Evaluating the nursing, midwifery and health visiting contribution to chronic disease management: An integration of three reviews

Research Report

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Angus Forbes[2], Alison While[2], Freda Mold[2], Billie Coomber[2] (2007).
Defining and evaluating the contribution of nurses to chronic disease management: an integrated review of the literature in diabetes mellitus, multiple sclerosis and chronic obstructive pulmonary disease (Report for Service Delivery Organisation. London)

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Preface

In 2005 the NIHR SDO programme commissioned three empirical studies, each of which responded to the brief to evaluate the nursing, midwifery and health visiting contribution to models of chronic disease management. The three commissioned studies were led by nursing academics from Kings College London, University College London and the University of Hertfordshire[1] and commenced in early 2006. Each research team had developed their own theoretical and methodological approach, giving rise to a sense of 'added value' to the overall delivery to SDO. One component that each team included in their proposals was to undertake a review of the literature that provides evidence of the nursing, midwifery and health visiting contribution to chronic disease management. Since these three reviews each took different conceptual and methodological pathways it was agreed with SDO that there might be value in synthesising the evidence from the three reviews into an 'integrative review'. The University of Hertfordshire was commissioned to undertake this piece of work.

The notion of an 'integrative review' has been noted in the literature for some time.[2,3,4] The purpose of the approach is to bring together evidence from a range of sources, incorporating both quantitative and qualitative components, and to synthesise the findings such that the tensions between the classic systematic review and the perceived level of qualitative evidence may be overcome. This approach has been taken to single reviews of nursing evidence to inform policy and practice. In view of the highly complex nature of nursing interventions in chronic disease management, and the variance in approaches taken by the three research teams to their reviews, it was decided that the integrative review of reviews would be the most appropriate method. While this incorporates the wide range of evidence identified within each review, there are clearly some limitations to including material exclusive to the commissioned reviews. Under usual circumstances the review team would have developed a search strategy that would identify other reviews from sources that met the review criteria. Therefore, it is important to include a number of caveats to the findings of the integrative review of reviews that is presented here.

Firstly, we do not claim that **all** evidence of the nursing, midwifery and health visiting contribution to chronic disease management has been identified or integrated into the review. The authors were restricted to the three previously commissioned reviews which themselves cover a vast range of research in this field. However, as discussed the approaches taken and the criteria that were adopted may mean that some studies have been omitted.

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[1] Subsequently one of the principal investigators moved from UCL to University of Hertfordshire

[2] See for example, Pawson R., Greenhalgh T., Harvey G. and Walshe K. 2005. Realist review--a new method of systematic review designed for complex policy interventions. J Health Serv Res Policy. Jul; 10 Suppl 1:21-34.

[3] Whittemore R. and Knafl K. 2005. The integrative review: updated methodology. J Adv Nurs.52(5):546-53.

[4] DiCenso A CN, Ciliska D, Guyatt G (Ed) 2005. Evidence - Based Nursing: A guide to clinical practice. Philadelphia: Elsevier Publishing.

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Secondly, the authors had to develop a framework and a methodology for this review in an iterative and flexible way so as to be as inclusive as possible and to ensure that the conceptual nuances of the three single reviews could be captured. Such a methodological task demands a degree of compromise in the way the evidence is managed and, therefore, there will be some areas with which readers may not agree. The authors have drawn on several existing methodologies to inform the progress of this work, but this has inevitably led to further questions about the ways in which narrative, quantifiable data and theory can be used to draw together an array of research findings from many competing perspectives.

The authors are interested in opening up the debate around the design and methods for synthesising vast quantities of evidence from both quantitative and qualitative sources. We hope that, as well as providing a picture of the current evidence on the nursing, midwifery and health visiting contribution to chronic disease management, this report will stimulate further debates on the value of synthesised evidence in the delivery and organisation of nursing interventions and the methods needed to appraise evidence and achieve such syntheses.

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Glossary of abbreviations and terms

Abbreviation/term	Definition/explanation
Appropriateness (of intervention/design)	Suitability in relation to the design and evaluation of complex nursing interventions[5]
Autonomy	Refers to the ability of nurses to practise as professionals in their own right, e.g., having responsibility, authority and involvement in decision making (Code of practice, Nursing & Midwifery Council)
CDM	Chronic disease management
Cross boundary working and primary/secondary interface	Includes integrating primary and secondary care (e.g. hospital out-reach where specialist nurses support patients in the community, specialist nurses supporting primary care; nurses interfacing with other professionals, services, carers, continuing care settings)
Drivers	Underlying/broader force encouraging nursing activity
Effect size	The measured impact of an intervention on a disease or other outcomes,(a marker of effectiveness)[6]
LTC	Long-term conditions
Mapping	A method for organising literature that aims to scope the literature more broadly and to demonstrate the types of studies that exist, answer questions about what evidence is available and identify gaps in research[7]. *(In this review we also mapped evidence onto our framework to draw out themes from the reviews)*
NMHV	Nurses, midwives and health visitors
'Proof of concept' studies	Pilot/preliminary studies that aim to demonstrate the feasibility, of using some concept or framework, or components of intervention, to verify that it may be potentially effective. Feasibility studies aim to validate a concept and aim to answer questions such as what the intervention is, how it works, how much of it you need, how it links to a predicted outcome[5,8]
RCT/CT	Randomised controlled trial (RCT): Studies in which participants are randomly allocated to either an experimental intervention or a control group; Controlled trial (CT): A non randomized comparison of an experimental intervention with a concurrent comparison

[5] *Campbell, Fitzpatrick R, Haines A, Kinmonth A, Sandercock P, Spiegelhalter D, Tyrer P. 2000. Framework for design and evaluation of complex interventions to improve health.BMJ 321: 694-696*

[6] *Swann C, Bowe K, McCormick G et al. Teenage pregnancy and parenthood: a review of reviews: Evidence briefing; Health Development Agency. 2003. Available at: http://www.nice.org.uk/aboutnice/whoweare/aboutthehda/hdapublications/teenage_pregnancy_and_parenthood_a_review_of_reviews_evidence_briefing.jsp*

[7] *The Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre, part of Social Science Research Unit, Institute of Education, University of London) Methods of synthesis available at: http://eppi.ioe.ac.uk/cms/Default.aspx?tabid=89*

[8] *Forbes, A., Clinical intervention research in nursing: A discussion paper. Int J Nurs Stud(2008), doi:10.1016/j.ijnurstu.2008.08.012*

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	group
Simplification	Reducing structures and pathways (e.g. care pathways)[9]
Substitution	Substitution of nurses for other health care professionals, in particular nurses undertaking roles and tasks previously done by doctors[9]
Supplementation	Refers to a nurse supplementing or extending the care of doctors by providing a new service (such as patient education or counselling), usually in liaison with multi-professionals to strengthen the links between primary and secondary care[9].

[9] *Singh D. 2006. Making the Shift: Key Success Factors. A rapid review of best practice in shifting hospital care into the community. NHS Institute for Innovations and Improvement*

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Executive Summary

Background

This report integrates the evidence from three related, but independent, reviews commissioned by the National Institute for Health Research (NIHR) Service Delivery Organisation (SDO) to evaluate the nursing, midwifery and health visiting (NMHV) contribution to models of chronic disease management (CDM). The three reviews were the first phase of work of three larger projects specifically commissioned to add to the understanding of the contribution of nurses, midwives and health visitors to chronic disease management.

1. Bunn et al 2007. Evaluating the nursing, midwifery and health visiting contribution to chronic disease management: a mapping of the literature. *University of Hertfordshire & City University, London*

2. Forbes et al 2007. Defining and evaluating the contribution of nurses to chronic disease management: an integrated review of the literature in diabetes mellitus, multiple sclerosis and chronic obstructive pulmonary disease. *King's College London*

3. Scott et al 2007. Evaluating the contribution of nurses, midwives and health visitors to the care of people affected by long-term conditions: a literature review. *Royal College of Nursing Institute, London, St. Georges, University of London, University College London, University of Hertfordshire, University of Surrey, King's College London*

These research projects were commissioned in the context of recognition of the growing prevalence of people with chronic diseases and the associated costs to them, their families, the health and social care services and the economy. Approximately two thirds of emergency hospital admissions are related to chronic diseases and the costs for managing patients with multiple chronic conditions are high. Nurses make up a large part of the health workforce in the UK and Government policies have suggested that nurses play a greater role than before in the health service response to people with chronic diseases[10]. The impetus for this integrated review came from the NIHR SDO representatives.

Aims and Objectives

Principal research questions

Each review had its own focus, but all were guided by the principal research questions derived from the NIHR SDO commissioning brief:

[10] *The terms chronic diseases and long term conditions have been used in this review to reflect the terminology used by the three reviews*

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- What are the different models of chronic disease management that involve nurses, midwives, health visitors, how have they developed and why?
- What are the ways that they involve service users and carers?
- What are the roles and responsibilities of nurses, midwives and health visitors in current models of chronic disease management?
- What is the impact of nurses' contribution to the experiences of patients, service users, professionals and carers?
- What enables nurses to contribute most effectively to successful outcomes of care?
- What is the impact of the nurses' contribution upon the cost, quality, effectiveness and organisation of the care provided?

Aims and Objectives of the integrated review

Aim

To synthesise the findings of the three reviews on the contribution of NMHV to CDM

Objectives

- To integrate the three reviews using appropriate methodologies and to provide an overall review of NMHV contribution to CDM
- To summarise the different approaches of the three reviews, their theoretical assumptions and methods
- To synthesise the findings and highlight methodological challenges
- To demonstrate the synergy, commonality and consensus between the three reviews
- To describe the process and outcomes for NMHV contribution and evidence of its impact
- To establish the types of NMHV activity and the contextual settings that have the strongest evidence base for practice
- To identify gaps in the evidence about effectiveness and appropriateness of specified interventions/models of care
- To make recommendations for practice and research

Methods

The process of integrating the three reviews

An iterative, consensus based approach was adopted through joint meetings and workshops with all three teams involved in planning and discussing the integration. Initially this process involved exploring methodologies for integrating evidence, developing a protocol and establishing a framework to support the synthesis of the findings. Latterly, it was employed to validate the synthesis and develop a consensus on the presentation of the final report. The ways in which the work was shaped through the workshops and editorial group meetings included:

1. Appraisal of the three reviews by DT
2. Development, compilation and circulation of all materials (by DT) to the three teams prior to meetings

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3. Consensus building through editorial group meetings with the three reviewers. Specific issues included methods of summarising and organising data, and synthesis of evidence from the three reviews
4. Further discussions on the draft report with the three teams at joint workshops to reach a consensus on the final review.

Through this approach, the review benefited from discussion and guidance from the three teams and was therefore subject to ongoing internal peer review.

Data extraction and synthesis of the three reviews

Data were extracted using the framework to map and integrate the content of the three reviews. The areas examined included: the underpinning research questions and focus of the reviews; the type of material included in the reviews (methods, settings, country of origin); the range of disease conditions examined; nursing roles, specific nursing interventions; models of nurse-led services; the nursing contribution to care and organisations; the impact of nursing on structure, process and outcome; barriers and facilitators to the contribution of nurses; and the main implications for practice and recommendations for research identified by the reviews.

A flexible framework, driven by current models for CDM, was developed and used to organise data extraction and synthesise the findings from the three reviews. It incorporated key distinguishing features/domains of NMHV contribution to CDM, with specific questions for drawing out the required information from the evidence presented in the three reviews. Thematic findings from the reviews were mapped on to the key NMHV contribution concepts identified in this framework.

Methodologies employed by the three reviews

All three reviews differed in their theoretical approach, focus and the way the data were organised, categorised, synthesised and discussed. This made it difficult to extract comparative data.

Conceptual frameworks

Bunn et al (2007) used a cyclical 'whole systems' approach based on a framework for implementing evidence-based, protocol–driven care. They focused on most chronic conditions (except cancer) and all ages. Forbes et al (2007) conceptualised the nursing contribution according to assessment, health promotion, clinical care, and health care organisations. They focused on three tracer conditions (Chronic Obstructive Pulmonary Disease (COPD), Diabetes, Multiple Sclerosis (MS)). Scott et al (2007) developed a framework based on current policy themes and focussed on case management for older people and organisational interventions for five target conditions: COPD, asthma, epilepsy, Parkinson's disease and rheumatoid arthritis.

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Searching, retrieval and categorisation of items[11]

Search strategies described by Bunn et al (2007) and Scott et al (2007) were similar and systematic with searches conducted from 1996-2006 using a range of electronic databases. Forbes et al (2007) conducted systematic and consistent searches for each disorder; from 1980 – 2006 for COPD and diabetes and 2002-6 for MS (they had already undertaken a review of earlier literature). Independent screening of abstracts was conducted by Bunn et al (2007) and Forbes et al (2007). Scott et al (2007) developed included items through the data extraction process, refining the inclusion criteria iteratively, rather than through systematic screening and selection. All reviews sought grey literature and expert opinion and searched reference lists.

All three reviews included key data on study types, designs, disease condition, nursing roles, interventions or service models, process and outcome measures and each used its own structured tool according to the review's organising framework.

Evidence synthesis

The reviews used different approaches, mainly descriptive and narrative, using their initial frameworks or theoretical assumptions to guide the synthesis. Bunn et al (2007) mapped findings on nursing roles, interventions and effectiveness according to disease categories and Forbes et al (2007) conceptualised the nursing contribution using an overall theoretical interpretation of the content of three reviews (COPD, Diabetes, MS). This included interventions, nursing roles and their effects on care structures, processes, outcomes and cost effectiveness. Scott et al (2007) applied realist synthesis to the evidence on 'organisational interventions' of nurse-led services for five conditions according to the types of settings.

Results

Descriptive Mapping

The majority of the material included in the reviews was from the UK. The exception was studies on case management which were largely from the USA. Collectively the reviews examined 477 research papers. Scott et al (2007) also included 78 non-research items (articles such as policy documents, book chapters, etc). Bunn et al (2007) identified 203 items, Forbes et al (2007) identified 160 items, and Scott et al (2007) identified 192, of which 114 were research-based papers.

Diabetes was the most common item, followed by COPD, asthma and cardiovascular disease (CVD) although there was considerable variation between the reviews in the proportions of items by disease categories. There was some overlap of included items for disease conditions common to one or more reviews although this was fairly minimal. This reflected the differing foci, inclusion criteria and methodologies of the three reviews for screening and retrieving items for inclusion. Most items were evaluative in

[11] *Refers to articles or papers*

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nature and also included systematic reviews, descriptive and qualitative papers; there was considerable variation in the proportion of study types and designs.

Care Context: Health care delivery

Interventions by nurses

The reviews reported considerable heterogeneity and overlap in intervention types. Common areas of intervention were:

- Educational interventions to promote self management skills
- Case management and care co-ordination
- Interventions to support continuous disease management (monitoring and therapy adjustment)
- The management of health technology (assessing, prescribing, implementation and safety)
- Psychological support (varying from communication to applied psychological methods)
- The management of the care system (access, onward referral, discharge planning)
- The provision of outreach nursing and home-based support

The use of protocols and evidence based guidelines seemed to be more common for some conditions, such as diabetes, than others (Bunn et al 2007). Classification according to Kaiser Permanente (KP)[12] levels of care showed that nursing interventions were active at all levels of this vertical model. However, there was variation within and between disorders in the contribution of nurses at and across the different levels of this model. There was a preponderance of items relating to the specialist disease management levels. Health promotion and self care interventions providing patient education were mostly reported for secondary or tertiary prevention, employed different approaches and varied between disorders. The evidence for interventions of more recently legislated authority by nurses in the UK, such as nurse prescribing, is embryonic.

Case management, which in the US is sometimes regarded as a component of disease management, was described in various ways and was often poorly defined. The reported interventions carried out by nurses are complex and involve inter-related components that do not easily identify 'active' elements. The levels and types of intervention may reflect the degree of complexities and chronic disability in conditions.

The types and roles of nurses in chronic disease management

Specialist nurses, practice nurses and designated nurse case managers (from a variety of professional nursing backgrounds) were the most commonly identified providers of care for CDM in this literature. They deliver interventions in a variety of settings mostly in the community (for example the patient's own home), primary care or hospital outpatient clinics with limited examples in inpatient settings. They also work across

[12] *Department of Health. 2005b. Supporting People with Long Term Conditions. An NHS and Social care Model to support local innovation and integration. DH: London*

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primary/secondary sectors (cross boundary) with the aim to improve the interface between primary and secondary care (i.e. specialist hospital-based nurses working in primary care).

There is an intrinsic heterogeneity in the nurses described with diverse roles and functions, reflecting a lack of standardisation. The contribution of nurses is influenced by funding, infrastructure, location, education, clinical expertise and other contextual factors.

Nursing roles are described as expanding hierarchically, for example clinical specialist and nurse consultant roles, as well as laterally (across boundaries or settings). This includes substitution for doctors, for example through nurse-run clinics, expansion through cross boundary working and advanced practice such as leading new service developments. Training pathways for taking on new roles are diverse and unclear and, in many cases, nurse specialists work with widely different levels of responsibility and professional autonomy.

Intra-professional relationships are increasingly important. With the shift towards primary care, practice nurses are taking a lead in the day-to-day management of some disorders such as diabetes and COPD. However, there were many examples showing that these roles are dependent on the provision of ongoing clinical support and education from specialist nurses. In some disorders, such as MS, there is little evidence of a primary care focus with specialist nurses providing most support. There was also some evidence of sub-specialisation with nurses with other problem specific roles providing intermittent input in areas such as continence, pain and tissue viability

The case management function of nurses was an emerging area with some evidence showing that the nursing workforce was being redesigned to expand this function. A key driver for this has been the Government's target for reducing emergency admissions in England. However, this function was poorly defined, as reflected in the multiple titles applied to the role (such as community matrons, advance primary nurses, case or care managers, care co-ordinators) and in the varying foci of case management between disorder specific and generic case management.

The reviews identified very little literature on the role of midwives and health visitors in CDM and there are very few accounts of general nursing care.

Service context: Health care organisation

Nurses contribute to the management of care systems at all levels. They are involved in the organisation of care as well as at the 'micro' level of interaction between nurses, patients and other professionals. They have a role in workforce and service development through improving access and developing new interfaces/systems between services. Nurses' roles in health technology include managing and monitoring care performance although the level of their involvement is unclear. Service configurations, structures and resources appear to influence the continuity of care. The regulation of care systems for each type of disease and the nursing contribution to different levels of this system is unclear (Forbes et al 2007).

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Evidence of impact

Overall the level of evidence examining the impact of nursing is of poor quality (reflecting a low investment in nursing research). There is little standardisation of interventions with often little explicit linkage to the outcome measures adopted. The problem is compounded by a lack of clarity, in many studies comparing nurses with other health care professionals, as to whether the desired outcome is equivalence (e.g. nurses are as safe and effective as doctors) or evidence of increased effectiveness. In addition, although many studies have shown that nurses can provide safe and effective care, they often do not examine the contribution of nursing activities specifically. Nevertheless, the reviews identified examples showing how nurses contribute to care structures, processes and clinical outcomes. Economic benefits were also reported particularly in relation to the minimisation of acute care use (hospital stay and emergency care). In addition the reviews identified evidence indicating that the contribution of nurses is likely to have benefits in terms of quality of care, such as patient satisfaction, care experience and continuous support.

There is evidence that nurses can safely and effectively run out-patient clinics (for example anticoagulant and cardiovascular clinics). In primary care, specialist nurses and practice nurses qualified in asthma care appear to improve process of care, clinical outcomes and reduce costs. Hospital at home schemes appeared to be safe for people with mild COPD, although their effects on people with severe COPD are unknown, and nursing outreach programmes may reduce hospital admissions in people with severe disability. The contribution of nurses may be effective in improving clinical outcomes and produce benefits for people with diabetes, which has modifiable factors and a clear care management process compared with COPD or MS.

The nursing contribution appeared to improve access, especially for vulnerable or hard to reach groups, and service infrastructure/care systems by responding to gaps and quality of services (Forbes et al 2007). Nursing focused service models designed to improve the interface between primary and secondary care through 'shared care' appeared to improve communication between health professionals (Bunn et al 2007; Scott et al 2007).

Barriers and facilitators to the contribution of nurses in CDM

The evidence on barriers and facilitators to the nursing contribution reflects common factors previously identified as influencing innovation and change in organisations[13]. The issue identified in these reviews, which is, perhaps, specific to nursing, is that of autonomy. Overall the reviews identified the following key factors that facilitated the contribution of nurses to CDM:

[13] *Isles V and Sutherland K. 2002. Change management - Review of existing research evidence on change management and quality improvement. Available at http://www.sdo.lshtm.ac.uk/files/adhoc/4-review.pdf*

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- Organisational preparation for new roles
- Good communication and collaboration between health professionals and primary/secondary interface
- Responsive doctors providing high levels of professional autonomy for nurses
- Adequate resources
- Continuous professional development
- Role clarity
- User involvement (few examples of nurses involving users in their care are given by Forbes et al (2007) with little material describing nurses' consultations with service users in a formal way to promote better care)

The barriers identified reflect the converse of the facilitating factors plus some other contextual features and inter professional issues:

- Constant reconfiguration of services and roles
- Instability in resources
- Lack of opportunities for training to expand nurses' roles
- Work force changes
- Lack of autonomy and recognition of expertise
- Poor interface between primary and secondary care
- Lack of managerial support
- Inappropriate use of nurses' time
- Professional concerns when new roles are not understood

Patient perspectives

The literature suggests that, when asked, patients report general satisfaction with the care provided by nurses, in particular patients view nurses as more approachable and accessible than doctors and value their consultation styles. However, the evidence also suggests that patients do not see nurses as currently able to provide all their chronic disease management needs particularly in relation to medication, although this perception does not come from studies specifically examining patient perspectives on nurse prescribing. Patients also value the appropriateness and timeliness of educational support from nurses although the reviews found that patients sometimes receive conflicting information or advice from different health care professionals. In addition, patients may have a differing view to professionals on what their own responsibility is in managing their condition.

Policy context

All three reviews focused on the English policy (which adopted the Kaiser Permanente Model and community matrons) in line with SDO conventions. Scott et al's review of the policy literature was part of the evidence review and was based on assumptions underlying English policy, rather than the UK.

Healthcare services internationally are seeking new ways to cope with the challenges posed by the growing number of people who are living with long-term conditions. A common policy goal is to reduce the number and length of hospital attendances and admissions that these people have historically experienced. The literature reflected this, and provided examples of how nurses are helping to increase the capacity and capability of the primary

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care sector through nurse-led clinics, role expansion and the provision of new and innovative ways of working to meet complex needs (such as outreach services and 'hospital at home' provision). The nurse is identified as a key provider in English policy and the community matron was identified as the key worker in supporting people with complex and long-term problems.[14] This was influenced by research and practice on case management in the United States. There were also some examples of primary care based nurses taking greater responsibility for referrals and managing case loads across organisational boundaries, in line with government policy on the care of people affected by long-term conditions. Department of Health policy is aimed at promoting new and innovative roles for nurses, accompanied by a drive to modernise nursing careers which addresses the identified need for nurses to receive appropriate training and support. Current policy also emphasises the importance of user involvement in service developments, but there were few accounts of this in the literature.

Limitations and methodological challenges

A number of methodological limitations were reported by the three reviews including poor quality studies, heterogeneity of interventions and short-term outcomes. The studies demonstrated a lack of clarity about whether interventions aimed to demonstrate equivalence or benefit or what elements of the complex interventions were being compared. There is also minimal empirical work that distinguishes between different approaches to providing nursing care. Information on a theoretical basis, content and intensity of interventions which are likely to influence effectiveness were not often available. There were few cost effectiveness evaluations or full economic appraisals. In addition to the limitations identified by each review, there were methodological challenges integrating the three reviews. The reviews each had a different theoretical approach and focus, different conceptual frameworks and adopted different methodologies for the conduct and synthesis of their reviews. This presented challenges for integration and made the identification of unifying concepts problematic. Moreover, the variations in the proportions of study types and how they relate to the impact of nursing contributions evaluated is unknown. The literature is restricted to the evidence base drawn from the three reviews with their individual distinct focus and other relevant studies on CDM may therefore have been excluded.

Conclusions

The evidence from the three reviews suggests that the nursing contribution to chronic disease management may improve quality of care, such as

[14] *Department of Health. Liberating the talents. Helping primary care trusts and nurses to deliver the NHS Plan.* London: *Department of Health*; 2002. *www.dh.gov.uk/assetRoot/04/07/62/50/04076250.pdf*

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patient satisfaction, care experience and continuous support. There is also evidence to show that nurses are integral to the structure and process of CDM and that they help implement care with proven clinical outcomes. It has also been shown that in some circumstances nurses provide care that is at least as safe and effective as that provided by doctors, although the cost effectiveness of many interventions is unproven.

Implications for policy, organisation and service delivery

The implications for policy, organisation and service delivery are that whilst nurses make a positive contribution to chronic disease management, several key issues need to be addressed. For policy makers, practitioners and managers, areas of policy, organisation and service delivery relevant to nursing contribution and supported by review evidence include:

1. Standardising nursing roles and functions through a consensus dialogue involving patients and other professionals. It will be important to recognise that different disorders and care contexts have different requirements. There will not be a 'one role fits all' solution. It is particularly clear from the reviews that both generic and specialist roles are required and while primary care can manage much of the care of people with long-term conditions they will require the support of specialist roles if they are to maintain care standards and incorporate new technologies and practices. Furthermore, it must be recognised that different disorders, specifically degenerative disorders, require a different approach as they may be less sensitive to target models based on disease outcomes
2. Appropriate training
3. Improving levels of professional autonomy for nurses
4. Identifying the types of 'professionals' suitable for a case management role, preparing and supporting nurses for a case management role in complex organisational infrastructures
5. Development and evaluation of new roles in joint practice based services of specialist nurse and practice nurse
6. Involving patients and users in the design of interventions, particularly patient reported outcome measures
7. Preparing and empowering GPs and relevant stakeholders for new developing roles, ensuring adequate support for nurses through collaborative working
8. Change management to address the barriers and facilitators for the development of effective models of nursing contribution

Gaps in evidence and recommendations for research

This synthesis of the three reviews shows that while there are many nursing activities in CDM, very few of these have been properly developed or evaluated. If the nursing contribution is to be properly developed and understood an ongoing programme of research is required to develop and test specific activities. The tendency has been for whole role evaluations or comparisons that provide little enduring knowledge to help nurses, policy makers or health care commissioners determine cost-effective approaches to care. The following recommendations are made for future research and will be particularly useful for practitioners, educators and researchers:

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1. The need to assess the effectiveness of specific nursing activities and interventions in relation to patient centred outcomes that have a proven relationship to those activities (this may require proof of concept studies). The activities should be clustered to reflect the main areas of activity identified in the reviews (health promotion; self-care support; case management; interventions to support continuous disease management; health technologies; psychological interventions; system level initiatives; and interface interventions like outreach nursing and home-based support.
2. The need to identify and test the efficiency and patient experience of different assessment systems for identifying needs and factors that are important in meeting those needs.
3. The need for user involvement in the development of nursing interventions and tools for measuring patient reported outcomes.
4. The need to develop methods appropriate for assessing nursing interventions and tools for measuring patient (and carer) outcomes.
5. The need to develop, compare and evaluate standardised core components for case management to be deployed in different care contexts (disorder specific, generic and older frail).

These initiatives would best flourish in integrated, ongoing, collaborative (inter-professional and inter organisational) research programmes located in diverse settings with facilitated access to patients and carers.

New insights of nursing contribution in CDM

Two reviews proposed evolving models of nursing contribution based on their evidence base. Forbes et al (2007) suggested an evolving model of nursing contribution to continuing care management with the nurse functioning in her relationship with the patient as an educator; interpreter; monitor; modulator and referrer. Scott et al (2007) acknowledged the inherent difficulties in integrating the medical, psychological and social models for evaluating the nursing contribution in chronic disease management and suggested a trajectory framework. It involves 'supportive assistance', an ongoing process that takes into account of the whole trajectory, shifting in accordance with changes in the patient's illness and circumstances. Such models may be useful in placing nursing services appropriately to increase the benefits of their contributions.

Despite the limitations, our review involved extensive coverage and provides an understanding, from different perspectives, of the current evidence on the nursing contribution to chronic disease management. It generates insights into the importance of process and context to outcome and also gives due weight to the perspectives of research participants. An overview such as this review provides a sense of 'added value' to the overall approaches and messages from reviews that all explore the nursing contribution to CDM in very different ways. Summaries of reviews are designed to be accessed by a variety of users[6] and those requiring detailed syntheses, can refer to the original reviews and their primary studies. The process of drawing together, mapping and synthesising evidence from the reviews enabled us to pull together common findings and to reach an overall consensus on key issues. Further findings from their current empirical work examining existing models and determining future nursing service requirements may provide more insights into future models for nursing in England.

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The Report

1 Background

The National Institute for Health Research (NIHR) Service Delivery Organisation (SDO) commissioned three projects to evaluate the nursing, midwifery and health visiting (NMHV) contribution to models of chronic disease management (CDM) and its impacts upon organisational, patient, carer and staff outcomes, quality and costs of care. This composite report brings together three reviews which were the first phase of work of three larger projects specifically commissioned in the context of recognition of the growing prevalence of people with chronic diseases and the associated costs to them, their families, the health and social care services and the economy. This review provides an overview of the three reviews and synthesises the key findings and issues around the nursing contribution to CDM. It draws out the main themes in the literature and identifies the range and quality of evidence to inform the nursing, midwifery and health visiting contribution to chronic diseases[15]. It does not include any new material over and above the material included in each of the supporting research reviews but provides an integration and synthesis.

1.1 Outline of the report

Our approach and findings are summarised in the Executive Summary.

Section 1 gives the background and the context for the review

Section 2 sets out the aims of the project and details the methods we employed for integrating three reviews.

Section 3 provides a summary of the review questions, conceptual frameworks and methods employed by the three reviews.

Section 4 provides a comprehensive map and a synthesis of the available evidence from the three reviews. It includes the following sub-sections:

Section 4.1 gives a descriptive mapping of evidence according to various categories (study types, diseases and country) and identifies the extent of overlap across the reviews

Section 4.2 uses our review framework to describe the nursing contribution, settings, nursing roles and development within the context of care delivery

Section 4.3 uses our review framework to describe the evidence within the context of service organisation.

Sections 4.4 and 4.5 provide a detailed synthesis of the evidence of impact (outcomes, provision and organisation of care, quality of care, resource use,

[15] *The terms chronic diseases and long term conditions have been used in this review to reflect the terminology used by the three reviews*

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barriers and facilitators, patient perspectives) and the policy context respectively.

Sections 5 and 6 provide a summary of the key messages from the evidence base and the limitations and the challenges of our approach.

Section 7 highlights what we have learnt, the implications for policy, organisation and service delivery, identifies gaps in current knowledge and proposes areas for further research. This section will be useful to all audiences (policy makers, practitioners, managers, educators, researchers). More specifically, policy makers may like to consider the key messages on types of nursing interventions and their impact on patient outcomes (Sections 4.2-4.5). They may encourage practitioners, managers, educators and researchers to take up the recommendations for future development and evaluations. (Section 7.2).

This is followed by the bibliography and appendices, which detail our methodological framework and evidence table of the overall findings from the three reviews.

1.2 Nurses and chronic disease management

Prevention of long-term conditions (LTC) is a main priority for the UK government and the rising incidence of chronic diseases presents a huge challenge not just to the NHS but worldwide (Department of Health [DOH] 2004a, 2004b). Almost 80 per cent of GP consultations relate to chronic disease and two-thirds of emergency hospital admissions are for exacerbations of chronic diseases. In addition, costs for patients with co-morbidities are much higher than those for a patient with only one chronic disease. Chronic disease management (CDM) focuses on providing well-integrated care that aims to enhance the quality of care while reducing costs across various settings (DOH 2005a, 2005b). A growing body of evidence from service improvements and programmes in the UK and other countries suggests that the following components are needed for good chronic disease management:

- Use of information systems to access key data on individuals and populations
- Identifying patients with chronic disease
- Stratifying patients by risk
- Involving patients in their own care
- Co-coordinating care (using case-managers)
- Using multidisciplinary teams
- Integrating specialist and generalist expertise
- Integrating care across organisational boundaries
- Aiming to minimise unnecessary visits and admissions
- Providing care in the least intensive setting

(*Source:* DOH 2004a)

This is a move away from expensive reactive unplanned care to effective, responsive and anticipatory care. It recognises the nursing role as key to the development and implementation of CDM. Although the contribution of nurses is evident at all levels of care identified in the Kaiser Permanente (KP) model (DOH 2005b) and in different CDM systems, there is much diversity in the levels of this contribution in the different contexts. Nursing

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is seen as key to improving patient outcomes and minimising inappropriate service use. However, whilst there has been some research into the effect of nurses in long-term conditions, there is a very limited evidence base for practice reflecting a lack of rigorous evaluations and it is not clear what types of nursing roles make the most difference for patients with long-term conditions. Nurses make up a large part of the health workforce in the UK and Government policies have suggested that nurses play a greater role than before in the health service response to people with chronic diseases.

The impetus for this integrated review came from the NIHR SDO representatives.

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2 Methods for the integrated review

This section describes the research questions, aims and objectives of the integrated review and the methods employed to integrate the reviews.

2.1 The three reviews

The context for the integrated review comes from the following three reviews, each with a different theoretical approach and focus:

1. Bunn et al 2007. Evaluating the nursing, midwifery and health visiting contribution to models of chronic disease management: a mapping of the literature. *University of Hertfordshire and City University, London*

2. Forbes et al 2007. Defining and evaluating the contribution of nurses to chronic disease management: an integrated review of the literature in diabetes mellitus, multiple sclerosis and chronic obstructive pulmonary disease. *King's College London*

3. Scott et al 2007. Evaluating the contribution of nurses, midwives and health visitors to the care of people affected by long-term conditions: a literature review. *Royal College of Nursing Institute, London, St. Georges, University of London, University College London, University of Hertfordshire, University of Surrey, King's College London*

2.2 Principal Research Questions

Although each review had its own particular focus, their aims and objectives were guided by the following overall principal research questions derived from the NIHR SDO commissioning brief:

- What are the different models of chronic disease management that involve nurses, midwives, health visitors, how have they developed and why?
- What are the ways that they involve service users and carers?
- What are the roles and responsibilities of nurses, midwives and health visitors in current models of chronic disease management?
- What is the impact of nurses' contribution to the experiences of patients, service users, professionals and carers?
- What enables nurses to contribute most effectively to successful outcomes of care?
- What is the impact of the nurses' contribution upon the cost, quality, effectiveness and organisation of the care provided?

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2.3 Aims and objectives of the integrated review

Aim

To synthesise the findings of the three reviews on the contribution of NMHV to CDM

Objectives

- To integrate the three reviews using appropriate methodologies and to provide an overall review of NMHV contribution to CDM
- To summarise the different approaches of the three reviews, their theoretical assumptions and methods
- To synthesise the findings and highlight methodological challenges
- To demonstrate the synergy, commonality and consensus between the three reviews
- To describe the process and outcomes for NMHV contribution and evidence of its impact
- To establish the types of NMHV activity and the contextual settings that have the strongest evidence base for practice
- To identify gaps in the evidence about effectiveness and appropriateness of specified interventions/models of care
- To make recommendations for practice and research

2.4 The process of integrating the three reviews

An iterative and a consensus approach was adopted through joint meetings with all three teams involved in planning and discussing the integration of the three reviews. This was considered important because the three commissioned reviews already had defined criteria and objectives and each team had employed different approaches to their reviews. Their contributions were, therefore, considered to be crucial in the progression of the overall review and in helping to reach a consensus on the synthesis of the findings.

Our iterative process was led by DT and involved:

1. Exploring methodologies for integrating evidence from the three reviews
2. Producing a draft protocol and a framework for the integrated review, and using them as a guide to organise and synthesise this report
3. Organising two workshops for the three teams to discuss the progress of the integrated review and to reach a consensus on the final report
4. Conducting two meetings of the Editorial Group (chaired by DT and represented by the three lead reviewers) to discuss the ongoing development of the integrated review, as well as the validity of the synthesis.

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Ways in which the work was shaped through the workshops and editorial group meetings

1. The three reviews were appraised independently in the first instance by DT. All the material for the integrated review were developed, compiled and circulated by DT prior to all meetings. These included protocol, framework, reference lists to identify papers common to one or more reviews and to map the extent of overlap across disease categories.

2. This progress was presented by DT at the first joint workshop of the three teams. The three reviewers (FB,AF,CS) presented their contexts, theoretical frameworks, and approaches they had taken for their individual reviews to inform the work developed by DT. Consensus on materials and methods was reached through team discussions

3. The editorial group had two meetings as well as ongoing liaison with DT. This approach was crucial in ensuring the validity of the synthesis and appropriate use of the one overall framework to summarise three different reviews, all addressing NMHV contribution to CDM. The group provided feedback on development reports and revisions of materials produced by DT.

   Specifically the issues considered by the group were:

   - Summarising data into overall categories of study designs, roles and types of nursing contribution,
   - The level of detail to be considered in an integrated review for descriptive mapping
   - The appropriateness of critically appraising reviews that were not designed to be systematic
   - The organisation of synthesis, particularly on the impact of nursing contribution to the provision of care. The group agreed to adopt the model proposed by DT (based on Webb 2006) to address Quality of care, clinical outcomes and resource use.

4. The work of the editorial group and a final draft report (compiled by DT) were presented at the second workshop of the three teams. A consensus was reached on the final submission to the SDO, authorship issues and publication of the integrated review in a peer reviewed journal.

The limitations and methodological challenges are discussed in Section 6. Our approach endeavoured to ensure the validity of the synthesis and provides an understanding, from different perspectives, of the current evidence on the nursing, midwifery and health visiting contribution to chronic disease management. The review benefited from discussion and guidance from the three teams and was therefore subject to ongoing internal peer review. Our organic process, whilst using a framework, was shaped largely by the methods used and findings of each of the independent literature reviews. The process of drawing together, mapping and synthesising evidence from the reviews enabled us to pull together common

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findings and to reach an overall consensus on key issues which are discussed in sections 4 and 5.

2.4.1 Exploring methodologies for integrating the three reviews

The review teams have used different conceptual frameworks and metaphors to explain key concepts of NMHV contribution. They have different foci and used different criteria to assess quality and effectiveness. They are not strictly systematic reviews and they presented different challenges in the methodology for their integration. Furthermore, there are very few established methodologies for integrating such reviews since most of these have been developed for systematic reviews (Swann et al 2003). More recently, methods for synthesising different types of evidence in reviews to inform policy and management have also been reported (Mays et al 2006, Oliver et al 2005, Popay et al 2006). Having explored the feasibility of developing and applying a methodological base for the synthesis of evidence across complex bodies of evidence, a narrative approach (combined with theoretical synthesis) was considered for an 'overview' of the three reviews. Application of approaches and methodologies for work on service organisations where different reviewers have conceptualised and investigated the 'same' problem in different ways and produced either similar and/or contradictory findings have been documented for systematic reviews (Greenhalgh et al 2004, Greenhalgh et al 2005).

Since we were unable to identify a single method that met the needs of the NIHR SDO for this integration of findings we used an organic process, which not only considered these methods but was shaped largely by the methods used and findings of each of the independent literature reviews. For our synthesis we considered only appropriate elements of several other methodologies, such as developing a framework (Oliver et al 2004). This approach added a useful methodological component to the integrated review of reviews and provided a tool for explaining findings in terms of different paradigms from which the reviews' data were synthesised. Key questions about interventions identified as being fundamental for improving the organisation and service delivery were considered in driving the protocol and framework for the integrated review. These included whether or not the intervention works, how and why it works, how best it can be implemented, how much better it works than existing programmes, for whom it works, the cost of its implementation, as well as questions relating to feasibility, acceptability and organisational requirements (Mays et al 2006).

2.5 Data extraction and synthesis for the integrated review

2.5.1 Framework for synthesising findings from the three reviews

Data were extracted according to a review protocol which was modified as appropriate based on the contents of the three reviews. A flexible framework was applied to organise data and to identify the themes and messages from the reviews, which were mainly descriptive or reflective rather than based strictly on systematic review methods. Figure 1 shows the outline of this framework, which is detailed in Appendix 1. It incorporates

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key distinguishing features/concepts of NMHV contribution and structures these into a framework for describing and analysing the evidence base. The main components are nursing contribution to the care and service contexts and the impact of this contribution on a number of outcomes. The framework addresses key questions pertinent to the evaluation of nursing contribution in people with LTCs and underpinned by existing models of care for the management of chronic diseases. In addition, we selected as key features of our framework those characteristics which we assumed would influence the process and outcomes of care, as well as provide insights into the nature of the nurses' role across care structures. The answers to the questions in the framework emerged from 'mapping' of thematic findings from the reviews on to the key NMHV contribution concepts/features identified in this framework. This method enabled us to explore relationships between the different domains of nursing contribution within the contexts of care, organisation, policy and evidence of impact on service, health, clinical, quality of care and economic outcomes (Appendix 1). The framework provided both a means of identifying major gaps in evidence in different contexts and recommending areas for future research.

A formal critical appraisal of the three reviews was considered to be inappropriate. The reviews were not strictly systematic reviews and had employed different methodologies appropriate to their review questions. Each review addressed the same overall question of evaluating the nursing contribution in CDM in different ways, and the purpose of the integrated review was to provide an overview of the overall questions, methods and findings. However, the following factors were considered for each review and the extent to which these were addressed by each review is discussed to help identify methodological differences between reviews and their implications on the findings:

- Clearly stated review questions and use of conceptual framework
- Inclusion of search methods to find evidence on their primary research question
- Inclusion criteria and screening methods for inclusion
- Methods of addressing bias and quality assessment
- Categorisation of data from primary studies
- Types of study designs
- Methods of synthesis
- Conclusions based on review's own data
- Limitations
- Gaps in evidence
- Recommendations for research and practice
- Implications for policy and practice

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Figure 1. Outline framework for evidence synthesis of nursing contribution to CDM from three reviews (Appendix 1)

<table>
<tr><th colspan="3">Key features of nursing contribution to CDM</th></tr>
<tr>
<td>Care context: Health care delivery

Assessment

Types of interventions/services models of care

Settings/places of care

Nursing roles and development</td>
<td>Service context: Health care organisation

Structures and service development, Access
Cross boundary working
Care management systems
Workforce issues
Technologies
User involvement</td>
<td>Care outcomes: Impact of nursing contribution

Quality of care
Service
Health
Clinical/disease
Economic
Patient/carer experiences
Barriers and facilitators
Policy context</td>
</tr>
<tr><td colspan="3">Discussion/Conclusions

Overall findings and key messages on:
Nursing roles, interventions and evidence of impact
Implications for policy, organisation and delivery
Evidence gaps and recommendations for research</td></tr>
</table>

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3 Methods of the three reviews

The work in all three reviews was guided by a steering group comprising of members with specialist knowledge and experience required for each review. A stated aim of the reviews was to further inform the ongoing empirical work of evaluating NMHV contribution within the UK.

This section compares the methods used to conduct the three reviews, their contexts and ways that the evidence has been synthesised. Each review's research questions and methods employed by the three reviews are summarised in Table 1.

3.1 Conceptual frameworks, review questions and inclusion criteria

The three reviews addressed a number of common research questions, although the drivers for the reviews varied. Whilst all described the nature of the nurse's role and the impact of nursing interventions, they differed in their theoretical approach, focus and the process. The domains addressed by all three included care delivery and organisational context, user and nurses views, patient and service related outcomes. The reviews included both quantitative (outcome evaluations), descriptive and qualitative studies (views studies) as well as reviews and considered material with a potential relevance to the UK. All study designs were included by Bunn et al (2007) and Forbes et al (2007) whereas Scott et al (2007) used a 'sufficiently rigorous design' to evaluate the effects of the nursing contribution on the outcomes of care. All three reviews differed in their selection process, the way the data were organised, categorised, synthesised and discussed, thus making it difficult to extract comparative data.

Bunn et al (2007)
The review applied a cyclical 'whole systems' approach to evaluate nursing contribution based on a framework for implementing evidence-based, protocol – driven care within the context of industrialisation of health care to meet mass population needs. It comprised a mapping of the literature which aimed to:
Describe the nature of the nursing roles and contribution to CDM
Evaluate their effects on CDM, barriers and facilitators and patient perspectives

It included most chronic conditions (except cancer) and NMHV interventions delivered to people of all ages.

Forbes et al (2007)
The review conceptualised the nursing contribution to CDM and aimed to:
Evaluate the effects of that contribution to assessment, health promotion, clinical interventions, care organisation, enabling and inhibiting factors, care structures, process and outcomes.

It focused on three tracer conditions: Chronic Obstructive Pulmonary Disease (COPD), Diabetes, Multiple Sclerosis (MS).

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Scott et al (2007)

The review provided a policy dimension by placing the evidence from the literature within the current policy arena. Assumptions underlying current policy in England on nursing interventions were used as a framework to guide the selection of literature and to synthesise the findings. The review aimed to:
Establish the evidence for the effectiveness and cost effectiveness of nurse-led service/care models (organisational interventions) for managing LTCs
Consider the impact of different sorts of nurses, working in different types of nurse-led services, upon patient outcomes

It focused on older people, case management, policy related evidence and five target conditions: COPD, epilepsy, rheumatoid arthritis, Parkinson's disease and asthma, areas which the author believed would identify a range of service delivery models. Interventions targeting children/young adults and studies of long-term mental health problems were excluded.

3.2 Searching and retrieval of items

The search for evidence was 'systematic' for all reviews and considered to be reasonably comprehensive. Screening for inclusion was non-systematic in one review (Scott et al 2007). It was appropriate for the methods employed to review a broad evidence base in that, studies were not only selected according to the inclusion criteria, but also from a 'fitness for purpose' perspective (Scott et al 2007). There were differences in the range and type of items included in each review. Search strategies for two reviews (Bunn et al 2007; Scott et al 2007) were similar, with sensitive and specific searches using most electronic databases and broader searches for chronic illness and LTC with and without NMHV search terms, as well as inclusion of some condition specific searches from 1996-2006. Forbes et al (2007) specified search strategies independently for each disorder and conducted systematic and consistent searches for each disorder with independent screening of abstracts identified by two reviewers, whereas only one reviewer screened items for inclusion for the other reviews (Bunn et al 2007; Scott et al 2007). Year of searches included 1980 – 2006 for COPD and diabetes and 2002-6 for MS (they had already undertaken a review of earlier literature). A list of databases and search results are shown in Table 1.

3.3 Data extraction, quality and categorisation of studies

The reviews identified the following categories: study types, which included reviews, outcome evaluations and qualitative/views studies, location (country) and types of disease or condition specified. Further classification, for example according to the Kaiser Permanente stratification, conceptual frameworks used, roles, settings and interventions/services were described if appropriate by the reviews and varied considerably, particularly with intervention types and outcome measures. Data extraction forms/templates were used appropriate for the review's framework, research questions and inclusion criteria (Section 3.1). Full quality assessment was not undertaken and the reviews varied in the extent to which they assessed quality of their included studies since they used different tools (Table 1).

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3.4 Methods of synthesis

The reviews employed different approaches to synthesise their evidence. Bunn et al (2007) used descriptive, narrative and tabulative mapping using an initial framework for evaluation. This included types of setting, interventions, nurses' roles, training, prescribing, substitution, integration (primary and secondary interface), simplification, use of protocols/guidelines, effectiveness of nursing interventions (including case management) according to disease category, barriers and facilitators, and the patients' perspective. Forbes et al (2007) used a consistent methodology of narrative, tabulative and theoretical synthesis of their three separate reviews according to their predefined conceptual framework: assessment, health promotion, clinical care and health care organisation. This included role attributes, practice innovations and types and levels of interventions, types of effects of the nursing contribution on care structures processes and outcomes in CDM in relation to the strength of the underpinning evidence, and cost effectiveness. Scott et al (2007) applied a realist approach that aims to synthesise the literature on social interventions by drawing on a wide range of sources. The method was underpinned by a predefined set of implicit assumptions, or theories, used as a framework. Evidence was organised into different categories of nurse-led services for the five conditions (according to types of setting), cross boundary working, case management, nurses and patients perspectives as well as for testing theoretical assumptions underpinning current policy on the involvement of nurses in the care of people with long-term conditions.

The conclusions reached by the reviews were supported by the review's own data, but the level of analysis varied. Forbes et al (2007) conducted an in-depth analysis with illustrations of examples of types and levels of nursing contributions to draw out relevant themes. Bunn et al (2007) reported findings according to intervention types within disease categories. Scott et al (2007) reported findings based on service models and analytical themes were difficult to draw from their synthesis. Each review highlighted its limitations and not all reviews derived new insights/models. They explored the links among the different components of frameworks/models to different degrees with the greatest transparency from Forbes et al (2007).

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Table 1. Summary of methods in the reviews for nursing contribution to chronic disease management

	Bunn et al 2007	Forbes et al 2007	Scott et al 2007
Type of review	Systematic mapping of literature	Integrated literature review of three reviews. The three 'feeder' reviews are based on the principles of systematic review	Literature review
Research Aims	To identify, map and evaluate models of CDM involving nurses, midwives or health visitors. To describe the nature of the nursing roles and contribution to CDM, their effects on CDM, barriers and facilitators and patient perspectives in relation to CDM	To identify nursing roles and their impact on care structures, process and outcomes, their contribution to assessment, health promotion, clinical care and care organisation, and enablers and inhibitors of nursing contribution to CDM. To develop theoretical models detailing the contribution of nurses in different systems of CDM (using organisational theory and conceptual framework)	Establish the evidence for the effectiveness and cost effectiveness of nurse-led service/care models (organisational interventions) for managing LTCs Consider the impact of different sorts of nurses, working in different types of nurse-led services, upon patient outcomes
Conceptual frameworks/ focus	Implementing evidence-based protocol – driven care: Focused on a 'whole systems approach' of nursing interventions within the context of industrialisation of health care to meet mass population needs	Conceptual framework mapping out key dimensions of the contribution of nurses to CDM: Nursing roles and health care : assessment, health promotion, clinical care, health care organisations, enabling and inhibiting factors, impact on user and service related outcomes	Assumptions underlying current English policy on nursing interventions were used as framework; identified relevant organising concepts: levels of research studies (user/nurse level, localised models of care delivery programmes), insights from different theoretical perspectives

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Table 1 continued

	Bunn et al 2007	Forbes et al 2007	Scott et al 2007
Inclusion criteria	Outcome evaluations and views studies (patients, carers, providers), NMHV contribution was a major component of chronic disease care. All study types, all ages, most chronic conditions, but excluding papers identified in included reviews. Cancer studies were excluded. Limited to English language only and published from 1996- April 2006	Nursing contribution within three tracer conditions: Chronic obstructive airways disease (COPD), Diabetes, Multiple sclerosis (MS), potential relevance to England, all study types (evaluations, descriptive and qualitative) but excluding papers identified in included reviews. Limited to English language only and published from 1980-2006; MS 2002-6	Nurse led care delivery services and interventions. All study types (outcome evaluations, views of patients, carers, nurses) including policy-relevant papers. Excluded studies of long-term mental health problems, children and/or young adults with LTC. Included studies also identified in reviews. Target conditions: COPD, asthma, Parkinson's disease, rheumatology, epilepsy. Case management for all chronic conditions, Limited to English language only and published from January 1996 - September 2006
Searching and retrieving items	Sensitive and specific searches using most electronic databases, checked reference lists and grey literature. Broader searches using chronic illness, LTC, with and without NMHV terms, some condition specific, additional searches in Endnote. Screening of abstracts by one reviewer to arrive at the final list of included items, followed by data extraction of included items	Search strategy specified independently for each disorder; grey literature, reference lists, expert opinion and snowballing were used to expand searches. Systematic and consistent searches across all three disorders. Independent screening of abstracts identified by two reviewers where explicit nursing practice was described, followed by data extraction of the included items	Sensitive and specific searches using most electronic databases, checked reference lists and grey literature. Broader searches using chronic illness, LTC, with and without NMHV terms, some condition specific, extra searches on neoplasms; additional searches in Endnote. List of included items developed through the data extraction process rather than through screening and selecting for inclusion

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Table 1 continued

	Bunn et al 2007	Forbes et al 2007	Scott et al 2007
Databases and number of items (See table of numbers by condition)	PubMed, CINAHL, AMED, BNI.DH Data, HMIC (incl. in DH Data, Kings Fund, PsycInfo, Embase, NRR ERIC, NTIS, Cochrane library: CTR, DARE, SR, HTA, NHS EED; WoS (SCI, HCI, SSCI), TRIP SCIRUS, OMNI, Medline Plus 12,680 records retrieved in Endnote 4724 screened in Endnote 403 full papers screened 203 items (183 studies) included	Medline 1996-2006;CINAHL 1982-2006 BNI 1985-2006 DHData via HMIC OVID database all dates – January 2006 Kings Fund via HMIC OVID database all dates – January 2006 Embase 1980-2006; ERIC 1984-2005; 1990-2006;Cochrane Diabetes MS COPD 672 227 867 records 90 53 120 papers 79 34 47 included	Databases identical to review 1; I January 1996 – 1 September 2006 (plus extra search terms) 15,536 retrieved in Endnote 1465 potentially relevant 606 full papers 192 items included (114 research based, 78 policy papers, etc)
Data extraction & quality	Developed & piloted data extraction tool, quality assessment of systematic reviews and RCTs using key criteria associated with bias in RCTs as well as how applicable the findings were to broader populations.	Developed and piloted data extraction tool, formal critical appraisal of all research papers and assessed them as being broadly weak, moderate or strong, according to the level of bias.	'Level' of evidence recorded; data extraction template based on Cochrane Effective Practice and Organisation of Care Group (EPOC)
Synthesis	Descriptive, narrative and tabulative mapping using the framework for evaluation ;analysis according to intervention types within disease categories	Narrative, tabulative and theoretical synthesis, according to the predefined conceptual framework. Underlying mechanisms within different models of CDM analysed to generate new insights into the nature of nursing contribution. Synthesis included an in-depth analysis and a theoretical interpretation of the content of the three reviews together	Realist syntheses to examine policy and research perspectives. Assumptions underlying current policy on nursing interventions were used as a framework to synthesise the findings

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4 Results: Evidence synthesis

This section discusses the descriptive evidence on nursing roles and development and the impact of nursing interventions on a number of outcomes. The synthesis integrates the thematic output from the individual reviews to provide an overview and to inform future work. The findings from the three reviews are discussed broadly around the nursing contribution in relation to the key domains/components of nursing contribution to CDM. Specific questions within each domain are used to draw out the key messages from the evidence. These are shown in the subsections and detailed in our framework (Appendix 1). A summary of overall key messages is shown in boxes only for those subsections where findings are discussed in great detail.

The findings from the reviews on nursing contribution are presented under the following headings:

4.1 Descriptive Mapping
4.2. Care context: Health care delivery
4.3 Service context: Health care organisation
4.4 Evidence of impact

4.1 Descriptive Mapping

This section provides an overview of the characteristics of the included items and a matrix of comparison of included items across the three reviews. All three reviews evaluated the NMHV contribution to CDM and one of the aims of the synthesis was to describe the types of items and the extent of overlap of included items across the three reviews.

4.1.1 Types of items by country

The majority of the material was from the UK: 47% (Bunn et al 2007); 59% (Forbes et al 2007) and 56% (Scott et al 2007) (Table 2). This reflects the common focus of identifying studies that have applicability to the UK setting. Case management studies were based largely in the USA.

4.1.2 Included items in the three reviews according to disease category

The number and the types of conditions included in each review are shown in Table 3.

Seven conditions were described by more than one review: COPD/respiratory, diabetes, MS, asthma, epilepsy, rheumatology, Parkinson's disease. Bunn et al (2007) identified 203 items, Forbes et al (2007) identified 160 for COPD, Diabetes, and MS and Scott et al (2007) identified 192, of which 114 were research based papers for its five tracer conditions: asthma, COPD, epilepsy, Parkinson's disease, rheumatoid arthritis, conditions which were also included by Bunn et al (2007). COPD, Diabetes and MS conditions were identified by two reviews (Bunn et al 2007; Forbes et al 2007) and only COPD condition was described by all three reviews.

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Figure 2 shows the total number of items according to condition specified in the three reviews.

There were 477 research based papers in total and 78 others such as policy related papers (Scott et al 2007). Of the total number of research papers included in the three reviews, diabetes was identified in 26%, followed by COPD (17%) and asthma (9%) (Figure 2). Case management papers (7.3% of the total) which were identified mostly by Scott et al (2007) focussed largely on older people and included about fourteen conditions. Figure 3 shows the percentage of items in each review by disease category. Bunn et al (2007) identified only sixty items describing the three conditions: COPD, diabetes and MS compared with 160 identified by Forbes et al (2007). There was a considerable variation in proportions of these items within each review with Forbes et al (2007) showing higher proportions of items within its review for the three conditions compared with the other reviews (Figure 3). Scott et al (2007) identified higher proportions of COPD, asthma, epilepsy, Parkinson's disease and rheumatology items compared with review Bunn et al (2007). Around 30% of their research items were on case management.

4.1.3 Overlap of items across three reviews

Conditions common to one or more reviews: COPD, diabetes, MS, asthma, epilepsy, rheumatology, Parkinson's disease and 'non-condition specific' areas were identified in about 52 papers out of 399 that identified these conditions. Overall there appears to be minimal overlap (14%) across the three reviews although the proportion of overlap varies considerably between the disease conditions. COPD, diabetes, MS and non-condition specific items for example show 6 – 12% overlap compared with other conditions, such as asthma, epilepsy, rheumatology, Parkinson's disease which range from 22-27% (Bunn et al 2007; Scott et al 2007). This extent of overlap overall is not unexpected due to differing foci, inclusion criteria, search dates, and methodologies of the three reviews for screening and retrieving items for inclusion. In addition, Scott et al (2007) included papers which were also identified in their systematic reviews whereas the other two reviews excluded these. The extent of 'double counting' was not assessed and it is possible that the overlap might be greater if the studies already in systematic reviews were also included in the two reviews (Forbes et al 2007, Bunn et al 2007), but this was not explored.

Study types within the three reviews

Figure 4 shows the study types within the three reviews. These are broad categories and the methods of classification of the studies in these categories may have varied between the three reviews. There is a considerable variation in the proportion of study types between reviews and disease categories. Overall, most items were evaluative in nature, within all three reviews for most of the disease categories; 69% (Bunn et al 2007), 48% (Forbes et al 2007) for the three tracer conditions (compared with only 19% for COPD, diabetes and MS from Bunn et al, 2007) and 55% (Scott et al 2007). The prevalence of descriptive studies was higher in one review (Forbes et al 2007) for the three tracer conditions (42%) compared with the other reviews (around 10%), whereas Bunn et al (2007) and Scott et al (2007) described more qualitative studies (around 15%) compared with

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only about 3% identified by Forbes et al (2007) (Figure 4). Overall, 43% of items tested effectiveness of nursing interventions in randomised controlled trials (RCT) across all chronic diseases, in addition to those RCTs described in their systematic reviews (Bunn et al 2007). Scott et al (2007) identified 38% as RCTs (of hospital based, primary care based, cross boundary based nurse-led services/models and nurse case management), most of which were also included in their systematic reviews. Around 5% for the three tracer conditions: COPD, Diabetes and MS were identified as RCTs by Forbes et al (2007) compared with around 29% described by Bunn et al (2007) for these conditions. For the five conditions (COPD, asthma, epilepsy, Parkinson's disease, rheumatology) described by two reviews together, over half were RCTs compared with just above a third in Scott et al's (2007) review. This also reflects the selection of items that would provide useful insights into the nature of nursing contribution, factors affecting their role developments and their impact rather than being restricted to the effectiveness using RCTs which have limitations for evaluating complex interventions.

Table 2. Location of studies by country

	Bunn et al 2007	**Forbes et al 2007**	**Scott et al, 2007**
Country	**Number of items (%)**	**Number of items (%)**	**Number of items (%)**
UK	96 (47)	95 (59)	64 (56)
USA/ Canada	48 (24)	35 (22)	24 (21)
Europe (not UK)	32 (16)	16 (10)	5 (4)
Australia/New Zealand	4 (2)	4 (3)	4 (4)
Asia/Other	7 (3)	10 (6)	1 (0.9)
Not specified or mixed (e.g. systematic review)	16 (8)		16 (14)
Total	**203**	**160**	**114**

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Table 3. Included papers in the three reviews according to disease category

Review	No of included items (% of total)	Categorisation of conditions in each review	Conditions common to one or more reviews & no of papers in the review
Bunn et al 2007	203 (36.6)	Range of conditions: Asthma Anticoagulation Bowel disease Cardiovascular COPD/respiratory Dermatology Diabetes Epilepsy Health promotion HIV Hypertension MS Not condition specific Parkinson disease Rheumatology Stroke Other (chronic pain, etc)	 COPD 13 (Common to all three reviews) Diabetes 45 MS 2 (Common to Bunn et al 2007,Forbes et al 2007) Asthma 25 Epilepsy 10 Rheumatology 10 Parkinson's disease 5 (Common to Bunn et al 2007, Scott et al, 2007)
Forbes et al 2007	160 (28.8%)	COPD Diabetes MS	COPD 47 Diabetes 79 MS 34
Scott et al 2007	192 (34.6) Research based items 114 Other (policy papers etc) 78	Asthma COPD Epilepsy Rheumatoid Arthritis Parkinson's Disease Case management	COPD 22 Asthma 19 Epilepsy 16 Rheumatoid Arthritis 18 Parkinson's Disease 4 Case management 35
Total	Total 555; Research based 477		

COPD Chronic Obstructive Pulmonary Disease; MS Multiple Sclerosis.

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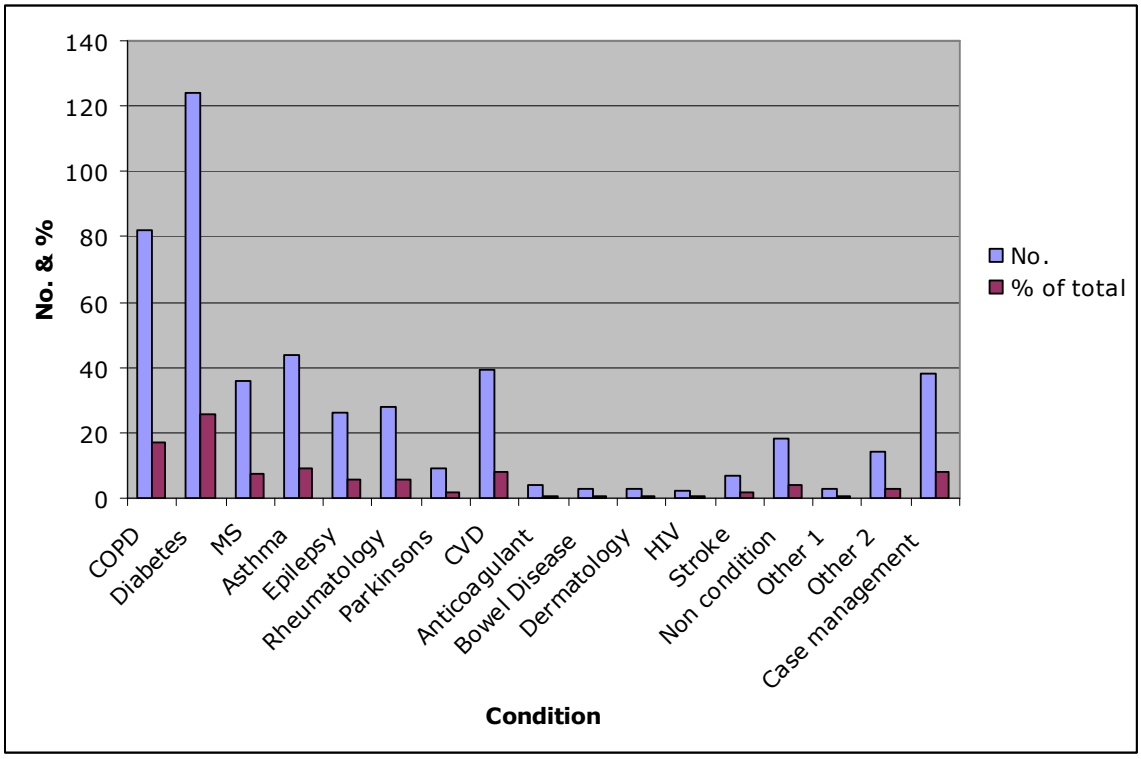
Figure 2 Included items by condition



COPD Chronic Obstructive Airways Disease; MS Multiple Sclerosis; CVD Cardiovascular disease; Other 1 = chronic pain, etc & other 2 = health promotion and hypertension identified by Bunn et al (2007; Case management identified by Scott et al (2007) although other reviews identified a small number of case management interventions within the disease categories shown

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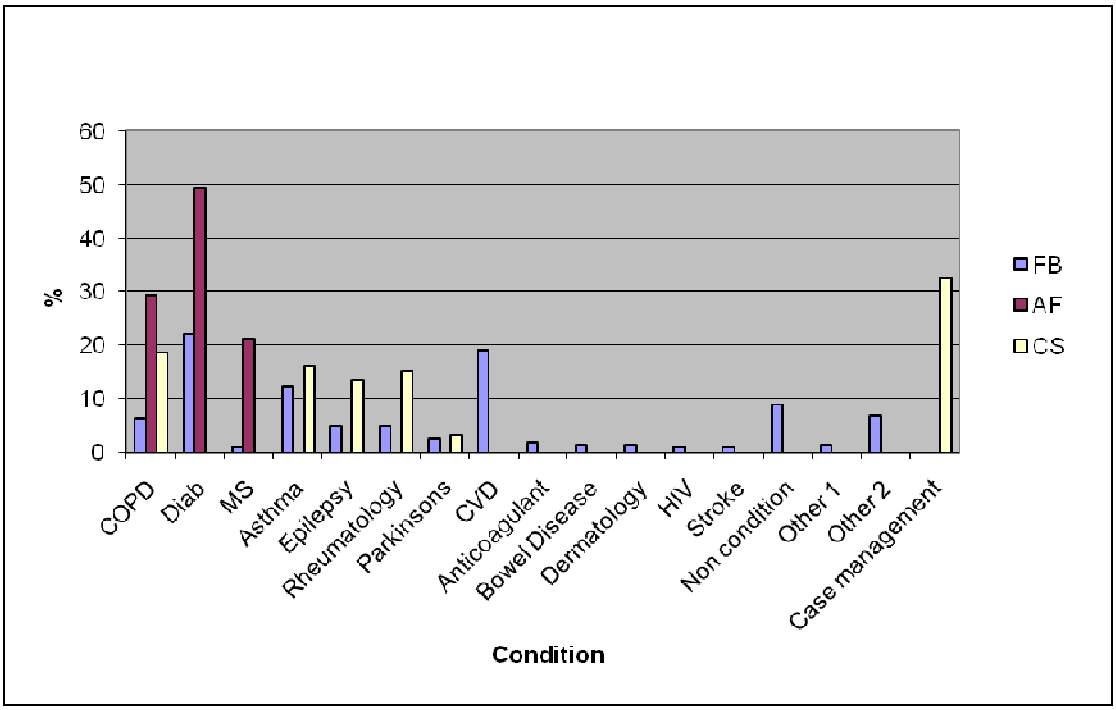
Figure 3 Included items within each review by disease category



FB: Bunn et al (2007); AF: Forbes et al (2007); CS: Scott et al (2007)
COPD Chronic Obstructive Airways Disease; MS Multiple Sclerosis; CVD Cardiovascular disease; Other 1 = chronic pain, etc & other 2 = health promotion and hypertension identified by Bunn et al (200)7; Case management identified by Scott et al (2007) although other reviews identified a small number of case management interventions within the disease categories shown

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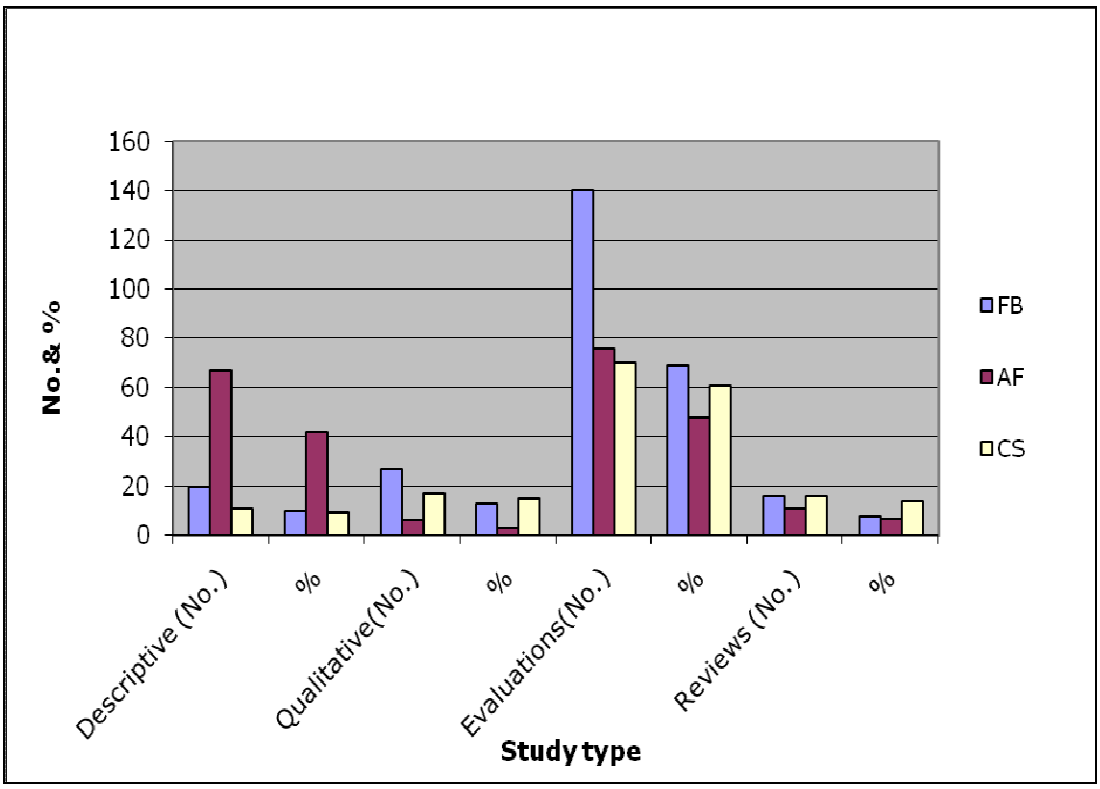
Figure 4 Study types within reviews



FB: Bunn et al (2007); AF: Forbes et al (2007); CS: Scott et al (2007)

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4.2 Care context: Health care delivery

- *What is the role of nurses in assessment practices?*
- *Do nurses provide care that aims to meet the health needs?*
- *Is there evidence to show how effective the nursing care is in meeting the identified needs?*
- *What is the evidence of impact on assessment?*

4.2.1 Improving care to meet identified needs

Assessment practices aim to identify patients with similar needs in order to allocate specific care and resources to meet their needs. The KP Model acknowledges that people affected by or at potential risk of LTCs have greatly differing needs – varying from preventing the development of an LTC in the first place, to the needs of highly complex and dependent patients.

The nursing contribution to assessment was examined by Forbes et al (2007) for their three tracer conditions COPD, diabetes and MS and described in about 50% of the items. (90% of the items in diabetes; 53% COPD and 41% for MS). Assessment practices were not defined separately by the other two reviews although they were mentioned as part of the overall intervention or care provided in most types of nurse-led care models, particularly in case management and disease management with multifaceted interventions for most chronic conditions. The role and extent of nursing contribution varied within and between the disorders reflecting broad practices and highly individualised needs. Nurses had a role, largely at the individual level, in finding patients and allocating them to an appropriate care programme. It was identified at a number of levels and was described as 'proactive initiation' for diabetes and a mixture of proactive and reactive initiation for MS and COPD. They also played a major role in monitoring patients in the care programme through collecting a broad range of data using various technologies, although their level of involvement in the design of technologies or interpreting data remains unclear (Forbes et al 2007). Doctors and nurses appeared to have different consultation styles in that nurses enabled and encouraged more patient participation. Further clarity is required on the optimum frequency and level of regular follow-up for sub-groups of patients, the degree of influence of different health professionals on the care systems, patients' preferences, nurse-patient interactions and assessment practices at group or family level. It is important to clarify how assessments are used to inform decision-making or to perform risk assessments and to determine practices that are efficient in both identifying and meeting the needs of patients.

4.2.2 Type of intervention/care organised and/or delivered by nurses

- *What is the evidence in relation to the types of interventions and care organised and/or delivered?*

Types of interventions, care and nurse-led services were described by all reviews, although not all studies from the reviews gave clear descriptions of the nature of the nursing intervention and how it was delivered. The reviewers categorised these differently, for example as nursing or clinical interventions (Forbes et al 2007; Bunn et al 2007) or as 'organisational

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intervention' that is 'establishment of services that are directed and/or delivered by nurses for people with long-term conditions' (Scott et al 2007). All three reviews reported a lack of clarity about the specific components of interventions overall, with a considerable overlap across the intervention types since most nursing interventions are complex and involve a number of inter-related components that often do not have identifiable 'active' elements. The range of categories is shown in Box 1, which highlights the different areas of contribution rather than reflect any particular model described by the reviews.

Box 1: Types of interventions/care/services

Assessment *(Forbes et al 2007)*

Education/health promotion to develop self management skills, health/self care advice, preventative care, behavioural interventions

Clinical interventions including:
Nurse-led/run clinics/models of care
Case management and care coordination
Disease management (monitoring and therapy adjustment)
Management of health technology (assessing, prescribing, implementation and safety)
Psychological support
Management of the care system (access, onward referral, discharge planning)
Cross boundary services/models e.g. liaison and outreach nursing
Home based support, hospital at home
Use of protocols/guidelines

Main Intervention areas described for COPD, diabetes, MS (review 2 Forbes et al 2007)

Symptom elevation
Care coordination
Disorder management
Rehabilitation
Palliation

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Specialist nurse interventions incorporating some form of education/advice were a feature of most chronic disease management described by the three reviews. The different types of interventions varied in their focus and were cited within the main care/service models described in different conditions and settings by Scott et al (2007). For example, a wide range of respiratory specialist services for COPD, and home-based schemes were described by most studies for COPD in all three reviews. The case management role for COPD was more clearly defined in relation to the community based chronic disease management model rather than the acute care model (Forbes et al 2007) as well as mostly in cross boundary working (Scott et al 2007). The nursing contribution for MS is multifaceted reflecting the complexity of dealing with the condition. Forbes et al (2007) attribute the lack of examples of case management for MS to an under representation of this form of care in the literature. Care co-ordinating interventions were common in diabetes and MS literature whereas rehabilitation and palliation were more common in COPD and MS. Forbes et al (2007) suggest that these reflect the key characteristics of the condition, with secondary prevention more dominant in diabetes and rehabilitation and palliation stronger in COPD and MS where the degree of chronic disability is greater. They also described more of the 'micro' level management of MS by a specialist nurse with his or her diverse role directed at specific problems or events (for example fatigue, diagnosis, relapse) and less often about 'macro' level management including care co-ordination although the nature of such models was not clear.

Of the papers on diabetes, around half described case management and educational interventions (Bunn et al 2007) with examples of disease management and nurse-led clinics for most chronic conditions. Others included nursing care, discharge management, health technology, psychological support, onward referral and follow-up care. Use of protocols and guidelines was documented in all three reviews, and seemed to be more common for some conditions than others, although this comprised only about 36% of studies overall (Bunn et al 2007). For example, in one review the use of protocols was more common in diabetes than for cardiovascular disease, although the authors relate this to insufficient details provided in the literature (Bunn et al 2007).

Health promoting and self care interventions providing patient education were described in most studies by Forbes et al (2007). This was as secondary or tertiary prevention with few accounts of primary prevention and with very little evidence of nurses working at the population level. Although nurses were involved in tailoring education for ethnic minority groups, it is not clear how this is adapted for specific communities, or whether it is effective in meeting their specific needs. There is more emphasis on structured multidisciplinary programmes of psychological education enabling patient involvement, although the appropriateness of information and education according to the different stages of diseases needs to be determined. The impact of health promotion interventions remains unclear due to the generic nature of many of these interventions and outcomes. As for COPD, a wide range of practices were identified for diabetes with much of the self-care advice being related to the safe and effective use of health care technology which were often nurse-led in both primary and specialist care settings.

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Classification according to KP model (DOH 2005b) showed considerable overlap of items across the levels of care, with many items identified at levels 1 and 2 (self care and specialist disease management). Although the prevalence of items was similar across all levels in their tracer conditions, variations within them were highlighted in that health promotion was most prevalent in diabetes compared with COPD and MS (Forbes et al 2007). Self care was least prevalent and disease management most prevalent in COPD. For MS, self care was most prevalent compared with other levels of care (Forbes et al 2007). Only case management was defined distinctly by Scott et al (2007) although their nurse-led models of delivery described interventions that targeted all levels of care. The utility of these models in this context may be questionable since the categories are based on non–UK model of care and the nursing roles identified in the literature did not clearly match with any particular level of care defined by the KP model (Bunn et al 2007).

Case management

Case management is a core component of many interventions for long-term conditions. It was a key focus of one review (Scott et al 2007) and represented around 30% of their included studies in comparison with 14% and 18% from the other reviews (Bunn et al 2007; Forbes et al 2007). Nurse case management roles are outlined in section 4.2.4. Overall case management was not well defined in the literature, most of which was US based, and was used in different ways between disorders. For example, in diabetes care the case-management role was based on a comprehensive care approach (therapy intensification and monitoring) whilst in COPD and MS care the case management activity was more fragmented and determined by patient events or advancing disease (Forbes et al 2007). There is a considerable variation of nurse case management models across different managed care programmes. Models being used include the NHS and social care model, KP model (DOH 2005b), United health care and Pfizer (Scott et al 2007) and often models were not stated. The evidence raises important concerns related to a lack of clear definition of case management and the various ways of describing case management functions (such as monitoring critical care pathways, 'assertive outreach service', comprehensive assessments, the development and monitoring of care plans, referrals and regular follow-up).

Based on the overall evidence, nurse case management is considered to be "…. *a multi-faceted intervention, which may be delivered with varying degrees of intensity and which may have some – or most – of the following components: case finding and organising preventive measures; improved education for self management, provided in inpatient or community settings; discharge planning; monitoring care after discharge by home visits or telephone; liaison with other health and social care agencies….".* Scott et al (2007) described five distinctive types of nurse case management:

- In-patient case management such as implementing critical care pathways
- Following hospital admission, such as discharge planning, secondary prevention
- Community-based preventive case management of high risk older people, such as community-based nursing to maintain people at home

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- Preventive case management of people with specific long-term conditions, such as promoting self care/management to help people manage their own condition
- Preventive case management of high-risk nursing home residents, such as the Evercare model of care delivered by community matrons

Key messages: Interventions

- Lack of clear descriptions of the nature of interventions and how they are delivered
- Considerable heterogeneity between the types of interventions, settings, populations and designs described
- Nursing interventions are complex and involve inter-related components that often have no easily identifiable 'active' elements
- The levels and types of intervention may reflect the degree of complexities and chronic disability in conditions
- Most interventions included case management, disease management, discharge planning, health technology, home-based support
- The contribution of nurses was less clear in palliation
- Nurses have an important function in assessment but their level of involvement is unclear
- Use of protocols and guidelines were more common for some conditions than others
- Health promotion and self care interventions providing patient education were mostly for secondary or tertiary prevention, employed different approaches and varied between disorders
- Case management was described in various ways and poorly defined
- Various models of case management are described and often models used are not stated
- Considerable overlap of items across the levels of care defined by the KP model with variations between disease conditions

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4.2.3 Settings and cross boundary

- What types of settings are described for nurse-led models of care?
- What is the evidence in relation to interface working?
- What types of cross boundary working are described?

The delivery of nursing care has shifted the focus of the nursing roles into more primary and continuing care settings particularly for COPD, diabetes and MS (Forbes et al 2007). Nurses deliver interventions in a variety of settings mostly in the community (for example the patient's own home), primary care or hospital outpatient clinics, with limited examples of inpatient settings. They work in primary or secondary care and also across sectors (cross boundary) with the aim to improve the interface between primary and secondary care (i.e. specialist hospital based nurses working in primary care). Forbes et al (2007) also described 'intermediate and rehabilitation' and tele-care (for diabetes) but no examples of 'continuing care'. Bunn et al (2007) described around 25% of their included studies as outpatient clinics for various chronic conditions, Forbes et al (2007) identified around 25% as 'secondary/tertiary' and 11% as 'acute' for their three tracer conditions, and Scott et al (2007) described around 13% as innovative nurse clinics in a hospital outpatient setting for their five tracer conditions.

Nurses contribute to cross boundary working in many ways such as through community teams, collaboration and primary/secondary interface activities. For example, nurses complement the role of doctors (mostly partial substitution) focusing on patient-centred care (Forbes et al 2007, Bunn et al 2007, Scott et al 2007). UK models of care included specialist nurses providing liaison and outreach service for Parkinson's disease, epilepsy, home-based education and support, practice nurses for asthma, hospital at home services for COPD and a structured holistic model for diabetes care, enabling patients to actively participate in their own care. These have been shown to improve shared care, links and communication between the primary and secondary sectors. However, joint working within health care and local authority to deliver 'holistic health care and support' highlighted complexities of multiagency practice (Scott et al 2007). Nurses work with other professionals such as occupational therapists and physiotherapists, and as community matrons, although interface with social services, carers and continuing care settings were not well represented in the literature. Shared care and transmural clinics are also described for diabetes, COPD and rheumatology (Bunn et al 2007, Scott et al 2007). In general, these interventions appeared to improve communication between health care professionals although the effect on clinical outcomes was less clear. Nurses' roles have evolved and expanded across various settings with the aim of promoting better integration across primary/secondary interface. (Section 4.2.4)

4.2.4 Nursing roles and development

- What types of nursing roles are explicitly defined and described?
- Does the evidence describe innovative/new and enhanced roles for nurses?
- What does the evidence tell us about the development of nursing roles, levels of skills and training in providing long-term care?
- What are the key factors relating to the development of nursing roles?

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- What does the evidence on developing roles/responsibilities tell us about career structure which enables them to work in different care settings, to take on changed roles and responsibilities, to pursue education and training and to develop the required skill mix? How does this fit into "Modernising nursing careers setting the direction?" (DOH Report 2006)

This section describes the issues around nursing roles within the context of the overall care delivery system.

Types and roles of nurses in chronic disease management

The nature of the nurses' roles in delivering the interventions varied across the disease categories and the reviews. Whilst various titles including specialist nurse, nurse practitioner, nurse case manager, practice nurse and advanced practice nurse are identified, there is little clarity about the specifics of each role and the qualifications and skills required (Box 2). Many studies did not specify roles. The majority of the roles were classified as specialist nurses, with practice nurse roles more commonly featured in the management of diabetes, COPD, asthma and cardiovascular conditions, hypertension and health promotion but not for MS (Forbes et al 2007, Bunn et al 2007, Scott et al 2007). Clinical nurse specialists working with widely different levels of responsibility across the UK is attributed partly to a lack of standardisation in their roles.

Nurses were involved in the monitoring and treatment of patients on anticoagulants including computerised decision support and patient testing, as well as telemonitoring. Specialist nurses were also a feature of stroke, bowel disease, dermatology and HIV. Very few examples of community/district nursing were encountered for HIV and stroke and overall less than a quarter reported that they had any specialist training (Bunn et al 2007).

The role of nurses as case managers was poorly defined in the literature. Scott et al (2007) further identified a considerable variation in the role and functions of nurse case managers ranging from what the author describes as a 'brokerage' type of role such as coordinating, monitoring and cost control to a 'hands on' clinical role incorporating a case management function, suggesting a need for standardisation. In line with the Department of Health policy initiative, advanced nurse practitioner case managers or community matrons offer personalised care plans for vulnerable people most at risk. Their role ranged from needs assessment and provision of clinical care to the cross-boundary coordination of provider agencies. Their work has identified the extent of the unmet need for health and social support amongst community-dwelling older people. There were no examples of the 'community matron role' from the COPD, diabetes and MS review (Forbes et al 2007). Although the community matron role appeared to be largely generic, examples of case managers for intensive disease management were described also in diabetes and congestive heart failure (Scott et al 2007).

Structures and role development

The evidence from the three reviews suggests that nursing roles are expanding hierarchically, for example clinical specialist and nurse consultant roles, as well as laterally to include doctor substitution, mostly partial, for example through nurse prescribing, boundary expansion through cross

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boundary working and advanced practice, for example leading new service developments.

Common forms of substitution were nurse-led clinics, for example nurse-run anticoagulation clinics or clinics for patients with diabetes or cardiovascular disease. The substitution role was usually considered to be complimentary and collaborative with highly specialised and experienced nurses in outpatient clinics nurses providing longer consultations than doctors which was considered to improve continuity of care and achieve clinical outcomes at least equal to those provided by doctors (Forbes et al 2007, Bunn et al 2007, Scott et al 2007). Examples of nurse-doctor substitution included identifying disease; diagnosis; the initiation of therapies including prescribing; and independent management of acute episodes of care (Forbes et al 2007). Substitution was identified in 30% of the studies, but in many cases this was only partial as nurses could not always prescribe medication, order investigations or make referrals (Bunn et al 2007). However, the nature and the level of supervision from doctors and nurses' levels of autonomy were generally not specified (Bunn et al 2007). In general, nurses do not appear to have a high level of professional autonomy. The extent of duplication of services by nurses and doctors was unclear, as was the impact of nurse-doctor substitution on doctors' workload. Hospital at home schemes for patients with COPD and respiratory problems where care was generally provided by specialist respiratory nurses provide examples of substitution of care from secondary to primary care. Technology was used to substitute in a relatively small number of studies whereas around 30% of studies reported the use of some form of telephone intervention or follow up (Bunn et al 2007). A 'combined approach' to care delivery from hospital based 'transmural rheumatology nurse clinics' in the Netherlands providing 'expert nursing care' appeared to be as safe as, and in some cases more acceptable than, their consultant colleagues. These nurses were managing their own caseloads and had authority for making referrals and coordinating care (Bunn et al 2007, Scott et al 2007). Although role developments are linked to increasing use of evidence based protocols and guidelines, the level of autonomy for nurses may be influenced by the management of the care environment. For example, a trained nurse practitioner delivering bronchiectasis care can practice autonomously within a specialist outpatient clinic and be as effective as a doctor, although the implications for such roles in primary care setting are not clear (Scott et al 2007).

Specialist nurses in liaison posts and outreach nursing provided care for COPD, asthma, Parkinson's disease (PD) and epilepsy with examples of PD nurse being more conversant with guidance on prescribing than doctors and working in joint nurse/consultant clinics, with responsibility for referrals, some substitution work and coordinating multidisciplinary teams for disease management (Scott et al 2007). Nursing roles are expanding to meet the complex needs of diabetic patients through nurse link workers to improve the primary/secondary interface and nurse advisors to improve hospital in-patient management as well as advancing nursing practice through nurse practitioners, and nurse prescribing for the management of diabetes complications. An example of a new and innovative role for epilepsy in primary care was combining a nurse-specialist role with a case manager role, which expanded the skill mix, promoted experiential learning, provided more flexible care responsive to patients' needs, improved the overall process of care and reduced overall costs (Scott et al 2007, Bunn et al 2007). These few examples highlight the importance of the collaborative

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working relationships between doctors and specialist nurses, and strengthening the links between primary and secondary care, through 'supplementation' rather than direct 'substitution'.

Nurse consultant posts leading service development are emerging with examples of nurses administrating medications for COPD for rapid access and nurse consultants developing and supporting other nurses to deliver the service especially in MS. The interface between the specialist nursing roles, particularly for MS, and other nurses, was unclear in the literature and in the authors' opinion may reflect a bias towards the specialist role in the literature, whereas non-specialist roles such as continence nurses were considered to have an important role in managing symptoms in people with long term conditions (Forbes et al 2007). District nurses were involved in a range of public health and health education activities which were largely opportunistic. Paediatric and community children's nursing for acute and chronically ill children required different levels of nursing skills, for example enabling, facilitating and empowering the child and the family relationships, as well as providing individualised care according to assessed needs of the child and identifying other professional support for the families (Bunn et al 2007). There is a lack of evidence for the role of midwives and health visitors' contribution as well as for traditional or more general nursing.

Box 2: Types of nursing roles

Specialist nurse *(39% of studies Bunn et al 2007, Forbes et al 2007)*
Practice nurse/primary care nurse *(14% studies, Bunn et al 2007, Forbes et al 2007)*

Other examples from the literature:

Advanced Practice nurse
Nurse practitioner
District nurse/community nurse
Hospital nurse
General nurse
Nurse consultant
Nurse/case-manager - non UK
Nurse educator - non UK
Nurse advisor
Nurse manager
Nurse link worker
Multiple
Continence nurse
Palliative care nurse
Psychiatric nurse

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Training and skills development

The following themes were identified:

1. There are different pathways to specialist training
Very few studies indicated specialist training (postgraduate training, specialist diplomas) or 'relevant' experience which varied greatly and no formal or established training pathways were identified. The roles of specialist nurses, nurse practitioners and advanced practice nurses with formal qualifications depend largely on their level of clinical experience and knowledge acquired to some extent by working under the guidance of doctors (e.g. rheumatology, epilepsy, Parkinson's disease). Their personal qualities are more likely to influence success rather than structured posts or training. Regulation of advanced nursing roles is considered to be important although nursing appointments and their career structures are likely to be based on competencies for the role in line with DOH's guidance on nursing appointments (DOH 1999, NHS Executive 1999)

2. Role of practice nurses
Practice nurses are taking active roles in diabetes, (particularly Type 2), asthma and COPD. There is, however, a mismatch between the nurses' level of training and responsibility for conducting regular asthma reviews, suggesting a need to support nurses to acquire asthma qualifications to ensure the delivery of best possible care. Only a few nurses considered they had a 'maximum' role in asthma care and were unlikely to view their role as fully responsible unless they had an asthma qualification. Furthermore specially trained nurses are more confident in their ability to develop and encourage self management skills in patients and the evidence suggests that nurse-led clinics are more likely to carry out thorough assessments and checking of medication than GPs alone (Scott et al 2007).

3. Specialist nurses' role in workforce development
The literature identifies a need for practice nurses to develop their skills for the management of other conditions such as epilepsy. Specialist nurses can support practice nurses through joint practices and education to improve their competencies and confidence in managing other chronic conditions, such as epilepsy, case management, etc. Specialist nurses have a role in providing education to other health professional and care workers to improve the quality of care provided and to enable an expansion in care provision (e.g. enabling people with MS to receive their intravenous steroids at home) (Forbes et al 2007).

4. Professional autonomy and nurse prescribing roles
Although there were some examples of nurses taking greater responsibilities for referrals and managing case loads in line with the Government's initiatives on promoting new and innovative roles for nurses, the level of autonomy was varied and unclear. Nurse prescribing roles and the required training were not adequately addressed in the primary studies. Examples of varying levels of autonomy are given in the literature, such as advanced practice nurse identified for diabetes and a few that contributed to new or innovative service developments with higher levels of authority, responsibility and autonomy for example in epilepsy, rheumatology and asthma care (Scott et al 2007). The extent of nurse prescribing from the literature is not clear and appears to be at a monitoring or advisory level. Only about 15% of studies specified that nurses could alter or prescribe medication and this appeared to be mostly for titration or modification of

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drugs previously prescribed by a doctor (Bunn et al 2007). Moreover many specialist nurses consider themselves to be incompetent in the prescribing of anti-epileptic medication (Scott et al 2007).

5. Preparing for case management roles
Although most studies for nurse case managers were USA based, some themes emerged on the training of nurses for a community-based case management role applicable also in the UK:

Nurses from different backgrounds need to be prepared for case management roles, such as moving from secondary care to community case management role as well as adaptation by district nurses to a more proactive Evercare/community matron type of role. Important differences in the skills and training of staff providing case management were reported, such as registered nurses from the USA with master's level qualifications and UK nurses having some form of post-graduate qualifications. (Scott et al 2007). Moreover practical problems of preparing and supporting nurses and 'other professionals' for the community matron role and getting it accepted by general practitioners, other community nurses, patients and other stakeholders have been identified (Bunn et al 2007, Scott et al 2007).

6. Educational and supportive role in CDM
The nurses role in education and the promotion of self management in CDM is important and valued by patients and their families, although how to acquire these skills needs to be addressed. There is hardly any evidence on the adequacy of current professional education for this role.

Nurses' current contribution (if any) on traditional nursing roles is not known. It is not clear whether the more specialised roles deliver more focused or more fragmented care with inefficient use of resources. Multidisciplinary team work, the associated changes in professional boundaries and diminishing professional autonomy for nurses is reflected in much of the literature. The extent to which nurses lead developments and the extent to which they are externally driven is unclear. Current policy on 'modernising nursing careers' (DOH 2006) is addressing the lack of clear definitions and competencies surrounding specialist and advanced nursing practice evident from the literature.

Key factors relating to nurse role developments in CDM

A number of factors relating to nursing role developments in CDM have been highlighted in the literature. Roles and structures need to be viewed within the whole care system since many factors influence their development such as management of complex care systems, workforce changes, improving access, economic issues and emphasis on self management and patient empowerment. Other factors include variations in roles and their stability, role of practice nurses delivering specialist care, implications of role expansion for traditional nursing as well as levels of nursing care for sub-specialisation. Forbes et al (2007) also suggests an 'evolving care' where different disease trajectories determine different levels of nursing care or service.

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Key messages: Nursing roles and developments

- Specialist nurses, practice nurses, case managers are the most commonly identified providers of care for CDM. The focus of the nursing roles has shifted into more primary and continuing care settings through cross boundary working
- There is an intrinsic heterogeneity and flexibility with multiple titles, roles and functions
- The pathways to training are diverse and unclear
- Nursing contribution is influenced by funding, infrastructure, location, education, clinical expertise and other contextual factors
- Nursing roles are expanding hierarchically (specialist and nurse consultant) and laterally (substitution, boundary advanced practice)
- There is a lack of high levels of professional autonomy
- Insufficient detail about nursing input is reported
- Practice nurses need support in obtaining asthma qualifications and training to deliver the best possible care
- Specialist nurses have a role in developing practice nurses' skills in the management of other chronic diseases e.g. epilepsy
- Case managers have a range of titles: community matrons, advance primary nurses, case or care managers, care co-ordinators. They are not always nurses and need to be prepared for case management roles
- There is evidence of redesigning the nursing workforce to fit case management approach
- Focus of care for case management may be people with specific diseases /problems, discrete populations or chronic disease as one part of a more generic role e.g. most common LTCs are COPD, diabetes, heart failure, coronary heart disease. Some specify case load size and patient inclusion criteria
- Drivers are reduced emergency admissions to meet Government targets

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4.3 Service context: Health care organisation

What is the evidence for NMHV contribution in relation to the various aspects of health care organisation such as improved access, development of new services, care management systems?

Nursing contribution to the delivery system for CDM (case management, disease management, supportive self care, health promotion) needs to be considered both within the care context and the care organisation (Framework, Appendix 1). The former actively seeks to influence the care experience of the individual patient, whereas the latter influences the context of the care provision, the underpinning system or the environment. There is some overlap between these since nurses' roles in delivering interventions or care are linked to services and systems of care management with the overall aim to improve patient care. Nursing contribution to the various aspects of the health care organisation has been well described by Forbes et al (2007) for COPD, diabetes and MS. Many of these themes have also emerged from the organisational interventions described by Scott et al (2007) and types of interventions identified by Bunn et al (2007). Key themes include:

1. Workforce development (section 4.2.4)

2. Management of care systems: Nurses contribution is described at the macro (strategic) level through policy initiatives; the meso level (the operational level), where most activity is focused, and; the micro level of interaction between nurses, patients and other professionals, for example nurses contribution to self management (Bunn et al 2007, Forbes et al 2007, Scott 2007). Within the whole care system, nurses are involved in care functions described in section 4.2.2. The relationship of the nurse to the care system is not clear and Forbes et al (2007) suggest that nurses may function either more actively or passively within the care systems depending on their levels of responsibility and autonomy.

3. Service development: Examples of specialist nurses' involvement in service development included work force development, improving access, developing interfaces between services, information resources, patient support systems, databases, communication methods, improving interventions and monitoring service quality. Nurses improved access to services in a number of ways: Targeting specific patient groups, such as older people, ethnic minorities, etc, case finding and better management processes. MS nurses, for example, were involved in developing new systems for assessment, innovative initiatives such as new diagnostic clinics, relapse services and fatigue management clinics, as well as involving users in developing information resources (Forbes et al 2007). Other examples include telephone review for asthma, direct access for a rapid review of rheumatoid arthritis, a nurse consultant combined approach to care of delivery to rheumatology patients, innovative joint practice/specialist nurse for epilepsy and multi agency outreach team led by respiratory nurse specialist providing home care for COPD. Case management for hospitalised COPD patients improved access to health care personnel, resources and equipment after discharge (Scott et al 2007). Case management for CVD provided rapid access to prescriptions, equipment and support services, and practice nurse as an advocate provided appropriate and rapid access to GP (Bunn et al 2007). Involving

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users in developing interventions, organising and planning services needs to be addressed.

4. Health technology: The nurses' roles in the use of health technology to manage and monitor care performance included video care, nurse-led telecardiology, telemonitoring for hypertension, telemedicine for COPD and telephone interventions. These interventions may benefit patients although the extent to which nurses engage positively with technology is unclear.

5. Continuity of care: Nurses provided this through some aspects of coordinated care, cross boundary working and information giving although inconsistencies in care and professional advice were noted for COPD. Service configurations, structures and resources appear to influence continuity of care (Forbes et al 2007).

6. Evidence based practice: Nurses supported evidence-based care for diabetes through the implementation of evidence-based guidelines and providing education and support to patients and other professionals (Bunn et al 2007, Forbes et al 2007). The extent of evidence-based care in other conditions, how the care systems are regulated within each type of disease condition and what the contribution of nurses is to different levels of this system regulation was less clear.

Key messages: Nursing contribution to health care organisation

- Nurses have a role in workforce development
- Nurses contribute to the management of care systems at all levels. They are involved in the organisation of care as well as at the 'micro' level of interaction between nurses, patients and other professionals
- Nurses have a role in service development through improving access and developing new interfaces/systems between services
- Nurses' roles in health technology include managing and monitoring care performance although the level of their involvement is unclear
- Service configurations, structures and resources appear to influence continuity of care
- Involving users in developing interventions, organising and planning services needs to be addressed. MS nurses involved users in developing information resources
- The regulation of care systems for each type of disease and what the nursing contribution is to different levels of this system is unclear

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4.4 Evidence of impact

- What does the evidence tell us about the impact of the nursing contribution in CDM?
- What is the evidence for different levels of NMHV practices and benefits in different settings?
- What outcomes were defined and what was the evidence for improving these outcomes?
- What is the evidence for improved experiences for patients/carers/professionals?
- What were the barriers and facilitators?
- How is nursing perceived in public services?
- What is the evidence of impact on health care quality?

This section examines the impact of nursing contribution on a number of outcomes. The synthesis only describes nursing contribution since there were hardly any accounts of midwifery or health visitor contribution.

4.4.1 Outcomes

The findings on the impact of nurses' contribution in CDM from each review by disease category are shown in Table 4 (Appendix 2) indicating the types of studies, interventions, settings and outcomes described for specific conditions. Most of the findings are reported from outcome evaluations, which included RCTs as well as mixed design studies. The types of outcomes reported overall included those related to health (quality of life), patient behaviours and knowledge, services (e.g. access, hospital admissions, use of emergency departments, length of stay, or hospital days) clinical/disease (e.g. mortality, morbidity, risk factors, symptoms, medication use), quality of care, cost effectiveness, although not all dimensions of health care quality (Maxwell 1992) were reported. The reviews reported process indicators, data on effectiveness as well as views/experiences from qualitative and survey data. All three reviews defined the measures of outcomes differently. Forbes et al (2007) defined structures, processes and outcome measures for 'nursing contribution' as an intervention rather than the impact of specific types of interventions. In contrast, Bunn et al (2007) has described the evidence of various intervention types and outcomes according to disease categories. Scott et al (2007) has reported the impact of nursing interventions on various outcomes in particular settings. It was therefore not possible to extract accurate comparative data from the three reviews nor was it feasible to delineate the findings from all the reviews into common concepts such as structure, process and outcome. The categories defined by Forbes et al (2007) have been used as a guide whilst incorporating related themes from the other reviews to provide a picture of some unifying concepts across the three reviews. The findings are presented therefore according to themes identified as those that have emerged from all three reviews on the impact of nursing contribution/services.

4.4.2 Organisation of synthesis

The synthesis is organised broadly around the key domains identified in our framework, mainly the care context and health care organisation (Appendix 1). Where appropriate and where data were available, within these

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dimensions we have addressed quality of care (including process of care), clinical outcomes, and resource use or cost effectiveness based on the format used by Webb (2006), with some overlaps due to the differences in reporting of outcomes between the reviews. Since there was much overlap between types of interventions, and therefore difficult to categorise the evidence according to the components of the delivery system, we have reported the impact of 'nursing contribution' as a whole, with examples of components of the contribution where possible. Case management as a specific intervention is discussed separately in section 4.4.3.

4.4.3 Impact of nursing contribution to the provision of care: Nurse-led interventions/care/services

The findings on the effectiveness of nursing contribution need to take into consideration the limitations of the three reviews, which are discussed in section 6. Despite the number of outcome studies and systematic reviews from all three reviews in a range of chronic diseases, many nursing interventions were not well evaluated and there was insufficient evidence to say whether or not they were effective. However the reviews, through their unique methodologies and diversity of included materials, provide important insights into the potential impact of nursing contribution and benefits rather than an estimation of effect sizes. Overall, there was little data on the effectiveness of nursing interventions across most disease categories (Forbes et al 2007, Bunn et al 2007, Scott 2007) and little impact on quality of life measures due to measurement problems.

Although there is limited evidence overall for inpatient services, intermediate care in nursing-led inpatient units, was believed to have great potential for inpatient care. Patient education before discharge may help people to manage their condition at home and smoking cessation advice was found to be most effective in the hospital setting (Scott et al 2007). Much of the evidence discussed in this section shows examples of how nurse-led outpatient clinics are helping both to improve people's access to specialist care and to enhance the quality of the service in clinics for a number of conditions such as diabetes, rheumatology, asthma, respiratory and Parkinson's disease. Highly specialised and experienced nurses can achieve clinical outcomes that are at least equal to those provided by doctors (Bunn et al 2007, Scott et al 2007). There is inconclusive evidence about the effectiveness of specialist nurse-led primary care based clinics and cross boundary models of care, although examples of those demonstrating improvements in process of care and which may be potentially effective are discussed.

Quality of care

The most frequently described nursing interventions are specialist nurses, nurse led clinics and nurse led outpatient follow up. The effects of nurse led contribution in CDM vary somewhat according to the disease studied. Nursing contribution is potentially effective in producing benefits for diabetes and improving care processes such as screening support (Forbes et al 2007, Bunn et al 2007). There is good evidence to suggest that for COPD, diabetes and MS, nursing has generally beneficial effects on care experience (for example by reducing waiting times), such as patient satisfaction and care quality as well as on continuous support to meet the patients' ongoing needs. Smoking cessation programmes (health promotion interventions) delivered early after diagnosis may be effective in patients with

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cardiovascular disease (Bunn et al 2007). Such interventions and support from nurses can be effective in a hospital setting although when delivered at health checks for prevention they might also have some impact and needs further evaluation (Scott et al 2007).

Primary care based clinics, such as asthma clinics run by trained nurses in the UK have a positive effect on the process of care and can result in more effective use of medications and better self management of their condition although the evidence was based on national audits (Scott et al 2007). Bunn et al (2007) found no evidence to support primary care asthma clinics. Educational interventions to promote self-management for children and adolescents in hospital showed mixed results on self management skills, knowledge and quality of life.

Nurses-led clinics for anticoagulant provision and cardiovascular disease appear to provide care that is as safe and effective as that provided by doctors, although difficulties in distinguishing between the contribution of the nurse and doctor were noted. There is good evidence that some expert specialist nurses in the UK and new transmural clinics in the Netherlands (respiratory conditions, rheumatology, epilepsy) can provide 'shared' care that is as effective and safe as doctors (Bunn et al 2007, Scott et al 2007) which have been attributed to the development of good inter-professional teamwork providing an additional new service rather than substitution. For example the relationship between the MS specialist nurses and the neurologists appears to be complementary, and may help reduce the neurologists' workload as well as improve many service developments (Forbes et al 2007). Moreover, the nurses became more aware of patients' needs and are better able to coordinate the care optimally. Patients with rheumatic disease showed greater improvement in levels of pain, psychological status, knowledge and satisfaction with care in people with rheumatic disease. Direct access from an outpatient clinic to rapid review may also improve patient satisfaction and reduce consultations with the rheumatologist (Scott et al 2007). Other examples of nurse role developments involving substitution included relapse management, a 'patient-led, responsive service' in MS, nurse prescribing for diabetes, and the assessment of COPD and were considered to be effective service developments (Forbes et al 2007). However patient dissatisfaction with information received, communication between health care professionals and nurses' inability to prescribe medication were noted for diabetes and COPD (Bunn et al 2007).

Cross boundary working models involving liaison nurses, for example follow up care in general practice for patients discharged after a hospital diagnosis of myocardial infarction or angina, appeared to improve communication between health care professionals, facilitated practice nurse involvement and increased notification of discharge, although more research is required to examine both process and clinical outcomes (Bunn et al 2007). Patients with COPD and respiratory disease may benefit from nursing outreach programmes and hospital at home appeared to be safe, although it may not be appropriate for all patients and may be less suitable for those with more severe disease (Bunn et al 2007, Scott et al 2007). There is less evidence of effectiveness from home based education and pulmonary rehabilitation programmes (Bunn et al 2007), although continuous support and education was considered to be highly important to recovery in many cases (Scott et al 2007). Parkinson's disease nurses in liaison posts (cross boundary models) may improve patient wellbeing and high satisfaction, both considered to be important factors in long-term conditions. The example of

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this intervention demonstrated that the nurse was more conversant with national guidance on prescribing than the local GPs. A wider implementation of this model would require the willingness of general practices to accept the services of specialist nurses (Scott et al 2007).

Innovative roles that combine specialist nurse with case manager, for example in epilepsy providing education as well as management and coordination of patient care in outpatient clinics, may have better patient and service outcomes, such as higher levels of satisfaction, reduced medical consultations, visits to accident and emergency units, and reduction in both primary and secondary care costs as well as improving the overall process of care through better management of primary-secondary interface. Practice based clinics jointly run by an epilepsy specialist nurse and practice nurses may improve the overall process of care. Such models need more rigorous evaluations as well as testing their applicability in other clinical areas (Scott et al 2007). For newly diagnosed epilepsy, nurse-led clinics have the potential for targeting particular groups, such as people with previous educational disadvantage and older people in that a timely nursing intervention at the time of diagnosis could prevent these patients from encountering social inequalities. Asthma specialist nurses, using a liaison model which combined the education of patients after discharge with educational outreach and clinical support for primary care clinicians, reduced unscheduled care for asthma in a deprived multi-ethnic health district, although not all ethnic groups benefited equally. This could be important in inner-city areas where there are variations in general practices' capacity to manage chronic illness (Bunn et al 2007, Scott et al 2007).

Clinical Outcomes

There was no evidence on the effectiveness of assessment practices or health promotion on clinical outcomes (Forbes et al 2007). The impact of health promotion interventions remains unclear due to the generic nature of many of these interventions and outcomes. Home-based education by a respiratory nurse for example requires further evaluation for highly selected patients as well as to ensure better integration with interventions in primary care and emergency settings.

A positive effect of nurses on disease outcomes (e.g. better glycemic control) was reported only for diabetes with little evidence of benefit in COPD and in a particular for MS (Forbes et al 2007), although a strong and consistent effect was reported on patient behaviour, mostly self-care behaviours, for all three disorders. Improvements in disease specific quality of life outcomes rather than general quality of life were also reported, although Bunn et al (2007) considered case management and disease management potentially effective for diabetic control with mixed effects on other outcomes. The findings may reflect a more limited scope for disease modification in COPD and MS compared with diabetes (Forbes et al 2007). More research is needed to assess effectiveness in the long term for all outcomes.

Nurses-led clinics for anticoagulant provision and cardiovascular disease appear to reduce mortality although more rigorous evaluations are required. Other evaluations showed mixed evidence for effect on mortality, CVD risk factors and uptake of therapy, hospital admissions or length of stay (Bunn et al 2007). Case management approaches for CVD showed short-term improved risk factor profile with little impact on hospitalisations, medication or mortality. In Scotland, nurse-led clinics have been used successfully for

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the secondary prevention of coronary heart disease, although there is little evidence to support the widespread implementation of nurse-led management interventions for COPD. There is insufficient evidence for discharge management and follow up, as well as use of technology for people with cardiovascular disease. Interventions to reduce hypertension showed mixed results, and more high quality data are required to assess the impact of home and community telemonitoring on blood pressure.

There was little evidence of benefit from nurse-delivered care for stroke, dermatology and bowel conditions although patient satisfaction was good. Audit evaluations for bowel disease showed a reduction in outpatient visits, length of stay and an improved patients' understanding of their condition (Bunn et al 2007). Practice nurse initiated rehabilitation programmes for chronic pain may improve symptoms but more evaluations are needed. Home-based support for older people that include regular long-term visits over a long-term period may be effective. Although nursing outreach programmes and hospital at home appear to be safe in patients with COPD, rigorous assessment is required to identify the suitability of patients and further evaluations to determine the effects on clinical outcomes (Bunn et al 2007, Scott et al 2007).

Substitution of doctors by nurses in primary care showed no important differences between doctors and nurses in health outcomes for patients, process of care, resource utilisation, or cost, although patient satisfaction was higher with nurse-led care. Nurses tended to provide longer consultations, give more information to patients and recall patients more frequently than did doctors (Scott et al 2007). Whilst substitution has the potential to reduce doctors' workload it may not always do so. This may be either because nurses are being used to meet previously unmet patient need, by providing a new service, or because nurses may create new demand for care. The literature suggests that clinics providing care for Parkinson's disease which combine medical and nursing skills in a constructive way may be more beneficial and cost-effective but there is insufficient data to support this (Scott et al 2007). Other studies of outpatient and primary based clinics that involve Parkinson's disease specialist nurse showed no positive impact on any disease, health, service or economic outcomes (Bunn et al 2007).

Resource use: Cost effectiveness

There was little evidence on resource use and cost effectiveness across most chronic conditions (Bunn et al 2007, Forbes et al 2007, Scott et al 2007). It has been suggested from non UK studies that nursing contribution may reduce costs by reducing hospital admissions and the length of hospital stay for diabetes although it is unclear whether service utility has an impact on costs (Forbes et al 2007). There was inconclusive evidence about the cost effectiveness of home-based services for COPD and the effect of home based interventions on hospital readmissions, days in hospital and GP visits were equivocal (Bunn et al 2007, Scott et al 2007). Home nursing support for patients on long-term-oxygen-therapy reduced hospital admissions and some nurse-led interventions may have an impact on reducing hospital stays and admission rates (Forbes et al 2007). There was some evidence to show that nurses can alter consultation rates either through better and appropriate use of services and provide cost savings although there was little data on cost effectiveness. Nurse-led community based outreach

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programmes may reduce hospital admissions in people with severe disability from COPD (Scott et al 2007).

Practices that had NHS accreditation, completed audits and practice nurses with a recognised diploma in asthma care showed many positive associations with favourable clinical outcomes, and a decreased use of accident and emergency departments and hospital outpatient clinics. Primary care services (with trained practice nurses as an important component) might reduce the overall costs of asthma care. For example telephone reviews may improve access and reduce cost per consultation (Scott et al 2007). Mixed results were reported for asthma educational interventions in children and adolescents in hospital and in primary care (Bunn et al 2007).

Nurses-led clinics for anticoagulant provision and cardiovascular disease appear to reduce admissions, readmissions, mortality and costs, although there is little data on cost effectiveness of complex programmes and more rigorous evaluations are required. Other evaluations including case management approaches, showed mixed evidence for effects on resource use (Bunn et al 2007). Forbes et al (2007) cites some examples of economic benefits, such as reducing hospital bed occupancy by targeting specialist nurses to ensure the early identification of patients and provision of support for the ward team for effective care management and rapid discharge.

Full economic appraisals that include comparative data are required to assess cost effectiveness, with more robust evidence to assess the impact on efficiency, effectiveness and patient well-being.

Case management

There is a considerable amount of literature on case management, but there is a lack of good quality, consistent evidence for the effectiveness of case management for people with chronic conditions (Scott et al 2007). The evidence, even from some good quality research, of the impact of nurse case managers on reducing emergency admissions or length of hospital stay is inconclusive. A few studies showed reduced hospital admissions and rapid discharge with CM for COPD and improved patient satisfaction, quality of life, functional status and better glycemic control with CM for diabetes. However, the costs are unknown and more research is needed in the UK (Scott et al 2007, Forbes et al 2007, Bunn et al 2007). The effectiveness may be influenced by the variability in the training and delivery of interventions. Factors considered to be important in producing better outcomes in patients with congestive heart failure include close monitoring of condition, patient education combined with regular contact with health professional, care programmes with a small team that is responsive to the specific needs of patients and with good links to multidisciplinary care. Nurse case management, in the sense of an intensive and timely intervention targeted effectively on the most vulnerable people, is reported to be a challenging and labour-intensive activity. It requires nurses to develop relationships with patients and carers which are based on empathy and trust, focusing on improving a person's sense of well-being in order to help them to cope better in situations where achieving physical improvement may be difficult and/or impossible (Scott et al 2007).

Most of the evidence on CM comes from Scott's review (2007) of mainly US based literature, whose applicability to UK settings is uncertain. The review

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considered five distinctive types of nurse case management with inconclusive results (section 4.2.2). Evaluations in England of the community matron role based on the KP model showed little significant impact on reduction in emergency admissions, although they identified unmet needs for health and social support amongst community-dwelling older people. In addition they provided useful insights into the practical problems of preparing and supporting nurses for the community matron role and getting it accepted by general practitioners, other community nurses, patients and other stakeholders (Bunn et al 2007, Scott et al 2007).

4.4.4 Impact of nursing contribution to health care organisation: Structures and systems of care

The nursing contribution to CDM involves the use of specific systems and processes in CDM and their contribution to the health care organisation (summarised in section 4.3). Nurses are involved in managing and developing various aspects of the care system, care settings, health technology, cross boundary working, service development, user involvement and improving access. The major impact of nursing contribution is on service development and improving access (section 4.4.3).

Nurses influence service provision by responding to gaps in services. The effect of nurses on service structures, such as cross boundary working, education of professionals, non-professionals and carers, access, service use and developing care systems has been examined from very few studies for COPD, diabetes and MS by Forbes et al (2007). Service models designed to improve the interface between primary and secondary care through 'shared care' and 'transmural clinics' appeared to improve communication between health professionals (Bunn et al 2007, Scott et al 2007). Liaison nurses coordinating and supporting follow up care in general practice for patients discharged after a hospital diagnosis of myocardial infarction or angina, facilitating practice nurse involvement and increasing the notification of discharge (Bunn et al 2007). Specialist asthma nurses using liaison model of care and promoting guidelines reduced unscheduled care for acute asthma in a deprived multiethnic area in London (Bunn et al 2007, Scott et al 2007). Structured holistic care for diabetes may improve links between primary and secondary care and such studies require further evaluation.

A number of assessment and health promoting systems are used by nurses, but there is no evidence on their effectiveness on clinical outcomes (Forbes et al 2007). Nurses' impact on assessment procedures included case-finding, diagnosing, identifying needs and assessing risk. A strong impact on care co-ordination, care quality and information needs for MS patients was documented, with examples of innovative models, implemented by MS nurse consultants from a few established specialist centres (Forbes et al 2007). Much of the evidence relating to targeting high risk patients focuses on case management with little information on its impact. Although nurses have an important role in the use of routine monitoring, data management and decision support systems to identify and monitor high risk people, their impact on clinical outcomes is not known.

A shift of some health care services from secondary to primary care is evident in examples of specialist nurses working in a General Practice setting, such as primary care based epilepsy specialist nurse service providing information, advice, liaising with other health care professionals

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and providing education to primary health care teams. The intervention appeared to improve consultation rates, although the effects on clinical outcomes are unclear (Bunn et al 2007, Scott et al 2007). The nursing contribution appeared to improve access, especially for vulnerable or hard to reach groups (for diabetic care), and the development and improvement of service infrastructure/care systems, although it may have a negative impact on the work of doctors by increasing their workload for COPD. A beneficial educational effect on non-professionals (diabetes) and professionals (COPD, MS) was documented, although the evidence was weak. In particular Forbes et al (2007) has highlighted the 'entrepreneurism' of MS nurses in developing services and involving users for improving the overall care system, for example, establishing a relapse service where nurses co-ordinate the input of the medical and therapy teams. Examples of the impact of nurses on service structures include nurses defining the organisation of care, such as the diabetic nurse's role in linking two services (e.g. diabetes eye screening clinic). Developing a new care system not only improved communication between primary and secondary care but also highlighted treatment needs to general practitioners. For asthma patients, accident and emergency departments with a higher throughput of asthma patients may benefit from ready access to a nurse with asthma training (Scott et al 2007). There is insufficient consistent evidence to judge the effectiveness of care pathways across CDM and much of the evidence focuses on case management. Use of technology was considered to be important in nurses' interactions with patients, but its impact on outcomes is not known.

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Key messages: Evidence of impact

- There is a lack of evidence on effectiveness and little high quality data on cost effectiveness
- Contribution of nurses may have benefits in terms of quality of care, such as patient satisfaction, care experience and continuous support
- Very little evidence for inpatient services; patient education before discharge may be effective
- Nurse-led outpatient clinics: nurses appear to provide care as safe and effective as that provided by doctors but there is a lack of data on cost-effectiveness
- Primary care: Specialist nurses and practice nurses e.g. qualified nurses for asthma may improve process, clinical outcomes and reduce costs
- Cross boundary or shared care: liaison and outreach nursing e.g. Hospital at home is safe and acceptable for mild COPD; improves communication and facilitates care processes
- Home-based support for older people that include regular long-term visits over a long-term period may be effective
- Nursing contribution may be effective in improving clinical outcomes and produce benefits for patients with diabetes which has modifiable factors compared with COPD or MS.
- Smoking cessation delivered early after diagnosis may be effective for CVD
- Nursing contribution appeared to improve access especially for vulnerable or hard to reach groups and service infrastructure/care systems
- There is insufficient evidence for the effectiveness of health technology and the extent of nurses engaging positively is unclear
- Nurses aim to deliver care largely appropriate to patient needs but there is no evidence on effectiveness of assessment practices and little data on user involvement or nurse interactions
- There is inconclusive evidence for case management models, further evaluations of specialist nurses, particularly in innovative roles are required
- Nursing roles reflect current policy developments

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4.4.5 Patient perspectives

- What is the evidence for improved experiences for patients/careers/professionals?
- What were the barriers and facilitators?
- How is nursing perceived in public services?

The overall findings for chronic diseases mainly from qualitative/views studies and surveys are shown in Table 5. Areas relevant to specific disease conditions are indicated although they may be applicable across all disease conditions.

The evidence in the literature suggests that when asked patients reported general satisfaction with the care provided by nurses, in particular patients viewed nurses as more approachable and accessible than doctors, having the required skills and more time for supporting them. They felt that nurse-led care provided easier access to primary care staff such as practice nurses and GPs. The patients also preferred availability of doctors when required such as prescribing or dealing with medical complications. They valued the appropriateness and timeliness of diabetes education including experiential and collaborative learning with group support. Patients and carers had positive feelings overall about home treatment for COPD. It is not clear whether the uncertainties relating to posts and respiratory services result in patients being unable to experience proactive management and access care when they need it. For asthma and cardiovascular care the findings suggested a mismatch between the views of patients and professionals, with patients reporting conflicting and confusing advice from different health care professionals who felt information provided at the clinics helped patients to manage their condition better. Most patients, however, reported improved communication between secondary and primary care, timely notification of discharge and better understanding of current and planned care. MS patients regarded therapeutic communication, provision of information and nurse assessment most helpful followed by other health professionals. Patients with epilepsy appreciated the nurses' responsive approach to information provision, although they believed they would have benefited most by seeing a special nurse when epilepsy was first diagnosed. Rheumatoid arthritis patients felt they required support on a regular basis, not just at times of increased disease activity, so that people could continue to function normally. The most important aspect of case management intervention for a patient was the continuity of care, and the availability of a consistent resource. People with more severe conditions regard nurses as professionals who should have a good understanding of their illness and its impact so that they are better able to provide support in improving their symptoms, as well as symptoms of other concurrent health problems. Nurses need to become patient advocates to help meet complex needs (Scott et al 2007). Patients considered nurses as being the most effective support for their psychological needs, but apart from the diabetes nurse specialists the majority of nurses did not recognise the skills required for this type of care.

The findings highlight the importance of involving patients and carers in the intervention development and design of patient-reported outcome measures.

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4.4.6 Nurses' perspectives

Nurses' views varied greatly and depended on their role in the management of different conditions. Overall, they expressed concerns about their role and level of prescribing which is a recurring theme on nurses' levels of responsibility. Practice nurses would like more education on prescribing and viewed their roles as patient advocates to GPs.

There were differences in opinion amongst nurses about nurse prescribing, teamwork, professional responsibility and education/training for diabetes. Nurse prescribing was considered by most nurses to improve care but only a few wanted to be independent prescribers. Nurses had concerns regarding introduction of new interventions and the extent of their responsibilities in continuing to deliver them. Apart from the diabetes nurse specialists, nurses showed resistance towards 'expert patients' possibly reflecting a lack of professional confidence and concerns about litigations (Bunn et al 2007). The nurses felt that asthma review clinics could be beneficial to patients but they were unlikely to view their role as fully responsible unless they had an asthma qualification. They felt they should be supported to obtain asthma qualifications if they were to give the best possible care to people with asthma. Epilepsy nurses in new innovative roles had concerns about being a pioneer and encountering numerous difficulties such as adapting to primary care, motivating practice staff, and heavy workload. Overall the nurses felt the service was beneficial to patients and health care professionals, although it may be important for nurses to have community experience prior to setting up the service (Bunn et al 2007, Scott et al 2007). Nurses considered it important for patients with rheumatoid arthritis to prioritise their own needs and for nurses to help find solutions (Scott et al 2007). In the nurses' opinion, case management systems overall improved continuity of care were of benefit to patients and carers and increased nurses job satisfaction with new responsibilities, although it was felt that they did not have an 'autonomous role' in primary care (Scott et al 2007). For some nurses, difficulties were encountered with combining new activities with normal community service duties.

4.4.7 Barriers and facilitators to nursing contribution

The evidence on barriers and facilitators to the nursing contribution reflects common factors previously identified as influencing innovation and change in organisations (Isles and Sutherland 2002). The aspect that is perhaps specific to the nursing contribution identified in these reviews is that of issues of autonomy. The evidence from the reviews identified the following key factors that facilitated the contribution of nurses to CDM:

Good communication between nurses and GPs, and other health professionals, good clinical support through collaborative working with multidisciplinary teams, supervision, networking clinical systems, supportive organisational systems and technology. Other facilitators included good primary/secondary interface; responsive doctors who recognised nurse expertise, accepted high level of professional autonomy and acted upon their advice; flexibilities in roles and systems and greater clarity around skills and competencies required for specialist nurse role; professional development through adequate education and training; nurses' consultation time and accessibility for patients; clear guidelines, adequate time and resources, sound leadership and user involvement. Specific issues around case management included adequate preparation for case management

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roles and a good consensus on role and function of nurse case managers. Manageable caseloads for CM can promote good and supportive relationships with vulnerable individuals.

In terms of barriers the key factors were those that limit professional aspirations such as inadequate preparation of nurses for new, leadership roles, lack of managerial support for nurses who are implementing changes in service, pressure to meet national targets without adequate resources, lack of autonomy, role clarity and opportunities for professional development. Others include changes in service structures, poor interface and collaboration, inappropriate use of nurses' time in terms of administrative and clinical tasks, work force changes and professional concerns when new roles are not understood.

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Key messages: Patient perspectives

- Patients report general satisfaction with the care provided by nurses
- Patients feel nurses are more approachable and accessible than doctors and appreciate their longer consultations
- Patients report that nurse-led care provides easier access to primary care and improves communication
- Patients do not see nurses as currently able to provide all their CDM needs, especially in relation to medication
- Patients value the appropriateness and timeliness of educational support
- Patients sometimes receive conflicting and confusing advice from different health care professionals
- Patients and professionals have differing views on what their own responsibility is in managing their condition

Key messages: Barriers and facilitators

- Facilitators include: organisational preparation for new roles, good communication and collaboration between health professionals and primary/secondary interface, responsive doctors providing high levels of professional autonomy for nurses, adequate resources, continuous professional development, role clarity, user involvement
- Barriers include: constant reconfiguration of services, instability in resources, lack of opportunities for training to expand nurses' roles, work force changes, lack of autonomy and recognition of expertise, poor interface between primary and secondary care, lack of managerial support, inappropriate use of nurses' time, professional concerns when new roles are not understood

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4.5 Policy context

- What are the enduring themes about policy?
- Does the evidence on NMHV contribution reflect current policy priorities and developments?
- What is the future direction for nursing in CDM?
- What are the consequences of policy on practice?
- Is there evidence to show how nurses are delivering an explicit policy initiative?

All three reviews focused on the English policy (which adopted the Kaiser Permanente and community matrons) in line with SDO conventions. Scott et al's review of the policy literature was part of the evidence review and was not designed to analyse different UK or non-UK policies. Their review framework was based on assumptions underlying English policy, rather than the UK (personal communication) and they identified some general themes from the evidence base.

Healthcare services internationally are seeking new ways to cope with the challenge posed by the growing number of people who are living with long-term conditions. It is a recurrent theme of health policy in the developed world that people with long-term conditions should be enabled to self manage their disease and adopt healthier lifestyles (World Health Organisation, WHO 2006). A common policy goal is to reduce the number and length of hospital attendances and admissions that these people have experienced in the past. Current policies recognise that nurses, more than any other health professional, have a key and a central role in CDM. The evidence base suggests that the nursing contribution largely reflects current policy initiatives. It functions within a dynamic system and is expressed in various service structures, roles and responsibilities.

The nurse is identified as a key provider in English policy and the community matron is identified as the key worker in supporting people with complex and long-term problems. (DOH 2002). This was influenced by research and practice on case management in the United States (Kane et al 2002).

Although there was very little empirical evidence to show how nurses were delivering an explicit policy initiative, overall they were reflecting the policy agenda through initiatives such as assessment practices to identify health needs, the provision of educational support to promote self management, as well as coordinated care through interface working and improving accessibility. Nurse-led clinics are already a well-established feature of NHS services where nurse specialists are providing a service that appears to be as safe as, and in some cases, more acceptable than, their consultant colleagues. The literature provided examples of how nurses are helping to increase the capacity and capability of the primary care sector through these clinics, role expansion and the provision of new and innovative ways of working to meet complex needs (such as outreach services and 'hospital at home' provision).

There were some examples of nurses taking greater responsibilities for referrals and managing case loads in line with the Government's initiatives on promoting new and innovative roles for nurses (DOH 2001). The level of

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autonomy experienced by the nurses and their role in prescribing medication appeared to be limited. Specialist nurses from community or general practice settings, or practice nurses may provide the care, with wide variations in the levels of responsibility. Collaboration between specialist nurses and practice nurses is potentially effective in improving shared care between the primary and secondary sectors (Scott et al 2007). The developments in the professional scope of nurse practice (e.g. nurse practitioner role) have enabled nurses to assume greater responsibilities within clinical teams in all sectors. Nurses' roles are continuing to evolve in many areas, such as doctor substitution, providing specialist expertise in chronic diseases, and care targeted for complex disease management and 'high risk' patients through case management and community matron roles (DOH 2004c). In the UK, there is an established policy stream aimed at promoting new and innovative roles for nurses, accompanied by a drive to modernise nursing careers which addresses the identified need for nurses to receive appropriate training and support (DOH 2006). Key factors relating to nurses role developments in relation to policy initiatives including the role of practice nurses, the educational roles and preparation for case management roles, are addressed in section 4.2.4. The DOH's guidance to Primary Care Trusts on appointment of 'nurses with special interests' further emphasises a competency-based career structure (DOH 1999, NHS Executive 1999).

Nurses are involved in new and improved developments but experience barriers such as lack of support, resources, opportunities and autonomy. The influence of contextual factors, such as development of new models of service delivery on nursing contribution is highlighted in the evidence base. Policy initiatives to improve better interface working are reflected in cross boundary models providing shared care and better access, although very few accounts of user involvement in developing interventions, or decision making were reported. Strategies to reduce the use of hospital resources by reducing emergency admissions and reducing the length of stay after admission are high on the health policy agenda, although there is little good quality evidence on the impact of nursing contribution. Having specialist nurses who rapidly assess and co-ordinate in-patient care may substantially reduce the use of hospital beds, but more rigorous evaluations of nursing models of care, incorporating key success factors in developing new interventions are required since nurse case managers/community matrons alone are unlikely to achieve these outcomes. This would depend on improved inter-agency collaboration at the respective interfaces between primary and secondary care, as well as health and social care. Current policy in England also emphasises the importance of user involvement in service developments, but there were few accounts of this in the literature.

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Table 5 Patient and nurses' perspectives in chronic disease management

Disease category	Patients' perspectives	Nurses' perspectives
COPD	Nurses who gave quality time, were sympathetic to patients' concerns, developed empathy, were valued and perceived to provide better care. Patients/carers felt positive feelings about home treatment, nurses were seen as friendly and approachable. Patients perceived positive effects of programmes promoting self management after discharge, appreciated the education which gave them the confidence not to call a doctor	Not clearly identifiable from the literature
Diabetes	Patients were satisfied with the overall care and valued the appropriateness and timeliness of diabetes education including experiential and collaborative learning with group support	Differences in opinion about nurse prescribing, teamwork, professional responsibility and education/training. Nurse prescribing was perceived to improve care, only few nurses wanted to be independent prescribers. Nurses had concerns regarding introduction of new interventions and the extent of their responsibilities in continuing to deliver them
MS	Positive experiences with nurse in relation to therapeutic communication and provision of information, improved their understanding of MS, nurses made everyday life easier, helped family members, assessment was regarded as the most helpful followed by the physiotherapist, the GP, the district nurse, the OT, the neurologist, and the social worker	Relationship between MS specialist nurses and neurologists is complementary and influenced doctors' workload and other service developments
Asthma	Practice nurse or GPs were considered most important for patients, although the advice from different health care professionals was conflicting and confusing. Review clinics were not highly valued but nurses were valued for enabling rapid access in emergencies. Mismatch between the views of patients and professionals behaviour. Patients reported making little use of asthma clinics, or of recording and monitoring their asthma for nurses. Compliance of adolescents with asthma is influenced by support from nurses, motivation, energy and willpower, and no fear of complications	Trained asthma nurses made little use of self management plans, but provided individualised written plans to selected patients. Nurses were unlikely to view their role as fully responsible unless they had an asthma qualification. Practice nurses' level of training did not predict their responsibility for carrying out reviews on their own and needed support to obtain qualifications. GP's need to trust the autonomy of nurses, recognise their expertise and act on their advice

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Table 5 continued

Disease category	Patients' perspectives	Nurses' perspectives
Epilepsy	Doctors' time is too limited to explain condition and how to manage it, appreciated the nurses' responsive approach to information provision. Believed would have benefited most by seeing a special nurse when epilepsy was first diagnosed. Nurse valued for her explaining the social aspects and acting as a key worker for other services	Nurses felt service was beneficial to patients and health care professionals, although they encountered operational problems including: difficult adapting to primary care, problems meeting and motivating practice staff, and heavy workload
Rheumatology	Patients' perceptions of living with Rheumatoid arthritis include: - minimising pain before people perceived they had any control - requiring support on a regular basis, not just at times of increased disease activity for normal functioning - nursing consultation important for addressing their psychological concerns - Provision of information enabled understanding and participation in care	Best practice was considered to include education, advice, exercise, drug treatment and support so that a person could retain some control over their lives and not become over-dependent on others. People with rheumatoid arthritis could manage their condition well at home when the disease was relatively stable. Patients should prioritise their own needs and for nurses to help find solutions
Cardiovascular	Improved communication between secondary and primary care, timely notification of discharge and better understanding of current and planned care. Mismatch between nurses' and patients views': Had more time for discussion and information provision Patients confused about investigations and needed more accessible information, found lifestyle advice difficult to remember or adhere to.	Mismatch between nurses' and patients views' Nurses felt information provided helped patient to manage their condition better and empowered them. Felt more education on prescribing would be helpful Viewed their roles as patient advocate to GP
Case management	The most important aspect of nurses' intervention was the continuity of care, and the availability of a consistent resource	Developing protocols and pathways was time-consuming, difficulties with combining new activities with normal community service duties. Case management systems overall improved continuity of care and benefit to patients and carers. Increase in job satisfaction with new responsibilities, although it was felt that working to the study protocols restricted the full development of an 'autonomous role' in primary care

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5 Discussion

This section addresses the overall findings in the context of our stated objectives of the integrated review (Section 2.3).The aim of this review was to combine evidence from three different reviews evaluating the nursing contribution in chronic disease management and to summarise the findings using appropriate methodologies.

1. We summarised the different approaches taken by the three reviews to demonstrate the synergy, commonality and consensus between the three reviews. Bunn et al (2007) provided a scoping review on many chronic conditions, Forbes et al (2007) conceptualised the nursing contribution for three tracer disorders COPD, diabetes, MS and Scott et al (2007) reviewed the evidence on organisational interventions for older people in five disorders: COPD, asthma, epilepsy, Parkinson's disease, rheumatology, and case management for people with long term conditions.

The reviews, each with a different theoretical approach, focus, inclusion criteria, search dates and methodology for selecting papers and conducting and synthesising their reviews presented different challenges in the methodology for their integration. They compared different types of studies and outcome measures and categorised their findings differently with minimal overlap of included items across the three reviews. The descriptive mapping (Section 4.1) was conducted only from the included papers. Forbes et al (2007) and Bunn et al (2007) excluded studies already identified in systematic reviews, whereas Scott et al (2007) included these. It is possible that the overlap may have been greater if these studies were included in the two reviews (Forbes et al 2007, Bunn et al 2007), but this was not explored. It was not always possible to extract data that were comparable from the three reviews and obtaining descriptive data from the authors to draw some comparisons proved to be time consuming. Identifying unifying concepts was problematic and therefore this integrated review presents an overview of the nursing contribution in CDM. A review of reviews relies on the reviewers' judgement of 'how well' or 'badly' the complex multifaceted interventions were delivered and how the quality of the included studies was rated. The reviews varied in their assessment of quality of their studies, since formal critical appraisal was not conducted consistently for the three reviews. The variations in the proportions of study types between the reviews and how they relate to the impact of nursing contributions evaluated is unknown. Furthermore, reviews of service innovations have employed the World Health Organization Health Evidence Network (WHO-HEN) criteria (Greenhalgh et al 2004) to appraise evaluations of service developments. This could be considered for reviews of this type to provide a more consistent approach to levels of evidence from reviews since it not only takes into account study design and quality but also whether or not the studies originate in health service organisations.

2. We used an iterative approach through joint meetings and workshops to consolidate the methods and key findings from the three reviews (Bunn et al 2007, Forbes et al 2007, Scott et al 2007). Through these discussions and exploratory work on integrating reviews that did not lend themselves to any particular methodology, we developed a framework that identified key

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components or areas to examine the evidence on the nursing contribution from the three reviews (Section 2.4 and 2.5; Appendix 1). The methodological challenges of this approach are highlighted in section 6. By mapping the findings from each review onto this framework we were able to describe the types of NMHV activity and contextual settings that identified the strongest evidence base for practice.

5.1 Key messages from the evidence base

Nursing roles and interventions: Nurses have a key and a central role in delivering a variety of complex interventions for CDM through outpatient clinics, primary and community based services and through integrated primary/secondary interface working (Sections 4.2 & 4.3). The interventions are often not well defined in the literature and various models are being used, although often these are not stated. The levels and types of intervention may reflect the degree of complexities and chronic disability in conditions. Although many nurses work as specialist nurses or case managers, their roles are diverse, reflecting a lack of standardisation as well as clear training pathways. In particular, nurses need to be prepared and supported for 'case management' or 'community matron' roles. The Government's initiatives aim to open the way for flexible, diverse and rewarding careers for all nurses such that they are able to respond to the complexities of the demands placed upon them in delivering care for people with long-term conditions. The expansion of nursing roles through specialist and consultant roles, substitution and advanced practices further identifies the need to set a clear direction for nurses' professional development. They have an educational role in training practice nurses to deal with long-term chronic conditions in primary care, other than asthma and diabetes. The nursing contribution reflects the policy agenda to increase the capacity and capability of the primary care sector through nurse-led clinics, role expansion and promoting new and innovative ways of working to meet complex needs (DOH 2001), although the level of autonomy experienced by the nurses appears to be limited. The evidence suggests a constant reconfiguration and definition of nursing roles and models of care.

The impact of nursing contribution: There is a lack of good quality, consistent evidence available about the impact of nursing contribution on patient outcomes and cost effectiveness across most disease categories. The evidence is limited on the applicability of non-UK service models to UK settings although new evaluations are emerging. In general, specialist nurses provide care that is at least as safe and effective as that provided by doctors, attributed to 'complementary' contribution rather than pure substitution although their cost effectiveness is unproven. There was no evidence on the effectiveness of assessment practices on clinical outcomes although nurses aim to deliver care in ways that are largely appropriate to the needs of the patients.

The nursing contribution is likely to have benefits in terms of quality and process of care, such as patient satisfaction, care experience and continuous support. Specialist nurses and practice nurses with specialist training, for example, qualified asthma nurses, appear to improve process of care, clinical outcomes and reduce overall costs. However, more research is required for nurse-led asthma clinics. There is support for smoking cessation programmes in patients with cardiovascular disease delivered early after diagnosis.

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Nursing outreach programmes and hospital at home appear to be safe for people with mild COPD, although rigorous assessment is required to identify suitable patients. Shared care models appeared to improve communication between health care professionals and facilitate care processes, although the effect on clinical outcomes was less clear. Home-based support for older people appears to be more effective if visits are frequent and extended over time.

Nursing contribution may be effective in improving clinical outcomes and produce benefits for diabetes, which has modifiable factors and a clear care management process compared with COPD or MS. There is inconclusive evidence on the effectiveness of case management interventions. In general, patients report good satisfaction with the nurses but some of the nursing care appears to be superficially addressed. For example, patients with asthma reported that they received conflicting and confusing advice from different health care professionals, although the nurses felt that the information provided at the clinics helped patients to manage their condition better. This mismatch of views between patients and nurses needs to be addressed to improve the overall process of care. The contribution of nurses to CDM can be better facilitated by ensuring that the nurses have good support, good communication with multidisciplinary teams and adequate training. Factors that inhibit the nursing contribution such as lack of opportunities for developing skills, funding, work force changes, lack of autonomy and recognition of expertise, poor interface and collaboration, lack of support need to be addressed for more effective models of care. The extent to which these factors are incorporated in intervention development or service models is not known. Our reviews did not lend themselves to this analysis.

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6 Limitations

One of our objectives was to highlight the methodological challenges of synthesising findings from three different reviews. We acknowledge a number of limitations in the integration of the three reviews: The inherent limitations of each review and the differences between the three reviews. In particular, the difficulties experienced in developing and using novel approaches for synthesis are highlighted in section 6.1.

Limitations of each review

The authors of the three reviews commented on the poor methodological quality of the studies they reviewed, as well as limitations of their reviews which may have an important bearing on the validity of their results (Bunn et al 2007, Forbes et al 2007, Scott et al 2007).

These included quality issues with the primary studies included in the review, such as high attrition rates, lack of long-term follow up, the use of weak or inappropriate study designs, underpowered studies, inadequate quality assessment and variability in outcome measures reported. The studies demonstrated high levels of heterogeneity, with respect to types of interventions, settings, populations and designs. For example it is not clear what truly constitutes case management as an intervention and an overlap between the nursing interventions identified in case management studies and in other studies was reported. Information on the content and intensity of interventions which may influence effectiveness were often not available. There were few examples of nurses using evidence-based protocols or guidelines, although the theoretical basis of nursing interventions was not evident. There was a lack of clarity about whether interventions aimed to demonstrate equivalence or benefit or what elements of complex interventions were compared (for example lack of comparable evidence on nurses' versus doctors' interventions). Although all study designs were included there was inadequate detail about nurses' role, qualifications and experiences.

The above limitations are known to introduce significant bias in reviews (Higgins and Green 2008). All three reviews acknowledged the implications of their limitations, in that the variation in validity can contribute to variation in results in the studies, more rigorous studies are more likely to yield reliable results and poor quality studies, such as underpowered studies can inflate treatment effects. The potential sources of bias addressed were selection bias (caused by systematic differences in comparison groups) intervention bias (caused by variations in the way care is provided to the comparison groups other than the intervention being tested), attrition bias (caused by systematic differences between the comparison groups in the loss of participants from the study e.g. through protocol deviations, loss to follow up) and detection/measurement bias (caused by systematic differences between the comparison groups in outcome assessment).

Differences between the reviews

The reviews varied in their methods for conducting their reviews, the level of analysis and the synthesis of the evidence (section 3).

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Unpacking the nuances of complex interventions in various care and organisational contexts can vary according to the approach of each reviewer. For example in the realist approach the reviewer's interpretive judgements can be integral to the synthesis process (Pawson et al 2004). Overall, there was minimal empirical work that distinguished between different approaches to providing nursing care. The focus of the literature reflected a bias towards specialist nurse roles as well as from missing potentially relevant studies. The literature is restricted to nurses due to very little research material on health visitors and midwives and their role in CDM is unknown. Scott et al (2007) reported an inadequate evidence base for the contribution of health visitors to the preventive and supportive care of older people and an exclusion of midwives and school nurses by focusing on older people. Whilst they recognised that nurses, midwives and health visitors are involved in all aspects of care for people with long-term conditions they focused their review on care delivery services in which nurses played a key and/or leading role (Scott et al 2007, Forbes et al, 2007). Bunn et al (2007) found no studies that involved midwives or health visitors in chronic disease management.

Although around half the studies were based in the UK, considerable differences in local contexts as well as study heterogeneity raise questions about the applicability of the findings and their implications for practice in the UK. Cost effectiveness evaluations did not generally include full economic appraisals or comparative data. Many RCTs employed in the evaluations of innovative organisational interventions were not well designed and their methodological limitations for complex interventions need to be addressed for such evaluations.

6.1 Advantages and limitations of our methodological approach

In addition to the limitations identified by each review (section 6), there were methodological challenges integrating the three reviews. Due to the different approaches taken and the criteria that were adopted, literature is restricted to the evidence base drawn from the three commissioned reviews and other relevant studies on CDM may therefore have been excluded. We had to develop a framework and a methodology for this review in an iterative and flexible way so as to be as inclusive as possible and to ensure that the conceptual nuances of the three single reviews could be captured. Whilst we have drawn on several existing methodologies to inform the progress of this work, it has raised questions about the ways in which narrative, quantifiable data and theory can be used to draw together an array of research findings from many competing perspectives.

Despite the limitations, our approach endeavoured to ensure the validity of the synthesis. The review benefited from discussion and guidance from the three teams and was therefore subject to ongoing internal peer review. The process of drawing together, mapping and synthesising evidence from the reviews enabled us to pull together common findings and to reach an overall consensus on key issues. Our organic process, whilst using a framework, was shaped largely by the methods used and findings of each of the independent literature reviews. Whilst the review does not provide clear-cut evidence about the effectiveness of a simple intervention, it does

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generate insights into the importance of process and context to outcome and also gives due weight to the perspectives of research participants. The inclusion of data from many studies in this area that do not meet the stringent criteria of conventional systematic reviews means that the reviewer can report on, and assess the value of, contextual information about the planning, conduct and outcomes of nursing interventions.

Our methodological approach enabled us to meet our study objectives. We developed a methodology to integrate three reviews, to summarise their different approaches and to synthesise the findings. Our key output was an analytical framework which, driven by current models for CDM, provided the basis for synthesising the evidence and integrating the three reviews.

An overview such as this review provides a sense of 'added value' to the overall approaches and messages from reviews that all explore the nursing contribution to CDM in very different ways. Summaries of reviews are designed to be accessed by a variety of users (Swann et al 2003) and those requiring detailed syntheses, can refer to the original reviews and their primary studies.

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7 Conclusions

Our aim was to evaluate the NMHV contribution to chronic disease management, highlight evidence gaps and to make recommendations for practice and research. The evidence from the three reviews, suggests that the nursing contribution to chronic disease management may improve quality of care, such as patient satisfaction, care experience and continuous support (section 4.4). There is also evidence to show that nurses are integral to the structure and process of CDM and that they help implement care with proven clinical outcomes. It has also been shown that in some circumstances nurses provide care that is at least as safe and effective as that provided by doctors, although the cost effectiveness of many interventions is unproven.

Given the inherent complexity of this work, our major output is an overview synthesised from our analytical framework which delineates key concepts of NMHV contribution. Whilst NMHV impacts on some outcomes, there is a scarcity of rigorous evaluations, especially in studies carried out in the UK, despite the emphasis on evidence based care (DOH 2004a). In this section we highlight implications of our findings for practice and research.

7.1 Implications for policy, organisation and service delivery

Overall there is mixed evidence on the impact of the nursing contribution to CDM and there is a need for further rigorous evaluations in this area. However, despite these limitations, this review does enable us to draw some pointers for practice when developing nurse-led services for CDM. The implications for practice are that whilst nurses make a positive contribution to chronic disease management, several key issues need to be addressed. For policy makers, practitioners and managers, areas of policy, organisation and service delivery relevant to NMHV contribution and supported by review evidence include:

1. Better standardisation and understanding of roles and functions through a consensus dialogue involving patients and other professionals. It will be important to recognise that different disorders and care contexts have different requirements. There will not be a 'one role fits all' solution. It is particularly clear from the reviews that both generic and specialist roles are required and while primary care can manage much of the care of people with long-term conditions they will require the support of specialist roles if they are to maintain care standards and incorporate new technologies and practices. Furthermore, it must be recognised that different disorders specifically degenerative disorders, require a different approach as they may be less sensitive to target models based on disease outcomes.
2. Clarification of the competencies required for the various nursing roles and the development of appropriate pathways for education and training

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3. Improving the level of professional autonomy for expanding nursing roles through better educational opportunities as well as appropriate practice environments
4. Identifying the types of 'professionals' suitable for a case management role, preparing and supporting nurses for a case management role in complex organisational infrastructures
5. Development and evaluation of new roles in joint practice-based services of specialist nurse and practice nurse (such as in epilepsy)
6. Better integration of advanced practice nursing services with other specialist nurses
7. Involving patients and users in the design of interventions, particularly patient reported outcome measures to be able to capture all aspects of patients' experiences
8. Preparing and empowering GPs and relevant stakeholders for new developing roles, ensuring adequate support for nurses (e.g. for practice nurses to provide care for long-term conditions other than their routine care for asthma or diabetes)
9. Service development needs to ensure that nurses substituting for doctors does not lead to unnecessary duplication of services
10. Ensuring good communication between nurses and GPs, and other health professionals, through collaborative working with multidisciplinary teams and having supportive organisational systems and technology
11. Difficulties of implementing cross boundary models such as joint ways of working between providers of care need to be addressed
12. Appropriate change management to address the barriers and facilitators for the development of effective models of nursing contribution[16]

7.2 Gaps in evidence and recommendations for research

This synthesis of the three reviews shows that while there are many nursing activities in CDM very few of these have been properly evaluated. If the nursing contribution is to be properly developed and understood an ongoing programme of research is required to develop and test specific activities. The tendency has been for whole role evaluations or comparisons that provide little enduring knowledge to help nurses, policy makers or health care commission determine cost-effective approaches to care. The following recommendations are made for future research and will be particularly useful for practitioners, educators and researchers:

1. The need to assess the effectiveness of specific nursing activities and interventions in relation to patient centred outcomes that have a proven relationship to those activities (this may require proof of concept studies). The activities should be clustered to reflect the main areas of activity identified in the reviews (health promotion; self-care support; case management; interventions to support continuous disease management; health technologies; psychological interventions; system level initiatives; and interface interventions like outreach nursing and home-based support.

[16] *This review cannot comment on effective change models as this was not our focus.*

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2. The need to identify and test the efficiency and patient experience of different assessment systems for identifying needs and factors that are important in meeting those needs.
3. The need for user involvement in the development of nursing interventions and tools for measuring patient reported outcomes.
4. The need to develop methods appropriate for assessing nursing interventions and tools for measuring patient (and carer) outcomes.
5. The need to develop, compare and evaluate standardised core components for case management to be deployed in different care contexts (disorder specific, generic and frail older people).
6. The need to develop research designs that are more appropriate for complex interventions delivered in the different contexts of nursing contribution (Campbell et al 2000). Outcome evaluations should include integral process evaluations.
7. The need to develop more empirical knowledge on the nature and benefits of specific nursing activities upon clinically important outcomes so that nursing activities relate to the needs of patients.

These initiatives would best flourish in integrated, ongoing, collaborative (inter-professional and inter-organisational) research programmes located in diverse settings with facilitated access to patients and carers.

The education role of specialist nurses and the impact of such interventions on health professionals' training, skills, and resource use warrant further examination. More research is required on interactions between nurses, professionals, carers and on policy relevant areas which may influence professional standards of practice. It is important that policies, roles and structures are examined within the broad and multifaceted care system so that the findings can be related to other factors that may contribute to the effects on outcomes.

The findings from the three reviews are consistent with those from recent reviews of nursing strategies in chronic diseases (Webb 2006). Some of the barriers and facilitators of nursing contribution identified by the reviews have also been highlighted by Singh (2006) in her review of supporting the overall shift of care into the community and also reflect common factors previously identified as influencing innovation and change in organisations (Isles and Sutherland 2002). Lack of communication between practitioners, and sometimes conflicting advice, means that users may still experience a fragmented system. Transmural care in the Netherlands was developed to overcome a fragmented system and provides examples of 'shared care' models for evaluation in the UK (Bunn et al 2007, Scott et al 2007).

7.3 New insights of nursing contribution to chronic disease management

Two reviews proposed evolving models of nursing contribution. Based on the dominant specialist nursing roles, Forbes et al (2007) suggest an evolving model of nursing contribution to continuing care management involving "a highly integrated process in which the nurse identifies with the patient changes in their disorder, helps the patient respond to those changes, adjusts the patient's therapy and supports the patient in the adoption of positive self-care behaviours". The nurse functions in her

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relationship with the patient as an educator; interpreter; monitor; modulator and referrer. Forbes et al (2007) further suggested four models for the relationship of the nurse to the care system, with the nurse functioning more actively or passively within the different models:

1. The nurse as technology: the nurse functions as a technical interface (or as a technology) feeding the system with the information required for others to interpret.
2. The nurse as technologist: the nurse acts as an output analyst (monitoring patient progress through determining, directing and meeting care needs).
3. The nurse as system engineer: the nurse acts as the system manager and contributes to the way that the care is organised to fulfil the overall purpose of the care system thereby shaping the care system to improve its efficiency.
4. The nurse as architect: the nurse contributes to the primary system design by deciding factors such as inclusion criteria for the service, treatment processes and other structural components that define the care system.

Scott et al (2007) acknowledged the inherent difficulties in integrating the medical, psychological and social models for evaluating the nursing contribution in chronic disease management. They suggested that the 'trajectory framework' developed by theorists Corbin & Strauss (1991) could be helpful in understanding the nature of the nursing contribution to the care of people with long-term conditions: that is, helping individuals to shape the course of their condition while maintaining an acceptable quality of life.

It involves 'supportive assistance', an ongoing process that takes into account of the whole trajectory, shifting in accordance with changes in the patient's illness and circumstances. The model, considered to be widely applicable, takes account of the shift of emphasis away from acute care management to health promotion and prevention of chronic illness and other long-term conditions, as well as the new emphasis on primary care.

There were very few examples of community nursing from the reviews. A recent review of community nursing in Scotland (not included by the three reviews) makes recommendations for supporting nurses to maximize their potential and make their role in CDM more 'visible' and less hidden behind other professionals (Scottish Executive 2006). It suggests a new model for community nursing that:

- Builds on the core strengths of nurses (the practice framework)
- Supports nurses to respond to the health needs of Scotland's diverse communities
- Strengthens partnerships with health and social services
- Harnesses the opportunities presented by modern science and technology

The new nursing team central to the service model sits within a wider multi-disciplinary, multi-agency context and incorporates strong professional leadership, administrative support, health care support workers, registered nurses and nurses with specialist qualifications and having strong interfaces

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with many community services. Such models may be useful in placing nursing services appropriately to increase the benefits of their contributions.

This integrated review involved extensive coverage and provides an understanding, from different perspectives, of the current evidence on the nursing contribution to chronic disease management. Further findings from their current empirical work examining existing models, and determining future nursing service requirements, may provide more insights into future models for nursing within the UK.

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Appendix 1 Framework for synthesising evidence from the three reviews

This document sets out a plan for preparing a review of three reviews commissioned by the National Institute for Health Research (NIHR) Service Delivery Organisation (SDO). The aim is to produce an overall review of the three reviews which integrates and maps the process and findings from the three reviews on the nursing, midwifery and health visiting contribution to long-term conditions.

This framework incorporates key distinguishing features of NMHV contribution to CDM (based on research questions) and specific questions for drawing out the required information from the evidence presented in the three reviews and which would be important to the commissioners. The answers to these questions will emerge from 'mapping' of thematic findings on to the key NMHV contribution concepts/features identified in this framework. The following main sections are identified which show some overlap. Reference to frameworks or models are indicated.

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NMHV Contribution Key features/areas/key concepts	**Evidence (Source the review and relevant information)**	**Reference to framework/models in relation to key concepts defined** *Does it fit within the framework?*
Implementing evidence based care	Rational/strategy for each review	Conceptual frameworks from the reviews
Care context		**Health Care delivery**
~~Improving care to meet identified needs~~ Role of NMHV in assessment practices i.e. targeting patients with similar needs	Linking evidence for NMHV contribution to identified needs: ▪ *What is the role of nurses in assessment practices?* ▪ *Do nurses provide care that aims to meet the health needs?* ▪ *Is there evidence to show how effective the nursing care is in meeting the identified needs?* ▪ *What is the evidence of impact on assessment?*	Risk stratification in Kaiser Permanente (KP); Singh D (2006)
~~Types of intervention/care organised and/or delivered~~ Includes care systems, shared contribution, case management	▪*What is the evidence in relation to the types of interventions and care organised and/or delivered?*	Delivery System (NHS and social care LTC model (DOH 2005b) Case Management Disease Management Supported self care Promoting better health; Singh D (2006)
~~Settings and cross boundary working~~	▪*What types of settings are described for nurse-led models of care?* ▪ *What is the evidence in relation to interface working?* ▪*What types of cross boundary working are described?*	Delivery System (NHS and social care LTC model (DOH 2005b); Singh D (2006)
~~Nursing roles & development~~ Types of roles, substitution of care, location, technology, organisation Structures & role development Training & skills development Supporting careers Modernising nursing careers	▪ *What types of nursing roles are explicitly defined and described?* ▪*Does the evidence describe innovative/new and enhanced roles for nurses?* ▪ *What does the evidence tell us about the development of nursing roles, skills & training in providing long-term care?* ▪ *What are the key factors relating to the development of nursing roles?* ▪ *What does the evidence on developing roles/responsibilities tell us about career structure which enables them to work in different care settings, to take on changed roles and responsibilities, to pursue education and training and to develop the required skill mix?*	Health System, Delivery system design, Chronic Care Model (Wagner 1998); NHS and social care LTC model (DOH 2005b); Singh D (2006); "Modernising nursing careers Setting the direction" DOH Report 2006

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Service context		**Health Care Organisation**
~~Contribution to services/Health care organisations~~	▪*What is the evidence for NMHV contribution in relation to the various aspects of health care organisation such as improved access, development of new services, care management systems?*	Infrastructure, NHS and social care LTC model (DOH 2005); *Singh D (2006)*
Evidence of impact ~~What does the evidence tell us about the impact of the NMHV contribution in CDM to:~~ Provision of care: Nurse-led interventions/care/services Health care organisation: structures & systems of care	▪ *What is the evidence for different levels of NMHV practices and benefits in different settings?* ▪*What outcomes were defined and what was the evidence for improving these outcomes?* ▪*What is the evidence for improved experiences for patients/carers/professionals?* ▪*What were the barriers and facilitators?* ▪*How is nursing perceived in public services?* ▪*What is the evidence of impact on health care quality?*	**Better outcomes** Self management, support, Chronic Care Model (Wagner 1998) Maxwell Dimensions of health care quality (Maxwell 1992)
~~User/professional perspectives~~	~~Perspectives and evidence of impact~~ ▪*What is the evidence for improved experiences for patients/careers/professionals?* ▪*What were the barriers and facilitators?* ▪*How is nursing perceived in public services?*	~~Better outcomes~~ Prepared practice teams (Chronic Care Model, Wagner 1998), Empowered and informed patients, better prepared and proactive teams (NHS and social care LTC model (DOH 2005b)
Policy context	▪ *What are the enduring themes about policy?* ▪ *Does the evidence on NMHV contribution reflect current policy priorities and developments?* ▪ *What is the future direction for nursing in CDM?* ▪ *What are the consequences of policy on practice?* ▪ *Is there evidence to show how nurses are delivering an explicit policy initiative?* *Note: Some of these that reflect policy for example could be in improving access, increasing user involvement in decision making, emphasising health needs assessment, etc (cross reference NMHV contribution and policy themes to the relevant sections)*	Underpinning philosophy Chronic Care Model (Wagner 1998); NHS and social care LTC model (DOH 2005b)

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Discussion/Conclusions Key messages	▪ *What are the key messages?* ▪*What are the gaps in evidence in relation to NMHV contribution and the above contribution dimensions?* ▪ *What are the implications of the findings from the reviews?* ▪ *What were the challenges and limitations of the reviews?* ▪*What were the challenges of the process of integrating three reviews?*	From consensus of evidence
Implications for policy & practice	▪*What are the implications of the evidence for NMHV practice, policy, workforce development, education, training etc* ▪*Is there a need to establish the skills base for NMHV in particular areas of their care context to inform future role development?*	
Gaps in evidence and recommendations for research	▪*What does the evidence tell us about future work, models, key success factors, and implications for practice?* ▪*What are the inferences that we can draw from the collective evidence in the UK/Non-UK context?*	
New insights	▪*Does the evidence suggest new models of nursing contribution to CDM?*	

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Appendix 2 Table 4: Evidence of nursing contribution to chronic disease management

Disease & Study types	**Settings and interventions**	**Evidence of impact/ findings**	**Applicability /Quality**
COPD (Bunn 2007) 11 outcome evaluations. 3 RCTs (2 low quality) 3 SR low/high quality 5 UK based	Home-based interventions overlapping with case management interventions with promotion of self care/self management Mainly case management Mainly home-based support Community nurse supported discharge programme which included home visits and education	Potentially effective: Patients with COPD and respiratory disease may benefit from nursing outreach programmes; hospital at home appears to be safe. No significant effect on mortality or health related quality of life. Effects on hospital readmissions, days in hospital and GP visits were equivocal No significant effect in readmission to hospital or mortality; hospital at home was more cost-effective than inpatient care. Hospital at home is not suitable for all patients, depends on severity of disease Less evidence on effectiveness of pulmonary rehabilitation programmes No effect on health care use or health related QOL . No significant difference in unplanned readmissions, hospital bed days, ED visits, functional and psychosocial status or caregiver burden. (6 month follow up) Little data on effectiveness but most patients would be happy to be treated at home, improvements in exercise tolerance, breathlessness and QOL post intervention (weak designs)	Some applicability to UK

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Table 4 continued

Disease & Study types	Settings and interventions	Evidence of impact/ findings	Applicability /Quality
COPD (Forbes 2007) 15 outcome evaluations 5 UK based	Effect of nurse-led interventions on structures, process, outcomes, cost effectiveness	Outcomes between patients with stable COPD and those in an acute state are distinct. Little evidence to show how nurses were contributing to service structures. Weak evidence of improving care satisfaction through better management of care following an exacerbation of COPD; an increased expressed preference for domiciliary rather than hospital care by both patients and carers in the acute support model. Weak effects on self-care behaviours (e.g. improved smoking cessation); patient knowledge; QOL (mixed evidence), no effect on psychological domains, physical disease impact, mortality. Very little evidence of economic effect; some benefit on hospital readmissions and inpatient stays, A&E use, drug and GP costs (RCTs); Home support was cheaper than alternative hospital admissions model.	Mostly equivalence trials; not very robust
COPD (Scott 2007) (See Case management) 3 SR; 11 outcome evaluations; 5 RCTs, 9 UK based	Hospital (inpatient) based nursing case management and 'high' risk case management Cross boundary models: Outreach nursing. 'Supervised, home-based interventions involving the provision of care, education and support' A patient group directive (PGD) developed to enable nurses operating the at-home service to supply and administer appropriate drugs without having to refer to a doctor	See case management Insufficient data to report on the QOL & satisfaction of carers. May be effective on mortality and QOL in patients with moderate COPD (but not for severe cases); Outreach appeared to be resource intensive with limited measurable benefit in terms of health-related QOL or mortality. Patient satisfaction high with acute episodes being managed at home. Most GPs found service good /excellent. *Comments:* Success factors: nurses practising autonomously, continuing support of the lead respiratory physician. Patients received appropriate therapy during the acute phase,(PGD scheme), Nurses undertaking this clinical leadership role required extensive knowledge of COPD, its management and therapies. Patient education relating to compliance with medication, inhaler technique, coping strategies and issues around the disease process was seen as the key to success.	Low quality studies

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Table 4 continued

Disease & Study types	Settings and interventions	Evidence of impact/ findings	Applicability /Quality
COPD (Scott 2007)	Nurse-led respiratory intermediate care team (RICT). Team consisted of 3.4 full time nurses, providing a 6-day service with input as requested from occupational therapy and physiotherapy services, a community care manager and care assistants Hospital at home schemes	RICT reduced costs and patient satisfaction was high. (Full costings not given) People with acute exacerbations could be as successfully and safely treated at home as they would as inpatients, provided that they were discharged to home care with support from respiratory nurses and a multi-disciplinary team.	Poor quality data on cost effectiveness
Diabetes (Bunn 2007) 1 SR good quality 31 outcome evaluations, 15 RCTs mixed quality, mostly low 10 studies UK based	Interventions: Specialist nurses or case management (10 studies) Disease management Education Nurse-led clinics Community –based – domiciliary diabetes assessments Shared care (cross boundary) transfer of care from doctors to nurses and from secondary to primary care	Potentially effective: Case management and disease management for patients with diabetes, more research with strong designs is needed Some improvement in HbA1c, Little evidence of effectiveness in the long term on ED visits, hospitalisations or QOL; Overall mixed results Some improvement in glycemic control and some risk factors, diabetes related symptoms, improved patient satisfaction and knowledge In general, the interventions appeared to have no significant effect on glycaemic control or other clinical variable Some positive effect on blood pressure. No impact on any outcome measures Some improvements in quality indicators, glycaemic control, no effect on risk factors or patient satisfaction.	Applicability uncertain (only 6 studies)

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Table 4 continued

Disease & Study types	Settings and interventions	Evidence of impact/ findings	Applicability /Quality
Diabetes (Forbes 2007) Overall evidence from all study types: 49 outcome evaluations 25 descriptive 5 reviews	Nursing contribution, included nurse-led clinical interventions to improve care structures, processes, outcomes and cost effectiveness	Very little empirical material. Overall the benefits of any approach including nursing interventions remain unproven. However, the nursing contribution had some positive effect on diabetes control and symptoms (glycaemic and metabolic control), patient knowledge and self-care behaviours. Inconsistencies in the effect of nurses on patient well-being and quality of life. Weak evidence of positive effect on access, service use, some effect on care satisfaction and screening support, equivocal results on concordance; Non-UK material suggested reduction in costs by reducing hospital in patient care and admissions, overall cost effectiveness findings were inconsistent from very few studies	Few high quality studies
Diabetes (Scott 2007) 1 SR; 15 studies mixed designs from SRs which included RCTs and other studies)	Case management in primary care and delivered also as a component of disease management (condition-specific)	Improved perception of health status, improved blood pressure, & some process measures, mixed overall results on glycemic control, more effective when delivered in conjunction with disease management and when delivered with one or more educational, reminder or support interventions. *Comments:* Might be more efficient use of resources if intensive case management was instituted amongst all patients to stabilise their regime and improve their self-management skills and self-confidence. Nurse case management would then be continued only for high risk patients	Mixed study designs, mostly USA
MS (Bunn 2007) 2 SR	Role of MS specialist nurses. Interventions: information, education and advice to patients and carers; psychological support; and community follow up visits Psychosocial support, co-ordination of care, onward referral, provision of specialist advice and patient education. (Forbes 2007)	In general patients and general practitioners reported that they found the nurse helpful. Little data on effectiveness on any outcomes Appears to be a good fit between what patients want and what the nurses do.	Medium/good quality

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Table 4 continued

Disease & Study types	Settings and interventions	Evidence of impact/ findings	Applicability /Quality
MS (Forbes 2007) 12 outcome evaluations 2 SR (18 descriptive 2 Qualitative)	Nurse-led care for MS. Nurses coordinating medical and therapy teams; contributing to the education and information needs of other professionals to enable other professionals to take on specific roles, facilitating access to supportive assessments and multidisciplinary care, nurses have encouraged users in the development of information resources.	Effects attributed to nursing roles in MS in relation to care structures, processes and outcomes. About 13 studies gave examples of how nurses impact on care structures. Overall the positive effects were from weak studies. Structures: Cross boundary working, educating professionals, access and service use, developing care systems. The effect of nurses on the care process was strongest in terms of *care co-ordination, care quality and information needs* Nurses can affect care processes, in terms of: needs assessment; identifying clinical risks; and the organisation of respite care. Onward referral had no effect in overall use of services No benefit in terms of disease impact, although effect of nurses on clinical outcomes is centred around adaptation, psychological well-being and functioning and problem management. *However, in contrast to diabetes there is no direct impact reported on clinical indicators which is because patients' problems generally worsen despite care input.* Weak evidence of impact on self care behaviours, knowledge, QOL, physical disease impact Cost effectiveness: Weak evidence of cost benefits in relation to hospital admissions, length of hospital stay, although not based on full economic costings and with no comparative data Medium evidence on MS problems and symptoms Continence care can improve problems and Quality of care	SR good quality (as above)

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Table 4 continued

Disease & Study types	Settings and interventions	Evidence of impact/ findings	Applicability /Quality
Asthma (Bunn 2007) 23 studies 15 RCTs and other evaluations; All ages including children and adolescents 11 UK based	Specialist nurse-led hospital outpatient, primary care, schools; education and outreach, case/disease management, Mainly specialist nurses and other educators Cross boundary: liaison models of care Very few hospital based and outpatient clinics	Mixed results for asthma clinics. Outcomes reported: hospital admissions, length of stay, ED, GP visits. QOL, knowledge, attitudes, medication adherence Reduced unscheduled care; Whites may benefit more than other ethnic groups Smoking cessation advice and support from nurses can be effective in a hospital setting; Outcomes reported; Medication adherence, peak flow, routine consultations	Some applicability to UK ; mostly poor quality and weak designs
Asthma (Scott 2007) 19 studies, 2 SR, 8 RCT/CT and other evaluations 10 UK based	Primary care clinics Practices with NHS accreditation, audits and nurses with recognised diploma Practices with trained nurses leading clinics Asthma reviews by trained & qualified asthma nurses Nurse case management – intensive telephone intervention	Positive associations with favourable clinical outcomes, and a decreased use of accident and emergency departments and hospital outpatient clinics Fewer lost days from work or school, more patients in possession of a care management plan, fewer acute attacks and more short courses of systemic steroids. Improved prescribing and use of medication, use of peak flow meters morbidity. Telephone reviews, may improve access and reduce cost per consultation Value of clinics was in the opportunity they provided for education around self management and medication regimes Increased use of anti-inflammatory medication	

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Table 4 continued

Disease & Study types	Settings and interventions	Evidence of impact/ findings	Applicability /Quality
Epilepsy (Bunn 2007) 4 studies, 1 SR 2 RCTs 1 controlled study 4 UK based	Mostly primary care specialist nurses Providing information, advice, support, liaison with health professionals, education to primary care teams, making recommendations for care Hospital–based: Improving out patient care Innovative role that combined specialist nurse with case manager	Little evidence of improvement in quality of care. No significant effect on frequency of seizures, depression and anxiety or sick leave or school days missed. No effect on long-term patient, clinical or health outcomes: health related QOL, perceived QOL, health status, service use Overall improvement in process of care, some improvement in knowledge, reduced risk of depression in people with no recent attacks, no significant impact of psychosocial or clinical outcomes, improved knowledge with medical and social aspects, satisfaction with care	SR good quality; 1 RCT good quality
(Scott 2007) 16 studies, 6 UK based 2 RCTs	Primary care: Nurse run clinics Joint practice nurse/nurse specialist clinic to promote experiential learning ~~Cross boundary~~ Specialist nurses providing liaison service: information, advice and support to patients; liaise between different components of the health service and the wider public sector, and to educate primary health care teams	~~Primary secondary interface:~~ Fewer consultations with GPs and reduced A & E visits, reduction in annual costs in primary and secondary care. No evidence that delegating aspects of care to an experienced nurse had any adverse effect on clinical outcome Improved process of care in terms of more blood checks, recommendations to doctors by nurse on management of drugs, increased level of advice, willingness to attend nurse-run clinic Opportunity for nurses to be involved in other LTC; improved attendance and process of care Improved people's communication with their GPs; increased prescribing of monotherapy; increased access for the most needy. No significant impact in reported health status, not regarded as a potential cost-saving substitute for GP care. Patients reported a less positive perception of QOL	

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Table 4 continued

Disease & Study types	Settings and interventions	Evidence of impact/ findings	Applicability /Quality
Rheumatology (Bunn 2007) 8 studies, outcome evaluations; 6RCTs low/medium quality 4 UK based (Scott 2007) 18 studies 4 UK based 7 RCTs	Education including teaching self management skills, nurse-run clinics; few nurse specialists with relevant training or experience Outpatient clinics (included educational interventions) including 'expert' nursing care Transmural nurse clinics (described by Bunn et al 2007 and Scott et al 2007): The care from the nurse was additional to that provided by the rheumatologist and included information, prescription of treatment and referrals Primary care based: Education programmes Rapid access to outpatient clinic to improve shared care between primary and secondary care (new service, replacing traditional routine review)	No significant impact on disease activity scores, psychological status, pain, morning stiffness, knowledge, patient satisfaction, numbers taking medication, arthritis impact scales, health status. Care from a rheumatology nurse practitioner is as safe and effective as that by a junior doctor. Improved attendance, improved patient satisfaction. No major differences in outcomes reported. Care by the clinical nurse specialist (CNS) was as effective as inpatient care. No significant effect on functional ability, need for more information, hospital admissions, or the use of practical aids and adaptations. The intervention resulted in more contacts with rheumatologists and occupational therapists CNS care in the transmural clinic produced equivalent QOL and utility at lower costs. Preferred model of care by patients, compared with that provided by multidisciplinary team No significant impact on disability, pain, general health, mental health or GP visits. No effect on self-management behaviours, beliefs, QOL or health status. No significant effect on clinical or psychological outcomes. High patient satisfaction and confidence. Fewer appointments may reduce overall costs	A few applicable to UK but study designs limited
Parkinson's Disease (Bunn 2007) 3 studies, RCTs, UK based	Home based, case management, education delivered by specialist nurses/nurse practitioner Nurse-led multi disciplinary team: coordinated care	Little evidence of effectiveness. Outcomes included psychosocial variables, functioning and well-being, mortality, anxiety and depression, physical functioning or disability Economic analyses on a subgroup of patients found that specialist nurse care was more expensive than that by the neurologist. Improvement in pain, mobility and emotional reactions and in the overall score.	Some applicability to UK, although low quality RCTs

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Table 4 continued

Disease & Study types	Settings and interventions	Evidence of impact/ findings	Applicability /Quality
(Scott 2007) 4 studies, 3 UK based 1 RCT	Established nurse-led outpatient clinic (PDNS Parkinson's disease nurse specialist): substitution and 'add on' service	No overall difference in SF36 score or patient satisfaction. Median social disability and self care improved only in the group referred to the PDNS by a consultant. ~~Process measures~~: longer time with PDNS, nurses & consultants provided a different focus: doctors focused on explaining medical assessments, diagnosis, treatment, PDNS dealt with assessment, explanations and practical management of disability, plus referrals to other services. Cost of PDNS-only group was significantly higher than for the consultant group. Patients particularly valued the availability of consultant and PDNS at the same appointment; the professional approach of consultants and specialist nurses; information-giving; new medication and referrals to other services; short waiting times; and continuity of care. (weak study designs)	Some applicability to UK, study quality low
	Liaison nurse (cross boundary model) community based nurse working under the guidance of 'nurse manager', shared care service with GPs and consultants	No significant effect on clinical outcomes or mortality or process measures. Improvement in subjective well being (global heath Q). Significant change in use of medication reflecting nurses awareness of evidence-based best practice. Liaison nurses provide a service that is as safe as standard care, based on more up-to-date evidence about prescribing, no increase in healthcare costs. *(*similarities with case management as an organisational intervention)	
Anticoagulant provision (Bunn 2007) 3 studies outcome evaluations, 1 RCT UK based	Nurse-led clinics evaluating monitoring and treatment of patients on anticoagulants. Hospital based Computerised decision support in primary care	Nurses were at least as effective as doctors in managing patients on anticoagulation medication, the nurse service was not more expensive than the consultant led service No significant effect on INR control, improvement in proportion of time spent in the intervention group, more expensive than hospital-based follow-up	Most applicable to UK, but weak designs and not high quality

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Table 4 continued

Disease & Study types	Settings and interventions	Evidence of impact/ findings	Applicability /Quality
Bowel disease (Bunn 2007) 3 studies, outcome evaluations, 1 RCT; UK based	Hospital based outpatient clinics Nurse-led psychosocial counseling	There were no significant differences in general or mental health scores at 12 months. Reduction in outpatient visits and length of stay but no change in hospital admissions or quality of life, improve patients understanding of their condition and its management.	Applicability to UK uncertain due to weak study designs
Cardiovascular disease (Bunn 2007) 32 studies, 22 outcome evaluations, 4 SR 16 RCTs (SR included 46 studies between them) 8 UK based	Nurse-led clinics in hospitals, outpatient clinics, primary care. Case management Discharge management: liaison nurses to coordinate and support follow-up care in general practice, they gave support, education and training to practice staff. Education and health promotion Home based monitoring and cardiac rehabilitation programmes Technology	Nurse-led cardiac clinics (general nurse-led clinics were as effective as GP clinics or care by doctors for most outcomes with reductions in admissions, readmissions, mortality and costs. Complex programmes that involved hospital discharge planning were most effective. Little information on adverse events or cost effectiveness. Short-term improvement in appropriate aspirin use, increase in the use of ECG, reduced length of stay, improved patient satisfaction , better lipid control, dietary consumption and physical activity levels, no significant effect in hospitalisation, rehospitalisation, ED visits, and use of cardiac medication or death, (weak designs); overall mixed results on major risk factors, Quality of life, readmissions, ED/GP visits, costs; smoking cessation programmes may be particularly effective, if delivered early after diagnosis Post hospital nursing care: Impact on clinical outcomes, health care costs and resource use was unclear Some reduction in readmissions, positive change in quality of life, knowledge of angina and exercise tolerance (Weak study designs) Improvement in numbers screened for a trial fibrillation; no significant impact in health or mental status or hospitalisations, short-term reduction in ED visits and costs in the intervention groups (both telecare and telephone care). Weaker designs of telemonitoring showed reductions in hospitalisations, length of stay and ED visits.	9 studies applicable to UK; RCTs mostly low or medium quality

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Table 4 continued

Disease & Study types	Settings and interventions	Evidence of impact/ findings	Applicability /Quality
Cardiovascular disease (Scott 2007) 6 studies; 4RCTs	Preventative case management Education in self care Hospital outpatient following discharge	Significant lipid reduction, as well as improvements in dietary and exercise patterns	
Dermatology (Bunn 2007) 3 studies, outcome evaluations, 1 SR, 2 RCTs, UK based	Nurse-led clinics in various clinical settings Education by trained nurses Includes children in General practice	Patients seem to be happy with nurse-led services and appreciated being able to see a nurse quickly. Some support for nurse education in general, little evidence of effectiveness was reported. Short term follow-up. No effect on quality of life or impact on the family, fewer GP visits and greater knowledge about treatment.	UK based, poor quality review and studies
Stroke (Bunn 2007) 7 studies, 5 RCTs 3 UK based	Stroke nurse specialist delivering Education Cross boundary Home-based care; outreach and education after discharge	No significant effect on risk factors (BP, cholesterol, glucose) or depression, quality of life, perceived well-being or health status; patients felt more able to consult staff and more satisfied with information. Carers may benefit from increased attendance In general, there was little evidence of benefit from the interventions. No significant effect in functional ability (Barthel index), social activity, perceived health status or carer stress, satisfaction, quality of life, use of rehabilitation services, anxiety and depression, activities of daily living	3 studies applicable to UK; Most RCTs good quality
Hypertension (Bunn 2007) 7 studies, 6 outcome evaluations; 1 SR UK based; 4RCTs	Nurse-led clinics – primary care Case management Discharge management Technology	Little effect on blood pressure, nurse-led care did not appear to be less safe than care by a GP. Mixed results on blood pressure and medication adherence Home telemonitoring and the community telemonitoring groups significantly reduced blood pressure	Applicability to UK uncertain; SR poor quality UK based; RCTs low quality

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Table 4 continued

Disease & Study types	Settings and interventions	Evidence of impact/ findings	Applicability /Quality
Health promotion (Bunn 2007) 7 studies 1 SR, 3RCTs Different countries	Smoking cessation interventions for Cardiovascular disease, diabetes, respiratory disease and general population Diet and education by nurse case manager	Smoking cessation interventions may be effective patients with cardiovascular disease if delivered early after diagnosis. Small changes in dietary intake and physical activity, attitudes towards consumption of soya foods and milk for osteoporosis prevention	Some applicability to UK; SR good quality; RCTs poor
HIV (Bunn 2007) 2 studies No outcome evaluations	Not applicable	Quality of care from nurse consultants good; more training required for district nurses. No patient data	
Chronic pain, dizziness (Bunn 2007 3 studies, 2 outcome evaluations, 1 RCT UK based	Nurse-led clinic primary care Practice nurse initiated rehabilitation	Improvements in mean pain scores and self reported symptoms although study design weak with short follow-up	
Non condition specific (Bunn 2007) 16 studies 8 outcome evaluations 1 SR; 5 RCTs	Interventions: Case management, education, home based support and nurse-led clinics. Case management delivered by Advanced practice nurse in primary care Cross boundary (integration of primary and secondary care): co-ordination of services, psychosocial support, care planning and the promotion of independence	Home-based support for older people. This appears to be most effective if visits are frequent and extended over time. Additional range of services in primary care such as regular monitoring, psychosocial support and referral. No effect on emergency admissions or mortality No significant effect on quality of life, patient satisfaction, activities of daily living, hospital admissions or length of hospital stay and more visits to the emergency department.	Applicability to UK uncertain; Most USA based, 2 UK based; SR good quality, RCTs low quality

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Table 4 continued

Disease & Study types	Settings and interventions	Evidence of impact/ findings	Applicability /Quality
Non condition specific (Bunn 2007) *continued*	Community based case management Case management plus home visits and remote video technology Nurse coaching support for patients with chronic illness. Theory-based, included behavioural counselling, motivational interviewing and goal setting Home visits Nurse-led clinics Community based stress reduction for children and parents by paediatric nurse	Less hospital admissions, ED visits, shorter LOS and cost savings (small study) No significant effect on compliance, knowledge, patient satisfaction or service use but there was a cost saving associated with the intervention No significant effect in health status, social role limitations, or general health Although some patient related improvements, in general the effects on patient outcomes were mixed. No significant effect on health status; disease-specific physiological measures; satisfaction; or use of ED, specialist, or inpatient services Parents had lower anxiety and higher satisfaction and coping scores than the control group. (short follow-up)	
Intermediate care (Scott 2007) 2 reviews (1SR): 11RCTs, 1 audit; 8 UK based	Nurse led in patient care models of care where nurses had replaced the care management function of hospital doctors and nursing was identified as the lead therapy. Settings included acute hospitals, GP-run community hospitals, nursing homes and community care centres (in the UK) and sub-acute care centres, transitional care services and units focusing on the care of the 'chronically critically ill' (in the US).	At the point of discharge people discharged from the nursing-led units were more independent in terms of functional status, and experienced greater well-being. Fewer patients were discharged to institutional care, although this finding was not sustained by longer-term follow-up. There was a reduction in early readmissions for patients discharged from these units. Considered to be 'the most promising model of inpatient care for future investment' Patients included in the trials were post-acute medical and surgical admissions, with diagnoses including stroke, heart, respiratory, neurological and orthopaedic conditions.	Some applicability to UK

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Table 4 continued

Disease & Study types	Settings and interventions	Evidence of impact/ findings	Applicability /Quality
Case management (Scott 2007) 35 studies 6 SR, 15 RCTs	Reviews; primary care interventions included nurse-directed education; post-hospital needs assessment; medication review; telephone and clinic follow-up visits; and home visits. Some delivered by highly trained nurses and targeting specific populations	Generally positive impact on patient satisfaction, QOL and functional status, but at an unknown cost.	USA; overall poor quality data
	Hospital-based Nurse case managers oversaw patients' care needs during admission and followed them up after discharge, providing a 'without walls' service.	Overall, not significantly effective in reducing length of stay and hospital admissions compared with usual care. Reduced length of stay for heart patients but not stroke, US studies effective in reducing the readmission rate, with an overall 6% reduction in the rate.	
	Case management of older people with complex needs, delivered by mainly registered nurses with post graduate qualifications	May reduce hospital admissions, mixed results on cost effectiveness. Mixed results on LOS or hospital days, use of ED, functional health status Workforce dimensions: Few significant differences between case management provided by different personnel. The findings did not support investment in nurse case managers in place of other staff. Conflicting evidence on the effects of case management on clinical and resource outcomes. Case management might have some benefit for people at greatest risk of hospitalisation, but might not always be worthwhile for other people with long-term conditions	
	Inpatient case management (part of wider quality improvement initiatives e.g. monitoring implementation of critical care pathways)	Very few studies, No evidence of reduction in health care costs.	

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Table 4 continued

Disease & Study types	Settings and interventions	Evidence of impact/ findings	Applicability /Quality
Case management (Scott 2007) *continued*	Case management following discharge planning	Improved access to health care personnel, resources and equipment after discharge. No significant effect on functional ability, satisfaction with care and health services use.	
	Telephonic case management	Reduction in readmissions reported in a few studies but which had weak designs, No effect on functional outcomes, quality of life, costs of care. Patient satisfaction high	
	Community based preventive case management for high risk older people	Hospitalisation rates, hospital days, multiple readmissions reduced, no evidence of cost shifting to outpatient setting	
	Preventative home visits Preventative CM of high risk nursing home residents: Nurse practitioners Evercare model, supplement physician care; financial incentive for nursing homes	Reduced hospital admissions, ED and physician visits; reduced resource use (weak designs). Overall little effect on functional autonomy, well-being or perceived social support, health service utilisation	
		High risk group showed no effect, patient satisfaction high	
		Reduced hospitalisation. People admitted were managed with fewer hospital days, with a cost saving	
		No effect on overall quality of care or reduced use of services	

SR systematic review; RCT randomised controlled trial; CT controlled trial; COPD Chronic Obstructive Pulmonary Disease; MS Multiple Sclerosis; GP General Practice; ED Emergency department; QOL Quality of life; LTC Long term conditions

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Addendum:

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The management of the SDO programme has now transferred to the National Institute for Health Research Evaluations, Trials and Studies Coordinating Centre (NETSCC) based at the University of Southampton. Although NETSCC, SDO has conducted the editorial review of this document, we had no involvement in the commissioning, and therefore may not be able to comment on the background of this document. Should you have any queries please contact sdo@southampton.ac.uk.