would recommend team-based learning (TBL) to other students					
n) The tutor strongly steered the group					
o) The tutor conveys interest in TBL and the subject material					
p) The TBL cases give good illustrations of clinical concepts					

### Section B: Student perceptions of Web-based learning (WBL)

Now you have completed the subject we are interested in your perceptions of Web-based Learning (WBL). Read the following statements and using the attached scale (1 - Strongly agree, 2 - Agree, 3 - Neither agree nor disagree, 4 – Disagree and 5 – Strongly disagree) rate each statement as to whether you agree or disagree with the statement.

Statement	Tick appropriate box				
	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
a) I found the web-based learning (WBL) sessions too easy					
b) I found the web-based learning (WBL) sessions too challenging					
c) I enjoyed the web-based learning (WBL) sessions					
d) I found that web-based learning (WBL) is a good way of learning about Travel Health					
e) The web-based learning (WBL) was an inconvenient way to learn					
f) Web-based learning (WBL) took more time than traditional lectures					
g) I learnt more with web-based learning (WBL) than with traditional lectures					
h) I got more feedback from my lecturers with web-based learning (WBL) than with traditional lectures					



### Section B: Student perceptions of Web-based learning (WBL) (Continued)

Now you have completed the subject we are interested in your perceptions of Web-based Learning (WBL). Read the following statements and using the attached scale (1 - Strongly agree, 2 - Agree, 3 - Neither agree nor disagree, 4 – Disagree and 5 – Strongly disagree) rate each statement as to whether you agree or disagree with the statement.

Statement	Tick appropriate box				
	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
i) I found the web-based learning (WBL) resources gave useful feedback	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
j) I found the web-based learning (WBL) assessments were too easy	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
k) I consider web-based learning (WBL) to be an effective learning style for myself	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
l) Working online at my own pace helped the learning process	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
m) I would recommend web-based learning (WBL) to other students	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
n) I lacked direction when working on line	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
o) I needed to have a strong personal interest in the subject material to drive my study	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
p) The web-based learning (WBL) give good illustrations of clinical concepts	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree

**Section C: Was Team-based learning (TBL) or Web-based learning (WBL) the better method of learning?**

Now you have completed the subject we are interested in your perceptions of which teaching method you think is the better method, either Team-based Learning (TBL) or Web-based learning (WBL). Below is a list of teaching aims for the subject, using the attached scale (1 – TBL Far Superior, 2 – TBL Superior, 3 – Both methods equal, 4 – WBL Superior and 5 – WBL Far Superior) rate which method will be the better method for each particular teaching aim

Teaching Aim	Tick appropriate box				
	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
a) Teaching method encourages self-directed learning	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
b) Student obtains feedback from academic staff	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
c) Student obtains feedback from fellow students	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
d) Student is able to monitor their own progress in the subject	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
e) Student obtains peer-review from fellow students	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
f) Student receives high quality learning	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
g) Student receives learning at an appropriate level	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
h) Teaching method enhances the student's ability to solve clinical problems	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior

**Section C: Will Team-based learning (TBL) or Web-based learning (WBL) be the better method of learning? (Continued)**

Now you have completed the subject we are interested in your perceptions of which teaching method you think will be the better method, either Team-based Learning (TBL) or Web-based learning (WBL). Below is a list of teaching aims for the subject, using the attached scale (1 – TBL Far Superior, 2 – TBL Superior, 3 – Both methods equal, 4 – WBL Superior and 5 – WBL Far Superior) rate which method will be the better method for each particular teaching aim

Teaching Aim	Tick appropriate box				
	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
i) Teaching method encourages student participation in the subject					
j) Teaching method encourages student engagement with the material being taught					
k) Teaching method better prepares the student for clinical practice					
l) Teaching method promotes active learning					
m) Student learns to think critically					
n) Teaching method does not increase the workload of academic staff					
o) Teaching method does not increase the workload of the students for the same outcome as traditional teaching methods					
p) Teaching method enhances student satisfaction with the subject material					

**Section C: Will Team-based learning (TBL) or Web-based learning (WBL) be the better method of learning? (Continued)**

Now you have completed the subject we are interested in your perceptions of which teaching method you think will be the better method, either Team-based Learning (TBL) or Web-based learning (WBL). Below is a list of teaching aims for the subject, using the attached scale (1 – TBL Far Superior, 2 – TBL Superior, 3 – Both methods equal, 4 – WBL Superior and 5 – WBL Far Superior) rate which method will be the better method for each particular teaching aim

Teaching Aim	Tick appropriate box				
q) Teaching method increases the student's level of interest in the subject material	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
r) Teaching method stimulates student to obtain more information about the subject material	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
s) Teaching method is the most effective teaching method available	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior
t) Teaching method aids the development of the student's communication skills	1 TBL Far Superior	2 TBL Superior	3 Both methods equal	4 WBL Superior	5 WBL Far Superior

#### Section D: Additional Questions

a) On average, how much time did you spend preparing for each team-based learning (TBL) session?  
\_\_\_\_\_ hours

b) On average, how long did it take you to complete each web-based learning (WBL) session?  
\_\_\_\_\_ hours

c) Now that you have completed the subject, what do you think are the main advantages of the two teaching methods? (Write your comments below)

Team-based Learning (TBL)

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Web-based Learning (WBL)

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d) Now that you have completed the subject, what do you think are the main disadvantages of the two teaching methods? (Write your comments below)

Team-based Learning (TBL)

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Web-based Learning (WBL)

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e) Now that you have experienced the various teaching methods, which of the following methods is your preferred method of learning? (Tick the appropriate box)

- ☐ Traditional lectures and tutorials
- ☐ Team-based Learning
- ☐ Web-based Learning

f) If you could change anything to improve this subject, what would you change? (Write comments below)

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**Thank you for taking the time to complete this survey, your input is appreciated.**  
**Ian Heslop (Principal Investigator)**

## Appendix 5.5: Data collection template for focus group (Elective study)



**A comparison of team-based learning and online learning in a level 4 BPharm elective subject**

**Focus Group Data Collection Template**

**Date:** 29.04.2010

**Start Time:** 11.00 am

**Stop Time:**

**Moderator:** Ian Heslop

**Venue:** Interview Room 1, Building 47, James Cook University.

**Moderator Notes**

- We have a discussion scheduled for 30-60mins today. During the focus group we want to obtain your views on the two teaching methods used in the Travel Health elective this year
- My role is to facilitate the session today. You will not offend me, whatever opinions you give. We are interested in hearing your point of view even if it disagrees with the opinion of others.
- It is my role to keep the discussion focussed on the topics we are here to discuss, so I may need to move the discussion along so that we can cover all of the items and to make sure that we get to hear from everyone here today.
- It is important that we maintain confidentiality and respect others' beliefs and opinions.
- We will be audiotaping the discussion, with your permission, because we don't want to miss any comments. It is important for you to realise that no names will be attached to the report or any publications. You may be assured of complete confidentiality in the report and publications.
- Before we start the group I would like to emphasise the need for respect and confidentiality and the importance of hearing everyone's views.

Question	Responses	Key Issues
<p>1. A general theme from the comments in the student questionnaires was that WBL was more convenient, in that students can do it at a time convenient for them. But the comments also suggest that WBL took longer.</p> <p>Why did WBL take longer when the activities were similar?</p> <p>(Background data to discuss with students if required - Ave time prepare for TBL Session was 2.25hrs. Ave time to complete WBL session was 3.29hrs. (Need to add TBL session time – calculate average but probably 1-2 hrs – therefore actual times are probably similar?).</p>		

<p>2. With TBL, an initial concern from students were issues relating to people either dominating the group, people not pulling their weight in the group, or not taking it seriously and thus affecting the group mark. It appears that this was a lesser concern in the post-subject questionnaire (5 responses to 2 responses).</p> <p>a) Was this actually a major issue?</p> <p>b) Would it still be a concern if you came across TBL in future subjects? (i.e. has this pilot project alleviated any preconceived anxiety?).</p> <p>c) How would the group have dealt with these issues, if they had actually occurred?</p>		
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<p>3. Post subject questionnaires demonstrated a conflict of opinion. With TBL "there is more pressure to learn material (rather than just see it as a reference guide) because you need to be able to discuss it", but others said that that they learnt less or retained less knowledge in TBL sessions compared with the WBL materials. Likewise, with WBL, some students said that they could just skim through the readings and use them whilst answering the questions and so didn't need to know the material as well or said just tend to copy answers from readings with WBL, whereas other felt that they learnt more from the WBL sessions</p> <p>a) Which method was the best overall for the learning and retention of material and why?</p> <p>b) One criticism of WBL for cpd is that if you are skimming material for answers to questions to can obtain the points without reading the articles properly. Is this the case here?</p> <p>c) If you had to do examination in subject – which would better prepare you for an OSCE or written exam?</p>		
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<p>4. a) Which method would prepare you better for dealing with clinical problems and why?</p> <p>b) If we review the marks from the case studies TBL&gt;WBL in 3 sessions, TBL=WBL in 2 sessions, WBL&gt;TBL in 1 session, does this compare with comments relating to WBL better and teaching clinical skills?</p>		
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<p>5. After completing the 6 sessions, responses suggested that students feel that they can better monitor their progress with WBL as opposed to TBL.</p> <p>a) Why is WBL superior at allowing you to monitor your progress, and</p> <p>b) How can TBL be improved to allow better self monitoring of your progress?</p>		
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<p>6. Compared to TBL, why does WBL better encourage active learning and self-directed learning?</p>		
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<p>7. Which method allowed greater student engagement with the material?</p>		
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<p>8. The average IRAT marks for WBL sessions were higher than the TBL sessions.</p> <p>What is the reason for this? (spending more time, using resources when answering questions etc)</p>		
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<p>9. In the TBL session the TRAT mark was always higher than the IRAT. Does teamwork help the learning process?</p>		
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<p>10. Results from the post-subject questionnaire suggest that the students think that WBL stimulates the students to obtain more information about the subject material.</p> <p>a) Why is this so?</p> <p>b) Did you do more reading of the suggested readings for WBL sessions? or</p> <p>c) Did you mean that you did more background research and reading other than the suggested materials?</p>		
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<p>11. Students were asked what was their preferred method of learning. The pre-subject questionnaire suggested that TBL was preferred (6TBL, 1Trad) but after completing the 6 sessions the post-subject questionnaire suggested there was a switch to traditional teaching (3Trad, 2TBL, 1WBL).</p> <p>a) Why do you think this switch occurred?</p> <p>b) What does traditional LBL offer over TBL and WBL?</p>		
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12. This is an elective (intended to have a relatively light workload, no exam etc)

a) Which method would you prefer for a core subject and why?

## **Appendix 6: Appendices Specific to Chapter 6**

Appendix 6.1: UniQuest Ltd confidentiality agreement

## CONFIDENTIALITY AGREEMENT

DATED: \_\_\_\_\_

BETWEEN: Associate Professor Ian Heslop of the School of Pharmacy, James Cook University, Townsville in the State of Queensland ["Discloser"],

AND: James Cook University of Townsville in the State of Queensland ["JCU"],

AND: The individuals listed as signatories to this agreement, of Townsville in the State of Queensland ["Recipients"].

### BACKGROUND:

- A. The Discloser is Doctor of Public Health candidate of the School of Pharmacy and Molecular Sciences at JCU, and, with other staff of JCU, is an originator of an invention ("the Invention") which is the subject matter of a training course and a travel health advisory service.
- B. The Recipients are employees of Amcal Robert Poole's Pharmacy (ABN: 50 624 995 083) of Shop 10, Fairfield Central Shopping Centre, Cnr Lakeside Drive and Waterfront Pde, Idalia Qld 4811 ("the Pharmacy") which has agreed to trial the Invention with its customers.
- C. Information about the Invention, whether incorporated in documents the Discloser discloses to the Recipients, disclosed verbally or disclosed in any other manner by the Discloser to the Recipients, is Confidential Information.
- D. Confidential Information relating to the Invention will be disclosed to the Recipients in the training course in which they will be participants and through the software and associated materials by which the Pharmacy will deliver the travel health advisory service to its customers.
- E. The Discloser warrants that use of the Invention will be in accordance with all requirements imposed by JCU's Human Research Ethics Committee.
- F. Any unauthorised disclosure or use of the Confidential Information may prejudice JCU's commercial negotiations with third parties, and may cause JCU and the Discloser to suffer financial loss as a result of the unauthorised disclosure or use of the Confidential Information.

### THIS AGREEMENT PROVIDES

#### 1. MEANINGS

- 1.1 In this Agreement, the following words have the following meanings:

**Confidential Information** means all information relating to the Invention including discoveries; facts; data; ideas; manner, method or process of manufacture or use; methodologies; techniques; products; prototypes; processes; names; know how; routines; specifications; drawings; trade secrets; computer programs; works in respect of which copyright subsists; and other knowledge;

**Purpose** means to engage in discourse in relation to the Invention during the training course and to deliver a travel health advisory service through the Pharmacy.

#### 2. PURPOSE OF DISCLOSURE

- 2.1 The Recipients must use the Confidential Information only for the Purpose, and must not use the Confidential Information for any other purpose.

#### 3. CONFIDENTIALITY

- 3.1 The Recipients must keep the Confidential Information secret and confidential.
- 3.2 The Recipients must not disclose to any person or make known in any manner to any person any part of the Confidential Information.
4. ENDING OF OBLIGATION OF CONFIDENTIALITY
- 4.1 A Recipient will be relieved from the Recipient's obligations of confidentiality in this Agreement in respect to any part of the Confidential Information which:
- (a) the Recipient can show was in the possession of the Recipient as at the date of the disclosure, and the Recipient notifies the Discloser that fact within 7 days of the date of this Agreement; or
  - (b) becomes part of the public domain otherwise than by a breach of this Agreement; or
  - (c) the Recipient can show was received in good faith from a person entitled to provide it to the Recipient; or
  - (d) the Recipient can show was independently developed by the Recipient, without access to the Confidential Information.
- 4.2 If parts or elements or features of the Confidential Information are in the public domain, or otherwise fall within one of the categories mentioned in clause 4.1, but the combination of those parts or elements or features is unique, the Recipient may not take the benefit of clause 4.1.
5. OWNERSHIP OF CONFIDENTIAL INFORMATION
- 5.1 The Recipients acknowledge that the Confidential Information remains at all times the property of the JCU.
6. INFRINGEMENT OF CONFIDENTIALITY
- 6.1 If any Recipient learns or believes that:
- (a) any unauthorised person has come into possession of any part of the Confidential Information;
  - (b) any unauthorised person is doing any thing in contravention of rights that attach to and arise from the Confidential Information,
- the Recipient must immediately report full particulars to the Discloser, and must provide to the Discloser and JCU all reasonable assistance and information they may request with respect to that information.
7. DURATION OF CONFIDENTIALITY
- 7.1 The parties acknowledge that the confidential nature of the Confidential Information can subsist for an indefinite period of time.
- 7.2 The parties acknowledge that the elapsing of a predetermined period of time does not by reason of that alone cause the Confidential Information to cease having its confidential character, and that the passage of any particular period of time does not extinguish the need to maintain the secrecy of the Confidential Information.
- 7.3 The parties acknowledge that the obligations upon the Recipients in this Agreement continue to subsist until one of the events set out in clause 4 as ending the obligation of confidentiality occurs.

SIGNATURES OF PARTIES

SIGNED  
by the Discloser

Signature

Print Name of Signatory

Witness

Print Name of Witness

SIGNED  
by JCU

Signature

Print Name of Signatory

Witness

Print Name of Witness

SIGNED  
by the Recipients

Signature

Print Name of Recipient

Signature

Print Name of Recipient

Signature

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Print Name of Recipient

Signature

Print Name of Recipient

Appendix 6.2: Service outcome record (APharmTHAS™ leaflet evaluation) (Level 1 Pre-travel service)



### Service Outcome Record (APharmTHAS Leaflet Evaluation)

To be completed when answering simple travel health enquires with or without the separate APharmTHAS leaflets. If the traveller has undergone a formal APharmTHAS assessment do not use this form - complete the service outcome record at the back of the pretravel interview schedule. Complete the following questions or tick the appropriate boxes.

#### Section A: Data about Traveller

1. Gender of traveller (Tick appropriate answer)

- ☐ Male  
☐ Female

2. Age of traveller (Approximate if not clinically required to ask) (Tick appropriate answer)

- ☐ Between 18 and 30 years  
☐ Between 31 and 40 years  
☐ Between 41 and 50 years  
☐ Between 51 and 60 years  
☐ Between 61 and 70 years  
☐ Older than 71 years

3. Destination being visited

\_\_\_\_\_

4. Reason for journey?

- ☐ Holiday or Leisure  
☐ Business or work  
☐ Visiting relatives and friends  
☐ Education  
☐ Religious reasons  
☐ Other

5. Type of Destination

- ☐ Major towns or cities  
☐ Tourist resort  
☐ Rural or remote areas  
☐ Living in close proximity to local population or staying with friends or relatives

#### Section B: Traveller's questions

6. Initial question(s) from the traveller

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



7. Additional information collected from traveller (if clinically appropriate)

Medical History

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Medications

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Other information

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**Section C: Advice given to traveller**

8. Advice given to traveller (Tick appropriate boxes)

- |   |   |
|---|---|
| <input type="radio"/> Disease risks at destination  | <input type="radio"/> Medications   |
| <input type="radio"/> Current disease outbreaks at destination                              | <input type="radio"/> Travel specific medications   |
| <input type="radio"/> Special situations (Counselling may be required depending on journey) | <input type="radio"/> Medications for chronic diseases (Supply and storage)                                 |
| <input type="radio"/> Food and water precautions  | <input type="radio"/> Obtaining medications overseas  |
| <input type="radio"/> Travellers' Diarrhoea – prevention and treatment                      | <input type="radio"/> Self treatment and prophylaxis of conditions  |
| <input type="radio"/> Insect precautions  | <input type="radio"/> First Aid kits  |
| <input type="radio"/> <input type="radio"/> Bite prevention                                 | <input type="radio"/> Safe sexual activity  |
| <input type="radio"/> <input type="radio"/> Malaria prophylaxis                             | <input type="radio"/> Obtaining local medical care  |
| <input type="radio"/> Environmental risks   | <input type="radio"/> Crime and safety  |
| <input type="radio"/> <input type="radio"/> Water-borne disease                             | <input type="radio"/> Travel health insurance   |
| <input type="radio"/> <input type="radio"/> Vector-borne disease                            | <input type="radio"/> When to get assessed post-travel  |
| <input type="radio"/> <input type="radio"/> Climate   | <input type="radio"/> Special situations (depends on journey) includes (consider if referral is necessary): |
| <input type="radio"/> Jet lag   | <input type="radio"/> <input type="radio"/> Altitude (climbing)   |
| <input type="radio"/> Motion sickness   | <input type="radio"/> <input type="radio"/> Marine and Diving disorders                                     |
| <input type="radio"/> DVT/TE prevention (if appropriate)                                    | <input type="radio"/> <input type="radio"/> Excessive heat or cold  |
| <input type="radio"/> Trauma (motor vehicle accidents and animals)                          | <input type="radio"/> <input type="radio"/> Adventure or expedition health risks                            |
| <input type="radio"/> General health and routine illness                                    | <input type="radio"/> <input type="radio"/> Pregnancy   |
| <input type="radio"/> Clothing and footwear   | <input type="radio"/> <input type="radio"/> Immunocompromised   |
|   | <input type="radio"/> <input type="radio"/> Young children or infants                                       |
| <input type="radio"/> Other Advice  |   |

9. Were APharmTHAS leaflets given to traveller? (Tick appropriate boxes)

- ☐ No
- ☐ Yes      If so, which leaflets? (Tick all that apply)
- ☐ Traveller's diarrhoea
- ☐ Avoiding insect bites
- ☐ Malaria
- ☐ Motion sickness
- ☐ Venous thromboembolism
- ☐ Travelling with medicines and buying medicines overseas
- ☐ First aid kits for travellers

10. Was any other written information given to the traveller?

- ☐ No
- ☐ Yes      If so, state items given
- 
- 

#### Section D: Service Outcomes

11. Time taken

Approximate time to interview and counsel the traveller \_\_\_\_\_ mins

12. Referrals (Was the traveller referred to another health professional?)

- ☐ No
- ☐ Yes      If Yes, who was the traveller referred to?
- ☐ GP
- ☐ Travel Clinic
- ☐ Other (state) \_\_\_\_\_

Why was the traveller referred?

- |   |                          |  |
|---|--------------------------|--|
| <input type="radio"/> Needed vaccination  | Which vaccination? _____ |  |
| <input type="radio"/> Needed antimalarials  |                          | <input type="radio"/> Expedition or adventure travelling, including: |
| <input type="radio"/> Needed antibiotics  |                          | <input type="radio"/> Mountaineering or visiting high altitudes      |
| <input type="radio"/> Needed other prescription medications                         |                          | <input type="radio"/> Specialised diving or marine advice            |
| <input type="radio"/> Had more specialised needs:                                   |                          | <input type="radio"/> Exposure to extreme environmental conditions   |
| <input type="radio"/> Travelling whilst pregnant                                    |                          | <input type="radio"/> Other reason (state) _____                     |
| <input type="radio"/> Travelling with young children or infants to exotic locations |                          | _____  |
| <input type="radio"/> Severe chronic ailments requiring review before travel        |                          | _____  |
| <input type="radio"/> Immunocompromised   |                          |  |

13. Purchases

After counselling, did the traveller purchase any items? If so list items and cost:

Description	Quantity	Cost (\$)	Description	Quantity	Cost (4)
1.			5.		
2.			6.		
3.			7.		
4.			8.		

14. Other comments or information about services given to traveller

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### Appendix 6.3: Initial traveller enquiry form



**Initial Traveller Enquiry Form**  
**(CONFIDENTIAL – Keep in Pharmacy after Interview)**

Please answer these questions before you are interviewed by the pharmacist. This will give the pharmacist some important initial information that will help in your interview

**Section A: Tell us about yourself**

What is your name? \_\_\_\_\_

What is your date of birth? \_\_\_\_/\_\_\_\_/19\_\_

What are your contact details?

Current Address \_\_\_\_\_

\_\_\_\_\_

Phone Number \_\_\_\_\_

**Section B: Where are you going?**

What countries will you visit? \_\_\_\_\_

\_\_\_\_\_

Will you be stopping anywhere on the way to these countries? (Tick appropriate box)

☐ Yes

☐ No

If Yes, where will you be stopping and for how long? \_\_\_\_\_

Where will stay in these countries? (Tick all that apply)

☐ Major towns or cities

☐ Tourist resort

☐ Rural or remote areas

What will your accommodation be like? (Tick all that apply)

☐ Medium to high standard tourist resorts or hotels

☐ Lower standard tourist resorts or hotels

☐ Backpacker hostels or similar accommodation

☐ Staying with relatives or friends

☐ Camping

When will you be going? \_\_\_\_\_

Why are you travelling? (Tick all that apply)

- ☐ Holiday or Leisure
- ☐ Business or work
- ☐ Visiting relatives and friends
- ☐ Education
- ☐ Religious reasons
- ☐ Other – please state reason \_\_\_\_\_

How long will you be away? \_\_\_\_\_

### Section C: What will you doing whilst away?

Will you be doing any hazardous activities whilst you are away (these may include activities such as Diving, Mountaineering, Trekking, Sky Diving etc)?

- ☐ Yes
- ☐ No

If Yes, what will you be doing? \_\_\_\_\_

### Section D: Who are you travelling with?

Are you travelling alone or with other people?

- ☐ Travelling alone
- ☐ Travelling with other people

If travelling with other people, how many people are in your travelling party?

Number of Adults \_\_\_\_\_

Number of Children \_\_\_\_\_

## Appendix 6.4 Pre-travel interview schedule (Level 2 Pre-travel service)





Traveller Study Number (To be assigned by JCU)  
**A**



**Pre-travel Interview Schedule**  
**(CONFIDENTIAL – Keep in Pharmacy after Interview)**

To be completed by the pharmacist during the pre-travel interview and consultation

**Section A: Demographic information**

*Some of these details may be taken from the Initial Traveller Enquiry Form. However, discuss them with the traveller and confirm details with the traveller at the start of the interview e.g. "Can we start by confirming your personal details"*

What is your name? \_\_\_\_\_

What is your date of birth? \_\_\_\_/\_\_\_\_/19\_\_\_\_ and age? \_\_\_\_\_ years

What are your contact details?

Current Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone Number \_\_\_\_\_

What is your current occupation? \_\_\_\_\_

Are you travelling alone or with other people?

- ☐ Travelling alone  
☐ Travelling with other people

If travelling with other people, how many people are in your travelling party?

Number of Adults \_\_\_\_\_ Number of Children \_\_\_\_\_

**Section B: Destination-related information**

*Again, some of these details may be taken from the Initial Traveller Enquiry Form. However, confirm details with the traveller whilst asking the additional questions below e.g. "We need to ask you some questions about where you are going"*

What countries will you visit? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

What is the reason for your journey?

- ☐ Holiday or Leisure  
☐ Business or work (If so, what is their occupation? \_\_\_\_\_)  
☐ Visiting relatives and friends  
☐ Education  
☐ Religious reasons  
☐ Other – please state reason \_\_\_\_\_

Will you be stopping anywhere on the way to these countries? (If Yes, where will you be stopping and for how long?) \_\_\_\_\_

Where exactly in these country(ies) will you be visiting? (For example names of places, regions or towns) (Tick all that apply)  
(Names of places) \_\_\_\_\_

- ☐ Major towns or cities
- ☐ Tourist resort
- ☐ Rural or remote areas
- ☐ Living in close proximity to local population or staying with friends or relatives

What will your accommodation be like? (Tick all that apply)

- ☐ Medium to high standard tourist resorts or hotels
- ☐ Lower standard tourist resorts or hotels
- ☐ Backpacker hostels or similar accommodation
- ☐ Staying with relatives or friends
- ☐ Camping

When will you be going? (departure date) \_\_\_\_\_

How long will you be away? (weeks/months) \_\_\_\_\_

What will be the season at your destination? \_\_\_\_\_

What activities will you do whilst you are away? (Ask about standard tourist activities as well as higher risk activities such as extreme sports and sky diving, diving, trekking, mountaineering etc)

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*In the assessment of the traveller, consider the possible risks associated with each destination and whether there are destination-related factors (such as type or location of accommodation) or traveller-related factors (such as pre-existing disease states) which may increase the overall risk*

### Section C: Mode of Transport

What modes of transport will you be using on your journey?

Main mode of transport to main destination(s)? \_\_\_\_\_

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Main modes of transport whilst at destination? \_\_\_\_\_

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*In the assessment of traveller, consider the risks associated with the particular mode of transport and any traveller-related factors that may increase the risk.*

## Section D: Medical History of the Traveller

How would you describe your current overall state of health?

- ☐ Excellent
- ☐ Good
- ☐ Fair
- ☐ Poor
- ☐ Other (as stated by traveller) \_\_\_\_\_

### **Medical History**

*This section is designed to assess the traveller for conditions that may alter the risk of travel-related conditions. Ask the traveller the following questions and if they answer yes, then obtain from the traveller details regarding the condition, how long have they suffered from the condition, the level of control (if appropriate) or level of current symptoms and the details of the medications being used to manage the condition. Details should be summarised below and in Table 1 Medical and Medication History*

Do you have any history of cardiovascular (heart) diseases such as high blood pressure, angina, thrombosis, pace maker, heart failure, previous heart attack, high cholesterol?

- ☐ Yes    If Yes, details \_\_\_\_\_
- ☐ No

Do you have any respiratory (breathing) problems such as asthma, chronic bronchitis or emphysema?

- ☐ Yes    If Yes, details \_\_\_\_\_
- ☐ No

Do you have any history of anxiety, depression or other psychiatric problems?

- ☐ Yes    If Yes, details \_\_\_\_\_
- ☐ No

Do you have any history of neurological problems such as stroke, epilepsy, multiple sclerosis?

- ☐ Yes    If Yes, details \_\_\_\_\_
- ☐ No

Do you have diabetes or any hormone problems such as thyroid disease?

- ☐ Yes    If Yes, details \_\_\_\_\_
- ☐ No

Do you have any current infections or are you prone to repeated infections such as ear infections, urinary tract infections or thrush infection?

- ☐ Yes    If Yes, details \_\_\_\_\_
- ☐ No

Do you have any history of liver disease, jaundice or hepatitis?

- ☐ Yes    If Yes, details \_\_\_\_\_
- ☐ No

Do you have any history of gastrointestinal problems such as stomach ulcers, Crohn's disease or ulcerative colitis?

- ☐ Yes If Yes, details \_\_\_\_\_  
☐ No

Do you have any history of blood problems such as anaemia and blood clotting disorders?

- ☐ Yes If Yes, details \_\_\_\_\_  
☐ No

Do you have any history of kidney disease?

- ☐ Yes If Yes, details \_\_\_\_\_  
☐ No

If the traveller is female - Could you be pregnant (or likely to become pregnant in the next three months) or are you breastfeeding?

- ☐ Yes If Yes, details \_\_\_\_\_  
☐ No

Apart from those already discussed, do you have any other long term or chronic diseases?

- ☐ Yes If Yes, details \_\_\_\_\_  
☐ No

Do you have a weakened immune system or a history of cancer?

- ☐ Yes If Yes, details \_\_\_\_\_  
☐ No

Do you have any allergies? (For example to medicines (especially antibiotics), foods, egg, rubber or preservatives)

- ☐ Yes If Yes, details \_\_\_\_\_  
☐ No

Have you had any recent surgery?

- ☐ Yes If Yes, details \_\_\_\_\_  
☐ No

When was your last dental check up, or have you recently had dental surgery?

Date/details \_\_\_\_\_

Do you smoke tobacco or drink alcohol?

- ☐ Yes  
☐ No

If Yes (to either), to what levels, and will your intake alter during this journey?

Smoking

Current level of smoking \_\_\_\_\_

- ☐ Increase  
☐ Decrease

Drinking alcohol

Current level of drinking alcohol \_\_\_\_\_

- ☐ Increase  
☐ Decrease

Could others in your travelling party have travel-health risk factors such as those above?  
(Pregnancy, Elderly, Children, Chronic Diseases)

- ☐ Yes (A separate assessment would be required for that traveller)
- ☐ No

### **Vaccination History**

Can you remember what vaccinations have you had previously?  
Have you had any previous vaccinations for other previous journeys?

*(Summarise in Table 2: Vaccination History what the traveller can tell you. Ideally it is useful to know when they received each particular vaccination and the number of doses given (for vaccines requiring multiple doses). Unfortunately, this may not be possible for all travellers as some may be poor historians)*

### **Medication History**

What medicines are you currently taking or have used in the last 3 months?  
*(For each try to obtain name, strength/dose, indication, duration of use and summarise answers in Table 1: Medical and Medication History)*

Check with traveller re: all medication types including:

- ☐ Prescription meds including:
  - ☐ Sleeping tabs
  - ☐ Inhalers, puffers and sprays
  - ☐ SL tabs and sprays
  - ☐ Oral contraceptives and HRT (If female)
- ☐ OTC medicines including
  - ☐ Analgesics
  - ☐ GI drugs (Especially medicines for reflux, heartburn, indigestion, constipation, diarrhoea)
  - ☐ Complementary meds (herbal remedies, vitamins and natural remedies)
- ☐ Topical meds (creams, ointments, lotions and patches)
- ☐ Inserted medicines (nose/eye/ear drops, pessaries, suppositories)
- ☐ Injected meds
- ☐ Recently completed courses of medicines
- ☐ Other peoples medicines
- ☐ Social and recreational drugs

What medicines will they be taking on their journey with them? *(Summarise in Table 1: Medical and Medication History)*

**Travel-related health history**

On previous journeys, have you had any health problems? If so how severe

- ☐ Yes (*Write details in Table 3: Travel-related health history*)  
☐ No

If you require medical care or help during your journey, how do you plan to obtain it?

---

Do you have any travel health insurance?

- ☐ Yes (*Type, if known* \_\_\_\_\_)  
☐ No



<b>A</b> Traveller Study Number (To be assigned by JCU)	Name		Contact Details:		Allergies:
	DOB/Age _____ / _____ / 19____ years		Phone:		

Destinations (Country)	Regions/Towns	Accommodation standard	Time at destination	High risk activities? Yes / No	Modes of transport	Overall Risk of Destination
	Metro / Rural	Low / Medium / High			Air / Sea / Road	Low / Medium / High

[illegible]



**Table 2: Vaccination Summary**

National Immunisation Program Vaccinations							Travel-related Vaccinations						
Vaccination	Immunised?					Recommended for journey?	Vaccination	Immunised?					Recommended for journey?
	Yes	No	Don't Know	When?	Full course			Yes	No	Don't Know	When?	Full course?	
Diphtheria, Tetanus, Pertussis (DTPa and dTpa)							Cholera						
Hib							Japanese Encephalitis						
Polio							Rabies						
Hepatitis B							Typhoid						
Pneumococcal conjugate (7vPCV)							Tuberculosis						
Measles, mumps rubella (MMR)							Yellow Fever						
Rotavirus							Tick-borne Encephalitis						
Meningococcal C							Q fever						
Varicella													
HPV (Females)													
Influenza													
Pneumococcal polysaccharide (23vPPV)													

**Table 3: Previous Travel-related Health Issues**



Condition or health problem	Destination at which health problem occurred	Severity (Scale 1=minor to 5=very severe)	Treatment	Other information about condition from traveller
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

## Section E: Counselling Checklist

*This is a list of recommended topics for which travellers may or may not require counselling. Which topics are discussed will depend on the nature of the destination and the any other risk factors the traveller may possess. Before counselling the traveller, tick the topics that you feel the traveller should receive counselling on and this will serve both as a record of the counselling that was given, and also a reminder of which topics to discuss during the counselling session. Some of the topics listed below may not be appropriate for each traveller (Refs available on request).*

- |   |   |
|---|---|
| <input type="radio"/> Disease risks at destination  | <input type="radio"/> Medications   |
| <input type="radio"/> Current disease outbreaks at destination                              | <input type="radio"/> Travel specific medications   |
| <input type="radio"/> Special situations (Counselling may be required depending on journey) | <input type="radio"/> Medications for chronic diseases (Supply and storage)                                 |
| <input type="radio"/> Food and water precautions  | <input type="radio"/> Obtaining medications overseas  |
| <input type="radio"/> Travellers' Diarrhoea – prevention and treatment                      | <input type="radio"/> Self treatment and prophylaxis of conditions  |
| <input type="radio"/> Insect precautions  | <input type="radio"/> First Aid kits  |
| <input type="radio"/> Bite prevention   | <input type="radio"/> Safe sexual activity  |
| <input type="radio"/> Malaria prophylaxis   | <input type="radio"/> Obtaining local medical care  |
| <input type="radio"/> Environmental risks   | <input type="radio"/> Crime and safety  |
| <input type="radio"/> Water-borne disease   | <input type="radio"/> Travel health insurance   |
| <input type="radio"/> Vector-borne disease  | <input type="radio"/> When to get assessed post-travel  |
| <input type="radio"/> Climate   | <input type="radio"/> Special situations (depends on journey) includes (consider if referral is necessary): |
| <input type="radio"/> Jet lag   | <input type="radio"/> Altitude (climbing)   |
| <input type="radio"/> Motion sickness   | <input type="radio"/> Marine and Diving disorders   |
| <input type="radio"/> DVT/TE prevention (if appropriate)                                    | <input type="radio"/> Excessive heat or cold  |
| <input type="radio"/> Trauma (motor vehicle accidents and animals)                          | <input type="radio"/> Adventure or expedition health risks  |
| <input type="radio"/> General health and routine illness                                    | <input type="radio"/> Pregnancy   |
| <input type="radio"/> Clothing and footwear   | <input type="radio"/> Immunocompromised   |
|   | <input type="radio"/> Young children or infants   |



## Section F: Service Outcome Record

To be used for service evaluation – complete the following questions or tick appropriate boxes.

### 1. Time taken

Approximate time to interview and assess the traveller \_\_\_\_\_ mins  
Approximate time to collect information and resources \_\_\_\_\_ mins  
Approximate time to counsel traveller \_\_\_\_\_ mins  
**Total time** \_\_\_\_\_ mins

### 2. Referrals

After counselling was the traveller referred to another health professional?

- ☐ No
- ☐ Yes If Yes, who was the traveller referred to?
- ☐ GP
- ☐ Travel Clinic
- ☐ Other (state) \_\_\_\_\_

Why was the traveller referred?

- ☐ Needed vaccination Which vaccination? \_\_\_\_\_
- ☐ Needed antimalarials
- ☐ Needed antibiotics
- ☐ Needed other prescription medications
- ☐ Had more specialised needs:
- ☐ Travelling whilst pregnant
- ☐ Travelling with young children or infants to exotic locations
- ☐ Severe chronic ailments requiring review before travel
- ☐ Immunocompromised
- ☐ Expedition or adventure travelling, including:
- ☐ Mountaineering or visiting high altitudes
- ☐ Specialised diving or marine advice
- ☐ Exposure to extreme environmental conditions
- ☐ Other (state) \_\_\_\_\_

### 3. Purchases

After counselling, did the traveller purchase any items? If so list items and cost:

Description	Quantity	Cost (\$)	Description	Quantity	Cost (\$)
1.			5.		
2.			6.		
3.			7.		
4.			8.		

## Appendix 6.5: Example MASTA health brief

## EXAMPLE



This Health Brief was prepared for:

**Mr A. Traveller**

## Health Brief

[Print Health Brief](#)

This report was generated from the MASTA server on : February 18, 2010, 9:03 pm and is valid **ONLY** for the period of travel

### Journey Details: Travelling for 72 days.

Destinations:	Living Conditions:	Arrival Date:	Departure Date:
1. Hong Kong	TOURIST	03/03/2010	06/03/2010
2. Bangladesh	RURAL	08/03/2010	31/03/2010
3. United Kingdom	REASONABLE	02/04/2010	21/04/2010
4. Guinea-Bissau	RURAL	23/04/2010	13/05/2010

(Trip Departs From & Returns To Australia)

**Note:** The information in this document is provided as a general guide. We advise it be used together with a Doctor's advice.

**Standard Vaccinations:** Travellers should be up to date with all standard vaccines recommended by their National Immunisation Program

## Yellow Fever Travel Information

The following countries are designated 'AT RISK' with regard to contracting Yellow Fever and vaccination is recommended (for exceptions, further details, see below)

Guinea-Bissau

The following countries require a **VALID** Yellow Fever Certificate from travellers arriving from a Yellow Fever risk country.

Bangladesh: If arriving from Guinea-Bissau within the preceding 6 days, all travellers over 1 year of age.

Specific countries on your journey may accept an Exemption Certificate in place of a current Yellow Fever Vaccination Certificate for the reason stated below:

Travelling to Guinea-Bissau: Immunisation is contraindicated on medical grounds

Travelling to Bangladesh: Immunisation is contraindicated on medical grounds

**Please Note:** Although you may satisfy Yellow Fever Certificate requirements for one country, you must also satisfy the requirements for your other destinations.

### Specific Country Information:

#### Guinea-Bissau

Risk of Yellow Fever may occur throughout the country

#### Bangladesh

Yellow Fever does NOT occur in this country

#### United Kingdom

Yellow Fever does NOT occur in this country

#### Hong Kong

Yellow Fever does NOT occur in this country

## Other Vaccine Preventable Diseases

### Recommended immunisations for your journey

Overseas travel provides an opportunity for all travellers to review their current immunisation status. All travellers are advised to be up to date with their regular immunisations as per their National Immunisation Program Schedule e.g. travellers should be 'in date' for the tetanus, diphtheria, polio, pertussis, measles/mumps and rubella (MMR). All travellers should carry an **International Certificate of Vaccination or Prophylaxis** in which their immunisations are recorded.

As of 30 September 2009, a vaccine that induces protective immunity against the **Pandemic Influenza A/H1N1**

vaccine became available and is free. Australian health authorities advise that all travellers should be vaccinated with this new influenza vaccine prior to travelling overseas, provided there are no contraindications.

### **Poliomyelitis**

#### **There is a risk of polio on your journey - Vaccination is Recommended**

Polio is a virus infection that occurs worldwide, with most cases now seen in Asia and Africa. Polio virus is usually contracted from food, water or hands contaminated with faeces of infected persons. The virus invades the blood stream and nervous system. There is no cure. Cases either recover spontaneously, die or develop permanent paralysis. Risk of paralysis increases with age. Prevention is by food and water precautions but up-to-date polio vaccination status is absolutely essential for protection.

**Vaccination:** After the primary course of the vaccine, boosters are usually given every 10 years for those travelling to risk areas. Adults who have never been vaccinated need 3 doses of injectable polio vaccine over 3-6 months before they are protected.

### **Hepatitis A**

#### **There is a risk of Hepatitis A on your journey - Vaccination is Recommended**

Hepatitis A is a virus infection of the liver. It is acquired by consuming contaminated food and water. In adults, up to 2% of cases are fatal, but higher rates (eg 4%) may be seen. Cases either recover spontaneously or die.

**Vaccination:** Hepatitis A vaccines are safe and highly effective at preventing infection.

### **Hepatitis B**

#### **There is a risk of Hepatitis B on your journey - Vaccination is Recommended**

Hepatitis B is a virus infection of the liver. It is spread by sexual contact, contaminated blood & body secretions. Contaminated needles, syringes and any instrument that breaks the skin or contacts mucosal surfaces can also spread the virus. It can lead to liver damage, cirrhosis, liver cancer, liver failure & death. About 5% of adults remain carriers after acute hepatitis B and can infect other people, including from mother to baby.

**Vaccination:** Hepatitis B vaccine is very effective protection against infection. The vaccine is usually given as a 3 dose course over 6 months, but accelerated regimes can be used if time is short.

### **Typhoid Fever**

#### **There is a risk of Typhoid on your journey - Vaccination is Recommended**

Typhoid is caused by bacteria (*Salmonella typhi*) which is contracted by ingesting food or water contaminated by the typhoid bacteria. The bacteria enter the blood stream from the gut. Illness usually causes fever, lethargy and change in bowel habit. Typhoid can be fatal. Prevention is by food and water precautions, and vaccination.

**Vaccination:** There are 3 moderately effective vaccines: one oral (Vivotif Oral); and two (Typhex and Typhim Vi) as injections. A combined hepatitis A and typhoid vaccine (Vivaxim) is also available and is useful for groups at risk of contracting both infections. Protection is thought to last up to 3 years with all available typhoid vaccines.

### **Meningococcal Disease**

#### **There is a risk of Meningococcal Meningitis on your journey - Vaccination should be Considered (see below for guidance)**

**Meningococcal disease** is a bacterial infection that often affects the tissues lining the brain and spinal cord (the meninges) causing **meningitis**. If not treated early, coma and death can occur within a matter of hours. You pick up the bacteria from close contact with persons who are carrying it in their throat. They are usually not sick at the time.

**Guidelines for Vaccination:** Living in dormitory type accommodation, or spending time in crowded areas like buses, trains, market places etc are high risk areas to pick up the bacteria. Large outbreaks of meningitis occur in sub-Saharan Africa and parts of Asia annually. Although seasons are not entirely predictable risk is greatest during the months stated. For updated information on outbreaks, risk also see Health News below.

There is an effective vaccine against 4 strains (ACWY) of the meningococcus bacteria (Mencevax or Menomune). This vaccine usually covers the strains that cause outbreaks in most developing countries. Under some circumstances, valid proof of vaccination (within previous 3 years) may be needed otherwise travel may be restricted in some countries at certain times of the year. **Note:** Conjugate vaccines (Meningitec, Menjugate, NeisVac-C) only protect against one strain of meningococcus and are not advised for travellers.

#### **Local Notes for:**

**Guinea-Bissau:** Meningitis outbreaks are seasonal. Outbreaks usually occur in the following period: **December to May**

Note that this information is for guidance only as seasons for outbreaks are not fully predictable.

The following travellers should consider immunisation with the ACWY vaccine if at risk (also check Latest Health News below):

Rural travellers

Persons with close contact with the local population



Long stay visitors

## EXAMPLE

### Immunisations to be considered for your journey

The requirements for these immunisations may depend on your activities, lifestyle and length of stay. We advise you to discuss these with your travel health advisor.

#### Japanese Encephalitis

**There is a risk of Japanese Encephalitis on your journey - Vaccination should be Considered (see below for guidance)**

**Japanese Encephalitis (JE)** is a virus infection of the brain that causes a severe flu-like illness with prominent headache, neck stiffness, confusion and coma. Death rates may be up to 30% or higher and long-term brain damage is common in persons who survive. There is no cure. Cases either recover spontaneously, die or develop permanent brain damage. It occurs mostly in rural areas of many parts of South East Asia, China, Korea, Northern India and Nepal and some parts Papua New Guinea. It is spread mostly in rural areas where conditions favour breeding of the mosquito that carries the virus. They are most likely to bite from late afternoon to early evening. Use an effective insect repellent. Effective repellents include products that contain adequate amounts of deet, picaridin or extract of lemon eucalyptus (for more information, go to [www.mosiguard.com.au](http://www.mosiguard.com.au)). **Guidelines for Vaccination:** Although seasons are not entirely predictable **risk is greatest during the months stated below**. JE vaccination is generally only given if staying in rural areas in endemic areas for more than 2 weeks during the season. For trips of < 2 weeks duration in rural areas, antimosquito measures are usually only required. For trips of 2-4 weeks in rural areas, many authorities still do not recommend JE vaccination, preferring to recommend it only for persons travelling in rural areas during the season for 4 weeks or more. Expatriates staying in endemic areas with regular rural exposure are recommended to have the JE vaccination.

#### Local Notes for:

**Bangladesh:** Japanese Encephalitis outbreaks are **seasonal**. Outbreaks usually occur in the following period: **July to December**

Note that this information is for guidance only as seasons for outbreaks are not fully predictable.

#### Rabies

**There is a risk of Rabies on your journey - Vaccination should be Considered (see below for guidance)**

Rabies is a virus infection of the nervous system. Symptoms are muscular paralysis and spasm with bizarre behaviour leading to delirium and convulsions and death. Infection is usually contracted from the saliva of an infected or rabid animal (any mammal). Most human cases are acquired from a dog or cat bite but just a lick on an open cut, sore, or even the eyes or mouth may be enough. Once symptoms develop, death is inevitable in all cases. There is no cure.

**Prevention:** Prevention is extremely important. Immediately after the bite, lick or exposure treat the wound or exposed part of the body with soap (or detergent) and water to thoroughly clean the wound then flush with water all exposed areas. Then seek immediate medical care to ensure all appropriate measures have been taken to prevent rabies.

**Vaccination:** Current rabies vaccines available in Australia and New Zealand are safe and very effective. The vaccine can be given either before travel (pre-exposure prophylaxis) or after exposure (post-exposure prophylaxis). **Pre-exposure prophylaxis** is often advised for persons going to remote areas of rabies countries, especially if risk of rabies is high or if travelling in rural areas for longer than 1 month. Rabies has occurred in travellers in shorter trips and in urban locations. Cyclists, Children and Health and Humanitarian Aid Workers are often at increased risk. Never accept a "she'll be right" or "it won't happen to me" approach after potential rabies exposures, even from medical personnel. Expert medical advice on rabies management is essential. All travellers should be aware of the risk and consider pre-exposure prophylaxis in discussion with their doctor.

#### Cholera

**There is a risk of Cholera on your journey - Vaccination should be Considered (see below for guidance)**

**Cholera** is a bacterial infection of the gut that causes painless but profuse **watery diarrhoea** which rapidly leads to dehydration. Vomiting may also occur. If diarrhoea is profuse **death can occur within a day**. The cholera bacteria are usually spread by water or food contaminated with infected faeces.

**Guidelines for Vaccination:** Cholera is not very common at all in travellers. For most travellers safe food and water precautions alone usually are enough to prevent cholera. The following persons are at higher risk of cholera and should consider cholera vaccination more strongly - health care and aid workers who are likely to have close contact with the local population, persons travelling or working in rural areas of a country especially when a cholera outbreak is occurring and/or who may be in a remote location away from reliable medical care.

## Malaria

### There may be a risk of malaria on your trip.

Malaria, a serious disease than can be fatal, is caused by a parasite (*Plasmodium* species) of red blood cells transmitted by mosquitoes. Not all mosquitoes transmit malaria. The species that transmits malaria is the anopheline mosquito. It usually prefers to bite between dusk and dawn. Whilst feeding it injects saliva containing the parasites which then travel to the liver and develop over the next 8-21 days (incubation period) before appearing in the blood stream. Therefore, minimum period between mosquito bite and first symptom is 7 or 8 days. There are two main forms of malaria:

1. **Malignant malaria** (due to *P.falciparum*) is fatal if untreated. A similarly serious form of malaria may also be caused in humans by *P.knowlesi* ("Monkey Malaria").
2. **Benign malaria** (due to *P.vivax*, *P.ovale* or *P.malariae*) is rarely life threatening but relapses may occur over several years (up to 10 years after last exposure to malaria)

This section of your health brief describes the **geographical risk areas for malaria** (in dark green ♦) in the countries to be visited and the relevant preventive measures. If antimalarial drugs are recommended in your Health Brief, they should provide protection for all malaria risk areas visited on your journey.

**Note:** Malaria maps are for guidance only. Malaria borders can change. If there is any doubt, we advise that you take the antimalarial drugs. Dark green shaded areas indicate that antimalarial drugs may be advised. Check geographical data in the text description of malaria risk that accompanies the map.

**Choose one of the recommended antimalarial drugs and its schedule listed below.** Generally, we do not advise changing antimalarials while you are travelling, unless you suffer significant side effects, or develop malaria. In either case, decision on an alternative should be made in consultation with a knowledgeable medical practitioner.

### Risk Areas \*



### The highest risk destination for MALARIA is Bangladesh

Malaria is present in the whole country except Dhaka City. The malaria risk is especially high in the Chittagong Hill Tract District in south-east of the country and anti-malarials are recommended for this area. Elsewhere the risk is lower and anti-malarials are not generally required. However, high risk travellers (ie those staying in very basic accommodation in rural areas) may wish to consider taking them as a precaution. All travellers should take steps to avoid mosquito bites.

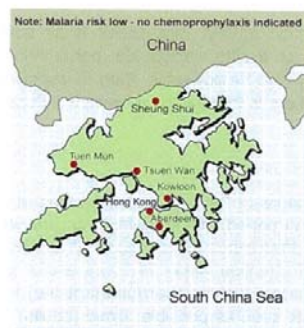
### Malaria also occurs in some of your other destinations.



### Guinea-Bissau

There is a risk of malaria risk (mostly *P.falciparum*) in all areas of the country.

## EXAMPLE



### China, People's Republic of - Hong Kong

There is a risk of malaria but only in rural parts of the New Territories (especially border areas with China). Because the risk of malaria is so low, antimalarial tablets are not recommended for prevention of malaria. Instead, anti-mosquito measures alone are strongly recommended for malaria prevention.

### Recommended anti-malarial drugs

**Malaria risk is high** for both Benign Malaria (mostly *P. vivax*) & Malignant Malaria (*P. falciparum*) & Malignant Malaria (*P. falciparum*) is Resistant to Chloroquine, Proguanil & sometimes other drugs.

### PREVENTION

Antimosquito measures plus Preventive Medication (chemoprophylaxis) as follows:

Choose either **Doxycycline** (daily) or **Malarone** (daily) or **Mefloquine** (weekly).

Which medication suits you best depends on side effects, cost, convenience & length of stay. You should discuss the best choice for you with your travel health advisor.

### ADULT DOSE SCHEDULES

**Doxycycline** ONE (100mg) tablet DAILY - Take with food. Start **2 Days before** departure & Continue Tablets for **28 Days after** leaving the Malaria area

OR

**Malarone** ONE tablet DAILY - Take with food. Start **2 Days before** departure & Continue Tablets for **7 Days after** leaving the Malaria area

OR

**Mefloquine (Lariam)** ONE (250mg) tablet WEEKLY. Start **2 Weeks before** departure & Continue Tablets for **4 Weeks after** leaving the Malaria area

### ALTERNATIVES

There are few alternatives to the above medications. Seek specialist advice if alternatives are required.

### CHILDREN, PREGNANT & BREAST-FEEDING MOTHERS

Malaria prevention and anti-malarial medications should be discussed with a knowledgeable medical practitioner.

### WARNING

If none of the above medications is suitable for you, you should discuss with your doctor whether it is safe for you to travel to the malaria areas in this country. No preventive measures are guaranteed to be 100% effective in preventing malaria. Therefore, any fever occurring within the first 3 months (even up to 12 months) of having been exposed to malaria should be evaluated for malaria. See below ("Malaria Symptoms and Treatment").

### Avoiding Mosquito Bites

**Use an insect repellent that works** e.g. products that contain DEET, Picaridin or Extract of Lemon Eucalyptus (Mosiguard). Don't use products whose claims can't be supported. In Australia, check the repellent has an **APVMA registration number** which guarantees thorough scientific tests prove it works. MASTA recommends Mosiguard. Extensive testing by world leaders in insect repellent research proves Mosiguard to be powerful, effective and safe for all the family (aged 12 months or over). Mosiguard provides effective protection for at least 6 hours, but 10 hours or more under field condition - easily superior to all other natural repellents & equivalent to, or better than, all synthetic repellents. Mosiguard is DEET-free, so it won't dissolve or damage your sunglasses, expensive synthetic garments like swimwear, sportswear, fishing gear or your golf club grip! For more information, go to [www.mosiguard.com.au](http://www.mosiguard.com.au)

**Dress appropriately** especially in between dusk and dawn (long sleeved shirts/tops, long trousers etc to minimise



bare skin exposed to mosquitoes)

**Air conditioned accommodation** provides very good protection against mosquitoes. If air conditioning is not available, we advise you sleep under a **mosquito net impregnated with insecticide** (permethrin). A knock-down spray (fly spray) at night to kill any mosquitoes in your room may also be advisable. **Plug-in vapourisers** containing permethrin and related compounds are very effective provided there is 24 hour power supply. "Buzzers", "Zappers", Thiamine (vitamin B1) do not protect against mosquito bites.

### Malaria Symptoms and Treatment

The most important symptom to remember is a raised temperature of 38°C or higher starting at least one week after first potential exposure to malaria (the minimum incubation period). Other symptoms are very variable and cannot be relied on. If you do develop a fever a week or more after exposure to malaria, **you must seek medical attention as soon as possible**. If you cannot get to medical attention within 24 hours and/or your condition is deteriorating, you should consider emergency self-treatment. **Riamet (artemether/lumefantrine)** is suitable to use as an emergency treatment, but you should still see a doctor as soon as possible. Dose (adults): 4 tablets as an initial dose followed by five further doses of four tablets taken at 8, 24, 36, 48 and 60 hours thereafter. Alternative emergency treatment is Malarone (atovaquone/proguanil) taken as 4 tablets once daily for 3 days.

## Health News by Destination

### Bangladesh

An **avian influenza** (H5N1) case was reported in Bangladesh in a child from Komalapur, Dhaka, May 08 and has been the only identified case up to 30 December 2009. Avian influenza is a serious viral infection usually transmitted to humans by contact with infected poultry. The risk to travellers is low. Travellers should avoid visits to live animal markets / poultry farms and wash their hands regularly. See MASTA Fact Sheet.

Outbreaks of **dengue** fever, a viral illness transmitted by mosquitoes, have been reported in recent years. Many areas including Dhaka have been affected in 2009 (including Central Road, Dhanmondi, Ganderia, Kalabagan, Minto Road, Mirpur, Muhammadpur, Siddeswari). This unpleasant viral disease can cause fever, rash and joint pains. Rarely, it can be fatal. There is no specific cure. Treatment is given to relieve symptoms. In dengue especially one should avoid the use of aspirin and other anti-inflammatory medications as they may aggravate bleeding tendencies caused by the disease. Use paracetamol instead. Dengue virus is transmitted by daytime biting mosquitoes so travellers should take steps to avoid mosquito bites. See MASTA Fact Sheet.

Media sources reported a large number of cases of **diarrhoea** in Dhaka, Barisal and Bhola, April 08. Seasonal peaks are seen each year around March-May and August-Sept. Travellers should take extra care with food and water hygiene and consider taking a diarrhoea treatment kit with them.

There are press reports that 4 million people (3% of the population of Bangladesh) are suffering from **Hepatitis C**. This disease is commonly transmitted by used needles or blades and blood transfusions. There is no vaccine.

Health officials have identified **Nipah** virus as the cause of 6 recent deaths in Manikganj and Rajbari districts (W of Dhaka), March 08. Date palm sap, a local sweet delicacy, has been identified as the cause of these recent cases. Outbreaks have occurred in Bangladesh in recent years and have usually been associated with close contact with pigs or bats although the exact mode of transmission is uncertain.

17 cases of **polio** were reported in Bangladesh during 2006 - these were the first reported cases of the disease since 2000. Travellers should take care with food/water hygiene and be immunised against polio.

Health officials have reported an encephalitis outbreak affecting 200 people (21 deaths) in remote Goainghat (NE), Nov '07. The cause is being investigated but presently unknown.

17 children have died from an undiagnosed illness in Karandighi block, Khulna (S), June 08. Japanese encephalitis was suspected. Travellers should take steps to avoid mosquito bites, and consider vaccination if at risk.

An outbreak of **Meningococcal Meningitis** caused by Serogroup A was reported in 2009 affecting the Chittagong Hills Tract bordering the Indian states of Tripura Meghalaya and Mizoram. The risk to most travellers is very low but long stay visitors to the region including stays Delhi may wish to consider the meningitis ACWY immunisation.

**Medical facilities** are poor. Routine tests and X-rays are unreliable. Travellers should have suitable medical insurance and be prepared to travel outside Bangladesh for treatment.

### Guinea-Bissau

7 cases of anthrax were reported following the consumption of contaminated meat in Bissau (44 miles north of Bissau), April 07. The local population have been warned against eating meat of uncertain origin. Travellers should ensure meat is well cooked.

A large cholera outbreak throughout the country has reportedly affected nearly 14, 000 people, Jan-Nov 08. The outbreak started in Timbali (S) but has spread to many areas including the capital and the Bijagos Islands. Cholera is transmitted by contaminated food and water. Outbreaks tend to occur in areas with poor sanitation. An oral cholera vaccine is available for those at particular risk.

## EXAMPLE

<http://www.masta.edu.au/brief.php>

There is only limited HIV surveillance in Guinea-Bissau but 3.8% of the population are estimated to be infected. Casual sexual intercourse is risky and ill-advised. Risk is reduced but not eliminated by the use of a condom. Medical facilities in Guinea-Bissau are extremely limited. Consider taking some basic medical supplies. Ensure that medical insurance covers the cost of emergency transfer to good medical facilities.

### Hong Kong (China, People's Republic of)

There is a risk of dengue fever in Hong Kong. 17 imported cases have been reported during 2008. This unpleasant viral disease is spread by daytime biting mosquitoes. Travellers should take steps to avoid mosquito bites by using an effective repellent on exposed skin. There is no vaccine.

Cases of gastroenteritis have been reported in previous years as a result of consuming oysters. Travellers should ensure all shellfish is well cooked.

Health officials have reported an increased incidence of Hepatitis E affecting mixed age groups in Hong Kong, April '08. The virus is acquired by ingestion of contaminated food or water. Travellers are encouraged to observe good personal and food hygiene and wash hands regularly.

### United Kingdom

7 cases of hepatitis E have been reported in travellers on a world cruise which departed from Southampton in March 08. This viral infection is transmitted via contaminated food and water and can be especially dangerous if contracted during pregnancy. There is no vaccine. The source/country of infection has not yet been established.

There has been a continued rise in cases of Lyme disease reported in the UK over recent years. In 2006, 768 cases were officially reported. 'Hot spots' for Lyme disease include the New Forest, Salisbury Plain, Exmoor and Thetford Forest. Other endemic areas include the Lake District, Yorkshire moors and Scottish Highlands and Islands. Travellers to these areas should be aware of the risk and take steps to avoid tick bites.

The Health Protection Agency have reported 475 confirmed measles cases, Jan-Aug 07. Most cases (77%) have been identified in the south east. Children are encouraged to follow the recommended childhood immunisation schedule.

The Government announced that from September 05, the BCG vaccine will no longer be given routinely to children aged 10 to 14 years. The vaccine will be reserved for those at increased risk for example, those born in to high risk families and those living in high risk areas. The risk of TB for most UK children is thought to be low. The BCG vaccine would still be recommended for long stay (1 month +) unvaccinated travellers and those planning to be in close contact with the local population in high risk countries (see health brief). The vaccine is thought to be less effective in adults but does provide a valuable level of protection in young children. Unvaccinated adults may be offered the vaccine if their tuberculin test is negative (grade 0 or 1). Protection may be limited and can take approximately 8 weeks to develop. The Department of Health have changed their advice regarding BCG vaccinations for travellers. Previously, vaccination was recommended for travellers under 35 staying in risk countries for three months or more stating in The Green Book "The vaccine (BCG) is recommended for those under 16 years who are going to live or work with local people for more than 3 months in a country where the annual incidence of TB is 40/100, 000 or greater." Travellers who are occupationally at risk when they travel such as healthcare workers should always be put into 'rural' living conditions when generating a health brief.

### Security Advice - Department of Foreign Affairs and Trade

For further advice, please consult [the Department of Foreign Affairs](#)

### Security Advice - from the British Foreign & Commonwealth Office

For advice from the FCO, please consult their [information website](#)

### Important Items You May Need To Take With You

#### Emergency

- First aid kit containing antiseptic, bandages, plasters, scissors, thermometer, tweezers
- Consider taking a sterile medical equipment kit (needles, sutures, syringes for emergency treatment of injuries in countries where sterile needles & syringes may not be available so there could be a risk of HIV, Hepatitis B or C)
- Consider taking an emergency dental kit for temporary treatment of dislodged fillings and crowns
- Carry a note that states your blood group & consider joining the Blood Care Foundation in case emergency safe blood transfusion could be required

#### Bites

- Repellent that works against biting insects

- Mosquito net impregnated with permethrin
- Plug in insecticide vaporiser and pads
- Knockdown insect spray (fly spray)

#### **Safe Water**

- Water purification tablets or an Iodine resin water purifier

#### **Sun Protection**

- Sun block
- "After Sun" skin care products

#### **Sex**

- Condoms if appropriate

#### **Medication**

- Painkillers
- Travel sickness medication as required
- Antimalarial drugs for malaria prevention if recommended
- Loperamide and oral rehydration preparations for Travellers' Diarrhoea
- Malaria treatment medication (Malarone or Riamet) for emergency (standby) treatment of malaria for travellers who may be unable to access to reliable medical attention
- Antifungal treatments for women taking doxycycline for malaria prevention
- Antibiotics may be appropriate for treatment of diarrhea, skin and chest infections (this should be discussed with your doctor)
- If you are on any regular medication, it is a good idea to take a bit more than is required for the trip duration in case of loss or damage. Keep some in your hand luggage and some in your check-in luggage. Carry a letter from your regular doctor listing your regular medications (both the trade and generic names) and the dosages you take
- Documentation that lists any allergies which you have ever had and any medications which you cannot take

#### **Travel Insurance**

- Copy of your travel insurance policy with emergency contact numbers

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## EXAMPLE

<http://www.masta.edu.au/brief.php>



### Fact Sheet

#### Vaccines & Antimalarials in Pregnancy & Breast-Feeding

##### Vaccines

- **Hepatitis A:** Hepatitis A vaccine is safe for use in pregnancy & is recommended.
- **Typhoid:** While the current injectable typhoid vaccines have not been shown to be harmful in pregnancy to mother or fetus, most authorities advise that typhoid vaccine should not be given to the pregnant traveller. Food and water precautions however must be stressed and followed completely.
- **Live virus vaccines** including Yellow Fever vaccine, oral polio vaccine and oral typhoid vaccine should be avoided in pregnancy

• **IMPORTANT NOTE:** Travel while pregnant can be risky for both mother and foetus. In general, we advise against travel in pregnancy to developing countries unless absolutely necessary. Sometimes, when disease risk is high for certain destinations such that pregnancy poses a high risk of severe illness and even death, vaccination recommendations may be modified for pregnant travellers according to such risk. Under such circumstances, pregnant travellers should seek advice from specialists in travel medicine, infectious diseases and obstetrics.

##### Malaria

Malaria in pregnancy can have severe consequences for the mother and fetus. Unless travel to malaria areas is essential and cannot be deferred, it may be safer to defer travel or change itinerary to avoid malaria exposure. The decision as to what are the best antimalarials for prophylaxis should balance the risk of malaria versus the risk of side effects.

Additionally, treatment options for malaria in pregnancy are limited, and expert assessment is required should malaria be suspected. The medications below for standby treatment have not been passed as safe for use in pregnancy. Quinine, Artemether and Fansidar are the most commonly used drugs in pregnancy, but there are other options that need expert assessment should malaria develop in a pregnant women. For non-pregnant women, standby treatment with either Malarone or Riamet (see below) is preferred.

For prevention of malaria in pregnancy, antimosquito measures must be stressed. Additionally, any fever in the first 3 (even up to 12 months) after return should be evaluated for malaria. Medications for prevention of malaria are discussed below.

##### Chloroquine 2 tablets weekly plus Paludrine 200mg daily

- This is the only universally regarded safe option for first trimester of pregnancy. Unfortunately, this combination may not provide very good protection from malaria for many destinations (see health brief).

##### Lariam (mefloquine) & Pregnancy

- The teratogenic potential of Lariam is low if at all. Review of women who have taken mefloquine in pregnancy indicated no increase in adverse outcome above that of normal pregnancy.
- Mefloquine is regarded as safe to take in second and third trimester. In first trimester, as stated above, it has not been associated with any increased adverse outcome for either mother or fetus. Having said that, most prescribers would advise women against taking Mefloquine in first trimester.
- How long after stopping mefloquine would it be safe to become pregnant? This is not known with certainty. However, because the available data suggests there is likely to be no risk to the fetus, women should be aware that if pregnancy occurs while on mefloquine or soon after stopping it (eg within 3 months) there does not seem to be a cause for concern. Termination is definitely not advised.

##### The following medications are contra-indicated in pregnancy:

- Doxycycline
- Malarone

##### Breast Feeding & Antimalarials

The following are all excreted in small amounts into breast milk

- Mefloquine (Lariam), Paludrine (proguanil), Chloroquine and Tetracyclines

For the following, there is no data available:

- Doxycycline or Atovaquone (the other component in Malarone = Proguanil + Atovaquone)

The only antimalarials with safety data for breast-feeding are Chloroquine, Paludrine (proguanil) and Lariam but there are no randomised trials on safety of malaria medications for a child when the mother is breast feeding. Short-acting drugs taken after breast feeding probably are less likely to be concentrated in breast milk, being either metabolised and/or excreted in urine and faeces rather than breast milk for the child. Unfortunately, this is not a useful tactic for antimalarials which, of necessity, have long half-lives. For drugs, for which there is data, there is no



evidence that the amounts in breast milk are either protective or harmful to the breast-fed child. Certainly, we know that the amounts found in breast milk are not adequate to protect the child. A breast-fed baby does not receive adequate amounts of the mother's antimalarials in the breast milk for protection. The child should be prescribed its own antimalarials. See malaria section of the health brief for details of the malaria risk in the specific countries. As for pregnancy, the decision as to what are the best antimalarials for prophylaxis should balance the risk of malaria versus the risk of side effects.

Antimosquito measures are still very important. Even if risk of malaria is low, any fever especially in the 3 months after return should be evaluated for possible malaria.



## EXAMPLE

### Fact Sheet

#### Children Aged 10 Years or Less

For children aged 10 years or less, the vaccinations recommended are the standard childhood vaccines.

To determine whether additional vaccinations are required, please refer to the information below.

**NOTE:** It is most important that the information below is discussed with the child's regular doctor in order to decide on the best vaccination and malaria schedules for children travelling on the itinerary described in this health brief.

- **Hepatitis A vaccine** is optional depending on age. The lower age limit for Hepatitis A vaccine is 1 year. Hepatitis A vaccine is recommended for children aged over 1 year but a cut-off of 5 years may also be reasonable. Hepatitis A is a mild illness in children aged less than 10 years so that vaccination of children aged more than 1 year is not given to prevent illness but rather more to prevent the child spreading the hepatitis A virus to non-immune adults on return.
- **Typhoid vaccine** is not usually required if staying in 5 star accommodation for less than 2 weeks. The lower age limit for Typhoid vaccine 2 years. All children aged over 2 years should be immunised against Typhoid if staying in anything less than 5 star accommodation for more than 2 weeks. For children aged less than 2 years, food and water precautions are the only form of protection.
- **Hepatitis B.** All children of any age should be immunised against Hepatitis B. The full Hepatitis B schedule is 1 birth dose plus 3 other doses (or if missed birth dose, give just 3 doses) with the 3 doses given at 2, 4 and anywhere between 6-12 months. Minimum interval between Hepatitis B doses is 1 month, but preferable interval between 2nd and 3rd doses is 2 months. Use pediatric formulation or in combined pediatric vaccines

**Special situations** may determine whether BCG (for Tuberculosis) or Yellow Fever or Rabies or Japanese Encephalitis vaccination is recommended:

- **Tuberculosis (TB):** Chest (TB) Clinic review for TB vaccination (BCG) is strongly advised for children aged less than 5 years if living for > 3 months in High Incidence Countries (as this provides reasonably good protection against severe forms of TB in children in that age group eg miliary TB and severe TB meningitis)
- **Yellow Fever:** The lower age limit for Yellow Fever vaccination is usually quoted as 9 or 12 months (most authorities prefer 12 months unless risk of Yellow Fever is great). Rarely it can be given down to age 6 months of age if justifiable based on risk-benefit assessment (but it is essential to get specialist confirmation for those situations). For a 12 month old child, Yellow Fever vaccine is safe to give, providing there are no contraindications. Yellow Fever occurs only in parts of Africa, South and Central America and some Caribbean islands. Check the first vaccination section of this health brief to see if Yellow Fever vaccination is recommended for either personal protection or for entry requirements or both.
- **Rabies:** Care to avoid rabies exposures is very important as well as knowing to seek post-exposure prophylaxis for suspected or potential rabies exposures. If rabies risk is likely to be significant, pre-exposure prophylaxis (3 doses) should be given as this simplifies post-exposure prophylaxis should it be necessary. Check the vaccination section of this health brief to see if rabies is a risk in any countries you are visiting
- **Japanese Encephalitis (JE)**

JE vaccination is generally only given if staying in rural areas in endemic areas for more than 2 weeks during the season (see vaccination section of the health brief). As JE illness is very rare in travellers, for trips of < 2 weeks duration in rural areas, antimosquito measures are usually only required. For trips of 2-4 weeks in rural areas, many authorities still do not recommend JE vaccination, preferring to recommend it only for persons travelling in rural areas during the season (see health brief) for exposures in rural areas of 4 weeks or more. Expatriates staying in endemic areas with regular rural exposure are recommended to have the JE vaccination.

The previously available JE vaccine (JE-Vax) is no longer readily available. A new JE vaccine (JESPECT) will be available from the end of March 2009. The shortest immunisation protocol for JESPECT vaccine is 2 doses 28 days apart. It is preferred that the last dose be completed at least 7 days before departure in order to allow adequate immunity to JE to develop. For children, there is no data readily available for the new vaccine although this is expected to be available by 2010. Currently the lower age limit for the JESPECT vaccine is 18 years of age. For persons aged less than 18 years, vaccination is currently problematic and specialist advice is required.

#### Diarrhoea in Children

- Carry oral rehydration solution (Pedialyte or similar) in case of gastroenteritis
- The oral cholera vaccine (Dukoral) can be used for protection of children aged 2 years or more against Cholera and Travellers' Diarrhoea due to certain bacteria (Enterotoxigenic E.coli or ETEC). See section on Travellers' Diarrhoea for more information.

#### Accelerated & "Catch-Up" Vaccination Schedules

- **MMR** – If given between ages of 9 & 12 months, a further dose will be needed at 12 months or 4 weeks after the first dose whichever comes later. The usual dose at 4 years should also be given. Unfortunately, the first dose before 12 months of age may provide protection but does not count for approved measles immune status
- **Hib** – Schedule depends on previous vaccine type and number of doses. For age over 15 months, 1 dose of any

Hib vaccine suffices. For ages 7-11 months, if PRP-OMP (eg Pedvax-HIB, Comvax) has been given, a total of 3 doses is the full course, with the last (3rd) dose given between 12 & 15 months, but at least 2 months after the second dose. For other Hib vaccines (or if vaccine type unknown), a 3rd dose is given 1 or more months after the 2nd dose, and a 4th dose is required at 18 months

- Conjugate Meningococcal –age 12 months or more, 1 dose only is required; for age 4-11 months only 2 doses are required (minimum separation of doses is 4 weeks)
- Conjugate Pneumococcal - age 12 months or more, 1 dose only is required; for age 7-11 months only 2 doses are required usually with the second dose at 12 months of age but at least 2 months after the second dose

#### **For Children Aged 6 months or less**

Such children are below the lower age limit for all except the childhood vaccines and rabies vaccine. Care to avoid rabies exposures is very important as well as knowing to seek post-exposure prophylaxis for suspected or potential rabies exposures. If rabies risk is likely to be significant, pre-exposure prophylaxis (3 doses) should be given as this simplifies post-exposure prophylaxis should it be necessary.

In general, we advise against travel with such young children to developing countries unless absolutely necessary.

#### **MALARIA**

For malaria protection, if antimalarials are required (see health brief for geographic details), Chloroquine + Paludrine are the have the longest history of safe use. However, if areas will be visited where chloroquine and antifolate resistance are present, the preferred antimalarial for children who weigh over 11kg is Malarone. A paediatric preparation of Malarone is now available. If the child weighs less than 11kg, options are limited for the trip stated. Our advice for such children (weight less than 11kg) is to avoid all malaria areas. If travel with young children is unavoidable, then permethrin impregnated outer clothing, shawls and nets for bassinets offer extra protection. See also the section on prevention of mosquito bites

## Appendix 6.6: Pre-travel referral letter pro forma



**Amcal Robert Poole's Pharmacy**  
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Idalia  
Queensland 4811  
Ph: (07) 4778 2095  
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Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

Dear Dr \_\_\_\_\_

### Re: Pre-Travel Referral

**Traveller's Name:** \_\_\_\_\_ **Traveller's D.O.B:** \_\_\_\_/\_\_\_\_/\_\_\_\_

**Traveller's Home Address:** \_\_\_\_\_  
\_\_\_\_\_

The above named client presented at this pharmacy seeking travel health advice for a journey to (insert name of destination/s) \_\_\_\_\_ which he/she will be taking in (insert month & year of journey) \_\_\_\_\_

The client has been given the following travel-related health advice:

- A MASTA health brief for the planned journey, which gives information on the recommended immunisations required for the journey, whether antimalarials are required and the disease and other risks associated with the destinations
- An APharmTHAS booklet giving general travel health tips and advice about the management and prevention of some common travel-related health issues
- Counselling from a pharmacist to reinforce some of the above information

The travel health advisory service at this pharmacy is designed to provide standard pre-travel advice to travellers to low-risk destinations or to travellers who would not normally visit their medical practitioner before travelling. The main aims of the service are to provide low-risk travellers with travel-related health advice, and to identify high-risk travellers requiring more specialised advice and/or prescription medications, who are then referred to their medical practitioner.

Therefore, I feel that this client would benefit from your review for the following reason(s) (Tick appropriate items requiring review):

☐ Immunisations

The following immunisations are recommended for the client's destination. Please review with the client whether these immunisations are actually required for their particular journey:

Immunisation Recommended	Authority recommending immunisation (e.g. MASTA, CDC etc)

☐ Malarial Chemoprophylaxis

Part of the client's journey is through a known malarial area, and the client has been advised about standard methods to prevent insect bites. However, it is also recommended that they take an appropriate antimalarial agent. Please review with the client whether an antimalarial agent is actually required for their particular journey. Recommended agents for this destination are:

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☐ More specialised advice

The traveller needs more specialised advice regarding (Tick appropriate items requiring review):

- ☐ Travelling whilst pregnant
- ☐ Travelling with young children or infants to exotic locations
- ☐ Severe chronic ailments requiring review before travel (Give details below)
- ☐ Immunocompromised
- ☐ Expedition or adventure travelling, including:
  - ☐ Mountaineering or visiting high altitudes
  - ☐ Specialised diving or marine advice
  - ☐ Exposure to extreme environmental conditions

☐ Other

Please review the following issues with the client: (State issues for medical practitioner to consider)

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On behalf of our client and myself, thank you for reviewing these issues with our client.

Yours sincerely

\_\_\_\_\_  
(Pharmacist signature)

\_\_\_\_\_  
(Pharmacist name – print)

## Appendix 6.7 Post-travel interview schedule





Traveller Study Number (To be assigned by JCU)

D



## Post-travel Interview Schedule (CONFIDENTIAL – Keep in Pharmacy after Interview)

To be completed by the pharmacist during a post-travel interview and consultation.

*Most post-travel consultations with pharmacists involve an initial symptom-based request and it then becomes evident that the patient has recently been overseas during the consultation. It is intended that this interview schedule will allow the pharmacist to deal with the initial symptom-based request and to collect some basic information that will help the pharmacist to decide whether to refer the patient, and then to complete a standard referral letter. The interview schedule lists some situations where the patient should be referred, but it cannot list every situation where referral is required. Therefore, if the pharmacist is unsure, concerned or is suspicious about any of the presenting symptoms, the pharmacist should be cautious and refer the patient to their medical practitioner.*

### Section A: History of the Travel-related Health Problem

Who is the person affected? \_\_\_\_\_

What are their current symptoms?

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How long have they had the problem? What is the relationship of their problem to their travel?  
(i.e. when did their symptoms start in relation to the time of travel or return to Australia?)

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Have they taken any action so far?

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Are they taking any medicines? (Or have they taken any medicines in the last 3-4 weeks)

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Is there any relationship between the symptoms described by the patient and exposure to risk factors for travel-related health issues (e.g. insect bites, swimming in fresh water (in schistosomiasis-endemic areas), sexual contacts, tattoos or injections, eating raw food, unpasteurised milk or raw meat and seafood)

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Situations in which referral would be recommended after travel:

- ☐ Fever in a traveller returning from a malarial area
- ☐ Unexplained fever
- ☐ Fever with associated skin rashes, skin lesions or skin colouring
- ☐ Fever with associated shortness of breath or coughing
- ☐ Fever with unusual bleeding or bruising
- ☐ Persistent gastrointestinal upsets or diarrhoea with the presence of blood or mucus in the stools
- ☐ Persistent vomiting
- ☐ Development of jaundice or yellowing of the skin
- ☐ Any other suspicious signs or symptoms

### Section B: Background information from the Patient

What is your name? \_\_\_\_\_

What is your date of birth? \_\_\_\_/\_\_\_\_/19\_\_ and age? \_\_\_\_\_ years

What are your contact details?

Current Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone Number \_\_\_\_\_

What is your current occupation? \_\_\_\_\_

### Section C: Destination-related information

What country(ies) did you visit? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

What was the reason for your journey?

- ☐ Holiday or Leisure
- ☐ Business or work (If so, what is their occupation? \_\_\_\_\_)
- ☐ Visiting relatives and friends
- ☐ Education
- ☐ Religious reasons
- ☐ Other – please state reason \_\_\_\_\_

Did you stop anywhere on the way to these countries? (If Yes, where did you stop and for how long?) \_\_\_\_\_

Where exactly in these country(ies) did you be visit? (For example names of places, regions or towns)  
(Tick all that apply)

(Names of places)

- ☐ Major towns or cities
- ☐ Tourist resort
- ☐ Rural or remote areas
- ☐ Living in close proximity to local population or staying with friends or relatives

What was your accommodation like? (Tick all that apply)

- ☐ Medium to high standard tourist resorts or hotels
- ☐ Lower standard tourist resorts or hotels
- ☐ Backpacker hostels or similar accommodation
- ☐ Staying with relatives or friends
- ☐ Camping

When did you go? (departure date)

How long were you away? (weeks/months)

What activities did you do whilst you were away? (Ask about standard tourist activities as well as higher risk activities such as extreme sports and sky diving, diving, trekking, mountaineering etc)

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*In the assessment of the traveller, consider the possible risks associated with each destination and whether there are destination-related factors (such as type or location of accommodation) or traveller-related factors (such as pre-existing disease states) which may increase the overall risk*

## Section D: Medical History of the Traveller

### Medical History

Did you have any long-term health problems before you went on your journey?

Examples would include:  
Cardiovascular (heart) diseases  
Respiratory diseases  
Diabetes or other endocrine disorders  
Gastrointestinal problems  
Psychiatric or neurological disorders  
Liver or kidney diseases  
Chronic or frequent infections  
History of allergies

- ☐ Yes
- ☐ No

(Summarise answers in Table 1: Medical and Medication History)

**Vaccination History**

Did you receive any vaccinations before your last journey?

- ☐ Yes    If Yes, details \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
☐ No

**Medication History**

What medicines are you currently taking or have used in the last 3 months?  
(Summarise answers in Table 1: Medical and Medication History)

Traveller / Study Number (To be assigned by JCU) <b>A</b>	Name		Contact Details:		Allergies:
	DOB/Age _____ / _____ / 19____ years		Phone:		

Destinations (Country)	Regions/Towns	Accommodation standard	Time at destination	High risk activities? Yes / No	Modes of transport	Overall Risk of Destination
	Metro / Rural	Low / Medium / High			Air / Sea / Road	Low / Medium / High

[illegible]

## Section E: Service Outcome Record

To be used for service evaluation – complete the following questions or tick appropriate boxes.

### 1. Outcome

#### a. Non-Referrals

What was your recommendation for the traveller? (Briefly summarise outcome and reasoning for decision if appropriate)

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#### b. Referrals

After counselling was the traveller referred to another health professional?

☐ No

☐ Yes If Yes, who was the traveller referred to?

☐ GP

☐ Travel Clinic

☐ Other (state) \_\_\_\_\_

Why was the traveller referred? (Detail)

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### 2. Time taken

Approximate time to interview and assess the traveller

\_\_\_\_\_ mins

Approximate time to collect information and resources

\_\_\_\_\_ mins

Approximate time to counsel traveller

\_\_\_\_\_ mins

**Total time**

\_\_\_\_\_ mins

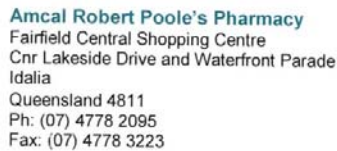
### 3. Purchases

After counselling, did the traveller purchase any items? If so list items and cost:

Description	Quantity	Cost (\$)	Description	Quantity	Cost (\$)
1.			5.		
2.			6.		
3.			7.		
4.			8.		

## Appendix 6.8: Post-travel referral letter pro forma





**Traveller's Home Address:** \_\_\_\_\_

(summarise the symptoms reported by the returning traveller),

This image shows a single sheet of white paper with horizontal blue or grey ruling lines, typical of notebook paper. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.



## Appendix 6.9: APharmTHAS™ Travel Tips Brochure

## APharmTHAS Travel Tips

Tips to reduce health problems or medicine-related problems  
whilst on your journey



## Introduction

Approximately 3 million Australians travel overseas every year and the number of Australians travelling overseas is increasing. No matter where they are travelling, all travellers are exposed to risks from one source or another.

For example, a traveller to a remote area of Central Africa could be at risk of some very severe infections or perhaps security issues such as robbery or violence. However, a traveller to a European country could also catch an infection such as the 'flu or diarrhoea. They could also be at risk of a motor vehicle accident because they do not know the road rules, or be mugged if they strayed into the wrong part of a city. The main difference between these two travellers would be that the traveller to Central Africa may be expecting problems, and so may spend a lot of time preparing for their journey. They may visit their doctor to check if they need any vaccinations before they travel. They may also be more careful about their own personal security when they are at their destination. Whereas a traveller to a European country may just assume they are going to a relatively safe country, just get on the plane and take no precautions for their journey. However, we must remember that visiting any country carries some level of risk and we must always take appropriate precautions, as even relatively mild health problems could still spoil your journey.

Take this booklet with you on your journey it contains some simple precautions that can help you stay healthy while on your journey. It also contains some tips on how to manage some common travel-related health problems if they occur while you are away.

## Contents

1. Traveller's Diarrhoea
2. Avoiding insect bites
3. Malaria
4. Motion sickness
5. Venous Thromboembolism
6. Travelling with medicines and buying medicines overseas
7. First Aid Kits for Travellers

# 1. Traveller's Diarrhoea



## APharmTHAS Travel Tips

### Amcal Robert Poole's Pharmacy

Fairfield Central Shopping Centre  
Cnr Lakeside Drive and Waterfront Parade  
Idalia  
Queensland 4811

Ph: (07) 4778 2095  
Fax: (07) 4778 3223

## What is in this Leaflet

This leaflet answers some common questions about Traveller's Diarrhoea. It does not contain all of the available information.

It does not take the place of talking to your doctor or pharmacist.

**Take this information with you on your journey.**

You may want to read it again later.

## Traveller's Diarrhoea

Traveller's diarrhoea has many different names including "Bali Belly", "Montezuma's Revenge" and the "Turkey Trots". It is the most common health problem reported by Australians travelling overseas. In many cases, it is mild, does not last long and is not very serious. However, in some people it can be very severe and even life threatening, especially if they are very young or very old. This is because people with severe diarrhoea can very quickly become dehydrated. However, even mild cases of diarrhoea can cause major disruption to your journey.

The risk of diarrhoea can vary depending on your destination, where you are staying and even the time of year in some countries. Some medicines can also increase your risk of diarrhoea. Countries with a low risk of diarrhoea include

the USA, Canada, New Zealand, Japan and Northern and Western Europe. High-risk countries include many countries in Asia, the Middle East, Africa and Central and South America. The risk is often higher if you are visiting a country with poor levels of hygiene and sanitation, or if the drinking water is contaminated. The risk of diarrhoea is also high if the standards of food preparation, handling and storage are poor. However, travellers must not assume that they can only get diarrhoea in developing countries. You can get diarrhoea just as easily in some developed countries.

## Causes of Traveller's Diarrhoea

There are many different causes of diarrhoea. The most common cause of diarrhoea for travellers is an infection with unfamiliar bacteria in your bowel. Common bacteria causing bowel infections include *E.coli*, *Campylobacter*, *Shigella* and *Salmonella*. Viruses and parasites such as *Giardia* are also involved in some cases. Eating spicy food, stress, jet lag, malaria and typhoid can also cause diarrhoea, but these causes are not as common in travellers.

## Symptoms of Traveller's Diarrhoea

Travellers often get loose stools or bowel motions, especially if they are visiting developing countries. If you have loose bowel motions, but do not go to the toilet more frequently than usual and otherwise also feel well, then you do not have traveller's diarrhoea. In this situation, you do not usually need treatment.

If you have traveller's diarrhoea, you usually pass loose or watery stools more frequently than normal, usually at least three times a day. In severe cases, you can pass loose or watery stools up to six or more times a day. You will also feel unwell and often have other symptoms such as nausea (feeling sick), vomiting or stomach pains and cramps. You may also have a fever, and often feel the need to rush suddenly to the toilet because you are unable to hold on. In some situations, you may see blood in your stools. Symptoms often start about 1-2 weeks after arriving at your destination, but sometimes they take longer to develop. The symptoms usually last for 3-5 days and will often go away without any treatment. However, in a small number of cases the symptoms can continue for over a month, and may need treatment with antibiotics to stop them totally.

## Traveller's Diarrhoea

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## Prevention of Traveller's Diarrhoea

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One of the great pleasures of travelling is trying the local food and drink. However, eating or drinking contaminated food and water is a major cause of diarrhoea. Therefore, you need to be careful when choosing what to eat and drink. Following some simple steps can reduce the risk of diarrhoea, especially when visiting high-risk countries. These are:

### General Water Precautions

**Avoid tap water if you think it may be contaminated.**

**Avoid ice cubes, ice blocks and milk products.**

They may contain contaminated water or have bacteria growing in them.

**Do not drink water from swimming pools.**

Although it contains chlorine, it is not sterile.

**Bottled water is usually safe, but only drink from bottles with an intact seal.**

Street vendors may refill bottles.

**Use bottled water to clean your teeth.**

**Hot drinks are usually safe.**

**Usually, soft drinks, carbonated water, wine and bottled beers are safe.**

Have the bottle or can opened at your table.

**Be careful with fruit juice or diluted cordial.**

Check that they do not contain contaminated water.

### Water Treatment

**You can boil water for 3 to 5 minutes to destroy many of the bacteria that can cause diarrhoea.**

**You can treat water with water purifying tablets containing**

**chlorine or iodine to destroy the bacteria in the water.**

These may be bought at Pharmacies and camping stores. Ask your Pharmacist for advice on which preparations are available and how to use them.

### General Food Precautions

**Maintain good personal hygiene.**

Regularly wash your hands, especially after going to the toilet and before eating. Use an alcohol hand rub if adequate soap and water is not available.

**Choose food that is well cooked, freshly prepared and served hot.**

**Avoid raw foods or reheated food.**

Eating raw meat and raw seafood is extremely risky

**Dry foods are generally safer than moist foods.**

Bacteria rapidly multiply on moist foods, such as salads, left exposed in a warm environment.

**Thoroughly wash and soak raw fruit and vegetables.**

**Avoid fruit and vegetables with thin skins that you cannot peel.**

### Vaccinations

Dukoral®, a cholera vaccine gives some protection against traveller's diarrhoea. However, it does not protect against all of the bacteria that can cause diarrhoea, and the protection is short-lived.

### Prevention with Antibiotics

Generally, healthy travellers do not get antibiotics to take throughout their journey to prevent diarrhoea. This is because of side effects that can occur with the long-term use of antibiotics. Your doctor may consider giving you preventative antibiotics if you have a serious medical condition that increases the risk or the effect of diarrhoea.

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## Self-treatment of Mild Traveller's Diarrhoea

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This leaflet advises you on the self-treatment of mild traveller's diarrhoea using remedies that are readily available from Pharmacies. It does not cover the treatment of severe diarrhoea or types of diarrhoea that will need antibiotic therapy. In severe cases, you should see a doctor as soon as possible. This leaflet does list some symptoms and warning signs of more severe types of diarrhoea and if they occur, you should see a doctor as soon as possible. It is important that if you have any concerns that you obtain appropriate advice as soon as possible, as this leaflet cannot contain everything about diarrhoea or totally replace the advice of a doctor or pharmacist.

Diarrhoea is usually classed as "mild" if it is the first day of illness, you have had less than 4 loose or watery bowel motions, and you do NOT have a fever.

**There are five considerations when self-treating your diarrhoea:**

1. Drink plenty of fluid and avoid dehydration.
2. Decide whether to take something to "stop" the diarrhoea.
3. Treat your other symptoms.
4. Monitor your symptoms, and seek the advice of a doctor if needed.
5. Decide whether you can continue eating while you have diarrhoea.

### Keeping Hydrated and Avoiding Dehydration

When you have diarrhoea, you can lose fluid very quickly and can rapidly become dehydrated. You must make sure that you replace the fluid



being lost. This is very important if an infant, young child or elderly person has diarrhoea, as severe dehydration can be very serious in these patients. Healthy young adults can replace the fluid with water. With infants, young children or the elderly, it is better to use an **oral rehydration solution**. These come in the form of fizzy tablets or sachets, which dissolve in water to make a drink. Examples include Gastrolyte®, Gastrolyte-R® or Repalyte®. They do not reduce the symptoms of diarrhoea, but replace the fluid that is being lost. It is useful to carry some sachets in your travel first aid kit, but if you do not have any in your travel first aid kit you make a similar solution by mixing 8 teaspoonfuls of sugar and 1 teaspoonful of salt into 1 litre of water.

#### **Important points about the use of Oral Rehydration Solutions are:**

##### **Make sure you follow the instructions on the container of the sachets or tablets when you prepare the solution**

The concentration of the salts in the solution is important. The solution should be prepared with freshly boiled and cooled water.

##### **Follow the manufacturer's dosage instructions.**

Drink small amounts of the solution at regular intervals. Adults need to drink between 200mls and 400mls for each loose bowel motion.

#### **Trying to stop the diarrhoea**

Some doctors do not recommend trying to stop the diarrhoea. This is because diarrhoea is a form of defence mechanism and sometimes it is best to let it run its natural course. However, sometimes diarrhoea can be a problem if you

are travelling, especially when on a plane or bus, or if you are on a business trip. **Loperamide (Gastrostop® or Imodium®)** will stop diarrhoea. It is available from Pharmacies in most countries, but it may be useful to carry it in your travel first aid kit. However, Loperamide does not cure the problem it just slows down the rate of the diarrhoea. In some cases, it can actually prolong the diarrhoea so follow the important points below:

#### **Important points about trying to stop the diarrhoea with Loperamide are:**

##### **If using Loperamide to control your diarrhoea follow the dosage instructions of the manufacturer.**

If you get diarrhoea, take two capsules or tablets straight away and then take one capsule or tablet every time you have a loose bowel motion after that. Do not take more than 8 capsules or tablets in 24 hours.

##### **Loperamide should not be used in children under 12 years of age.**

Only use oral rehydration solution or fluid replacement in children.

##### **Loperamide should not be used if there is blood or mucus in your bowel motions.**

Blood or mucus in the bowel motions suggests a severe infection that may require antibiotic therapy. Therefore, if blood or mucous is present you should see a doctor as soon as possible.

#### **Treatment with Antibiotics**

##### **If you have been given a course of antibiotics to take if you get diarrhoea - Follow the instructions given to you by your doctor**

Most travellers leaving Australia do not take antibiotics with them. However, some doctors will prescribe you a course of antibiotics

to take with you to treat diarrhoea if it occurs. They sometimes do this if you are travelling to a remote area where the risk of diarrhoea is very high, or if you are visiting a place, where it may be difficult to get to a doctor. Only use these antibiotics to treat diarrhoea if it occurs. Do not use them to prevent diarrhoea from occurring, unless your doctor has told you to do this.

#### **Treating other symptoms**

**Hyoscine (Buscopan®)** can be used to treat cramps or abdominal pains in diarrhoea. It is available from Pharmacies in many countries but it may be better to carry some in your travel first aid kit.

**Paracetamol** can be used to help reduce any fever, but if fever is present you should see a doctor as soon as possible.

#### **Monitor your symptoms and seek the advice of a doctor if needed**

It is important that you monitor your symptoms and seek the advice of a doctor if your symptoms worsen. This is especially important if the person suffering from diarrhoea is an infant, a child or is elderly

#### **You should seek the advice of a doctor as soon as possible in the following situations:**

- if the person with diarrhoea is an infant under 12 months of age, and has had the diarrhoea for more than 24 hours
- if the person with diarrhoea is an infant under 12 months of age, and has signs of moderate to severe dehydration, such as being limp, not alert, with sunken eyes, loss of skin elasticity and a dry mouth

- if the person with diarrhoea is child under 3 years of age, or is a frail elderly person, and has had the diarrhoea for more than 2 days
- if the person with diarrhoea is a child over three years of age, or is normally a healthy adult, and has had the diarrhoea for more than 3 days
- if there is blood or mucus in the bowel motions
- if the person with diarrhoea also has severe vomiting and/or a fever.

#### ***Eating and Drinking when you have Diarrhoea***

##### **Do not starve yourself.**

You should try to eat when you have diarrhoea. There is no need to fast unless you also have nausea and vomiting.

**Avoid heavy, fatty or spiced foods.**

**Eat small light meals.**

**Eat starchy foods such as cooked rice, rice cereal, toast, mashed potato.**

**Continue to feed breast and bottle fed babies as normal during the diarrhoea. Do not dilute the formula feed.**

**Drink plenty of fluids but avoid drinks containing caffeine.**

Caffeine is a diuretic which aids the loss of water from the body and so is best avoided

**Avoid milk and dairy products until your bowel motions return to normal.**

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#### **Diarrhoea when you return from overseas**

**Tell your doctor if you develop diarrhoea when you return from overseas, especially if you also have a fever and/or if blood appears in your stools**

**There are many reasons why you can develop diarrhoea when you return home, including some quite unusual infections. Therefore you should have it checked by your doctor.**

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#### **Questions**

**After reading this leaflet, ask your pharmacist or doctor to answer any questions that you may still have about your journey.**

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#### **Disclaimer**

This information has been produced by the APharmTHAS project at James Cook University. It is designed to be a general guide giving general travel health advice and, (unless specified) all information presented is for an adult traveller. It is designed to be used in conjunction with the advice of your doctor or pharmacist, and is not designed to fully replace the advice of your doctor or pharmacist. Whereas every effort has been made to ensure the accuracy of the information supplied, APharmTHAS makes no warranty, express or implied, as to the accuracy, completeness or usefulness of the information and all liability is excluded save in respect of personal injury or death caused by the negligence of APharmTHAS.

## 2. Avoiding Insect Bites



### APharmTHAS Travel Tips

**Amcal Robert Poole's Pharmacy**  
Fairfield Central Shopping Centre  
Cnr Lakeside Drive and Waterfront Parade  
Idalia  
Queensland 4811

Ph: (07) 4778 2095

Fax: (07) 4778 3223

### What is in this Leaflet

This leaflet answers some common questions about avoiding insect bites. It does not contain all of the available information.

It does not take the place of talking to your doctor or pharmacist.

**Take this information with you on your journey.**

You may want to read it again later.

- avoiding actions that may attract biting insects or avoiding places where there could be large numbers of biting insects
- applying insect repellent to your skin and clothing
- impregnating clothing, mosquito nets and tents with insecticides
- using insecticides to remove any biting insects from rooms in which you will be staying or sleeping.

precautions throughout the day but especially from late afternoon until dawn.

**Keep your arms and legs covered.**

Wear long sleeved shirts and long pants, especially after dusk.

**Wear loose fitting clothing.**

Mosquitoes find it easier to bite through tight clothing.

**Wear light coloured clothing.**

Dark clothing attracts mosquitoes.

**Avoid strong smelling perfumes and aftershaves.**

Some strong smelling substances attract mosquitoes.

**Ideally, sleep in a room that is air-conditioned and that has good insect screens.**

Cool temperatures and air turbulence caused by air conditioning and fans makes mosquitoes less active.

**Sleep under an insecticide-impregnated mosquito net if your accommodation is not air conditioned and screened.**

**Use a knock down insecticide spray to clear rooms of mosquitoes before sleeping.**

### The Importance of Avoiding Insect Bites

Bites from insects such as mosquitoes, sandflies and ticks are not just annoying. They are a way of catching some very serious diseases such as malaria, yellow fever, dengue fever and many others. You should always try to avoid insect bites, especially if you are travelling in tropical areas or in areas where these diseases are common.

### Actions that Reduce the Risk of Insect Bites

Different biting insects are attracted to humans in different ways. You can reduce the risk of insect bites by taking actions that will make you less attractive to the insects. These are slightly different for different insects:

#### Mosquitoes

**Take precautions to prevent mosquito bites at all times.**

Mosquitoes can bite at any time but their activity peaks at certain times of the day. Ideally, try to avoid exposure to mosquitoes when they are most active. Malaria-carrying mosquitoes often bite at night and are most active in the evening or close to dawn. Dengue fever-carrying mosquitoes often bite in the daytime and are most active in the afternoon. Therefore, take

### Ways of Avoiding Insect Bites

There are four main ways of avoiding insect bites. It is best not to rely just on one method, but to use a combination of methods. The main methods are:

#### Sandflies

**If sleeping in the open, try to sleep above ground level.**

Sandflies are poor fliers.

Avoiding Insect Bites

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### **Sleep under an insecticide-impregnated mosquito net.**

Sandflies are very small and the insecticide stops them passing through the holes in the net.

### **Ticks**

Ticks live in both cool and tropical regions. You may pick up ticks when walking through long grass and undergrowth when out in the bush. Therefore when walking in an area where ticks may be present follow these precautions:

**Treat socks with insect repellent or insecticide.**

**Tuck your trousers into your socks.**

**Check for the presence of ticks on your body at the end of the day and remove them.**

### **Tsetse Fly**

Tsetse fly is an African fly that has a very painful bite and carries African "sleeping sickness" (Trypanosomiasis). Follow these precautions if travelling in parts of Africa where tsetse flies may be present:

**Use insect repellent containing DEET.**

**Avoid the colour blue.**  
The colour blue attracts tsetse flies.

**Close the windows of vehicles**  
Movement attracts tsetse flies and they have a habit of flying into vehicles.

## **Using Insect Repellents**

Using insect repellent is an important way of preventing insect bites. There are many different brands and some commonly used insect repellents include Diethyltoluamide (DEET), which is

present in the common brands Bushmans®, Rid® and Aerogard®. Picaridin, which is present in Autan Repel®, and Citriodiol, which is a lemon eucalyptus extract and is present in Mosi-gard®. All insect repellents currently on the market are effective, but you may notice that some appear to work better in some locations than others. There are many reasons for this. One reason is that there are many different species of mosquitoes and other biting insects, and some species are less sensitive to certain insect repellents. In addition, repellents are removed from the skin by sweat, abrasion, washing or when swimming. This reduces the length of time the repellent is effective after application to the skin. Here are some tips on using insect repellents:

### **How to use insect repellents**

**Only apply insect repellents to exposed skin and/or clothing.**  
Never apply repellents under your clothing.

**Do not apply to broken or inflamed skin.**

**Apply the repellent as often as the manufacturer recommends, usually every 4 hours.**

You may have to apply the repellent more frequently if you are sweating heavily, or if you have been in the water.

**Apply just enough repellent to cover the exposed skin.**

If the biting insects do not respond to a thin film of repellent, then apply another thin film. It is not necessary to saturate the skin.

**Be careful to avoid your eyes or mouth.**

When applying repellent to your face, do not spray the repellent directly into your face. Apply the repellent to your hands first, and then apply it to your face with your hands.

**Wash your hands after applying the repellent.**

This will avoid you accidentally getting repellent into your eyes or mouth.

**Wash off the repellent when you return indoors and/or before going to bed.**

**Do not rely on insect repellents to give you protection overnight.**

The duration of action of most repellent will not protect you throughout the night. Sleep under a mosquito net unless sleeping in a screened and air-conditioned room.

**If you need to apply a sunscreen and an insect repellent together, apply the insect repellent after the sunscreen.**

If you apply the sunscreen after the insect repellent, the repellent may not be effective. Combination products containing a sunscreen and an insect repellent are available, but they may not be as effective.

**Use a high strength DEET-containing repellent if you are visiting a tropical area where there is a high risk of malaria.**

Ask your doctor or pharmacist if you have any questions about this.

### **Using insect repellents on children**

**Do not use repellents containing Citriodiol or lemon eucalyptus extract on children less than 3 years of age.**

**Most other repellents are safe to use on children over 2 months of age.**

**Place children aged less than 2 months of age in an infant carrier draped with mosquito netting to protect them from insect bites.**

**When applying repellents to children, adults should first apply the repellent to their hands and then use their hands to apply the repellent to the child.**

**Do not apply repellent to the child's hands.**

This will avoid the child accidentally getting repellent into their eyes or mouth.

Avoiding Insect Bites

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### Things to be careful of

**DEET-containing insect repellents can damage plastic objects such as watch faces and sunglasses.**

**If using a repellent for the first time, test the product on a small area of skin in case of allergy.**

### Side effects of insect repellents

All medicines may have some unwanted side effects. Sometimes they are serious, but most of the time they are not. Large numbers of travellers have used insect repellents for many years, and the risk of side effects is very low.

**Ask your doctor or pharmacist to answer any questions that you may have.**

**Tell your doctor as soon as possible if you notice any of the following and they worry you:**

- rashes
- other skin reactions

**Tell your doctor immediately if you notice any of the following:**

- headache and fever, progressing to confusion or even paralysis
- disturbances of behaviour or speech.

These are all extremely rare reactions, but if they do occur, seek urgent medical attention.

**Do not be alarmed by this list of possible side effects.**

You may not experience any of them.

### Using Insecticides

Insecticides are products that kill insects. Permethrin is the most commonly used insecticide in Australia. Always follow the manufacturer's instructions. However, some ways of using insecticides to prevent insect bites include:

- some insecticides can be used to treat mosquito nets. This will prevent biting insects getting through the net and also stop being bitten through the net if you lie against it
- insecticides can be used to treat socks and trousers which will protect you from ticks that you may pick up when walking through the undergrowth
- insecticide packs can be purchased to treat items of clothing
- insecticides can be sprayed into a room to clear it of biting insects before you go to bed.

**Ask your doctor or pharmacist to answer any questions that you may have about using insecticides.**

### Other Methods of Avoiding Insect Bites

Some people claim that Vitamin B<sub>1</sub> (Thiamine) and garlic offers some protection against mosquito bites. However, there is not much scientific evidence to back these claims. Likewise, there is very little or no evidence to recommend the use of electronic devices that emit ultrasonic noises to deter mosquitoes.

### Questions

**After reading this leaflet, ask your pharmacist or doctor to answer any questions that you may still have about your journey.**

### Disclaimer

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James Cook University. It is designed to be a general guide giving general travel health advice and, (unless specified) all information presented is for an adult traveller. It is designed to be used in conjunction with the advice of your doctor or pharmacist, and is not designed to fully replace the advice of your doctor or pharmacist. Whereas every effort has been made to ensure the accuracy of the information supplied, AParmTHAS makes no warranty, express or implied, as to the accuracy, completeness or usefulness of the information and all liability is excluded save in respect of personal injury or death caused by the negligence of AParmTHAS.

# 3. Malaria



## APharmTHAS Travel Tips

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## What is in this Leaflet

This leaflet answers some common questions about Malaria. It does not contain all of the available information. You should also read APharmTHAS™ leaflet 2: Avoiding Insect Bites.

It does not take the place of talking to your doctor or pharmacist.

**Take this information with you on your journey.**

You may want to read it again later.

- the measures you take to avoid mosquito bites
- whether you take anti-malaria medicines to prevent malaria.

This leaflet discusses some of the main issues about malaria.

**Ask your pharmacist or doctor if you have any further questions about malaria after reading this leaflet.**

malaria caused by the other three common types of the parasite is not usually fatal, although sometimes death can occur. They produce the same symptoms as *Plasmodium falciparum*, but do not cause cerebral malaria. There are other types of *Plasmodium* parasites but they do not commonly cause malaria in humans.

## Malaria

Malaria is a very serious problem throughout the world. Between 1 to 2 million people die every year from malaria. The number of people catching malaria is increasing. It is very common in tropical and subtropical countries particularly in Central and South America, Africa, parts of the Middle East, Asia and the Pacific region. The risk of malaria is not the same throughout a country and can vary from area to area. Factors that can alter your risk of malaria include:

- the area in which you are staying
- the number and type of mosquitoes in the area
- the season or time of year (mosquitoes are often more common in the wet season)
- whether your accommodation is screened for mosquitoes

## Causes of Malaria

The bite of an infected female *Anopheles* mosquito can transmit malaria to humans. These mosquitoes only bite between dusk and dawn. The female mosquito bites humans to obtain a meal of blood. While the mosquito feeds, *Plasmodium* parasites pass from the mosquito into the blood stream of their human victim. The parasites then infect the liver and blood cells of the human, where they grow and multiply. The four common types of *Plasmodium* parasite that cause malaria in humans are *Plasmodium falciparum*, *Plasmodium ovale*, *Plasmodium malariae* and *Plasmodium vivax*. Each type produces a slightly different form of the disease. However, one type of the parasite (*Plasmodium falciparum*) produces a very severe form of the disease called 'falciparum malaria'. Falciparum malaria causes 'cerebral malaria', which is quickly fatal. The

## Symptoms of Malaria

Some of the early symptoms of malaria are similar to influenza. You may have a fever, chills, headache, aches and pains in the muscles. You will have a general feeling of being unwell and some people suffer from severe diarrhoea. You sometimes suffer from cycles of fever, and as the fever drops, you may experience episodes of severe sweating. The sufferer may also develop anaemia and jaundice. The severe, falciparum malaria can cause seizures, confusion, coma and death.

The symptoms of malaria can start between 7 to 14 days after being in a malarial area, but commonly occur after 30 days. Falciparum malaria can take up to 12 months to develop.

**Tell your doctor immediately, or go to the nearest hospital if you have been to a malaria area any time in the last 12 months and develop a fever or any of the other signs and symptoms mentioned above.**

Malaria

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## Prevention of Malaria

If you are visiting a country where there is a risk of malaria, you can prevent catching malaria by:

- being aware of the risk of malaria in the country and if possible trying to avoid the areas where the risk is highest
- trying to avoid mosquito bites as much as possible
- taking medicines that will prevent malaria
- being aware of the symptoms of malaria and seeking urgent medical attention if you develop a fever or any of the other early symptoms of malaria after you have visited a malarial area.

None of the above measures are 100% effective in preventing malaria on their own. It is important therefore that you follow all of the above steps.

### **Awareness of the risk of malaria**

**Ask your pharmacist or doctor if you are unsure whether there is a risk of malaria at your destination.**

Malaria is present in many tropical and subtropical countries. It is therefore important that you check whether malaria is a problem at your destination. It is always best to get the most up to date information as the risk of malaria varies so much within each country. The recommendations for malarial prevention also changes frequently in each country.

**Give the pharmacist or doctor full details of your itinerary and the activities you will be doing on your journey.**

The risk of malaria varies from area to area and some activities may

increase your risk, for example if you will be camping or spending time in the bush.

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## Avoiding Mosquito Bites

There are four main methods of avoiding insect bites:

- avoiding actions that may attract biting insects or avoiding places where there could be large numbers of biting insects
- applying insect repellent to your skin and clothing
- impregnating clothing, mosquito nets and tents with insecticides
- using insecticides to remove any biting insects from rooms in which you will be staying or sleeping.

APharmTHAS™ leaflet 2: Avoiding Insect Bites gives more information about how to avoid mosquito bites. Ask your pharmacist for a copy if you have not already received one.

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## Prevention of Malaria with Medicines

Anti-malarial medicines are an important way of preventing malaria, but must be used in combination with the techniques to avoid mosquito bites mentioned in APharmTHAS™ leaflet 2: Avoiding Insect Bites.

**If your doctor has given you a prescription for an anti-malarial medicine to take for prevention of malaria it is important that you:**

- take the medicine as directed, if you forget doses it will affect the ability of the medicine to prevent malaria
- follow the instructions given with the medicine, it is important to take the medicine before travel, during travel and for a time after leaving the malarial area

- monitor for any side effects and if you have any concerns tell your doctor or pharmacist

**Keep your anti-malarial medicines in a safe place, away from children.** Anti-malaria tablets can be fatal in an accidental overdose.

Some commonly used medicines to prevent malaria include:

- Atovaquone/proguanil (Malarone®)
- Chloroquine
- Doxycycline
- Mefloquine

Your doctor will choose the best medicine for you based on where you are going, the resistance patterns in the area and factors such as whether you have any other illnesses. This leaflet lists some important points about each of the medicines below, but does not state all of the available information.

**Ask your pharmacist or doctor if you have any further questions about the anti-malarial medicines you are taking.**

### **Atovaquone/Proguanil (Malarone®)**

**Take your dose of Malarone® once each day at the same time of day.**

**Take your dose of Malarone® from 1 to 2 days before travel, each day while in the malaria area and daily for 7 days after leaving the area.**

**Tell your doctor if you notice any of the following and they worry you:**

- stomach pain
- nausea
- vomiting
- headache

### **Chloroquine**

**Only take chloroquine in areas where chloroquine-resistance is not present.**

Malaria

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Take your dose of chloroquine once each week, on the same day of the week.

Take your dose of chloroquine for 1 to 2 weeks before travelling to the malaria area. Continue taking the chloroquine, once a week while travelling in the malarial area and for 4 weeks after leaving the malarial area.

Tell your doctor if you notice any of the following and they worry you:

- stomach pain
- headache
- dizziness
- blurred vision
- itch.

### **Doxycycline**

Take your dose of doxycycline once each day at the same time of day.

Take your dose of doxycycline from 1 to 2 days before travel, each day while in the malarial area and daily for 4 weeks after leaving the malarial area.

Take extra precautions to protect your skin from the sun.

Doxycycline makes your skin more sensitive to the sun.

Take your dose of doxycycline with food and a full glass of water. Do not take your doxycycline at bedtime.

Doxycycline can irritate the oesophagus (food pipe) and cause nausea, taking it with food and water helps to prevent this.

Tell your doctor if you notice any of the following and they worry you:

- stomach pain
- nausea
- vomiting
- headache

### **Mefloquine**

Take your dose of mefloquine once each week, on the same day of the week.

Take your dose of mefloquine for 1 to 2 weeks before travelling to the malaria area. Continue taking the mefloquine, once a week while travelling in the malarial area and for 4 weeks after leaving the malarial area.

Tell your doctor if you notice any of the following and they worry you:

- stomach disturbances
- headache
- difficulty sleeping
- abnormal dreams
- disturbances of your sight.

Tell your doctor immediately if you notice any of the following:

- depression or mood changes
- anxiety
- agitation or restlessness
- tremors or 'pins and needles'
- hallucinations

### **Awareness of the Symptoms of Malaria**

As already mentioned, malaria is a serious disease and falciparum malaria is quickly fatal. Therefore, immediately report any suspicious symptoms to your doctor and get a proper assessment.

Tell your doctor immediately if you notice any of the following symptoms while in a malarial area or after returning to Australia:

- fever
- chills
- headache
- muscle aches and pains
- jaundice or yellowing of the skin.

### **Prevention of Malaria in Children**

Malaria is very serious in children and infants. Anti-malarial medicines should be prescribed for all children visiting malarial areas.

Ask your pharmacist or doctor if there are children in your traveling party and you have any questions about preventing malaria in children.

### **Prevention of Malaria in Pregnant Women**

Malaria infection is very serious in pregnant women and can lead to premature birth, spontaneous abortion and stillbirth. Therefore:

**Ideally, pregnant women should not travel to malarial areas.**

**Anti-malaria medicines to prevent malaria are essential if you are pregnant, and must travel to a malarial area.**

Ask your pharmacist or doctor if you have any questions about preventing malaria in women who are pregnant.

### **Treatment of Malaria**

There are very effective treatments for malaria. However, the consequences can be severe or even fatal if treatment is delayed.

**Tell your doctor immediately if you notice any of the symptoms of malaria.**

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## Questions

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**After reading this leaflet, ask your pharmacist or doctor to answer any questions that you may still have about your journey.**

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## Disclaimer

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## 4. Motion Sickness



### APharmTHAS Travel Tips

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### What is in this Leaflet

This leaflet answers some common questions about motion sickness. It does not contain all of the available information.

It does not take the place of talking to your doctor or pharmacist.

**Take this information with you on your journey.**

You may want to read it again later.

### Motion Sickness

Motion sickness is not a disease but is a normal response to certain types of motion. It is a general term for all forms of sickness caused by different types of transport including seasickness, carsickness and airsickness. It is very common, and most people will suffer from motion sickness if the stimulus is very severe. However, it is more common in children aged 2 to 12 years of age, and it becomes less common as you get older. Motion sickness is rare after 50 years of age.

### Causes of Motion Sickness

The main cause of motion sickness is an imbalance between the senses. When you are in a ship's cabin

without windows, or sitting in the back of a car, your inner ear transmits messages to the brain to say that it senses that the body is moving. However, because you cannot see the horizon, your eyes cannot sense that you are moving and sends messages to the brain at the same time, telling the brain that you are not moving. The body responds to these conflicting messages from your eyes and inner ears by making you feel nauseous and for you to develop motion sickness.

### Symptoms of Motion Sickness

When you are suffering from motion sickness and before you vomit, your skin may turn pale and start to feel clammy. You may feel light-headed, start sweating or feeling restless, and some people complain of a headache. You may start to feel nauseous and your mouth may start producing more saliva. You may then vomit.

### Prevention of Motion Sickness

You can use a variety of strategies to help prevent motion sickness, and there is a range of medicines available from pharmacies. A combination of non-medicine strategies and a suitable preventative

medicine often produces the best results in travellers who often suffer from motion sickness.

**Ask your pharmacist or doctor if you have any questions about the measures described below or which would be the most appropriate preventative measure for you to take.**

### Non-medicine strategies to prevent motion sickness

The recommended strategies vary depending on whether you are travelling by sea, road or air. Here is a list of strategies that help prevent seasickness, airsickness or carsickness:

#### General strategies

**General strategies to prevent motion sickness for all types of transport include:**

- avoid alcohol
- avoid strong smells
- avoid spicy or greasy foods
- never watch someone else who is vomiting.

**If you develop motion sickness:**

- lie down and close your eyes if possible
- keep head and body movements to a minimum.

#### Seasickness

Motion Sickness

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**Ideally, stay on deck and fix your eyes on the horizon.**

This provides a fixed point of reference for the senses.

**If below deck, lie down with your eyes closed facing the centre of the ship.**

Lying down produces less nausea than standing up, and the centre of the ship usually moves less compared to the rest of the vessel.

### **Airsickness**

**If possible, obtain seating over the wings of the aircraft.**

Less turbulence is felt by passengers sitting in the wing area of the cabin.

### **Carsickness**

Fewer people experience motion sickness if they are sitting in the front of the car. However, this is a problem with children, who legally must be in the rear of the vehicle.

**Adult passengers will experience less motion sickness if seated in the front of the vehicle.**

**Avoid reading in the car.**

Reading seems to provoke motion sickness. It is better to look out of the windows.

**Children in the rear of the vehicle should be seated in an approved safety seat that allows the child to look out of the car windows.**

**The driver should take bends slowly and avoiding abrupt acceleration and braking.**

## **Preventative Medicines for Motion Sickness**

Three groups of medicines are available from Australian pharmacies to help prevent motion sickness. These are:

- hyoscine
- antihistamines
- natural products, such as ginger.

This leaflet discusses some of the main issues with these medicines.

**Take preventative medicines before you travel.**

All of the medicines mentioned in this leaflet are more effective if taken before you travel.

**Ask your pharmacist or doctor if you have any questions about the medicines described below or which would be the most appropriate medicine for you to take.**

### **Hyoscine**

There are several different brands of Hyoscine Hydrobromide available including Kwells® and Travacalm®. Hyoscine is an effective medicine, but it can cause side effects such as dry mouth and dry eyes.

**Take the hyoscine tablets 30 minutes before travel and repeat the dose every 4 to 6 hours if necessary.**

**If using hyoscine to prevent motion sickness, follow the manufacturer's dosage instructions.**

**Avoid giving hyoscine to children less than 2 years of age, unless approved by the manufacturer of the product.**

### **Antihistamines**

Two common antihistamines are used to prevent motion sickness; Promethazine (Phenergan®) and Dimenhydrinate (Dramamine®). Antihistamines can cause drowsiness.

**Antihistamines may cause drowsiness and may increase the effects of alcohol. If affected do not drive or operate machinery.**

**Do not use these antihistamines in children less than 2 years of age.**

**If using an antihistamine to prevent motion sickness, follow the manufacturer's dosage instructions.**

**Take Promethazine-containing products (e.g. Phenergan®) the night before the journey or 2 hours before the journey.**

Taking promethazine 2 hours before your journey can make you feel very drowsy. If promethazine is taken the night before your journey, the drowsiness is much less in the next morning, but it is still effective at preventing motion sickness.

**Take Dimenhydrinate-containing products (e.g. Dramamine®) 30 minutes before travelling.**

## **Other Methods of Preventing Motion Sickness**

### **Ginger**

Ginger tablets or powder is effective at preventing motion sickness for some people. As it is a 'natural' product, many people think that it is safe to use in all people, but it can interact with some prescription medicines and is not suitable for all travellers.

**Ask your pharmacist or doctor if you have any questions about the use of ginger to prevent motion sickness.**

### **Wristbands**

You can buy wristbands that apply pressure to acupuncture pressure points. However, there is not much evidence to suggest that they will prevent motion sickness.



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## Treatment of Motion Sickness

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**Seek medical advice if the symptoms of motion sickness are severe or prolonged.**

Motion sickness is usually mild but if it is severe or prolonged you may rapidly become dehydrated.

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## Questions

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**After reading this leaflet, ask your pharmacist or doctor to answer any questions that you may still have about your journey.**

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## Disclaimer

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# 5. Venous Thromboembolism



## APharmTHAS Travel Tips

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## What is in this Leaflet

This leaflet answers some common questions about venous thromboembolism. It does not contain all of the available information.

It does not take the place of talking to your doctor or pharmacist.

**Take this information with you on your journey.**

You may want to read it again later.

## Venous Thromboembolism (VTE)

Venous thromboembolism (VTE) is the development of clots in your veins. The two commonest types of VTE are Deep Vein Thrombosis (DVT) and Pulmonary Embolism (PE), although there are other less common types. DVT is often called 'Economy Class Syndrome' in the newspapers, as it is sometimes reported in air travellers after long flights in cramped conditions. However, first class travellers are just as likely to develop VTE if they have the appropriate risk factors. DVT is the formation of a clot which blocks one of your veins. The clot stops the blood flowing through

the vein, which causes the symptoms of the DVT to develop. Once the clot has formed, part of it may break off to form an embolus. The narrow blood vessels of your lungs may then trap the embolus and a pulmonary embolism forms, which is potentially fatal.

## Causes of VTE

There are many causes and risk factors for VTE. Long-distance air travel increases the risk of you developing VTE, but so does long distance travel by car, train or bus. The increased risk of VTE due to travelling is because you cannot easily move around the aircraft, bus or car.

### Other recognised risk factors for VTE include:

- some types of blood clotting problems
- recent major surgery
- previous spinal cord injuries
- some types of cancer
- some types of heart or lung diseases
- hormone replacement therapy or oral contraceptives
- previous VTE
- pregnancy
- if you are over 40 years of age
- obesity.

## Symptoms of VTE

Deep vein thrombosis (DVT) often occurs in your calf, but it can occur in other veins. You may notice swelling, redness, pain or tenderness in the region of the clot. You may notice that the area over the clot feels warm. Sometimes the DVT initially feels like a muscle strain or injury or appears like a skin infection.

The symptoms of a pulmonary embolism (PE) range from very mild to severe. In its most severe form, it resembles a heart attack or stroke. Common symptoms are chest pain and shortness of breath. Other symptoms of PE include dizziness, fainting, anxiety

## Prevention of VTE

You can help reduce the risk of VTE when flying long distance by taking the following precautions:

### Measures to be taken by all air travellers

**Drink plenty of fluid but avoid drinking large quantities of alcohol or caffeine-containing drinks.**

Venous Thromboembolism

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Alcohol and caffeine can dehydrate you and increase the risk of clot formation.

**Move around as much as possible during the flight and exercise your calf muscles every half hour by flexing and rotating your ankles.**

**Ask your pharmacist or doctor if you have any questions about the measures described above.**

#### ***Extra precautions for travellers at minor risk of VTE***

**Travellers who would be at minor risk of VTE may include:**

- people who are 40 years of age or older
- people who are very tall or short
- people who have experienced leg swelling previously when flying
- people who have had recent minor surgery or a minor leg injury
- people with a lot of varicose veins.

**Again, drink plenty of fluids but avoid drinking large quantities of alcohol or caffeine-containing drinks.**

**Take only short naps unless you can get into a normal sleeping position.**

**Avoid crossing your legs during your flight.**

**Consider wearing support stockings.**

**Ask your pharmacist or doctor if you have any questions about the measures described above.**

#### ***Extra precautions for travellers at moderate risk of VTE***

**Travellers who would be at moderate risk of VTE may include:**

- people with recent heart disease

- women who are pregnant or taking hormonal medication
- people who have had recent surgery or a major leg injury
- people who have a strong family history of DVT.

**Follow the advice above for travellers at minor risk of VTE plus:**

**Seek medical advice about potential risks, the need for support stockings and other methods of prevention.**

#### ***Extra precautions for travellers at major risk of VTE***

**Travellers who would be at moderate risk of VTE may include:**

- people who have had a DVT before
- People with clotting diseases
- people who have had recent major surgery or a stroke
- people with cancer or receiving chemotherapy
- people with paralysed lower limbs.

**Follow the advice above for travellers at minor and moderate risk of VTE plus:**

**Seek medical advice about potential risks before flying and consider postponing your flight if necessary.**

**Your doctor may consider it necessary to give you anticoagulant injections for the journey.**

medical advice for assessment and treatment.

**Tell your doctor immediately, or go to the nearest hospital if you notice any of the following:**

- swelling, redness, pain or tenderness in your calf or another region of your limbs
- chest pain
- shortness of breath

### **Questions**

**After reading this leaflet, ask your pharmacist or doctor to answer any questions that you may still have about your journey.**

### **Disclaimer**

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### **Treatment of VTE**

Venous thromboembolism is a serious condition and is potentially life threatening. Therefore if you develop symptoms of VTE it is important that you immediately seek



## 6. Travelling with Medicines and Buying Medicines Overseas



### APharmTHAS Travel Tips

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### What is in this Leaflet

This leaflet answers some common questions about travelling with medicines in your luggage. It also gives information on whether it is safe to buy medicines overseas. It does not contain all of the available information.

It does not take the place of talking to your doctor or pharmacist.

**Take this information with you on your journey.**

You may want to read it again later.

### Travelling with Medicines

It is often necessary to carry medications with you on your journey. These may be:

- your own regular medicines
- a small range of medicines in your first aid kit to treat minor ailments such as headaches
- medicines that are required for a specific journey, such as medicines to prevent malaria when visiting a tropical country
- medicines that have been prescribed for a specific journey

that you will only take if you become ill during your journey.

When carrying medicines on your journey it is important that you follow these general rules:

#### **Keep all medicines away from children.**

People are often more careless with their medicines when they are travelling away from home. They often leave their medicines in places such as a suitcase, where a young child can get easy access to them. Place your medicines in a safe, secure location away from children.

#### **Keep all medicines in their original containers.**

To save space in your luggage, it is tempting to take your medicines out of their original container and just take the tablet strips or loose tablets on your journey. However, this means that all of the identifying labels on your medicines will be lost. Your medicines are also more stable in their original containers, taking them out of their container can affect their stability.

#### **Place your medicines in their original container inside a re-sealable plastic bag or plastic Tupperware-type box.**

This will help protect your medicines from moisture during your journey.

#### **Carry with you a copy of your prescription or a letter from your doctor or pharmacist listing all of your current medicines.**

This will show that the medicines you are carrying are for your own personal use, and that they have been prescribed by a doctor.

#### **Before leaving Australia check that any of the medicines you will be carrying are not restricted or prohibited in the country you are visiting.**

Different countries have different laws and regulations and some medicines that are available in Australia are restricted or prohibited in other countries. Ask your pharmacist or doctor if you have any concerns about which medicines are restricted or prohibited at your destination. The consular websites of many countries often carry useful information about the medicines that are allowable in their country.

#### **When travelling, do not have all of your medicines in checked luggage.**

This may cause problems if your suitcase is lost in transit. If possible, either split your medicines into two caches, one in your suitcase and one in your hand luggage, or carry your medicines in your hand luggage. However, if you carry your medicines in your hand luggage you will have to

Travelling with medicines and buying medicines overseas

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comply with the security guidelines about carrying liquids and sharp objects. If you have any concerns check with your airline.

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## Remember your regular medicines

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If you normally take regular medicines, it is important that you take those medicines with you on your journey.

**Take all of your regular medicines with you on your journey.**

**Make sure that you have sufficient supply for your journey plus some extra in case there is an unexpected change of plan.**

Your medicines may not be available in the country you are visiting. It may also be difficult to explain to a doctor or pharmacist what you need, and you may need a local prescription.

**Make sure that you take all of your medicines, including the ones that you only use occasionally at home, in case they are needed during your journey.**

This would include medicines such as asthma puffers, painkillers, antihistamines and sleeping tablets, which you only use occasionally, but may need on your journey.

**Check with your pharmacist what to do if your medicines have special storage conditions, such as store in a refrigerator.**

**If you are travelling through several time zones, ask your doctor or pharmacist if you should change the dose times of your medicines to fit in with the time at your destination and during your journey.**

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## Obtaining medicines overseas if you forget or lose them

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Travellers sometimes forget their medicines, lose them or occasionally they are stolen. If this happens and the medicines are important, you will have to try to obtain replacement medicines while you are still overseas. The laws and regulations about the sale of medicines are different for each country. If your medicines are lost or stolen, you will need to contact a local health care provider.

**Find a reputable English-speaking healthcare professional.**

The following people may be able to assist in finding adequate care:

- your travel health insurer
- your tour guide or hotel
- Australian consulate in the country being visited

**Carry copies of your prescriptions or a letter from your doctor or pharmacist listing your current medicines.**

Most overseas pharmacists will not dispense Australian prescriptions. However, as already mentioned, they are useful to allow healthcare professionals to identify the medicines you are taking. In some developing countries, many medicines may be bought from pharmacies without prescription.

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## Buying medicines overseas

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Many people buy medicines overseas and in some cases it is safe to do so as the medicines and health care professionals in many countries are as good as those in Australia. However, some overseas pharmacies sell counterfeit or poor quality medicines. Therefore, take care when buying medicines overseas.

**Only buy medicines from a reputable pharmacist or doctor.**

**Try to talk to an English-speaking doctor or pharmacist.**

Some medicines have different brand names in different countries. They may also come in different strengths. If you are ill, you will have to describe your symptoms to the doctor or pharmacist. It is difficult to discuss these issues if you cannot discuss them with the health professional in English, unless you are fluent in the local language or you have a good interpreter.

**Be aware that the medicines that you buy may not be the same as those in Australia.**

Different countries have different licensing requirements. They may have different names, appearances or contain different ingredients. Do not buy them or take them if you have any concerns about the medicines.

**Be aware that counterfeit or fake medicines are common in some countries.**

Fake medicines may not work or could be harmful to you. Do not buy them or do not take them if you have any concerns about the medicines.

**Ask the pharmacist or doctor if you have any concerns about the medicines you are buying.**

**If you have any doubts about the medicines, then do not buy them.**

**See a doctor or go to a hospital immediately if you experience any side effects with the medicines you have bought overseas.**

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## Questions

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**After reading this leaflet, ask your pharmacist or doctor to answer any questions that you may still have about your journey.**

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## Disclaimer

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This information has been produced by the AParmTHAS project at James Cook University. It is designed to be a general guide giving general travel health advice and, (unless specified) all information presented is for an adult traveller. It is designed to be used in conjunction with the advice of your doctor or pharmacist, and is not designed to fully replace the advice of your doctor or pharmacist. Whereas every effort has been made to ensure the accuracy of the information supplied, AParmTHAS makes no warranty, express or implied, as to the accuracy, completeness or usefulness of the information and all liability is excluded save in respect of personal injury or death caused by the negligence of AParmTHAS.

## 7. First Aid Kits for Travellers



### APharmTHAS Travel Tips

**Amcal Robert Poole's Pharmacy**  
Fairfield Central Shopping Centre  
Cnr Lakeside Drive and Waterfront Parade  
Idalia  
Queensland 4811

Ph: (07) 4778 2095  
Fax: (07) 4778 3223

### What is in this Leaflet

This leaflet answers some common questions about first aid kits for travellers. It does not contain all of the available information.

It does not take the place of talking to your doctor or pharmacist.

**Take this information with you on your journey.**

You may want to read it again later.

### Travelling with a Medical or First Aid Kit

Many travellers have health problems when they are overseas. Usually these problems are mild such as diarrhoea, stomach upsets or the common cold. Sometimes these problems are severe such as motor vehicle accidents, malaria or other tropical infections. Many problems are preventable by taking the following precautions:

**Take time to prepare for your journey before you go.**

- find out about the common health risks at your destination
- check whether you need any vaccinations for your journey

- check whether malaria or other tropical diseases are a problem at your destination.

**Be careful and cautious whilst overseas.**

Travellers wish to experience new things that are not available at home. However, taking some simple precautions about what you eat and drink, the activities that you take part in, and how and where you travel can prevent many common travel-related health problems and accidents.

**Carry a medical or first aid kit on your journey.**

The most common health problems that affect travellers are usually mild. Some of these problems are treatable with remedies available over the counter from pharmacies. It is often useful to take a range of these remedies with you on your journey, so that they are available if you need them. What you decide to take with you will depend on factors such as your actual destination, what you plan to do when you get there and who you are travelling with. If you are travelling to an unusual or remote destination that has a high risk of health problems you may wish to take a wider range of items with you.

This leaflet lists some items you may wish to consider taking on your journey. What you finally decide to take will depend on:

- where you are going and what activities you are planning to do when you get there
- how much room you have in your luggage
- the Customs regulations in the country being visited.

### Items to be considered for all Travellers

All travellers should consider taking the following items on their journey:

- their own regular medication
- a range of remedies to treat minor ailments such as diarrhoea and headaches etc
- some first aid items
- adequate instructions on how to use their medicines
- some documentation for Customs.

### Own Medicines

**Take all of your regular medicines with you on your journey.**

**Make sure that you have sufficient supply for your journey plus some**



extra in case there is an unexpected change of plan.

Make sure that you take all of your medicines including any medicines that you only occasionally use, such as asthma puffers, as you may need them at your destination.

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## Remedies for Minor Ailments

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It is useful to take a range of medicines and items to treat any minor ailments you have whilst overseas. Most of these medicines are readily available from pharmacies. Here is a list of remedies that other travellers have found useful and have included in their travel first aid kit. Read the list. Then from your understanding of the health risks at your planned destination, use the list to help to decide which remedies you should take with you on your journey.

**Ask your pharmacist or doctor if you have any questions about what items you should include in your travel first aid kit.**

### *Stomach and intestinal remedies*

Many travellers suffer from diarrhoea and indigestion whilst overseas, and some travellers suffer from constipation. Therefore, consider taking some of these items with you.

#### **Suggested items:**

- some sachets of oral rehydration salts (such as Gastrolyte® or Repalyte®) to prevent dehydration if you have diarrhoea
- Loperamide (Immodium® or Gastrostop®) to treat diarrhoea
- Hyoscine (Buscopan®) for stomach cramps
- an antacid or indigestion remedy

- a laxative if you tend to suffer from constipation.

**Ask your pharmacist or doctor if you have any questions about these remedies.**

**Ask your pharmacist for a leaflet on how to prevent and treat traveller's diarrhoea.**

### *Motion sickness*

Many travellers suffer from motion sickness. The risk of motion sickness varies from person to person and may depend on the type of transport you are using. If you are prone to motion sickness, we recommend that you take a remedy with you to prevent it.

#### **Suggested items:**

- Hyoscine hydrobromide (Kwells® or Travacalm®) or an antihistamine to prevent motion sickness

**Ask your pharmacist or doctor which of these remedies would be most suitable for you.**

**Ask your pharmacist for a leaflet on how to prevent motion sickness.**

### *Analgesics (Pain Killers)*

It is useful to carry a small quantity of a suitable analgesic with you on your journey. This is to treat any mild aches and pains, such as headaches, that occur on your journey. They are also useful to treat fever if you catch a cold or get influenza. It is better to take a simple analgesic such as paracetamol, as some combination products also contain codeine, which is restricted or prohibited in some countries. If you regularly use analgesics and/or a codeine-containing preparation, and will have large quantities of tablets with you, it is useful to carry a doctor's letter or prescription. You can show this to the Customs officers if they have questions, to help show that the medicines are for your own personal use.

#### **Suggested items:**

- Paracetamol, Aspirin or Ibuprofen.

**Ask your pharmacist or doctor which of these analgesics would be most suitable for you.**

**Ask your pharmacist or doctor if you have any concerns about which medicines are restricted or prohibited at your destination.**

### *Cough and cold remedies*

After diarrhoea, the most common health problem for travellers is the common cold. Therefore, it is often useful to carry a cough and cold remedy with you and you can consider taking some of these items with you.

#### **Suggested items:**

- Paracetamol to help with any aches, pains or fever
- some throat lozenges to ease a sore throat
- a nasal decongestant or antihistamine combination.

**Ask your pharmacist or doctor which of these remedies would be most suitable for you.**

**Ask your pharmacist or doctor if you have any concerns about which medicines are restricted or prohibited at your destination.**

Be aware that some nasal decongestants, such as Pseudoephedrine (Sudafed® and other brands), are prohibited in some countries.

### *Prevention and treatment of insect bites*

Bites from insects are annoying and are a way of catching some very serious diseases. Therefore, it is useful to carry items that you can use to help avoid insect bites and to treat them if they occur. The range of items that you will carry will depend on where you are going, the standard of your accommodation and whether serious diseases such as malaria is present in the area you are visiting.

#### **Suggested items for most travellers:**

- a suitable insect repellent
- an antihistamine or sting gel to treat bites.

**Suggested items for travellers to tropical areas**

- an insecticide-treated mosquito net
- a suitable insecticide to treat clothing
- a suitable insecticide to kill mosquitoes present in rooms.

**Ask your pharmacist or doctor if you have any questions about these items.**

**Ask your pharmacist for a leaflet on how to avoid insect bites.**

**Sun protection**

Most Australians are aware of the need to protect themselves from the sun and the risks of skin cancer if they are not careful. However, many Australians assume that the sun is not as strong when they are overseas and do not take the same precautions to prevent sunburn or skin cancer. It is important that you take the same precautions that you would at home.

**Suggested items:**

- a suitable sun screen (SPF 30+)
- a hat
- sunglasses

**Ask your pharmacist or doctor if you have any questions about these items, or skin cancer prevention.**

**Treatment of allergies**

You may encounter unusual foods, insect bites or plants and chemicals on your journey. These can cause an unexpected allergic reaction in some people. Therefore, it is useful to carry an antihistamine and some hydrocortisone cream to treat any mild allergic reactions that occur. However, it is important that more severe reactions receive urgent medical treatment.

**Suggested items:**

- a suitable antihistamine
- a small tube of Hydrocortisone cream.

**Ask your pharmacist or doctor if you have any questions about these items, or about the treatment of allergic reactions.**

**If you do have a severe allergic reaction when you are travelling or if any of the following happens, see a doctor immediately or immediately go to the nearest hospital:**

- sudden onset of rash, itching or hives of the skin
- swelling of the face, lips, mouth, tongue or throat or other parts of the body
- problems with swallowing
- shortness of breath, wheezing or trouble breathing.

**First Aid Items and Wound Care**

It is always useful to take a small selection of first aid items to treat minor cuts and abrasions. If you are travelling to remote locations where the medical facilities could be poor, you may wish to take more a wider selection of items.

**Suggested items for most travellers:**

- plasters
- crepe bandage
- triangular bandage
- adhesive tape
- eye irrigation solution
- antiseptic cream
- iodine-based antiseptic (Betadine®)
- digital thermometer (mercury thermometers are not allowed on some aircraft)
- \*tweezers and \*scissors

**Ask your pharmacist or doctor for advice on what additional items to take if travelling to a remote area, or an area where medical facilities will be poor. Some items for consideration include:**

- water purification tablets

- \*commercial sterile suture, needle and syringe pack to be used by local doctors

\* Items that will not be allowed in your hand luggage.

**Instructions, Documentation and Packaging of Travel First Aid Kits**

**Instructions**

Before travelling, make sure that you understand how to use all of the items in your First Aid Kit

**Ask your pharmacist or doctor who supplied the items if you have any questions about them.**

**Documentation**

You should declare all items you are carrying to the Customs officers when entering a country. Customs officers generally do not have a problem with travellers carrying medicines if they are for your personal use, you are carrying appropriate quantities and if they are appropriately packaged and labelled. Therefore:

**Keep all medicines in their original containers.**

**All prescription medicines should be appropriately labelled by a pharmacist.**

**Carry either a doctor's letter or copies of your prescriptions with you.**

This will allow Customs officers to see that the medicines are for your own personal use and that you have a doctor's authority to use them.

**Packaging**

Ready-made kits can be bought that contain many of the items mentioned above. These have the advantage of

being clearly labelled and identifiable as a first aid kit. If you choose to assemble your own kit, then follow the directions below:

**Place all items in a strong waterproof container.**

**Clearly label the container as a First Aid Kit.**

**Keep all medicines in their original containers and place them into resealable plastic bags before placing them into the container.**

**Check with your pharmacist or doctor if any of the medicines in your first aid kit are restricted or prohibited at your destination.**

### Contact card

In an emergency it is important that you can quickly locate important contact information. It is useful to carry a contact card which contains the address and phone numbers of the following people:

- a family member or close contact still in Australia
- your doctor at home
- area hospitals or clinics
- the Australian embassy or consulate in the country you are visiting.

### Commercial First Aid Kits

Commercial first aid kits are available ranging from basic kits for the general traveller, through to fully comprehensive kits for single travellers or groups of travellers to more adventurous destinations.

**Ask your pharmacist or doctor if you have any questions about commercially available kits.**

### Travellers Needing Specialist Advice

This leaflet gives general advice about first aid kits for tourist or business travellers to relatively safe, well-developed countries. The following travellers or issues may require more specific or specialized advice, or medicines that require a doctor's prescription. Therefore, if you fit into one of the categories below discuss these issues with your pharmacist. They will advise you on the appropriate actions to take before your journey. This may need the pharmacist to refer you back to your doctor or to a specialist in travel health.

**Ask your pharmacist for further advice before you travel if you are:**

- travelling whilst pregnant or with children
- travelling to remote or unusual destinations
- taking part in activities such as diving or climbing at altitude, that have their own associated health risks
- travelling to high-risk destinations that may require special vaccinations
- travelling to destinations where you will have to take antimalarial tablets.

### Questions

**After reading this leaflet, ask your pharmacist or doctor to answer any questions that you may still have about your journey.**

### Disclaimer

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Appendix 6.10: Diagnostic testing interview schedule for the development of the APharmTHAS™ Travel Tips Brochure and Leaflets



Participant  
Number:



**A review and evaluation of a travel health advisory service operated from a community pharmacy in North Queensland. Stage 1: Resource Development (Interviews)**

**Introduction:**

My name is Ian Heslop and I am from the School of Pharmacy & Molecular Sciences at James Cook University. We are developing a travel health advisory service that will be operating from a community pharmacy. As part of the service, we have developed a booklet containing information that will help travellers prevent or deal with some common travel-related health problems.

We would like you to help test the booklet and give your opinions. The testing will involve an interview that lasts about 20 to 30 minutes. Taking part in this study is voluntary, and you can stop taking part at any time without explanation or prejudice. All of your answers are completely confidential. If you give your permission we will record the interview, but this is not compulsory.

Here is an information sheet that explains the project, and I am happy to answer any questions that you may have. If you are still happy to take part after reading the information sheet, I will ask you to complete and sign the consent form.

*Give the participant the information sheet and consent form. If the participant gives signed consent:*

What I'll do now is give you the booklet and ask you some questions about the information in it.

The answers you give to my questions will help me understand how difficult or easy it is to find and understand the information in the booklet, and where improvements need to be made.

The more that you tell me about any difficulties you experience, the greater the chance I have of improving the booklet. It is important to remember that I am testing the information in the booklet, not you.

*Give the participant the booklet*

This is the booklet we are testing, it consists of an introduction and currently seven leaflets about traveller's diarrhoea, the prevention of insect bites, malaria, motion sickness, venous thromboembolism, travelling with medicines and first aid kits for travellers.

*Allow the participant a few minutes to view the layout of the booklet, but not read it in detail.*

I will now ask you some questions about the travel-related health conditions or precautions. Remember, we are trying to find out what is wrong with the booklet and how we can improve it. Even if you know the answer without looking, I want you to show me where the information is in the booklet. Make any criticisms or comments as you are using the booklet and tell me what you are doing as you do it.

**Interview:**

**1. What is Venous Thromboembolism, are there different types of venous thromboembolism and does it have any other names?**

- How do they search? (Pages, Columns and Sections)

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- Can they find the information?

- ☐ No

- ☐ Yes – how easily?

- ☐ Very easily
- ☐ Easily
- ☐ Little difficulty
- ☐ Lots of difficulty

- Can you tell me what it says in your own words?

- ☐ What do they say?

---

---

---

- ☐ Can they show they understand what they find?

- ☐ No
- ☐ Yes

- ☐ Do they omit any information

- ☐ No
- ☐ Yes – provide details

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- ☐ Do they add any information?

- ☐ No
- ☐ Yes – provide details

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**2. What causes traveller's diarrhoea?**

- How do they search? (Pages, Columns and Sections)

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- Can they find the information?
  - ☐ No
  - ☐ Yes – how easily?
    - Very easily
    - Easily
    - Little difficulty
    - Lots of difficulty
- Can you tell me what it says in your own words?
  - What do they say?

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---

- Can they show they understand what they find?
  - No
  - Yes
- Do they omit any information?
  - No
  - Yes – provide details

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- Do they add any information?
  - No
  - Yes – provide details

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**3. When you are suffering from motion sickness, what symptoms will you experience before you actually vomit?**

- How do they search? (Pages, Columns and Sections)

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- Can they find the information?
  - ☐ No
  - ☐ Yes – how easily?
    - Very easily
    - Easily
    - Little difficulty
    - Lots of difficulty

- Can you tell me what it says in your own words?
  - What do they say?

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---

- Can they show they understand what they find?
  - No
  - Yes

- Do they omit any information?
  - No
  - Yes – provide details

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- Do they add any information?
  - No
  - Yes – provide details

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#### 4. You are going bushwalking, what can you do to prevent tick bites?

- How do they search? (Pages, Columns and Sections)

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---

- Can they find the information?

- No
- Yes – how easily?
  - Very easily
  - Easily
  - Little difficulty
  - Lots of difficulty

- Can you tell me what it says in your own words?
  - What do they say?

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---



---

- Can they show they understand what they find?
  - No
  - Yes

- Do they omit any information
  - No
  - Yes – provide details

---



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---

- Do they add any information?
  - No
  - Yes – provide details

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### 5. What insect repellents are safe to use in children?

- How do they search? (Pages, Columns and Sections)

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- Can they find the information?

- No
- Yes – how easily?
  - Very easily
  - Easily
  - Little difficulty
  - Lots of difficulty

- Can you tell me what it says in your own words?

- What do they say?

---



---



---

- Can they show they understand what they find?
  - No
  - Yes

- Do they omit any information
  - No
  - Yes – provide details

---



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- Do they add any information?
  - No
  - Yes – provide details

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**6. Your doctor prescribes Atovaquone/Proguanil or Malarone® to prevent malaria. How long should you take this medicine to prevent malaria?**

- How do they search? (Pages, Columns and Sections)

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- Can they find the information?

- No
- Yes – how easily?
  - Very easily
  - Easily
  - Little difficulty
  - Lots of difficulty

- Can you tell me what it says in your own words?

- What do they say?

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---

- Can they show they understand what they find?
  - No
  - Yes

- Do they omit any information?
  - No
  - Yes – provide details

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- Do they add any information?
  - No
  - Yes – provide details

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**7. Your doctor prescribes Doxycycline to prevent malaria. Why should you not take the medicine at bedtime?**

- How do they search? (Pages, Columns and Sections)

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- Can they find the information?

☐ No

☐ Yes – how easily?

- Very easily
- Easily
- Little difficulty
- Lots of difficulty

- Can you tell me what it says in your own words?

☐ What do they say?

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---

---

☐ Can they show they understand what they find?

- No
- Yes

☐ Do they omit any information

- No
- Yes – provide details

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☐ Do they add any information?

- No
- Yes – provide details

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**8. You are on holiday and develop diarrhoea. When should you not use Loperamide to treat diarrhoea?**

- How do they search? (Pages, Columns and Sections)

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- Can they find the information?
  - ☐ No
  - ☐ Yes – how easily?
    - Very easily
    - Easily
    - Little difficulty
    - Lots of difficulty
- Can you tell me what it says in your own words?
  - What do they say?

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---



---

- Can they show they understand what they find?
  - No
  - Yes
- Do they omit any information
  - No
  - Yes – provide details

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- Do they add any information?
  - No
  - Yes – provide details

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**9. What should you use to prevent dehydration in a child with diarrhoea?**

- How do they search? (Pages, Columns and Sections)

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- Can they find the information?
  - ☐ No
  - ☐ Yes – how easily?
    - Very easily
    - Easily
    - Little difficulty
    - Lots of difficulty

- Can you tell me what it says in your own words?
  - What do they say?

---



---



---

- Can they show they understand what they find?
  - No
  - Yes

- Do they omit any information
  - No
  - Yes – provide details

---

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---

- Do they add any information?
  - No
  - Yes – provide details

---

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**10. How can you check whether the medicines you are taking with you on holiday are not restricted or prohibited in the country you are visiting?**

- How do they search? (Pages, Columns and Sections)

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- Can they find the information?

- No
- Yes – how easily?
  - Very easily
  - Easily
  - Little difficulty
  - Lots of difficulty

- Can you tell me what it says in your own words?

- What do they say?

---

---

---

- Can they show they understand what they find?
  - No
  - Yes

- Do they omit any information
  - No
  - Yes – provide details

---

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---

- Do they add any information?
  - No
  - Yes – provide details

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**11. What medicines should you include in your first aid kit to treat allergies when you are overseas?**

- How do they search? (Pages, Columns and Sections)

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- Can they find the information?

- No
- Yes – how easily?
  - Very easily
  - Easily
  - Little difficulty
  - Lots of difficulty

- Can you tell me what it says in your own words?

- What do they say?

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---



---

- Can they show they understand what they find?

- No
- Yes

- Do they omit any information

- No
- Yes – provide details

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---

- Do they add any information?

- No
- Yes – provide details

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**12. Are the instructions good enough to follow?**

- What do they say?

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**13. Overall, what do you think of the instructions?**

- What do they say?

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**14. What are the bad points about this booklet? How can we improve it?**

- What do they say?

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**15. Are there any good points?**

- What do they say?

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**16. Is there anything about the booklet that we haven't discussed yet that you would like to raise?**

- What do they say?

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**Thank you for your help today.**



Appendix 6.11: Participant information leaflet for the diagnostic testing interview schedule for the development of the APharmTHAS™ Travel Tips Brochure and Leaflets

#### INFORMATION SHEET

##### **A review and evaluation of a travel health advisory service operated from a community pharmacy in north Queensland. Stage 1: Resource Development (Interviews)**

Every year many people travel away from home and whilst they are away, many travellers place themselves at risk of accidents or health problems. However, many travellers do not get any health advice before travelling. You are invited to take part in a research project that will review a travel health advisory service that is being run from a community pharmacy. The advisory service is designed to offer advice to travellers who would not normally obtain travel-related health advice from any other source before they travel. This part of the project will involve a group of people giving their opinions about a series of information leaflets. They will be asked to give their opinion about how easy the leaflets are to read, whether they can find information on the leaflets, whether they can understand the information and whether they think that the layout of the leaflets can be improved. The study is being conducted by Ian Heslop and will contribute to his doctoral thesis in the Doctor of Public Health program at James Cook University.

If you agree to be involved in the study, you will be invited to be interviewed. The interview, with your consent, will be audio-taped, and should only take approximately 30 minutes of your time. The interview will be conducted in the School of Pharmacy & Molecular Sciences at James Cook University, or a venue of your choice.

Taking part in this study is completely voluntary, and you can stop taking part in the study at any time without explanation or prejudice.

Your responses and contact details will be strictly confidential. The data from the study will be used in research publications, the investigator's doctoral thesis and reports to the School of Pharmacy & Molecular Sciences, James Cook University. You will not be identified in any way in these publications.

If you have any questions about the study, please contact Ian Heslop, Prof Beverley Glass, Dr Michelle Bellingan or Prof Richard Speare.

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*If you have any concerns regarding the ethical conduct of the study, please contact:*  
*Tina Langford, Ethics Officer, Research Office, James Cook University,*  
*Townsville, Qld, 4811. Phone: 4781 4342, [Tina.Langford@jcu.edu.au](mailto:Tina.Langford@jcu.edu.au)*

Cairns - Townsville - Brisbane - Singapore  
CRICOS Provider Code 00117J

Appendix 6.12: Consent form for the diagnostic testing interview schedule for the development of the APharmTHAS™ Travel Tips Brochure and Leaflets

**INFORMED CONSENT FORM**

PRINCIPAL INVESTIGATOR	Ian Heslop
PROJECT TITLE:	A review and evaluation of a travel health advisory service operated from a community pharmacy in north Queensland. Stage 1: Resource Development (Interviews)
SCHOOL	Pharmacy & Molecular Sciences

I understand the aim of this research study is to look at a series of information leaflets and survey questionnaires and give my opinion about how easy the documents are to read, whether I understand them and whether I think that their layout can be improved.

I consent to participate in this project, the details of which have been explained to me, and I have been provided with a written information sheet to keep.

I understand that my participation will involve participating in an interview.

I agree that the researcher may use the results as described in the information sheet.

I acknowledge that:

- taking part in this study is voluntary and I am aware that I can stop taking part in it at any time without explanation or prejudice and to withdraw any unprocessed data I have provided;
- that any information I give will be kept strictly confidential and that no names will be used to identify me with this study without my approval;

*(Please tick to  
indicate consent)*

I consent to be interviewed	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
I consent for the interview to be audio taped	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No

Name: <i>(printed)</i>	
Signature:	Date:

## Appendix 6.13: Examples of marketing materials for the APharmTHAS™



Robert Poole's Pharmacy Fairfield Central



## Going Overseas?

### Needing more information about travel-related health problems?

Many common travel-related health complaints are preventable – don't let them spoil your holiday

Ask the Pharmacist at this Pharmacy for advice and information about these common travel health problems:



**Traveller's Diarrhoea**

**Avoiding Insect Bites**

**Malaria**

**Motion Sickness**

**Venous Thromboembolism (DVT)**

**Travelling with medicines and buying medicines overseas**

**First Aid Kits for Travellers**



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Amcal Robert Poole's Pharmacy

Fairfield Central Shopping Centre

Idalia, Qld 4811

Ph: (07) 4778 2095

## Travel Health Advisory Service

### Travel Health Facts

- About 3 million Australians travel overseas every year.
- Many travellers suffer from one or more health problems while they are overseas.
  - Fortunately, for many travellers the health problems experienced are mild such as mild diarrhoea and the common cold or influenza.
  - However, a smaller number of travellers experience severe health problems such as malaria and other serious diseases.
- All destinations have some level of health risk.
- Studies have shown that over 50% of Australians do not get any travel-related health advice before they travel because:
  - Many travellers think they are travelling to a safe destination and just assume that there are no risks involved or
  - They have been to the destination before and did not have problems the first time they visited or
  - They just assume that travel health advice before a journey is unnecessary.

### APharmTHAS Project

- Most people recognise that pharmacies are an excellent and easily accessible source of health information.
- As many travellers do not get travel-health advice before their journey a collaborative project has been set up between the School of Pharmacy & Molecular Sciences, JCU, the School of Public Health, Tropical Medicine & Rehabilitation Sciences, JCU and Amcal Robert Poole's Pharmacy to provide a travel health advisory service from a community pharmacy in Townsville.
- The project will not replace the important role of your doctor or travel health clinics in providing travel health advice.
- The service aims to target the over 50% of travellers who would not normally visit their doctor before their journey and the service will:
  - Provide general travel health advice for all travellers who use the service.
  - Formally assess each traveller for travel-related health risks and:
    - Provide general advice and supplies to travellers who are travelling to low risk destinations or who are at low risk of travel-related health problems.
  - But the service will also advise and refer travellers back to their doctor if they require further, more specialised assessments and services or if they:
    - Need vaccinations or immunisations for their destination.
    - Need prescription medicines to prevent malaria or other diseases.



- Need more specialised advice relating to any medical conditions they may have or because of where the traveller is visiting or the activities that they may be intending to do on their journey.
- The service is aimed at travellers who may not normally visit their doctor before their journey or who may think they are visiting a low risk destination. As some of these travellers may be advised to see their doctor, it is hoped that the service may increase the number of travellers visiting their doctor and reduce the number of travellers who experience health problems while overseas.

### Where is the APharmTHAS service?

The APharmTHAS project is being run from:

**Amcal Robert Poole's Pharmacy**

Fairfield Central Shopping Centre

Idalia, Qld 4811

Ph: (07) 4778 2095

Contact the Pharmacy and they will tell you the most appropriate time to visit or drop in and see them in the pharmacy.

### What will happen when I visit the APharmTHAS service?

- The pharmacist will interview you and ask you questions about yourself and your planned journey.
- The pharmacist will then organise an individual portfolio of information for you.
- The pharmacist will then counsel you about the health risks associated with your journey and give you the portfolio to take home.
- If you require further, more specialised information, counselling or services such as vaccinations and immunisations, the pharmacist will refer you back to your doctor. They will give you a referral letter to take with you when you see your doctor.
- As it is a research project, the portfolio will also contain two questionnaires that we would like you to complete so that we can find out what you thought of the service and whether you found it useful.

### Will I be charged to use the APharmTHAS service?

The APharmTHAS service is a JCU research project and so the service will be free until the project is finished.

### How do I contact the APharmTHAS service?

If you wish to use the APharmTHAS service and make an appointment to see them, contact them at:

**Amcal Robert Poole's Pharmacy**, Fairfield Central Shopping Centre, Idalia

Ph: (07) 4778 2095

If you have any questions about the APharmTHAS research project, then contact:

Associate Professor Ian Heslop, School of Pharmacy & Molecular Sciences, James Cook University.

Ph (07) 4781 4699

Appendix 6.14: APharmTHAS™ leaflet evaluation (Level 1 pre-travel service)  
questionnaire and participant information leaflet

## INFORMATION SHEET

### **A review and evaluation of a travel health advisory service operated from a community pharmacy in north Queensland. APHarmTHAS Leaflet Evaluation Questionnaire**

Every year many people travel away from home and whilst they are away, many travellers place themselves at risk of accidents or health problems. Yet many travellers do not get any health advice before travelling. You are invited to take part in a research project that will review a travel health advisory service that is being run from a community pharmacy. The advisory service is designed to offer advice to travellers who would not normally obtain travel-related health advice from any other source before they travel. We would like you to give us your views about the service and counselling you have received. The study is being conducted by Ian Heslop and will contribute to his doctoral thesis in the Doctor of Public Health program at James Cook University.

If you agree to be involved in the study, we would like you to complete the attached questionnaire. The questionnaire should only take approximately 10 to 15 minutes of your time. We would like you to complete the questionnaire before you leave the pharmacy and place the completed questionnaire in the sealed box provided in the pharmacy.

Taking part in this study is completely voluntary and you can stop taking part in the study at any time without explanation or prejudice. You may also withdraw any unprocessed data from the study.

Your responses will be strictly confidential and anonymous. The data from the study will be used in research publications, the investigator's Doctoral thesis and in reports to the School of Pharmacy & Molecular Sciences, James Cook University. You will not be identified in any way in these publications.

If you wish to participate in a prize draw to win an Apple iPod, complete your contact details at the end of the questionnaire. Please note: To maintain your anonymity, the survey box will be opened by an Administration Officer of the School of Pharmacy & Molecular Sciences at James Cook University and your contact details will be separated from the completed questionnaire before it is given to the investigator. If you win the Apple iPod it will be sent to your postal address.

As part of the evaluation of the travel health advisory service, it would be useful to interview a small number of people who have completed this questionnaire. These volunteers will be contacted at a later date and asked a series of more in depth questions and the interviews will take approximately 15 minutes. The interviews will be carried out over the telephone and with your permission, the interview would be audio taped. Taking part in the interview is again completely confidential and anonymous. If you consent to be contacted at a later date to participate in an interview then complete the final section of the questionnaire. If you do not consent to be interviewed your entry will still be included in the prize draw.

If you have any questions about the study, please contact Ian Heslop, Prof Beverley Glass, Dr Michelle Bellingan or Prof Richard Speare

**Principal Investigator:**  
**Ian Heslop**  
Associate Professor - Pharmacy  
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[richard.speare@jcu.edu.au](mailto:richard.speare@jcu.edu.au)

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*Townsville, Qld, 4811. Phone: 4781 4342, [Tina.Langford@jcu.edu.au](mailto:Tina.Langford@jcu.edu.au)*

Cairns - Townsville - Brisbane - Singapore  
CRICOS Provider Code 00117J



Traveller Study Number (To be assigned by JCU)

L

## APharmTHAS Leaflet Evaluation Survey (CONFIDENTIAL)



We would like you to give us some feedback about what you thought of the advice and service that you have received. Please complete this anonymous survey and place it into the survey box in the pharmacy. If you wish to be included in a draw to win an Apple iPod please also add your contact details to the last page. So that you will remain anonymous, this page will be separated from your completed survey before it is given to the researcher.

### Section A: Some questions about yourself

These are questions about yourself. You will not be identified from the answers to these questions but they will give us some background information about the travellers using the service. If you prefer us not to know the answer to a question then just tick the "prefer not to say" box or leave the space blank.

1. What is your gender? (Tick appropriate answer)

- ☐ Male
- ☐ Female

2. What is your age? (Tick appropriate answer)

- ☐ Between 18 and 30 years
- ☐ Between 31 and 40 years
- ☐ Between 41 and 50 years
- ☐ Between 51 and 60 years
- ☐ Between 61 and 70 years
- ☐ Older than 71 years
- ☐ Prefer not to say

3. What is your current occupation? (state occupation) \_\_\_\_\_

4. How are you employed? (Tick appropriate answer)

- ☐ Full-time
- ☐ Part-time
- ☐ Retired
- ☐ Unemployed
- ☐ Prefer not to say

5. What is your highest level of education? (Tick appropriate answer)

- ☐ Grade 10
- ☐ Grade 12
- ☐ Trade qualification or Diploma
- ☐ Degree
- ☐ Postgraduate qualification
- ☐ Prefer not to say

6. How much do you earn? (Tick appropriate answer)

- ☐ Less than \$40,000 a year
- ☐ Between \$40,000 and \$60,000 a year
- ☐ Between \$60,000 and \$80,000 a year
- ☐ Between \$80,000 and \$100,000 a year
- ☐ Between \$100,000 and \$120,000 a year
- ☐ Greater than \$120,000 a year
- ☐ Prefer not to say

7. Where are you travelling to on this journey? (state destination or destinations) \_\_\_\_\_

### Section B: Why did you use the travel health advisory service at this pharmacy?

We are interested to find out why you chose to use the travel health advisory service at this pharmacy.

8. Why did you choose to use the travel health advisory service at this pharmacy to obtain advice for your journey? (Tick all answers that apply)

- ☐ The service was recommended to me      If so, state who recommended the service \_\_\_\_\_
- ☐ It was more convenient to come to the pharmacy than go elsewhere for advice
- ☐ I would not normally get travel health advice before a journey but saw the service advertised and thought I would try it
- ☐ It was easier to come to the pharmacy than get an appointment with my doctor
- ☐ My doctor does not offer a travel health service
- ☐ Other      (State reason) \_\_\_\_\_

9. BEFORE speaking to the pharmacist, did you get any travel health advice for your journey from any other sources? (Tick appropriate answer)

- ☐ No
- ☐ Yes      If Yes, where did you get that travel health advice from? (Tick all answers that apply)
  - ☐ Books
  - ☐ Internet
  - ☐ Travel clinic
  - ☐ Your GP
  - ☐ A Pharmacist
  - ☐ Travel agent
  - ☐ Family or friends
  - ☐ Magazines

10. AFTER speaking to the pharmacist, will you now try to get more travel health advice before your journey from another source?

☐ No

☐ Yes If Yes, where will you try to get more travel health advice from? (Tick all answers that apply)

- ☐ Books
- ☐ Internet
- ☐ Travel clinic
- ☐ Your GP
- ☐ A Pharmacist
- ☐ Travel agent
- ☐ Family or friends
- ☐ Magazines

If Yes, why will you get more travel health advice after speaking to the pharmacist? (Tick all answers that apply)

- ☐ The pharmacist recommended for me to visit a doctor for some vaccinations or medicines they could not supply without prescription
- ☐ I would like a second opinion and so will seek further advice
- ☐ The pharmacist did not answer all of my questions
- ☐ The advice the pharmacist gave was poor
- ☐ Other reason (State reason) \_\_\_\_\_

### Section C: How useful was this service?

We are interested to find out what you thought of the travel health advisory service at this pharmacy, was it useful and how do you think it could be improved?

11. We would like you to give an OVERALL score for the travel health advice service at this pharmacy. Using a scale from 1 to 10 where 1 (lowest score) is a very poor service and 10 (highest score) is an excellent service give your overall score for the travel health advisory service at the pharmacy. (Place a tick in the appropriate box below)

Overall Score	1 Very Poor	2	3	4	5	6	7	8	9	10 Excellent

12. Rate the QUALITY of the advice you were given at this pharmacy? (Tick appropriate answer)

- ☐ 1. Very high quality
- ☐ 2. Good quality
- ☐ 3. Just acceptable
- ☐ 4. Poor quality
- ☐ 5. Very poor quality

13. How USEFUL was the advice you were given at this pharmacy? (Tick appropriate answer)

- ☐ 1. Very Useful
- ☐ 2. Useful
- ☐ 3. Slightly useful
- ☐ 4. Useless
- ☐ 5. Totally useless

14. Read the following statements about the travel health advisory service at this pharmacy and using the attached scale (1 - Strongly agree, 2 - Agree, 3 - Neither agree nor disagree, 4 - Disagree and 5 - Strongly disagree) rate each statement as to whether you agree or disagree with the statement. These statements are about the interview you had with the pharmacist

Statement	Tick appropriate box				
a) The interview with the pharmacist took too long. I would have liked a shorter interview.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
b) The pharmacist asked too many questions.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
c) The pharmacist was very professional when he/she interviewed me.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
d) The pharmacist had a good interview technique and a pleasant manner.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
e) It was difficult to remember all of the information I needed to answer the pharmacist's questions.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
f) I felt comfortable answering all of the pharmacist's questions. None of the questions were too personal or intrusive.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
g) I was happy with the level of privacy in the pharmacy.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
h) I was happy that all of the information I gave the pharmacist would be confidential.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree



15. Read the following statements about the travel health advisory service at this pharmacy and using the attached scale (1 - Strongly agree, 2 - Agree, 3 - Neither agree nor disagree, 4 - Disagree and 5 - Strongly disagree) rate each statement as to whether you agree or disagree with the statement. These statements are about the information that the pharmacist gave you.

Statement	Tick appropriate box				
	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
a) I was confident that all of the information that the pharmacist gave me was correct and up to date.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
b) I could understand everything that the pharmacist told me.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
c) The pharmacist told me too much, I was swamped with too much information.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
d) The pharmacist took too long in explaining what I needed to know.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
e) I do not need to know about many of the things the pharmacist explained.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
f) I was given too much written information.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
g) The written information given was clear, concise and easy to understand.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
h) The written information will be useful when I go away, as I may have forgotten some of the information that the pharmacist told me before I go.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
i) The information I received from the travel health advisory service is of a high quality	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree

16. Read the following statements about the travel health advisory service at this pharmacy and using the attached scale (1 - Strongly agree, 2 - Agree, 3 - Neither agree nor disagree, 4 - Disagree and 5 - Strongly disagree) rate each statement as to whether you agree or disagree with the statement. These statements are about whether you agree or disagree that pharmacies should offer services like this.

Statement	Tick appropriate box				
	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
a) Pharmacies should not provide travel health services. It is not an appropriate role for pharmacists.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
b) I am just as happy and confident to see a pharmacist for travel health advice as see my doctor.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
c) Some travellers do not see a doctor before they travel because they think they are not at risk of health problems. The pharmacist can help these travellers decide whether they need to visit the doctor for a vaccination before they travel.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
d) Pharmacists can advise travellers on what medications to take with them on their journey.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
e) Pharmacists need more training to give travel health advice. They do not know enough about travel health risks.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
f) Pharmacies would be able to offer better travel health services if the traveller could also get vaccinations and malaria tablets at the pharmacy without having to see a doctor.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
g) More pharmacies should offer travel health advisory services.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
h) This service was more convenient than making an appointment to see my doctor.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree

17. Have you ever obtained travel health advice for any PREVIOUS journeys? (Tick appropriate answer)

☐ Yes      If Yes, where did you get that travel health advice from? (Tick all answers that apply)

- ☐ Books
- ☐ Internet
- ☐ Travel clinic
- ☐ Your GP
- ☐ A Pharmacist
- ☐ Travel agent
- ☐ Family or friends
- ☐ Magazines

☐ No      If No, why did you not get any travel health advice before any previous journeys? (state reason or reasons) \_\_\_\_\_

\_\_\_\_\_  
(If you have answered No to question 17, jump to question 20)

18. How does the QUALITY of the advice you were given for any PREVIOUS journeys compare with the advice you have been given in this pharmacy? (Tick appropriate answer)

- ☐ 1. Far better than the advice given in this pharmacy
- ☐ 2. Better than the advice given in this pharmacy
- ☐ 3. Similar to the advice given in this pharmacy
- ☐ 4. Poorer than the advice given in this pharmacy
- ☐ 5. Far poorer than the advice given in this pharmacy

19. Was the advice you were given for any PREVIOUS journeys more USEFUL than the advice you have been given in this pharmacy? (Tick appropriate answer)

- ☐ 1. Much more useful than the advice given in this pharmacy
- ☐ 2. More useful than the advice given in this pharmacy
- ☐ 3. Similar to the advice given in this pharmacy
- ☐ 4. Useless compared to the advice given in this pharmacy
- ☐ 5. Totally useless compared to the advice given in this pharmacy

20. Would you use the travel health advisory service at this pharmacy again? (Tick appropriate answer)

☐ Yes

☐ No      If No, why would you not use the service again (state reasons) \_\_\_\_\_

21. Would you recommend the travel health advisory service at this pharmacy to others? (Tick appropriate answer)

☐ Yes

☐ No      If No, why would you not recommend the service to others? (state reasons) \_\_\_\_\_

22. This is a study organised by James Cook University and therefore the service is free. In future would you be willing to pay for this service? (Tick appropriate answer)

- ☐ Yes
- ☐ No      If No, why would you not be willing to pay for this service? (state reasons)

---

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23. If you were willing to pay for this service, what would you consider to be an appropriate payment for the service you have received? (Tick appropriate answer)

- ☐ \$10
- ☐ \$20
- ☐ \$30
- ☐ \$50
- ☐ \$75
- ☐ \$100
- ☐ \$150
- ☐ Greater than \$150
- ☐ Not willing to pay for this service

24. Finally, would you like to make any comments about the travel health advisory service available from this pharmacy? (Write your comments below)

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**Thank you for completing this survey. If you wish to take part in a draw to win one of two Apple iPods please complete the attached form.**



## APharmTHAS Leaflet Evaluation Survey

### Prize Draw

Thank you for completing the attached survey. If you wish to participate in a prize draw to win one of two Apple iPods then please complete your details below.

**Please note:** So that your answers to the survey will remain anonymous, this slip will be separated from the completed survey before the survey is given to the researcher at James Cook University.

The prize winners will be notified by post.

Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Post Code: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

### Post-Counselling Interviews

As part of the evaluation of the travel health advisory service, it would be useful to interview a small number of travellers. These volunteers will be asked a series of more in depth questions and the interviews will take approximately 15 minutes. The interviews will be carried out over the telephone and with your permission the interview would be audio taped.

Would you be interested in volunteering to participate in one of these interviews?

(Please tick to indicate consent)

I consent to be contacted by telephone to be interviewed

☐ Yes

☐ No

I consent for the interview to be audio taped

☐ Yes

☐ No

Name: *(printed)*

Signature:

Date:

Please note:

- If you are not willing to be interviewed your entry will still be included in the prize draw.
- Only a small number of volunteers will be interviewed and a random sample will be chosen, therefore you may not be contacted
- If your name is selected and you are contacted, you will be asked again on the telephone whether you still agree to be interviewed and whether you give consent for the interview to be audio taped. If you say that you no longer wish to be interviewed, your right not to participate in the interview will be respected and the interviewer will terminate the interview.

Appendix 6.15: APharmTHAS™ level 2 client post-counselling questionnaire and participant information leaflet

## INFORMATION SHEET

### **A review and evaluation of a travel health advisory service operated from a community pharmacy in north Queensland. Post-Counselling Questionnaire (Traveller)**

Every year many people travel away from home and whilst they are away, many travellers place themselves at risk of accidents or health problems. Yet many travellers do not get any health advice before travelling. You are invited to take part in a research project that will review a travel health advisory service that is being run from a community pharmacy. The advisory service is designed to offer advice to travellers who would not normally obtain travel-related health advice from any other source before they travel. We would like you to give us your views about the service and counselling you have received. The study is being conducted by Ian Heslop and will contribute to his doctoral thesis in the Doctor of Public Health program at James Cook University.

If you agree to be involved in the study, we would like you to complete the attached questionnaire. The questionnaire should only take approximately 10 to 15 minutes of your time. We would like you to complete the questionnaire before you leave the pharmacy and place the completed questionnaire in the sealed box provided in the pharmacy.

Taking part in this study is completely voluntary and you can stop taking part in the study at any time without explanation or prejudice. You may also withdraw any unprocessed data from the study.

Your responses will be strictly confidential and anonymous. The data from the study will be used in research publications, the investigator's Doctoral thesis and in reports to the School of Pharmacy & Molecular Sciences, James Cook University. You will not be identified in any way in these publications.

If you wish to participate in a prize draw to win an Apple iPod, complete your contact details at the end of the questionnaire. Please note: To maintain your anonymity, the survey box will be opened by an Administration Officer of the School of Pharmacy & Molecular Sciences at James Cook University and your contact details will be separated from the completed questionnaire before it is given to the investigator. If you win the Apple iPod it will be sent to your postal address.

As part of the evaluation of the travel health advisory service, it would be useful to interview a small number of people who have completed this questionnaire. These volunteers will be contacted at a later date and asked a series of more in depth questions and the interviews will take approximately 15 minutes. The interviews will be carried out over the telephone and with your permission, the interview would be audio taped. Taking part in the interview is again completely confidential and anonymous. If you consent to be contacted at a later date to participate in an interview then complete the final section of the questionnaire. If you do not consent to be interviewed your entry will still be included in the prize draw.

If you have any questions about the study, please contact Ian Heslop, Prof Beverley Glass, Dr Michelle Bellingan or Prof Richard Speare

**Principal Investigator:**  
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Cairns - Townsville - Brisbane - Singapore  
CRICOS Provider Code 00117J





Traveller Study Number (To be assigned by JCU)

**B**

## Post-Counselling Survey (CONFIDENTIAL)



We would like you to give us some feedback about what you thought of the advice and service that you have received. Please complete this anonymous survey and place it into the survey box in the pharmacy. If you wish to be included in a draw to win an Apple iPod please also add your contact details to the last page. So that you will remain anonymous, this page will be separated from your completed survey before it is given to the researcher.

### Section A: Some questions about yourself

These are questions about yourself. You will not be identified from the answers to these questions but they will give us some background information about the travellers using the service. If you prefer us not to know the answer to a question then just tick the "prefer not to say" box or leave the space blank.

1. What is your gender? (Tick appropriate answer)

- ☐ Male
- ☐ Female

2. What is your age? (Tick appropriate answer)

- ☐ Between 18 and 30 years
- ☐ Between 31 and 40 years
- ☐ Between 41 and 50 years
- ☐ Between 51 and 60 years
- ☐ Between 61 and 70 years
- ☐ Older than 71 years
- ☐ Prefer not to say

3. What is your current occupation? (state occupation) \_\_\_\_\_

4. How are you employed? (Tick appropriate answer)

- ☐ Full-time
- ☐ Part-time
- ☐ Retired
- ☐ Unemployed
- ☐ Prefer not to say

5. What is your highest level of education? (Tick appropriate answer)

- ☐ Grade 10
- ☐ Grade 12
- ☐ Trade qualification or Diploma
- ☐ Degree
- ☐ Postgraduate qualification
- ☐ Prefer not to say

6. How much do you earn? (Tick appropriate answer)

- ☐ Less than \$40,000 a year
- ☐ Between \$40,000 and \$60,000 a year
- ☐ Between \$60,000 and \$80,000 a year
- ☐ Between \$80,000 and \$100,000 a year
- ☐ Between \$100,000 and \$120,000 a year
- ☐ Greater than \$120,000 a year
- ☐ Prefer not to say

7. Where are you travelling to on this journey? (state destination or destinations) \_\_\_\_\_

### Section B: Why did you use the travel health advisory service at this pharmacy?

We are interested to find out why you chose to use the travel health advisory service at this pharmacy.

8. Why did you choose to use the travel health advisory service at this pharmacy to obtain advice for your journey? (Tick all answers that apply)

- ☐ The service was recommended to me      If so, state who recommended the service \_\_\_\_\_
- ☐ It was more convenient to come to the pharmacy than go elsewhere for advice
- ☐ I would not normally get travel health advice before a journey but saw the service advertised and thought I would try it
- ☐ It was easier to come to the pharmacy than get an appointment with my doctor
- ☐ My doctor does not offer a travel health service
- ☐ Other      (State reason) \_\_\_\_\_

9. BEFORE speaking to the pharmacist, did you get any travel health advice for your journey from any other sources? (Tick appropriate answer)

- ☐ No
- ☐ Yes      If Yes, where did you get that travel health advice from? (Tick all answers that apply)
  - ☐ Books
  - ☐ Internet
  - ☐ Travel clinic
  - ☐ Your GP
  - ☐ A Pharmacist
  - ☐ Travel agent
  - ☐ Family or friends
  - ☐ Magazines

10. AFTER speaking to the pharmacist, will you now try to get more travel health advice before your journey from another source?

☐ No

☐ Yes If Yes, where will you try to get more travel health advice from? (Tick all answers that apply)

- ☐ Books
- ☐ Internet
- ☐ Travel clinic
- ☐ Your GP
- ☐ A Pharmacist
- ☐ Travel agent
- ☐ Family or friends
- ☐ Magazines

If Yes, why will you get more travel health advice after speaking to the pharmacist? (Tick all answers that apply)

- ☐ The pharmacist recommended for me to visit a doctor for some vaccinations or medicines they could not supply without prescription
- ☐ I would like a second opinion and so will seek further advice
- ☐ The pharmacist did not answer all of my questions
- ☐ The advice the pharmacist gave was poor
- ☐ Other reason (State reason) \_\_\_\_\_

### Section C: How useful was this service?

We are interested to find out what you thought of the travel health advisory service at this pharmacy. was it useful and how do you think it could be improved?

11. We would like you to give an OVERALL score for the travel health advice service at this pharmacy. Using a scale from 1 to 10 where 1 (lowest score) is a very poor service and 10 (highest score) is an excellent service give your overall score for the travel health advisory service at the pharmacy. (Place a tick in the appropriate box below)

Overall Score	1 Very Poor	2	3	4	5	6	7	8	9	10 Excellent

12. Rate the QUALITY of the advice you were given at this pharmacy? (Tick appropriate answer)

- ☐ 1. Very high quality
- ☐ 2. Good quality
- ☐ 3. Just acceptable
- ☐ 4. Poor quality
- ☐ 5. Very poor quality

13. How USEFUL was the advice you were given at this pharmacy? (Tick appropriate answer)

- ☐ 1. Very Useful
- ☐ 2. Useful
- ☐ 3. Slightly useful
- ☐ 4. Useless
- ☐ 5. Totally useless

14. Read the following statements about the travel health advisory service at this pharmacy and using the attached scale (1 - Strongly agree, 2 - Agree, 3 - Neither agree nor disagree, 4 - Disagree and 5 - Strongly disagree) rate each statement as to whether you agree or disagree with the statement. These statements are about the interview you had with the pharmacist.

Statement	Tick appropriate box				
	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
a) The interview with the pharmacist took too long. I would have liked a shorter interview.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
b) The pharmacist asked too many questions.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
c) The pharmacist was very professional when he/she interviewed me.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
d) The pharmacist had a good interview technique and a pleasant manner.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
e) It was difficult to remember all of the information I needed to answer the pharmacist's questions.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
f) I felt comfortable answering all of the pharmacist's questions. None of the questions were too personal or intrusive.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
g) I was happy with the level of privacy in the pharmacy.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
h) I was happy that all of the information I gave the pharmacist would be confidential.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree

15. Read the following statements about the travel health advisory service at this pharmacy and using the attached scale (1 - Strongly agree, 2 - Agree, 3 - Neither agree nor disagree, 4 - Disagree and 5 - Strongly disagree) rate each statement as to whether you agree or disagree with the statement. These statements are about the information that the pharmacist gave you.

Statement	Tick appropriate box				
	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
a) I was confident that all of the information that the pharmacist gave me was correct and up to date.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
b) I could understand everything that the pharmacist told me.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
c) The pharmacist told me too much, I was swamped with too much information.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
d) The pharmacist took too long in explaining what I needed to know.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
e) I do not need to know about many of the things the pharmacist explained.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
f) I was given too much written information.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
g) The written information given was clear, concise and easy to understand.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
h) The written information will be useful when I go away, as I may have forgotten some of the information that the pharmacist told me before I go.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
i) The information I received from the travel health advisory service is of a high quality	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree

16. Read the following statements about the travel health advisory service at this pharmacy and using the attached scale (1 - Strongly agree, 2 - Agree, 3 - Neither agree nor disagree, 4 - Disagree and 5 - Strongly disagree) rate each statement as to whether you agree or disagree with the statement. These statements are about whether you agree or disagree that pharmacies should offer services like this.

Statement	Tick appropriate box				
	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
a) Pharmacies should not provide travel health services. It is not an appropriate role for pharmacists.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
b) I am just as happy and confident to see a pharmacist for travel health advice as see my doctor.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
c) Some travellers do not see a doctor before they travel because they think they are not at risk of health problems. The pharmacist can help these travellers decide whether they need to visit the doctor for a vaccination before they travel.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
d) Pharmacists can advise travellers on what medications to take with them on their journey.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
e) Pharmacists need more training to give travel health advice. They do not know enough about travel health risks.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
f) Pharmacies would be able to offer better travel health services if the traveller could also get vaccinations and malaria tablets at the pharmacy without having to see a doctor.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
g) More pharmacies should offer travel health advisory services.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree
h) This service was more convenient than making an appointment to see my doctor.	1 Strongly agree	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Strongly disagree

17. Have you ever obtained travel health advice for any PREVIOUS journeys? (Tick appropriate answer)

☐ Yes      If Yes, where did you get that travel health advice from? (Tick all answers that apply)

- ☐ Books
- ☐ Internet
- ☐ Travel clinic
- ☐ Your GP
- ☐ A Pharmacist
- ☐ Travel agent
- ☐ Family or friends
- ☐ Magazines

☐ No      If No, why did you not get any travel health advice before any previous journeys? (state reason or reasons) \_\_\_\_\_

(If you have answered No to question 17, jump to question 20)

18. How does the QUALITY of the advice you were given for any PREVIOUS journeys compare with the advice you have been given in this pharmacy? (Tick appropriate answer)

- ☐ 1. Far better than the advice given in this pharmacy
- ☐ 2. Better than the advice given in this pharmacy
- ☐ 3. Similar to the advice given in this pharmacy
- ☐ 4. Poorer than the advice given in this pharmacy
- ☐ 5. Far poorer than the advice given in this pharmacy

19. Was the advice you were given for any PREVIOUS journeys more USEFUL than the advice you have been given in this pharmacy? (Tick appropriate answer)

- ☐ 1. Much more useful than the advice given in this pharmacy
- ☐ 2. More useful than the advice given in this pharmacy
- ☐ 3. Similar to the advice given in this pharmacy
- ☐ 4. Useless compared to the advice given in this pharmacy
- ☐ 5. Totally useless compared to the advice given in this pharmacy

20. Would you use the travel health advisory service at this pharmacy again? (Tick appropriate answer)

- ☐ Yes
- ☐ No      If No, why would you not use the service again (state reasons) \_\_\_\_\_

21. Would you recommend the travel health advisory service at this pharmacy to others? (Tick appropriate answer)

- ☐ Yes
- ☐ No      If No, why would you not recommend the service to others? (state reasons) \_\_\_\_\_



22. This is a study organised by James Cook University and therefore the service is free. In future would you be willing to pay for this service? (Tick appropriate answer)

- ☐ Yes
- ☐ No      If No, why would you not be willing to pay for this service? (state reasons)

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23. If you were willing to pay for this service, what would you consider to be an appropriate payment for the service you have received? (Tick appropriate answer)

- ☐ \$10
- ☐ \$20
- ☐ \$30
- ☐ \$50
- ☐ \$75
- ☐ \$100
- ☐ \$150
- ☐ Greater than \$150
- ☐ Not willing to pay for this service

24. Finally, would you like to make any comments about the travel health advisory service available from this pharmacy? (Write your comments below)

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**Thank you for completing this survey. If you wish to take part in a draw to win one of two Apple iPods please complete the attached form.**



## Post-Counselling Survey

### Prize Draw

Thank you for completing the attached survey. If you wish to participate in a prize draw to win one of two Apple iPods then please complete your details below.

**Please note:** So that your answers to the survey will remain anonymous, this slip will be separated from the completed survey before the survey is given to the researcher at James Cook University.

The prize winners will be notified by post in September 2010.

Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Post Code: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

### Post-Counselling Interviews

As part of the evaluation of the travel health advisory service, it would be useful to interview a small number of travellers. These volunteers will be asked a series of more in depth questions and the interviews will take approximately 15 minutes. The interviews will be carried out over the telephone and with your permission the interview would be audio taped.

Would you be interested in volunteering to participate in one of these interviews?

(Please tick to indicate consent)

I consent to be contacted by telephone to be interviewed	<input type="checkbox"/> Yes	<input type="checkbox"/> No
I consent for the interview to be audio taped	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Name: <i>(printed)</i>	
Signature:	Date:

Please note:

- If you are not willing to be interviewed your entry will still be included in the prize draw.
- Only a small number of volunteers will be interviewed and a random sample will be chosen, therefore you may not be contacted
- If your name is selected and you are contacted, you will be asked again on the telephone whether you still agree to be interviewed and whether you give consent for the interview to be audio taped. If you say that you no longer wish to be interviewed, your right not to participate in the interview will be respected and the interviewer will terminate the interview.

Appendix 6.16: APharmTHAS™ level 2 client post-travel questionnaire and participant information leaflet

## INFORMATION SHEET

### **A review and evaluation of a travel health advisory service operated from a community pharmacy in north Queensland. Post-Travel Questionnaire (Traveller)**

Every year many people travel away from home and whilst they are away, many travellers place themselves at risk of accidents or health problems. Yet many travellers do not get any health advice before travelling. You are invited to take part in a research project that will review a travel health advisory service that is being run from a community pharmacy. The advisory service is designed to offer advice to travellers who would not normally obtain travel-related health advice from any other source before they travel. Again, we would like you to give us your views about the service and counselling you have received, but we would like you to now give us your views on how useful you found the counselling that you were given after you have completed your journey. The study is being conducted by Ian Heslop and will contribute to his doctoral thesis in the Doctor of Public Health program at James Cook University.

If you agree to be involved in the study, we would like you to complete the attached questionnaire after you have completed your journey. The questionnaire should only take approximately 5 to 10 minutes of your time and asks you to report any health problems you had whilst you were travelling and how useful you found the advice given by the pharmacist before your departure. We would like you to complete the questionnaire when you return home and post the questionnaire to us in the stamped addressed envelope provided.

Taking part in this study is completely voluntary and you can stop taking part in the study at any time without explanation or prejudice. You may also withdraw any unprocessed data from the study.

Your responses will be strictly confidential. The data from the study will be used in research publications, the investigator's Doctoral thesis and in reports to the School of Pharmacy & Molecular Sciences, James Cook University. You will not be identified in any way in these publications.

If you wish to participate in a prize draw to win an Apple iPod, complete your contact details at the end of the questionnaire. Please note: To maintain your anonymity the envelope will be opened by an Administration Officer of the School of Pharmacy & Molecular Sciences at James Cook University and your contact details will be separated from the completed questionnaire before it is given to the investigator. If you win the Apple iPod it will be sent to your postal address.

As part of the evaluation of the travel health advisory service, it would be useful to interview a small number of people who have completed this questionnaire. These volunteers will be contacted at a later date and asked a series of more in depth questions and the interviews will take approximately 15 minutes. The interviews will be carried out over the telephone and with your permission, the interview would be audio taped. Taking part in the interview is again completely confidential and anonymous. If you consent to be contacted at a later date to participate in an interview then complete the final section of the questionnaire. If you do not consent to be interviewed your entry will still be included in the prize draw.

If you have any questions about the study, please contact Ian Heslop, Prof Beverley Glass, Dr Michelle Bellingan or Prof Richard Speare

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**Ian Heslop**  
**Associate Professor - Pharmacy**  
**School of Pharmacy & Molecular Sciences**  
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Cairns - Townsville - Brisbane - Singapore  
CRICOS Provider Code 00117J



Traveller Study Number (To be assigned by JCU)

C

### Post-Travel Survey (CONFIDENTIAL)



We would like to find out whether the travellers who used the travel health advisory service at this pharmacy experienced any health problems on their journey, and if so how they treated them. Please complete this survey when you return from your journey and post it to James Cook University in the stamped addressed envelope provided. If you wish to be included in another draw to win an Apple iPod also add your contact details to the last page. So that you will remain anonymous, this page will be separated from your completed survey before it is given to the researcher.

#### Section A: Some questions about yourself

These are questions about yourself. You will not be identified from the answers to these questions but they will give us some background information about the travellers using the service. If you prefer us not to know the answer to a question then just tick the "prefer not to say" box or leave the space blank.

1. What is your gender? (Tick appropriate answer)

- ☐ Male
- ☐ Female

2. What is your age? (Tick appropriate answer)

- ☐ Between 18 and 30 years
- ☐ Between 31 and 40 years
- ☐ Between 41 and 50 years
- ☐ Between 51 and 60 years
- ☐ Between 61 and 70 years
- ☐ Older than 71 years
- ☐ Prefer not to say

3. What was your main destination? \_\_\_\_\_

4. How long were you at your main destination? \_\_\_\_\_ days

5. Did you stop anywhere on the way to your main destination? (Tick appropriate answer)

- ☐ No
- ☐ Yes If Yes, where did you transit? (State place) \_\_\_\_\_  
How long were you at your transit destination? \_\_\_\_\_ days

6. What is the reason for your journey? (Tick appropriate answer)

- ☐ Holiday or Leisure
- ☐ Business or work
- ☐ Visiting relatives and friends
- ☐ Education
- ☐ Religious reasons
- ☐ Other – please state reason \_\_\_\_\_

7. What type of areas did you visit at your main destination? (Tick all that apply)

- ☐ Major towns or cities
- ☐ Tourist resort
- ☐ Rural or remote areas
- ☐ Stayed with friends or relatives
- ☐ Other (state) \_\_\_\_\_

8. What was the standard of your accommodation at your main destination? (Tick all that apply)

- ☐ Medium to high standard tourist resorts or hotels
- ☐ Lower standard tourist resorts or hotels
- ☐ Backpacker hostels or similar accommodation
- ☐ Staying with relatives or friends
- ☐ Camping

9. When did you go on your journey? (State month of departure) \_\_\_\_\_

10. What activities did you do on your journey? (List the main activities that you did. Include activities that you may consider to be "safe" as well as those that you think of as "risky")

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### Section B: Some questions about any health problems that you had during your journey.

We are interested in the types of health problems (if any) travellers have on their journey. We would like you to answer the questions below and tell us about any health problems you had whilst overseas. Please report all health problems you experienced while you were away from home, no matter how trivial they may have appeared.

11. Did you have any health problems during your journey? (Tick appropriate answer)

- ☐ Yes If Yes, go to question 12.
- ☐ No If No, go to question 14

12. What affect did your health problems have on your journey? (Tick the most appropriate answer)

- ☐ No affect, I could complete all of the activities I had planned without disruption
- ☐ Minor affect, I did most of the activities I had planned, there was only a minor disruption to my journey
- ☐ Moderate affect, I stayed at my accommodation for a day or two until the symptoms subsided.
- ☐ Major affect, I had to go to hospital
- ☐ Very severe affect, I had to go to hospital and/or return home early.

13. If you answered Yes to question 11, and you had health problems during your journey. Please complete this table by completing the appropriate boxes and giving details of:

- The name of any illness you had (no matter how minor the illness seemed).
- How severe you thought the illness was by grading the symptoms from a scale of 1 to 5, where 1 is a very minor illness and 5 is very severe illness.
- How you managed the illness?

The table contains two examples to show you how to complete the table:

Number	Name of illness	How severe was the illness? (Tick appropriate box)					How did you manage the illness?
		1 Very minor illness	2	3	4	5 Very severe illness	
1		1	2	3	4	5	
2		1	2	3	4	5	
3		1	2	3	4	5	
4		1	2	3	4	5	
5		1	2	3	4	5	
6		1	2	3	4	5	
Example 1	<i>Common Cold</i>	1	2 ✓	3	4	5	<i>Symptoms weren't bad so just took some Paracetamol that I had brought with me</i>
Example 2	<i>Twisted ankle while skiing (very painful, I thought it was broken)</i>	1	2	3	4 ✓	5	<i>Went to local hospital for X-ray to check it wasn't broken. Doctor gave me a prescription for pain killers (I think they were called Voltarol) which I got from a local chemist</i>



**Section C: Some questions about the health care services that you may have used on your journey**

14. Did you use any healthcare services at your travel destination? (Tick all appropriate answers)

- ☐ No                      If No, go to question 20
- ☐ Yes                      If Yes, which healthcare services did you use? (Tick all answers that apply)
- ☐ General Practitioner
- ☐ Hospital
- ☐ Community Pharmacist
- ☐ Dentist
- ☐ Other                      (State) \_\_\_\_\_

15. Approximately (in Australian dollars) how much did you spend on healthcare during your journey? (Write the approximate total cost below, including the costs of medicines, surgery and any fees charged by health professionals)

\$ \_\_\_\_\_

16. Who paid for your healthcare? (Tick appropriate answer)

- ☐ I (or my family) paid the full cost
- ☐ My travel insurance paid the full cost
- ☐ My travel insurance paid a portion of the cost                      (If so, state the approximate percentage of the costs paid by the travel insurance company \_\_\_\_\_%)
- ☐ Other                      (state) \_\_\_\_\_

17. How would you rate the quality of the healthcare you received during your journey? Using a scale from 1 to 10 where 1 (lowest score) is a very poor service and 10 (highest score) is an excellent service, give your score for the quality of the healthcare you received. (Place a tick in the appropriate box below)

What was the quality of the healthcare received during your journey?	<b>1</b> Very poor service	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b> Excellent service
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18. Would you say that the healthcare that you received during your journey was comparable with the healthcare that you would have received at home? Using the scale from 1 to 5 where 1 (lowest score) is a much poorer service than you would receive at home, and 5 (highest score) is a far superior service than you would receive at home, give your score on how you thought the healthcare received during your journey compared. (Place a tick in the appropriate box below).

How does the healthcare you received during your journey compare with the healthcare you would have received at home?	<b>1</b> Much poorer than the healthcare at home	<b>2</b> Poorer than the healthcare at home	<b>3</b> Exactly the same as the healthcare at home	<b>4</b> Superior to the healthcare at home	<b>5</b> Far superior to the healthcare at home
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19. Do you have any comments about the healthcare you received on your journey?

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**Section D: How useful was the pre-travel advice that you received from this pharmacy on your journey?**

You received travel advice from this pharmacy before your journey. Now that you have completed your journey, we would like to find out if you found the advice useful.

20. Did you use any of the information given to you by the travel health advisory service from this pharmacy while you were on your journey?

- ☐ No  
☐ Yes

If Yes, what were the most useful pieces of information you were given? \_\_\_\_\_

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21. When you visited the pharmacy before your journey, you were given a MASTA health brief and an AParmTHAS booklet. Which of the following information leaflets did you read and find useful on your journey? (Tick all that apply)

- ☐ MASTA health brief for your itinerary  
☐ AParmTHAS booklet section on travellers' diarrhoea  
☐ AParmTHAS booklet section on insect bite prevention  
☐ AParmTHAS booklet section on malaria  
☐ AParmTHAS booklet section on travel sickness  
☐ AParmTHAS booklet section on venous thromboembolism (VTE)  
☐ AParmTHAS booklet section on travelling with medicines  
☐ AParmTHAS booklet section on first aid kits for travellers

22. How useful was the written information you were given by the pharmacy? Read the following statements and using the attached scale (1 - Strongly agree, 2 - Agree, 3 - Neither agree nor disagree, 4 - Disagree and 5 - Strongly disagree) rate each statement as you whether to agree or disagree with the statement.

Statement	Tick appropriate box				
The written material provided was relevant and useful for my journey.	1. Strongly agree	2. Agree	3. Neither agree nor disagree	4. Disagree	5. Strongly disagree
The written material provided increased my knowledge about travel-related health risks.	1. Strongly agree	2. Agree	3. Neither agree nor disagree	4. Disagree	5. Strongly disagree
After reading the written material, I understood what precautions to take to prevent health problems on my journey.	1. Strongly agree	2. Agree	3. Neither agree nor disagree	4. Disagree	5. Strongly disagree
The written material helped me feel more confident about dealing with health problems while on my journey.	1. Strongly agree	2. Agree	3. Neither agree nor disagree	4. Disagree	5. Strongly disagree
After reading the written material I felt that I was better prepared for my journey	1. Strongly agree	2. Agree	3. Neither agree nor disagree	4. Disagree	5. Strongly disagree
The information was presented in a logical manner	1. Strongly agree	2. Agree	3. Neither agree nor disagree	4. Disagree	5. Strongly disagree
I followed the precautions suggested in the written material	1. Strongly agree	2. Agree	3. Neither agree nor disagree	4. Disagree	5. Strongly disagree

23. Do you think that any of the information you were given by the pharmacy altered how you behaved on your journey or any precautions that you took while on your journey?

- ☐ Yes  
☐ No

24. If you answered Yes to question 21, how did the information alter your behaviour? If you answered No to question 21, why did the information not alter your behaviour?

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25. Do you have any other comments about the information you were given about your journey? Write any comments below:

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**Section E: What medications did you take with you on your journey and what medications did you buy while on your journey?**

Finally, we are interested to know what medicines people take on journeys with them and what medicines people buy when they are travelling.

26. Read the list of common types of medicines below and tick any of the medicines that you took with you on your journey and any medicines that you bought on your journey:

Type of medicine	Tick this box if you took this medicine with you on your journey	Tick this box if you bought this medicine while you were on your journey
Your regular medicines (for any long term conditions)		
Antidiarrhoea medicines		
Antacids or indigestion remedies		
Analgesics or pain killers		
Cough or cold remedies		
Antihistamines		
Sunscreens		
Antibiotics		
Antimalarial tablets		
Sleeping tablets		
Laxatives		
Inhalers		
Oral contraceptives		
Complementary medicines such as herbal or homeopathic remedies		
Creams or ointments		
First Aid Kit		
Insect repellent		
Sharps kit (containing sterile needles and syringes for emergencies)		
Antiseptic solution, cream or ointment		
Condoms		
Thermometer		
Dressings		

27. Did you take any medicines that are not listed above on your journey? If so, list what additional medicines you took with you on your journey:

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28. Did you buy any medicines that are not listed above on your journey? If so, list what additional medicines you bought while on your journey?

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29. Did you have any concerns about taking medicines with you on your journey?

☐ No

☐ Yes If Yes, what were your concerns? (state your concerns)

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30. Did you have any concerns about buying medicines at your destination?

☐ No

☐ Yes If Yes, what were your concerns? (state your concerns)

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**Thank you for completing this survey.**

**Please place the completed survey in the stamped addressed envelope and post the survey to James Cook University.**

**If you wish to take part in a draw to win one of two Apple iPods please complete the attached form.**



## Post-Travel Survey

### Prize Draw

Thank you for completing the attached survey. If you wish to participate in a prize draw to win one of two Apple iPods then please complete your details below.

**Please note:** So that your answers to the survey will remain anonymous, this slip will be separated from the completed survey before the survey is given to the researcher at James Cook University.

The prize winners will be notified by post in September 2010.

Name: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Post Code: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

#### Post-travel Interviews

As part of the evaluation of the travel health advisory service, it would be useful to interview a small number of travellers. These volunteers will be asked a series of more in depth questions and the interviews will take approximately 15 minutes. The interviews will be carried out over the telephone and with your permission the interview would be audio taped.

Would you be interested in volunteering to participate in one of these interviews?

(Please tick to indicate consent)

I consent to be contacted by telephone to be interviewed	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
I consent for the interview to be audio taped	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No

Name: <i>(printed)</i>	
Signature:	Date:

Please note:

- If you are not willing to be interviewed your entry will still be included in the prize draw.
- Only a small number of volunteers will be interviewed and a random sample will be chosen, therefore you may not be contacted
- If your name is selected and you are contacted, you will be asked again on the telephone whether you still agree to be interviewed and whether you give consent for the interview to be audio taped. If you say that you no longer wish to be interviewed, your right not to participate in the interview will be respected and the interviewer will terminate the interview.

Appendix 6.17: Participant information leaflet, consent form and interview schedule for the pharmacist APharmTHAS™ evaluation interviews



## INFORMATION SHEET

### **A review and evaluation of a travel health advisory service operated from a community pharmacy in north Queensland. Participating Pharmacist Interview**

Every year many people travel away from home and whilst they are away, many travellers place themselves at risk of accidents or health problems. Yet many travellers do not get any health advice before travelling. You have been participating in a research project that has been reviewing a travel health advisory service at the community pharmacy where you work. As one of the final evaluations of the service we would like you to give us your views about the service, what you thought was good about the service and/or how you think the service could be improved. This study is being conducted by Ian Heslop and will contribute to his doctoral thesis in the Doctor of Public Health program at James Cook University.

If you agree to be involved in this part of the study, you will be invited to take part in an interview. The interview, with your consent, will be audio-taped, and should only take approximately 15-30 minutes of your time. The focus group will be conducted at the School of Pharmacy and Molecular Sciences at James Cook University.

Taking part in this study is completely voluntary and you can stop taking part in the study at any time without explanation or prejudice.

Your comments will be totally confidential and any data collected will be de-identified so that you cannot be identified in any publication produced from the data obtained from this study.

The data from the study will be used in research publications, the investigator's doctoral thesis and reports to the School of pharmacy & Molecular Sciences, James Cook University. As mentioned above, you will not be identified in any way in these publications.

If you have any questions about the study, please contact Ian Heslop, Prof Beverley Glass, Dr Michelle Bellingan or Prof Richard Speare

**Principal Investigator:**  
**Ian Heslop**  
**Associate Professor - Pharmacy**  
**School of Pharmacy & Molecular Sciences**  
**James Cook University**  
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**Supervisors: Prof B Glass, Dr M Bellingan & Prof R Speare**  
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**[richard.speare@jcu.edu.au](mailto:richard.speare@jcu.edu.au)**

*If you have any concerns regarding the ethical conduct of the study, please contact:*  
*Tina Langford, Ethics Officer, Research Office, James Cook University,*  
*Townsville, Qld, 4811. Phone: 4781 4342, [Tina.Langford@jcu.edu.au](mailto:Tina.Langford@jcu.edu.au)*

Cairns - Townsville - Brisbane - Singapore  
CRICOS Provider Code 00117J

### INFORMED CONSENT FORM

PRINCIPAL INVESTIGATOR	Ian Heslop
PROJECT TITLE:	<b>A review and evaluation of a travel health advisory service operated from a community pharmacy in north Queensland. Participating Pharmacist Interview</b>
SCHOOL	<b>Pharmacy &amp; Molecular Sciences</b>

I understand the aim of this research study is to review and evaluate a travel health advisory service at the community pharmacy where I work. I understand that I will be participating in an interview where I will discuss my views of the service, what I thought was good about the service, and/or how I feel that the service could be improved. I consent to participate in this project, the details of which have been explained to me, and I have been provided with a written information sheet to keep.

I understand that my participation will involve an interview and I agree that the researcher may use the results as described in the information sheet.

I acknowledge that:

- any risks and possible effects of participating in the interview have been explained to my satisfaction;
- taking part in this study is voluntary and I am aware that I can stop taking part in it at any time without explanation or prejudice and to withdraw any unprocessed data I have provided;
- that any information I give will be kept strictly confidential and that no names will be used to identify me with this study without my approval;

(Please tick to indicate consent)

I consent to participate in an interview

☐

Yes

☐

No

I consent for the interview to be audio taped

☐

Yes

☐

No

Name: (printed)	
Signature:	Date:

**A review and evaluation of a travel health advisory service operated from a community pharmacy in north Queensland. Participating Pharmacist Interview.**

**Interview Data Collection Template**

Date:

Start Time:

Stop Time:

Interviewer: Ian Heslop

Venue: Interview Room 1, Building 47, James Cook University.

**Interviewer Notes**

- The interview should last no more than 15-30mins today. During the interview I would like to obtain your views on the travel health advisory service that was established at Amcal Robert Poole's Pharmacy, Fairfield Central.
- My role is to act as your interviewer today. You will not offend me, whatever opinions you give. I am interested in hearing your point of view even if it disagrees with mine.
- It is my role to keep the discussion focussed on the topics we are here to discuss, and so during the interview I may need to move the discussion along so that we can cover all of the items but it is also important that you give your honest opinion of the service.
- It is important that confidentiality is maintained and so your comments will be de-identified.
- With your permission I will be audiotape the discussion, because I don't want to miss any comments. It is important for you to realise that no names will be attached to the report or any publications. You may be assured of complete confidentiality in the report and publications.

Question	Responses	Key Issues
<p>1. General questions about Pharmacies offering travel health services:</p> <p>a. Is there a role for Pharmacists in travel health? And if so, what is their most appropriate role?</p> <p>b. Do you think that travel health services are commercially viable from pharmacies? If not, why are they not viable and what could be done to make them viable?</p>		

<p>2. AParmTHAS service – general questions</p> <p>a. Overall how did you rate the quality of the service and its resources?</p> <p>b. Did you feel adequately trained to provide the service and were you professionally comfortable providing the service?</p> <p>c. Do you think that privacy was an issue when interviewing and counselling the traveller? Was the traveller comfortable with how they were interviewed and the environment where it was done?</p> <p>d. There were two types of enquiry (simple enquiry and full assessment), which do you feel is the most viable from a pharmacy and why?</p> <p>e. Do you think this is a commercially viable model for a pharmacy-run travel health service?</p> <p>f. What other services should be added to this model to make it more viable (antimalarials, antibiotics and vaccinations)?</p>		
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<p>3. The Initial Enquiry Form</p> <p>a. Was it useful to have the traveller to complete this form prior to interview?</p> <p>b. Did it help you prepare for the interview or did it just duplicate the questions that would be asked in the interview?</p> <p>c. How can it be adapted or improved (Are there other questions that should be added etc) to make it more useful?</p>		
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<p>4. Do you have any comments about the interview schedule (such as):</p> <p>a. Was it too long or short?</p> <p>b. Were there questions that should be added or removed?</p> <p>c. Were the vaccination history and medication history tables useful?</p> <p>d. Did the interview schedule highlight all of the travel-related risk factors and issues?</p> <p>e. What was good about the interview schedule and what was poor or should or could be improved?</p> <p>f. Would it be better to use an electronic interview schedule?</p>		
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<p>5. MASTA resources</p> <p>a. Was the MASTA website easy to use, did it provide you with the information that you required to counsel the patient?</p> <p>b. Did you find the MASTA traveller's health brief useful when counselling patients?</p> <p>c. Could the MASTA health briefs be improved – if so how?</p> <p>d. Did you use any other resources and how did they compare with the MASTA resources?</p>		
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<p>6. APharmTHAS leaflets</p> <p>a. Were the leaflets useful when counselling travellers?</p> <p>b. Are there any other topics that should be included in the leaflets?</p> <p>c. What was good/bad about the leaflets, how could they be improved?</p>		
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<p>7. Referral letter</p> <p>a. Was the referral letter useful?</p> <p>b. Could it be improved?</p> <p>c. Should pharmacists refer travellers and if so which travellers should be referred?</p>		
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<p>8. Counselling</p> <p>a. Was the counselling checklist useful?</p> <p>b. Was there sufficient time to adequately counsel the traveller?</p> <p>c. Were there topics that you always counselled the traveller on and were there topics you avoided (and if so which and why?)</p> <p>d. Are there any materials or resources we could add which would help with the counselling of travellers?</p> <p>e. Could the checklist be improved?</p>		
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<p>9. Did you do any post-travel assessments and interviews? If so do you have any comments regarding the post-travel assessment and referral tools, were they useful or could they be improved?</p>		
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<p>10. Do you think that the travellers you assessed valued the service?</p> <p>a. What informal feedback were you given?</p> <p>b. Would they pay for the service?</p> <p>c. How much do you think that they will be willing to pay?</p> <p>d. How much do you think they should pay?</p>		

<p>11. Would you be happy to assess and counsel travellers over the telephone or use other technologies such as e-mail or the internet? If yes or no, what problems would this cause and how could they be resolved?</p>		



12. Finally, Do you have any suggestions or comments about the APharmTHAS model? How should the model be altered or improved?

## **Appendix 7: Articles on the topic of travel health published during candidature**

### Appendix 7.1: Travel health article in Australian Pharmacist

Heslop I. Health Promotion: Travel health. Australian Pharmacist 2012; Feb: 120-126

## HEALTH PROMOTION

The articles in this series are independently researched and compiled by PSA commissioned authors and peer reviewed.

Continuing Professional Development



## Travel health

By Associate Professor Ian Heslop

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