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**RESPONDING TO LOCAL NEEDS:  
IMPLEMENTING RESEARCH AND  
EVALUATION IN GENERAL PRACTICE IN  
NORTH QUEENSLAND**

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**MBBS, MPH, FAFPHM, FRACGP**

**A thesis submitted to the Faculty of Medicine, Health and  
Molecular Sciences, James Cook University, in fulfilment of the  
requirements for the degree of Doctor of Public Health**

**July 2013**

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## Dedication

This thesis is dedicated to the general practitioners and general practice nurses of North Queensland.

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## ABSTRACT

### **RESPONDING TO LOCAL NEEDS: Implementing research and evaluation in General Practice in North Queensland.**

#### Background

Following the Australian Government's review of its general practice strategy in 1998, policies were implemented to increase the contribution of general practice to health research, and move general practice towards a population based approach to service delivery.

The Primary Health Care Research Evaluation and Development (PHCRED) program was established to enable all Australian University Departments of General Practice to increase research output and build research capacity in primary health care including general practice. The North Queensland Practice-Based Research Network (NQPBRN) was formed by James Cook University (JCU) in 2007 to implement general practice research and build capacity for research and evaluation in the primary health care sector.

At the same time, the Townsville General Practice Network (TGPN) was promoting population health practice and addressing the increasing burden of chronic conditions. Evaluation of TGPN chronic condition management projects provided an opportunity for further research within general practice, and complemented the work of the NQPBRN.

This thesis is based on research and evaluation projects undertaken simultaneously at the author's two workplaces - the JCU Discipline of General Practice and Rural Medicine where she coordinated the NQPBRN, and TGPN where she advised their population health program on chronic condition management. The projects are therefore grouped into two sections: general practice clinical research projects undertaken within the NQPBRN and chronic condition management evaluations completed at TGPN. While completing the projects, the author also gained a broader understanding of the most

appropriate ways to implement and sustain research in general practice settings.

## Aims

1. To design, implement and publish original research undertaken within a network of general practices in North Queensland, and through this build research capacity in general practices in the region.
2. To evaluate chronic condition management projects undertaken by the Townsville General Practice Network population health program.

## Methods

Part One: Projects completed within the North Queensland Practice-Based Research Network.

Three clinical studies were designed and implemented to respond to local needs as identified by the general practitioners (GPs) affiliated with the NQPBRN. Practices were recruited, practice nurses were trained in data collection, and the network coordinator worked closely with practices to ensure projects were completed. Mixed research methods were chosen to suit the clinical questions and the limitations of the general practice setting. The methods used for each study were:

1. GP management of acute otitis externa (AOE) – a descriptive study using medical record audits, prospective data collection including microbiological testing, and a GP survey to explore usual clinical practice. The three components were then compared for validation of outcomes.
2. Evaluation of over 75 years health assessments – a descriptive study based on medical record audits benchmarked against guidelines, and a practice survey of general practitioner and practice nurse attitudes to health assessments.



3. Improving vaccination rates in new parents – this study measured the impact of a practice nurse vaccination intervention, using patient surveys before and after the intervention.

An evaluation of the NQPBRN was performed to assess its progress and inform further development of research studies. The results of the evaluation are included in the discussion and conclusion to Part One.

#### Part Two: Evaluation of chronic condition management projects at TGPN.

Four evaluations were undertaken of chronic condition management projects implemented by the TGPN population health program. The evaluations applied mixed methods as follows:

1. Evaluation of self-management support training for health professionals - this project used semi-structured interviews to explore the application of self-management support by a cohort of health professionals who underwent training with TGPN. Barriers and enablers of self management support were identified.
2. Evaluation of an integrated health care partnership for chronic condition management – this evaluation was done in partnership with Queensland Health and used hospital avoidance data to assess the impact of multi-disciplinary team care planning for frequent re-admissions with chronic conditions. Semi-structured interviews with the team of health professionals were done to ascertain the benefits of the partnership.
3. Evaluation of a rural chronic condition management program – this extension of the integrated health care partnership to a rural town was evaluated using self-reported patient satisfaction surveys before and after the intervention. Health professionals

and patients were interviewed to provide a more detailed understanding of the limitations of the program.

4. Evaluation of a Team Care Arrangement support program – this study was undertaken to assess the impact of an initiative to help practices improve their team care arrangement completion rates. It used practice audits before and after the intervention and semi-structured interviews with practice personnel.

Literature reviews were undertaken to inform the two sections of the thesis. The outcomes of the reviews have been integrated with the NQPBRN evaluation and the author's experience while implementing the projects, to provide a number of conclusions and recommendations for sustainable general practice research and evaluation.

## Results

### Part One. Projects completed within the North Queensland Practice Based Research Network.

1. Management of acute otitis externa (AOE) by general practitioners in North Queensland.

*Pseudomonas aeruginosa* was the most common causative pathogen of AOE in all participating practices; GPs were able to correctly name the most common causative pathogens; there was variation in the use of oral antibiotics between regions (15.8 to 36.6%); ear syringing was commonly used in managing AOE (51.3%); and most patients (68.9%) required only one GP appointment.

2. Evaluating the use of enhanced primary care health assessments by general practices in North Queensland.

Preventive health screening tests were recorded more frequently in patients with a completed health assessment: notably urinalysis, visual acuity and Faecal Occult Blood Test or colonoscopy. Blood pressure was the most frequently recorded test with or without a health assessment. The questionnaires provided useful information on how health

assessments are implemented and showed that GPs believed they can provide more information about their patients' conditions.

3. Are new parents fully vaccinated? An evaluation of a general practice parent vaccination intervention.

Vaccination histories were taken from 117 new parents and recommendations made by a clinician. Catch-up vaccination was recommended for 66.1% (117/177) of parents, and 53% (62/117) complied, resulting in an improvement in up-to-date vaccination status from 33.9% (60/177) to 68.9% (122/177;  $p < 0.0001$ ).

#### Part Two: Evaluation of chronic condition management projects at TGPN.

1. Self-management support capacity (SMS) of providers of chronic condition primary care.

All interviewees rated their understanding of the principles of SMS as moderate or better. In relation to how much they use the principles in their practice, several (5 of 14) said minimally or not at all. The tools they were most likely to use were SMART goals (8 of 14) and decision balance (5 of 14). Core skills used included problem solving (11 of 14), reflective listening (13 of 14), open-ended questions (12 of 14), identifying readiness to change (12 of 14) and goal setting (10 of 14). The most important barriers to implementing SMS were current funding models for health care, lack of space, and staff not interested in change. The most highly rated enabling strategies were more training for general practitioners and practice nurses; the lowest rated strategy was more training for receptionists.

2. A health care partnership for managing chronic conditions: a case study of integrated primary health care.

The evaluation identified positive outcomes from the involvement of a GP liaison team in a Queensland Health chronic condition management team. Better understanding of the Medicare system and improved communication with general practitioners were reported. However, there were some barriers to integration between public and private health care,

most notably the current funding models. Wide consultation before implementing new programs was recommended.

3. Extending the Reach - Integrated chronic condition management in rural Queensland.

Eighteen clients participated in this case conferencing project between hospital and general practice staff. An evaluation showed that clients were generally positive about the case conferencing, reporting greater confidence in managing their condition. Providers expressed diverse opinions of the value of self-management.

4. Evaluation of a team care arrangement (TCA) support program.

Completion rates of TCAs were audited in four general practices. They were 38.75% for the first audit and 40% for the second. One practice increased its completion rate from 30% to 60% while another practice showed a decrease from 40% to 25%. The more successful practice targeted a specific group of patients, gave them more choice of allied health practitioners, and provided clients with more detailed descriptions of the TCA process. Most practices stated that failure to complete TCAs was due to GPs and patients having different goals in the management of their chronic conditions.

## Conclusion

Implementing research and evaluation within general practice requires a commitment from the whole practice team, but delegation of the research tasks to a practice nurse is most effective in maintaining high quality research outcomes. Training and mentoring through practice visits and regular contact is essential. Ideally the research questions should arise through local need and discussion with the practice team. Methods used in practice based research need to be feasible and appropriate to the clinical question, and relevant to the clinical context of general practice.

Successful implementation of CCM programs in general practice requires involvement of the whole practice team and collaboration across sectors.

Divisions of General Practice (and now Medicare Locals) can play an important role in supporting this collaboration and evaluating the impact of programs.

Well-maintained disease registers within practice information systems are a fundamental requirement for effective population health strategies, research and evaluation. Patient empowerment through self-management support and patient-centred care planning are highly desirable components of CCM.

The following recommendations are made to support research and evaluation in general practice settings:

- To engage clinicians in practice based research and evaluation, one should ask clinically relevant questions and include reflection on clinical practice in the methodology.
- Clinicians should make a major contribution to the selection of their research questions and topics.
- Financial, academic and infrastructure support is essential for sustainable practice-based research, particularly to undertake time-consuming tasks such as ethics applications, grant applications, analysis and publication of results.
- Practice based workshops for training and timely dissemination of results are important in maintaining motivation of clinicians to do research.
- Face-to-face practice visits from academic researchers and program staff are an important component of coordinating and sustaining a clinical research and evaluation network.
- Research champions who emerge from clinical practice should be generously supported.

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## Specific Research Questions

- Do general practitioners in north Queensland manage acute otitis externa in accordance with clinical guidelines?
- Do over 75 year old health assessments result in better preventative health care?
- Do opportunistic vaccination reminders in general practice improve adult immunisation rates in general practice?
- How did the practice based research network improve research capacity and confidence amongst general practice staff?
- What are the barriers and enablers to delivering self-management support strategies in chronic condition management?
- What is required for successful integration of chronic condition management programs between general practice and the public sector?
- Does case conferencing between private and public health care providers lead to improved patient satisfaction with their chronic condition care?
- Does training and support for general practice team care arrangement (TCA) systems lead to improved completion rates of TCAs?

## Publications, Awards and Presentations

### Publications from thesis

Cheffins T, Heal C, Rudolph S, Evans R, Veitch C. Acute otitis externa-management by GPs in North Queensland. *Australian Family Physician* 2009; 38(4): 262-266.

Cheffins T, Spillman M, Heal C et al. Evaluating the use of Enhanced Primary Care Health Assessments by general practices in north Queensland. *Australian Journal of Primary Health* 2010;16: 221-223.

Cheffins T, Spillman M, Larkins S, Heal C. Recommending vaccination. General practice intervention with new parents. *Australian Family Physician* 2011;40(6): 437-439.

Cheffins TE, Twomey JA, Grant JA, Larkins SL An evaluation of the self-management support capacity of providers of chronic condition primary care. *Australian Journal of Primary Health* 2011;18(2): 112-115.

### Submitted manuscripts

*Australian Family Physician:*

Fleming R, Cheffins T. Are Team Care Arrangements completed?

*Australian Health Review:*

Cheffins T, Grant J, Dorman K, Larkins S, Waugh H. A health care partnership for managing chronic conditions: A case study of integrated primary care.

Cheffins T, Grant J, Sanoullier A, Street A, Pain T, Larkins S. Extending the Reach -Integrated chronic condition management in rural Queensland.

### Awards and presentations

North Queensland General Practitioner Research Prize for the most outstanding research paper presented at the 2011 North Queensland Conference - "Recommending vaccination: General practice intervention with new parents".

RACGP Prize for the Best Research Paper Published in the *Australian Family Physician* in 2011 - "Recommending vaccination: General practice intervention with new parents".

*Primary Health Care Research Conference, 30 June-2 July 2010, Darwin:*  
Cheffins T., Spillman M. Are new parents fully vaccinated?

*General Practice and Primary Health Care Research Conference, 15-17 July 2009, Melbourne:* Cheffins T., Spillman, M. Evaluating the use of health checks by general practices in North Queensland.

## Abbreviations

ACT	<i>Australian Capital Territory</i>
AGPN	<i>Australian General Practice Network</i>
AIHW	<i>Australian Institute of Health and Welfare</i>
AOE	<i>Acute Otitis Externa</i>
APHCRI	<i>Australian Primary Health Care Research Institute</i>
CDM	<i>Chronic Disease Management</i>
CHIC	<i>Connecting Healthcare in Communities</i>
COPD	<i>Chronic Obstructive Pulmonary Disease</i>
ED	<i>Emergency Department</i>
EPC	<i>Enhanced Primary Care</i>
FOBT	<i>Faecal Occult Blood Test</i>
GP	<i>General Practitioner</i>
GPMP	<i>General Practice Management Plan</i>
HREC	<i>Human Research Ethics Committee</i>
IHCP	<i>Integrated Health Care Partnership</i>
IT	<i>Information Technology</i>
JAG	<i>Joint Advisory Group</i>
JCU	<i>James Cook University</i>
MJA	<i>Medical Journal of Australia</i>
MMR	<i>Measles, Mumps and Rubella</i>
MOU	<i>Memorandum of Understanding</i>
NHS	<i>National Health Service</i>
NQPBRN	<i>North Queensland Practice Based Research Network</i>
NSW	<i>New South Wales</i>
NT	<i>Northern Territory</i>

PACIC	<i>Patient Assessment Chronic Illness Care</i>
PBRN	<i>Practice Based Research Networks</i>
PHC	<i>Primary Health Care</i>
PHCRED	<i>Australian Primary Health Care Research Evaluation and Development.</i>
PN	<i>Practice Nurse</i>
QH	<i>Queensland Health</i>
RACGP	<i>Royal Australian College of General Practitioners</i>
RCT	<i>Randomised Controlled Trial</i>
SA	<i>South Australia</i>
SM	<i>Self Management</i>
SMS	<i>Self Management Support</i>
SPSS	<i>Statistical Package for Social Sciences</i>
TCA	<i>Team Care Arrangements</i>
TGPN	<i>Townsville General Practice Network (now Townsville Mackay Medicare Local)</i>
TRIP	<i>Translation of Research into Practice</i>
UK	<i>United Kingdom</i>
Vic	<i>Victoria</i>
WONCA	<i>World Organisation of Family Doctors</i>

## Chapter Summaries

### Chapter 1 Introduction to General Practice Research Networks in Australia

This introductory chapter explores, through the literature, the role of general practice research networks, reviews the history of research within general practice in Australia, and describes the variety of networks already in existence, before outlining the local network in which this research was undertaken.

Chapters 2 to 4 describe three projects undertaken within the North Queensland Practice Based Research Network.

### Chapter 2 Management of acute otitis externa by General Practitioners in North Queensland

This study evolved from a discussion between local GPs and the Head of the Rural Health Research Unit. It used mixed methods (survey, audits and prospective data collection) to explore GP management of a common clinical condition in North Queensland. The study revealed that with some notable exceptions, GPs manage acute otitis externa in accordance with guidelines. Antibiotic prescribing and use of ear syringing were two areas where clinical practice varied. Results of the three research components were closely aligned.

### Chapter 3 Evaluating the use of Enhanced Primary Care Health Assessments by General Practices in North Queensland

This research was instigated by members of the network, who wanted evidence of the effectiveness of the Enhanced Primary Care health assessment items they were using in their practices. It utilised a practice audit to compare prevention outcomes between two groups of patients, and a survey to explore GP and nurse attitudes towards health assessments. Over 75 years health assessments were associated with higher documented rates of preventive interventions as recommended by the RACGP.

**Chapter 4** Are new parents fully vaccinated? - An evaluation of a general practice parent vaccination intervention.

This research originated in consultation with practice nurses from the NQPBRN, who shared a common interest in immunisation and had developed research skills in previous NQPBRN projects. The study involved vaccination data collection by nurses and follow-up of participants following a recommendation for vaccination. The study showed that a reminder from a practice nurse, to parents presenting with their infants for vaccination, resulted in a doubling of adult “up-to-date” vaccination status.

**Chapter 5** Discussion and conclusion to Part One.

Results of an evaluation of the NQPBRN are presented and the findings related back to the literature review. The evaluation identified a number of critical factors for improving research capacity: training and support for practice nurses; funding for practices to cover staff research time; regular practice visits and early dissemination of results.

The research capacity building initiatives undertaken within the NQPBRN are also described.

**Chapter 6** Introduction to Part Two .

This introductory chapter for Part Two of the thesis discusses how the discipline of general practice has traditionally focussed on the acute primary health care of individuals and their families. However, as the prevention and long-term management of chronic conditions has emerged as a significant part of medical practice, general practice has adopted a more systematic and continuing approach to providing health care. The chapter uses a literature review to explore how general practice can use population health strategies to manage chronic conditions.

Chapters 7 to 10 outline four evaluation projects conducted through TGPN to strengthen population health capacity and chronic condition management in the region.

**Chapter 7** Self-management support capacity of providers of chronic condition primary care in north Queensland.

This evaluation of self-management training given by TGPN to primary health care service providers was designed to identify barriers and enablers for self-management. The evaluation consisted of questionnaires at the time of training, and telephone interviews several months after completion of training. It showed that health professionals working in primary health care face barriers to the use of self-management strategies including funding models that don't support chronic condition care

**Chapter 8** A healthcare partnership for managing chronic conditions: a case study of integrated primary care.

This evaluation of an intervention which added a General Practice Liaison component to an existing chronic condition management program within Queensland Health(QH) involved telephone interviews with QH and TGPN team members. TGPN implemented the GP liaison role, employing a GP and nurse to advise the QH Integrated Health Care Partnership (IHCP) allied health team. The evaluation showed that multi-disciplinary chronic condition programs in the public sector can reduce hospital admissions, but the integration of these programs with the private sector remains problematic. The presence of a GP liaison person within such a program is a positive way to overcome barriers.

**Chapter 9** Extending the Reach - Integrated chronic condition management in rural Queensland.

This evaluation was undertaken in a rural community within the Townsville Health Service District. Patients with early re-admission to hospital for a chronic condition were the target

group. Case conferencing between public and private medical service providers was evaluated using patient questionnaires and face-to-face interviews with the providers. The evaluation showed that in rural settings, integration between the private and public sectors can be achieved through structured case conferencing and careful selection of patients, leading to higher patient satisfaction.

#### Chapter 10 Effectiveness of a Team Care Arrangement support program.

This evaluation was conducted in collaboration with a project officer at TGNP. It was an evaluation of a program designed to improve the completion rate of team care arrangements (TCAs) developed by GPs for patients with chronic conditions. It involved audits of medical records to assess whether the patients completed the allied health visits as recommended by their GP in a TCA. The audits were done before and after an education and support program was implemented with the GPs. The evaluation showed that TCAs are most effective when patients are carefully selected, allowed choice of whom they consult, and fully understand the process.

#### Chapter 11 Discussion and conclusion to Part Two

This chapter uses the Alma Ata declaration on primary health care to illustrate the links between chronic condition management and the principles of primary health care. A case study is used to illustrate how a supported general practice can rapidly increase its capacity to manage chronic conditions. The conclusion is reached that the projects evaluated in Part Two of the thesis contributed to this capacity of general practice teams to manage chronic conditions more effectively.

#### Chapter 12 Personal reflection

This chapter documents the author's experience of undertaking the research thesis, including her observations from working in



general practice and the value of increasing research and evaluation in the primary health care sector.

## Chapter 13 Conclusion and Recommendations

The concluding chapter draws on the projects, literature reviews, case studies, evaluations and reflections, to describe how building research and evaluation capacity in general practice enables the primary health care sector to provide more effective health care, to a population living with an increasing burden of chronic conditions. A number of recommendations are made on how to sustain research and evaluation within general practice.

### Chapter 1. Introduction to General Practice Research Networks in Australia

In exploring the role of general practice research networks it is useful to review the history of research within general practice in Australia, and outline the variety of networks already in existence, before describing the local network in which this research was undertaken.

#### Research in General Practice

##### Research by general practitioners

Between 1990 and 2007, Australian General Practitioners (GPs) published in peer reviewed journals at the rate of 3 publications per 1000 practitioners per year. This compared with rates of 159.5 and 67.8 respectively for physicians and surgeons (Askew et al. 2008). The authors of this survey noted that GPs were working predominantly in a fee-for-service environment where research time is not remunerated. In contrast to this, physicians and surgeons had higher rates of salaried employment where research is an expected component of their work (Askew et al. 2008). Research by general practitioners is considerably more advanced in other developed countries, as described later in this chapter.

Almost half of the GP-authored Medical Journal of Australia (MJA) publications between 1997 and 2001 consisted of surveys of GPs' opinions. Physician and surgeon authored papers did not have the same reliance on descriptive research (Chew and Armstrong, 2002). Reasons for this imbalance in research outputs were thought to be the short term funding of GP research, less research capacity and expertise in GP, and the complexity of practice not favouring randomised controlled trials (Raupach and Pilotto, 2001).

MJA editors Chew and Armstrong stated that if the purpose of medical research is to improve population health, then the research must ask questions from everyday practice, and use rigorous study methods to answer those questions

(Chew and Armstrong, 2002). These sentiments were echoed by GPs surveyed by their academic colleagues in 2002 and 2008 (Askew et al. 2002; Gunn et al. 2008). Askew et al. (2002) found that one third of GPs would be prepared to increase their involvement in research provided it was relevant to their practice and properly structured to suit the environment and culture of general practice.

Gunn et al. (2008) conducted a survey of 29 GPs who participated in a randomised controlled trial (RCT) on childhood obesity, showing that learning new skills, updating knowledge and reflection on practice were their main motivators. These were seen as more important than rewards such as college medical education points. However, it was noted that only 5.5% of invited GPs participated in the RCT, in spite of their declared interest in paediatrics. The authors concluded that researchers must clearly articulate the clinical benefits of their research to GPs and their patients, and include reflection on current practice as part of the methodology.

#### Research by others within General Practice

Beyond engaging individual GPs in research projects, other strategies to increase the research output from general practice have been recommended in order to overcome the barriers relating to fee-for-service practice. Financial support for non-GPs (nurses, psychologists and epidemiologists) to undertake research in practices is one model, with practice incentive payments for participation in accredited projects (Yallop et al. 2006). Other important structural reforms include sustained funding of GP research infrastructure costs, and budgets for GP payments and research nurses (Yallop et al. 2006).

Divisions of General Practice were established in 1993 to support general practice and deliver programs within GP settings. However, an evaluation of Divisions in 2006 found that collaboration between GP Divisions and universities has been hindered by misunderstanding and uncertainty about the purpose and nature of the research relationship (Kalucy et al. 2006). More effective links between Divisions and academia require more opportunities for partnering and greater fairness in the relationship. The latter should be characterised by flexibility, respect, reciprocity and inclusion (Kalucy et al. 2006).

The Australian Primary Health Care Research Evaluation and Development (PHCRED) Program commenced in 2000 after a review of Australia's General Practice strategy completed in 1998 (Australian Department of Health and Family Services, General Practice Strategy Review Group, 1998). Phase One of the program (2000-2004) aimed to embed research into primary health care and specifically general practice, starting with a research priority setting process, then introducing capacity building and researcher development components (Oceania Health Consulting, 2005). An evaluation of the program found that links between Divisions of General Practice and PHCRED funded university departments varied depending on how clearly expectations were defined (Oceania Health Consulting, 2005).

The second phase of the PHCRED program ran from 2005 to 2008 and aimed to increase the number of researchers in primary health care, improve the quality of their research, and ensure the uptake of evidence in policy and practice (Healthcare Planning & Evaluation, 2009). Support for researchers was provided through web-based modules, small grants, fellowships, short courses, and supervision. Several universities applied their PHCRED funding to the development of primary health care research networks engaging GPs and other health professionals (Healthcare Planning & Evaluation, 2009). At James Cook University, the North Queensland Practice Based Research Network was developed, with general practices across the region participating in a number of clinical research projects (Cheffins et al. 2009; Cheffins et al. 2010).

The current phase of the PHCRED program, from 2010-2014, focuses on larger scale research into improving access and equity, chronic condition management, prevention and improved quality and accountability (Department of Health and Ageing, 2010). Collaborative networks of primary health care researchers will compete for funding to establish Centres of Research Excellence in the focus areas (Department of Health and Ageing, 2010). The agency tasked with overseeing this phase of primary care research development is the Australian Primary Health Care Research Institute (APHCRI).

## Practice Based Research Networks

The World Organisation of Family Doctors (WONCA) met in Canada in 2003 to progress the role of family medicine research in improving health globally. Based on evidence provided by an international panel of primary care researchers, a number of recommendations were made (Van Weel and Rosser, 2004). Along with a need to disseminate primary care research more systematically, there was strong support for practice based research networks to be developed around the world.

### **What are practices based research networks (PBRNs)?**

One definition provided by Jones (2006) states that:

*“PBRNs are groups of practices networked together to serve ambulatory patients, usually affiliated with professional organisations or university schools of medicine with the objective of asking and answering questions that arise from daily practice” (Jones, 2006 p. 1045).*

Pearce’s (2004) definition also embraces the concepts of sustainability and collaboration:

*“PBRNs are sustained collaborations between practitioners and academicians dedicated to developing relevant research questions, working together on study design and conduct, and translating new knowledge into practice” (Pearce, 2004 p. 425).*

Early examples of PBRN originated in the Netherlands in the 1970s when general practitioners realised they needed an evidence base for their unique community role and to differentiate their professional practice from specialised medicine (Van Weel, 2002). A morbidity database serving a network of practices was founded in Nijmegen in 1971. Subsequently, PBRNs in the United States, United Kingdom and the Netherlands have progressed to epidemiological and clinical research, effectiveness studies, and the study of processes of care (Van Weel, 2002).

In the UK, PBRNs began to develop in the 1960s, but primary care research was first included in the NHS research strategy in 1997 (Thomas et al. 2001). Since that time the role of PBRNs has evolved from research capacity building (practitioner-centred) to that of managing high quality research into health services and clinical research including randomised controlled trials, and the recruitment and retention of participants (Sullivan et al. 2007). For example, a well-cited randomised controlled trial in general practice was able to conclusively identify the role of oral prednisolone in the management of Bell's palsy (Sullivan et al. 2009).

Each country has taken a unique path in implementing and supporting PBRNs. England uses centralised coordination of its PBRNs to ensure a focus on national health priorities, while Scotland has a more regional approach and maintains a strong role in capacity building. In Wales and Northern Ireland PBRNs are more integrated with secondary and tertiary medical research (Sullivan et al. 2007).

PBRNs are well established in the United States, with the Journal of the American Board of Family Medicine publishing an annual issue dedicated to research undertaken in PBRNs (Bowman et al. 2008). The editors of this journal state that:

*“our research networks are expanding and they offer hope for getting evidence based on real-life medicine, reflecting patients in our practices rather than carefully collected subpopulations of patients from tertiary care centres” (Bowman et al. 2008; p. 255)*

The 2008 research issue included three RCTs, one large retrospective study, five patient surveys, and two physician behaviour studies (Bowman et al. 2008), indicating the success of PBRNs in fostering rigorous research methods in primary care.

The leadership of PBRNs can be defined as either top-down, bottom-up or whole system. The first refers to having strong institutional links and research projects led by experts, while the second encourages practitioners to develop their own ideas, with the network led by the peer group. Whole system

leadership is multi-disciplinary, and provides links between experienced and novice researchers, and is thus more effective in bringing about cultural change towards research (Thomas, Griffiths et al. 2001). There are strengths in all of these leadership styles, and networks may adopt different approaches depending on their stage of development, and the diversity of their membership. There are also risks associated with the different leadership styles. In top-down networks the research questions may not be generated by the network members, with a resulting lack of relevance to them. Alternatively, bottom-up networks can waste time with impractical research ideas and poorly designed studies that do not lead to useful evidence.

The contextual complexity of general practice is difficult to study using most current medical research methods, due to the interaction between disease, social situation and the doctor-patient encounter (Van Weel, 2002). The International Study of Errors in Family Practice, done in six countries including Australia, provides an example of data collection that captures both medical and patient factors (Makeham et al. 2002).

This complexity of practice is also reflected at the interface between quality improvement and research. PBRNs play an important part in linking research to practice – a role that is defined as Translation of Research into Practice (Mold and Peterson, 2005). There is a need for practice guidelines based on research that includes co-morbidities, financial barriers and patient priorities, as few guidelines are field-tested in the real-world environment of a primary care practice (Mold and Peterson, 2005).

PBRNs have been described as the basic laboratories of primary care research, requiring basic infrastructure to achieve their goals and sustain their efforts (Green et al. 2005). This infrastructure includes a coordinator, support staff, electronic medical records, multi-user databases, mentoring programs, and research training. Barriers to participation in PBRN projects can be reduced if adequate infrastructure is available to support the network. It has been shown that face-to-face recruitment is effective, as is the regular involvement of practices in the planning of projects. Research methods must also be perceived

as easy to implement and not time-intensive on practice staff (Goodyear-Smith et al. 2009).

PBRNs have evolved around the globe to meet a recognised need for evidence directly useful to the practice of primary health care. The structure and protocols of PBRNs vary according to their resources, membership and leadership. This variation is appropriate given the diversity of primary care practice, and essential to ensuring the sustainability of practice based research.

### Australian Practice Based Research Networks

Several Australian universities have independently established PBRNs in their local general practice communities with the aim of building research capacity. The universities provide organisational structure and academic expertise, with each network functioning uniquely to meet the needs of its members (McIntyre, 2009). PBRNs have been defined in Australia as “groups of local practices supported to undertake research relevant to general practice and the local community’s needs” (Dwan and Magin, 2008 p.871). Table 1-1, adapted from Soos et al. (2010), describes PBRNs by structure and function. The table shows great diversity in the activity of PBRNs across Australia, but they all aim to build research capacity.



**Table 1-1: Diversity in the activity of PBRN's across Australia (Soos, Temple-Smith et al. 2010)**

PBRN	Members	Aims	Activities
Greater Green Triangle Research Network (Vic and SA)	<ul style="list-style-type: none"> <li>• Medical and Nursing Directors</li> <li>• Allied health managers</li> <li>• GPs</li> <li>• Division heads</li> </ul>	<ul style="list-style-type: none"> <li>• Improve research performance</li> <li>• Provide sites for research</li> <li>• Build a culture of research</li> </ul>	<ul style="list-style-type: none"> <li>• Regular writing groups and retreats</li> <li>• Meetings with collaborating practices</li> <li>• Focus on diabetes, heart disease and depression</li> </ul>
North Queensland Practice Based Research Network	<ul style="list-style-type: none"> <li>• GPs</li> <li>• Practice nurses</li> </ul>	<ul style="list-style-type: none"> <li>• Undertake relevant and important grassroots clinical research</li> </ul>	<ul style="list-style-type: none"> <li>• Practice nurse training and support</li> <li>• Practice visits</li> <li>• Dissemination of research project results</li> </ul>
Network of Research General Practices (NSW)	<ul style="list-style-type: none"> <li>• GPs</li> <li>• Practice nurses</li> <li>• Allied health</li> <li>• Practice managers</li> <li>• Admin staff</li> </ul>	<ul style="list-style-type: none"> <li>• Build capacity</li> <li>• Conduct clinical research</li> </ul>	<ul style="list-style-type: none"> <li>• Annual research forum</li> <li>• Participation in projects</li> <li>• Individual mentoring</li> </ul>
Primary Healthcare Research Network-GP (NSW)	<ul style="list-style-type: none"> <li>• GPs</li> <li>• Registrars</li> <li>• Divisions</li> <li>• Practice Nurses</li> </ul>	<ul style="list-style-type: none"> <li>• Support an coordinate GPs and Divisions in high quality priority-driven research</li> </ul>	<ul style="list-style-type: none"> <li>• Pilot projects</li> <li>• Participation in larger projects</li> <li>• Broad research development program</li> </ul>
Practice Network-PracNet (ACT)	<ul style="list-style-type: none"> <li>• GPs</li> </ul>	<ul style="list-style-type: none"> <li>• Involve GPs in research</li> <li>• Improve GP knowledge and skills</li> </ul>	<ul style="list-style-type: none"> <li>• Regular meetings</li> <li>• On-site research support</li> <li>• Assistance with statistics and grants</li> <li>• Library access</li> </ul>
The Victorian Primary care Practice Based Research Network – VicReN	<ul style="list-style-type: none"> <li>• GPs</li> <li>• Practice nurses</li> <li>• Managers</li> <li>• Chiropractors</li> <li>• PHC stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>• Develop high quality PHC research</li> <li>• Influence PHC policy through research</li> </ul>	<ul style="list-style-type: none"> <li>• Develop relevant research</li> <li>• Material development and workshops</li> <li>• Writing weeks</li> <li>• Member events</li> </ul>

Many of these networks were established under the PHCRED program funded by the Department of Health and Ageing. However, there was no systematic approach to their introduction and many lacked clearly defined aims, strategies and performance indicators (Gunn, 2002). The initial network strategies to increase research were focussed on up-skilling, research literacy and dissemination, but it was soon recognised that they required more academic support and links to Divisions of General Practice in order to complete high quality research (Zwar et al. 2006). Evaluation data about PBRNs at a national level has been limited.

The essential components of a model for larger-scale primary care research, according to Zwar et al. (2006) are:

- Input from practitioners into development of projects
- Systematic study selection to match capacity
- Systems for feedback on progress and recruitment
- Systems for discussing findings with practitioners
- Training for practice staff
- Information technology and data collection capacity
- Remuneration for practices and practice staff
- High-quality coordination staff for outreach and face-to-face support.

(Zwar et al. 2006)

Similarly, South Australian GPs interviewed about their research needs identified mentoring, research networks and intensive research skills training as the most useful strategies to overcome practitioner isolation (Jones et al. 2003).

As mentioned, the balance between top-down (academic) and bottom-up (practitioner) leadership of networks is important (McIntyre, 2009), with the

former sometimes stifling ideas, and the latter leading to lack of direction. Another significant challenge is sourcing core funding of the networks, as external project funding does not cover the on-going costs of coordination, training and communication within the networks (McIntyre, 2009). The main barrier to the successful implementation of PBRNs in Australia remains inadequate long-term financial support. Unlike the United Kingdom and Netherlands where Government funding is available, PBRNs in Australia rely on grants, the PHCRED program (now less accessible) or internal university funding (Dwan and Magin, 2008). The likely implications of this are a loss of continuity in research teams, and a lack of experienced researchers to build the evidence base for primary health care.

Small networks of GPs working with skilled GP researchers, embedded within Divisions of General Practice and supported by an academic department of primary care, provide an attractive model for PBRNs in Australia (Gunn, 2002). An example of a successful project undertaken in such a PBRN was an RCT on the use of wet or dry wound management by GPs in north Queensland (Heal et al. 2006). The research question arose directly from the practitioners, and was developed into an RCT and coordinated by an academic GP within the North Queensland Practice Based Research Network (NQPBRN). An evaluation of the process used to implement the trial made several recommendations about enabling GP research within PBRNs (Heal et al. 2008):

- There needs to be an adequate GP workforce
- Administrative support is essential
- Use RCT methods suited to general practice
- Allow adequate time for all aspects of research including ethics applications, practice staff training, data collection, data analysis and dissemination of results (Heal et al, 2008)

## North Queensland Practice-Based Research Network (NQPBRN)

The local, national and international PBRN literature outlined above provided a useful evidence base for the strategic development of the NQPBRN. Prior to the establishment of NQPBRN, General Practice research in North Queensland was not coordinated and research output was very limited.

NQPBRN was funded by the Australian Government's PHCRED program between 2007-2010, and continues to operate with support from individual research grants. The two main objectives of the NQPBRN are:

1. To implement and publish General Practice based research projects
2. To build research capacity in General Practice targeted at practices nurses.

A total of 26 North Queensland general practices are affiliated with NQPBRN, either as participants in projects, attendance at research training, or involvement in the development of research questions. By September 2012 the number of GPs who had been involved with PBRN was estimated to be 40 (GP numbers fluctuate within practices), with at least one practice nurse from each practice supported to improve their research skills. Table 1-2 gives more details of the geographic and temporal distribution of the 14 practices that participated in NQPBRN research projects.

**Table 1-2: NQPBRN practice research project activity (current at September 2012)**

<b>Location</b>	<b>Practice clinicians involved</b>	<b>Projects/ activity</b>
<b>Townsville Practice 1</b>	3 GPs 1 practice nurse	Whiplash study 2011 Chlamydia study 2010 Enhanced primary care 2009 Otitis externa 2008
<b>Townsville Practice 2</b>	1 GP 1 practice nurse	Parent vaccinations 2010
<b>Townsville Practice 3</b>	2 GPs 1 practice nurse	Whiplash 2011 Chlamydia 2010
<b>Townsville Practice 4</b>	1 GP 1 practice nurse	Parent vaccination 2010
<b>Townsville Practice 5</b>	1 practice nurse	Parent vaccinations 2010
<b>Townsville Practice 6</b>	6 GPs 2 practice nurses	Chlamydia 2010 Parent vaccination 2010
<b>Townsville Practice 7</b>	1 practice nurse	Parent vaccinations 2010 Otitis externa 2008
<b>Townsville Practice 8</b>	2 GPs 1 practice nurse	Whiplash 2011 Chlamydia 2010
<b>Mackay Practice 1</b>	2 GPs 1 practice nurse	Chlamydia 2010 Parent vaccination 2010 Otitis externa 2008

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<b>Mackay Practice 2</b>	4 GPs 1 practice nurse	Whiplash 2011 Chlamydia 2010 Enhanced primary care 2009 Otitis externa 2008
<b>Mackay Practice 3</b>	3 GPs 2 practice nurses	Whiplash 2011 Chlamydia 2010 Patient views of EPC 2010 Parent vaccinations 2010 Enhanced primary care 2009
<b>Mackay Practice 4</b>	1 GP 1 practice nurse	Chlamydia 2010
<b>Cairns Practice 1</b>	1 GP 1 practice nurse	Otitis externa 2008 Parent vaccinations 2010 Enhanced primary care 2009
<b>Cairns Practice 2</b>	4 GPs 1 practice nurse	Otitis externa 2008

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Recruitment of practices was via practice visits from the NQPBRN medical coordinator (the author) and presentations at local medical meetings in Cairns, Townsville and Mackay. At commencement of the NQPBRN in 2007, a formal expression of interest form was mailed out to any practice that showed interest at meetings, and practice nurses from those practices were invited to an initial research training workshop. Follow-up practice visits were made to assist the nurses with implementation of projects. As more projects were developed between 2007 and 2011, additional practices were invited to participate. Individual practices chose which projects they were interested in, with some undertaking only one, while others did several (Table 1-2). Research training workshops were held in Townsville and Mackay on an annual basis.

Research support for the NQPBRN practices included dinner meetings where results from completed projects were presented and new research projects explained. Some GPs attended these meetings but did not participate in research projects. Practice nurses were provided with more detailed training, as they were the main group implementing the research, with their employing GPs nominating them for this role.

NQPBRN studies used a combination of methods (including medical record audits, prospective clinical data collection, surveys and interviews) to answer locally relevant research questions, with results disseminated directly to the practices and via peer reviewed publications. Practice nurses undertook the majority of data collection and received training from the NQPBRN coordinator. Practices were compensated for the hours they spent on research (usually by way of an honorarium paid per patient recruited to compensate the practice for the nurse's time). Research topics were selected in consultation with the practice teams, thus ensuring they were genuinely interested in the research and results. The NQPBRN projects included in this thesis relate to important clinical issues in general practice in north Queensland: acute otitis externa, aged care and immunisation of new parents. The research ideas came from general practitioners and general practice nurses.

The NQPBRN was established to increase research capacity in primary health care settings in north Queensland. The published experience of other networks in Australia and abroad was useful in informing the leadership style, support and research methods used by our network. The following chapters in Part One of the thesis report research projects completed by the NQPBRN, and the concluding section to Part One describes the impact of NQPBRN on general practice research capacity in North Queensland, including reporting on an evaluation of NQPBRN activities.



## Chapter 2. Management of Acute Otitis Externa By General Practitioners In North Queensland

This study was funded by the Primary Health Care Research Evaluation and Development (PHCRED) program at James Cook University, and undertaken within the North Queensland Practice-Based Research Network (NQPBRN). The original idea for the project evolved from a discussion between local general practitioners (GPs) and the Head of the Rural Health Research Unit. It uses mixed methods to explore GP management of a common clinical condition in North Queensland.

### Publication Reference

Cheffins T, Heal C, Rudolphy S, Evans R, Veitch C. Acute otitis externa-management by GPs in North Queensland. *Australian Family Physician* 2009; 38(4): 262-266.

The original paper published in the *Australian Family Physician* is presented here. Content has not been changed and format used for the *Australian Family Physician* has been retained, including the need to comply with word limits for an original research article. Re-formatting has been minor and involved making the paper comply with a thesis chapter structure, including placing references at the end of the thesis.

### Authors' contributions

#### Tracy Cheffins

- Developed research project design
- Wrote and submitted ethics application
- Coordination and recruitment of research practices
- Training of research nurses
- Oversight of data collection and analysis
- Writing report and publication

#### Clare Heal

- Assisted with recruitment of practices and training of nurses in Mackay

#### Steven Rudolphy

- Assisted with the recruitment of practices and training of nurses in Cairns.

Rebecca Evans

- Research assistant for data analysis.

Craig Veitch

- Provided advice to first author on design of study, and responsible for initial discussion of a study into acute otitis externa.

## Abstract

### Background

Acute otitis externa (AOE) is a common condition in North Queensland. Clinical guidelines exist for the management of this condition. This study explores the pattern of causative pathogens and management of AOE by general practitioners in North Queensland.

### Methods

Eight general practices in three regional cities of North Queensland participated in the study. The three components were: a retrospective case audit of AOE management, a survey of GPs' self reported usual management and collection of clinical data and microbiological specimens from new cases.

### Results

The three components of the study showed considerable alignment in their results. *Pseudomonas aeruginosa* was the most common causative pathogen in all regions; GPs were able to correctly name the most common causative pathogens for AOE; there was variation between the three cities in whether oral antibiotics were prescribed by the GPs (15.8-36.6%); ear syringing is commonly used in managing AOE (51.3%); and most patients (68.9%) required only one GP appointment.

### Discussion

General practitioners have good knowledge of the causative pathogens for AOE in their region. While clinical guidelines are generally followed, there is some variation in the prescription of oral antibiotics and use of ear syringing in managing this condition.

## Background and Aims.

Acute otitis externa (AOE) is a common ear condition seen in primary health care settings. Also known as swimmer's ear or tropical ear, it is prevalent in hot humid climates such as North Queensland where swimming is a common activity (Murtagh, 1998). There is limited research relating to the range of pathogens that cause this condition, or its management in primary care settings in tropical North Queensland.

Clinical guidelines developed by the American Academy of Otolaryngology – Head and Neck Surgery Foundation (Rosenfeld et al. 2006) make recommendations relating to: assessment of co-morbidities requiring modification of management; use of topical rather than systemic antimicrobials; cost-effective and safe choice of medications; patient instructions about correct use of drops; the role of aural toilet and wicks; and review of non-responding cases.

A systematic review and meta-analysis of 18 randomised controlled trials of topical antimicrobial therapy for AOE found that use of any topical antimicrobial significantly increased cure rate over placebo, but comparative studies between types of antimicrobials showed only minor differences which were often not statistically or clinically significant. Steroid drops alone were found to increase cure rates by 20% compared with steroid plus antibiotic drops (Rosenfeld et al. 2006).

Australian therapeutic guidelines for antibiotic use (Therapeutic Guidelines Antibiotic expert group, 2006) state that, following dry aural toilet, topical corticosteroid and antibiotic combination drops should be instilled for three to seven days. Severe cases may require a wick, with systemic antibiotics reserved for those with fever, spread to the pinna or folliculitis.

Although the Australian therapeutic guidelines inform the treatment and management of AOE, they are relatively broad and anecdotal evidence suggests that management practices may vary considerably. In addition, anecdotal evidence from North Queensland suggests that the pathogens

associated with AOE infections may vary between sites. The Cochrane Library lists a protocol developed to systematically review the management of AOE (Kaushik et al. 2004), but this has not been completed.

### Project aims

- gain an understanding of how North Queensland general practitioners (GPs) manage this common condition,
- determine the most common causative pathogens, and any variation in pathogens between different sites, and
- find if any underlying risk factors influence management decisions.

### Methods

Ethical approval for the project was granted by the James Cook University human ethics committee (approval number H2517). Eight general practices from three large regional cities in North Queensland were recruited into the study which consisted of three phases:

Phase One: An audit of management of acute otitis externa cases presenting to GPs in the preceding 12 month period.

Phase Two: A self-reported questionnaire for GPs, assessing usual management practices.

Phase Three: A prospective clinical survey of patients presenting to GPs over the 2007-8 summer, including microbiological testing.

The population demographics of the three North Queensland centres are similar, with a younger age profile than Queensland overall, and higher proportions of Aboriginal and Torres Strait Islander people (Office of Economic and Statistical Research, 2011).

For Phase One, practice nurses were trained to search their medical record database to find cases, and then complete an audit sheet, which was de-

identified. We aimed for 60 audits from each region. Practices were given some financial recompense to cover the nurses' time.

For Phase Two, GPs at participating practices were asked to provide written consent and complete a questionnaire reporting their usual management practices in relation to AOE.

For Phase Three, GPs were asked to identify patients with new presentations of AOE during a variable time period determined by each practice based on convenience and staffing levels. Practice nurses obtained consent from patients, collected a microbiological swab, and completed a clinical information sheet that included swab results.

The de-identified audits, questionnaires and clinical reports were forwarded to a nominated GP coordinator in each region, who then passed them on to the central coordinator for analysis. Simple frequency analyses and two sided Chi square tests for statistical significance of specific associations were conducted using SPSS (2005). Variables explored in each phase are listed in Box 2-1.

**Box 2-1: Variables Explored in the Study**

Variables explored in each phase of the study

**Phase 1 - Case audit**

Age, gender, month of presentation, use of swabs, swab results, co-morbidities and contributing factors, ear cleaning methods, pharmaceutical treatments prescribed, non-pharmaceutical management, number of visits, referrals made.

**Phase 2 - GP questionnaire**

Number of AOE cases seen per year, enquiry about co-morbidities and contributing factors, use of swabs, most prevalent pathogens, methods of cleaning, preferred treatments (pharmaceutical and non-pharmaceutical), use of referral.

**Phase 3 - Clinical reports including swabs**

Age, gender, contributing factors and co-morbidities, use of swabs, pathogens isolated, ear cleaning, pharmaceutical and non-pharmaceutical treatments prescribed, value of swab result, referral to other providers.

## Results

### Phase One (see Table 2-1)

There were 201 clinical cases of AOE audited, with the three regions providing 93, 70 and 38 cases respectively. The median age was 32.6 years (range 1-87), with 52.2% males. Co-morbidities and contributing factors were documented in 18.5% and 25% of cases respectively. Almost half (47.2%) presented in the three months January to March.

**Table 2-1: Results of Phase one – case audit**

Factor studied	(%)
<b>Demographics:</b>	
Total number of audits	N=201
Mean age	32.6 yrs (1-87)
Male gender	52.2
<b>Risk factors:</b>	
Co-morbidity documented	19.5
Swimming	14.1
Presenting Jan-March	47.2
<b>Management:</b>	
Cleaning method-	
Syringing	18.1
Suction	2.1
Dry swabbing	1.6
Nil documented	76.7
Swab collected	23.6
Ear drops used	95
Oral antibiotics	30.3
One GP visit only	68.9
Referral to ENT	8.2
<b>Pathogens isolated:</b>	
<i>Pseudomonas aeruginosa</i>	45.7
<i>Candida species</i>	10.9
<i>Staphylococcus aureus</i>	10.9
<i>Aspergillus</i>	2.2
No growth	26.1

Less than 25% (23.6%) of audit cases had a swab taken. The most common pathogen isolated in all regions was *Pseudomonas aeruginosa* (45.7%). There was some regional variation in the proportion of infections caused by *candida species* (24% compared with 4.8%), but numbers were small overall.

The majority were prescribed ear drops (95%), with combination steroid/framycetin the most commonly used (47.5%). When a second ear drop was prescribed it was most likely (31.3%) to be ciprofloxacin. Oral antibiotics were prescribed in 30.3% of cases overall, but regional variation was noted (from 15.8% to 36.6%). More than two thirds (68.9%) were managed with only one visit to that GP, and less than 10% (8.2%) were referred to an ENT specialist.

Statistically significant associations were found between:

- presence of a co-morbidity and having a swab taken ( $p = .041$ )
- having a swab taken and use of oral antibiotics ( $p < .001$ )
- number of GP visits and use of oral antibiotics ( $p = .001$ )
- Presence of a co-morbidity and referral to ENT specialist ( $p = .006$ ).

### Phase Two (see Table 2-2)

Thirty-nine questionnaires were returned by GPs working at the participating practices. Due to the turnover of GPs during the extended period of the project, and the varied methods of questionnaire distribution, an exact response rate is difficult to determine. Based on the current staffing levels of these practices, we estimate our response rate to be over 90%. This was achieved by having local GP coordinators and practice nurses distributing and collecting the questionnaires personally.

The majority of GPs (94.4%) reported seeing more than 10 cases of AOE per year, with 47.2% seeing more than 30 per year. The majority (74.4%) routinely enquire about middle ear disease, but less do so about diabetes and immunosuppression (48.7% and 17.9%). Swabs are not used routinely (17.9% reported

taking a swab at initial presentation), but more than half (56.4%) report swabbing if the patient fails to improve. Almost a half (46.2%) of the GPs will take a swab if the case is clinically severe. However 74.4% of GPs find swabs only sometimes or rarely useful.

GPs identified the same three most prevalent pathogens found by the audit. More than half (51.3%) reported syringing to clean the ear, 41% use dry swabbing, but 12.8% state that cleaning is not usually required. Only 7.7% use suction under microscopic control as recommended in guidelines.

Relatively few GPs (23.1%) reported using oral antibiotics, and topical combination steroid/framycetin drops are their preferred prescription medication (50%) – consistent with the audit findings. Almost half (48.7%) of GPs insert wicks to manage AOE.



**Table 2-2: GP Questionnaire (n=39)**

Factor studied	%
Number of cases seen per year:	
<10	5.6
10-30	47.2
>30	47.2
Management:Enquiry about co-morbidities:	
Diabetes	48.7
Middle ear disease	74.4
Immuno-suppression	17.9
Contributing factors seen:	
Swimming	100
Hearing aid	71.8
Trauma	59.0
Cleaning method used:	
Suction	7.7
Syringing	51.3
Dry swabbing	41.0
Timing of swabs:	
Initial presentation	17.9
Follow-up visit	56.4
Clinically severe	46.2
Usefulness of swab:	
Rarely useful	23.1
Sometimes useful	51.3
Very useful	25.6
Preferred ear drops:	
Framycetin /steroid	50.0
Ciprofloxacin	26.3
Use oral antibiotics	23.1
Wick inserted	48.7
Have referred to ENT	84.6
Named as common pathogen causing AOE:	
<i>Pseudomonas aeruginosa</i>	84.8
<i>Staphylococcus aureus</i>	56.4
Fungal	51.3

### Phase Three (see Table 2-3)

Practices recruited 49 patients with AOE who agreed to have a swab taken and provide the practice nurse with relevant clinical information. The practice nurse completed a form which included risk factors, management provided and swab results for each consenting patient.

Patients were predominantly male (72.3%) and were slightly older than the audit population (mean age 40.8 years). Swimming was cited as the most commonly reported contributing factor (23.4%), and 36.1% had a documented co-morbidity. Ear cleaning was done by syringing (29.8%) and dry swabbing (14.9%), but no method of cleaning was documented for 42.6%. The majority (89.4%) were prescribed ears drops with 8.5% having two different drops. Oral antibiotics were given to 25.5 % of cases.

**Table 2-3: Results of prospective phase – clinical management microbiology**

Factor studied (n=47)	%
Mean age	40.8 years (range 4-87)
Male	72.3
Comorbidity (total)	36.1
Diabetes	2.1
Other	34.0
Contributing factors (total)	46.8
Swimming	23.4
Hearing aid	6.4
Other	17.0
Pathogen isolated (first or second pathogen)	
<i>Pseudomonas aeruginosa</i>	55.4
<i>Staphylococcus aureus</i>	8.6
<i>Aspergillus niger</i>	4.3
<i>Candida species</i>	10.7
None	34.0
Method of cleaning	
Dry swabbing	14.9
Syringing	29.8
Both	2.1
Ear drops used (total)	89.4
Framycetin/steroid	34.0
Ciprofloxacin	19.1
Oral antibiotics	25.5
Other treatments	
Insertion of wick	10.6
Other	8.5
nil	76.6
Changes made after swab	
No	74.5
Yes	12.8
Referral to other provider	
ENT specialist	6.4
Not required	87.2

*Pseudomonas aeruginosa* was the most common pathogen isolated (55.3%), with *Candida species* (10.7%), *Aspergillus niger* (4.3%) and *Staphylococcus aureas* (8.6%) also noted. No pathogen was isolated for 34.0% of cases. The swab result was not responsible for any change in treatment in 74.5% of cases.

## Discussion

The project provided an opportunity for a network of general practices to contribute a relatively small amount of professional time and resources to the completion of a clinically relevant and multi-faceted study. The three phases allowed the topic to be explored from different perspectives – a retrospective description of past practice, a self-reported survey of usual practice and a prospective study of management and gathering of microbiological data. The retrospective component of the study is subject to selection and measurement bias and on its own is not useful. However, there were several areas where the three phases showed an interesting alignment of results. GPs estimated that they used swabs in around 20% of cases and this was confirmed by the audit. *Pseudomonas aeruginosa* was found to be the causative pathogen in around half of the audit and prospective cases, with a large majority of GPs correctly naming it as the most common causative pathogen. Swab results were found useful in managing only 25% of the prospective cases, a figure which was mirrored in the self-reported GP survey.

According to clinical guidelines, oral antibiotics are only recommended for complicated AOE infections. In North Queensland, use of oral antibiotics was found to be 30% in the audit, and 23.1% of GPs reported using them. The prospective study revealed an intermediate use rate of 25.5%. We are not able to analyse directly whether antibiotics were used only for complicated or severe infections. However, we saw in the audit results that oral antibiotic use was associated with more visits to the GP and with collection of a swab, both possible indicators of more severe infection.

Another area which is somewhat controversial is the use of ear syringing. Guidelines recommend against its use, however 62.1% of surveyed GPs reported using this method. In the prospective phase, ear syringing was performed in 29.8% of cases. The reasons for this inconsistency with guidelines may be explained by lack of access to microscopy for suction.

In summary, the project has shown consistency in the causative pathogens and management of AOE in North Queensland. Clinical guidelines are generally followed, however, use of oral antibiotics varies between regions, and lack of access to preferred cleaning equipment leaves GPs little option but to use less preferred methods. Further research into the effectiveness and safety of different ear cleaning methods is recommended.

### Acknowledgments

GPs, practice nurses and staff of participating practices.

References for this chapter are included in the final reference list.

## Chapter 3. Evaluating the use of Enhanced Primary Care Health Assessments by General Practices in North Queensland

This study was funded by the Primary Health Care Research Evaluation and Development (PHCRED) program at James Cook University, and undertaken within the North Queensland Practice-Based Research Network (NQPBRN). The research idea came from the members of the network, who wanted evidence of the effectiveness of the Enhanced Primary Care health assessment items they were using in their practices. It utilises a practice audit to compare prevention outcomes between two groups of patients, and a survey to explore GP and nurse attitudes towards health assessments.

### Publication reference

Cheffins T, Spillman M, Heal C, Kimber D, Brittain M, Lees M. Evaluating the use of Enhanced Primary Care Health Assessments by general practices in North Queensland. *Australian Journal of Primary Health*, 2010; 16, 221-223.

The original paper published in the *Australian Journal of Primary Health* is presented here. Content has not been changed and format used for the *Australian Journal of Primary Health* has been retained, including the need to comply with word limits for an original research article. Re-formatting has been minor and involved making the paper comply with a thesis chapter structure, including placing references at the end of the thesis.

### Authors' contributions

#### Tracy Cheffins

- Development of study design
- Submission of ethics proposal
- Recruitment of practices
- Training of practice research nurses
- Oversight of data collection and analysis
- Preparation of manuscripts for publication

#### Margaret Spillman

- Research officer for data analysis and presentation

#### Clare Heal

- Recruitment and training of practice research staff in Mackay

Debbie Kimber

- Practice research nurse in Mackay

Maureen Brittain

- Practice research nurse in Cairns

Michelle Lees

- Practice research nurse in Mackay

## Abstract

### Background

The Enhanced Primary Care (EPC) program funds General Practitioners (GPs) to provide preventative health assessments through a specific set of Medicare item numbers. The study aimed to show whether patients completing these health assessments had better recorded screening rates than those receiving usual care.

### Methods

A retrospective clinical record audit was undertaken in north Queensland general practices by practice nurses from the North Queensland Practice Based Research Network (NQPBRN). Comparisons were made between the recorded screening test rates for patients who completed an over 75 years health assessment with those who did not. A questionnaire was also completed by practice nurses and practice principals.

### Results

Screening tests were recorded more frequently in patients with a completed health assessment: notably urinalysis, visual acuity and Faecal Occult Blood Test or colonoscopy. Blood pressure was the most frequently recorded test with or without a health assessment. The questionnaires provided useful information on how health assessments are implemented and whether GPs believe they are useful.

## Introduction

General practitioners (GPs) in Australia have access to a range of Medicare funded preventative health assessments for their patients through the Enhanced Primary Care (EPC) program. The content of health assessments is based on Royal Australian College of General Practitioners (RACGP) guidelines for preventative activity in general practice (Royal Australian College of General Practitioners, 2009). Previous evaluations of the EPC program show inconsistent uptake and impacts of health assessments (O'Halloran et al. 2006; Williams et al. 2007; Chan et al. 2008). A randomised controlled trial of health assessments in the elderly, conducted elsewhere in Australia, showed no reduction in mortality, but some improvements in self rated health (Newbury et al. 2001).

A review of elderly health assessments in primary care recommended using practice nurses to support the process (Gray, 2004). Practice nurses (PNs) have been shown to possess the organisational and clinical skills required (Walker, 2006).

The PNs who participated in this study undertakes health assessments for practices that are part of the North Queensland Practice Based Research Network (NQPBRN). The network is funded through the Primary Health Care Research Evaluation and Development (PHCRED) program, and has previously completed research projects with data collection done primarily by practice nurses (Heal et al. 2006; Cheffins et al. 2009).

The aims of this study were:

- to involve practice nurses in an evaluation of their own practices' health assessment services.
- to compare recorded screening rates for over 75 year old patients who have participated in health assessments with those who have not.
- to document the use of and attitudes towards health assessments in general practices.



- The study hypothesis was that patients who undergo formal health assessments have better rates of documented recommended screening and prevention interventions than those who do not have health assessments.

## Methodology

Ethics approval for the study was granted by the James Cook University Human Research Ethics Committee (approval number H3145).

There were two components: a clinical audit and a self-reported practice survey. Eight practices that had expressed interest in the NQPBRN were invited to participate, and four of these completed the research.

## Clinical Audit

Practice nurses were trained to use their practices' management and clinical software to identify patients who had been billed for the relevant Medicare item numbers over the preceding two years, up to a maximum of 100 records. Lists of patients who had not had a health assessment billed over that time were created, and an equal number of records were selected consecutively from the lists. The assessed and non-assessed groups were audited for any record of preventative interventions occurring in the last two years. The recording of these items in the patient records were the outcome measures for the study (see Figure 3-1). Audit data were entered directly into electronic spreadsheets by the practice nurses using patient codes and no identifying information.

**Figure 3-1: Audit items included in the over 75yrs health assessment**

Audit items included in the over 75 years health assessment
<ul style="list-style-type: none"><li>• Smoking status</li><li>• Influenza and pneumococcal immunisations</li><li>• Blood pressure</li><li>• Urinalysis</li><li>• Visual acuity</li><li>• FOBT or colonoscopy</li></ul>

De-identified data for each practice were analysed by the research team at James Cook University, using frequency analyses to compare rates of recording of items for the assessed and non-assessed groups. De-identified aggregated data from all practices were also analysed. Statistical significance calculations (chi square) were undertaken to compare relative rates. Results are expressed as proportions with confidence intervals. Practices were given their own results and those of the aggregated data analysis.

### Self-reported practice survey

A practice nurse and GP from each participating practice were surveyed, using a jointly completed questionnaire, to explore their use of and attitudes to health assessments. Questionnaires were sent to the four research practices and one other interested practice (see Figure 3-2).

**Figure 3-2: Questions included in self-reported practice survey**

**Questions included in self-reported practice survey**

- Please indicate which of the EPC health assessments your practice is using.
- Please indicate the reasons why you are not using particular health assessments.
- Who initiates (recruits patients for) health assessments in your practice?
- Who is primarily responsible for the assessments and data collection?
- What do you think are the most useful aspects of health assessments?
- What do you think are the least useful aspects of health assessments?
- Provide one or more examples of how a health assessment changed your management of a patient who was well known to you.

### Results

#### Audit results

There were statistically significant differences between the groups in the recording of all screening and prevention interventions audited (see Table 3-1). Visual acuity and urinalysis had much lower rates of recording in the group who had not had health assessments. Bowel cancer screening was the least frequently recorded item for both groups, and blood pressure was the most

frequently recorded. Immunisation rates for influenza and pneumococcal disease were also lower in the group that did not have a health assessment.

**Table 3-1: Comparison of screening rates**

<b>Comparison of screening rates between patients who had or did not have an over 75 year old health assessment completed in the preceding two years.</b>					
<b>HA item</b>	<b>HA completed (n= 294) % with item recorded</b>	<b>95% Confidence Intervals</b>	<b>HA not completed (n=301) % with item recorded</b>	<b>95% Confidence Intervals</b>	<b>p value</b>
BP	100		98.7	97.4, 100.0	.047
Smoking status	100		82.4	78.1, 86.7	< .001
Influenza vaccine	93.5	90.7, 96.3	85.0	81.0, 89.0	.001
Pneumovax	87.8	84.1, 91.5	71.8	66.7, 76.9	<.001
Visual acuity	85.7	81.7, 89.7	53.8	48.2, 59.4	<.001
Urinalysis	69.0	63.7, 74.3	23.9	19.1, 28.7	<.001
FOBT/colonoscopy	34.4	29.0, 39.8	25.6	20.7, 30.5	.019

### Survey results

All five questionnaires were completed. They were examined for consistent themes. When asked which health assessments they use, practices reported that the 40-49 years diabetes check is not done routinely due to a lack of understanding of the process. The 45-49 years age group health assessment was thought to be too narrow in its target age group for sustainable application in general practice. Some felt that this service should be extended to 40-60 years and repeated regularly to be effective.

GPs and PNs in our sample share responsibility for recruitment of over 75 year olds for health assessments. Most practices use a recall system for this service. Some practices have begun linking the four year old health assessment to the immunisation visit.

There was a view that the four year old and 45-49 years assessments are less likely to find new problems because these groups have regular GP checks already, and therefore the practices have not implemented them as widely as the over 75 years assessment.

The health assessments were considered useful in finding un-recognised clinical and social issues. Specific health problems which GPs reported finding during an over 75 years health assessment included:

- Incontinence
- Complementary medication interactions
- Unsafe housing with falls prevention intervention required
- Dental and nutrition problems
- Dementia
- Incomplete immunisation

## Discussion

The results of this study indicate that health assessments increase the likelihood that a patient aged over 75 years will receive their recommended preventative interventions. Clinicians reported that the health assessments also identified a range of otherwise unreported clinical problems.

Not all categories of health assessment were considered to be as useful, with the 45-49 years check being most criticised. Health professionals surveyed thought it should be made available to a wider age group, and repeated regularly.

The major limitation of the study was its retrospective design which impacted on the ready availability of clinical data for audit purposes. We could only measure whether data had been recorded. We could not measure cases where the screening test had been conducted, but not recorded, and therefore our results may not indicate true screening rates. Practice nurses used the same method to audit both the assessed and non-assessed patients, so the rate of missing data

should be similar for both groups. The study design did not control for the number of visits to the GP, a possible confounding factor in patients' access to screening tests and health assessments.

We recommend that the Enhanced Primary Care over 75 years health assessment be retained and other health assessments reviewed to ensure optimal outcomes in general practice.

### Acknowledgements

Primary Health Care Research Evaluation Development (PHCRED program);  
GPs and staff from the participating practices.

References for this chapter are included in the final reference list.

## **Chapter 4. Are new parents fully vaccinated? An evaluation of a general practice parent vaccination intervention.**

This study was funded by the Primary Health Care Research Evaluation and Development (PHCRED) program, and undertaken within the North Queensland Practice-based Research Network (NQPBRN). The research idea originated in consultation with practice nurses from the NQPBRN, who share a common interest in immunisation, and have developed research skills in previous NQPBRN projects. The study involved clinical data collection and follow-up of individual participants.

### **Publication reference**

Cheffins T, Spillman M, Larkins S, Heal C. Recommending vaccination. General practice intervention with new parents. *Australian Family Physician* 2011; 40 (6): 437-439.

The original paper published in the *Australian Family Physician* is presented here. Content has not been changed and format used for the *Australian Family Physician* has been retained, including the need to comply with word limits for an original research article. Re-formatting has been minor and involved making the paper comply with a thesis chapter structure, including placing references at the end of the thesis.

The paper was awarded the best general practice paper in *Australian Family Physician* for 2011.

### **Authors' contributions**

#### **Tracy Cheffins**

- Development of research questions and methodology
- Submission of ethics proposal
- Recruitment of practices
- Training of Practice Nurses for data collection
- Oversight of data collection and analysis
- Preparation of manuscripts for publication

#### **Margaret Spillman**

- Research officer undertaking data analysis and presentation

Sarah Larkins

- Advice on the study design

Clare Heal

- Assistance with practice recruitment and practice nurse training in Mackay

## Abstract

### Introduction

To reduce risk of infants contracting vaccine-preventable diseases, parents should be up to date with their own vaccinations.

### Methods

Parents at eight general practices in north Queensland had immunisation histories recorded and catch-up recommendations made when they brought their infants for vaccination. They were followed-up by practice nurses after two months.

### Results

Catch-up vaccination was recommended for 66.1% (117/177) of parents. Of these parents, 53% (62/117) complied, resulting in an improvement in up-to-date vaccination status from 33.9% (60/177) to 68.9% (122/177;  $p < 0.0001$ )

### Discussion

Parent immunisation history is a worthwhile intervention to add to the childhood vaccination program of a general practice.

## Introduction

While 80 per cent of notified pertussis infections in Australia occur in adults, 80 percent of pertussis deaths occur in infants aged two months or younger (Brotherton et al. 2007; Owen et al. 2007). Parents are the source of their infant's infection in 15-55% of cases (Schellekens et al. 2005; Wendelboe et al. 2007; Jardine et al. 2010). To reduce the risk of infants contracting the disease it is important that adults residing with infants are vaccinated. An adult pertussis vaccine (combined with tetanus and diphtheria) is subsidised by the Australian Government for parents of children born after 1<sup>st</sup> May 2009. Other vaccinations recommended for parents are mumps, measles, rubella (MMR), and varicella if there is no history of infection (Department of Health and Ageing and National Health and Medical Research Council, 2008). MMR is provided free to adults born after 1966, but adult varicella vaccine is not subsidised.

Adult vaccination uptake has been shown to be problematic for general practice (GP) internationally. In one study, audits before and after a GP education program showed decreased adult vaccination rates, in spite of improved childhood vaccination rates in the same practices (Schmitt et al. 2007). Personal risk perception, access to public funding support and physician recommendations are thought to be important factors for adults considering vaccination (Skowronski et al. 2004).

In the absence of a comprehensive adult vaccination register, Australian primary healthcare providers and researchers have to rely on self-assessed vaccination status or on locating vaccination records to assess immunisation status (Skull and Nolan, 2007). A general practice study that relied on patients' immunisation self-assessment, coupled with provider-generated reminder tools, showed no significant improvement in vaccination coverage. The main barriers identified were lack of provider time and the complexity of adult vaccination recommendations (Fishbein et al. 2004). After controlling for socioeconomic status, vaccination coverage is better when practices have a reliable practice management system and adequate support staff (Grant et al. 2010).



Health professionals have been identified as the most effective advocates for vaccination and the most important source of vaccination information for the general public (Schmitt et al. 2007). Over 70% of Australian childhood vaccinations are delivered in general practice (Medicare Australia, 2010). These visits potentially provide an opportunity for health professionals to screen parents for their immunisation status and offer catch-up vaccination.

In Australian general practice, vaccination programs are administered by registered practice nurses. These nurses are well placed to implement a research study that required consent, a vaccination history, information about recommended vaccinations, and follow-up of patient outcomes. The research practices who participated in our study are affiliated with the North Queensland Practice Based Research Network (NQPBRN) based at James Cook University School of Medicine and Dentistry. The network's academic support team trains the practice nurses for data collection, undertakes data analyses, and has published a number of clinical studies (Cheffins et al. 2007; Cheffins et al. 2009; Cheffins et al. 2010).

This paper describes parental immunisation status and examines whether parents will act on recommendations for vaccination given by their general practitioner and practice nurse.

## Methods

Ethical approval for this study was granted by the James Cook University Human Research Ethics Committee (approval number H3413).

The study used a before and after self-reported survey method to assess the impact of a vaccination intervention delivered to new parents by general practice nurses. The study was undertaken in eight general practices affiliated with the North Queensland Practice Based Research Network (NQPBRN). Practice principals were invited to support their practice nurse's participation in the project. The nurses received training in specific data collection protocols, as well as broader training in research methodology.

The target population was parents bringing their infants and children aged less than 4 years to the practice for scheduled vaccinations. Each practice was asked to recruit up to 30 parents into the study. This number was chosen based on 8-10 participating practices, with a total sample size of 170 able to show a statistically significant improvement in immunisation rates of 15% (Brant, 2001).

The intervention consisted of practice nurses taking an immunisation history from the parent, and conferring with the general practitioner who recommended catch-up vaccines according to Australian immunisation guidelines (Department of Health and Ageing and National Health and Medical Research Council, 2008) and the parent's medical history.

Follow-up of parents recommended for vaccination was undertaken two months after the initial visit. This was done by the practice nurse reviewing their file and contacting them by phone if no vaccination was documented. Subjects were asked whether they had completed the recommended vaccinations elsewhere, and reasons for not completing. Consent and contact details for this follow-up call were obtained at the initial visit.

## Results

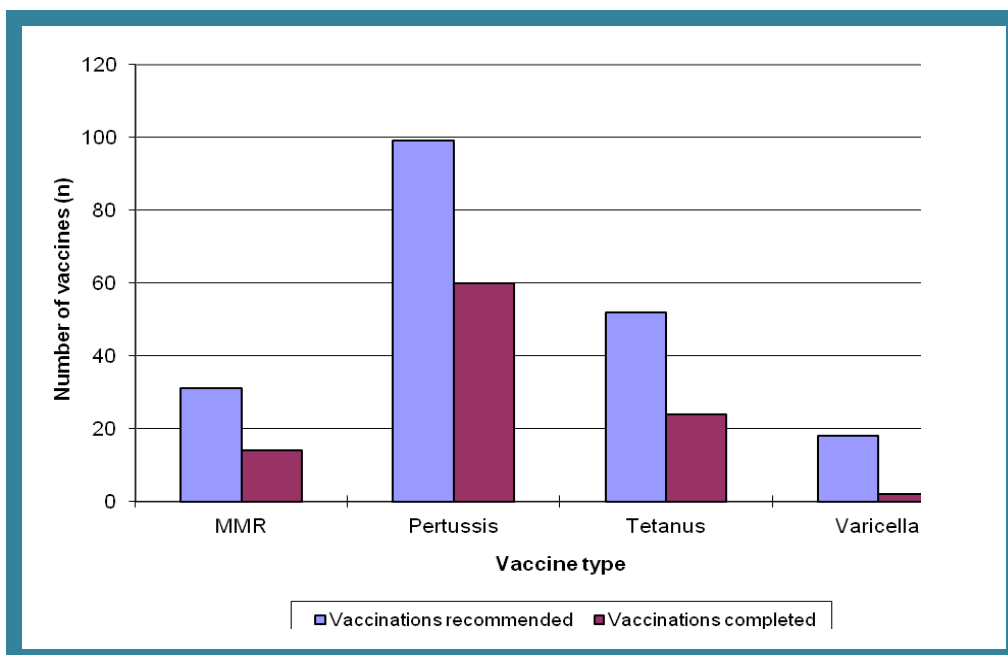
A total of 177 parents were consented (48 male, 128 female and 1 unknown) in eight practices. As shown in Table 4-1, the proportion of parents who were either fully vaccinated or immune to vaccine preventable diseases were MMR 79.7% (141/177), pertussis 42.1% (74/176), tetanus 72.3% (128/177), and varicella 85.9% (152/177). The rates of uncertainty regarding immunisation status were tetanus 17.5% (31/177), MMR 15.8% (28/177), pertussis 15.3% (27/176) and varicella 6.8% (12/177).

**Table 4-1: Parents knowledge of their vaccination status**

Vaccination status	MMR		Pertussis		Tetanus		Varicella	
	n 177	= (%)	n 176*	= (%)	n 177	= (%)	n 177	= (%)
Confirmed infection	31**	(17.5)	0	(0)	0	(0)	136	(76.8)
Fully vaccinated	110	(62.1)	74	(42.0)	128	(72.3)	16	(9.0)
Incomplete vaccination	8	(4.5)	0	(0)	18	(10.2)	0	(0)
Not vaccinated	0	(0)	75	(42.6)	0	(0)	13	(7.3)
Unsure of status	28	(15.8)	27	(15.3)	31	(17.5)	12	(6.8)

Catch-up vaccination was recommended for 66.1% (117/177) of parents, for 200 individual vaccines. The most frequently recommended vaccine was pertussis 49.5% (99/200), followed by tetanus 26.0% (52/200) refer to Figure 4-1. Of the vaccinations recommended, 50% (100/200) were completed during the two month follow-up period. The recommended vaccine with lowest completion rate was varicella.

**Figure 4-1: Recommended and completed vaccinations**



Of the 117 parents who were recommended catch-up vaccination, 62 (53%) complied, resulting in an improvement in up-to-date vaccination status from 33.9% (60/177) to 68.9% (122/177;  $p < 0.0001$ ) (2002-2005). The most common reason given for non-completion by those contacted was "haven't got around to it" (19/56), much higher than the next category "don't want vaccination" (5/56; Table 4-2).

**Table 4-2: Ranked reasons for non-completion of vaccinations**

Reason	n = 53
Haven't got around to it	19
Don't want vaccination	5
Affordability	4
Pregnant	3
Forgot to ask parent	2
Serology not done	2
Immunity confirmed	2
Other	12
Unknown - unable to contact patient	7
<b>Total</b>	<b>56*</b>

\***Note:** Total includes additional reason given by 3 patients

## Discussion

This study allowed GPs and general practice nurses to implement and evaluate a health promotion strategy in their own general practice population. The study design was chosen to reflect the teamwork and time limitations that characterise Australian general practice. Hence, there was minimal involvement required by the general practitioners, other than to confirm the medical history and vaccination recommendations for each person in the study. Patient recruitment, data collection and follow-up were all conducted by the practice nurse, a method that has demonstrated effectiveness in the Australian general practice setting (Cheffins et al. 2007; Cheffins et al. 2009; Cheffins et al. 2010).

Two thirds of the parents in the study were assessed as needing at least one catch-up vaccine. This indicates that taking a parent's immunisation history is a worthwhile intervention to add to the childhood vaccination program of a general practice. One limitation of the study was that it relied on self-reporting of immunisation status. It was decided to use this measure rather than serological confirmation of immunisation status for pragmatic reasons. However, there is also support for this approach amongst public health professionals given the low rate of adverse reactions in adults when re-vaccinated (Department of Health and Ageing and National Health and Medical Research Council, 2008). Most parents in this study, when asked directly, were able to give their immunisation history for relevant illnesses.

Although this is a small study restricted to northern Queensland, there is no reason to expect that the findings would not be transferrable to other Australian GP settings. The close engagement of practice nurses with an academic research unit was valuable in ensuring the success of the study. It is possible that improvements in vaccination rates could be lower in practices without this history of research engagement.

#### Implications for general practice

When a vaccine was recommended by a health professional within the GP setting, 50% were completed within two months. No reminders were needed to achieve this improved outcome. It is likely that additional reminders would further increase the immunisation coverage of parents.

Teamwork between GPs and nurses is a necessary component of prevention practice in primary care. General practice nurses have the opportunity, knowledge and skills to implement health promotion interventions such as parent catch-up vaccination. Trialling the intervention in a broader cross-section of general practices would be a useful next step.

The references for this chapter are included in the final reference list.

## Chapter 5. Research capacity building through the NQPBRN: Conclusion to Part One

### NQPBRN research projects.

The three published studies comprising the first section of the thesis, demonstrate the evolving research methods employed by North Queensland Practice-Based Research Network (NQPBRN). With training and experience, the practice research nurses were able to progress from studies based primarily on clinical audits to more complex designs involving prospective data collection and follow-up of individual participants.

A research coordination cycle was developed that allowed practices to work with the academic team in a predictable way, allowing sufficient time for recruitment, training, data collection, analysis and dissemination. These research cycles lasted approximately six months, and were defined by practice visits. Each practice visit had three separate objectives:

- Dissemination of previous project results.
- Recruitment and training for current project
- Consultation on ideas for longer term projects.

General practitioners (GPs) were most involved in the recruitment and dissemination phases of the cycle, while practice nurses (PNs) underwent training in the research methods required for each study. PNs were responsible for data collection and for ensuring any GP specific components were completed. PNs also attended additional workshops to receive generic research skills training, and were encouraged to give presentations and design their own research.

### Evaluation of the NQPBRN.

An evaluation of the research network was undertaken in 2009. This consisted of semi-structured interviews with a sample of GPs (11) and PNs (7) from 12 different practices. The interviews were performed by a research officer

employed by JCU School of Medicine. Ethics approval was granted by the James Cook University Human Research Ethic Committee (approval number H2747). Recruitment for the evaluation was done face-to-face at network meetings, by email and by telephone. The response rate of 85.7% (18 from 21 invited practice staff) was high. Subjects were invited based on their practice's participation in two or more NQPBRN research projects. Interviews covered experience with doing research, training for research, and their experience of being in the network. They were also asked whether they would remain involved with research, and what support they would like. Interviews were conducted by telephone, recorded, transcribed and coded manually. Thematic analysis was conducted by three coders comparing coded themes of interview findings. Differences were resolved by consensus. The medical coordinator (the author) was not directly involved in the interviews as this could have influenced the responses. However, the coordinator did contribute to the thematic analysis of the transcripts, and findings from the evaluation were utilised by the coordinator to refine subsequent research projects.

Overall, the evaluation participants indicated that the NQPBRN was of considerable value in ensuring that research was relevant to practice needs, and in providing training and up-skilling in research methods. The strategy of using practice nurses to do most of the data collection was strongly supported.

The key themes that emerged from the evaluation (with illustrative quotes) were:

- 1. Research in general practice needs to be closely aligned to “usual business”**

Participants supported findings in the literature review around the critical importance of aligning PBRN research with practice procedures, to minimise disruption to the practice and time-wasting.

*“Research should be within the scope of what we normally do”*

*“..research is useful when it shows positive results relating to the role of the GP”*

*“ ..happy to participate but don't have time to set it up”*

Participants emphasised the importance of streamlined research methods, readily available research support (that they felt was provided by the NQPBRN), and the importance of keeping research locally relevant.

*“Research that's keeping things relevant to what we do so you can see an outcome and you can see how it would improve your practice, that's what I'd like to see. An outcome from doing research or being part of research, you're not going to keep people interested if they don't feel things are relevant to them.”*

**2. General practice based research is important to ensure relevance to the community.**

Participants described the importance of moving research out of hospitals and into general practice, stressing the need for GP research to answer questions encountered only in community based practice.

*“Simple things that won't win any gold medals but they make a difference to our patients”*

*“Need more research with elderly patients in General Practice – such as when to stop drugs – drug companies are unlikely to fund this research”*

*“Research foisted on us is not from primary care - it's hospital based and that's a whole different population of patients”*

*“Definitely should do research as it all starts with the GP”*

Participants also indicated that patients were quite happy to participate in GP based research, and that the strengthened links with JCU were an added benefit. Dissemination strategies were particularly well regarded.



*“Patients were almost excited about being involved in a research project, patients wanted to know results when came back... Good in that respect, good for us to know as well as to question some of these things yourself. Consent had JCU on it, patients used to uni as have students come through here almost felt they were helping medicine in some ways by being involved.”*

*“Good that both written up in journal - helpful to other practitioners as well”*

### **3. Training, networking and dissemination of results.**

The provision of training for practice nurses was highly valued. Site visits to conduct meetings were considered useful to enable networking and dissemination of results.

*‘My impression is that most people pick it up as they go along and it’s sort of higgledy- piggedy’*

*“Interesting to get together and compare each others’ results”*

*“Good to have face-to-face opportunity to hear results and meet other researchers”*

*“Really good as often do projects and don’t actually discuss results”*

*“Haven’t done anything like this before so made it less daunting”*

*“It was good engaging with other people and looking at how to gather your data. Talking to other PN and within the group too those who were lecturing and those who had been part of bigger research projects in the past.”*

### **4. Protocols preferred for GP research.**

Practice nurses are the preferred data collectors for research, but practice GP owners wanted to be involved in choosing research and approving nurse involvement.

*“As practice owner, I can involve the nurses and reception staff in research and say “yes” we are going to do this as a practice...”*

*“it helps having someone else organise it .. having the practice nurse involved”*

*“Nurses are generally quite good at collecting data – better than doctors.”*

## **5. Role of NQPBRN in building future research capacity.**

Participants were satisfied with their role in collecting data. However, there was an emerging interest in research and an understanding of how they could work with PHCRED to conduct their own projects.

*“I quite enjoyed the collection, that’s really all I’ve been involved in so far.”*

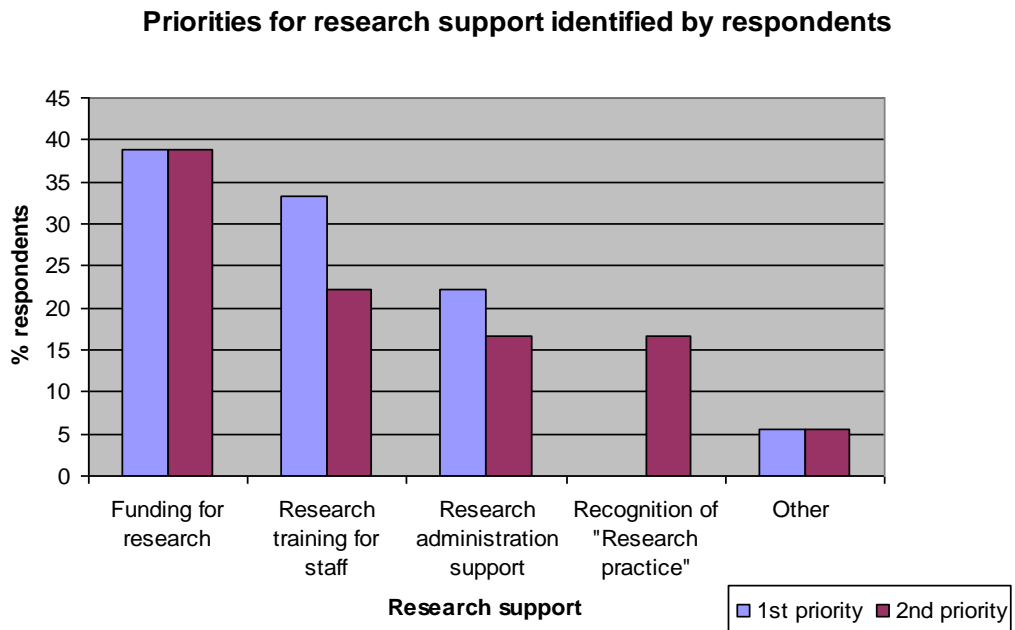
*“If more spare time would like to do a little more in depth research. At this point in time quite happy to collect data.”*

*“There’s a part of me that would like to do research but I haven’t got the time at the moment so very happy to help someone else with it and interested in the results. Without having to worry about working out statistics or writing of a paper”*

*“Don’t have time to do that but maybe down the track.”*

The interviewees were also asked about their priorities for research support and as shown in Figure 5-1 they identified funding and training as the most useful means of support.

Figure 5-1: Priorities for general practice research support.



Overall, the evaluation demonstrated a high level of satisfaction within general practices for the support provided by NQPBRN. The outcomes of this evaluation were used to develop the strategic direction and work plans for NQPBRN over the remaining period of the PHCRED funding cycle. The following case study describes one of the highlights of the author's experience as medical coordinator of NQPBRN.

## Case Study 1 – Building research capacity in general practice

Practice B was established 85 years ago in a regional city in North Queensland. It is owned by two GP partners who employ four other GPs on a part-time basis. Two practice nurses are employed to manage the treatment room and support chronic condition management. The practice was previously involved in a randomised controlled trial of wound management methods. The practice was invited to join the NQPBRN, and the practice principals agreed to be involved provided the studies could be completed by the practice nurses without too much intrusion into their usual duties. The practice nurses volunteered to attend two research skills workshops, with funding provided by NQPBRN to support travel and back-filling of the nurses' positions. The workshops ran for one day and one evening respectively, and included specific training for two research projects.

When NQPBRN recruited practices for an evaluation of over 75 years health assessments, the GPs and practice nurses were interested because they had been using recalls undertaking these assessments for their ageing patients and wanted to know whether this strategy was effective. They readily agreed to take part and both nurses attended a one day training session on research methods. One nurse became the contact person within the practice, and the audits were successfully completed.

On completion of the study, I visited the practice to meet with the GPs and practice nurses and share the outcomes. This study resonated with the nurse because at her practice she was responsible for the implementation of health assessments. While completing the study, she began to question whether we should have included a study of the attitudes of the patients to health assessments. The discussion led to the practice nurse requesting support to undertake a survey of older patients on how they view health assessments.

With support from the academic team at NQPBRN, the nurse designed her own patient survey and obtained ethics approval. The patient survey was undertaken by mail-out from the practice and analysis completed by NQPBRN personnel in

collaboration with the nurse. A paper with the practice nurse as co-author was published in a peer reviewed nursing journal (Spillman et al. 2012). The nurse also was supported to attend a national primary health care research conference to present her findings.

This case highlights the research capacity building achieved within the NQPBRN – a practice nurse has gone from being a passive data collector to someone with strong research skills and the ability to conceptualise primary health care research questions and implement a publishable project.

## PART TWO

### Chapter 6. Introduction to the evaluation of chronic condition management projects in general practice.

The discipline of General Practice (GP) has traditionally focussed on the acute primary health care of individuals and their families. The first half of this thesis focussed on research capacity building largely within this paradigm. However, as the prevention and long-term management of chronic conditions has emerged as a significant part of medical practice, general practice has adopted a more systematic and continuing approach to providing health care. This requires general practices to pro-actively engage with their whole practice population and consider the health status and inequities within their community.

#### Population health in general practice

Population health in the context of general practice has been defined as:

*“Encompassing planned and organised responses to promote and protect health, to prevent illness, injury and disability, to decrease the burden of illness and to restore and rehabilitate those with chronic disease. It also encompasses an understanding of the social, economic, cultural and political determinants of health. This can take place in a variety of settings and can include opportunistic interventions and care in the general practice setting”*

(Joint Advisory Group on General Practice and Population Health, 2000 p. 1)

This definition was published in a Joint Advisory Group (JAG) consultation paper that outlined the key issues for improving population health:

- More integration between GPs and other health workers
- Financial incentives to reward population health practice
- A network of population health coordinators to support GPs in this work
- Population health education for GPs
- A leadership role for Divisions of General Practice in population health.

(Joint Advisory Group on General Practice and Population Health, 2000)

## Enhanced Primary Care Program

The main outcome from the JAG consultation was the introduction of the Enhanced Primary Care (EPC) program in 2001 which created a limited range of new Medicare payments to enable more systematic and comprehensive care by GPs (Department of Health and Ageing, 2001).

Evaluation of the initial EPC program showed significant barriers to its implementation, and that education and support for GPs to implement the program was essential (Blakeman et al. 2001). In rural areas shortages of allied health workers made the multi-disciplinary approach difficult and time pressures in under-serviced areas were a major barrier (Lewis et al. 2003). Following these evaluations, a more specific range of population health interventions was introduced into General Practice through the Medicare system in 2006 as the Chronic Disease Management (CDM) program (Department of Health and Ageing, 2006).

All members of the practice team, including nurses and other allied health professionals, are involved in delivering CDM. Practice-based patient registers are used to identify and monitor those at highest risk of morbidity and mortality. Under the CDM program patients who have a chronic disease, defined as being expected to last at least six months, can receive any or all of the interventions from their GP listed in Table 6-1:

**Table 6-1: Chronic disease management items funded by Medicare.**

GP management plan (GPMP)	GP assesses patient, agrees management goals, identifies patient actions, treatments and follow-up.
Coordination of team care arrangement (TCA)	Coordinates care for a patient with chronic condition by collaborating with at least 2 other health care providers. Patient then eligible for limited free allied health services.
Contribution to team care arrangement	Contributes to TCA being coordinated by another health care provider.
Reviews of GPMP and TCA	Reviews and changes are made every six months.

A separate schedule of item numbers is available for Aboriginal and Torres Strait Islander people, with the eligibility age for an older person's health assessment adjusted to 55 years for this group. To be eligible to utilise the EPC items, general practices are required to establish a diabetes and chronic disease register, a fundamental step in addressing population health. There were one-off incentives for practices to invest in information technology to support population health. Preventive health checks and mental health management items have also been included in the EPC program. Registers are also crucial for practice audit and quality improvement activities, as recommended by the Royal Australian College of General Practitioners for its continuing professional development program.

### Chronic disease epidemiology

In its biennial report on the health status of Australians, the Australian Institute of Health and Welfare (AIHW) described how chronic diseases contribute the most to morbidity, disability, and mortality in Australia (Australian Institute of Health and Welfare, 2008). Burden of disease data from AIHW indicated that ischemic heart disease, stroke, lung cancer, chronic obstructive pulmonary disease (COPD), diabetes and dementia accounted for 32.6% of disability adjusted life years lost in Australia (Mather et al. 1999).

Data on avoidable mortality in Queensland show that 29.3% of deaths in this state could be prevented through appropriate health care. If optimal health behaviours and socio - economic policies were also implemented, up to 72.8% of deaths could be avoided (Population Health Information Development Unit, 2007). Avoidable hospitalisations, based on the concept of optimal ambulatory care, constitute 7.6% of admissions in the Townsville Health Service District (compared with 8.5% in Queensland). Diabetes mellitus is by far the greatest contributor to avoidable hospital admissions, with 676 identified avoidable admissions per annum in this region (Population Health Information Development Unit, 2007). Recent studies in Australian General Practice have demonstrated that the majority of patients with diabetes are not achieving recommended clinical targets for blood pressure and lipid levels, thus



increasing their chance of complications and avoidable admissions (Furler et al. 2013).

Townsville lies in the Queensland Health Northern Zone, which covers the area from Mackay in the South to Torres Strait in the north and west to the NT border. Compared with Queensland overall, deaths from diabetes are 70% higher and hospitalizations 80% higher in the Northern Zone. Much of this excess disease burden is due to the high prevalence of diabetes in Aboriginal and Torres Strait Islander people (Queensland Health, 2008).

It is also noteworthy that rates of co-existent diabetes type 2 and obesity were found to be higher in Townsville than the rest of Queensland and Australia (Population Health Information Development Unit, 2007). It has been estimated that the cost of treating diabetes for people aged 25 years and over in 2000 in Australia was A\$636 million (Davis et al. 2006).

#### Government chronic disease policies

The Australian Government has released a chronic disease strategy which has the following objectives:

- Prevent and/or delay the onset of chronic disease for individuals and population groups
- Reduce the progression and complications of chronic disease
- Maximize the wellbeing and quality of life of individuals living with chronic disease and their families and carers
- Reduce avoidable hospital admissions and health care procedures
- Implement best practice in the prevention, detection and management of chronic disease
- Enhance the capacity of the health workforce to meet the population demand for chronic disease prevention and care into the future.

(National Health Priority Action Council, 2006)

The Queensland Government also has a chronic disease strategy for the period 2005-2015. The principles underlying the strategy are:

- Achieving respectful and committed person-centred care and optimal self-care
- Encompassing prevention across the continuum of care
- Providing the most effective interventions
- Addressing the needs of disadvantaged groups
- Promoting integrated multi-disciplinary care
- Working together in partnership and collaboration
- Building on current best practice models.

(Queensland Health, 2005)

These policies underpin all Government funded chronic disease programs, including those implemented through the Australian General Practice Network (AGPN). However, barriers such as different funding sources for primary and secondary health care and professional boundaries can impede the implementation of effective CDM.

### Australian General Practice Network

In 1993, the Australian Department of Health and Ageing established a network of Divisions of General Practice across Australia. These organisations supported General Practices and other primary health care providers to meet the needs of their local communities.

Divisions of General Practice were funded by the Australian Government to implement health care reforms including the uptake and appropriate use of EPC items. Chronic disease has also been recognized as a key priority for primary health care through State Government programs such as Connecting Health Care in Communities (CHIC). This program brought together local leaders of primary health care providing agencies to share information about their services and reduce duplication of effort through better integration of programs.

CHIC and other Division programs aimed to build capacity for general practices to undertake more systematic management of chronic disease. This included patient self-management support training to teach people how to take more control of their conditions (Battersby, 2002), and education programs for GPs and practice staff about the clinical and organisational aspects of chronic condition management. Auditing of chronic disease registers to assess quality of care and to guide change within the practice team is an important strategy requiring the development of IT systems suitable for population health practice. Divisions of General Practice were instrumental in driving these activities and this responsibility has now transferred to Medicare Locals.

#### Chronic disease management in GP - barriers and enablers

A number of barriers to the provision of high quality chronic disease management (CDM) in GP were identified in a systematic review of CDM literature: the method of financing care; lack of availability of allied health teams; poor uptake of self-management education; and inadequate decision support systems (Harris and Zwar, 2007).

A 2006 systematic review of the evidence to support improved CDM found that a combination of better self-management support and delivery system design would have the greatest impact on improving health outcomes (Zwar et al. 2006). It also found that GP adherence to CDM guidelines is achieved through better decision support and clinical information systems (Zwar et al. 2006).

A review of Australian CDM research was conducted by the Primary Health Care Research and Information Service in 2009 to inform CDM programs implemented within Australian Divisions of GP. It found enabling factors for CDM in primary health care included strong relationships between local health services, use of multi-disciplinary care, congruent clinician values and systematic approaches to care. Barriers were lack of GP engagement, uncertainty about sustainability of programs, workforce shortages and competing priorities for service delivery (Isherwood and Kalucy, 2009).

## Integrated care in Chronic Disease Management

Integrated care refers to comprehensive and multi-disciplinary care aimed at reducing the burden of disease through coordination of best practice care, targeting of groups with greatest need, and partnering between consumers and providers (Willcox and Gill, 2007).

A systematic review of integrated health care identified several universal principles that enable integration: maximising patient accessibility and minimising duplication; use of inter-professional teams across the continuum of care; state of the art information systems to collect, track and report activities; and funding mechanisms to promote inter-professional teamwork (Suter et al. 2009).

Care planning is a tool used by Australian primary care providers to achieve this model of integrated care. Funded through the Enhanced Primary Care program, care planning includes assessment of goals, participatory development and implementation of the plan, monitoring and review (Martin and Peterson, 2008). Care plans have been shown to improve adherence to guidelines and lead to better health outcomes for patients with diabetes (Zwar et al. 2007), although the increased paperwork associated with their preparation, and the risk of over-servicing are possible negative outcomes.

Access to allied health care has been supported by the Australian Government through the implementation of Team Care Arrangements (TCAs) which allow GPs to refer their CDM patients for a limited number of free or subsidised allied health services. Evaluation of the use of TCAs for patients with diabetes has shown improved inter-professional communication and patient satisfaction (Grimmer-Somers et al. 2008). The utilisation of allied health referrals by GPs and their CDM patients has also been evaluated. Factors associated with referral included age over 45 years, multiple conditions, long illness duration, and poor mental and physical health (Harris et al. 2010).

## Self-management support

Self management support (SMS) refers to patients and carers taking more responsibility for their own care (Wagner et al. 1996), and is explored in detail in Chapter 7 of the thesis. In summary, strategies that support more effective self-management include: patient education; motivational counselling; and distribution of educational materials (Zwar et al. 2006) and goal setting, care planning and review (Battersby, 2005).

Australia's National Chronic Disease Strategy states that more training of primary care providers is needed to encourage use of SMS in routine practice (National Health Priority Action Council, 2006). Implementation of SMS in practice is dependent on practitioners and policy makers seeing evidence of its value and their encouragement to undertake behavioural and organizational change at the practice level (Newman, 2008).

## Townsville General Practice Network and Medicare Local Population Health Programs

Townsville General Practice Network (TGPN) was the Division of General Practice that supported general practitioners and other primary health care providers to improve health care delivery in the Townsville region. In July 2011 it transitioned to the Townsville–Mackay Medicare Local (TMML) and continued its programs in a wider area encompassing the regional cities of Mackay and Townsville and a number of rural and remote communities.

Continuing professional development and quality assurance activities are delivered, along with specific service provision in the areas of mental health and after hours care. A number of initiatives have been implemented by TMML to enable more systematic care of practice populations, particularly those living with chronic conditions (Townsville-Mackay Medicare Local, 2013).

TMML has a chronic condition management group consisting of a medical adviser and a number of project staff who work with practice teams (GPs, nurses, managers and allied health professionals). Self-management support

training, uptake of enhanced primary care services, and integration between public and private services are the main priorities for chronic care.

Quality improvement is undertaken using collaborative methodology at practice level based on Plan, Do, Study, Act cycles. De-identified health outcome data is collected regularly from each practice using automated extraction tools and presented graphically to the practice team to monitor progress and assist with population health planning within the practice. Aggregated de-identified data provide a broader view of the health outcomes at Medicare Local level. Lifestyle modification programs are delivered for people identified as at high risk of chronic conditions, in collaboration with workplaces and sporting clubs.

## Conclusion

This chapter has briefly reviewed the policy and practice context and literature about population level care within primary health care settings, particularly in relation to chronic condition management. It describes the practical implementation of population health programs at GP Division, Medicare Local and practice level, and discusses the barriers that exist. The chapters in Part Two describe four project evaluations undertaken within the TGPN chronic condition management and population health program.

## Summary of projects undertaken at TGPN

### Evaluation of Self-Management Support (SMS)

As part of its chronic condition management program, TGPN provided SMS training for local health professionals. The course was based on the Flinders Model of SMS (Battersby et al. 2002) and participants were GPs, practice nurses, allied health practitioners and health administrators.

The training was conducted as a two day workshop, with participants then required to submit case studies from their own practice. Several participants did not complete case studies, with some reporting that their workplaces could not provide the environment and resources necessary for SMS.

An evaluation of the capacity of our workshop participants to implement SMS in their workplaces was undertaken to allow us to modify training to maximise community benefit. The evaluation aimed to:

- ascertain whether workshop participants were able to implement SMS in their workplace
- identify reasons they were unable to implement SMS
- identify barriers to SMS in practice
- identify enablers of SMS in practice

### Integrated Health Care Partnership (IHCP) project

The Townsville Health Service District has a program to reduce hospital admissions due to chronic condition co-morbidities by improving community-based care. A team consisting of nurses and allied health practitioners assess and treat clients referred from within the hospital, and works with the GP to optimise care. TGPN received funding from the Queensland Health Connecting Health Care in Communities Initiative (CHIC) to improve the integration of this

program with general practice. An evaluation of the 12 month intervention was undertaken.

#### Extending the Reach – a rural CDM project

Following the IHCP project, CHIC funding was provided to TGPN to implement integrated chronic condition care in a rural town within the Townsville Health Service District. In consultation with the community, GPs and hospital staff, it was agreed to focus on case conferencing for clients who had early re-admissions (less than 28 days after discharge) to the local hospital because of a chronic condition. Public-private medical case conferences were held in the general practice, resulting in care plans held by the patient. An evaluation of this project was done including client and health professional surveys.

#### Completion of Team Care Arrangements

The TGPN chronic condition team supports general practices to use Team Care Arrangements (TCAs) by educating the GP team about their implementation, and through the development of an electronic referral and monitoring tool. TCAs allow patients with chronic conditions to access Medicare funded allied health services on referral from their GP. The TCA specifies a detailed team-based care plan. An audit of completion rates of TCAs was undertaken to evaluate the effectiveness of the TGPN support program.



## Chapter 7. Self-management support capacity of providers of chronic condition primary care

This study was funded by the Primary Health Care Research Evaluation and Development (PHCRED) research capacity building program, and undertaken in collaboration with a project officer from Townsville General Practice Network (TGPN). It involved an evaluation of self-management training given by TGPN to primary health care service providers.

### Publication reference

Cheffins TE, Twomey JA, Grant JA, Larkins SL. An evaluation of the self-management support capacity of providers of chronic condition primary care. *Australian Journal of Primary Health*. 2012; 18(2):112-115

The original paper published in the *Australian Journal of Primary Health* is presented here. Content has not been changed and format used for the *Australian Journal of Primary Health* has been retained, including the need to comply with word limits for an original research article. Re-formatting has been minor and involved making the paper comply with a thesis chapter structure, including placing references at the end of the thesis.

### Author contributions

#### Tracy Cheffins

- Designed the study and developed the questionnaire and protocols
- Submitted ethics proposal
- Supervised the project officer undertaking interviews
- Analysed interview data and prepared manuscript for publication

#### Julie Twomey

- Assisted in development of the interview questions
- Undertook interviews and collated results under supervision of first author
- Assisted in preparation of manuscript for publication

#### Jane Grant

- Delivered self-management support training
- Designed the post-training evaluation questionnaire
- Assisted in preparation of manuscript for publication

#### Sarah Larkins

- Provided general academic advice on the evaluation and subsequent publication

## Abstract

### Background

Self-management support (SMS) is an important skill for health professionals providing chronic condition management in the primary health care sector. Training in SMS alone does not always lead to its utilization. This study aimed to ascertain whether SMS is being used, and to identify barriers and enablers for SMS in practice.

### Methods

Health professionals who underwent SMS training were invited to participate in a semi-structured interview.

### Results

A response rate of 55% (14 of 24) was achieved. All interviewees rated their understanding of the principles of SMS as moderate or better. In relation to how much they use the principles in their practice, several (5 of 14) said minimally or not at all. The tools they were most likely to use were SMART goals (8 of 14) and decision balance (5 of 14). Core skills that were used included problem solving (11 of 14), reflective listening (13 of 14), open-ended questions (12 of 14), identifying readiness to change (12 of 14) and goal setting (10 of 14). The most important barriers to implementing SMS were current funding models for health care, lack of space, and staff not interested in change. The most highly rated enabling strategies were more training for general practitioners and practice nurses; the lowest rates was more training for receptionists.

### Conclusion

The increasing prevalence of chronic conditions due to ageing and lifestyle factors must be addressed through new ways of delivering primary health care services. Self-management support is a necessary component of such programs, so identified barriers to SMS must be overcome.

## Background

The aim of chronic condition self-management support (SMS) is to develop the skills and confidence of patients and families so that they can take more responsibility for their own care. Specifically there are six principles of self-management (SM) that translate into an individuals' capacity to:

1. Have knowledge of their condition.
2. Follow a treatment plan (care plan) agreed with their health professionals.
3. Actively share in decision making with health professionals.
4. Monitor and manage signs and symptoms of their condition.
5. Manage the impact of the condition on their physical, emotional and social life.
6. Adopt lifestyles that promote health (Wagner et al. 1996).

Effective SMS therefore might include patient education sessions, patient motivational counselling, and distribution of educational materials (Zwar et al. 2006).

Specific SMS strategies are more effective than general ones and groups are more effective than one-on-one interventions (World Health Organization, 2002). The Flinders Model of SMS is a clinically led model of education using trainer-the-trainer techniques to provide skills and information to the primary health care team, emphasising goal setting, care planning and review (Battersby, 2005). Other models of SMS are the Stanford Model and Expert Patient Program (Lorig et al. 1999; Department of Health, 2001).

Self-management education has been shown to be most effective when tailored to patients' needs, and integrated into primary health care programs (Osborne, 2008). However, there is ambiguity among health care providers about the meaning and significance of SMS, and the skills and processes required to implement it (Willcox and Gill, 2007). Research into the uptake and sustainability of chronic disease SMS has shown that while clients strongly support the concept of SMS, and many clinicians find it valuable, general

practice members of the primary care team are less willing to engage in the process (Williams et al. 2007).

In Australia there has been limited integration of SMS into primary health care. There is a need for better understanding of infrastructure, systems and training required by patients and health professionals (Jordan et al. 2008). Integration of SMS into general practice is limited by capacity constraints and difficulties incorporating it into existing work practices. There is a need for more collaboration between providers, better training of practice staff, and changes to the organisation of services (Harris et al. 2008).

Acceptance of SMS principles requires the accumulation of robust evidence to persuade policymakers and healthcare professionals of its value (Newman, 2008). A review of the current evidence for self-management, recommended integration of SMS principles into clinical, educational and workplace contexts (Glasgow et al. 2008). A systematic review of chronic condition management recommended more SMS training for GPs and practice nurses, and incorporation of SMS education into care plans (Zwar et al. 2006).

*Australia's National Chronic Disease Strategy* and the *Queensland Strategy for Chronic Condition – Framework for self-management* both state that more training of primary care providers is needed to encourage use of SMS in routine practice (Queensland Health, 2005; National Health Priority Action Council, 2006).

As part of its chronic condition management program, Townsville General Practice Network (TGPN) provides SMS training for health professionals, based on the Flinders Model of SMS (Battersby et al. 2002). This paper reports on findings from a two-stage evaluation of one group of SMS workshop participants.

## Methods

Flinders Model training is conducted as a two day workshop, with participants then required to submit case studies from their own practice. The training aims to provide each participant with the ability to:

- understand the evidence for chronic condition self-management;
- undertake a self-management assessment ;
- use a problems and goals approach;
- develop a self-management care plan;
- use a range of interventions & strategies; and
- Have an understanding of the stages of change.

A set of tools is provided to enable clinician and client to undertake a structured assessment of self-management behaviour, and collaboratively identify problems and goals, leading to the development of individualised care plans. Volunteers with chronic conditions are recruited to give participants practical experience in providing SMS.

Participants in two workshops held in 2009 were the focus of this evaluation. The group consisted of GPs (2), practice nurses (11), allied health practitioners (8) community nurses (11) and health administrators (4).

At the time of training, post workshop evaluation questionnaires were administered to assess:

- the participant's understanding of the main objectives of SMS training
- the degree to which the workshop met their learning needs
- the participant's confidence and ability to use SMS

In spite of a positive evaluation (see results section), several participants did not complete their case studies. Some stated that their workplaces could not

provide the environment and resources necessary for SMS. This led to TGPN undertaking a more detailed follow-up survey of participants that aimed to:

- ascertain whether workshop participants were able to implement SMS in their workplace
- identify barriers to implementing SMS
- identify enablers of SMS in practice

A purposive sampling method of recruitment for interview was used. Participants from the two SMS training workshops held in 2009, for whom we had contact details, were invited by personal email and phone call to be interviewed (n = 24). One follow-up telephone reminder was used if necessary. Interviews were conducted by telephone and took approximately 20 minutes. The interviewer was a member of TGPN staff not directly involved in the SMS training. Interviews were semi-structured, with brief free comments documented by the interviewer who was not a close associate of any of the interviewees.

The structured interview questions utilised a combination of Likert scale responses (1= lowest and 10= highest) and checklists. Structured question responses were analysed by frequency analysis, and comments reviewed by three authors independently. Comments were grouped into common themes.

Ethics approval for the survey was granted by the James Cook University Human Research Ethics Committee (H3469).

## Results

### Post workshop evaluations

Seventeen participants from the two workshops completed a confidential post-workshop questionnaire. There was a perceived high level of understanding of the learning objectives relating to SMS (Table 7-1). The degree to which learning needs were met was high, with all participants rating them as entirely

met. All participants agreed that the activity was partially or entirely relevant to their own practice.

**Table 7-1: Self assessed level of understanding of key SMS learning objectives following workshop. (n=17)**

Learning objective	Not understood	Partially understood	Entirely understood
Conduct interview using the Flinders Program Tools	-	-	17 (100%)
Assess self-management capacity using the Partners in health and Cue & Responses	-	-	17 (100%)
Use Problems & Goals Assessment	-	3 (17.7%)	14 (83.3%)
Develop Care Plan to improve self-management of their chronic condition/s	-	2 (11.8%)	15 (88.2%)

#### Follow-up interviews

The distribution of professional groups among those who consented (n=14) or declined (n=10) to be interviewed is listed in Table 7-2. The response rate was 55%.

**Table 7-2: Professional categories of those invited for follow-up interview**

Professional group	Responders (n = 14)	Non-responders (n = 10)
Nursing – management	1	1
Nursing – general practice	5	2
Nursing – project officers	2	0
Nursing – Queensland Health	0	2
General practitioner	0	2
Podiatrist	4	0
Other allied health providers	2	3

Figure 7-1: Barriers to self-management support

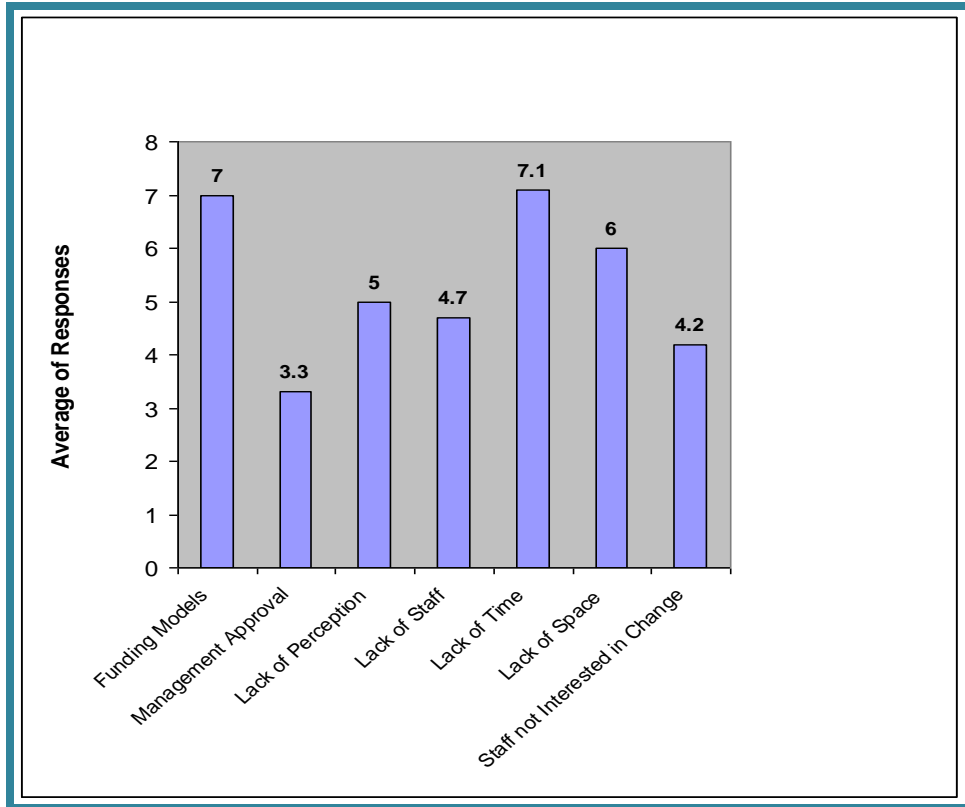
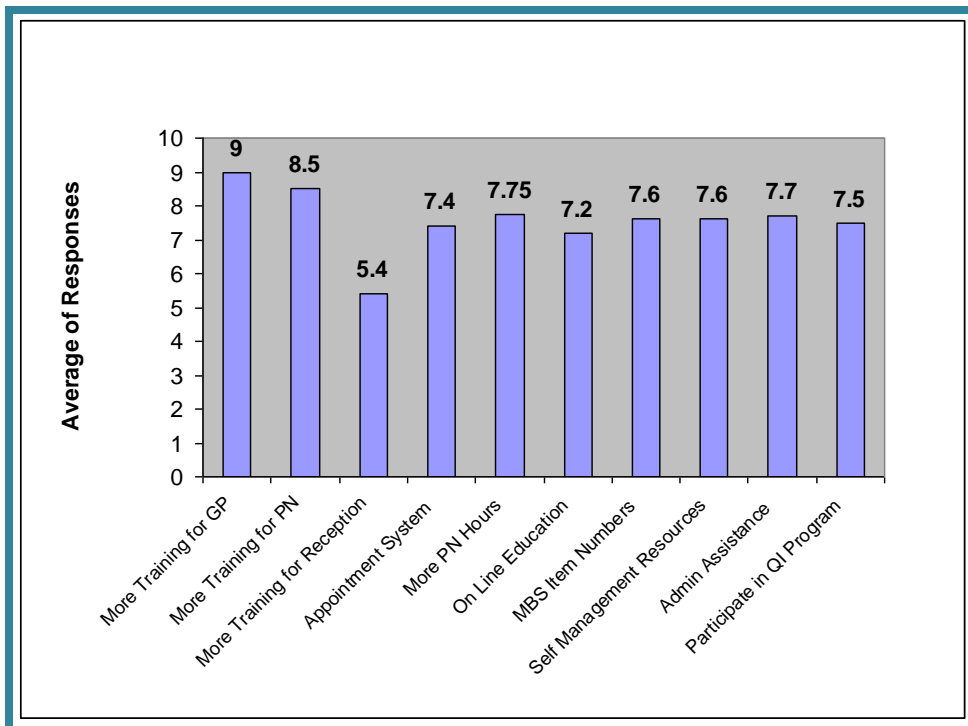


Figure 7-2: Enablers of self-management support





## Discussion

Our research was limited by the relatively small number of interviewees (n=14), but this represented 55% of those invited, and included participants from a range of professional groups. There was considerable consistency in their responses to all questions. Our findings support other studies in recognising the need to integrate SMS into clinical care and training for all primary health care professionals (Harris et al. 2008; Jordan et al. 2008).

The evaluation also identified current funding models for chronic condition care as problematic, reflected in their perceptions that adequate time for SMS is not available in most clinical settings. This mismatch between awareness of the value of SMS, and their ability to implement it, is a potential source of dissatisfaction and conflict for clinicians working in chronic condition care (Harris et al. 2010).

More SMS education for GPs, as recommended by our participants, could overcome the negative views found in previous GP research. A team based approach to SMS education within primary care is more likely to achieve the commitment required to change models of care and to redirect resources to delivering SMS.

As articulated in national health reform policy documents (DoHA, 2009; NHHRC, 2009), the increasing prevalence of chronic conditions due to ageing and lifestyle factors must be addressed through new ways of delivering primary health care services, with more emphasis on prevention, early detection and systematic chronic condition management. SMS is a fundamental requirement for the successful implementation of such programs, so the barriers outlined in this paper must be overcome.

References for this chapter are included in the final reference list.

## **Chapter 8. A health care partnership for managing chronic conditions: A case study of integrated primary care**

This project was funded by the Connecting Healthcare in Communities (CHIC) Initiative within Queensland Health (QH). It consisted of the evaluation of an intervention which added a general practice (GP) liaison component to an existing chronic condition management program within QH. Townsville General Practice Network (TGPN) implemented the GP liaison role, employing a GP and nurse to work with the QH Integrated Health Care Partnership (IHCP) team. The evaluation involved telephone interviews with QH and TGPN members of the team, conducted by an external evaluator using the first author's interview protocol. The Townsville CHIC Partnership Council supported the project and received the final evaluation report.

### **Authors' contributions**

#### **Tracy Cheffins**

- Wrote proposal for the GP liaison intervention grant
- Designed the evaluation protocol
- Submitted ethics proposal
- Prepared manuscript for submission as presented in this chapter.

#### **Jane Grant**

- Nurse member of the GP liaison team within IHCP
- Assisted with design of evaluation protocol

#### **Katrina Dorman**

- Nurse manager of the IHCP
- Assisted with design of the evaluation protocol
- Provided patient admission data for manuscript.

#### **Hillary Waugh**

- Conducted the external evaluation interviews
- Collated the interview results and provided an evaluation report

#### **Sarah Larkins**

- Provided academic advice on the evaluation

## Abstract

### Objective

The objectives of the project were to create stronger links between a Queensland Health chronic condition program and general practice (GP), to extend the scope of the program to a wider range of clients, and include private allied health services in chronic condition care plans.

### Method

A GP liaison team was employed to support an existing chronic condition program within Queensland Health. Case conferencing and GP communication protocols were reviewed and education sessions provided for team members. Practice visits to assist GPs and clients in accessing the service, and attendance by the GP liaison team at clinical review meetings were included. The project was externally evaluated through key stakeholder interviews.

### Results

The evaluation identified positive outcomes from the involvement of the GP liaison team. There were some barriers to integration between public and private health care, most notably the current funding models.

### Conclusions

Integration programs need wide consultation prior to implementation, and clear definition of team members' roles. Communication and training are critical factors in achieving integrated health care.

## Background

In 2007 a multi-disciplinary community based program commenced within a Queensland Health service district to provide chronic condition care for clients at risk of frequent hospital admissions. Clients can only join the program, known as the Integrated Health Care Partnership (IHCP), with the agreement of their general practitioner (GP).

On enrolment, a comprehensive assessment is done by an IHCP clinical nurse who remains the client's care coordinator. Clinical assessments and care are delivered by phone and in the client's home, with some group allied health sessions delivered at a community health centre. Multi-disciplinary review meetings are held regularly, and reports sent to the client's GP who continues to provide medical care.

In 2008, a 12 month project grant was obtained from Queensland Health's Connecting Healthcare in Communities (CHIC) Initiative to fund a GP liaison nurse and GP adviser to support the IHCP program. These personnel were employed by the local GP Network.

## Objectives

The objectives of the CHIC project were:

- To create stronger links between the IHCP and general practice.
- To extend the scope of the IHCP to a wider range of chronic disease clients.
- To include private allied health services in the care plans of clients.

## Setting

The local health service district where the project was implemented has a population of 211,736 and an avoidable hospital admission rate of 3,146 per 100,000 population, or 8.9% of all admissions (Queensland Health, 2008). Avoidable admissions are defined as ambulatory sensitive conditions that are

potentially avoidable through preventive care and early disease management (Queensland Health, 2008). Common causes are diabetes, congestive cardiac failure and chronic obstructive pulmonary disease.

## Participants

The IHCP team consists of the client, clinical nurse consultant, clinical nurses, physiotherapist, dietician, exercise physiologist, occupational therapist, and administrative officer. For the 12 months of the CHIC project a GP liaison nurse and GP adviser became members of the team.

Clients are referred to IHCP by discharge planners, emergency department (ED), outpatient clinics, ward clinicians, allied health and GPs.

The main criteria for inclusion in the program are:

- age over 50yrs (or 30yrs for Indigenous people);
- presence of a chronic condition;
- 3 admissions to hospital per year, multiple admissions to ED or high risk of admission;
- need for multidisciplinary care; and
- a desire to self-manage (Queensland Health, 2008)

Exclusions to participation in the program are listed in Table 8-1.

**Table 8-1: Exclusions to participation in Integrated Health Care Partnership**

- Clients with metastatic cancer under care of palliative care team
- Residents in high residential care facilities
- Clients receiving renal dialysis
- Clients receiving predominantly mental health services
- Clients receiving community aged care or extended aged care at home packages.

## Methodology / Sequence of events

For the duration of the CHIC project, the GP liaison nurse provided daily support to the IHCP team, and the GP adviser attended review meetings. Practice visits were made to solve problems and raise GPs' awareness of the IHCP. Clinical case conferences were organised between GPs and IHCP team members to assist in the preparation of management plans.

Written communication procedures with GPs were revised, and flow charts explaining Medicare case conferencing requirements were prepared. Educational sessions were delivered to IHCP personnel on the availability and operation of allied health services in the private sector.

The project evaluation included collection of key performance indicators and stakeholder interviews conducted by the Rural Health Research Unit, School of Medicine and Dentistry, James Cook University. Ethical approval was granted by the local health district research ethics committee and the JCU Human Research Ethics Committee.

The semi-structured interviews were conducted with health service district managers (n=2), GP network team members (n=2), and IHCP staff (n=10). Consent was obtained for audio-recording and analysis of the transcripts. Analyses included descriptive statistics of Likert scale responses and prevalent thematic analysis of qualitative responses.

## Outcomes

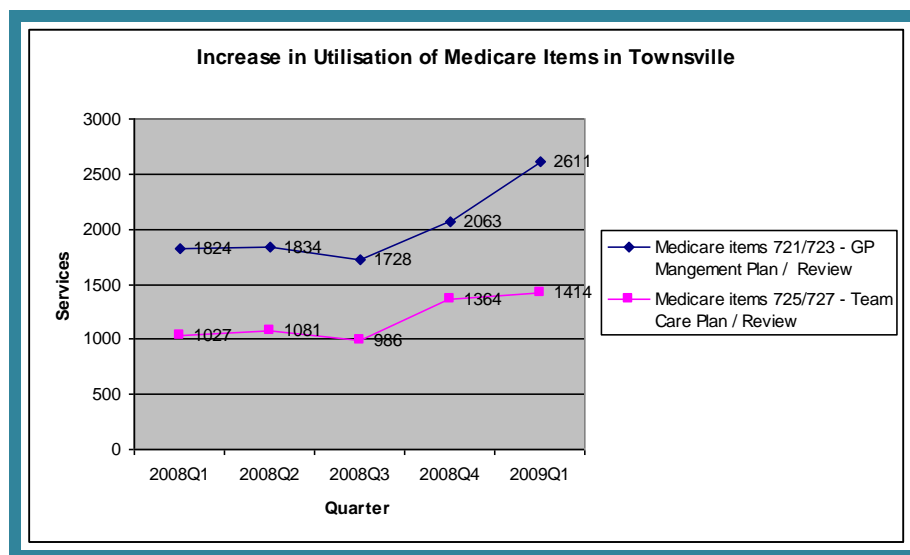
The medical adviser and GP liaison nurse were employed for six and 36.7 hours per week respectively for the 12 month duration of the CHIC project. Three team training sessions per month and up to 24 liaison visits per month were arranged by the GP liaison nurse and IHCP clinical nurses. Care planning protocol documents were developed and endorsed by the team.

All IHCP clients received timely care planning during the project period. Referral pathways for private allied health services were developed but there was minimal uptake by IHCP clients. This was explored further in the evaluation interviews.

The number of new client referrals increased, with 35 new referrals each quarter.

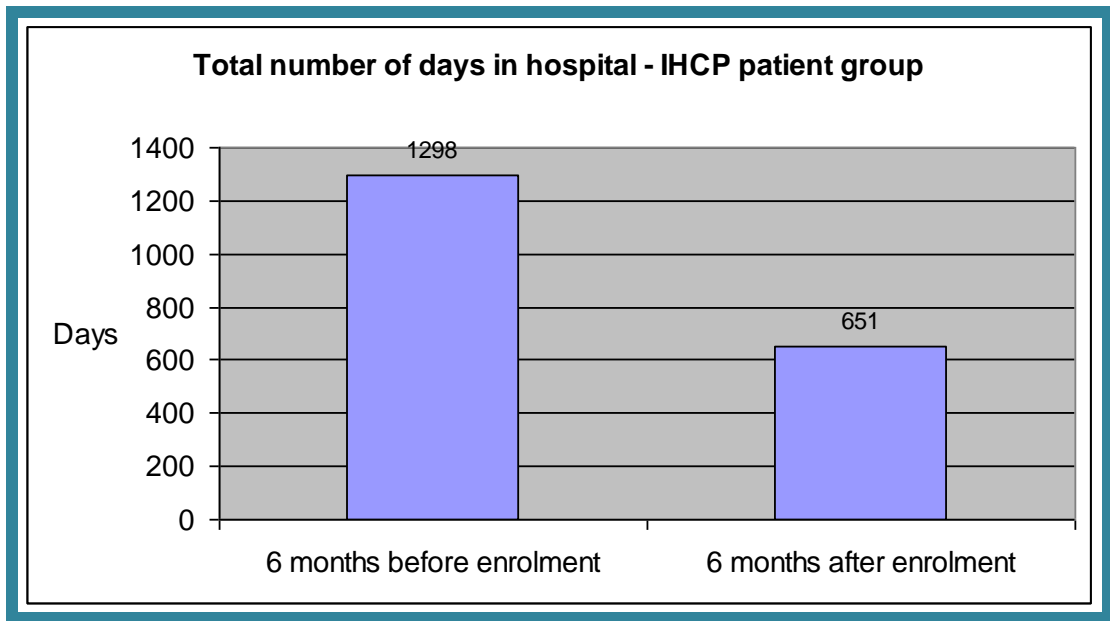
New sources of referrals included the chronic pain clinic and non-government organisations. The proportion of clients meeting their goals as outlined in care plans ranged from 78% to 90% each quarter (average 82.6%). The number of Medicare funded chronic condition services utilised by GPs in the district increased during the project (see Figure 8-1).

**Figure 8-1: Utilisation of Medicare chronic condition care items**

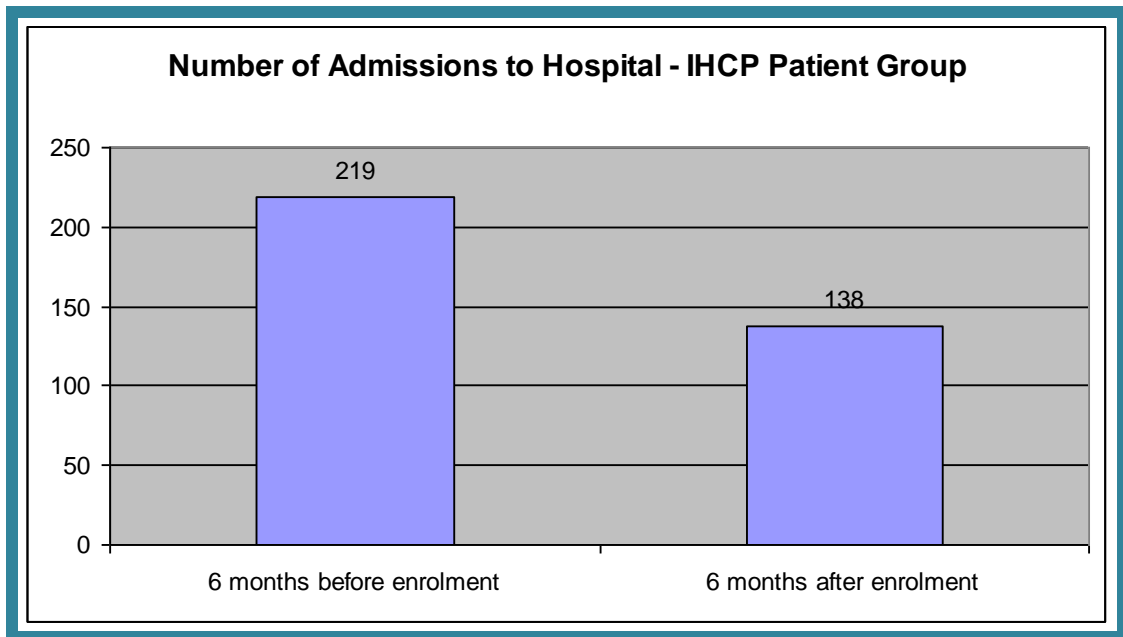


In addition to the CHIC project evaluation, hospital admission data before and after client enrolment were collected by the IHCP to evaluate the effectiveness of their program in reducing hospitalisations. The number of admissions to hospital and the total number of client days in hospital decreased following enrolment as indicated in Figures 8-2 and 8-3.

**Figure 8-2: Total number of days in hospital-IHCP client group**



**Figure 8-3: Number of hospital admissions-IHCP client group**





## Stake-holder interviews

As shown in Table 8-2, the GP liaison nurse and GP adviser were seen to have made a positive contribution. A majority of interviewees said that the project had improved communication between the IHCP and GPs. The perception of integration between IHCP and private allied health services was less positive overall, with the majority of responses indicating there had been little or no improvement.

**Table 8-2: Results of structured interview questions**

	0 None	1	2	3	4 A great deal
Assistance from GP Liaison Nurse (n=13)	0	0	8 61.5%	4 30.8%	1 7.7%
Assistance from GP medical adviser (n=13)	1 7.7%	1 7.7%	7 53.9%	4 30.8%	0
Improved communication between IHCP & GPs (n=12)	0	0	5 41.7%	5 41.7%	2 16.7%
Better integration of IHCP & PAHS* (n=13)	3 23.1%	6 46.2%	3 23.1%	1 7.7%	0

\*Private Allied Health Services

Respondents recalled several initiatives aimed at increasing IHCP client access to private allied health services. The GP liaison nurse had provided a list of local allied health providers and coordinated information meetings between private allied health providers and IHCP. GPs were encouraged to link IHCP clients to private allied health providers, and to use team care arrangements to enable access to Medicare rebates for allied health services.

A majority of respondents reported positive outcomes from the project. IHCP staff had a clearer understanding of the role of the GP and how Medicare billing works, whilst the GPs gained a better understanding of how to refer their clients to IHCP. IHCP staff confidence in promoting their work and relating with GPs was improved. IHCP business and client management practices were tightened, with more referrals and a stronger focus on self-management. Facilitation of

allied health professional meetings led to the IHCP team having better links with other teams in the community. There was a flow-on effect to other integrated programs such as the pain clinic and sexual health, and the team learned more about how to work in effective partnerships.

### Problems and Limitations

There were significant barriers to integration with private allied health services. Confusion remained about how many services were allowed, what was approved by the local health district, and what the real costs were to clients. It was reported that some clients could not afford to pay the gap between the Medicare rebate and the charge for the allied health service, thus limiting access to those private services available to them.

Respondents nominated several limitations to the overall effectiveness of the project:

- lack of effective communication and consultation amongst and between stakeholders in the development, planning and implementation of the project (including the definition of roles);
- various stakeholder organisations having different policy perspectives, values, schedules, workloads and funding structures (GPs, TGPN, Health Service District, IHCP and private allied health practitioners); and
- The limited time available for achieving outcomes when a process of change (both organisational and of individual practice) was required across various health sectors and institutions.

### Lessons learned

Useful lessons have been learned from the project and should be considered when planning integrated care initiatives. They are grouped into three key themes.

1. Project planning and implementation should include:

- Communication and collaboration between stakeholders before the project begins to ensure understanding, earn trust and foster commitment (including the signing of an MOU).
- Regular communication between management and coal face workers, within and across teams, and with other organisations and sectors.
- Involvement of senior management so they remain aware of the issues and can guide and support their staff effectively.
- Assessment of project impact on regular workloads and planning of strategies to ameliorate this.
- Validation of current work processes and outcomes, and a collaborative partnership to identify gaps and issues, develop strategies, and define roles.
- Investigation of the feasibility of embedding external project staff within Queensland Health, and providing them with full access to the building, computers, databases, information, email and hospital-based patient management systems.
- Creation of standardised, sustainable procedures that will remain after the project has finished.

2. The GP Liaison Nurse and GP Adviser roles:

- Were seen as valid and effective in bridging gaps, creating links, providing education and support to stakeholders, and continued funding for these roles should be considered.
- Provided new communication and support mechanisms that should be included in the regular work processes of IHCP staff and GPs to ensure sustainability.

3. Integration of IHCP with allied health services could be improved by:

- An analysis of the costs associated with bridging the gap between Medicare and private allied health fees, and how to meet these costs.
- A better understanding of client's knowledge of available health services and their capacity to pay for these services.
- Stronger links between the IHCP and private allied health providers to facilitate negotiation around the issues of referrals and obtaining Medicare rebates.

## Discussion

These recommendations are supported by evidence in the area of chronic condition care published in Australia. A 2006 systematic review of chronic condition management found that multi-disciplinary teams need clearly defined roles and responsibilities for all team members (Zwar et al. 2006). The importance of a coordinated approach to new service delivery models and the need to sustain engagement of clients, health professionals and organisations has also been described (Jordan et al. 2008).

A rural chronic condition program evaluation showed that effective communication between organisations, and a high level of community engagement were needed to achieve sustainability (Wakerman et al. 2005). Good collaboration and communication between providers and more training have previously been found crucial to improving chronic condition management in general practice settings (Harris et al. 2008) and this was the case in our project.

Better integration between GPs and allied health providers can be achieved by the use of multi-disciplinary management plans that have also been shown to improve patient satisfaction and confidence (Grimmer-Somers et al. 2008). However, funding models that adequately reimburse nursing and allied health services are required (Martin and Peterson, 2008). This lack of adequate

funding models was the main barrier to integration of private and public health care identified by our project.

### Acknowledgments

- Funded by Health Connecting Health Care in Communities Initiative.
- Nursing, administration and allied health staff from Integrated Healthcare Partnership.
- Aileen Colley, formerly Clinical and nursing director of the Institute of Primary Health and Ambulatory Care.

References for this chapter are included in the final reference list.

## Chapter 9. Extending the Reach - Integrated chronic condition management in rural Queensland

This project was funded by the Connecting Healthcare in Communities (CHIC) Initiative within Queensland Health, as an extension of the preceding Integrated Health Care Partnership (IHCP) project. The project was undertaken in a small rural community within the Townsville Health Service District. Patients with early re-admission to hospital for a chronic condition were the target group. Case conferencing between public and private medical service providers was evaluated using patient questionnaires and face-to-face interviews with the providers. The interviews were undertaken by an external evaluator.

### Authors' contributions

#### Tracy Cheffins

- Developed and wrote project proposal
- Submitted ethic proposal
- Analysis of patient questionnaires
- Designed evaluation protocol
- Prepared manuscript for submission, as presented in this chapter

#### Jane Grant

- Project nurse for the study
- Participated in case conferences
- Assisted with analysis of patient questionnaires

#### Alain Sanouiller

- Clinical supervisor of the project in the rural town
- Responsible for patient selection

#### Alice Street

- Clinical nurse consultant on the project
- Responsible for obtaining consent and baseline data collection

#### Tilley Pain

- conducted external evaluation interviews and collated results

#### Sarah Larkins

- Academic advice on the design of evaluation and preparation of manuscript

## **Abstract**

### **Objective**

The major objective was to improve and evaluate chronic condition multi-disciplinary care for clients in a rural community, including Aboriginal and Torres Strait Islander clients.

### **Methods**

Community consultation, multi-disciplinary case conferencing and care planning were used to improve the integration of chronic condition care across the private and public health care sectors in a rural town in Queensland. An evaluation consisted of patient questionnaires and key stakeholder interviews.

### **Results**

Eighteen clients participated in the case conferencing project. Evaluation interviews showed that clients were generally positive about the case conferencing, reporting greater confidence in managing their chronic condition. Providers expressed a more diverse range of opinions about the role of self-management in their client's care.

### **Conclusions**

Our methods and results were consistent with evidence from literature in the area of chronic condition care integration. The role of a community advisory group in encouraging sustained integration of chronic condition care was important.

## Background

Connecting Health Care in Communities (CHIC) is a Queensland Health Initiative to support integration of chronic condition care in the community. In 2008 CHIC funded a general practice (GP) liaison nurse and GP adviser to work with a Queensland Health team in a regional city to develop protocols for communication and case conferencing between GPs, Queensland Health staff and private allied health practitioners.

Additional CHIC funding was received in 2009 to extend the use of these protocols to a rural town within the same Health Service District. The location was chosen in consultation with the local CHIC partnership group, and based on the willingness of hospital staff to collaborate with the local GPs. The liaison nurse and adviser from the original project were employed by the GP Network to implement the extension.

## Objectives

The objectives for this rurally based project were:

- To improve chronic condition multi-disciplinary care for clients in the community, including Aboriginal and Torres Strait Islander patients.
- To provide an effective communication tool for use by the client and their care providers
- To provide patient-centred chronic condition care.
- To prepare multi-disciplinary care plans for patients with chronic conditions.
- To improve access to comprehensive and continuing care for patients with chronic conditions.

## Participants

In 2006, the town had a population of 4,726 including 414 Aboriginal and Torres Strait Islanders (8.8% of the population compared with 2.3% for Australia). 24.3% of the population was aged over 65 years, compared with 13.3% for



Australia overall. The median age was 43 years compared with 37 years for Australia (Australian Bureau of Statistics, 2011)

Primary health care is provided by private GPs, a mix of public and private allied health practitioners and non-Government organisations. All hospital admissions are to the local Queensland Health facility, as a public or private patient. Specialist in-patient care is provided at a tertiary hospital 110 km away.

For the duration of the project, clients with chronic conditions who had unexpected early re-admission to hospital (less than 28 days after discharge) were invited to participate in a case conferencing initiative between the hospital and their GP.

Queensland Health doctors, nurses and allied health practitioners worked with private general practitioners, allied health, community and non-Government organisations to implement the project, supported by the GP liaison team.

#### Methodology/ Sequence of events

Ethical approval for the project was granted by the Townsville Health Service District human research ethics committee (HREC/09/QTHS/71).

The project commenced with an open community forum attended by health professionals, community agency representatives and consumers. The forum attendees presented their perceptions of gaps in existing services and priorities for meeting the needs of the community.

A service navigation day attended by allied health professionals defined access and referral procedures for a comprehensive range of local chronic condition services.

Community advisory group meetings including an Aboriginal and Torres Strait Islander group were held regularly to provide guidance to the project team.

A meeting between hospital doctors and private GPs reached agreement on client eligibility for case conferencing. Potential case conference participants

were identified by the hospital doctor, and written consent obtained. A base-line Patient Assessment of Chronic Illness Care (PACIC) (MacColl Institute for Healthcare Innovation Group Cooperative, 2004) questionnaire was completed by participants at the time of consent. This tool measures 20 aspects of chronic condition care experienced by clients. It was repeated at an interim point and on completion of the project.

Case conferences were organised by the hospital's nurse unit manager and private general practice managers. They were held at the private practice with hospital doctor, GP, practice nurse, and other allied health professionals attending as necessary. Clients were invited but not required to attend.

An agreed multidisciplinary care plan was then prepared by the GP according to Medicare guidelines, and this was shared with the patient and hospital team. In some cases the care plan was developed by a provider other than the GP, particularly when a community nursing agency was involved in their care. All other health care was conducted as usual.

An external qualitative evaluation consisting of key stakeholder semi-structured interviews was conducted by an independent consultant to determine client' and health professionals' perceptions of the care planning process.

## Outcomes

Eighteen clients consented to participate in the project, and 13 of these were discussed at a formal case conference. The three PACIC questionnaires (initial, interim and final) were completed by 17, 14 and 13 clients respectively. The average scores for each PACIC element are presented in Table 9.1. The biggest perceived improvements were for "helped me plan ahead for hard times", "showed me how self-care influenced my condition" and "told how other specialists could help me".

**Table 9-1: Average Likert Scores at baseline and follow-up (1= never, 5=always)**

PACIC element	Base-line (n=17)	Interim (n=14)	Final (n=13)
Asked my ideas for treatment plan	2.8	3.3	3.1
Given choices about treatment	2.9	3.4	3.6
Asked about medication problems	3.8	3.6	3.2
Given written list of things to improve health	3.1	3.4	3.2
Satisfied care well organized	4.1	4.8	4.7
Shown self-care influenced condition	3.1	3.9	3.9
Asked about my goals	3	3.4	3.4
Helped to set goals, RE: eating/exercise	3.1	2.6	3.5
Given copy of treatment plan	2.5	3	3.2
Encouraged to attend group or class	2.6	3.1	3.2
Asked about my health habits	3.1	3.4	3.8
Dr/nurse thought of my values/beliefs	3.6	3.6	4.2
Helped me make a treatment plan I can do	3.2	3.3	3.7
Helped me plan ahead for hard times	3.4	3.9	4.2
Asked how condition affects my life	2.9	3.7	3.5
Contacted after visit	2.6	2.5	3.3
Encouraged to attends programs	2.6	2.5	3.4
Referred to dietician, health educator	2.9	2.6	3.1
Told how other specialists can help me	3	3	3.8
Asked how visits with other docs were going	2.9	3.7	3.6

Interviews with health professionals (5 GPs, 1 hospital doctor and 1 nurse) revealed they supported the concept of patient self-management, both as a necessity due to time limitations, and as a positive means of encouraging more patient responsibility. However, there was some diversity of opinion about whether increased patient knowledge led to better health. There was a strong

view that programs such as this needed to be sustained long term in order to provide successful outcomes for patients. Examples of comments from health professionals are presented in Box 9-1.

Eight clients were interviewed. Many reported that their improved knowledge had led to positive behaviour change, and that they had less fear about contacting service providers. Some clients said that their reduced need for hospital admission was directly due to the program. Clients were positive about the level of communication between them and their providers, and between providers. They also liked having more to say in their own treatment. Examples of client's comments are presented in Box 9-2.

**Box 9-1: Health professional comments**

*"...I think patient's self management should mean looking after their diet, activity and mental health. As a GP it is difficult to do this all the time for every patient....."*

*"Just having the knowledge won't change behaviour; the person must accept that there is a need to change behaviour."*

*"The program is good but needs to continue for longer for sustainability".*

**Box 9-2: Client's comments**

*".. The fear factor has been eliminated due to the care plan...."*

*"This explanation has reduced my anxiety levels enormously."*

*"It's now 147 days that I haven't been back in hospital. Before that I always seemed to be going in to hospital....."*

A number of additional chronic condition care services were initiated as a result of the project. Optometry and podiatry clinics were established for the Indigenous community and better transport options were negotiated through the local community transport service. Improved communication between

residential aged care facilities and the acute care sector led to better access to clinical information.

### Problems and Limitations

The provider and client interviews highlighted some conflicting views about chronic condition care. Not all providers agreed that increased patient knowledge is helpful in changing behaviour. Some believed that it is more important to focus on the level of services available in the community. Service providers expressed concern that access to services is limited by costs, particularly for pensioners, although this was not raised by the clients. There was a view that it will never be possible to provide all the services required by our ageing population in such a small community.

### Discussion and lessons learned

Our methods and results were consistent with evidence from literature in the area of integrated chronic condition care. Sustainable chronic condition programs in rural areas need a high level of community engagement and effective communication systems. In this project, the local advisory group had input from the outset, and continued to meet monthly. The Chair of this group also met regularly with the project team to provide mentoring and local guidance.

The importance of a coordinated approach to new service delivery models has also been described, along with the need to sustain engagement of clients, health professionals and organisations (Jordan et al. 2008). The strengths of our project were its focus on case conferencing, and the support of the project team to encourage health professionals to maintain their involvement.

Multi-disciplinary care plans have been shown to increase adherence to guidelines and improve clinical outcomes for patients with type 2 diabetes (Zwar et al. 2007). They have also been shown to improve patient satisfaction and confidence (Grimmer-Somers et al. 2008). We did not measure clinical outcomes but our client group showed improved self-management capability

including better understanding of their treatments and condition although the study is too small to draw statistical inferences.

Multi-disciplinary teams need clearly defined roles and responsibilities (Zwar et al. 2006). The complexity of the enhanced primary care (EPC) program is a barrier to GPs undertaking care planning, as are time constraints and competing priorities (Martin and Peterson, 2008). Our project team identified a need for only one contact person at each practice, and at the hospital, to arrange the case conferencing and ensure management plans were followed up.

It has also been shown that more professional training is needed to improve chronic condition management in community settings (Harris et al. 2008). This project provided self-management training for health professionals and a service navigation day to assist local health care providers with their care planning.

A further round of CHIC funding was received to sustain the project through the appointment of a community based project officer. This funding went directly to a local non-Government organisation in the rural community.

References for this chapter are included in the final reference list.

## Chapter 10. Evaluation of a Team Care Arrangement support program

This study was funded by the Primary Health Care Research Evaluation and Development (PHCRED) research capacity building program and was conducted in close collaboration with a program officer at Townsville General Practice Network (TGPN). It was an evaluation of a program designed to improve the completion rate of team care arrangements (TCAs) developed by GPs for their patients with chronic conditions. It involved audits of medical records to assess whether the patients completed the allied health visits as recommended by their GP in a TCA. The audits were done before and after an education and support program was implemented with the GPs.

### Authors' contributions

#### Tracy Cheffins

- Developed study design and evaluation protocol
- Submitted ethics proposal
- Prepared final report and manuscript for submission as presented in this chapter.

#### Rhonda Fleming

- Implemented practice education and support program
- Undertook practice audits
- Assisted with analysis of results and preparation of report and manuscript

## Abstract

### Background

Team Care Arrangements (TCAs) are used by General Practitioners (GPs) for people living with chronic conditions to access Allied Health Providers (AHPs).

Townsville General Practice Network (TGPN) supports GPs to increase utilisation of TCAs. This study evaluates TGPN's support program and identifies strategies to improve completion rates of TCAs.

### Methods

Two audits of 20 randomly selected TCAs were completed in four general practices to measure completion rates. Surveys of practices' implementation processes for TCAs were completed, and perceived reasons for non-completion were recorded.

### Results

Completion rates in the four practices were 38.75% for the first audit and 40% for the second. One practice increased its completion rate from 30% to 60% while another practice showed a decrease from 40% to 25%. The more successful practice targeted a specific group of patients, gave them more choice of AHPs, and provided detailed descriptions of the TCA process. Most practices stated that failure to complete TCAs was due to GPs and patients having different goals in the management of their chronic conditions.

### Conclusions

Patients living with chronic conditions often have complex care needs which require AHP expertise. TCAs can assist patients to access AHPs. This study has identified strategies to support general practices in improving TCA completion rates.



## Background

The management of chronic conditions in primary care can be a complex process requiring input from a team of health care professionals. Effective collaboration between professional groups has been shown to improve patient care (Zwarenstein et al. 2009). Inter-professional collaboration is also a key element in the successful integration of health care systems.

A systematic review of integrated health care identified ten universal principles that enable integration (Suter et al. 2009). Several of these principles include references to collaboration between professionals – maximising patient accessibility and minimising duplication; use of inter-professional teams across the continuum of care; state of the art information systems to collect, track and report activities; and funding mechanisms to promote inter-professional teamwork.

Self-management support refers to developing the skills and confidence of patients and families so that they can take more responsibility for their own care. The principles of self-management support for chronic condition care include ensuring the patient's ability to follow a treatment plan agreed with their health professionals (Battersby et al. 2010).

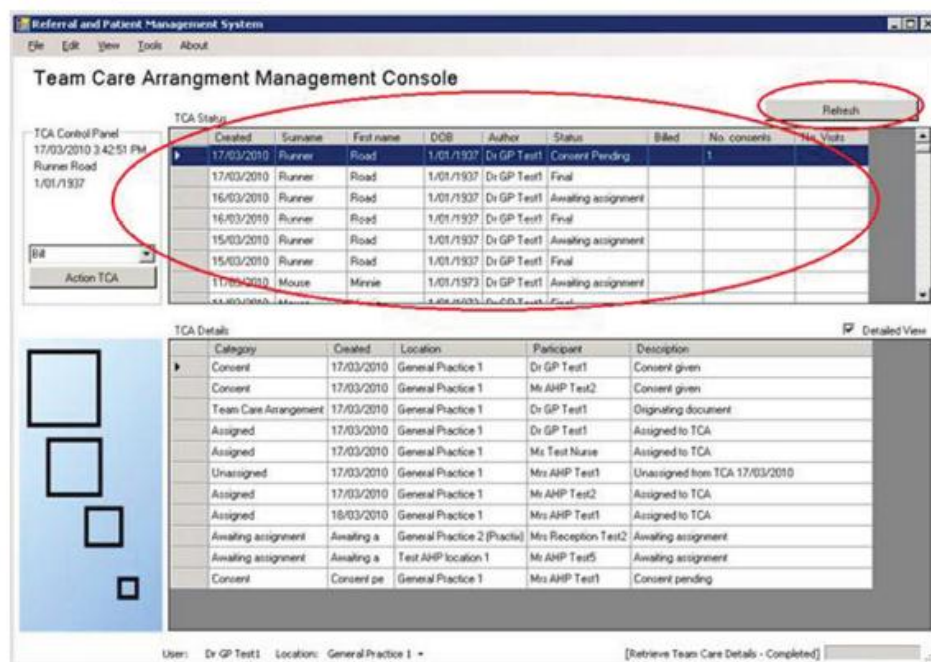
In Australia, the Medicare-funded Enhanced Primary Care (EPC) program supports GPs to provide comprehensive chronic condition care for their patients. Medicare items such as care planning, case conferencing and reviews are available for people with chronic conditions (Department of Health and Ageing). In addition, Team Care Arrangements (TCAs) can be developed by GPs to enable their patients to access Allied Health Providers (AHPs) funded through Medicare. A limited number of AHP consultations can be obtained when a TCA between at least three providers has been endorsed by those providers, and the patient has consented to the sharing of their information.

While Medicare data show increasing uptake of care planning items, the number of reviews is low, indicating a lack of follow-up once the initial item has

been claimed (Chan et al. 2008). The administrative workload involved in creating care plans, referring patients to multiple providers, and ensuring follow-up can be significant. Therefore Townsville General Practice Network (TGPN) has a support program for GPs implementing chronic condition management in their practices. Strategies including practice-based education sessions, quality improvement cycles and e-referral templates, aim to increase the utilisation and completion of TCAs. The web-based electronic referral tool (Figure 10-1) includes a tracking system, accessible by all parties, that allows a practice manager to identify patients whose TCA is incomplete.

This study evaluates the effectiveness of TGPN's support and identifies strategies to improve completion rates of TCAs.

**Figure 10-1: Team Care arrangement console**



**Each row contains a separate TCA with the following information:**

- Created date
- Surname, First Name
- Date of Birth of patient
- Author of the TCA
- Current Status - draft, consent pending, billing pending, or GP approval
- Date and time the patient was billed to Medicare
- Total number of consents
- Total number of AHP visits

## Methods

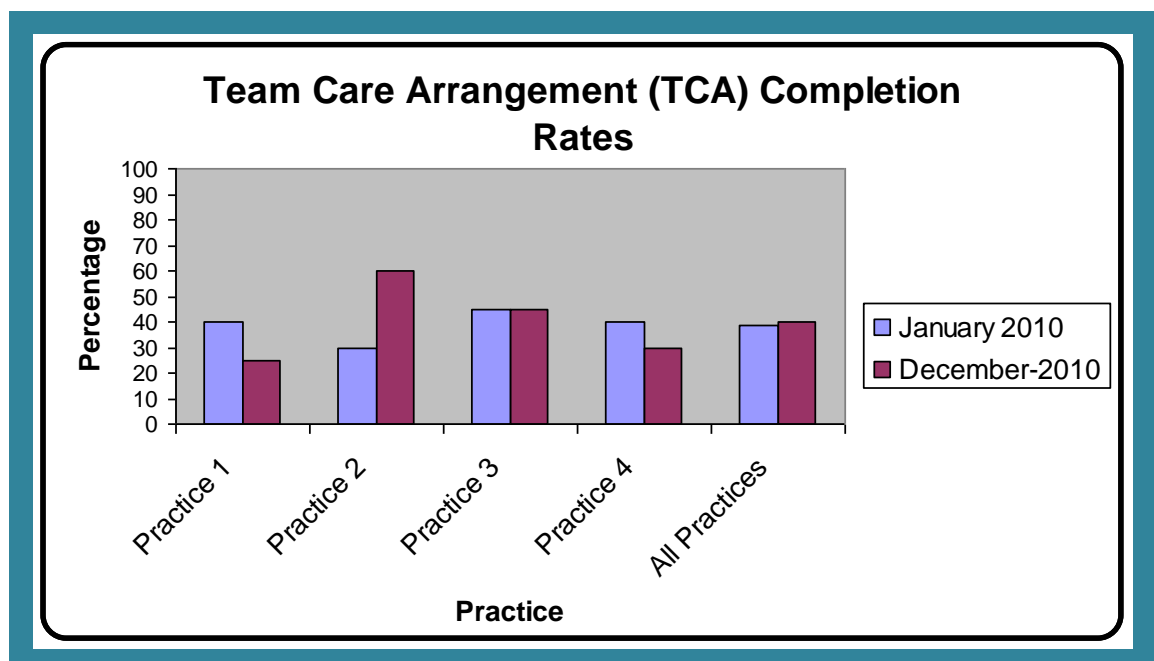
General practices that participated in TGNP's chronic condition programs were invited to participate in the evaluation. Two medical record audits of TCAs were done twelve months apart in each practice, before and after the support program was delivered. Each audit period was for three months, based on the dates that the TCAs were billed to Medicare. A list of TCA patients for each three month period was created, and 20 patients selected randomly from the list using an "every third name" method. The TCAs were assessed for completion based on whether a report from each participating AHP was located in the medical record.

Surveys of practices' implementation procedures for TCAs were completed by the practice managers, and their perceptions of reasons for non-completion were recorded.

The study received ethics approval from the JCU human research ethics committee (approval number H 3470).

## Results

Figure 10-2: Team Care arrangement completion rates



Four general practices participated in the evaluation. As shown in Figure 10-2 the combined completion rate in the four practices was 38.75% for the first audit and 40% for the second. One practice increased its completion rate from 30% to 60% while another practice showed a decrease from 40% to 25%.

The most successful general practice had implemented strategies to improve utilisation of TCAs. Their approach was to target a specific patient group with poorly controlled diabetes. They gave the patients more choice of which AHPs to include, and provided patients with a detailed description of the purpose of the TCA and how it would work. Practice managers believed that failure to complete TCAs was due mainly to GPs and patients having different goals in the management of their chronic conditions.

The electronic TCA referral tool was not well utilised during the evaluated time period, due to delays with its development and technical limitations. The practices were involved with piloting the software but not in widespread implementation.

## Conclusion

Patients living with chronic conditions often have complex care needs which require inter-professional care from GPs, specialists and allied health professionals. The Team Care Arrangement is a useful tool to assist patients in accessing AHPs, provided the GP selects patients carefully. Most importantly, the patient needs to fully understand the purpose for their referral to other health professionals and have the process of the TCA explained to them. These factors can improve the completion rates for TCAs, leading to more successful integration of chronic condition care.

Education of key practice personnel about the factors that support completion of TCAs should be included in practice support programs, in conjunction with information systems that enable health professionals to communicate effectively and monitor team based care.

References for this chapter are included in the final reference list.

## Chapter 11. Discussion and conclusion to Part Two.

The chronic condition management programs at Townsville General Practice Network (TGPN) (now Townsville-Mackay Medicare Local) are guided by the principles of primary health care, as agreed at the World Health Organization (WHO) Alma Ata Declaration of 1978 (World Health Organization, 1978). The ten WHO principles for effective primary health care can be summarised as follows:

1. Health is a human right requiring action from many social and economic sectors in addition to the health sector.
2. Health inequalities are politically, socially and economically unacceptable.
3. Promotion and protection of health contributes to better quality of life and world peace.
4. People have a right to and duty to participate in the planning and implementation of their health care.
5. Governments should provide adequate health care to permit people to lead socially and economically productive lives.
6. Primary health care must be accessible and affordable. It should be the first element of a continuing health care process.
7. Primary health care:
  - Is based on the results of social, biomedical and health services research.
  - Provides promotive, preventive, curative and rehabilitative services.

- Concerns itself with health education; food, water and sanitation; maternal and child health care; immunisation and disease control; treatment of common disease and injury; and provision of essential drugs.
  - Requires collaboration across sectors.
  - Promotes maximum community and individual self-reliance and participation.
  - Requires integrated functional and supportive referral systems.
  - Requires health workers to work as teams and respond to the needs of the community.
8. Governments need the political will to sustain primary health care as part of a comprehensive national health system.
  9. Attainment of health by people in any one country directly concerns and benefits every other country.
  10. Resources spent on armaments and military conflicts should be diverted to peaceful aims including primary health care.

The projects completed at TGNP for Part Two of the thesis relate directly to these principles of primary health care, in particular the over-arching principle that “*primary health care is based on the results of social, biomedical and health services research*” (World Health Organization, 1978 p.4).

The scope of the TGNP projects matches the WHO principles as follows:

1. Self-management training fits closely to the principles of promoting maximal community and individual self-reliance and participation. This project evaluated the ability of primary health care teams to implement effective chronic condition management in practices where support for self-management was limited by design and workforce issues. The

evaluation identified the same challenges to implementing SMS as identified in the literature review – poor acceptance by clinicians, and lack of time and skills.

2. The integrated healthcare partnership for improving chronic condition care in the community was an example of multi-disciplinary teams using the principles of self-management to give people maximal self-reliance and participation in their health care. Integrated referral systems were developed and collaboration across the public and private primary health care sectors was evaluated. However, there were limitations experienced by participants, in keeping with the challenges to integration discussed in the literature review – funding models, professional boundaries and time factors.
3. The extension of this community based approach to chronic condition care into a rural setting fits with the principles of accessibility and affordability, whereby rural communities should receive care similar to that in metropolitan regions. As outlined in the Alma Ata agreement, health inequalities (in this case due to distance from health care) are politically, socially and economically unacceptable. Availability of the full range of health professionals to enable multi-disciplinary integrated care (as described in the literature review) was a particular challenge in this rural community.
4. In all the chronic condition management projects, the target for the interventions was the tertiary prevention end of the disease spectrum, an important role for primary health care services, including general practice. Keeping people out of hospital to lead more productive lives is one of the social and economic outcomes attributable to effective primary health care.
5. The team care arrangement support project used the adoption of a more integrated referral system between primary health care providers. It used appropriate technology (accessible and affordable) to improve

collaboration between sectors, and ensure better continuity of care for people with chronic conditions. As described in the literature review, technological solutions encompassing robust information systems are an essential component of integrated healthcare.

General practice aims to provide effective health care to a population living with an increasing burden of chronic conditions. In addition to the clinical expertise to treat chronic conditions, practices need systems to identify those at risk or already needing care, and the capacity to monitor the outcomes of their care.

The projects evaluated in Part Two of this thesis contributed to the capacity of general practice teams to manage chronic conditions more effectively. They used strategies designed to overcome barriers to chronic condition management identified earlier in this thesis – lack of GP engagement, concerns about sustainability, workforce shortages and competing priorities for service delivery. They incorporated known enabling factors – strong relationships between services, multi-disciplinary models of chronic condition management, and systematic approaches to delivering care.

The evaluations of these projects provided useful local evidence for TMML and its partner agencies, to apply to future chronic disease management initiatives. Case Study 2 is an example of the chronic condition management capacity that can be built in local general practices with appropriate support.

### **Case Study 2 - Building chronic condition management capacity**

Practice A is an outer suburban General Practice with five full time GPs, including the two principal owners. There are three practice nurses, one of whom is now dedicated to chronic condition management strategies for the practice. Previously the practice principals had begun exploring systematic chronic condition management but were sceptical about its value, and their approach was ad hoc and ineffective.



With support from TGPN they enrolled in the Australian Primary Care Collaborative program and began regular quality assurance meetings based on Plan-Do-Study-Act cycles. Underpinning the change process was their ability to measure outcomes using data extraction tools that generated disease registers for diabetes and coronary heart disease. TGPN provided the tools and monthly data that allowed them to monitor progress in their chosen priority areas.

On completion of the initial program, the practice signed up for continued support through a local TGPN QA program focussing on better outcomes for Indigenous patients and improved prevention activity –namely adult immunisation and women’s health checks. Age-sex-disease registers with emphasis on recording of Indigenous status were an essential component for this program. Indigenous outreach workers employed by TGPN provided cultural awareness training to assist staff with the identification process.

Now the chronic condition nurse supports GPs with preparing care plans and team care arrangements. Having accurate disease registers allows them to carefully select patients for these interventions. An audit of completion rates for team care arrangements showed that these had improved from 30% to 60% during the period that they introduced their new systems, indicating acceptance within the practice of this more organised way of managing their patients.

This case study highlights the importance of using systematic population health approaches to chronic condition management. The practice has invested in development of accurate age-sex-disease registers and has a designated staff member to oversee their population health programs. On-going measurement of health outcomes is core business for the practice. Their chronic condition interventions can be targeted at specific groups within the practice based on evidence and need.

## Chapter 12. Personal reflection.

Since entering the discipline of general practice (GP) in 1984, I have observed the need of sick and vulnerable people for the familiarity, trust and empathy of their GP. No other sector of the health care system is able to meet those needs so comprehensively. We must ensure that these essential characteristics of general practice are preserved in any new primary health care model.

But are they enough? Can we afford a health system that allows everyone to access their own GP whenever they want? How many GPs should we have? Should GPs provide only evidence based care?

In undertaking the research projects included in this thesis, I interacted regularly with GPs and their staff in a wide range of general practices across North Queensland. Their awareness of the need to measure what they do, improve their patient outcomes, and obtain evidence within GP settings was generally high – what was difficult was finding the time to do it. My main objectives at the North Queensland Practice-based Research Network (NQPBRN) and the Townsville General Practice Network (TGPN) were to overcome time barriers and give the practice team skills to undertake research and evaluation.

The approach I took was to become a partner with the GPs and their staff – working with the whole practice team of managers, nurses and GPs. Foremost was a focus on communication and practical skills development within the workplace. Time lines had to be flexible, and research tasks designed to work in busy clinical environments. Each practice visit was carefully planned to maximise impact and minimise disruption to the practice.

There is considerable synergy between quality assurance and research activity within general practice. The fundamental requirements for both endeavours are the ability to identify specific population groups within the practice, and to measure processes and outcomes relevant to those groups. Computerised information systems are essential for the former and desirable for the latter.

The projects included in this thesis have used computerised patient record systems to identify or track eligible populations, and a combination of manual and/or computerised audits to measure the outcomes. The practices were already equipped with information systems, but in many cases were not utilising them for quality assurance or research purposes. Training of practice nurses in the selection and auditing of medical records was the first step in several projects, followed by regular practice visits to ensure consistency.

Time consuming tasks including submission of ethics applications, reporting to ethics committees, applying for grants, analysis of data, and preparation of papers for publication are not a viable option for GP teams to undertake. This is a major barrier for GPs interested in research. Even quality assurance activity within the practice is difficult to schedule without support from an external agency.

My approach of providing direct support for the academic components of research was essential in enabling practices to complete the projects. Numerous barriers to the involvement of GPs in research have been described in Chapter One of this thesis. NQPBRN GPs and nurses had input into the initial planning of projects, so that research topics and methods were feasible and relevant. Considerable effort was made to include a range of opinions from clinicians before ethics or grant applications were written.

The ideas for projects presented in the thesis were generated in diverse ways. The acute otitis externa audit project arose from an informal discussion between the Director of the Rural Health Research Unit and a group of GPs, while the enhanced primary care evaluation was developed in a formal consultation process with research network GPs. Parental vaccination was driven by practice nurses' expressed interest in vaccination and health promotion aligning with the public health interests of the author.

The CHIC evaluations undertaken within TGPN were funded by specific grants and developed at the time of submission, while the self-management and team

care arrangement evaluations arose from discussions between TGPN program staff.

As the NQPBRN progressed, I developed a research cycle that was readily applied to each project and suitable for practice-based consultation and dissemination visits. Formal practice visits occurred approximately every six months, with three main purposes: dissemination of the most recent completed project results; training for the implementation of the new project; and consultation for future project ideas. Projects were designed to take around six months from data collection to results collation. Preparation of publications was on-going, with the aim of submission within six months of project completion. These timelines allowed our small research team to progress research projects in a timely fashion and keep well connected to our practices. The feedback from GPs and nurses was an important motivation to continue the challenge of doing primary health care research with limited resources.

## Chapter 13. Conclusion and recommendations.

This thesis presents a range of evidence pertaining to the practical implementation of research and evaluation in general practice settings. The completed projects are a sample of the outputs of an evolving practice based research network funded by the Primary Health Care Research Evaluation and Development (PHCRED) program, and a chronic disease management program within a Division of General Practice. In implementing the projects, the author drew upon existing evidence and contributed further knowledge about the workings of practice based research networks (PBRN):

### 1. Literature review.

A review of PBRNs found that in order to engage primary health care in research and evaluation, you must ask questions from every day practice, and use rigorous study methods to answer those questions (Chew and Armstrong, 2002).

Gunn et al. (2008) showed that learning new skills, updating knowledge and reflection on practice were the main motivators for GPs to engage in research. These were seen as more important than rewards such as college medical education points. The authors concluded that researchers must clearly articulate the clinical benefits of their research to GPs and their patients, and include reflection on current practice as part of the methodology.

Other strategies to increase primary health care research include financial support for non-GPs, practice incentive payments for participation in accredited projects, funding of GP research infrastructure costs, and budgets for GP payments and research nurses (Yallop et al. 2006).

PBRNs require basic infrastructure to achieve their goals and sustain their efforts (Green et al. 2005). This infrastructure includes coordinator, support staff, electronic medical records, multi-user databases, mentoring programs, and research training. It has also been shown that face-to-face recruitment,

regular involvement of practices in the planning of projects, and methods perceived as easy to implement are effective (Goodyear-Smith et al. 2009).

The North Queensland Practice Based Research Network (NQPBRN) utilised all of the enablers identified in a 2006 systematic review of practice based research networks:

- Input from practitioners into development of projects
- Systematic study selection to match capacity
- Systems for feedback on progress and recruitment
- Systems for discussing findings with practitioners
- Training for practice staff
- Information technology and data collection capacity
- Remuneration for practices and practice staff
- High-quality coordination staff for outreach and face-to-face support.

(Zwar, et al. 2006)

## 2. NQPBRN evaluation.

An evaluation of NQPBRN confirmed that we were successfully following principles described in the literature review, particularly those relating to selection of research topics, and training and support for practice personnel.

The key findings from the evaluation were:

- Research in general practice should be closely aligned to their “usual business” so it can be done with minimal disruption and time-wasting.
- General practice based research is considered important to ensure that problems that present outside hospitals receive attention, and that the research relates to common problems.
- Training for practice nurses, and meetings to enable networking and dissemination of results are very useful.

- Practice nurses are the preferred data collectors but practice GP owners want to be involved in choosing research and approving nurse involvement.
- Network members value their role as collectors of data, but there is an emerging interest in conducting their own research projects as well.

### 3. Personal reflection.

Personal experience of the author as medical coordinator of the NQPBRN has been documented in Chapter 12. After considering the evidence from other networks and incorporating the expressed needs of the NQPBRN practices, a “research cycle” was developed and applied to each project. This enabled planning, training and dissemination of results to occur concurrently, and kept contact time to a minimum. A timeline of approximately six months for each project ensured they were feasible and motivation remained high within the practices. The timely feedback of results was an important factor in remaining engaged with the practices and harvesting new research ideas from GPs and practice nurses.

### 4. Projects.

Completion of the seven research projects provided practical evidence of the appropriateness of different research methods in general practice, and how to complete research in busy clinical settings. There are several limitations to the generalisability of the project results. This reflects the resources and timeframes available to the NQPBRN and TGPN. Implementation occurred in a relatively low number of practices, and with small numbers of participants. There were geographic limitations due to the projects being confined to North Queensland. Many of the projects were based on retrospective data collection and observation. Randomisation of practices and participants was not possible given the research capacity building nature of the network.

However, the research methods we developed in consultation with the clinicians, suited the environment and workforce capacity of clinical general

practice, and enabled completion of locally relevant research. Medical record audits and surveys undertaken by trained practice nurses were found to be feasible and acceptable methods of data collection. Recruitment and consent procedures were undertaken efficiently by the practice nurses. General practitioners participated in interviews and surveys, but did not have capacity for data collection due to time constraints.

Involvement of clinicians in developing research ideas, and providing feedback on progress and results were important strategies for the NQPBRN. Training for practice staff took priority, along with ensuring research methods suited the information technology available within practices.

Team work is an essential requirement for integration of chronic condition management between public and private sectors. Prior consultation and planning with all team members was identified as critical to the success of these initiatives. In addition, research methods need to take account of the business and clinical systems used within both sectors. Time invested in ensuring mutual understanding of roles between team members is also important.

#### 5. Case studies.

The two case studies presented in Chapters 5 and 11 provide a deeper understanding of the research and evaluation capacity building that occurred within NQPBRN and TGPN. They illustrate how partnerships between academic teams, program staff and clinical services can lead to rapid capacity building when a combination of skills development, mentoring and infrastructure support is provided. The goals of the academic teams and program staff need to align with those of the practice teams. The emergence of highly motivated individuals (champions) to drive further investment in practice based research and evaluation is a highly desirable outcome.



## Recommendations

Based on the projects, literature reviews, reflections and evaluation presented in this thesis, the following recommendations are made for sustaining research and evaluation in primary health care settings in North Queensland:

- To engage clinicians in practice based research and evaluation, one should ask clinically relevant questions and include reflection on clinical practice in the methodology.
- Clinicians should make a major contribution to the selection of their research questions and topics.
- Financial, academic and infrastructure support is essential for sustainable practice-based research, particularly to undertake time-consuming tasks such as ethics applications, grant applications, analysis and publication of results.
- Practice based workshops for training and timely dissemination of results are important in maintaining motivation of clinicians to do research and evaluation.
- Face-to-face practice visits from academic researchers and program staff are an important component of coordinating and sustaining a clinical research and evaluation network.
- Research champions who emerge from clinical practice should be generously supported.

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## Appendix - Published papers from thesis.