



**AUSTRALIAN PRIMARY HEALTH CARE
RESEARCH INSTITUTE**

MONASH UNIVERSITY

THE UNIVERSITY OF SOUTH AUSTRALIA

**REVIEW OF PRIMARY AND COMMUNITY
CARE NURSING**

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November 2007

ACKNOWLEDGMENT

The research reported in this paper is a project of the Australian Primary Health Care Research Institute, which is supported by a grant from the Australian Government Department of Health and Ageing under the Primary Health Care Research, Evaluation and Development Strategy. The information and opinions contained in it do not necessarily reflect the views or policies of the Australian Government Department of Health and Ageing.

Further Acknowledgements

We thank and acknowledge the support of the team at the Australian Primary Health Care Research Institute for funding this project and for their support over the 12 months. The regular meetings arranged by APHCRI were invaluable in the process of sharing ideas and learning from our Stream Six colleagues.

The review team gratefully acknowledges the contribution of key informants from participating organisations listed in Appendix F for their generosity of time and participation in face to face interviews.

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Suggested citation

Keleher H, Parker R, Abdulwadud O, Francis K, Segal L, & Dalziel K. (2007). Review of primary and community care nursing. Department of Health Science, Monash University.

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BACKGROUND AND RATIONALE

HEALTH SYSTEM REFORMS

Social and demographic changes driving health care reforms include ageing populations, increasing levels of chronic and complex illness associated with ageing populations, reduction in access to general practitioners and workforce shortages, particularly for nurses [1]. In addition, the changing roles of hospitals to more acute functions and shorter lengths of stay to constrain costs are driving reforms to the primary and community care sectors. Expansion of the primary care and community based service delivery system is intended to meet emerging and predicted needs and to reduce costs of ambulatory care provided by hospitals as well as to prevent avoidable hospital use by the provision of more appropriate care [1]. There is also pressure to improve access to services to underserved groups and communities. With reforms focused on integration and improved coordination of services, opportunities are sought to improve the interface between hospital and community as well as strengthening the role of primary health care and prevention to enhance individual and population health outcomes.

As care is moved away from institutional models and refocused on communities, particularly to cope with the demands of chronic and complex care, there is a need for new health care workforce modalities that strengthen and expand community-based primary care services. Most health professionals experience role enhancement which may be formally or self-taught as they adapt to changing health care needs and circumstances [2]. Likewise there is increasing interest in reforms to the scope of practice and job redesign of health professionals [3].

NURSING RESPONSES TO REFORMS

Nurses are the largest health workforce group. Despite the steady shift towards new modalities of care nurses are educated, primarily and somewhat inflexibly, to meet the needs of the acute sector where nurse shortages continue to be reported. Despite this, thousands of registered nurses have left the profession after just a few years of working in acute care, and are no longer working as nurses. Very few are attracted to careers in primary care such as general practice or community-based settings, for which competencies and career pathways differ from those of acute nursing.

Community health and primary care nursing is under-developed in Australia with a lack of national policy, limited education opportunities and little understanding of the evidence-base about outcomes or cost-effectiveness. Relatively few nurses are attracted to careers in general practice and community settings. Yet, it is in general practice and community settings that increasingly complex health care conditions are managed, with rapidly emerging needs for appropriately prepared case managers/coordinators of care. Nurses are potentially the most versatile health workforce and well suited to take on these roles. However, nurse education is not adequately preparing nurses for primary and community based work, and nurses are therefore under-utilised in those sectors. At the same time the provision of post-registration education is ad hoc and not underpinned by core professional competencies.

Internationally, nursing is undergoing changes in many countries. New Zealand has signaled a major shift in health system direction through the development of a comprehensive primary health care policy and strategy [4, 5]. Emphasis is placed in the reforms on the creation of opportunities for nurses to be involved in new service delivery opportunities and the identification of barriers to effective primary health nursing practice and strategies to overcome those barriers [4]. Education, role development, workforce development and innovative models of primary health care nursing practice are supported by a framework for primary health care nursing in New Zealand. In Japan, the roles of nurses who work in community care have been reviewed in order that visiting nurse services are better coordinated and integrated with community health promotion [6].

As long as a decade ago, nursing in the United States responded to the changing health care environment by a paradigm shift in education and nursing practice to meet health care needs, integrating health promotion and disease prevention into curricula and practice to prepare nurses for changing health care environments [7]. Predictions are that by 2010, between 70-80% of illness care will be delivered in the home, with increasing emphasis on prevention and self-management of disease. Central to these shifts has been recognition that nurses' preparation to address the needs of populations is different from expectations that nurses will be prepared to meet the needs of institutions.

In New Zealand and the United Kingdom (UK), a clear career trajectory has been developed to develop and support general practice nurses [8]. The development of advanced nurse roles in primary care in the UK is argued as 'a plausible strategy for improving service capacity without compromising the quality of care or health outcomes for patients' [9]. The development of nurses' scope of practice is extending into primary care with nurse-led clinics and walk-in centres, health advice by telephone while nurses increasingly substitute for general practitioners in the care of minor illness and routine management of chronic diseases.

In the Australian context, this review set out to examine threshold issues about primary and community care nursing. Stakeholders with interest in these questions include policy decision-makers, health service administrators, general practitioners, and nurses themselves. These threshold issues were identified as:

- The impact and effectiveness of primary and community care nursing on patient health outcomes compared with doctor-led care or usual care
- The economics and cost-effective models for supporting the practice nurse role: current arrangements and future options
- The education models and policy frameworks that support career pathways and that enhance recruitment and retention of nurses to primary and community care nursing

FUNDING OF AUSTRALIAN HEALTH CARE

Health expenditure has been steadily increasing. In 2004-05 total expenditure was \$87,296 million - a growth of 10.3% on the previous year [10]. Medical services constitute the second greatest component of recurrent spending (17.8%) behind hospitals. General practice is the largest contributor to "medical services" which are funded mostly by the Federal government, with patient contributions and some private health insurance. State governments also contribute to general practice and more broadly to primary care.

FINANCING OF GENERAL PRACTICE

General practice remains almost exclusively a private professional industry, dominated by self-employed practitioners [11]. General practice is predominantly funded through fee-for-service payments, met by Medicare, or other insurers (such as Veterans Affairs, Transport Accident or Workcover). General Practice income is based on a combination of the number of services and the service fee. In 2004-05 patient contributions constituted some 15% of all medical incomes. Historically the Medicare Schedule has predominantly paid GPs on the basis of a fee for a generic consultation, with more recent introduction of EPC items for more complex conditions.

A range of Federal (national) primary care initiatives have been introduced with the purported aim of improving the quality of primary care and especially of general practice. In terms of mechanisms the initiatives fall into 5 broad categories:

- 1) Additional items on the Medicare schedule presumed to be 'highly valued' and which are paid at a higher rate than the standard GP consult to promote uptake
- 2) Higher reimbursement for bulk-billed services to shore up bulk billing and patient access
- 3) Payments for meeting certain health service delivery objectives within a client population
- 4) Program-based funds to support general practice in rural and remote areas – such as to employ allied health staff and practice nurses
- 5) Research funds to support general practice-based research and research capability

APPROACH OF THIS REVIEW

This review uses an evidence synthesis approach. This approach makes use of methodological diversity to synthesise disparate forms of evidence intended to address questions about complex issues in primary and community nursing [12]. Recommendations are influenced by the policy consultations as well as the evidence, as no single form of evidence can address the questions raised or provide sufficiently broad information. Thus, various types of knowledge are sought that are policy relevant as well as scientifically relevant - marshalling the evidence in order to make an argument and draw inferences from the evidence [13].

KEY DEFINITIONS

PRIMARY CARE AND PRIMARY HEALTH CARE

Primary care and primary health care aim to bring health care as close as possible to where people live and work [14] in order to increase access and provide appropriate and affordable care.

Primary care usually refers to general practice led services that provide entry into the system for all new needs and problems, delivered to individuals as a single service or intermittent management of disease or illness [15]. Primary care providers are focused on the individual through early diagnosis and timely, effective treatment, disease prevention and disease management, and may include some opportunistic health education [16]. Primary health care is a broader sphere than primary care, aiming to address the health problems of communities and their underlying causes from social or environmental conditions that underlie disease or poor health. Primary health care nurses work from a social model of health and seek to work with individuals, families, groups or communities to change the social, economic, political and environmental determinants of health at local levels or more broadly, in order to create better circumstances for good health to flourish [16] although these aspects of care provided are not explicitly funded. Primary health care services are provided to individuals but also to communities as a whole using population health approaches with increasing emphasis on health promotion and efforts to reduce health inequalities between different groups in a given population [5, 17-19]. Australia does not yet have a primary health care strategy that articulates a vision for improving population health through primary health care, but the New Zealand Strategy for Primary Health Care [17] identifies six key directions to improve the health of the population and tackle health inequalities:

- work with local communities and enrolled populations
- identify and remove health inequalities
- offer access to comprehensive services to improve, maintain and restore people's health
- co-ordinate care across service areas
- develop the primary health care workforce

- continuously improve quality using good information

Nurses working in primary health care both in Australia and other countries are increasingly working with a population focus in multidisciplinary teams with their practice aligned to key primary health directions.

COMMUNITY NURSING

Community nursing has a sound theoretical foundation in primary health care and therefore, the social model of health, and is grounded in community models of practice. Community nursing practice covers a spectrum from individuals and families, to groups and communities, and includes care-giving, disease prevention and health and wellness promotion [20]. Community nursing encompasses both general community nurses in home (domiciliary) visiting, and specialists conducting for example, nurse-led clinics specialising in chronic disease in hospitals and health services, child health, women's health, mental health, and occupational health.

Community nurses are involved in the coordinating care in multidisciplinary environments, and in the provision of visiting services to clients in complex situations that often require advanced problem-solving skills [21]. Community nurses also work with a population health focus, identifying trends in community needs, and those of specific groups, working in multidisciplinary teams on primary health/health promotion projects to improve the health of specific population groups or whole communities[19, 21]. Such strategies include early intervention, health education, screening, and health and wellness programs.

This review has included studies about the general community nurse with some studies including maternal and child health and nurses working in chronic disease management. We have not included nurse practitioners as they are currently defined in the Australian context.

PRIMARY CARE NURSING INCLUDING PRACTICE NURSING

This review has a focus on the emerging specialism of practice nursing in general practice settings. The Australian Government defines a practice nurse as a registered or enrolled nurse, employed by, or whose services are retained by, a general practice. The general practice may be either accredited or non-accredited. The practice nurse must be appropriately qualified as a registered or enrolled nurse in order to provide the relevant services and must comply with any relevant legislative or regulatory requirements. The practice nurse role is essentially envisaged as a complement to the general practitioner, in part to extend the activities of general practice (nurse-led services) and in part to substitute for the general practitioner (nurses as supplements). There is considerable variation in the actual tasks undertaken by practice nurses, their level of responsibility and the model of practice, and the extent to which the practice nurse is a true 'partner in care' or more of an assistant to the general practitioner/general practice.

METHODOLOGY

An initial scoping search was conducted during February 2007 to identify studies and reviews relevant to the research questions. We established that there is lack of uniform definition of primary and community care nurse in the published literature, with definitions varying from country to country and study to study. Informed by the literature, for this review we have considered primary and community care nurse as any type of nurse who works in a primary care setting which in turn incorporate ambulatory care, family practice, general practice and domiciliary/home visits. The research questions were refined iteratively on the basis of the initial scoping search.

The aim of this review was to answer the following research questions:

- What is the impact of primary and community care nurse on patient health outcomes compared with doctor-led care or usual care?
- What are the education models and policy frameworks that support career pathways for primary and community care nursing?
- What are the economics of supporting the practice nurse role: current arrangements and future options?

A multi-strategy approach was used to answer the research questions. Each of these approaches is detailed below.

SCOPING SEARCH

The scoping search was developed to source policy documents, government reports and reports from professional bodies were sourced through web searches and broad literature search techniques. This search included grey literature from websites, bibliographies and reference lists, particularly from the UK, the USA, NZ and Australia.

A wide range of literature was identified and used as background material and to inform the key word selection to shape the systematic search process (2.3 below).

STAKEHOLDER CONSULTATIONS

Consultations with key informants in a two-staged process informed the analysis and provided perspectives of key stakeholders.

The first stage was in March 2007 when meetings were requested with key staff in stakeholder organisations to seek their views on issues raised by the literature about primary and community nursing. Interviews were granted by the DoHA (six staff working in the Nursing in General Practice, Workforce and Practice Incentive Payment areas) the Australian General Practice Network (Nurse Adviser), the AMA in Canberra and Western Australia, the RCNA, and Senior Advisers to the Minister of Health (the Hon Tony Abbott) and the Shadow Minister of Health (the Hon Nicola Roxon). Discussions were held at various times through the project, with the Australian Practice Nurse Association (APNA) which was an Associate Investigator on the project.

Meetings were requested by email with a brief explanation of the project. All stakeholders who were invited, accepted the invitation to participate. The duration of interviews was between 30 minutes – 1 hour. Notes were taken during all meetings, summarised and key themes developed. Senior people were more comfortable with note taking than audio recording which was not used for any interviews.

Meetings were also held in January 2007 in the UK with staff working in the National Health Services, WiPP and at the Royal College of Nursing.

The second stage of stakeholder consultation was conducted in early September 2007 to test the draft policy options and seek their responses. Three consultations were held with the Royal College of Nursing, Australia RCNA (two policy officers), the AMA (the GP liaison officer) and the DoHA with seven staff including the Head of the new Nursing and Allied Health Section, and the Director of the Primary Health Care Research Evaluation and Development (PHCRED) strategy. All were provided with the draft 3-page summary of the project that included the policy options. Discussion was lively and questioning with very useful feedback provided on the policy options that assisted in re-wording to sharpen their intent.

SYSTEMATIC REVIEW

A process was developed to conduct a systematic review to examine the effectiveness of primary and community nursing.

We used key articles identified in the scoping search and developed a comprehensive search strategy to identify the relevant studies. A range of pertinent text-words with medical subject headings were combined and several electronic databases were searched (Appendix B Table 7). Search terms are detailed in Appendix A (Tables 3,4,5,6). We also examined the reference sections of the retrieved studies and conducted Internet searches to ensure all relevant articles had been located.

STUDY SELECTION

Criteria were developed a priori to determine eligibility of relevant studies assessing the effectiveness of primary and community care nursing. Inclusion and exclusion criteria were agreed. Using these criteria, two reviewers examined titles and abstracts identified by the searches. When the reviewers were unable to decide on abstract alone, full-text of articles was retrieved. Disagreement between the reviewers was resolved by consensus or by a third reviewer.

Inclusion criteria: The following inclusion criteria were applied:

- Primary study or systematic review assessing the effectiveness of primary and community care nurse on patient health outcomes in primary care settings
- Study comparing nurse-led care against doctor-led care, or a nurse working as supplements to usual care
- Studies addressing education model, funding model, policy frameworks, or career pathways for primary and community care nurse
- Articles published in English language
- Studies originating from Australia, NZ, the UK, Canada, USA, Europe, Japan, Brazil, South Pacific Nations, Thailand, Malaysia, and Myanmar (Burma)
- The publication date 1996 to January 2007 (for studies evaluating patient health outcomes) and 1975 to January 2007 (for other research questions)

Exclusion criteria: The following exclusion criteria were applied:

- Studies assessing public health nursing, nurse managed centre, respiratory nurse, psychiatric nurse, diabetic education nurse, trainee nurses, nurse midwives or nurse telephone consultation
- Studies evaluating nursing care outside primary care setting (such as hospital emergency department, inpatient, diabetic clinic)
- Studies investigating the impact of nursing care on patients' health outcomes but not using the comparators of interest or not reporting the relevant data, or only reporting patients' views or satisfaction
- Studies with only observational data such as the work of primary and community care nurse (i.e. an audit)
- Studies evaluating patient health outcomes and published prior to 1996
- Non-English publications

Due to the volume of published articles, we searched for articles with a high level of evidence to assess the impact of nurse intervention on patient health outcomes and cost effectiveness. Explicitly, we sought level I evidence (such as systematic reviews, meta-analysis, health technology assessment.) and level II evidence from well designed RCTs. Subsequently the evidence in the studies was assessed and classified using the dimensions of evidence defined by the National Health and Medical Research Council [22]. The level of evidence is a measure of the susceptibility to bias of various study designs. Level I evidence is least susceptible to bias and Level IV evidence is most susceptible to bias. For other research questions (education or funding model, policy frameworks or career pathways), all types of study designs were searched and included in the review.

SEARCH RESULTS AND ARTICLES RETRIEVED

The search strategy identified 9524 articles for all research questions. After initial assessment, 8130 were excluded based on relevance of titles and 1394 abstracts were examined in detail. Of the 1394 abstracts, 1291 did not meet the inclusion criteria for patient health outcome assessment and were excluded. The remaining 103 articles were ordered for full text assessment. Of the 103, 31 met eligibility criteria and were subsequently included in the review. A sub-set of studies were identified from this literature that included a costing or economic evaluation component. For the other research questions (educational model, funding model, policy framework and career pathways), the relevant studies were screened from the initial search results (9524 articles).

Data was extracted from the included studies using pre-developed data extraction form developed for the assessment.

SUMMARY

A range of methodologies were utilised, including a systematic review, a search for grey literature from the UK, the USA, NZ and Australia and stakeholder consultations. Stakeholder consultations were conducted in two stages, at the outset of the review and when policy options had been drafted.

RESULTS

STAKEHOLDER CONSULTATIONS

Meeting notes from the first round of stakeholder consultations were summarised (Appendix F Table 13) and key themes developed. These key themes confirm the interest of stakeholders in the development of practice nursing, much more than in community nursing.

The consultations identified an interest among stakeholders in consolidating the role of the practice nurse (PN) in Australia. Stakeholders were open to the development of different roles for the PN within the current funding framework, including expanding MBS item numbers for PNs and enhancing the role of PIP in supporting the work of PNs. The importance of primary care and preventive health care were underlined as Australia faces an ageing population and the challenge of chronic disease. There was also concern about workforce shortages and the significant impact these shortages would have in the primary care sector. PNs were seen as one solution to helping address these challenges. There was recognition that the training of PNs for their role was not systematic and consistent across the country and that current funding of education may not represent best value for money.

Consultations in the UK provided the opportunity to see the framework outlined there for the development of the PN workforce, including the integration of education with skill level, scope of practice and a career pathway. The professions and government worked together to develop the framework so as to integrate it into the primary care setting.

HEALTH OUTCOMES

The studies focusing on patient health outcomes were examined and organised under the following two headings:

- Studies evaluating nurse-led care against doctor-led care
- Studies assessing the impact of nurses working as supplements to usual care

Overall we identified and included 31 studies that met our inclusion criteria for assessing the impact of nurse intervention on patients' health outcomes. Two of the 31 studies were conducted in Australia, 14 in the UK, six in the US, four in the Netherlands, two in Canada, and one in each of Sweden, NZ, and Hong Kong. The role of the nurse varied across the 31 included studies. Some of the studies compared nurse-led care against doctor-led care, while others assessed the impact of nurses working as supplements to doctors or usual care. We report the findings from these studies separately.

NURSE-LED CARE VERSUS DOCTOR-LED CARE

Nine of the 31 studies assessed the effectiveness of nurse-led care against doctor-led care on health outcomes (Table 8 Appendix C, Table 11 Appendix E). Two of the studies were systematic reviews, six were RCTs, and one was a randomised controlled crossover trial.

The title used to describe the nurse varied across the nine studies. The systematic review [23] included any qualified nurse working as substitute to a primary care physician such as nurse practitioner, practice nurse, health visitor, and others. In the other systematic review [24] and three RCTs [25-27], they were called nurse practitioners. In the remaining studies, nurses were regarded as community nurse [28, 29], registered nurse [30], or primary health care nurse [31].

The study patients' profile varied across the nine included studies. The patients studied in the two systematic reviews [23, 24] were not specific about the type of health problem for which care was provided. All of the RCTs focused on patients with one type of health problem namely incontinence [30] non-emergent medical condition [26], bronchiectasis [25], Parkinson's disease [28] dystonia [27], mobility impairments or history of falls [29], and excessive drinking [31].

Table 8 (Appendix C) summarises the main patient outcome measures following the evaluation of nurse-led care against doctor-led care in the nine studies. We expected that nurse-led care would achieve positive patient outcomes equivalent to doctor-led care. Hence patient health outcomes were selected to compare the quality of care between a nurse and a doctor.

The type of patient outcomes assessed varied across the nine studies. The reported outcome measures included mortality, health status (quality of life), compliance, knowledge, and satisfaction. Only the Cochrane systematic review [23] assessed all of the above five patient outcome measures. Overall, the most common patient outcome reported across the studies was quality of life and satisfaction. The studies also evaluated resources utilisation post intervention. The relevant patient outcome data were extracted from the nine studies and summarised, with the main findings as follows:

Mortality: Three studies had data on mortality [23, 28, 31]. Although the systematic review of RCTs [23] examined mortality, the authors were unable to conduct proper meta-analysis because there were few studies that examined this outcome. However, the two studies they identified both showed mortality to be the same with nurse-led care and doctor-led care. Likewise the RCT of patients with Parkinson's disease in general practice [28] found no significant difference in mortality between patients managed by nurse and general practitioners. Tomson et al [31] conducted a RCT of excessive drinkers and reported one death in the nurse-led group and three in the control group, but the difference was not significant (Table 8).

Quality of life: Seven studies reported quality of life measures [23-26, 28-30] and two did not [27, 31]. The systematic review [23] included 12 studies that assessed 38 outcomes measures of health status, and three of the outcome measures were better with nurse-led care and 35 showed no difference. Two RCTs [28, 30] also reported positive outcome in favour of nurse led-care. The other systematic review [24] and three RCTs [25, 26, 29] showed no significant difference between the two types of care delivery (Table 8).

Compliance: Better patient adherence to (compliance with) treatment and care is indicative of positive impact of an intervention program. Only two studies reported compliance outcome measure [23, 25]. The systematic review [23] included four studies that measured six compliance related outcomes and none of the outcomes was different between nurse-led care and doctor-led care. The RCT [25] in the UK showed significantly more patients in nurse care group were compliant with medication than doctor-led group (100% vs. 81%, $p=0.024$).

Overall based on the evidence, patient compliance with medication or care is better under nurse care than under doctor-care. Among the reasons why compliance is better under nurse care is that nurses spend more time and communicate more effectively about medication use.

Knowledge: Patient knowledge about their illness was only assessed and reported by one systematic review [23]. The authors did not conduct meta-analysis on this outcome because they identified only two relevant studies. However, they reported that both studies showed better patient knowledge under nurse-led care than doctor-led care.

Satisfaction: Studies that only reported patient satisfaction as a key outcome were excluded from the initial search but because some studies reported this outcome, we extracted it more systematically. Six of the nine studies reported data on patient satisfaction with care [23-27, 30]. The two systematic reviews [23, 24], and three RCTs [25, 27, 30] showed better patient satisfaction with nurse-led care than doctor-led care. One RCT [26] reported no significant difference in satisfaction between nurse-led care and doctor-led care. The systematic review by Laurant et al [23] found among seven studies that measured a total of 35 patient satisfaction related outcomes, 13 were better with nurse, 21 showed no significant difference, and one was better with doctor-led care. However, meta-analysis of three RCTs showed the overall effect was in favour of satisfaction with nurse care (standardised mean difference 0.28, 95% CI 0.2 – 0.34). Similarly, meta-analysis of five RCTs from the other systematic review [24] found patients were more satisfied with nurse care than doctor care (standardised mean difference 0.27, 95% CI 0.07 – 0.04).

Resource utilisation: Compared to doctor-led care, we anticipated that nurse-led care would provide equivalent or improved patient outcomes, and would be cheaper or similar in resource use. To assess this assumption, data on resource use were extracted from the appraised studies.

All of the included studies except one [30] assessed this outcome (Table 8). Laurant et al [23] performed a meta-analysis of three studies and found no significant differences for any of the resource use outcomes (scheduled return visits, prescription order, hospital referral, attendance at accident and emergency or hospital admission), between nurse care and doctor care. Equally, the meta-analysis by Horrocks et al [24] showed no significant differences in prescriptions, return consultations or referrals, between the two. However, they found that nurse practitioners made significantly more investigations (OR 1.22, 95%CI 1.02-1.46), and had longer consultations (weighted mean difference 3.67 minutes, 95%CI 2.05-5.29) than doctors did. Caine et al [25] found nurse care resulted in significantly more resource use than doctor care ($p < 0.001$). Among the remaining studies, five [26-29, 31] reported no significant difference. However, Lenz et al [26] noticed nurse-led patients had less primary care visits than doctor patients did (1.76 vs. 2.50 visits, $p = 0.02$) during the second year of follow-up.

SUMMARY: NURSE-LED CARE VERSUS DOCTOR-LED CARE

There is modest evidence that for care within the scope of nurses' practice nurses in primary care settings can provide effective care and achieve positive health outcomes for patients similar to that provided by doctors. Nurse-led care may involve higher levels of patient satisfaction and quality of life than doctor-led care in primary care settings and quality of life was even more evident and stronger than doctor-led care in primary care settings. Some studies suggest higher resource use with nurse led care.

NURSES WORKING AS SUPPLEMENTS

The main patient outcome measures assessed by the 22 included studies are summarised in Table 9 (Appendix C) and Table 12 (Appendix E).

The type of health outcomes assessment varied across the 22 studies. Two of the systematic reviews [32, 33] did not assess the patient outcome measures of interest. Kendrick et al [32] focused on the evaluation of quality of the home environment, parent child interaction, attitudes towards child and child rearing practices. The other systematic review [33] examined nursing intervention for smoking cessation. The remaining studies reported one or more of the relevant health outcomes including mortality, health status (quality of life), compliance, knowledge, and satisfaction. Only one systematic review [34] reported five outcome measures. Generally, the included studies reported some data on quality of life (health status) and compliance measures. The main findings are summarised below.

Mortality: Three studies reported mortality data [34-36]. Taylor et al [34] conducted a meta-analysis of seven trials of the long term or intensive nurse-led management interventions for COPD patients and found no significant difference in mortality between patients managed by nurse as supplements and usual care (OR 0.85, 95% CI 0.58-1.26). In the UK, Raftery et al [36] did a follow up of a RCT of patients with coronary heart disease. Over a 4-year period, they found that the intervention group (nurse-led) had 28 fewer deaths than control group, reporting a reduction in mortality among patients managed by a nurse working as supplements to usual care. Dalby et al [35] in Canada examined the impact of preventive home visits by a primary care nurse on the outcomes of frail elderly subjects in the community. They found no significant differences in the combined rate of deaths and admissions between the nurse and usual care patients.

Overall, there is no evidence to suggest that nurse-led care or a nurse working as supplements to usual care is more effective or less effective in reducing mortality, compared with doctor-led care.

Quality of life: Eleven of the studies reported no difference in quality of life between patients managed by a nurse as supplements and a doctor. However, the systematic review [32] of the effectiveness of a home visiting program on maternal and child health outcomes showed the intervention had a significant effect in improving the quality of the home environment. Similarly, Hunkeler et al [37] studied patients with major depressive disorder and reported better quality of life among those managed by nurses.

Compliance: The type of compliance measures investigated across the studies varied and included adherence with treatment [34, 37, 38], participation in exercise program for low back pain [39], attendance for breast screening [40], and oral corticosteroids use [41]. Three of the studies [42-44] showed better compliance with nurse care. Six studies [34, 37-41] reported no significant difference between the two models of care.

Knowledge: Some measure of patient knowledge was reported by five studies [34, 39, 41, 44, 45]. Two of the studies [39, 44] showed significantly better knowledge with nurse care, and three [34, 41, 45] reported no significant difference. The two studies that reported better knowledge recruited patients with either type 2-diabetes [44] or low back pain [39].

Three of the studies [39, 44, 46] showed significant improvement in patient's knowledge under nurse-led care than under doctor-led care. The remaining studies found similar effect on knowledge between the two methods. Based on the available evidence it is possible to conclude that nurses can significantly enhance patient's knowledge than doctor care, in primary care setting.

Satisfaction: Patient satisfaction was reported by one systematic review [34] and four RCTs [37, 39, 44, 47]. One systematic review [34] and one RCT [47] showed no difference. But three other RCTs [37, 39, 44] reported better patient satisfaction with care with nurse-led care. The patients in these trials had either type 2-diabetes [44] depressive disorder/dysthymia [37], or low back pain [39]. The studies reporting similar patient satisfaction between nurse and usual care had either COPD [34] or venous leg ulcer [47]. The higher levels of satisfaction with nurses than doctors is attributed to the close relationships that nurses develop with their patients during consultation and nurses spend more time with patients.

Resource utilisation: Fourteen studies assessed resource use but the type of outcomes measured varied across the studies. They included hospital readmission [34], admission [48], consultations [46, 49, 50], cost to national health service [36, 42, 47], and general use of health care service [35, 39, 41, 43, 51, 52]. Five of the studies [41-43, 48, 52] reported better resource use when a nurse works as supplement to usual care. The remaining nine studies including the systematic review [34] showed no significant difference between the two models of health care delivery.

The majority of the studies (22 out of 31) reported some kind of resource use measures by participating patients. However, the types of resource use measured varied across the studies and included hospitalisation, readmission, consultation, and visits to emergency departments. Six of the studies explicitly showed better resource use with nurse involvement. The remaining studies found similar resource use by patients managed by nurse and usual care. The reason for this discrepancy may relate to factors such as the method used to assess resource use and the type of patients studied.

SUMMARY OF NURSES WORKING AS SUPPLEMENTS TO USUAL CARE IN PRIMARY CARE SETTING

There is no evidence that nurses working as supplements have better impact on patient outcomes of mortality, hospitalisation or readmission, than usual care. However, nurses working as supplements to usual care can have a positive and beneficial effect similar to usual care on patient satisfaction and quality of life of patients.

COSTING AND ECONOMIC EVALUATION STUDIES

From the systematic review of studies of the effectiveness of primary care nursing we identified all those studies which included costs (and outcomes) or cost effectiveness analyses. Table 10 Appendix D presents a summary of the nine studies that included costs or a formal economic evaluation.

Summarising these results is complicated by the multifaceted nature of the term 'patient health outcome' which includes mortality, quality of life, morbidity, self-care or management skills, and knowledge about illness. Measurement of costs is also complex, and the various studies adopt quite different approaches, especially in terms of scope of costs included, whether downstream costs are included and the approach to valuation. Studies variously report on consultations, hospitalisation, readmission, emergency visits, and other cost categories.

We conducted a critical appraisal of these studies. The primary requirement for a sound economic evaluation is a high quality trial design that ensures confidence in measured outcomes and a sufficiently detailed description of the intervention that supports a full costing of resource inputs.

Note that if outcomes are no better under nurse-based care and costs are similar (or higher), or if outcomes are similar and costs are higher under those circumstance, the intervention is dominated (performs worse). Alternatively, where outcomes are better and the intervention is cheaper the intervention is dominant (performs better). It is only where outcomes are better and costs are higher (or costs lower but outcomes poorer) that a cost-effectiveness analysis is needed to establish performance.

We identified five costing studies that reported costs of an intervention as well as outcomes, but did not formally relate the two. We have combined this information in Table 10 Appendix D to ascertain the economic performance of these interventions. Three interventions [25, 28, 43] appeared more effective but also more costly and therefore formal economic evaluation is required to determine cost effectiveness. The study by Pugh et al [43] of hospital followed by home nurse visiting for new mothers resulted in improved breast feeding rates, at a net cost of \$54 per mother. Given the benefits of breast feeding, this is likely to represent a highly cost-effective program. One intervention, nurse consultation for patients with uncontrolled hypertension [38] had similar effectiveness but was more costly than the alternative medical only care and is therefore dominated. Two interventions were probably not cost-effective, a nurse counseling for persons with Parkinson's disease [28] and a nurse led bronchiectasis clinic [25] being both more expensive but with no evidence of improvement in clinical outcomes, although greater 'patient satisfaction' or 'improved sense of well-being' was reported. Nurse practitioner home-visits for botulinum injections for the treatment of dystonia [27] was similarly effective and cheaper than a clinic-based intervention indicating dominance.

In addition four studies reported formal cost-effectiveness analyses. Three interventions: nurse led clinics to promote medical and lifestyle management for CHD [36], a home based exercise program delivered by a district nurse for falls prevention in the elderly [48] and ulcer management by a clinic nurse [47], were found to be highly cost-effective or even cost-saving. On the other hand an eight-week nurse-delivered continence program [30] while achieving better outcomes, did so at considerably higher cost which may not be cost-effective relative to the alternative.

While it is clear that some nurse-based interventions are dominant or highly cost-effective, simple generalisations are not possible. It is also probable that economic evaluations are more likely to be completed where there is evidence of effectiveness, resulting in a bias in the sample of reported cost-effectiveness studies in favour of nurse interventions being more cost-effective.

We also recognise that only the most complex search strategies are likely to capture all (or even most) high quality studies reporting on the cost-effectiveness of interventions involving community nursing or the practice nurse in patient care.

Given this, because of the vast array of potential roles of community nursing, it has not been possible in this study to establish the performance of the community nurse in all their possible roles, taking into account various settings and contexts.

SUMMARY

While the reported outcome measures varied across the studies, there is some evidence from high level evidence (systematic reviews and RCTs) that nurse-led care or a nurses working as supplements is as effective as doctor-led care or usual care in some circumstances in improving some of the patient health outcomes and resource use.

To assess the impact of nurse intervention on patient health outcomes, we focused on systematic reviews and randomised controlled trials. However, the review is not without limitations and the findings should be interpreted cautiously.

EDUCATION AND CAREER PATHWAYS

This section reviews education models and policy frameworks that support career pathways for primary and community care nursing, providing:

- An overview of the policy frameworks that are guiding developments in Australian community and practice nursing
- An overview of policy frameworks in the UK that are guiding developments in practice nursing
- Data from stakeholder consultations
- A summary of the main findings from the small Australian research base and grey literature on policy, educational models and career pathways for nurses entering primary and community nursing. The extant literature from the UK and NZ is reviewed for developments that have the potential to inform Australian developments

AUSTRALIA

Nurses practice in diverse settings ranging from acute care environments to community based services that bridge the public and private sectors. Increasingly, practice opportunities for nursing are community based [53, 54] yet the effectiveness of pre-service education programs in preparing nurses for roles in diverse settings such as community, home and general practices is limited [53-58].

In Australia, there is little or no prerequisite educational preparation for nurses who wish to practice as a community nurse or practice nurse [53] There are some educational providers who offer post-graduate courses targeting community nurses and practice nurses but these programs are not mandatory for employment and the uptake of these programs is low [53]. Practice nurses' access to informal education is predominantly delivered by Divisions of General Practice or General Practices and is focused on the National Health Priorities which is more appropriate for registered not enrolled nurses [8, 59].

There is evidence in Australia of faculty perceptions that some types of nursing practice are more legitimate than others, coupled with limited exposure to practice environs beyond the acute care sector in undergraduate curriculum. These perceptions are influential on student career choices [60]. A lack of career development in non-acute and community based contexts of practice has limited the attractiveness of employment in these settings [58]. Career pathways with associated rewards are vital if practice and community nursing jobs are to be attractive [61, 62]. Multi-country experience has demonstrated that career progression, dependent on the demonstration of advanced knowledge and practice specific to the field of clinical expertise, is a strong incentive for nurses to remain in the workforce [63, 64].

SKILLS AND KNOWLEDGE FOR COMMUNITY NURSING

A major Australian review of nursing education was conducted in 2001 to assess the types of skills and knowledge required to meet the changing needs of nursing labour force, in the context of a increasing demand for, but decreasing availability of, health care resources [21]. The review reported that community nurses, particularly those in rural areas, require a new raft of skills and knowledge including working in multidisciplinary teams, analyzing and critiquing research findings, the implementation of evidence-based practice, health promotion, prevention and early intervention, coordination of care, high level communication and liaison skills, the ability to delegate, supervise and evaluate professional and unlicensed staff, knowledge of professional boundaries of practice, knowledge of available services, providers and health funding, advanced assessment skills and knowledge, clinical decision-making, health education and health teaching of carers and the facilitation of learning, counseling, advanced problem solving, and organisational management [21].

SKILLS AND KNOWLEDGE FOR PRACTICE NURSING

Nurses choose to work in general medical practices for reasons that include part-time employment, flexible working hours, and employment close to home [65-69]. Although some have argued that Australia's practice nurses have been largely unconcerned with career advancement [67], this milieu is changing as practice nurses' scope of practice expands and this context of practice gains recognition by government and the profession as a legitimate primary care nursing specialism [67, 69, 70]. Most practice nurses are registered nurses with many having a post-registration qualification - predominantly midwifery, immunisation and maternal and child health nursing [69]. However, over 1/3 of practice nurses had no additional qualifications [8, 71].

There has been little provision for mandatory training for practice nurses [72, 73], which Baird [74] argues is necessary. General practice nurses undertake a wide range of tasks in four different, but overlapping, dimensions of responsibility that are constant, irrespective of geographic location [59, 75, 76].

- Clinical care – responsibility for clinical based procedures and activities; specific clinical activities functioning as part of the care team such as assessment of risk factors, lifestyle screening, counseling and education, vaccination, wound care, cervical screening
 - Patient follow-up and recall – both arranging and undertaking follow-up tasks, especially in context of chronic disease management and prevention
 - Care planning, setting up care planning meetings, completing care plans
 - Working in treatment rooms
- Clinical organisation – activities that require management, coordination and higher level administration of clinical activities, particularly a systems approach
- Practice administration – activities that provide administrative support to the general practice as a business enterprise
- Integration – development of effective communication channels within the practice and between the practice and outside organisations and individuals

In addition, practice nurse knowledge should include fire safety, life support, infection control, child protection and health and safety, including OHS requirements to ensure practice nurses are cognisant of their need to be safe and current in their practice [65, 67, 77]. The RACGP/RCNA evaluation predicted that in the future, practice nurses will undertake a greater integration role with more time spent in clinical care and clinical organisation, and less time on practice administration [76].

Practice nurses themselves believe curriculum content should have breadth [8, 71] including:

- communication skills – written , verbal, patient advocacy and conflict resolution, dealing with difficult clients
- legal and ethical issues including confidentiality and national privacy principles
- infection control - wound care and management
- first aid and CPR
- chronic disease management - physical assessment, palliative and end of life care
- cold chain monitoring
- sterilisation
- triage
- enhanced primary care activities – counseling, health education and promotion, family planning, child health, screening, immunisation, mental health, drug and alcohol
- management skills - case management, practice accreditation, information technology, recall/reminder register

Practice nursing in Australia has not evolved a career pathway which may be related to the relative newness of this field and/or limitations placed on these nurses' scope of practice [69]. There is recognition that a career pathway needs to be developed [67]. Much of the Australian literature equates access to education as being equivalent to providing a career pathway [68, 78] although the experience of the UK is that those career pathways need to be linked to competencies with knowledge and skill development appropriate to articulated career levels.

UNITED KINGDOM

The UK has used practice nurses extensively for a number of years. Practice nurses are a specialisation of nursing and are all registered and qualified, often through specific degrees and post training courses. It is one of the fastest growing areas of nursing in the UK (7000 nurses in 1990 to 23,000 in 2005). Nurses are employed on a salary by general practices who belong to local health authorities. Nurses will form part of a team composed of general practitioners and possibly other practice nurses, pharmacists or dieticians. The nurses roles are varied but include treatment room duties, the running of nurse led clinics in health promotion or chronic disease management, prevention of heart disease, immunisations for children and travel, women's health, diabetes and asthma care (additional training is required to run specialised clinics).

Reforms in primary and community care nursing have evolved in the context of broader health system reforms. Strategies include changes to a broad mix of workforce skills, cost containment in the context of skills shortages, and the redesign of services to better meet the needs of patients [79]. The general practice nursing workforce has experienced dramatic growth since the mid-1990s, following reforms to general practice in the UK. There is an increasing shift of routine care from general practitioners to practice nurses with planned, safe substitution by nurses for doctors in a wide range of services, with the intention of reducing both demand for doctors and the direct costs of service provision [80].

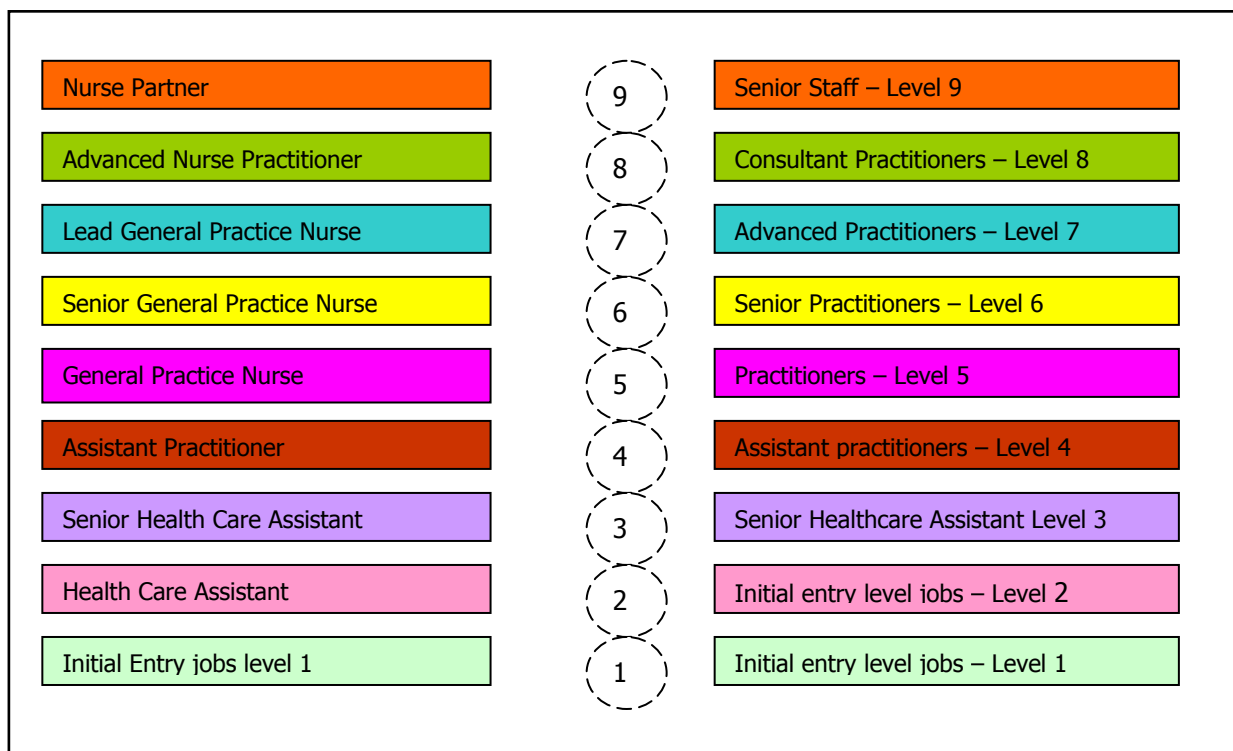
Primary care trusts are responsible at the local level for managing primary care, dentists, opticians, pharmacists, walk in centres and NHS Direct phone line services, and collectively they now control 80% of the NHS budget. The revenue of a practice is a product of the services they provide and additional payments if they meet quality markers according to the requirements in the Quality and Outcome Framework. The practice decides what proportion it spends on salaries for the various professionals it employs. General practitioners are paid either through mixed capitation systems (based on patient list size and specific target payments) or through salaries. A total of 82% of general practitioners in 2005 were either contracted or salaried with the majority of these, 67%, on GMS contracts [81]. The contract is between the practice (rather than an individual GP) and the local primary care organisation (PCO).

The PCO funds the practice in the following ways, via the global sum for essential services (calculated on a weighted capitation formula), quality payments, enhanced services, premises payments, information technology payments, dispensing payments where applicable and PCO administered funds including seniority payments [81]. In 2005 in the UK there were 31,683 FTE general practitioners compared to 13,793 FTE practice nurses [81]. In Australia in 2005 there were 14,789 general practitioners [82] and approximately 4500 (headcount) practice nurses although we know that around 82% are employed part time [83]. This suggests a higher ratio of practice nurses to GPs in the UK compared to Australia. In addition we see a greater proportion of GPs per head of population in Australia of 92 FTE per 100,000 population in 2004 [10] compared to approximately 57 FTE in the UK in 2004. In summary we see relatively more practice nurses in the UK and less GPs.

Prior to the 1990s, general practice nursing in the UK lacked structure and an educational framework. Since the 1990s, practice nurses in the UK have worked to gain access to ongoing professional development relevant to their practice, choosing to pay the costs associated with education and training to ensure they are current [65, 84]. More recently, in recognition of the importance of the practice nurse role, the WiPP has developed the General Practice Nursing Career Framework [80] (Figure 1) which has nine levels that take account of all levels of nurses working in the general practice setting.

The Framework aims to support GPs and practice nurses by linking expected levels of education and practice performance into a career pathway framework that provides for both standards and competencies and career acceleration [72, 73]. The toolkit assists practice nurses, practice managers and GPs identify roles for each of the practice team members and provides indicators for the education and training support of practice nurses [84]. The project acknowledges the need for effective and robust induction programs for new practice nurses, mentoring and support, comprehensive role information, accessible supportive training initiatives and indemnity through the GP employer.

Figure 1 UK General Practice Nursing Career Framework



NEW ZEALAND

New Zealand is an important example to explore as their health system was very similar to Australia until 2001 when they initiated primary health care reform through the release of The Primary Health Care Strategy involving the establishment of Primary Health Organisations (PHOs). The reform involved an emphasis on local primary health care services, health improvement, coordinated care, health promotion, the role of the community, preventative care, reducing inequalities, the need for a range of professionals, and funding based on needs rather than fee-for-service. PHOs were funded by District Health Boards (21 in total) to provide an essential set of primary health care services to their enrolled populations. An important goal was for all providers and practitioners to be involved in decision-making rather than one dominant group [17].

Funding

The government in 2001/02 spent \$337 million on GP services, and in addition has committed \$1.7 billion over six years from 2002/03 to implement the new Primary Health Care Strategy.

The 2006-07 primary health care budget for capitation based subsidies is \$623.5 million [17]. The 2006/07 budget for other initiatives is \$93.9 million. The capitation payments made to each PHO are dependent on the number of enrollees and their age, gender, ethnicity, deprivation quintile, and whether the person holds a Community Services Card (CSC) or a High Use Health Card (HUHC). The capitation rates are complex depending firstly on whether a practice is access or interim funded and then the characteristics of enrolled patients.

Objectives

The New Zealand Ministry of Health set specific population health objectives such as reducing smoking, improving nutrition, increasing levels of physical activity, reducing alcohol misuse, reducing the incidence and impact of cancer, cardiovascular disease and diabetes, improving oral health, reducing violence and suicide. Another objective was to reduce inequalities through accessible and appropriate services for lower socioeconomic groups, Maori and Pacific peoples [17].

Evaluation

The first evaluation of the Primary Health Care Strategy was published in 2005. The report outlines three major organisational and policy changes that occurred to implement the strategy [85]:

- Increased government funding for primary health care
- Development of PHOs as local, non-government, not for profit organisations that service the health needs of an enrolled group of people
- Public funding for primary care changed from fee-for-service subsidies at the practitioner level to capitation funding of PHOs

In April 2005 there were 77 PHOs in existence, with over 90% of the population enrolled, which represented a greater uptake than was expected. Major issues to emerge from qualitative analysis include: general support for the philosophy, some problems with GP acceptance, still some medical dominance, workforce capacity is often strained, quality remains a major issue, major opportunities for enhancement of nursing practice with a need for career pathways, training opportunities and financial recognition. Quantitative analyses are planned but have not yet been reported for change in programs, processes and health outcomes, impact on health inequalities, net costs, and expenditure changes.

UNITED STATES OF AMERICA

The professional nurse in the 21st century will function in a diverse health care system that incorporates a strong emphasis on community-based care [86].

In the early 1990s, groundbreaking reports were published in the USA [87-90] setting an agenda for nursing in relation to health reforms. There was wide acknowledgement of the need for paradigm shifts in nursing education to provide nurses who are competent practitioners in a range of contexts including primary health care. Nursing education in the USA has since moved to incorporate a profoundly different paradigm to traditional nursing programs, building a focus on community health, health promotion, disease prevention and primary care, preparing students for roles and responsibilities for community-based settings [7, 91]. The Commission on Collegiate Nursing Education (CCNE) has established accreditation standards for nursing education which are being applied to community-based curricula [86]. Education for community-based nursing is regarded as a realignment away from institutions, towards populations with an individual and family-centred orientation, emphasising partnerships with clients and communities, and respect for cultures and values of individuals, groups and communities [92].

A clinical ladder model is being used "... as a method of defining, recognising, and rewarding nursing practice" [93]. This model provides a framework for defining practice expectations and the differences across levels. There is recognition that clinical models and career pathways models are dependent on effective education and professional development strategies for nurses.

VETERAN'S HEALTH ADMINISTRATION (VHA)

The US Veterans' Health Administration is the US's largest integrated health system and it underwent major reform and reinvention commencing in 1995. The changes were impressive and turned the VHA into a modern, well managed, organisation that outperforms its competitors and has significantly increased its efficiency, quality and satisfaction [94]. Key components of the reform were changing large individual, independent and often competing hospitals into 22 integrated service networks [95]. The system changed from hospital focused to primary care focused and payment systems were revised to provide incentives for efficiency, quality and improved access. The VHA holds many lessons for other health care systems in regards to use of IT and information sharing, managing major health care reform, the provision of high quality integrated care, their strong quality audit and feedback mechanisms and the operation of a capitated funding system. They have managed to simultaneously improve quality and efficiency.

FUNDING OF AUSTRALIAN PRACTICE NURSES

ENHANCED PRIMARY CARE PROGRAM

The focus of this program is the provision of preventive care for the older population and the improvement of coordinated care for those with chronic conditions needing complex care. The program has a number of components including a 45 year old health check, multidisciplinary care planning and limited funding for allied health and dental services identified on a multi-disciplinary care plan, medical assessments for residents of aged care homes, discharge care planning and case conferencing [96]. These latter initiatives are of particular interest to the role of the practice nurse.

MEDICARE ITEM NUMBERS FOR PRACTICE NURSES

In February 2004, the Australian Government introduced two MBS item numbers for services provided by a practice nurse as part of the Strengthening Medicare package. They were for immunisation (10993) and wound management (10996) [97].

In November 2005, the government introduced a further two item numbers for them to take Pap tests (10998, 10999) [97]. This was followed in November 2006 by additional item numbers (10994, 10995) to take a Pap test plus one other preventive health check[97].

Again in November 2006 an item number (16400) to fund antenatal checks carried out by a practice nurse, midwife or Aboriginal health worker in rural and remote areas (RRMA 3-7) was introduced [97]. In July 2007 item number 10997 was introduced for practice nurses to monitor the condition of, and provide support to, people with chronic disease [97].

In addition to the establishment of the item numbers, the Australian Government provided \$1 million over two years (2004-05 and 2005-06) for the Practice Nurses Scholarship Scheme. The scheme is to support practice nurses in accessing training in wound management, immunisation and the provision of Pap tests with the funds administered by the Australian Practice Nurses Association in Partnership with the Australian Divisions of General Practice [98].

Items are claimed by a GP for service provided by a practice nurse on their behalf. For all item numbers, the GP retains responsibility for the health, safety and clinical outcomes of the patient. The GP must see the patient prior to wound management and can see the patient prior to immunisation and Pap smear tests at their own discretion and can claim separately for their professional service. The GP does not need to be present at the time of the service but provides instruction and maintains overall responsibility [97]. Table 1 provides an overview of item numbers claimed to date since their introduction. There has been steady growth in the use of all item numbers after the initiation of the practice nurse listings.

Table 1: Requested Medicare items processed from Jan 2004 to Dec 2006.

Year	Total services				TOTAL
	10993 (immunisation)	10996 (wound management)	10998 (pap smear)	10999 (pap smear ^(a))	
2004	1,206,286	794,479			
2005	1,754,506	1,177,772	11,866	361	2,000,765
2006	1,973,724	1,383,265	19,914	1,101	2,944,505
TOTAL	4,934,516	3,355,516	31,780	1,462	3,378,004
					8,323,274

Source: Australian Government, Medicare Benefits Schedule Item Statistics Report, www.medicareaustralia.gov.au/statistics, accessed 19th June, 2007, (a) refers to women aged 20-69 who have not had a test taken in the last 4 years.

The 2005-06 budget committed \$75.7 million to addressing domestic violence and sexual assault in Australia. As a component of the *Women's Safety Agenda practice nurses working in rural* and regional areas will be offered training to enable them to deal with domestic violence issues.

PRIMARY HEALTH CARE ACCESS PROGRAM (PHCAP)

This program is aimed at expanding primary health care services in Aboriginal and Torres Strait Islander Communities. It focuses on clinical care, early intervention strategies, illness prevention and the provision of management support systems [99]. The program is designed to allow pooling of new and existing Commonwealth funds with existing State funds for the flexible provision of clinical services, support services, social and preventative programs, policy and advocacy [100]. Primary clinical care is therefore permitted to more flexibly involve the PN in a variety of roles and extended roles. The challenge for the PHCAP in terms of nursing in primary care is the appropriate training, quality assurance and role delineation for the nurses.

PRACTICE INCENTIVES PROGRAM (PIP)

PIP is available to general practices that are either accredited or working towards accreditation. Payments that are made are in addition to other income, with the aim of compensating for the limitations of fee-for-service arrangements. PIP payments are mainly dependent on practice size rather than on the number of consultations performed [101].

In the February quarter of 2007 there were a total of 4,775 practices registered for the PIP program (2,981 were in capital cities, 361 other metropolitan, 303 large rural, 299 small rural, 674 other rural, 57 remote, and 100 other remote). There are many components to the PIP program only some of which impact on, or apply to, nursing in general practice. The following is a description of the PIP incentives activities by the registered practices along with the change in activity from May 2004 to May 2006 and the latest figures at February 2007 (Table 2).

Table 2: Calculations by activity for the registered practices (quarterly results)

	Approved practices participating in each of the PIP incentives (% of registered practices)			
	May-04	May-05	May-06	Feb-07
Number of Practices in the PIP	4,646	4,681	4,745	4,775
Provision of Data to the Commonwealth	4,646 (100)	4,681 (100)	4,745 (100)	*
Electronic Prescribing	4,272 (92)	4,364 (93)	4,480 (94)	*
Capacity for Electronic Transfer of Data	4,226 (91)	4,307 (92)	4,417 (93)	*
Ensuring patients have access to 24 hour care	4,519 (97)	4,554 (97)	4,601 (97)	4,644 (97)
Provision of at least 15 hours care from within the practice	3,150 (68)	3,116 (67)	3,120 (66)	3,103 (65)
Provision of all after hours care for practice patients	1,350 (29)	1,356 (29)	1,296 (27)	1,309 (27)
Teaching: Hosting Medical Students **	518 (11)	585 (12)	714 (15)	1,035 (22)
Quality Prescribing Initiative	1,197 (26)	1,200 (26)	1,203 (25)	*
Asthma sign on ***	4,078 (88)	4,138 (88)	4,211 (89)	4,266 (89)
Cervical Screening sign on ***	4,185 (90)	4,265 (91)	4,349 (92)	4,405 (92)
Diabetes sign on ***	4,111 (88)	4,202 (90)	4,295 (91)	4,351 (91)
Practice Nurses	1,475 (32)	1,617 (35)	1,756 (37)	2,116 (44)
Care Planning Incentive	*	*	*	*
IM/IT Tier 1 (basic)	*	*	*	3,886 (81)
IM/IT Tier 2 (enhanced)	*	*	*	3,745 (78)

* figure is suppressed for confidentiality reasons of the category and is not applicable

** all payments except for the teaching incentive are based on SWPEs

*** Sign on payments are one off practice payments (commencing Nov 2001)

Source: Australian Government, Medicare Australia, General Practice Statistics Report (PIP data), accessed 20 June 2007.

From Table 2 the total number of PIP registered practices qualifying for the practice nurse payment has increased over time. Not all practices will be eligible for the practice nurse initiative so this figure is not expected to reach 100%. We know from other sources that as at December 2005 almost 5,000 practices in total employed practice nurses which is around 57% [83]. The practice nurse initiative is specific to areas of urban workforce shortage and rural and remote areas as follows:

PIP Urban Practice Nurse Initiative

About \$139 million was provided in November 2003 over four years to support practices to employ practice nurses and allied health workers (including dietitians, physiotherapists, and speech pathologists). \$79.5 million of these funds were for the employment of practice nurses. These incentives are available to practices located in urban areas of workforce shortage as defined by the Department of Health and Ageing (population areas with a low doctor to population ratio). In May 2006, 640 practices were participating in the PIP Urban Practice Nurse Initiative [98].

PIP Rural Practice Nurse Initiative

The rural practice nurse initiative was introduced in the 2001-02 and 2005-06 federal budgets with funding of \$234 million over eight years. The aim of the program was to encourage additional practice nurses and allied health workers into general practices in rural and remote Australia and other areas of need, and to provide some training and professional support. In May 2006, over 1,100 rural practices were participating in this initiative [98].

Payments

The PIP payment formulas are complex. In essence, payments are proportional to practice size as measured by a measure of patient load called the standardised whole patient equivalent (SWPE). The SWPE value for a practice is the sum of the fractions of care it provides to each of its patients, weighted for age and sex of the patient [102]. The average FTE GP will attract a SWPE of 1000. This SWPE value is then applied to the monetary rates for each PIP activity. For example, employing or retaining a practice nurse attracts an annual payment of \$8 per SWPE. A practice of 4 FTE general practitioners with a SWPE of 4000 will therefore receive \$32,000 for engaging in this activity for one year. For the practice nurse or allied health worker PIP item practices receive set payments of \$8 per SWPE up to the equivalent of 5000 SWPE (this would require one full time nurse or allied health worker) up to a maximum of \$40,000 per annum.

To qualify for the payment practices must provide a minimum of two sessions per week or equivalent over a payment quarter [102].

Roles

A broad range of roles and functions are suggested for the practice nurse including clinical nursing services, patient services coordination, managing clinical environment, health promotion and community wellbeing, contributing to better management of human and material resources, improving health outcomes through management and prevention of ill health. In practice, nurses' roles are likely to include Medicare item numbers and other PIP incentives such as completing cycles of care for diabetes, asthma and other chronic conditions.

Evaluation of PIP outcomes

The uptake of the PIP incentives has been high although relatively stable over time Table 1. One of the only PIP activities that has seen growth in uptake over time has been the practice nurse initiative where the number of practices participating has increased by ~ 50% from its inception (1475 in May 2004 to 2116 in February 2007). From MBS data standard consultations such as items 52-57 (brief, standard, long and prolonged consultations) have decreased over time while all GP attendances have remained relatively stable although the number of practitioners has slightly increased over time. The total cost of GP consultations have gone up by 21% between 2004 and 2006. From PBS data PBS prescribing in GP has decreased over the last three years despite a slight increase in the number of practitioners.

On the other hand, practice nurse item numbers have increased in use (Table 1), as have the higher cost care planning item numbers, particularly for the GP only items This has been associated with increased services and increase in costs of GP. Further evaluation is required to determine impact on patient outcomes.

PIP conclusions

The PIP incentive payment does provide an incentive for eligible (urban workforce shortage, rural or remote) general practices to take on a practice nurse or allied health worker and does support a broader role for nurses than the Medicare item numbers alone. However, there remains an incentive to use the practice nurses to generate additional revenue from the fee-for-service items or other PIP payments rather than engaging them in broader best practice care in a flexible and responsive way.

SUMMARY

Policy frameworks are driving change in nursing education and practice. Significant advances have been made in NZ, the UK and the USA towards strengthening frameworks for primary and community nursing education to support policy shifts towards primary health care and community based service delivery by appropriately prepared nurses. The Australian government has invested significantly practice nurse employment and activity but the focus of this funding remains on fee-for-service rather than on activities that provide broader care. There is no comprehensive quality controlled education program in place for practice nurses in Australia and no career pathway has been developed.

DISCUSSION

This chapter considers the findings of this study and proposes policy options at health system level, and education models to support the recruitment and retention of nurses to primary and community sectors. These options include strategies to strengthen frameworks for competencies tied to career pathways as well as funding options which are limited to the general practice setting, noting that funding arrangements across all of community and primary care are too diverse to do justice or be instructive for this report.

The ageing of the Australian population, the increase in chronic disease and the shift of care from hospitals to the community has increased the demand for primary care services. At the same time, Australia is facing health workforce supply challenges at all levels. The Australian government has adopted a range of strategies for addressing workforce shortages in primary care and one of these strategies is to develop the role of the nurse and expand the clinical tasks nurses carry out in general practice in particular. Considerable funding for MBS item numbers for practice nurses have been allocated as have practice incentive payments (PIP) for the employment of nurses, resulting in the employment of nurses in nearly 60% of general practices. Additional funding has been made available for the training of PNs in certain clinical skills.

HEALTH OUTCOMES

There is modest evidence that nurses in primary care settings can provide effective care and achieve positive health outcomes for patient similar to that provided by doctors for care within the scope of nurses' practice. Moreover, the impact of nurse-led care on patient satisfaction and quality of life was even more evident and stronger than doctor-led care in primary care settings. However, there is no evidence that nurses working as supplements have better impact on patient outcomes of mortality, hospitalisation or readmission, than usual care. However, nurses working as supplements to usual care can have a positive and beneficial effect similar to usual care on patient satisfaction and quality of life of patients.

EDUCATION AND CAREER PATHWAYS

Current education in Australia does not prepare nurses for primary care and postgraduate education is piecemeal, and not comprehensive or consistent across the country and lacks quality assured outcome evaluation. There are limited or no career pathways for nurses working in the primary and community care sectors and no incentives to improve skills and enhance their role in the delivery of primary care. Similarly, remuneration is variable and does not seem to be linked to the nurse's skill and clinical expertise.

FUNDING AND INCENTIVES

In the last few years there have been a number of government initiatives to support increased practice nursing in Australia such as the PIP incentive payments, the Enhanced Primary Care program, additional Medicare item numbers and trials such as coordinated care. It is critical that these programs are thoroughly evaluated to determine how they are operating and the impact they are having on the delivery of effective and efficient care. This is particularly important prior to extension of these initiatives. Given the level of funding involved, it is crucial that assessment is made of how the schemes and programs are actually running on the ground, in order for learning and progress to occur.

MEDICARE ITEM NUMBERS

To date there is a limited role for the practice nurse as indicated by Medicare item numbers. They are specifically listed for specific tasks (wound management, immunisation, Pap tests, antenatal care and part of multidisciplinary case management) and it is the doctor who assumes responsibility and is mostly paid for their involvement. There is a possibility of extending the MBS item numbers for practice nurses in line with best practice care.

This would likely lead to greater use of practice nurses for a wider range of activities but is a model that inherits the limitations of a fee-for-service system.

SUMMARY OF FUNDING ARRANGEMENTS

There is much room for improvement in funding arrangements, especially around involvement of the practice nurse in patient care. Current funding arrangements tend to limit rather than extend the role of the practice nurse and certainly do not support use of the practice nurse in many of the roles that emerge from the international literature. Main barriers to the use of the practice nurse remain including the fact that 76% of general practice funding comes from Medicare fee-for-service items so that use of the practice nurse is largely linked to specific item numbers. The extension of Medicare item numbers would not allow for flexibility in mode of delivery. For example, it would not support alternative service delivery modes such as patient education by phone, or email or support health promotion work. Further efforts to improve quality of care through use of the practice nurse to support patient reminder and recall systems, to monitor care outcomes of patients, to support high quality care planning and so on, are not rewarded, partly because payments, as noted above, relate to service delivery and are unrelated to quality of care or to patient outcomes.

FUTURE OPTIONS

One option explored is providing additional training and greater responsibility for nurses to practice within existing funding systems for salaried nurses in areas of disadvantage and where there are identified workforce shortages. This is a specific solution for a specific reason but does not lead to best practice utilisation of practice nurses more generally but is realistic and feasible for an expansion of community nursing. Basing patient care that is related to the needs of the population where the community or practice nurse can be involved in complex or chronic disease care, health promotion and patient recall will improve health outcomes for the population and maximise the value gained from expenditure on primary care. For instance, single fund holding provides greater flexibility in payments for nurses and will support roles to reflect best practice. It is critical for cost-containment that fee-for-service models for nursing practice are limited and that nurses are retained on appropriate salaries related to their educational preparation and experience.

Community health centres funded as separate entities allow for a multidisciplinary team to practice cohesively and in a coordinated manner with professionals hired on salaries or contracts. This structure has some similarities with the general practices in the UK who hire a mix of appropriate staff to meet the needs of their population in accordance with funding incentives imposed by government. The community health centre model provides a means of meeting the care needs of those with complex conditions or co-morbidities.

It is thought that co-located, complementary service providers enhance the access of patients to best practice care and improve the likelihood of patients, particularly with complex care needs, being managed effectively and efficiently. In general, Australia has tended to move away from the community health centre model, with some recent renewed interest within the context of preventing hospital admissions (for example the GP plus centres being trialled in South Australia). However, the model is limited to a primary care model and is not able to address causal pathways to poor health through the wider determinants of health in which community health programs have a long history.

REMUNERATION OF PRACTICE NURSES

Financing practice nurses on salaries is an alternative to the current tendency to fund nurses through fee-for-service models. A salary provides different incentives and may encourage a greater sense of professionalism, quality of care and autonomy. It is important with regards to quality of care that independent quality assurance measures accompany this strategy. Historically, Australia funds hospital staff by salaries but GPs by fee for service. Other occupational groups such as nurses and allied health professionals are more likely to be salaried particularly when they work within community health centres.

The recent extension of Medicare item numbers for allied health professionals and nurses is a shift away from salaries towards the predominant GP funding model of fee for service which is not known for its ability to contain Medicare expenditure.

ROUND TWO STAKEHOLDER CONSULTATIONS

This section reports on the second round of stakeholder consultations which was focused on responses to the draft policy options presented to stakeholders. Nevertheless, discussion was across a number of policy areas and not necessarily confined to any single policy option. Key themes are summarised as follows:

- Issues of evidence and effectiveness of GP nurses need to be systematically addressed to develop a model of PN work and activity that is most effective for the community and most cost effective
- Some practice nurses are doing basic work (sterilising, reception, patient reminders and recall) while others are doing much more complex work, but there is no framework that clarifies the scope of practice for nurses
- A lack of clarity exists in relation to professional indemnity issues for nurses working in general practices and this is related to the lack of scope of practice frameworks to reduce questions of risk to nurses
- General practitioners need to know what skills and knowledge base they are paying for when they are hiring practice nurses. Standards are needed for practice nurses with training linked into competencies. Linking community nurse career frameworks with career frameworks for practice nurses would increase mobility between the two sub-sectors
- A standardisation of core learning for primary care nursing is required to guide educational programs for primary care and community nursing. Palliative care nursing is trying to standardise care through guidelines – this may be a model for primary care and community nursing practice
- There is need for training standards and quality control mechanisms for practice nurse training and education. However, training should not become fossilised or develop inflexibility. Training should be an incentive rather than a barrier to nurses and GPs moving forward and needs to be available for nurses in all geographical locations
- Strengthened quality assurance is being tied to competencies for a new Antenatal MBS Item (in development) which is a model that could be applied to all MBS items for practice nurses

- Competencies and standards would set boundaries to, and clarify, practice nurses' scope of practice
- Recognised standards and qualification frameworks could be incorporated in the accreditation standards for Divisions of General Practice
- DoHA is providing more funding to Divisions of General Practice for practice nursing from the Education and Training budget training than the whole of the similar training budget in the UK
- Strengthened data collection about practice nurses work related to MBS Item numbers could be picked up by MBS administrative processes
- Community needs, to which nurses could be responding, are not being articulated well in Australia. The key issue is illness prevention. Nurses do well at prevention so it is sensible to focus nurses on this work. Reforming the payment of primary care nurses to salaries, and strengthening the roles of both primary and community care nurses including practice nurses to enable a range of affordable models of prevention would be a major step forward for the health reform agenda in Australia
- The supervision of practice nurses should be provided by nurses but there is currently no standardised quality approach to practice nurse supervision in Divisions of General Practice. There are models developed with networks of general practices where nurses work being supervised by a Practice Development Coordinator (or similar). Divisions could receive targeted funding to employ suitably qualified practice nurse consultants/professional development coordinators in Divisions to provide professional supervision and support for practice nurses. This network model provides checks and balances on what nurses are being asked to do and provide support for quality.

SUMMARY

Developments with regard to the education, careers and funding of practice nursing need to be supported by evidence of the optimal practice nurse role that provides best value and enhanced patient health outcomes. This review has identified that the practice nurse role in Australia could be successfully embedded into the primary care system. However, literature from overseas suggests that policy development is needed to provide evidence of the efficacy and efficiency of this role, to support an education and career framework for the practice nursing profession and to develop an affordable funding model and framework for remuneration based on skill and education level.

POLICY OPTIONS

1. *Develop systematic approaches to collection of data on primary (general practice) and community care activity by nurses, linked to health outcomes and quality of care, to provide evidence of the efficacy and efficiencies of their role in patient care*

Although an increasing number of clinical and organisational activities are being carried out by nurses in primary care, there is no systematic gathering of data that measures what they do and what outcomes they achieve for patients and the settings or practices within which they work. Evidence presented in this review suggests that nurses in primary care and community settings can provide effective health care and that they are particularly effective in enhancing patient knowledge and patient compliance. Gathering stronger data in Australia would contribute to an evidence base about the most effective and efficient use of nurses' time and the most cost effective ways for these nurses to work.

2. *There are no comprehensive programs that train nurses for primary and community care. Funding the profession to standardise core elements of primary and community care, including health promotion and illness prevention, would build on existing competencies to develop nationally consistent standards for primary and community care nursing*

Nurses working in the GP setting receive no mandated training for their role even though competencies have been developed at a national level. No nationally approved core competencies have been developed for nurses working in the community outside the GP setting. Although accredited training is required for specific clinical tasks, training underpinning the competencies framework is lacking. Community nurses and practice nurses would benefit from national standards that ensured core competencies were consistent and supported by relevant training. Higher education institutions, working in collaboration with the profession, are best place to develop and deliver appropriate education and training but without incentives for nurses themselves to undertake higher learning, there are few incentives for universities to invest in such courses. Nurses themselves should be supported to undertake higher education qualifications to strengthen these very important community and practice nursing domains..

3. *Develop a nationally coordinated approach to implementing a career framework for primary and community nurses based on education levels, competencies and skills to support the professionalisation of primary and community nurses and attract and retain nurses into the sectors*

There is currently no career framework for primary and community based nurses and skill levels and scope of practice are not linked either to the needs of patients, or to the needs of the practice. Undergraduate training does not prepare nurses for the primary care setting. A career framework would provide a pathway for nurses to achieve the level of skill appropriate to their need and the needs of the population and practice they serve. It would also help attract younger nurses into primary care and retain the services of nurses who work in the sector.

4. *Reform the model of payment of practice nurses to award rates, while enabling a range of alternative and affordable models of care including prevention. Payment reforms for practice nursing will also ensure that nurses are appropriately rewarded in a manner consistent with the industry*

For efficiency and effectiveness, remuneration is best linked to skill levels and education and the tasks undertaken by nurses at those different skill levels. An emphasis on preventive health care, and funding to support the practice nurse role in this, would strengthen the role of primary care in illness prevention.

5. Divisions of General Practice, the RCNA in conjunction with DoHA develop systems for the management and appropriate supervision of nurses in the general practice setting

There is currently no comprehensive framework for the supervision of nurses working in general practice. As employees, they are supervised by their employing GP, but supervision for professional development and scope of nursing practice is usually absent. A system for providing this supervision by more senior nurses could be developed at a divisional level and support the nurse in her role.

APPENDICES

APPENDIX A: SEARCH STRATEGIES

Table 3: Search strategy for Medline (For four research questions)

1. Primary nursing care.mp. or *Primary Nursing Care/
2. Community health nursing.mp. or *Community Health Nursing/
3. Office nurs\$.mp. or *Office Nursing/
4. (Nurs\$ adj office).tw.
5. (Health adj2 visitor\$).tw.
6. ((District or visiting or Neighbourhood or ambulatory or outpatient or community or practice) adj2 nurs\$).tw.
7. Community based nurs\$.tw.
8. Primary care nurs\$.tw.
9. Primary health care nurs\$.tw.
10. general practice nurs\$.tw.
11. family practice nurs\$.tw.
12. family nurse practice.tw.
13. or/1-12
14. Education nurs\$.mp. or exp Education, Nursing/
15. *Models, Educational/ or Education model\$.mp.
16. ((Instructional or Education\$) adj2 model\$).tw.
17. (model\$ adj2 Education\$).tw.
18. (nurs\$ adj2 education).tw.
19. or/14-18
20. 13 and 19
21. *"Outcome Assessment (Health Care)"/ or Outcome assessment.mp.
22. (outcome\$ adj2 (research or measure\$ or stud\$ or assessment)).tw.
23. patient outcome assessment.tw.
24. outcome assessment\$ patient.tw.
25. ((assessment or Health or Patient) adj2 outcome\$).tw.
26. Quality of life.mp. or *"Quality of Life"/
27. Social support.mp. or *Social Support/
28. Mortality.mp. or exp Mortality/
29. morbidity.mp. or exp Morbidity/
30. or/21-29
31. 13 and 30
32. Government regulation.mp. or *Government Regulation/
33. health policy.mp. or *Health Policy/

34. public policy.mp. or *Public Policy/
35. Health care reform.mp. or *Health Care Reform/
36. National health policy.tw.
37. (Regulatory adj2 (framework or method or strategy or mechanism)).tw.
38. or/32-37
39. 13 and 38

/ = indicates that all subheadings were selected

*= before an index term indicates term was focused

exp= before an index term indicates term was exploded

.tw = indicates term in title or abstract

\$ = truncation symbol to represent a series of letters at the end of a word segment

() = nested terms to be searched together

adj= terms must be close to one another in the record

.mp= text word, keyword in the text of the title, abstract or subject heading fields

MeSH= medical subject headings, Medline's subject descriptors

and/or = Boolean operators "AND" and "OR"

For patient outcomes: (Core terms were combined with search filter for systematic reviews and RCTs and search limited to English articles, publication date 1996 to 2007).For other three research questions: (Search limited to English article and publication date 1975 to 2007)

Table 4: Search strategy for CINAHL database

1. community health nursing.mp. or exp Community Health Nursing/
2. office nursing.mp. or *Office Nursing/
3. nurs\$ office.tw.
4. community based nurs\$.mp.
5. primary health care nurs\$.tw.
6. ((community or practice or district or visiting or neighborhood or ambulatory) adj2 nurs\$).tw.
7. (health adj visitor\$).tw.
8. (nurs\$ adj practice).tw.
9. primary nurs\$ care.tw.
10. community-based nurs\$.tw.
11. primary care nurs\$.tw.
12. general practice nurs\$.tw.
13. family practice nurs\$.tw.
14. Family Nurse Practitioners.mp. or *Family Nurse Practitioners/
15. family nurse practice.tw.
16. *Ambulatory Care Nursing/ or ambulatory nursing care.mp.
17. or/1-16

18. education nursing.mp. or exp Education, Nursing/
19. educational model\$.mp. or *Models, Educational/
20. ((education\$ or instructional) adj2 model\$).tw.
21. ((model\$ or nurs\$) adj2 education\$).tw.
22. or/18-21
23. 17 and 22
24. nursing outcomes.mp. or *Nursing Outcomes/
25. (outcome\$ adj nurs\$).tw.
26. patient outcome.mp. or "Outcomes (Health Care)"/
27. (health adj2 outcome\$).tw.
28. quality of life.mp. or exp "Quality of Life"/
29. social support.mp. or exp Support, Psychosocial/
30. exp MORTALITY/ or mortality.mp.
31. morbidity.mp. or exp MORBIDITY/
32. or/24-31
33. 17 and 32
34. government regulation\$.mp. or *Government Regulations/
35. (regulatory adj2 (strateg\$ or method\$ or framework or mechanism)).tw.
36. public policy.mp. or exp Public Policy/
37. health policy.mp. or exp Health Policy/
38. policy making.mp. or *Policy Making/
39. (policy adj development).tw.
40. health care reform.mp. or *Health Care Reform/
41. national health policy.tw.
42. or/34-41
43. 17 and 42

/ = indicates that all subheadings were selected

*= before an index term indicates term was focused

exp= before an index term indicates term was exploded

.tw = indicates term in title or abstract

\$ = truncation symbol to represent a series of letters at the end of a word segment

() = nested terms to be searched together

adj= terms must be close to one another in the record

.mp= text word, keyword in the text of the title, abstract or subject heading fields

and/or = Boolean operators "AND" and "OR"

Table 5: Search strategy for PsycINFO database

1. primary health care.mp. or exp Primary Health Care/
2. Community Services.mp. or exp Community Services/

3. (community adj health).tw.
4. (community adj based).tw.
5. community-based.tw.
6. (primary adj care).tw.
7. community.tw.
8. neighborhood.tw.
9. Home Visiting Programs.mp. or exp Home Visiting Programs/
10. District.tw.
11. office.tw.
12. practice.tw.
13. or/1-12
14. exp Nursing/ or Nurs\$.mp.
15. nurse\$.mp. or exp Nurses/
16. 14 or 15
17. 13 and 16
18. (ambulatory adj2 (setting\$ or clinic\$)).tw.
19. 16 and 18
20. (ambulatory adj2 nurs\$).tw.
21. ((General or family) adj2 practice\$).tw.
22. 16 and 21
23. 17 or 19 or 20 or 22
24. Nursing education.mp. or exp Nursing Education/
25. educational program.mp. or exp Educational Programs/
26. ((instructional or education\$) adj2 model\$).tw.
27. or/24-26
28. 23 and 27
29. ((patient or health) adj2 outcome\$).tw.
30. quality of life.mp. or exp "Quality of life"/
31. Social suport.mp. or exp social support/
32. or/29-31
33. 23 and 32
34. government policy making.mp. or exp government policy making/
35. (public adj policy).tw.
36. exp health care policy/ or health policy.mp.
37. (regulatory adj2 (strategy or method\$ or framework or mechanism\$)).tw.
38. (government adj regulation).tw.
39. health care reform.mp. or exp health care reform/
40. or/34-39

41. 23 and 40

/ = indicates that all subheadings were selected

*= before an index term indicates term was focused

exp= before an index term indicates term was exploded

.tw = indicates term in title or abstract

\$ = truncation symbol to represent a series of letters at the end of a word segment

() = nested terms to be searched together

adj= terms must be close to one another in the record

.mp= text word, keyword in the text of the title, abstract or subject heading fields

and/or = Boolean operators "AND" and "OR"

Table 6: Search strategy for Embase database (patient health outcomes)

((('primary nursing care'/exp OR 'primary nursing care') OR ('primary nurse') OR ('community health nurse'/exp OR 'community health nurse') OR ('community health nursing'/exp OR 'community health nursing') OR ('office nursing'/exp OR 'office nursing') OR ('health visitor'/exp OR 'health visitor') OR ('practice nurse') OR ('practice nursing') OR ('district nursing'/exp OR 'district nursing') OR ('neighbourhood nursing') OR (general AND practice AND nurs*) OR (((('family'/exp OR 'family') AND practice AND nurs*)) OR (ambulatory AND nurs*) OR (((('family'/exp OR 'family') AND ('nurse'/exp OR 'nurse') AND practice)) OR ((primary AND ('health'/exp OR 'health') AND care AND nurs*)) OR (((('community'/exp OR 'community') AND based AND nurs*)) OR ((visiting AND ('nurse'/exp OR 'nurse')))) OR (nurs* AND office)) AND (((('health'/exp OR 'health') AND outcome*)) OR (((('patient'/exp OR 'patient') AND outcome*)) OR ((quality AND of AND ('life'/exp OR 'life')))) OR (social AND support) OR (nurs* AND outcome*) OR (support AND psychosocial)))

/ = indicates that all subheadings were selected

*= indicates term was expanded

exp= indicates term was exploded

() = nested terms to be searched together

and/or = Boolean operators "AND" and "OR"

APPENDIX B: ELECTRONIC DATABASES SEARCHED

Table 7: Electronic Databases

Databases	Period
Cochrane database of Systematic reviews	4 th Quarter 2006
EBM Reviews: Database of Abstracts of Reviews of Effects (DARE)	4 th Quarter 2006
Health Technology Assessment (HTA) database via Centre for Reviews and Dissemination (CRD) website	February 2, 2007
Medline (Ovid)	1966 to present with daily update
PubMed	January 29, 2007
Embase	February 2, 2007
CINAHL	1982 to February week 3 2007
PsycLIT/ PsycINFO	1967 to January week 5 2007
ISI Web of Science	2007
Maternity and Infant Care	1971 to January 2007
AUSTHealth (Australian Medical index, APAIS-Health, ATSIhealth, Health and Society database, Rural)	February 2, 2007
Organisation websites	
The National Research Register (UK)	22 January 2007
British Nursing Index (unable to access)	February 5, 2007

APPENDIX C: SUMMARIES OF EFFECTIVENESS

Table 8: Summaries of effectiveness of nurse-led care compared to doctor-led care in primary care settings

First Author & year	Study design and health focus	Setting	Patient outcome					Resource use
			Mortality	Quality of life	Compliance	Knowledge	Satisfaction	
Laurant 2004a	Cochrane review (all conditions)	Global	X	√	√	√	√	X
Horrocks 2002	Systematic review (all condition)	UK		X			√	√
Williams 2005	RCT (Incontinence)	UK		√			√	
Lenz 2004	RCT (non emergent medical condition)	USA		X			X	X
Caine 2002	RCT(crossover) (Bronchiectasis)	UK		X	√		√	f
Jarman 2002	RCT (Parkinson's disease)	UK	X	√				X
Whitaker 2001	RCT (Dystonia)	UK					√	X
Van Haastregt 2000	RCT (elderly with mobility impairments)	Netherlands		X				X
Tomson 1998	RCT (Excessive drinkers)	Sweden	X					X

X indicates no difference √ indicates nurse-led care significantly better Shaded cell indicates outcome not reported or assessed
 f Nurse care used more resources

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Table 9: Summaries of effectiveness of nurses working as supplements to usual care in primary care settings

First Author & year*	Study design and health focus	Setting	Patient outcome					Resource Use
			Mortality	Quality of life	Compliance	Knowledge	Satisfaction	
Taylor 2005	Systematic review of RCTs (COPD)	Global	X	X	X	X	X	X
Raftery 2005	RCT (coronary heart disease)	UK	√					X
Schroeder 2005	RCT (uncontrolled hypertension)	UK		X	X			
Edwards 2005	RCT (chronic Venous leg ulcer)	Australia		√ <i>f</i>				
Pilotto 2004	RCT (asthma)	Australia		X				√
Laurant 2004b	RCT (COPD, asthma, dementia, cancer)	Netherlands						X
Griffiths 2004	Cluster RCT (Asthma)	UK		X	X	X		√
Ko 2004.	RCT (Type2 diabetes)	Hong Kong		X		X		
Whittemore 2004	RCT (Type 2 diabetes)	USA			√	√	√	
Jones 2002	RCT (Musculoskeletal pain)	UK		X	√			√
Pugh 2002	RCT (low-income women after birth))	USA			√			√
Hebert 2001	RCT (old people at home and at risk of functional decline)	Canada		X				X
Robertson 2001	RCT (Elderly at home and at risk of fall)	NZ						√
Hunkeler 2000	RCT (depressive disorder or dysthymia)	USA		√	X		√	
Dalby 2000	RCT (Frail elderly in the community)	Canada	X					X
Mann 1998	RCT (Depression)	UK		X				X
Morrell 1998	RCT (Venous leg ulcer)	UK		X			X	X
Mynors-Wallis	RCT (emotional disorder)	UK		X				X

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1997								
Sharp 1996	RCT (breast screening)	UK			X			
Cherkin 1996	RCT (low back pain)	USA		X	X	√	√	X

√ indicates nurse better

X indicates no difference between nurse working as supplements and usual care

f Significant reduction in ulcer size, pain, impact of pain on mood, sleep and normal work in the intervention group.

*Rice & Stead (2004) was not included in the table because the review focused on smoking cessation did not measure all of the relevant patient health outcomes.

*Kendrick et al (2000) study was excluded from the table because the review examined the impact of postnatal home visits on home environment & parenting

Shaded cell indicates the outcome not reported or assessed

APPENDIX D: COSTINGS AND ECONOMIC EVALUATION

Table 10: Examples of simple costing studies and economic evaluations of primary care based nursing interventions

Study	Setting	Intervention	Economic evaluation design	Results	Comment
Costing studies					
Schroeder 2005	General practice, UK	20 minute consultation by the nurse + 10 minute follow up for patients with uncontrolled hypertension to assist with medication adherence	Simple cost comparison of two groups based on length of consultation and cost of professional (nurse or doctor)	<i>Costs:</i> Cost per consultation was £6.60 for nurse intervention compared to £5.08 for standard care. <i>Outcomes:</i> There was no statistically significant difference in medication adherence or blood pressure.	6 month follow up. Nurse intervention not cost-effective. Failed to demonstrate better outcomes but higher cost. Dominated
Pugh, 2002	Hospital and home visits, USA	Daily visits in hospital and supplementary home visits from community health nurse week 1, 2 & 4 following birth to support breastfeeding	Simple costing study comparing two groups. Costs included salary and number and length of contacts, travel costs. Cost of infant formula for the families was also included.	<i>Costs:</i> The intervention cost \$301 per mother (zero for control group). Including the savings on formula for the intervention group net cost was an +\$54 per intervention mother. <i>Outcomes:</i> Breastfeeding rates improved.	It is likely that the intervention would be cost saving in the longer term due to savings in health care usage Dominant ?
Jarman 2002	Primary Care, UK	Nurse counseling education and support for those with Parkinson's disease. Operated in an advisory role to GP rather than autonomous	Comparison of costs between groups including consultations, medication, respite, hospital, social security benefits, home aids and adaptations.	<i>Costs:</i> The costs of health care increased on average by £2658, although significance not established. <i>Outcomes:</i> Patients did not show improvements in clinical disease progression, but reported improved sense of wellbeing	Nurse counseling may have led to some improved outcomes, but at higher cost of care. Cost effectiveness uncertain.
Caine 2002	Specialist Outpatient clinic, UK	Nurse practitioner led outpatient clinic for bronchiectasis	Simple comparison of costs based on cost of consultation between nurse led and doctor led care	<i>Costs:</i> Nurse led care resulted in significantly increased resource use (+ £1498) for one year compared with doctors. <i>Outcomes:</i> Satisfaction and compliance also increased, although clinical parameters were comparable	Specialist clinic may have led to some improved outcomes, but at higher cost of care. Cost effectiveness uncertain.
Whitaker 2001	Hospital Outpatients,	Nurse practitioner	Comparison of costs between groups	<i>Costs:</i> Cost per visit was \$36.90	Home nurse intervention is

	UK	providing home visits for botulinum injections for treatment of dystonia	included costs of the injection, nurses travel costs, consultation/salary costs, and time off work for patient to attend appointment.	(\$306.20 including toxin cost) for the nurse home group compared to \$79.00 (\$323.70 including toxin cost) for the clinic group. <i>Outcomes:</i> Home care was clinically equivalent and patient preferred.	cheaper and at least as effective and therefore Dominant
Economic evaluations					
Williams 2005	Primary Care, UK	Delivery of an 8 week continence program by specially trained nurses	Trial based economic evaluation, based on a sub sample of the trial with complete data - may be a biased sample.	Incremental cost per additional symptom alleviated was £242 at 3 months and £488 pounds at 6 months	Nurse intervention associated with improved outcomes, but at higher cost of care. Cost effectiveness uncertain.
Raftery 2005	General Practice, UK	Nurse led clinics for 1 year in GP to promote medical and lifestyle components of secondary prevention of CHD	Trial based economic evaluation based on quality adjusted survival curves.	Incremental cost per life year gained of £1236, cost per QALY £1097	secondary prevention program Highly cost effective relative to societal norms
Robertson 2001	Community health service, New Zealand	Home based exercise program delivered by district nurse for elderly to prevent falls (1 year)	Trial based economic evaluation. Outcomes were conservatively assumed to only last the length of the trial	NZ\$1803/fall prevented or NZ\$155/fall prevented if including hospital costs averted. Cost saving in those aged 80+	community program delivered in participants homes. Cost effective relative to community norms
Morrell 1998	Community based health clinic, UK	Four layer bandaging for venous leg ulcers provided by nurses in a clinic	Trial based economic evaluation from the perspective of the NHS	Incremental cost of £2.46 per ulcer free week for nurse clinic compared to usual care. Average cost per visit was £29.90 for intervention and £10.60 for the control group	Higher cost for intervention, but well improved outcomes Highly cost effective relative to societal norms

APPENDIX E: SUMMARIES OF INCLUDED STUDIES

Table 11: Effectiveness of nurse-led care versus doctor-led care on health outcomes in primary care settings

	Study 1	Study 2
Full reference (Authors, title, year)	Laurant et al (2004) ^a . Substitution of doctors by nurses in primary care. Cochrane Database of Systematic Reviews, Issue 4	Horrocks et al (2002). Systematic review of whether nurse practitioners working in primary care can provide equivalent care to doctors. BMJ 324:819–23
Objectives	To investigate the impact of nurses working as substitutes for primary care doctors.	To determine whether nurse practitioners can provide care at first point of contact equivalent to doctors in a primary care
Setting (country, research location)	Centre for Quality of Care Research, University of Nijmegen, Netherlands	Bristol, United Kingdom
Study design & level of evidence	Cochrane Systematic Review (Level I evidence)	Systematic review (Level I evidence)
Intervention details	<p>Search strategy: Medline; Cinahl; Bids, Embase; Social Science Citation Index; British Nursing Index; HMIC; EPOC Register; Cochrane Controlled Trial Register, the National Primary Care Research and Development Centre database (1966-2002). Search terms: doctors/primary care physicians; nurses (nurse practitioners, clinical nurse specialists, advanced practice, practice, health visitors); and patients.</p> <p>Inclusion criteria: RCTs, controlled before-and-after-studies and interrupted time series, conducted within primary health care services.</p> <p>Exclusion criteria: Studies where nurses work as supplements, trainee, mental health nurses and accident and emergency department.</p> <p>Data collection and analysis: Two reviewers selected studies and extracted data independently. Meta-analysis and semi-quantitative methods.</p>	<p>Search strategy: Cochrane Controlled Trials Register, Specialist Register of trials, Medline, Embase, CINAHL, Science Citation Index, Database of Abstracts of Reviews of Effectiveness, National Research Register, hand searches, published bibliographies (1966-2001).</p> <p>Inclusion criteria: RCTs` and prospective observational studies where nurses provided first point of contact, made an initial assessment, and managed patients autonomously. Also studies where nurse provided care at first point of contact for unselected patients in primary care.</p> <p>Exclusion criteria: Studies from developing countries</p> <p>Data collection and analysis: Data extraction was independently done. Meta-analyses and data from observational studies combined narratively.</p>
Outcomes measured	Patient outcomes, process of care, resource utilisation and cost.	Patient satisfaction, health status, health service costs, process of care (consultation length, prescriptions, referrals, return consultation).
Summary of main findings	16 studies compared doctors against nurses providing the same care. However, the responsibility of nurse and outcomes assessed varied. Nurse was responsible for: a) First contact and ongoing care for all presenting patients (7 studies): Five studies measured a total of 25 patient outcomes but only two were significantly better with	The review included 11 RCTs and 23 observational studies. Patient satisfaction: Five studies showed that patients were more satisfied with care by a nurse practitioner than doctors (standardised mean diff 0.27; 95%CI 0.07 to 0.47). Three RCTs that reported dichotomous data showed no significant difference between the two (OR 1.56, 95%CI

	<p>nurse-led care. Four studies assessed 12 processes of care outcomes and three were significantly better with nurse-led care. Three studies evaluated 22 outcomes related to resource use and only four showed higher rates for nurses. Two studies evaluated direct costs and both showed no differences.</p> <p>b) First contact care for patients wanting urgent attention (5 studies): Four studies assessed patient outcomes; three process of care; five resource use; and two costs. Patient outcomes were similar for both groups but patient satisfaction was higher with nurse-led care (Standardised mean diff 0.28, 95% CI 0.21-0.34). Nurses provided longer consultations, more information and recalled patients more frequently than doctors. The impact on direct cost of care varied.</p> <p>c) Routine management of patients with chronic conditions (4 studies): The outcomes measured varied and data could not be combined. Overall no significant differences between the two methods of care in patient outcomes, process of care, resource use or cost.</p>	<p>0.56-4.34)</p> <p>Health Status: No differences were found</p> <p>Consultation: Nurse offered longer consultations (mean diff 3.67 minutes, 95% CI 2.05 to 5.29 minutes)</p> <p>Investigations: Nurses made more investigations (OR 1.22, 95%CI 1.02-1.46).</p> <p>Prescriptions, return consultations and referrals: No differences</p> <p>Quality of care: The reported measures were too heterogeneous for meta-analysis. Based on narrative syntheses the quality of care seems better for NP.</p> <p>Cost: Although 5 studies had data on cost they used different methods. Hence economic evaluation was not undertaken.</p>
Comments	<p>Author's concluded based on one powered study, appropriately trained nurses can provide as high quality care as primary care doctors and achieve as good patients health outcomes.</p> <p>Remarks: Focused question with clear inclusion and exclusion criteria. The search strategy was comprehensive and studies were independently assessed for inclusion. Data was independently extracted and the limitations of the review, implications for practice and research were highlighted.</p>	<p>Authors conclude nurse practitioners increased patient satisfaction, consultation period, and made more investigations than doctors. However, the impact on patient outcomes was similar for both.</p> <p>Remarks: Focused research and search strategy comprehensive. Considered unpublished studies. Study selection and validity assessment methods not stated. Significant heterogeneity across some outcomes and meta analysis not appropriate.</p>
	Study 3	Study 4
Full reference (Authors, title, year)	Williams et al (2005). Clinical and cost-effectiveness of a new nurse-led continence service: A randomised controlled trial. Journal: British Journal of General Practice 55 (518): 696-703	Lenz et al (2004). Primary care outcomes in patients treated by nurse practitioners or physicians: two year follow up. Medical Care Research & Review 61(3):332-51s
Objectives	To establish the clinical and cost-effectiveness of a new continence nurse practitioner led service compared with	To compare the outcomes of patients receiving primary care from a nurse practitioner or a physician 2-years following

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	existing care for individuals reporting urinary symptoms	their initial visit to the practice
Setting (country, research location)	Leicestershire and Rutland, United Kingdom	Primary care practices, New York City, USA
Study design & level of evidence	Randomised controlled trial (level II evidence)	Randomised controlled trial (Level II evidence) (phase II)
Intervention details	<p>Participants: 3746 subjects (40 years and over) living in private home</p> <p>Inclusion criteria: Those with self reported symptoms (incontinence, impact on quality of life, nocturia, urgency)</p> <p>Exclusion criteria: Pregnancy, urinary fistula, pelvic malignancy, and those receiving treatment for urinary symptoms.</p> <p>Intervention (n=2958): A specially trained nurse practitioners delivered continence service using pre-determined care pathways for 8-week. The intervention included advice on diet and fluids; bladder training; pelvic floor awareness and lifestyle advice.</p> <p>Control (n=788): Standard care (access to existing primary care including GP and continence advisory services in the area)</p>	<p>Participants: 406 patients from phase one study who received primary care only from the assigned practice and made at least one follow up visit to the practice during 2 years following the initial visit.</p> <p>stayed Those recruited from emergency room and urgent care centre</p> <p>Inclusion criteria: Those presenting with non-emergent medical condition and without a regular primary care provider.</p> <p>Exclusion Criteria: Not stated</p> <p>Intervention (n=222): Patients assigned to primary care follow-up at clinic run by a nurse practitioner</p> <p>Control (n=184): Patients assigned to a primary care follow-up at one of five clinics run by physicians</p>
Outcomes measured	Improvements in urinary symptoms, quality of life, problem, cost effectiveness and satisfaction with service (at baseline, 3 and 6 months)	Health status, disease-specific physiologic measures, satisfaction or use of specialist, emergency room or inpatient services.
Summary of main findings	<p>Symptoms: At 3 months 59% and 48% of the intervention and control groups, respectively reported improvement in at least one symptom (diff of 11%, 95%CI 7 - 16; p<0.001). Equally 25% and 15% of the patients in the intervention and control groups, respectively reported no symptoms or cured (diff 10%, 95%CI 6 - 13, p=0.001). The difference was maintained at 6 months</p> <p>Quality of life: At 3 months 74% and 68% of the intervention and control groups, respectively reported no or mild problem (diff 6%, 95%CI 2-10, p=0.003). This difference was also observed at 6 months</p> <p>Satisfaction: At 3 months 52% and 45% in the intervention</p>	<p>In phase one study, 1316 patients participated. Two years later, 1140 patients were eligible for phase two study but 405 subjects were lost to follow-up. The remaining 735 subjects were interviewed and only 406 of them returned to their assigned original practice for care after the initial visit (phase one).</p> <p>Self-reported health status: No differences at two years</p> <p>Disease-specific physiologic measures: No differences between groups in hypertension, diabetes or asthma</p> <p>Satisfaction with care: No differences in the overall satisfaction</p> <p>Health services use: No differences on their use of</p>

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	and control groups, respectively reported satisfaction with current urinary symptoms for the rest of their life (diff 7%, 95% CI 3-1, p=0.001). Cost-effectiveness: An incremental cost per additional symptom alleviated at 3 and 6 months was £242 and £488 pounds, respectively.	specialist, emergency room or inpatient hospital services. However, nurse-led patients had less primary care visits than physician patients (1.76 vs 2.50 visits, p=0.02) during the 2 nd year.
Comments	Authors believed that the continence nurse practitioner-led intervention had significant impact on symptoms of incontinence, frequency, urgency and nocturia. Remarks: Subject eligibility criteria and outcome assessment were based on self-report. Patients and the interviewer were not blinded and the follow-up period (6 months) was short to detect long-term clinical effects.	The authors believe that the quality of primary care delivered by nurse practitioners is equivalent to that by physicians. Remarks: A two year follow-up study and data analysis was confined to patients returning and using services from their allocated centres. The potential bias is excluding patients who did not receive care from their assigned centre from data analysis. An intention to treat analysis should have been used.
	Study 5	Study 6
Full reference (Authors, title, year)	Caine et al. (2002). A randomised controlled crossover trial of nurse practitioner versus doctor-led outpatient care in a bronchiectasis clinic. Health Technology Assessment (Winchester, England) 6 (27): 1-71.	Jarman et al (2002). Effects of community based nurses specialising in Parkinson's disease on health outcome and costs: randomised controlled trial. BMJ 324 (7345):1072-5
Objectives	To assess the feasibility and safety of nurse practitioner-led outpatient clinics and their acceptability to patients and their doctors; and to compare the cost-effectiveness of nurse practitioner-led with a doctor-led care.	To test the null hypothesis that there would be no difference in health outcomes or in net health care costs between patients who received community based care from a nurse specialist and standard care from general practitioner.
Setting (country, research location)	Papworth Hospital, a specialist outpatient clinic (Cambridge, United Kingdom)	438 general practices in nine randomly selected health authority, England
Study design & level of evidence	Randomised controlled trial of crossover (Level II evidence)	Randomised controlled trial (level II evidence).
Intervention details	Participants: 80 adult patients with bronchiectasis Inclusion criteria: Over 18 years of age with moderate or severe bronchiectasis confirmed by high-resolution computed tomography scans. Exclusion criteria: life expectancy of less than 2 years, those	Participants: 1859 patients with Parkinson's disease identified by general practices (23 patients died during recruitment) Inclusion criteria: Those taking one or more antiparkinsonian drugs.

	<p>needing transplantation within 2 years, FEV1 less than 30% of predicted, other pathology likely to modify management of bronchiectasis.</p> <p>Interventions: Two phases. Six months training of nurse practitioner and a randomised controlled trial of crossover. Eighty patients were randomised to nurse practitioner-led care (n=39) for 1-year or 1-year of doctor-led care (n=41). The two groups then crossed over to receive the alternate mode of care for another 1-year.</p>	<p>Exclusion criteria: Patients aged 17 years or less, with severe mental illness or cognitive impairment unable to give valid informed consent.</p> <p>Intervention (n=1028): Nurse counselling and education (patients and carers), information on drugs, monitoring clinical wellbeing, treatment response, instigating respite and day hospital care, assess social security benefit entitlement, liaise with local primary care team for ongoing care.</p> <p>Control (n=808): Standard care from general practitioner</p>
Outcomes measured	Lung function (measured by FEV ₁), walking distance, health-related quality of life, nurse practitioner autonomy, patient and general practitioner satisfaction with communications and care, compliance with treatment and resource use.	Survival, stand-up test, dot in square test, bone fracture, global health question, PDQ-39, Euroqol, health care costs. Outcomes assessed after two years of intervention.
Summary of main findings	<p>FEV₁: At the end of follow-up, the mean difference in FEV₁ between the two groups was not statistically different (p = 0.83).</p> <p>Walking distance: The mean difference in 12-minute-walk distance between the two methods of care was not different (p = 0.30).</p> <p>Infective exacerbation: No significant differences between methods.</p> <p>Compliance with medication: More patients receiving nurse care were compliant (100% vs. 81%, p =0.024).</p> <p>Quality of life: No significant differences.</p> <p>Hospital admission: 42 during doctor-led care and 66 during nurse-led care (a relative rate of 1.52, 95%CI 1.03-2.23, p=0.03)</p> <p>Patient satisfaction: More patients in nurse-led care were satisfied than doctor-led, mainly with communication and time spent with the patient.</p> <p>Resource use: Nurse-led care resulted in significantly more resource use than doctor [mean diff per patient £1498 (95% CI, 688-2674; p < 0.001).</p>	<p>Mortality: No differences between the two groups.</p> <p>Disease severity: No differences in the stand-up test and dot in square score.</p> <p>Bone fracture: No differences between the groups</p> <p>Quality of life: No differences in PDQ-39 or Euroqol questionnaires. However scores on the global health question significantly better in the nurse group (diff -0.23, 95%CI -0.4 to -0.06).</p> <p>Costs: Direct costs of health care increased by an average of £2658 during the study, but the difference in mean increase was not different.</p> <p>Medical treatment: No differences in daily dose of levodopa, use of anticholinergics, dopamine agonists, or apomorphine.</p>
Comments	The authors argue that nurse-led care for patients with stable chronic disease is safe and as effective as doctor-led care. They also noted better patient compliance (antibiotic therapy) and	<p>Authors concluded no significant difference in patient health outcome between the two groups.</p> <p>Remarks: Well-designed study and randomisation was</p>

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	satisfaction with nurse-led care but with significant additional resource use. Remarks: Well designed study with clear research question.	controlled centrally. The study was powered and used appropriate statistical test. Authors also acknowledged the strength and limitations of their study.
	Study 7	Study 8
Full reference (Authors, title, year)	Whitaker et al (2001). Botulinum toxin for people with dystonia treated by an outreach nurse practitioner: a comparative study between a home and a clinic treatment service. Archives of physical medicine and rehabilitation 82 (4): 480-4.	van Haastregt et al (2000). Effects of a program of multifactorial home visits on falls and mobility impairments in elderly people at risk: randomised controlled trial. BMJ. 321(7267):994-8
Objectives	To study whether a trained outreach nurse practitioner could provide a service that is as good as, or better than, that provided at a hospital outpatient clinic for people who had been diagnosed with dystonia and required treatment with botulinum toxin.	To evaluate whether a program of multifactorial home visits reduces falls and impairments in mobility in elderly people living in the community.
Setting (country, research location)	The movement disorder clinic at Hunters Moor Regional Neuro-rehabilitation center and patients' homes in Northern England.	Six general practices in Hoensbroek, the Netherlands.
Study design & level of evidence	Randomised controlled trial (level II evidence)	Randomised controlled trial (level II evidence)
Intervention details	Participants: 89 patients with a clinical diagnosis of dystonia. Inclusion criteria: Those with 1) definitive clinical diagnosis of spasmodic torticollis; blepharospasm; hemifacial spasm; or other segmental dystonia, hemi dystonia, or generalised dystonia; 2) treatment of dystonia with botulinum toxin injections on at least 2 preceding occasions with a clinical need for such injections to continue; and 3) willing to give fully informed consent. Exclusion criteria: 1) Inability to travel on a regular basis to the outpatient clinic during the study; 2) Pregnancy or child ; 3) Psychiatric or other psychologic problems; 4) Known allergy to botulinum toxin; 5) Past serious side effects or other reaction to botulinum toxin; 6) Complex or variable dystonic movement disorder that required variation in muscles injected with botulinum or in other treatments. Intervention (n=45): Ongoing botulinum injections at home by the nurse practitioner	Participants: 316 elderly with mobility impairments or history of falls. Inclusion criteria: Subjects 70 years or older, living in the community, reported two or more falls in the last 6 months or scored 3 or more on mobility scale of sickness impact profile Exclusion criteria: Bed ridden, fully dependent on wheelchair, terminally ill, on waiting list for nursing home admission, or receiving regular home care from community nurse. Intervention (n=159): Five home visits by community nurse over one year. Home visits consisted of screening for medical, environmental, and behavioural factors causing falls and impairments in mobility, specific advice, referrals, and other actions to address observed hazards. Control (n=157): No home visits or other intervention on fall prevention and impairments in mobility. Patient received

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	Control/clinic group (n=44): Hospital outpatient clinic attendance and injection by medical staff.	usual care from doctors and other health care staff.
Outcomes measured	Demographic profiles, dosage of botulinum toxin, treatment interval, side effects, external referrals, and qualitative opinion.	Falls and impairments in mobility (follow up 18 months)
Summary of main findings	<p>Efficacy of injection: Similar between groups, indicating the nurse practitioner was as effective as medical staff. However, the interval between the time that the injection effect wore off and the time of re-injection was lower in the intervention group (1.5 week) compared with the clinic group (3.8wk).</p> <p>Dosage: Similar in both groups</p> <p>Side effects: Significantly less dysphagia in the intervention group than in the clinic groups (7 vs 24, p<0.018)</p> <p>External referrals: There was a trend that the nurse practitioner made more external referrals than the clinic based medical staff.</p> <p>Opinion of service/satisfaction: Patients indicated statistically significant preference for home injections than clinic injection</p> <p>Cost: No significant difference in the overall cost of treatment</p>	<p>Falls: No difference in number of falls, injurious fall, or falls resulting in medical care.</p> <p>Mobility: No differences between the two groups in any of the mobility outcomes</p>
Comments	<p>The authors believe a trained outreach nurse practitioner can provide an effective, more flexible, safe and cost effective service for patients with dystonia.</p> <p>Remarks: The two groups were comparable at baseline, the randomisation method was stated but one of the assessors was not blinded to the treatment group. The study was not powered. Although patient follow-up was for 18 months, some of the subjects who entered into the study late were followed for 12 months.</p>	<p>Authors argue that the multifactorial preventive home visits had no effects on falls or mobility in elderly people at risk living in the community.</p> <p>Remarks: the study was powered however, the allocation concealment was unclear and 81 of 316 (26%) subjects dropped out during 18 months of follow up.</p>
Study 9		
Full reference (Authors, title, year)	Tomson et al (1998). Excessive drinking--brief intervention by a primary health care nurse. A randomised controlled trial. Scand J Prim Health Care 16 (3):188-92	
Objectives	To evaluate the effect of a nurse-conducted brief intervention on excessive drinkers at a health centre.	
Setting (country, research)	Catchment area of Varby Health Centre, Stockholm suburb, Sweden	

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location)	
Study design & level of evidence	Randomised controlled trial (level II evidence)
Intervention details	<p>Participants: 222 excessive drinkers</p> <p>Inclusion criteria: Subjects with gamma-glutamyl transferase (GGT) greater than 0.9 μkat/l.</p> <p>Exclusion criteria: Subjects with a diagnosis of chronic alcoholism</p> <p>Intervention (n=100): Three primary health care nurse consultations on lifestyle and alcohol consumption</p> <p>Control (n=122): One meeting with a general practitioner</p>
Outcomes measured	GGT, self-reported alcohol consumption (g/week), sickness allowance and use of health care. (assessed after one year of intervention).
Summary of main findings	<p>GGT: Mean GGT decreased from 1.52 to 1.21 μkat/l ($p = 0.02$) in the intervention group but increased in the control group (1.75 to 2.16 μkat/l.)</p> <p>Alcohol use: Although the mean weekly alcohol consumption in the intervention group decreased significantly (337 to 228 g/week, $p = 0.02$) and increased in the control group, the difference between the groups was not significant.</p> <p>Mortality: Three deaths in the control group and one in the intervention group.</p> <p>Sickness allowance and social services records: No significance difference ($p=0.62$). Sick days: No significant differences. Health Centre consultations and hospital days: Not different</p>
Comments	<p>Authors believe the intervention had an impact on GGT and alcohol consumption.</p> <p>Remarks: The authors didn't state the randomisation method and the allocation concealment was unclear. Assessment of alcohol consumption was based on self-report and the controls were also getting some intervention from GP, because they had an appointment.</p>

Table 12: Effectiveness of nurses working as supplements to usual care on health outcomes in primary care settings

	Study 1	Study 2
Full reference (Authors, title, year)	Taylor et al (2005). Effectiveness of innovations in nurse led chronic disease management for patients with chronic obstructive pulmonary disease: Systematic review of evidence. <i>BMJ</i> 331:485	Rice VH and Stead LF (2004). Nursing interventions for smoking cessation. <i>Cochrane Database of Systematic Reviews</i> Issue 1
Objectives	To determine the effectiveness of nurse-led management intervention for patients with chronic obstructive pulmonary disease (COPD).	To determine the effectiveness of nursing-delivered interventions on smoking behaviour in adults.
Setting (country, research location)	United Kingdom and the Netherlands	College of Nursing, Wayne State University, Detroit, Michigan, USA
Study design & level of evidence	Systematic review (Level I evidence)	Cochrane systematic review (Level I evidence)
Intervention details	<p>Intervention: Chronic disease management led, coordinated or delivered by nurses</p> <p>Search strategy: 16 electronic databases, English or Dutch language studies (1980-2005), hand searched conference proceedings and unpublished trials.</p> <p>Selection criteria: Randomised controlled trial of inpatient, outpatient, and community based interventions for COPD management</p> <p>Exclusion criteria: Studies evaluating drugs, hospital at home, early discharge plan for acute exacerbations, educational interventions for providers, or with fewer COPD patients.</p> <p>Data collection and analysis: Two reviewers independently screened citations and full text of all eligible studies. Data extraction and quality assessment by one author and checked by another. Conducted meta-analysis when feasible.</p>	<p>Intervention: Nursing intervention consisting of advice, counselling, and /or strategies to help smokers aged 18 years and older to quit.</p> <p>Search strategy: The Cochrane Tobacco Addiction Group specialised register, and CINAHL (1983-June 2003). Search terms included nurse, nursing health visitor, smoking cessation, and randomised controlled trial.</p> <p>Selection criteria: Trials of smoking cessation interventions by nurses or health visitors with at least 6-months follow-up, two treatment arms and random allocation to treatment arms.</p> <p>Exclusion criteria: Trials using historical controls and without data on smoking cessation rates.</p> <p>Data collection and analysis: Two authors extracted data independently and assessed the methodological qualities of the included studies. Meta-analysis was performed</p>
Outcomes measured	Survival, health care resource use, daily life activities, quality of life (patients and carers), care satisfaction, knowledge, pulmonary function, and social support.	Smoking cessation
Summary of main findings	Nine RCTs were assessed and most of them had methodological weaknesses. Intervention: Varied from a brief (one month), long (a	Twenty-nine studies were included in the review. Quitting: 20 studies that compared usual care (or control) to nursing intervention showed the intervention significantly

	<p>year) or more intensive intervention. Two studies that assessed brief interventions showed no benefit.</p> <p>Mortality: No differences at 9-12 months' follow-up.</p> <p>Quality of life: At 12 months follow-up, the long term interventions didn't improve patients' quality of life, psychological well-being, disability, or pulmonary function.</p> <p>Readmissions: No differences.</p> <p>Patient satisfaction: No difference</p> <p>Self-management skills: No difference</p> <p>Compliance/ adherence with treatment: no difference</p> <p>Smoking cessation and effect on carers: Little or no evidence of benefit was associated with the intervention.</p>	<p>increased the odds of quitting (Peto Odds Ratio 1.47, 95% CI 1.29 to 1.68), however there was heterogeneity among the study results.</p> <p>Hospital: Limited evidence that interventions were more effective for hospital inpatients with cardiovascular disease than for inpatients with other conditions.</p> <p>Non-hospitalised patients: The interventions in 11 trials showed evidence of benefit in non-hospitalised patients (Odd Ratio 1.90, 95%CI 1.48-2.43).</p> <p>Nurse-delivered: Five studies that compared different nurse-delivered interventions showed no significant benefits. Five studies in general practice setting showed the nurse intervention had less effect.</p>
Comments	<p>The authors concluded that there is little evidence to support a large-scale implementation of nurse led management interventions for COPD patients.</p> <p>Remarks: A well-conducted review with clear and focused question. The search strategy was comprehensive, the methodological qualities of the included studies were assessed and authors acknowledged the strengths and limitations of their review.</p>	<p>The authors concluded that nurse intervention has benefits and can be effective to assist smokers to quit.</p> <p>Remarks: Cochrane review with clear and focused research question. The methodology was rigorous and the conclusion followed from the results of the review. Authors acknowledged the strengths and limitations of their review.</p>
	Study 3	Study 4
Full reference (Authors, title, year)	Kendrick, et al. (2000). Does home visiting improve parenting and the quality of the home environment? A systematic review and meta analysis. Archives of Disease in Childhood 82(6): 443-451.	Raftery et al. (2005). Cost-effectiveness of nurse-led secondary prevention clinics for coronary heart disease in primary care: Follow up of a randomised controlled trial. BMJ 330(7493): 707-10.
Objectives	To evaluate the effectiveness of home visiting programs on a range of maternal and child health outcomes.	To establish the cost-effectiveness of nurse led secondary prevention clinics for coronary heart disease based on four years' follow up of a randomised controlled trial
Setting (country, research location)	Nottingham, United Kingdom	19 General Practices in Northeast Scotland, United Kingdom
Study design & level of evidence	Systematic review of the literature (Level I evidence)	Randomised Controlled Trial (Cost effectiveness analysis) (Level II Evidence)
Intervention details	Intervention: Home visiting programs with at least one	Participants: 1343 patients with coronary heart disease

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	<p>postnatal visit. Search strategy: Medline (1966-1996), CINAHL (1982-1996), Embase (1980-1996), Cochrane library, hand search (health visitor journal-1982 to 1997), and reference lists. Search terms included clinical trials, RCTs, comparative, evaluative, follow up, prospective, community health nursing, health visitor, home or domiciliary visit, effectiveness, and outcome. Inclusion criteria: RCTs or quasi-experimental studies including a control group evaluating a home visiting program with at least one postnatal home visit. Exclusion criteria: Studies not reporting outcomes relevant to British health visiting Data extraction and Analysis: Not clear how many of the reviewers were involved in data extraction. Study quality was assessed by three of the authors. Meta-analysis (Fisher's method) was conducted.</p>	<p>Inclusion criteria: Subjects aged <80 years with diagnosis of coronary heart disease Exclusion criteria: Those with terminal illness, dementia, and inability to leave home Intervention (n=673): Nurse led clinics at general practice to promote medical and lifestyle components of secondary prevention for one year. Control (n=670): Usual care</p>
Outcomes measured	Quality of the home environment, parent-child interaction, attitudes towards child and child rearing practices	Costs of clinics; health service cost; and cost per life year and per quality adjusted life year (QALY) gained, expressed as incremental gain
Summary of main findings	<p>Thirty-four studies reported the relevant outcomes. Of the 34 studies, 17 reported Home Observation for Measurement of the Environment (HOME) scores, 27 reported other measures of parenting, and 10 reported both outcomes.</p> <p>Effect on Home score: There was a significant effect of home visiting in improving the quality of the home environment based on HOME score ($\chi^2=126.9$, 28 df, $p<0.001$). Most of the studies reporting other measures of parenting also found significant treatment effects of the intervention on a range of measures.</p>	<p>Costs to primary care: Based on 1998/9 prices, the direct cost of intervention (clinics and drugs) was significantly higher in the intervention group (diff £136, intervention £1015, control £879; $p<0.001$).</p> <p>Other NHS costs per patient: Lower for the intervention group but not significantly different from control group.</p> <p>Mortality: Over 4-year period 100 deaths (out of 673) in the control group and 128 deaths (out of 670) in the intervention group. Thus the intervention group had 28 fewer deaths, leading to a gain in mean life years per patient of 0.110 (0.124 QALYs) in intervention group.</p> <p>Cost effectiveness: Incremental cost per life year gained of £1236 and cost per QALY of £1097.</p>
Comments	The reviewers concluded that home visiting programs were associated with improvement in the quality of the home environment, but the results cannot be generalised to the UK health visiting practice.	<p>The authors believe nurse led clinics for the secondary prevention of coronary heart disease in primary care seem to be cost effective.</p> <p>Remarks: This study follows from two other studies previously</p>

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	Remarks: Only one of the reviewers examined all of the retrieved studies against inclusion criteria and for relevance. It was unclear how many of the reviewers' extracted data from the primary studies.	published by the same authors. The strengths of the study are: long patient follow up, data analysis by intention to treat and authors conducted sensitivity analysis.
	Study 5	Study 6
Full reference (Authors, title, year)	Schroeder et al (2005). Nurse-led adherence support in hypertension: a randomised controlled trial. Family Practice. 22(2):144-51	Edwards et al (2005). Chronic venous leg ulcers: effect of a community nursing intervention on pain and healing. Nursing standard 19 (52): 47-54.
Objectives	To evaluate the effectiveness and cost-effectiveness of nurse-led support intervention to increase adherence to medication and reduce blood pressure in uncontrolled hypertensive people.	To investigate the effectiveness of a new community nursing model of care for clients with chronic leg ulcers
Setting (country, research location)	21 general practices in Bristol, United Kingdom	St Luke's Nursing Service, South Brisbane and Gold Coast region, Queensland, Australia
Study design & level of evidence	Randomised Controlled Trial (level II evidence)	Randomised controlled trial (Level II evidence)
Intervention details	<p>Participants: 245 women and men with uncontrolled hypertension.</p> <p>Inclusion criteria: Patients with hypertension with blood pressure \geq or $=$ 150/90 mmHg in the past six months. Exclusion Criteria: Subjects who failed to control their medication intake, with secondary hypertension, severe dementia, or recent bereavement.</p> <p>Intervention (n=128): Practice nurse-led 20 minutes adherence support and a 10 minutes reinforcement session after two months. The intervention group also received usual care.</p> <p>Control (n=117): Standard care at their practices.</p>	<p>Participants: 56 subjects with chronic venous leg ulcers referred for care.</p> <p>Inclusion criteria: Patients with a venous leg ulcer and an ankle brachial pressure index (ABPI) >0.8 and <1.3 Exclusion Criteria: Those with diabetes, ulcers of non-venous aetiology, or too immobile to be transported to the leg club. Intervention (n=28): Treatment from community nurses at a leg club during a weekly visit. Intervention included comprehensive health assessment, treatment, advice, support, follow up management, preventive care, peer support, social interaction and goal setting Control (n=28): Standard treatment at home from community nurses, including a comprehensive health assessment, venous ulcer treatment; advice, support and follow-up management and preventive care</p>
Outcomes measured	Adherence to medication ('timing compliance') and blood pressure.	Improvements in pain and ulcer healing at 12 weeks
Summary of main	Medication adherence:	Levels of pain: The intervention group had significant reduction

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findings	<p>a) Timing compliance: No difference between the groups at six months.</p> <p>b) Correct dosing and taking compliance: No difference</p> <p>Blood pressure: No difference at six months</p> <p>Cost: Projected costs for the primary care per consultation (based on 20 minutes duration) were £6.60 and £5.08 for the nurse intervention and control group, respectively.</p>	<p>in pain levels across several items by 12 weeks Mean (SD) pain: Intervention 3.09 (1.38), control 3.29 (1.52); p=0.001.</p> <p>Impact of pain on mood: Intervention 1.65 (0.89), control 2.05 (1.12), p=0.004.</p> <p>Impact of pain on sleep: Intervention 1.80(1.04), control 2.43(1.34), p=0.003.</p> <p>Impact of pain on normal work: Intervention 2.04(1.17), control 2.48(1.41), p=0.026</p> <p>Healing: A significant reduction in ulcer size for the intervention group (2.39cm²) compared to control group (6.8cm²) (p=0.004) .</p>
Comments	<p>Authors conclude no evidence of effectiveness of nurse intervention on medication adherence or blood pressure. The intervention was also judged to be more expensive for primary care setting.</p> <p>Remarks: Focused research question and outcome measures. The study was powered, randomisation method was stated and nurses were blinded. However, patient follow up period (6 months) was short to evaluate the long term benefits of the intervention.</p>	<p>Authors conclude the model of care intervention for patients with chronic venous leg ulcers promotes ulcer healing and decreased levels of pain.</p> <p>Remarks: The study was focused with clear outcome measures. Study was powered and computer randomisation was used to allocate subjects to treatment groups. The appropriate statistical tests were used to analyze data.</p>
	Study 7	Study 8
Full reference (Authors, title, year)	Pilotto et al (2004). Trial of nurse-run asthma clinics based in general practice versus usual medical care. <i>Respirology</i> 9(3):356-62	Laurant et al. (2004)b Impact of nurse practitioners on workload of general practitioners: randomised controlled trial <i>BMJ</i> 328 (7445):927 April 17
Objectives	To assess the ability of nurse-run asthma clinics in general practice compared with usual medical care to produce at least a moderate improvement in the quality of life of adults with asthma.	To examine the impact on general practitioners' workload of adding nurse practitioners to the general practice team.
Setting (country, research location)	11 General practices, Adelaide, Australia	34 General Practices in a Southern Region of the Netherlands
Study design & level of evidence	Randomised controlled trial (level II evidence)	Randomised controlled trial (Level II evidence)
Intervention details	Participants: 170 patients with asthma at 11 general practices Inclusion criteria: Patients aged 18years and older who	Participants: General practitioners organised into local groups Inclusion criteria: As above Exclusion criteria: Not specified

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	<p>attended participating general practices for asthma care within the previous 9 months. Exclusion Criteria: Not stated Intervention: Six general practices (received a nurse-run asthma clinic) with a total of 80 patients. Two trained respiratory nurses conducted the asthma clinics and followed patients (primary care nurse) Control: Six general practices provided usual medical care without asthma clinic (90 patients)</p>	<p>Intervention: Five nurse practitioners working with four local groups of 30 general practitioners in 20 practices Control: Three local groups of 18 general practitioners in 14 practices without nurse practitioners</p>
Outcomes measured	Quality-of-life, lung function, health services utilisation	Objective workload over 28 days (the number of contacts per day for COPD or asthma, dementia, cancer, by type of consultation (in practice, telephone, home visit), and by time of day (surgery hours, out of hours). Outcomes measured six months before and 18 months after intervention.
Summary of main findings	<p>Quality of life: No significant differences between the two groups in mean change in quality of life or quality of life components (activity, impact and symptoms). Lung function: No clinically significant differences between the groups.</p> <p>Health service use: The intervention group were more likely to attend hospital outpatient for their asthma (control 0% v intervention 8.5%, $p=0.009$) but were less likely to take time off work (control 21% v intervention 0%, $p=0.004$)</p>	<p>Contacts: The number of contacts during surgery hours increased significantly in the intervention group compared with the control group for COPD or asthma patients ($p < 0.006$).</p> <p>Consultation: No significant differences in the number of consultations out of hours between the two groups. The intervention group experienced a greater increase in the number of practice based consultations than control group ($p=0.003$)</p> <p>Subjective workload: the change from baseline to follow up was not significantly different between the two groups.</p>
Comments	<p>Authors concluded that general practice based nurse-run asthma clinics and usual medical care were similar in their impact on quality of life and lung function. Remarks: No information was provided on allocation concealment and blinding of assessors. Follow up period was also short (6-9 months) and 10% of the patients failed to complete the study.</p>	<p>Authors concluded that addition of nurse practitioners to general practice teams didn't reduce the workload of general practitioners in the short term. Remarks: Power calculation was done and authors used a validated tool to assess subjective workload. The unit of analysis was general practitioners and the appropriate statistics tests were used.</p>
	Study 9	Study 10
Full reference (Authors, title, year)	Griffiths et al (2004). Specialist nurse intervention to reduce unscheduled asthma care in a deprived multiethnic area: the east London randomised controlled	Ko et al. (2004). Effects of a structured health education program by a diabetic education nurse on cardiovascular risk factors in Chinese Type 2 diabetic patients: A 1-year

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	trial for high-risk asthma (ELECTRA). BMJ 328(7432):144.	prospective randomised study. Diabetic Medicine 21(12): 1274-79.
Objectives	To determine whether asthma specialist nurses, using a liaison model of care, reduce unscheduled care in a deprived multiethnic area.	To assess the effect of regular diabetic health education on cardiovascular risk factors in Chinese Type 2 diabetic patients
Setting (country, research location)	44 General Practices in two boroughs in East London, United Kingdom	Three Regional Diabetic Centres, Hong Kong
Study design & level of evidence	Cluster randomised controlled trial (Level II evidence)	Randomised controlled study (Level II evidence)
Intervention details	<p>Participants: 324 subjects with asthma</p> <p>Inclusion criteria: Patients with physician diagnosed asthma, aged 4 - 60 years, and were admitted or attended emergency department or general practitioner after hours service for acute asthma.</p> <p>Exclusion criteria: Not stated clearly.</p> <p>Intervention (22 practices with 175 patients): Patient review in a nurse led clinic and liaison with general practitioners and practice nurses comprising educational outreach, promotion of guidelines for high risk asthma, and ongoing clinical support.</p> <p>Control (22 practices with 149 patients): Control practices received a single nurse visit to promote standard asthma guidelines and to check inhaler technique.</p>	<p>Participants: 180 Chinese with type 2 diabetes and with or without past history of Cardiovascular Disease.</p> <p>Inclusion criteria: Subjects aged 35 to 70 years with poor glycaemic control irrespective of anti-diabetic, anti-hypertensive or lipid lowering medication regimens.</p> <p>Exclusion criteria: Not stated</p> <p>Intervention (n=90): Usual medical care by physicians and structured health education program by a trained diabetic education nurse after doctors' consultations every 3 months</p> <p>Control (n= 90): Received usual medical care without nursing reinforcement</p>
Outcomes measured	Attendance and time for first attendance for unscheduled asthma care, self-management behaviour and quality of life in the year after intervention.	Fasting plasma glucose, HbA1c, body mass index, waist circumference, blood pressure and lipid profiles (assessed before the study and 1 year later).
Summary of main findings	<p>Unscheduled asthma care: At one year the nurse intervention delayed time to first attendance for unscheduled asthma care (hazard ratio for re-attendance 0.73, 95% CI 0.54 - 1.00; median 194 days v 126 days) and fewer patients from the intervention group attended for unscheduled asthma care [58% intervention 68% control; adjusted odds ratio 0.61, 95%CI 0.38-0.99).</p> <p>Hospital admission, attendance (accident & emergency</p>	<p>Waist circumference: The percentage change in waist circumference was significantly better in the intervention than control group for both men and women [intervention (women) =-1.4, control (women)=0.6; p=0.012], [intervention (men)=-1.9, control (men)=0.4, p=0.017).</p> <p>Other cardiovascular risk factors: The change was not significantly different between the two groups.</p>

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	<p>or general practice): No difference between the two groups</p> <p>Overall rates of yearly attendance for unscheduled care: 1.98 and 2.36 per participants for intervention and control group, respectively (adjusted incidence rate ratio 0.91, 95%CI 0.66-1.26)</p> <p>Self management behaviour, quality of life and symptoms: No difference</p> <p>Oral rescue corticosteroids use: No difference</p>	Medication: Similar between the two groups
Comments	<p>According to the authors asthma specialist nurses using a liaison model of care reduced unscheduled care for asthma in a deprived multiethnic health district.</p> <p>Remarks: The two groups were similar at baseline and follow up was good (98%). Sample size calculation was performed prior to the study however it wasn't powered to detect differences in intervention effect between ethnic groups.</p>	<p>Authors believe that diabetic health education can help to control some of the cardiovascular risk factors in Chinese Type 2 diabetic patients.</p> <p>Remarks: The study was powered and the two groups were similar at baseline. Randomisation method was by coin-tossing and not clear if allocation was concealed.</p>
	Study 11	Study 12
Full reference (Authors, title, year)	Whittemore et al (2004). A nurse-coaching intervention for women with type 2 diabetes. <i>Diabetes Educator</i> 30(5): 795-804.	Jones et al (2002). A nurse-delivered advice intervention can reduce chronic non-steroidal anti-inflammatory drug use in general practice: a randomised controlled trial. <i>Rheumatology</i> 41(1): 14-21
Objectives	To determine the efficacy of a 6-month nurse-coaching intervention that was provided after diabetes education for women with type 2 diabetes.	To find out whether a nurse-delivered educational package can reduce chronic oral non-steroidal anti-inflammatory drug (NSAID) usage in general practice.
Setting (country, research location)	Outpatient Diabetes Education Centre, North Eastern Connecticut, USA	Five general practices in Nottinghamshire, United Kingdom
Study design & level of evidence	Randomised clinical trial (level II evidence)	Randomised controlled trial (Level II evidence)
Intervention details	<p>Participants: 53 women with type 2 diabetes</p> <p>Inclusion criteria: Female, diagnosed with type 2 diabetes, aged 30 - 70 years, cleared for exercise by a primary care provider, had no advanced complications of diabetes, had an A1C level >than 7%, fluent in English, and had previously participated in diabetes education.</p> <p>Exclusion criteria: Not stated.</p>	<p>Participants: 222 patients with non-malignant, non-inflammatory musculoskeletal pain.</p> <p>Inclusion criteria: Those aged ≥ 18 years; had oral NSAID prescriptions covering 6 or more weeks of the last 12 months; and currently taking oral NSAIDs.</p> <p>Exclusion criteria: Those with terminal disease, unable to give valid informed consent, with a defined inflammatory</p>

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	<p>Intervention (n=26): Nurse-coaching and standard diabetes care. The coaching consisted of 5 individualised sessions and 2 follow-up phone calls over 6 months. The sessions covered educational, behavioural, and affective strategies.</p> <p>Control (n=23): Control condition of standard diabetes care</p>	<p>arthropathy, or non-locomotor pain as reason for NSAID use.</p> <p>Intervention (n=110): A Nurse delivered advice. Patients were asked to stop using NSAIDs and make appropriate use of alternative drug and non-drug therapies. All advice was supported by patient literature and delivered by a nurse practitioner trained in musculoskeletal assessment.</p> <p>Control (n=112): Simple advice on safe NSAID use reinforced with a leaflet.</p>
Outcomes measured	<p>Physiologic adaptation (hemoglobin A1c [A1C], body mass index [BMI]), self-management (dietary and exercise), psychosocial adaptation (diabetes-related distress and integration), and treatment satisfaction at baseline, 3 and 6 months.</p>	<p>Self reported reduction in oral NSAID dose, changes in prescription data, health service, drug and patient costs, health status and functioning</p>
Summary of main findings	<p>Diet self management: Intervention group demonstrated better diet self-management than control group (F=4.1, p=0.02)</p> <p>Psychosocial distress: Intervention group showed less diabetes-related distress than control group (F=7.5, p=0.01)</p> <p>Integration: Better integration by intervention group than control group (F=3.9, p=0.03)</p> <p>Patient treatment satisfaction: Subjects in the coaching intervention were more stratified with their treatment than control group at 3 months (p<0.01) and 6 months (p<0.01).</p>	<p>Oral NSAID use: At six months more patients in the intervention group stopped taking oral NSAIDs than control group patients [42 (38.5%) v 14 (12.7%), $\chi^2 = 17.82$, df 1, p<0.0001].</p> <p>Health and well-being: No difference</p> <p>Prescription costs: After 6 months, oral NSAID prescription costs were significantly lower in the intervention group compared with baseline (p=0.008), but not in the control group (p=-0.52). No significant differences in total drug costs between the two groups.</p>
Comments	<p>Authors conclude the nurse-coaching intervention shows promise as a means of improving self-management and psychosocial outcomes in women with type 2 diabetes.</p> <p>Remarks: This is a pilot study with short 6-months follow up period. A convenient sample was recruited from outpatient diabetes education centre. The randomisation method was not stated, allocation concealment was unclear and some of the outcomes were assessed based on self-report. The study was also not powered.</p>	<p>Authors believe that primary care based nurse intervention can reduce chronic NSAID use, costs and might be cost-effective if maintained in the long term.</p> <p>Remarks: The two groups were similar at baseline. Most of the outcomes were assessed based on self report and the follow up period was brief (6 months). The nurse was blinded to study aims and the study was powered to detect differences between groups. The cost effectiveness was not properly done to reflect the cost of both intervention and control groups</p>
	Study 13	Study 14
Full reference	Pugh, et al. (2002). Breastfeeding duration, costs, and	Hebert et al (2001). Efficacy of a nurse-led multidimensional

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(Authors, title, year)	benefits of a support program for low-income breastfeeding women. Birth 29(2): 95-100.	preventive program for older people at risk of functional decline. A randomised controlled trial. Age and Ageing 30 (2): 147-53
Objectives	To evaluate a community health nurse/peer counselor intervention to increase the duration of breastfeeding among low-income mothers during the first 6 months of their infants' lives.	To verify the efficacy of a multidimensional preventive program on functional decline of older people living at home.
Setting (country, research location)	A large academic Medical Centre in mid-Atlantic region, USA	Community of Sherbrooke City, Quebec, Canada
Study design & level of evidence	Community-based randomised clinical trial (Level II evidence)	Randomised controlled trial (Level II Evidence)
Intervention details	<p>Participants: 41 low-income women recruited after delivery of a full-term singleton infant.</p> <p>Inclusion criteria: Low income women receiving financial medical assistance support</p> <p>Exclusion criteria: Not stated</p> <p>Intervention (n=21): Usual breastfeeding support and supplementary visits from community health nurse/peer counselor team, daily visits during hospitalisation, and home visits during week 1, 2, and 4, and at team discretion (for 6 months after delivery).</p> <p>Control (n=20): Usual breastfeeding support (support from hospital nurses, telephone assistance, one visit by a lactation consultant)</p>	<p>Participants: 503 old people living at home</p> <p>Inclusion criteria: Subjects over 75 years living at home and identified to be at risk of functional decline.</p> <p>Exclusion criteria: Not stated</p> <p>Intervention (n=250): Home visit by trained nurse. The nurse assessed subjects on 12 dimensions (including medication, depressive mood, risk of falls, hearing). Assessment results were sent to the GP with recommendations for interventions. A monthly telephone surveillance was conducted to monitor the implementation of recommendations.</p> <p>Control (n=253): Usual health care</p>
Outcomes measured	Duration of breastfeeding, use of health care services by infants, cost	Functional decline, functional autonomy, well-being, perceived social support and use of health care services.
Summary of main findings	<p>Breastfeeding duration: Women receiving the community health intervention breastfed longer than the women receiving usual care.</p> <p>Exclusive breastfeeding at 3 months: Intervention group (9), control (5)</p> <p>Exclusive and partial breastfeeding at 6 months: Intervention (15), control (10).</p> <p>Health care service use by infants: Infants in the intervention group had fewer sick visits ($p < 0.05$) and medication use ($p < 0.05$) than those in the control/usual</p>	<p>Functional decline: No difference in the incidence of functional decline between the two groups [48 (19.6%) of 245 in the study group and 49 (19.7%) of 249 in the control group, relative risk 1.00; 95% CI 0.82-1.23].</p> <p>Functional autonomy: No difference</p> <p>Well-being: No difference</p> <p>Perceived social support: No difference</p>

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	care group. Costs: The intervention cost \$301 per mother. The difference in total costs between the two groups was significant $p < 0.05$ [Intervention \$3840, control \$3194	Use of health care services: No difference between the groups.
Comments	Authors argue that community health nurse and peer counselor support can increase breastfeeding duration in low-income women and reduce total costs. Remarks: Allocation was by sealed envelope. The two groups were similar at baseline and patient follow up was 100%. However the study was not powered; small sample size and unclear if outcome assessors were blinded. The follow period of 6 months was short and the long-term benefit of the intervention is questionable.	Authors concluded: The study confirms the multidimensional programs is not effective in preventing functional decline in the older population. Remarks: This was a population-based study. Stratified and block randomisation were used. Sample size was calculated prior to the trial and groups were comparable at baseline. Interviewers were blinded to most of the outcomes and study subjects were also blinded to their treatment groups.
	Study 15	Study 16
Full reference (Authors, title, year)	Robertson et al (2001). Effectiveness and economic evaluation of a nurse delivered home exercise program to prevent falls. 1: Randomised controlled trial. BMJ 322: 697-701.	Hunkeler et al (2000). Efficacy of nurse telehealth care and peer support in augmenting treatment of depression in primary care. Archives of Family Medicine 9(8): 700-08.
Objectives	To assess the effectiveness of a trained district nurse individually prescribing a home based exercise program to reduce falls and injuries in elderly people and to estimate the cost effectiveness of the program.	To evaluate the efficacy of 2 augmentations to antidepressant drug treatment
Setting (country, research location)	Community health service (a geriatric assessment and rehabilitation hospital), New Zealand	Two managed care adult primary care clinics in Northern California, Oakland, United States
Study design & level of evidence	Randomised controlled trial (Level II evidence)	Randomised trial (Level II evidence)
Intervention details	Participants: 240 subjects living at home in west Auckland area. Inclusion criteria: Elderly people (75 years and older) living at home. Exclusion criteria: Inability to walk within home, receiving physiotherapy at the time of recruitment, or unable to understand the requirements of the study. Intervention (n=121): Five home based exercise program by a district nurse. Program included muscle strengthening; balance retraining exercises and walking course. Also included telephone call between home visits to	Participants: 302 patients starting antidepressant drug therapy. Inclusion criteria: Subjects with major depressive disorder or dysthymia and given a prescription for a selective serotonin reuptake inhibitor antidepressant. Exclusion criteria: Those receiving antidepressant drug prescription within the past 6 months, had an inadequate command of English language, reported current problems with substance abuse, current suicide risk, or thoughts of violence. Interventions: Nurse telehealth care (n=179) with or without peer support: For nurse telehealth care alone group (n=117), emotional

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	<p>motivate subjects and address their problems. Control (n=119): Received usual care</p>	<p>support and focused behavioral interventions in ten 6-minute calls during 4 months by nurses. For Nurse telehealth care and peer support group (n=62), telephone and in-person supportive contacts by trained health plan members recovered from depression. Control (n=123): Usual physician care</p>
Outcomes measured	Number of falls, injuries from falls, cost of program, and hospital costs related to falls.	Depression, and mental and physical functioning
Summary of main findings	<p>Participation: At one year only 43% of subjects in the home based exercise group completed: Falls: The exercise groups had fewer falls (109 vs 80) and 46% reduction in the number of falls compared to control group (incidence rate ratio 0.54, 95%CI 0.32-0.90). Subgroup analysis showed the reduction occurred among subjects 80 years or older [exercise group (43) vs control (81), p=0.007]. Injuries: the exercise group had fewer serious injurious falls than control group (2 vs 9, relative risk 4.6, 95%CI 1.0-20.7). Hospital admission: Five in the control group due to injuries caused by falls and none in the exercise group. Cost and cost effectiveness: The total program cost was \$NZ 52229 to deliver to 121 subjects for one year (\$NZ432 per participant). The incremental cost per fall prevented by delivering the program was \$NZ1803. When program cost and hospital cost avoided were considered the cost savings were \$NZ576 per fall prevented and \$NZ1563 per injurious fall prevented.</p>	<p>Depression: Compared to the usual physician care patients, the nurse telehealth patients with or without peer support experienced 50% improvement on the Hamilton Depression Rating Scale at 6 weeks (37% vs 50%; p=0.01) and 6 months (38% vs 57% p=0.003), on the Beck Depression Inventory at 6 months (37% vs 48%; p=0.05) and greater reduction in symptom scores on the Hamilton scale at 6 months (8.12 vs 10.38; p=0.006). Mental Functioning: Telehealth care patients improved their mental functioning at 6 weeks (47.07 vs 42.64; p=0.004) and treatment satisfaction at 6 weeks (4.41 vs 4.17; p=0.004) and 6 months (4.20 vs 3.94; p=0.001). Adding peer support to telehealth care did not show any significant effect. Medication adherence: No differences between the groups</p>
Comments	<p>Authors believe that a home exercise program delivered by a trained nurse was effective in reducing falls, serious injuries and hospital admissions. Remarks: Although follow up was 88% at one year, the compliance with the exercise program was low (43%). Allocation was concealed, outcome assessors were blinded and data was analysed on an intention to treat basis</p>	<p>Authors concluded that nurse telehealth care improves clinical outcomes of antidepressant drug treatment and patient satisfaction and fits well within busy primary care settings. Remarks: A complex study design with three arms to evaluate the impact of intervention. The research design makes the interpretation of the findings very difficult and the follow up duration was brief (6 months).</p>
	Study 17	Study 18
Full reference	Dalby et al. (2000). Effect of preventive home visits by a	Mann, et al. (1998). An evaluation of practice nurses working

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(Authors, title, year)	nurse on the outcomes of frail elderly people in the community: a randomised controlled trial. CMAJ 162(4):497-500	with general practitioners to treat people with depression. British Journal of General Practice 48 (426): 875-9.
Objectives	To examine the impact of preventive home visits by a primary care nurse compared with usual care on the outcomes of frail elderly people living in the community.	To evaluate an extended role for practice nurses in improving the outcome of depression through two specially designed interviews running in parallel.
Setting (country, research location)	Health Service Organisation, Ontario, Canada.	Twenty general practices participating in the Medical Research Council General Practice Research Framework, United Kingdom
Study design & level of evidence	Randomised Controlled Trial (Level II evidence)	Randomised Controlled Trial (Level II evidence) (Two trials in parallel)
Intervention details	<p>Participants: 142 elderly subjects living in the community</p> <p>Inclusion criteria: Subjects reporting functional impairment or admission to hospital or bereavement in the previous 6 months.</p> <p>Exclusion criteria: Those living in a nursing home, involved in another research study, previously visited by the nurse in their homes or participated in the pre-test of the survey</p> <p>Intervention (n=73): Nurse assessed and followed subjects at homes for 14 months. Program included review of medical record, a comprehensive assessment of physical, cognitive, emotional and social function, medication use, safety and suitability of the home environment. A care plan was developed, follow-up visits and phone calls were made as required. The nurse was as a case manager for the study subjects.</p> <p>Control (n=69): Usual care</p>	<p>Participants: Patients identified as depressed by their GPs.</p> <p>Inclusion criteria: General practice patients aged 18-74 years, had been depressed for at least four weeks</p> <p>Exclusion Criteria: Those with suicidal idea, their depression represented a phase in a manic-depressive psychosis, currently receiving treatment for depression from specialist psychiatric services.</p> <p>Study 1:</p> <p>Intervention (n=76): Assessment by a practice nurse and feedback to GP</p> <p>Control (n=82): No assessment by practice nurse or feedback to GP</p> <p>Study 2:</p> <p>Intervention (n=272): Practice Nurse follow up</p> <p>Control (n=148): Normal GP care</p>
Outcomes measured	Combined deaths and admissions rates to an institution and rate of health services use	Change in Beck Depression Inventory (BDI) scores and in the proportion of patients fulfilling DSM-III criteria for major depression.
Summary of main findings	<p>Mortality and admission: No significant differences in the combined rate of deaths and admissions between the two groups (10.0% nurse group vs 5.8% usual care group; $p = 0.52$).</p> <p>Vaccination: The rates of influenza and pneumonia vaccinations were significantly higher in the nurse group than in the usual group (90.1% vs. 53.0%, $p < 0.001$;</p>	BDI score and DSM: All groups of patients showed improvement at four months, but no difference in the improvement rate for the nurse intervention group. BDI mean scores fell from 18.54 (95% CI = 17.53 - 20.06) to 11.53 (95% CI = 10.02 - 13.04) in Study 1, and from 21.01 (95% = CI 20.26 - 21.86) to 10.62 (95% CI = 9.73 - 11.51) in Study 2. The proportion of patients fulfilling criteria for DSM-III major depression in Study 1 fell from 80% (95% CI = 73-87%) to

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	81.9% vs. 0.0%, $p < 0.001$). Health service use: Not significantly different between the two groups	30% (95% CI = 22 - 38%), and in Study 2 from 80% (95% CI = 76 - 84%) to 27% (95% CI = 23 - 31%). Prescription: Prescription rates of antidepressant medication were higher than expected in both studies (range 63% - 76%). GP contact: No significant differences
Comments	Authors concluded that the preventive nurse home visit did not have an effect other than vastly improve vaccination coverage. Remarks: Although the study was powered, authors failed to recruit the required sample size for the trial. As a result the study lacked power. The randomisation method was stated and the two groups were comparable at baseline except for one characteristic.	The authors concluded that there was an increase in the rate of antidepressant prescription and no additional benefit to patients from the nurse intervention. Remarks: Not an ideal design to assess the impact of nurse intervention on chronic disease (depression). Randomisation method was stated and blind assessment was done. However allocation concealment was unclear and the follow up period was short (4 months)..
	Study 19	Study 20
Full reference (Authors, title, year)	Morrell et al. (1998). Cost effectiveness of community leg ulcer clinics: Randomised controlled trial. <i>BMJ</i> 316(7143): 1487-91.	Mynors-Wallis, et al. (1997). A randomised controlled trial and cost analysis of problem-solving treatment for emotional disorders given by community nurses in primary care. <i>British Journal of Psychiatry</i> 170: 113-9.
Objectives	To establish the relative cost effectiveness of community leg ulcer clinics that use four layer compression bandaging versus usual care provided by district nurses.	To investigate whether community nurses could be trained in problem-solving therapy and, once trained, how effective they would be in treating emotional disorders in primary care.
Setting (country, research location)	Eight clinics in four community trusts in Trent, United Kingdom.	Four health centres in Oxford, United Kingdom
Study design & level of evidence	Randomised controlled trial (level II evidence).	Randomised controlled trial (Level II evidence)
Intervention details	Participants: 233 patients with venous leg ulcers Inclusion criteria: A venous ulcer below the knee to the foot that was present for at least 3 months and ability to travel to the clinic Exclusion criteria: Subjects with an ankle brachial pressure index < 0.8 Intervention (n=120): Weekly treatment with four layer bandaging in a leg ulcer clinic (clinic group)	Participants: 70 adult patients with emotional disorder. Inclusion criteria: Subjects (18-65 years) with emotional disorder (persistent symptoms) of at least a month's duration in primary care and referred by general practitioners. Exclusion criteria: Patients with somatic symptoms due to a physical disorder. Intervention (n=40): Problem-solving therapy by a trained community nurses.

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	Control (n=113): Usual care at home by district nursing service	Control (n=30): Usual care from their general practitioners.
Outcomes measured	Time to complete ulcer healing, health status, recurrence of ulcers, time free from ulcer, satisfaction with care, use of services, and personal costs	GP consultations, cost of consultation and medications.
Summary of main findings	<p>Healing: The ulcer of clinic group healed sooner than control group over one year follow up (log rank test statistic 4.90, df 1, p=0.03). At 12 weeks, 34% and 24% of the clinic and control group patients were healed, respectively (10% diff, 95% CI -2% - 22%). The initial ulcer was 1.45 times more likely to heal in the clinic group than in the control group (95%CI 1.04 to 2.03). On average the clinic group patients had 5.9 (95%CI 1.2-10.5) more ulcer free weeks than control group patients.</p> <p>Health status: Not significantly different</p> <p>Satisfaction with care: Not significantly different</p> <p>Cost: The mean (SD) cost per clinic visit was £29.90 (£14.18) and for home visit £10.60 (£3.79). The mean annual treatment costs were £804.03 and £681.04 for the clinic and control groups, respectively (diff £122.99, 95%CI £1.56 - £234.84). No significant differences in mean total NHS cost.</p>	<p>Clinical outcome: No difference between the two groups in four clinical measures at 8 and 26 weeks. However, patients in the treatment group (problem solving) had fewer disability days compared to the usual care [(at 8 weeks: 2.4, 95%CI 0.6 - 4.3 vs. 5.4, 95%CI 2.6 - 8.3, p=0.07); [(at 26 weeks: 0.9, 95%CI 0.4 - 1.5 vs. 2.9, 95%CI 0.9 - 4.9, p=0.04)] and fewer days off work.</p> <p>Economic outcome: No significant differences between the groups in the number or cost of all GP consultations, or medication received. However the total Health care cost for the treatment group (problem solving) was greater than the usual care group (£93.20 vs. £35.90, diff £57.30, 95%CI £70.0 - £44.6; p<0.001)</p>
Comments	<p>Authors conclude community based leg ulcer clinics with trained nurses using four layer bandaging is more effective than traditional home based treatment.</p> <p>Remarks: Randomisation method was stated, allocation concealed and sample size was calculated prior to the study. The groups were comparable at baseline, follow up was one year and data analysis was by intention to treat. However, the assessment of patient health status measures were based on self report.</p>	<p>Authors believe trained community nurses in primary care with appropriate training and supervision can deliver problem-solving treatment.</p> <p>Remarks: Randomisation method stated but allocation concealment unclear. The interviewer blinded to treatment. The study was not powered, baseline data for the two groups after randomisation was not presented, and the follow up period was short (26 weeks) to detect long term clinical effects or benefits from the intervention.</p>
	Study 21	Study 22
Full reference (Authors, title, year)	Sharp et al. (1996). Breast screening: a randomised controlled trial in UK general practice of three interventions designed to increase uptake. <i>Journal of Epidemiology & Community Health</i> 50(1): 72-6.	Cherkin et al. (1996). Pitfalls of patient education. Limited success of a program for back pain in primary care. <i>Spine</i> 21(3): 345-55.

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Objectives	To determine the relative effectiveness of three interventions designed to increase the uptake of breast screening	To evaluate educational interventions designed to improve the outcomes of primary care for low back pain
Setting (country, research location)	The area of southeast London served by the Butterfly Walk Breast Screening Unit in Camberwell, United Kingdom.	A large Health Maintenance Prganisation clinic/a suburban primary care clinic, Western Washington State, USA
Study design & level of evidence	Randomised controlled trial (Level II evidence)	Randomised Control Trial (Level II evidence)
Intervention details	<p>Participants: 799 Women registered with 27 GPs in the Lambeth, Southwark and Lewisham family health services authority.</p> <p>Inclusion criteria: Women aged 50-64 years who failed to attend the first round for breast screening after two appointments.</p> <p>Exclusion Criteria: Not stated</p> <p>Intervention:</p> <p>Group A (n=315): A nurse intervention at home consisting of interview about attendance for breast screening and health education.</p> <p>Group B (n=307): A nurse intervention at home consisting of interview about attendance for breast feeding and without health education</p> <p>Group C (n=160): A personal letter to non-attendees from GP expressing concern at their failure to attend for breast screening and encouragement to attend.</p>	<p>Participants: 293 patients with low back pain seen in primary care clinic</p> <p>Inclusion criteria: Those 20 –69 years old visiting clinic for back or low back pain, hip pain, or sciatica.</p> <p>Exclusion Criteria: Those without low back problem, with previous back surgery, systematic or visceral disease, known osteoporosis or corticosteroid therapy, pregnancy, cancer, unexplained weight loss, vertebral fracture or dislocation, progressive or severe neurologic signs, permanent disability or involvement in litigation, unable to speak English, severe or disabling coexisting problems (including substance abuse).</p> <p>Intervention:</p> <p>Group A (n=93): Clinic based 20 minutes educational session and telephone follow up by a nurse, educational booklet and usual care. Group B (n=100): Educational booklet and usual care. Group C (n=93): Usual care</p>
Outcomes measured	Attendance for breast screening (an increase in the uptake)	Care satisfaction, perceived knowledge, participation in exercise, functional status, symptom relief, health care use (assessed 1, 3, 7, and 52 weeks)
Summary of main findings	Attendance rate: No significant differences in attendance for breast screening between the three groups. Over the 12 weeks of study period, the overall attendance rate for breast screening from all three groups was vary low (Group A: 11.4%, Group B: 7.8%, Group C: 13.1%).	<p>Satisfaction: After one week, the nurse group patients were much more likely to try the exercises in the booklet than those who received booklet and usual care (group B) (74% vs. 45%, $p < 0.001$)</p> <p>Patient knowledge: After one week the nurse group had higher perceived knowledge about their back problem than usual care ($P < 0.001$), but the difference was no longer significant after 7 weeks.</p> <p>Exercise: Self-reported exercise participation was higher in the nurse group after a 1-week ($p < 0.001$) and 3 weeks ($p < 0.001$)</p>

		<p>follow-up period. The difference between the groups was no longer significant after 7 weeks</p> <p>Worry, symptoms, functional status, or health care use: No significant differences among the three groups.</p>
Comments	<p>According to the authors, a simple personal letter from the GP seems to be as effective as the nurse visit alone or the nurse visit with health education component.</p> <p>Remarks: The study was well designed and powered. The data on socio-demographic characteristics of the three groups were not provided, the intervention period was brief (12 weeks) and compliance was very poor from all three groups.</p>	<p>The authors conclude there was limited long term benefits associated with nurse education program in primary care.</p> <p>Remarks: The usual care group was made up of voluntarily patients (not randomised). Most of the outcome measures were assessed based on self-report. Authors acknowledged the strengths and limitations of their study.</p>

APPENDIX F: SYNOPSIS OF OPINIONS EXPRESSED BY STAKEHOLDERS DURING INTERVIEW

Table 13: Synopsis of opinions expressed by stakeholders during interview

Stakeholder details	Number interviewed	Country (State)	Main issues raised including concerns	Recommendations
DoHA	7	ACT	<p><u>MBS Item Nos etc</u></p> <ul style="list-style-type: none"> • Item numbers for PNs is policy focus • PIP incentives support these • Mental health will also become a focus • Rationale is that in time of workforce shortages PNs can provide services • There is an underlying assumption that Medicare item numbers CAN be provided by PNs • Lack of GPs ,means need to use PN • Underlying driver is ageing population need to access primary re chronic disease • Acute care is increasing in cost so need to have better primary care delivery <p><u>Career pathways</u></p> <ul style="list-style-type: none"> • Attractive option for mid aged nurses with family responsibilities-no shiftwork • DoHA responds to what is happening • GP is small business so PN pay reflects this • Federated system makes it difficult for Australia re PN qualifications etc • COAG work around Nat accreditation would help this situation • Difficulty at the moment in saying what nurses across the country can do • GPs need to satisfy themselves that training is appropriate 	<ul style="list-style-type: none"> • Need to have more effective primary care delivery due to increase in costs of acute care. • PNs important in this due to shortage of GPs and ageing population • MBS item numbers can be provided by PNs but need a more holistic approach. M BS too disease focused PIP can facilitate this more holistic approach to care. For example the PIP payments for cervical screening. Same model could be used for other conditions. • DoHa need to be more proactive • National accreditation standards and qualification framework needs to be developed for PN

			<p>Dream</p> <ul style="list-style-type: none"> • More PNs • More flexible than hospitals • GP practice could be multi purpose centres • PIP urban incentives for PNs and allied health • Work in collaborative fashion and have skills and competencies valued • Strong representation of PNs in the sector more collaboration amongst nursing organisations • Governance arrangements very important particularly at practice level • Practice have clinical procedures that govern what nurses can do • Need to look at how nurses fit in to accreditation cycle AAGPAL, RACGP standards for practice • Need comprehensive procedures and guidelines <p>Future</p> <ul style="list-style-type: none"> • Chronic disease a priority • If Govt should change don't know what that would mean • With this Govt business as usual no new initiatives • Govt has concern about workforce shortages and workforce is expensive, emerging ideas physicians assistant QLD TAFE developing PA competencies based course 	<ul style="list-style-type: none"> • PIP incentives for PN employment should include urban centres • Governance and supervision of PN needs to be addressed through comprehensive guidelines • Nursing organisations need to work better together <ul style="list-style-type: none"> • Need new thinking around the role of the PN with particular reference to future issues eg chronic disease • A competency based career structure needs to be developed supported by quality training
AGPN GP Nurse Advisor	1	ACT	<ul style="list-style-type: none"> • AGPN through Divisions working with UG students facilitating places in general practice • Key to training UG students in primary care • Looking at graduate program for nurses in PC • UG program currently too focused on acute care • Need to improve entry points from UG to PC • Work to be done to improve profile of nurses in GP • Need more structured career path • Challenge to national award is that GP small business 	<ul style="list-style-type: none"> • UG nursing curricula need to include more education for primary care • Graduate programs for nurses in primary care need to be developed • A struttred career pathway needs to be developed • PIP support for employing PN needs to be rolled out to cover all general practices in Australia • If fee for service is to continue it

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			<ul style="list-style-type: none"> • Need to continue to increase PIP and have PIP rolled out to all practices in Australia • If it is going to continue to be fee for service need additional MBS items for PNs • These should not be task specific but allow for flexibility in practice so more broad based items eg chronic disease, preventive health etc • GP needs to look at how best to utilise PN and increase income and outcomes and therefore improve pay to PN • All GP organisations supportive of PNs • AMA want generic item numbers not specific to PN in advanced role • Need to continue to educate GPs for requirement that nurse attend professional development • Need consumers to understand role of allied health • Current minister clear about role of GP team and policy has reflected this • The new general practice is a team based approach to care • Need flexible postgraduate training one size fits all doesn't work • Need targeted short courses as well • Need for more PNs to get formalised PG qualifications and therefore recognition of professionalism • Barriers- Who pays? • AGPN developing a leadership program for PNs. Nurses need to articulate what they are doing At the moment leaders are self selecting so far 70+ have expressed interest • Nurses in GP need to play a key role in developing primary care services 	<p>needs to be more flexibility in funding to address chronic disease etc</p> <ul style="list-style-type: none"> • PN professional development needs to be a priority • Professional development needs to be supported by flexible postgraduate education, including short courses • More PNs should be accessing accredited PG qualifications to build professionalism • A system for paying for PN G education needs to be developed
AMA	2	ACT and WA	<p><u>AMA 23/02/07</u> Canberra office with WA on teleconference</p>	<ul style="list-style-type: none"> • Training on the GP funding system needs to be available for PNs

			<ul style="list-style-type: none"> • PNs involved in a range of training linked to new initiatives around business activity. Business strategy not a caring strategy at the moment. Training e mental health item numbers working with Medicare Australia involves GPs and PNs. Reactive training not proactive • PNs say they have come from hospital or aged care and they don't have the support of a range of colleagues or systems in place eg sterilisation PNs don't know how to do it on site in hospitals it is sent out. So ad hoc training around these issues. • PNs need to be sufficiently attuned to business of GP • PNs have award in WA only for Registered Nurses NOT Enrolled Nurses • Could have systems where there are enrolled nurses and nursing assistants under the Reg nurses Med Asst→ Enrolled Nurse→ Registered Nurse • WA have 20 units of training part of a National Training package • AMA happy to support development of PN role but not working independently of GP • Antenatal Item- AMA comfortable but with PN working under supervision of GP • Up to the GP to work out if the nurse has the skills and competencies to carry out role. Need to do this in discussion with medical indemnity organisations • AMA doesn't want fragmented care GP should be at centre of holistic care • Should be symbiotic relationships nurse working in consultation with GP • Training program being developed for junior doctors various scenarios being piloted for linking GPS with community organisations more holistic set of skills to provide holistic care 	<ul style="list-style-type: none"> • Basic and advanced training for PNs needs to be developed • A system should be developed where more advanced nurses supervise less qualified nurses in the primary are setting • The issue of who supervises nurses in general practice needs to be addressed • Competency for undertaking roles need to be systematically monitored and attention paid to liability issues and insurance • National pay scales and conditions need to be developed, including a system for supervision • The funding of primary health care services need to be addressed to facilitate the funding of quality care for chronic conditions • A comprehensive standard package of training for PNs need to be developed nationally • The funding of Divisions of GP to provide training needs to be reviewed and the quality of the training they provide needs to be audited
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			<ul style="list-style-type: none"> • MBS should pay for the service being provided by PN eg diabetes educator ec • Currently Govt prescribing what nurses can do • Govt told that AMA, GPs and patients know population and then training should fit to need • Changing Medicare structure would encourage training of nurses • Divisions get a lot of funding support this may be should be given to AMA to train GPs and PNs so that they can have a different set of skills • Someone somewhere needs to develop a standard package of training • Tender needs to be sought to deliver PN training 	
RCNA	2	ACT	<p><u>RCNA 22/2/07</u></p> <ul style="list-style-type: none"> • Nurses in GP should be working at advanced level and autonomously • Some Divisions of GP are good at offering education and support for PNs but other aren't • The development of the PN role is exciting development in evolution of nursing in primary care • Now is the clearly the time to be thinking about the issues that impact on this role • Irish model- practice development co-ordinators funded from the Govt to G Practices support professional development of PNS. Break down isolation, provide networking and share ideas • There needs to be an ODRERLY development of education for PNs in Australia. Some Universities setting up programs, APNA developing BUT no overarching organise approach • Govt doesn't look at the full picture. It needs to fund the development of education. Policy need to be more rational • Pleased with Medicare item numbers but a lot more areas to be covered 	<ul style="list-style-type: none"> • The issue of PN supervision needs to be addressed • The role of Divisions in providing education needs to be reviewed • A national education and training system for PNs needs to be developed • Need a more systematic and holistic approach to policy development at a national level • A career pathway for PNs needs to be developed • Funding models for primary care should be more flexible and include education for PNs

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			<ul style="list-style-type: none"> • Going down right track but need more • No thought given by Govt to the educational support of nurses • Nurses need to be able to work to their full potential and in teams • Nurse practitioner role can work effectively (eg Canada) within a primary health care team • Career pathway can be from PN to NP in PHC team • Can be specialised practitioners eg Diabetes • One PN with speciality eg PAP, Diabetes can work across a number of practices • At the moment some nurses working as receptionists and others in advanced practiced-no system • Flexibility in funding models would allow GPs to do more, current model means that GPS are less likely to pay for education. So Govt should put conditions on funding eg educational development for PNs • Important for nurses to have job descriptions • Some payments eg wound care do not really allow for the time it takes need to review this 	
Advisor to Shadow Health Minister	1	ACT	<ul style="list-style-type: none"> • Currently developing policy • See significant role for primary health care • Acute setting expensive • Support role of PN in GP setting 	
Advisor to Health Minister	1	ACT	<ul style="list-style-type: none"> • Need to utilise PNs more in existing framework assist with GP tasks • Need to work within skill sets • Nurses very skilled professionals but the question is how we integrate them into the system • Part of the issue is political and must reflect whole of Govt policy • Incremental change has been the model 	<ul style="list-style-type: none"> • National accreditation ad professional standards for PNs need to be developed through COAG as a priority • Better data needs to be collected on the work PNs do and better evidence of the outcomes of their work is required

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			<ul style="list-style-type: none">• Funding for more Medicare item numbers for PNs on the agenda• Difficult to discuss national competencies and framework until national accreditation is in place - this impacts on career pathway• Decision making process and Dept Staff problematic need better data from the Dept but they are often not good at this• GP registrars get more than non-vocational GPs so this could be a model for PN remuneration	
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