Managed Clinical Networks – a literature review

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### Acronyms and abbreviations

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<tr>
<th>Acronym</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>ACN</td>
<td>Australian Cancer Network</td>
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<tr>
<td>ACT</td>
<td>Australian Capital Territory</td>
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<td>AHP</td>
<td>Allied Health Professionals</td>
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<td>AIHW</td>
<td>Australian Institute of Health and Welfare</td>
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<td>BAPM</td>
<td>British Association of Perinatal Medicine</td>
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<td>CanNET</td>
<td>Cancer Services Networks National Demonstration</td>
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<tr>
<td>CCC</td>
<td>Cancer care coordinator</td>
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<td>CMO</td>
<td>Context-mechanism-outcomes</td>
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<td>C Core</td>
<td>Collaboration for Cancer Outcomes Research and Evaluation</td>
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<td>GP</td>
<td>General Practitioner</td>
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<td>ICS</td>
<td>Integrated Cancer Services</td>
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<td>MBS</td>
<td>Metastatic bone surveys</td>
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<td>MCN</td>
<td>Managed Clinical Networks</td>
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<td>MDC</td>
<td>Multidisciplinary Care</td>
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<td>Multidisciplinary Teams</td>
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<td>MRI</td>
<td>Magnetic Resonance Imaging</td>
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<td>NBCC</td>
<td>National Breast Cancer Centre</td>
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<td>NiCS</td>
<td>National Institute of Clinical Studies</td>
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<td>NHPAC</td>
<td>National Health Priority Action Council</td>
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<td>NHS</td>
<td>National Health System (England)</td>
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<td>NHSS</td>
<td>National Health System Scotland</td>
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<td>NoSCAN</td>
<td>North of Scotland Cancer Network</td>
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<td>NSIF</td>
<td>National Service Improvement Frameworks</td>
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<td>NSW</td>
<td>New South Wales</td>
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<td>PCCN</td>
<td>Primary Community Care Networks</td>
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<td>PMF</td>
<td>Patient Management Framework</td>
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<td>QLD</td>
<td>Queensland</td>
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<td>RCT</td>
<td>Randomised Controlled Trial</td>
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<td>SCAN</td>
<td>South East Scotland Cancer Network</td>
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<td>WA</td>
<td>Western Australia</td>
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<td>WHO</td>
<td>World Health Organisation</td>
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<td>WoSCAN</td>
<td>West of Scotland Cancer Network</td>
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Cancer Services Networks National Demonstration (CanNET) Program

Literature review

Introduction

Cancer Australia is funding the Cancer Services Network National Demonstration Program (CanNET) as part of the 2nd Phase of the Strengthening Cancer Care - Mentoring Regional Cancer Services measure. This funding will enable the development of seven managed cancer service networks across Australia by linking regional and metropolitan cancer services into single networks.

The purpose of CanNET is to improve access to quality, clinically-effective cancer services throughout Australia, particularly for specific population groups that currently have poorer outcomes, including Aboriginal and Torres Strait Islander peoples and people living in rural and regional areas.

The model for the CanNET project is drawn largely from the ‘Managed Clinical Networks’ work of the National Health Service Scotland (Scottish Executive Health Department, 2002). This literature review has been undertaken to explore the key elements required for the establishment of effective cancer service networks.

Aim

The current literature review was developed by the CanNET National Support and Evaluation Service (provided by Siggins Miller), on behalf of Cancer Australia. It aims to provide a systematic review of relevant international and national policies, and recent published research and literature related to the establishment of clinical networks and multidisciplinary teams (MDTs).

Method

The methods used to identify relevant literature were as follows:

Computerised databases: A systematic search was made of computerised databases (Medline, Ovid, PubMed, pyscINFO, and Google Scholar). The search strategy for managed clinical networks (MCN) used the following terms singly or in combination: managed clinical networks, consumers, networks, health. The strategy for MDTs used the terms multidisciplinary teams, multidisciplinary care (MDC), multi-professional teams, multi-professional care, and cancer.

The Internet: Cancer sites on the Internet were investigated for up-to-date information on the most recent cancer publications. Organisations whose websites were accessed included Cancer Australia, Queensland Health, the National Priority Action Council, and the National Breast Cancer Centre (NBCC).

Additional identification of papers: In addition, individual searches were carried out on key authors by pursuing references and bibliographies from seminal articles and related links. Organisations whose reports provided such references included the World Health Organisation (WHO), Cancer Australia, the NBCC, the National Health Priority Action Council (NHPAC), the Victorian Government, Queensland Health, the National Health System UK (NHS), and the National Health System Scotland (NHSS).

Inclusion criteria: Different inclusion criteria were used for the paired areas of MCNs and MDTs owing to the lack of empirical literature covering MCNs. For MCNs all studies in the area of healthcare were included, whether their focus was cancer or not. Eight relevant studies regarding managed clinical networks were identified, none of which were of randomised controlled trial design. By contrast, a larger amount of literature was available for MDTs, and all studies which considered the use of multidisciplinary care or multidisciplinary teams caring for cancer patients and their families were included.
Twenty-four relevant studies covered multidisciplinary team and care: one had a randomised control design. Studies that focused on one cancer site, such as breast cancer, were included because it was felt the review would be too narrow otherwise.

In each case (MCNs or MDTs), a review of the theoretical literature is followed by a review of the related empirical research. Section 2 presents the literature and research associated with MCNs, while Section 3 focuses on the literature and research associated with MDTs. Copies of the original articles discussed in the review may be accessed from the listed addresses, or can be provided if required.

The current review also includes a summary of relevant current policies and frameworks for cancer control in fifteen locations here and overseas. This review is presented first, in Section 1, so as to ground the empirical studies within the current policy context.
Section 1. Current cancer control policies and frameworks

In Section 1, a brief summary of some Australian and international policies and frameworks for cancer control is provided. The summary also covers major international, national and state and territory policies and frameworks specific to the employment of multidisciplinary teams for cancer care. This section is not intended to be exhaustive, and we acknowledge that some policies and or frameworks in circulation will not be covered. Nor does this section cover guidelines and frameworks targeted to specific cancer types or patient populations.

The following sections present overviews of the World Health Organisation’s (WHO) policies and managerial guidelines (2002), the National Health Priority Action Councils (NHPAC) National Service Improvement Framework for Cancer (2005) and a selection of state based cancer plans and policies. Overviews of a range of other cancer-related policies and frameworks have been included as Appendix A.


The WHO provides policies and guidelines for the development of national cancer control programs (WHO, 2002). These public health programs are designed to reduce cancer incidence and mortality and improve quality of life of cancer patients, through the systematic and equitable implementation of evidence-based strategies for prevention, early detection, diagnosis, treatment, and palliation, making the best use of available resources. Establishing a national cancer control program offers the most rational means of achieving a substantial degree of cancer control, even where resources are severely limited by setting of appropriate priorities throughout the patient journey: prevention, early detection, treatment and palliation.

These guidelines acknowledge that objectives and priorities need to be tailored to the specific country context but suggest that the planning processes ought to follow four basic steps:

- Assessing the magnitude of the cancer problem;
- Setting measurable control objectives;
- Evaluating possible strategies for cancer prevention and control; and
- Choosing priorities for initial cancer control activities.

A flexible approach is needed, as political, socioeconomic and epidemiological situations vary and evolve. With this in mind, three separate scenarios are provided to help guide countries toward what is possible with their limited level of resources (low, medium or high).

The guidelines acknowledge that processes should be managed to meet the requirements and needs of customers, providers and other stakeholders. Some key processes to be considered in implementing a national cancer control program are: demonstration area; step by step implementation; optimising existing resources; organising activities with a systematic approach; education and training; and monitoring and evaluation.

Recommendations for the minimum essential actions by national cancer control programs are provided, and tailored to countries with different levels of resources. These recommendations refer to the components of prevention, early diagnosis, screening, curative therapy and pain relief and palliative care. Further information can be found in the policies and managerial guidelines (WHO, 2002).

1.2 National Service Improvement Framework for Cancer (National Health Priority Action Council, 2005)

In 2002-03, the Australian Health Ministers’ Advisory Council agreed to the development of a national strategic policy approach to chronic disease prevention and care in the Australian population. The National Chronic Disease Strategy provides the overarching framework of national direction for improving chronic disease prevention and care across Australia. This
strategy is supported by five disease specific National Service Improvement Frameworks (NSIF), including one which covers cancer.

These frameworks are intended to be tools to drive improvement in health services for people with national health priority conditions to achieve better health outcomes for all Australians, included disadvantaged groups. Each is structured to reflect the phases of the patient journey - reducing risk, finding disease early, managing acute conditions, long term care and care in the advanced stages of disease.

The NSIF for cancer:

- Includes strategies for prevention through to care at the end of life
- Is based on the needs of people with cancer, carers, families and communities to reduce the burden of illness and distress associated with cancer
- Considers the provision of best cancer care to all Australians
- Recognises that some communities and individuals need special programs and services to ensure that they can access appropriate cancer care
- Draws on existing international and national plans
- Recognises that, although hospitalisation and specialist treatment are critical components of combating cancer, a large part of the journey for people with cancer takes place in the community
- Identifies 19 critical intervention points during the patient journey, aimed at: Reducing risk; Finding cancer early; Managing and supporting during active treatment; Managing and supporting after and between periods of active treatment; and Caring at end of life if cancer is not curable.

Identified the following eight priority actions:

1. Establish integrated and networked cancer services to improve continuity of care, from reducing risk to care at the end of life.
2. Establish accreditation for cancer services and credentialing of practitioners using as a basis the recommendations about optimal services outlined in the framework.
3. Develop funding structures which support multidisciplinary care in hospitals and the community through specialist and general practitioner payment schedules.
4. Develop national, state/territory and local approaches to monitoring all aspects of cancer control including performance indicators.
5. Provided evidence-based consumer information about the environmental, behavioural and genetic risks of cancer, prevention, early detection, diagnosis and treatment and supportive care.
6. Establish national approaches to assist primary health care providers, especially general practitioners, to offer high quality and appropriate assessment of risk, detection of cancer, referral to treatment, coordination of treatment and supportive care (from diagnosis to palliative care).
7. Implement and evaluate culturally appropriate programs to improve cancer control with special emphasis on the needs of disadvantaged groups, particularly Aboriginal and Torres Strait Islander people.
8. Review the evidence, gaps in research and opportunities for action within a specific timeframe, at least every three years.

1.3 A Clinical Service Framework for Optimising Cancer Care (NSW Department of Health, 2003)

In 2003, a Clinical Service Framework for Optimising Cancer Care in NSW was developed as part of the NSW Chronic Care Program (2000 - 2009). The framework builds on the significant achievements of the NSW Health Optimising Cancer Management Initiative
(1999) and draws together evidence and clinical expertise to describe a model for the practical management of patients with cancer.

The standards for cancer care in this framework have been developed following extensive consultation, to facilitate consistency and best practice in the management of people with cancer. These standards are based on a generic cancer services approach rather than dealing with aspects of the clinical management of site-specific cancers.

The seven areas in which standards have been developed are:

1. Implementation, monitoring and review of standards of cancer care in NSW
2. An area-wide approach to optimising cancer care
3. Patient-centred care
4. Access to appropriate clinical services
5. Multidisciplinary care
6. Communication between primary, secondary and tertiary services
7. Education, training and continuing professional development

The key objectives of this framework include:

- Establishment of formal and effective management groups for cancer services in each Area Health Service, with clear leadership, membership and scope of activities
- Establishment of specific initiatives that promote patient-centred care, including provision of information packs and personal health records, development of a consent form, and use of care coordinators for appropriate patients
- Establishment of a multi-disciplinary care approach and development of Area-wide site-specific clinical groups and multi-disciplinary teams
- Establishment of waiting time limits and regular waiting time monitoring
- Encouragement and facilitation of involvement of general practitioners at all relevant stages of care
- Promotion of continuing professional development for all clinical and non-clinical members of the cancer workforce

In summary, cancer is a major priority for the NSW Department of Health and, as such, is reflected in the NSW State Health Plan (2007).

1.4 Western Australia Health Cancer Services Framework (WA Health Cancer Services Taskforce, 2005)

The Western Australian (WA) Cancer Services Taskforce supports the Federal Government’s commitment to the establishment of Cancer Australia as a national body to provide a link between multiple national cancer agencies and implementation of the recommendations in the National Service Improvement Framework for Cancer (National Health Priority Action Council, 2005). To progress this work the WA Health Cancer Services Framework (2005) has been developed with a focus on:

- Safety and quality in cancer care
- Patient focussed care with appropriate information and transparency
- Accessibility and timeliness of care
- Addressing all elements of the patient pathway including partnerships with patients, carers and families
- Ensuring multidisciplinary care
- Addressing issues of facilities and workforce
- Supporting staff education and development
• Linking research to care and providing opportunities for enhanced data collection and
• Evidence-based therapy

The WA Health Cancer Services Framework (2005) identified 45 initiatives within nine major strategic areas that will be implemented over the next five years to achieve the desired outcomes of reducing cancer incidence, increasing survival and care, and enhancing the quality of life of cancer patients. The nine strategic areas include:

• Appointment of Director of the cancer network
• Structure of the cancer network
• Cancer centres
• Models of care: Tumour collaboratives
• Patient support and cancer nurse coordination
• Clinical trials and cancer data collection
• Rural cancer services
• Prevention and screening
• Workforce planning

1.5 South Australia Department of Health: Statewide Cancer Control Plan 2006-2009
(The Cancer Council South Australia and the SA Department of Health, 2006).

The vision for the Statewide Cancer Control Plan (The Cancer Council South Australia and the SA Department of Health, 2006) is to:

• Save more lives by reducing the number of new cases of cancer and improving rates of survival when cancer does occur.
• Ensure people receive effective support as well as the best treatment and care.
• Improve the quality of life of people with cancer, cancer survivors and carers.
• Address inequalities in cancer risk and cancer outcomes, between more and less advantaged sectors of the community, by addressing the causes.
• Build for the future through investment in the cancer control workforce, infrastructure and strong cancer research.
• Provide and improve information for cancer control.

This will be achieved through:

1. Establishing a Statewide Cancer Control Advisory Group to coordinate cancer control across the state and to promote and monitor the implementation of the Statewide Cancer Control Plan.

2. Establishing sub-committees or entities to oversee progress of recommendations relating to different areas of cancer control, namely:
   a. Cancer Prevention and Early Detection Operations Group
   b. Cancer Care Operations Group
   c. Infrastructure Planning Operations Group
   d. Workforce Planning Operations Group
   e. South Australian Cancer Control Research Collaborative

3. Establishing and adopting key indicators of cancer control (e.g. through Regional Health Service funding agreements) and monitor progress.

In addition, a Statewide Integrated Clinical Cancer Service is proposed. The goal of this clinical service delivery model is to optimise the experience and outcomes of people with cancer and their carers by maximising co-ordination and integration of cancer services. It
aims to provide accessible, high-quality, people-centred, coordinated, and multidisciplinary cancer services for all South Australians.


In 2002, the Department of Human Services engaged a national expert consultancy group, the Collaboration for Cancer Outcomes Research and Evaluation (C Core), to develop the Cancer Services Framework for Victoria (2003). The framework advises on:

- Whether Victoria has the appropriate mix and location of cancer services to meet future requirements for cancer service provision
- Future directions for the Peter MacCallum Cancer Institute
- Consideration of a cancer service system and the relationship with non-acute health and other relevant services
- Recommendation of a role designation framework for hospitals for the provision of cancer services

The principles on which the Cancer Services Framework for Victoria (2003) has been based include:

- Multidisciplinary cancer care to ensure effective and efficient patient management;
- Maximal geographic access for patients and their carers/families; and
- High quality and safe cancer services.

It articulates a vision for a cancer service system in Victoria that identifies a number of major metropolitan and regional providers with formalised strategic links to intermediate and smaller services, and to rural services. Implementation will be informed by general and tumour-based standards of care in these areas:

- Access to a full range of services.
- Timely and accurate diagnosis.
- Treatment in line with evidence-based practice.
- Continuity of care from diagnosis through to palliative care.
- Outcome and performance measurement.
- Service approval through formal accreditation processes.

1.7 **Summary**

The sections above provided an overview of some Australian and international policies and frameworks for cancer control. The WHO’s National Cancer Control Programmes policies and managerial guidelines (2002) provide the framework for the development of national cancer control plans. They suggest that national cancer control programs should be designed through a four phase process - the first phase should involve assessing the magnitude of the cancer problem in a particular context; this information gathered during the first phase should then be used to set measurable control objectives; the third phase should involve evaluating possible strategies for cancer prevention and control; and the final phase should focus on choosing priorities for initial cancer control activities. The guidelines also put forward a range of recommendations for the minimum essential actions by national cancer control programs for countries with different levels of resources. These recommendations refer to the components of prevention, early diagnosis, screening, curative therapy and pain relief and palliative care.

The Australian National Service Improvement Framework (NSIF) for cancer (National Health Priority Action Council, 2005) is also structured to reflect the phases of the patient journey -
reducing risk, finding disease early, managing acute conditions, long term care and care in the advanced stages of disease. In this way the NSIF reflects the recommendations put forward in the WHO’s National Cancer Control Programmes policies and managerial guidelines (2002). The NSIF also identifies 19 critical intervention points during the patient journey and eight priority actions aimed at: reducing risk; finding cancer early; managing and support during active treatment; managing and supporting after and between periods of active treatment; and caring at end of life if cancer is not curable. The NSIF has informed the development of cancer plans in each Australian jurisdiction, except for the Northern Territory and Tasmania who currently don’t have cancer plans in place. Furthermore, Cancer Australia’s CanNET program is also underpinned by the NSIF and patient centred in design.
Section 2. Managed clinical networks

Increasingly over the years, health policy makers in countries such as Scotland, Canada and New Zealand have recognised the need for cooperation and collaboration and in light of the limitations of health systems working in isolation (Baker and Lorimer 2000; Scott & Hofmeyer 2007). This emerged out of the realisation that traditional hierarchies of primary, secondary and tertiary care does not meet what patients and service users want to see: fast access, efficient diagnosis and patient centred (as opposed to profession centred) care pathways. Additionally, in a fast changing and technologically advancing health service, the roles of doctors, nurses and allied health professionals is changing significantly. As such, the idea of professional boundaries has become outdated, and MCNs recognise this (Baker 2002).

In countries such as Scotland, the need for MCNs emerged out of a need for greater efficiency in health services, where reduced hours of work in the medical workforce, new training arrangements and increased specialisation of clinical practice made it difficult to maintain quality services, especially in geographically dispersed areas (Carter, Garside & Black 2003; Woods 2001b). MCNs address many of the problems that have been identified in the traditional delivery of health services. These include poor coordination of services, problems in identifying patients and in delivering treatment to all of them, lack of knowledge about the benefits of specific treatments, concerns about the use of resources, especially drug costs and clinician time (Baker 2002).

Therefore, a move away from traditional hierarchically structure healthcare systems and organisations is widely thought to be required in order to become more flexible and responsive to external operating environment (Conner 2001; Edwards 2002; Woods 2001a 2001b). In this way, MCNs represent a shift from buildings and organisations towards services and patients (Cropper, Hopper & Spencer 2002; Woods 2001b). Further, traditional referral and funding systems have worked for individual management but not for providing equitable services for populations of people. Nor have traditional systems managed changes in services and skills well, as they are slow to adapt, and often there is a lack of clarity of roles and how best to use resources available (Baker & Lorimer 2000).

2.1 Defining managed clinical networks

Managed clinical networks have been defined as:

“...linked groups of health professionals and organisations from primary, secondary, and tertiary care working in a coordinated manner, unconstrained by existing professional and [organisational] boundaries to ensure equitable provision of high quality effective services” (Scottish Executive Health Department, 2002).

In other words, MCNs operate as a group of healthcare professionals from different backgrounds working as a ‘virtual team’ to deal with a particular problem (Baker 2002; Carter, Garside & Black 2003). They involve the structured cooperation of primary, secondary and tertiary healthcare providers and different health professions (Baker 2002; Baker & Lorimer 2000; Carter, Garside & Black 2003; Kunkler 2000; Woods 2001b). A variety of arrangements operating on different scales is possible. These can be within primary care, across primary, acute and community care, within a health district, across health districts or larger geographical areas (Cropper, Hopper & Spencer 2002; Woods 2001b). They can cover a specific disease, specialty, location or function (Baker & Lorimer 2000; Cropper, Hopper & Spencer 2002; Woods 2001b). Additionally, they may be made up of a series of local diagnostic and treatment networks including hospitals, GPs, health care cooperative, community, intermediate hospitals, local health promotion services, and ambulance services (Baker & Lorimer 2000; Scott & Hofmeyer 2007).

MCNs may be defined as not flat in terms of power structure, but flexible. They consist of many layers and the major relationship is peer to peer. The purpose and agenda of the
network is in the first instance set by patients and then by the service delivery body nearest to the patients (Connor 2001).

MCNs are not intended to be organisations in their own right, although they may have a dedicated management function, joint recruitment and appointment of staff, shared rotation in staff training, common protocols and policies. They may also have shared access of rights to beds, information systems, patient records and training and auditing programs (Cropper, Hopper & Spencer 2002).

The following sections (Sections 2.2 & 2.3) provide an overview of the theoretical and conceptual literature associated with MCNs - much of this literature was informed by previous attempts to establish MCNs. This is followed by a review of the available empirical research studies that focuses on MCNs (Section 2.4) and a review of the key characteristics of effective MCNs (Section 2.5).

2.2 Benefits of managed clinical networks

There has been a great deal of literature generated about managed clinical networks, but most of the discussion has been of theoretical or conceptual nature which suggests that MCN represent a way to improve patient care in regards to the quality, access, convenience and coordination. The goal is to ensure the best treatment gets to the right patient, at the right time, in the most appropriate place and is delivered by the most qualified and skilled professional with the greatest resources (Baker 2002). MCNs should offer patients better access and more effective services, improved coordination, consistent advice, and better care and prevention (Baker 2002; Baker & Lorimer 2000).

Additional benefits of MCNs that have been promoted include:

- More involvement of patients and healthcare professionals in developing clinical services and in identifying research, educational, and training needs (Baker & Lorimer 2000).
- Interchange across all levels of service delivery and achieving a managed multidirectional flow of patients, expertise and resources (Baker & Lorimer 2000).
- Focusing existing health services on what matters, patients and their problems (Baker 2002; Edwards 2002).
- Full coverage of specialist services away from major centres and across geographical and political boundaries (Baker 2002).
- Identifying and sharing scarce resources, such as specialist practitioners (Cropper, Hopper & Spencer 2002).
- Release of, or joint investments in, scarce or costly resources (Cropper, Hopper & Spencer 2002).
- Sustaining vulnerable services and maintaining access where the requirements of training or subspecialisation would otherwise mean the complete closure of services to the area. Therefore, they represent a way of standardising care and improving access (Edwards 2002).
- An increased focus on clinical issues and opportunities to learn and share information between experts from different backgrounds. Innovation, change and improved treatments and services often result from this (Edwards 2002).
- Finally, clinical networks offer members autonomy, development and learning, and these are likely to result in higher retention rates and greater job satisfaction for health professionals (Edwards 2002).

2.3 Concerns about managed clinical networks

A number of questions have been raised in the theoretical and conceptual literature about the effectiveness of MCNs. Practical concerns relate to accountability for clinical governance of network members and consultant appointments, drug formularies and operational policies.
There may be practical solutions to these questions, but it has been observed that many networks struggle with these and other issues (Edwards 2002).

Another risk is that MCNs may be seen as the next structural panacea for healthcare systems. If they represent simply a structural change, networks will not be of benefit and may in fact be detrimental. Problems may include competing priorities, lack of connection between the parts, and confusion about responsibilities. Therefore many authors warn that to reap the benefits, MCNs must represent a true shift away from institutions, towards services for patients and a focus on building better relationships and improve the flow of information (Edwards 2002; Keen, Moore & West 2006). Structural solutions to problems may not be the answer, as research suggests that reorganisation tends to distract from the issues at hand, fails to address the stated problems, and tends to create new ones (Edwards 2002).

Progress towards more network-like arrangements must involve identification of strategies that improve coordination and collaboration between services. In light of the aforementioned concerns about MCNs, it is particularly important that beneficial treatment and care in one part of a patient’s journey is not undermined by uncoordinated activity elsewhere in the network. For these reasons, several authors caution policy makers and practitioners to think more carefully about the over all design of their services, the nature of their services, and better patient care (Edwards 2002; Keen, Moore & West 2006).

2.4 Detailed review of empirical research studies for managed clinical networks

There are very few empirical research studies to provide support for the theoretical and conceptual discussions about MCNs. In total, eight empirical research studies were identified – they were primarily comparative or observational in nature. These studies were summarised by extracting the data directly into tables (See Appendix B). The following text also provides a brief overview of these studies, however, readers are encouraged to take the time to review the more detailed overviews of the studies that can be found in Appendix B.

Most of empirical research studies on MCNs (7) took place in the United Kingdom, where MCNs have been introduced as part of government system for the NHS. One study occurred in Taiwan (Lin 2007).

Three studies examined the improved outcomes associated with the establishment of a MCN. These studies demonstrated that better care outcomes can be achieved with MCNs. However, any improvements occur at the cost of considerable practitioner effort and funding and require energetic leadership. It was also indicated that positive outcomes are likely to take some time to become apparent (Hamilton et al 2005; Tolson, McIntosh, Loftus & Cormie 2007).

One study assessed network based styles of management across the NHS in the United Kingdom (Ferlie & Pettigrew, 1996). This study demonstrated that such network based styles of management are of rising importance in the NHS, particularly in terms of management of inter-organisational communication. The study also highlighted several challenges associated with network based organisations that those looking to establish an MCN should be aware of, including the following:

- Network-based forms of management are highly time consuming (and did not necessarily lead to tangible output)
- The combination of network-based forms of management and a strong performance orientation (focused on quantification and short-term target setting) represents an uneasy and volatile combination
- Networks can easily proliferate and soak up a lot of time while delivering very little
- The need to ensure clarity in network forms and the purpose in network-based forms of organisation
- Network-based forms of management may threaten middle management and led to high levels of turnover
• The need to focus on the sustainability of networks
• The need to operate with an open system in terms of opening up networks and introducing new players
• Mutual orientation and reciprocity are key concepts, requiring a different management approach based on negotiation.

Studies assessing the process of establishing MCNs demonstrated that whilst there was agreement on the long term objectives of the network there was less agreement on short term goals and actions, highlighting the necessity of establishing clear objectives and processes of change (Livingston & Woods 2003).

In terms of partnership groups supporting MCNs several characteristics were shown to differentiate successful partnership groups from less successful ones, with results indicating that group activities progressed in scale and complexity as groups evolved (Richardson, Sitzia & Cotterell 2005). Successful partnership groups tended to have been established for 2 years or more and were well organised with systems in place to conduct communications and business in between meetings (sometimes practically on a full-time basis). Successful partnerships also had distinct leadership from a chairperson that was committed to the group, and had actual leadership/chairing skills, as well as a highly-committed and active core group of members. Richardson et al (2005) also found that context was important in terms of differentiating successful partnership groups from less successful ones - successful partnerships were situated in cancer networks where they had tangible support.

Further to ensuring network success, an observational investigation of cancer MCNs in Scotland identified that there were a number of key, yet generic, skills required for professionals working in networks, including: interpersonal skills; problem solving skills; decision making skills and an ability to manage change (Norris et al 2005).

The following section discusses the findings in relation to the key characteristics associated with effective MDTs.

2.5 Key characteristics of effective MCNs

Literature reflecting on previous attempts to establish MCNs suggests that, regardless of their focus or level, MCNs ought to possess a set of core principles and characteristics, broadly categorised into main areas. These are management and structure, patient orientation and involvement, evidence based practiced and continued professional development and finally reporting requirements, and are outlined in more detail below.

Management and structure
• Clear and structured management arrangements are required, with one lead person to take over-all management responsibility, as well as clearly delineated lines of accountability and responsibility (Baker 2002; Baker & Lorimer 2000; Collins 2000; Kunkler 2000; Woods 2001a).
• The structure of the network must be defined so that the access points and connections between them are evident to all (Collins 2000; Woods 2001a).
• They should be made up of multidisciplinary and multi-professional teams (Baker 2002; Collins 2000; Woods 2001a).

Patient focus and consultation
• MCNs must have a statement of the specific clinical and service improvements that patients may expect as a result of the network (Baker & Lorimer 2000; Collins 2000; Kunkler 2000; Woods 2001a).
• A clear policy must exist for the dissemination of information to patients and regarding the nature of this information (Baker 2002; Collins 2000; Woods 2001a).
• Patients must be involved and consulted in the development of networks (Baker 2002). MCNs should provide a mechanism for patients and health professionals to be involved in disease-specific planning and strategic thinking and include representations from patient organisations in its management arrangements (Baker 2002; Collins 2000; Woods 2001a).
• An attempt must be made to balance the services throughout the care pathway so that there are no delays at any one point for the patient (Cropper, Hopper & Spencer 2002).

Evidence base and professional development
• All MCNs must have a clinical evidence base and every individual involved in a MCN must demonstrate a commitment to expand this evidence base (Baker & Lorimer 2000; Collins 2000; Kunkler 2000; Woods 2001a).
• The educational and training potential of MCNs should be fully utilised and leveraged (Collins 2000; Kunkler 2000; Woods 2001a).
• Close relationships with universities, colleges and educational and research bodies need to be cultivated so that staff can experience a range of treatment modalities, from community and primary to acute and tertiary (Collins 2000; Woods 2001a).
• Ways in which to circulate staff must be developed to ensure patient access is improved and skills are maintained. There should be programs of continuous professional development for each staff member and there must be arrangements to review these programs and ensure they are being followed (Collins 2000; Kunkler 2000; Woods 2001a).

Reporting requirements
• Quality assurance programs that are acceptable to parent bodies must be put in place, and the general principles of clinical governance should apply across MCNs (Baker 2002; Baker & Lorimer 2000; Collins 2000; Kunkler 2000; Shortell, Gilles & Anderson, 1994; Woods 2001a).
• Annual reports should be prepared for parent bodies charting MCNs activities and policies. These should also be made available to the public (Baker 2002; Baker & Lorimer 2000; Collins 2000; Woods 2001a).
• Participation in audits should be a mandatory part of the process for MCNs and health professionals (Collins 2000; Kunkler 2000; Woods 2001a).

2.6 Summary and recommendations for establishing a MCN
Much appears to have been learnt from the success of early MCNs. Several authors have set out clear guidelines and processes for establishing an effective MCN. Consistent themes and key recommendations made are summarised in this section.
• Before establishing a new network, key stakeholders needs to identify why the network is needed, what the network can do that individual parts of the network, in their organisation cannot (why the whole is greater than the sum of the parts), what the network is trying to achieve and how will it know it has achieved it (Connor 2001).
• As MCNs are not a set design, but a way of working, each model should be developed in partnership with patients, clinicians and managers, and it should be tailored to deliver care within that context (Baker 2002). That is, while formal structure and governance are important, MCNs should retain sufficient flexibility to meet service delivery requirements, and ensure they remain adaptable enough to be responsive to a range of changes, specialties and locations (Connor 2001). In this way, strategy and structure need to be evolutionary and emergent not restrictive and de-motivating (Connor 2001).
• All elements of different networks will need clear linkage to one another. This can be achieved through regular meetings, information technology and shared protocols (Baker & Lorimer 2000). Strong support from information technology is needed that can manage the MCN to facilitate intended improvements (Baker & Lorimer 2000).
Another key issue to consider is the strategy of the MCN in relation to how it can co-exist with the organisational strategies of primary care organisations and trusts (Connor 2001). The service delivery strategy for the network as a whole should be an inclusive process, and one that is emergent rather than top down. Managers should therefore facilitate and align strategies, rather than “hand down” policies and plans (Connor 2001). Command and control approaches are unlikely to work for managers in MCN settings. Instead the aim of management should be to achieve synergy between parts of different organisations and developing a source of advantage through collaboration. As such, it is recommended that MCNs should be ‘leaderful’ not leaderless. That is, they should be comprised of a series of leaders working cohesively together (Connor 2001).

Geographical and demographic factors also influence the delivery of health services. Specialist centres in remote areas may not be feasible or cost effective options and thus alternate forms of healthcare delivery should be found for these areas (Baker & Lorimer 2000; Kunkler 2000). Potentially a telemedicine platform could provide an answer, where teleconferences between members of a network could link the work of members nationally. This would have the added benefit of substantial savings in staff travel time which could instead be devoted to service delivery (Baker & Lorimer 2000; Kunkler 2000).

Lateral orientation also appears to be of critical importance (Connor 2001). It appears essential that each link in the process must understand what comes before and what comes after in patient care pathways. If this can be achieved, service tends not so disjointed, as members of the MCN have an understanding of the whole process the patient goes through (Connor 2001).

Another point for consideration relates to tracking results and measuring outcomes. As the benefits will likely be over time and generalised across organisational settings, a key issue with tracking outcomes is the difficulty in maintaining an awareness of benefits and the pattern of distribution of these benefits (Baker & Lorimer 2000).

From the literature, it appears that developing and maintaining MCNs is time consuming and effortful process, and a long term view is required if they are to be successful. In summary, the key success factors appear to be a clear vision and statement of purpose and structure, lateral orientation, developing a strategy for working within existing organisations and also across these, carefully considering geographic and demographic issues, and focussing on new management and governance models (Shortell, Gilles & Anderson, 1994).
Section 3. Multidisciplinary care and teams

This section offers an overview of a selection of theoretical/conceptual and empirical literature concerning multidisciplinary care (MCN) and multidisciplinary teams (MDTs).

MCNs operate as a group of healthcare professionals from different backgrounds working as a ‘virtual team’ to deal with a particular problem (Baker 2002; Carter, Garside & Black 2003). Hence, a key element of MCNs is multidisciplinary care (Baker 2002; Collins 2000; Woods 2001a). Multidisciplinary care can be defined as “an integrated team approach to health care in which medical and allied health care professionals consider all relevant treatment options and develop collaboratively an individual treatment plan for each patient” (NBCC, 2005b, p. 2).

3.1 What are multidisciplinary teams?

MDTs involve a team approach to the provision of healthcare by all relevant medical and allied health disciplines (Zorbas et al 2003). They should be comprised of different professionals, possessing a variety of skills necessary to produce safe and effective care to patients (Firth-Cozens 2001). All members of a MDT are supposed to liaise and collaborate with one another, and in consultation with the patient, diagnose, treat and manage the condition to the best possible standards of care (Zorbas et al 2003). Decision making and accountability is shared by members of different disciplines working within a team (Ponte et al 2007).

Usually, whether or not an MDT is within a dedicated centre or institution, they comprise of a team of healthcare providers, offering a range of patient education programs, psychosocial support programs, and rehabilitative programs in addition to treatment services (Chang, 1998). Individuals and specialists from the MDT meet with the patient then with each other to discuss the particular case and individual factors in order to debate the diagnosis and conclude the best course of care (Flessig et al 2006; Seek & Hogle 2007). Only once consensus has been reached in terms of the diagnosis and treatment options are recommendations communicated to the patient and their family to ensure the consistency of information provided (Flessig et al 2006; Seek & Hogle 2007). Once this has been done, often social support workers are brought in to provide information and assistance regarding community support groups and other assistance as is appropriate (Seek & Hogle 2007). The outcome is the creation of a tailored treatment plan for each patient based on input from multiple disciplines (Jobe et al 2006; Seek & Hogle 2007).

MDTs generally deal with one type of specific illness or group of illnesses/conditions. Team compositions may vary depending on the focus or illness, but they may be made up of a physician-director, nurse coordinator, administrator, support staff, members from clinical disciplines such as pathology and radiology, board representatives from the diagnostic specialties, General Practitioners and clinical trials coordinator (Flessig et al 2006; Chang, 1998; Ruhstaller et al 2006). The support programs offered require input from nurses, social workers, physical therapists and dieticians. As such, representatives from nursing, medicine, and administration must be involved (Ponte et al 2007).

To date, various models and frameworks of multidisciplinary working have been applied to a range of illnesses, including breast cancer (Shuster et al 2000; Tripathy 2003; Zorbas et al 2003), thyroid cancer (Tuttle et al 2005), lung cancer (Seek & Hogle 2007) and a range of other cancers (Selby et al 1996).

The following sections (Sections 3.2 & 3.3) provide an overview of the theoretical and conceptual literature associated with MDTs - much of this literature was informed by previous experience in implementing MDTs and related MDC processes. This is followed by a review of the available empirical research studies that focuses on MDTs (Section 3.4) and a review of the critical components of an effective MDT (Section 3.5).
3.2 Advantages of MDTs

Increasingly, treatment for many conditions is spanning across multiple disciplines or specialties, and the best treatment available often involves a combination of treatments (e.g. surgery, radiation therapy, pathology, gynaecology; Seek & Hogle 2007; Tripathy 2003). Without MDTs, patients must individually consult with numerous clinicians, and then try to make sense of the different advice provided and resolve often conflicting treatment advice. This process can be significantly overwhelming and confusing for patients (Kagan 2004; Ruhstaller et al 2006; Seek & Hogle 2007; Selby et al 1996; Zorbas et al 2003). Therefore a multimodal treatment approach requires MDTs to effectively deliver services to the patient (Seek & Hogle 2007).

MDTs have also emerged out of a need to improve fragmented care, long waiting times, lack of coordination, inefficiencies with discharge planning, multiple patient admission problems, decreased patient satisfaction with services and financial losses (Ruhstaller et al 2006; Seek & Hogle 2007; Strusowski 2006). Other issues that MDTs are aimed at resolving include:

- Non-uniform access to clinical care (Flessig et al 2006; Ruhstaller et al 2006; Selby et al 1996; Strusowski 2006).
- Frequent reporting of inadequacies (Flessig et al 2006; Selby et al 1996; Strusowski 2006).
- Disjointed referral system (Flessig et al 2006; Ruhstaller et al 2006; Seek & Hogle 2007; Selby et al 1996; Strusowski 2006).
- Large variations in frequency of individual treatments used, caseloads for particular doctors, and patient survival rates (Flessig et al 2006; Ruhstaller et al 2006; Selby et al 1996; Strusowski 2006).
- Uncoordinated and fragmented treatment for serious illnesses (Ruhstaller et al 2006; Seek & Hogle 2007; Selby et al 1996; Strusowski 2006; Zorbas et al 2003).

It is widely argued in the literature that multidisciplinary teams provide better care than individuals working in isolation (Carter, Garside & Black 2005; Ruhstaller et al 2006; Seek & Hogle 2007; Tuttle et al 2005; Zorbas et al 2003). Among the purported benefits resulting from effective multidisciplinary team working are improved patient outcomes, better continuity of care and higher patient satisfaction (Chang, 1998; Carter, Garside & Black 2005; Maleshkin & Zalcberg 2006; Seek & Hogle 2007). The advantages of multidisciplinary teams broadly fall into three areas: benefits to patients, benefits to healthcare practitioners and professional development, and improvements to systems, processes and protocols.

Benefits to people affected by cancer

Specifically, some of the advantages for patients include:

- Being looked after by a team inspires confidence and reduces patients’ concerns that their treatment is based on the knowledge of just one individual (Carter, Garside & Black 2005).
- Patient satisfaction with MDTs tends to be very high, and patient psychological wellbeing also tends to be high (Chang, 1998; Flessig et al 2006; Jobe et al 2006; Maleshkin & Zalcberg 2006; Ponte et al 2007; Seek & Hogle 2007).
- Cost effectiveness to the patient and third party payers (Chang, 1998; Flessig et al 2006; Ponte et al 2007; Ruhstaller et al 2006; Tripathy 2003). Whilst it may not be time efficient for the clinicians, as they spend more time interacting with other health professionals, the benefits to the patient is great in terms of quality of care, time and cost (Chang, 1998).
• Patient safety can be enhanced (Connor, Pont & Conway 2002; Pont et al 2007).
• Reduction in delays to treatment and specialist waitlists, as well as timely referrals to specialists and support services (Flessig et al 2006; Petrelli & Grusenmeyer 2004; Ruhstaller et al 2006; Seek & Hogle 2007; Selby et al 1996; Strusowski 2006). Additionally, reductions in the amount of time patients wait on the days of their appointments (Flessig et al 2006; Ponte et al 2007).
• In most cases, multidisciplinary centres assist in the production of streamlined testing and patient care (Jobe et al 2006; Flessig et al 2006; Ruhstaller et al 2006; Seek & Hogle 2007; Tripathy 2003).
• Shared decision making between patients and their treatment teams (Maleshkin & Zalcberg 2006). Individual treatment plans are established in collaboration with the patient and are tailored to suit their individual needs, such as sensitivity to medication or treatment and biology of their particular illness (Tripathy 2003).
• MDTs increase the likelihood that patients will receive the best combination of treatments for their particular circumstances and the stage of their illness (Ruhstaller et al 2006; Zorbas et al 2003).
• Provides care that is patient focused, coordinated and efficient (Flessig et al 2006; Ruhstaller et al 2006; Selby et al 1996; Strusowski 2006; Tripathy 2003).

Benefits to healthcare practitioners

The advantages noted in terms of professional development and training include:
• Effective team dynamics and the establishment of clinical management protocols (Carter, Garside & Black 2005; Ruhstaller et al 2006).
• Better communication between individual members of the team and more frequent opportunities to discuss clinical matters (Carter, Garside & Black 2005; Flessig et al 2006; Ruhstaller et al 2006; Seek & Hogle 2007; Tripathy 2003). This increased discussion of the care of patients leads to a cross fertilisation of ideas to other situations (Carter, Garside & Black 2005).
• Knowledge sharing on a less formal level can be enhanced and clinicians learn through such informal channels (Carter, Garside & Black 2005; Ruhstaller et al 2006).
• MDTs have the potential to instil a sense of partnership and members can be a key source of support to one another in difficult circumstances, such as the management of clinical errors or complaints (Carter, Garside & Black 2005; Flessig et al 2006).
• Health professionals can learn from one another and this increases opportunities for professional development and more formalised training (Flessig et al 2006; Ruhstaller et al 2006). Jeffries & Chan 2004
• When modalities of treatment are combined, specialists working together are likely to gain a clear understanding that it is the combination of therapies that will be most beneficial in terms of outcomes for the patient (Seek & Hogle 2007; Tripathy 2003).
• Members of MDTs have been observed as having greater job satisfaction and psychological well-being (Flessig et al 2006; Seek & Hogle 2007).
• Increased hypothesis generation and problem solving (Jobe et al 2006).
• Multidisciplinary approaches may allow for the development of new treatment methods that are driven by research and science (Kim & Toge 2004).

Organisational benefits

In terms of systems, processes and protocols, benefits of MDTs mentioned in the literature are outlined below. They include:
• MDTs can address resource management issues in a more balanced way to minimise waste and to allow individuals to work together to more effectively rather than argue or compete for resources (Carter, Garside & Black 2005).
• Improved auditing processes and outcomes (Carter, Garside & Black 2005; Flessig et al 2006).
• MDTs enable the construction of care and treatment pathways and place an emphasis on the psychosocial care of patients and their families (Jobe et al 2006).
• MDTs are particularly helpful in situations when dealing with complex problems and high patient needs (Jobe et al 2006; Strusowski 2006).
• MDTs have the potential to make better decisions, more informed by determinations and debate by individuals with expertise and knowledge (Kagan 2004; Ruhstaller et al 2006; Selby et al 1996; Zorbas et al 2003).
• Better clinical outcomes can result from multiple experts from different disciplines pooling their resources (Flessig et al 2006; Kim & Toge 2004; Seek & Hogle 2007; Tripathy 2003).
• Participation in clinical trials is greater (Flessig et al 2006; Ruhstaller et al 2006; Strusowski 2006)
• MDTs promote the development of treatment and prevention programs, translational research collaborations, and greatly increase clinical trial accrual rates (Jobe et al 2006; Petrilli & Grusenmeyer 2004).
• In terms of the benefits to research, MDTs represent a way to pool resources (such as biostatistical, informatics, equipment, staff and space), enhance the development of evidence base for practice, promote cross training or education across disciplines, and create formal processes and systems to train individuals beyond their discipline or specialty (Tripathy 2003).

3.3 Disadvantages and challenges associated with MDTs

Despite the many advantages and potential benefits of MDTs, a number of challenges associated with setting up MDTs have been discussed in the literature. A history of poor relationships or minimal contact between different specialties and disciplines may create barriers and difficulties in establishing a MDT (Sternberg et al 2007). Due to fact that individual organisations, departments, and units have traditionally obtained resources, staff and money through local power structures, some may perceive sharing responsibility as a weakening of this power base for resource acquisition (Carter, Garside & Black 2005; Seek & Hogle 2007; Strusowski 2006; Tripathy 2003). Further, responsibility sharing between individuals might be resisted, as it may be seen to undermine a clinician’s capacity to treat patients or meet professional goals (Carter, Garside & Black 2005; Seek & Hogle 2007; Strusowski 2006; Tripathy 2000). Consequently, it may be difficult to sell the benefits to physicians on working in a multidisciplinary manner (Strusowski 2006). ‘Turf wars’ and staff politics may also result in conflict situations that lose sight of purpose of patient-focussed care (Seek & Hogle 2007; Strusowski 2006; Tripathy 2003).

Additional disadvantages and barriers associated with MDTs include:
• Different individuals from different areas may have different ideas on how to bring about a good outcome, and it can be hard to get members to even agree on what constitutes a good outcome (Firth-Cozens 2001; Seek & Hogle 2007; Strusowski 2006; Tripathy 2003)
• Sometimes patient and family care and communication can be compromised, due to the many specialists looking after them providing inconsistent reports, diagnoses and treatment recommendations. Sometimes, members of a MDT assume that other team members have communicated all relevant information to the patient and their family (Penson et al 2006; Seek & Hogle 2007; Strusowski 2006; Tripathy 2003)
• Time may also be a major issue. Outside the time devoted to clinical practice, there may not be sufficient time to engage in clinical management, team building and development. Teams can be viewed as time consuming and a waste of resources (Carter, Garside & Black 2005).
Potentially increased costs and increased complexity for the staff function and coordination and administration (Seek & Hogle 2007; Strusowski 2006; Tripathy 2003). Funding strategies may underestimate the real costs of running MDTs (Flessig et al 2006).

It may be difficult to define the boundaries of the MDT due to the many different linkages between staff within health organisations. Too many individuals may be included in the team, creating inefficiencies and wasting time (Carter, Garside & Black 2005). Where roles are ill-defined and not well understood the process of providing patient with information overloaded and differences in messages and gaps in certain areas may result (Firth-Cozens 2001).

The aforementioned challenges need to be taken into consideration when establishing a MDT. There are a range of strategies that could be employed to minimise the likelihood of such challenges occurring, for example by explicitly addressing the following issues in the Terms of Reference for MDTs: the teams purpose and expected outcomes; core and non-core members; decisions making processes; who has prime responsibility for communicating MDT recommendations to patient and their family; who will chair the MDT and be responsible for time management issues; who will provide the coordination and administrative support for the MDT; and how the MDT will be funded etc. More detailed guidelines for MDT meetings can be found in the NBCC’s (2005) guide, which is discussed in more detail in Section 3.6.

3.4 Detailed review of empirical research studies for multidisciplinary teams

Over all twenty-four empirical research studies relevant to this review of multidisciplinary care and MDTs were identified. Only one of these studies was a randomised controlled trial (RCT; Gabel, Hilton & Nathanson, 1997) - the majority of the studies were observational or comparative in design. A variety of outcomes were considered by these studies - they addressed aspects of patient care and case management, clinical outcomes, decision accuracy, treatment delays, psychosocial indices, the cost efficiency and effectiveness of MDTs, adherence to best practice, MDT member roles and expectations, MDT member health, and whether the introduction of telemedicine and videoconferencing enhanced MDT processes.

Once again, these studies were summarised by extracting the data directly into tables (See Appendix C). The following text also provides a brief overview of these studies, however, readers are encouraged to take the time to review the more detailed overviews of the studies that can be found in Appendix C.

Results from the RCT study indicated that MDTs resulted in improved patient satisfaction, as a result of involving the patient and their family/friends in treatment decisions. The study also revealed that MDTs provided more timely care than did traditional services (Gabel, Hilton & Nathanson, 1997).

Further benefits and incentives for clinicians and patients to be engaged in MDTs include: improved concordance between MDT decisions and final treatment implementation (Blazeby et al 2006); a reduction in a delay of treatment; and higher survival rates (Leo 2007). Studies assessing decision making and patient management also found that when patients were reviewed by an MDT it resulted positive changes to treatment plans (Newman et al 2006), as well as improved outcomes after surgery (Stephens et al 2006). In comparison to traditional services, MDTs were found to result in more patients being accurately staged, a greater proportion of patients receiving chemotherapy and more rapidly processed treatment (Davies et al 2006; Forrest et al 2005). Those studies which examined patient care also indicated that a MDT approach to cancer care can reduce mortality and improve quality of life for the patient (Rummans et al 2006; Stephens et al 2006). There is also evidence that decisions made by a MDT are more likely to be in accord with evidence-based guidelines than those made by individual clinicians (Chang et al 2001).

In contrast to the above, a study assessing the effect of direct patient involvement did not
demonstrate an improvement in patients access to information, nor understanding of the process or their decision making process. However, patient involvement did not have any negative impacts. Involvement did not lead to an increase in patient anxiety, and both patients and professionals found that it was acceptable for patients to attend MDT meetings (Choy et al 2007).

In response to claims that MDTs require ongoing coordination and tend to face a number of organisational challenges (Nouraei et al 2007), several studies investigated methods to improve the effectiveness of MDTs. One study concluded that an MDT coordinator was an intrinsic player to the smooth running of MDT teams (Whelan, Griffith, Archer 2006). The use of a database was also found to significantly improved MDT efficiency and reduced delay of treatment planning for patients (Nouraei et al 2007). Two other studies addressed the use of telemedicine/videoconferencing. Results showed that the technology allowed for more professionals to provide input into MDT meetings, which led to improved patient outcomes. Although it did not serve to increase member attendance itself, it was useful in improving access to those that do normally attend (Davison 2004; Delaney 2004).

In summary, the evidence appears to show that certain outcomes are improved by MDT processes, such as psychosocial and patient satisfaction indices, treatment delays, clinical outcomes, adherence to best practice and decision accuracy. However, some studies indicate that the benefits are not always consistent, that advantages do not inevitably arise from the adoption of a multidisciplinary approach and that there is still a need for improvement and further research. For example, Acher et al (2005) found that MDT meetings made no difference to the clinical management of cancer cases, and two other studies found no consistent improvement of range and accuracy of prognostic predictions after team discussions (Kee, Owen & Leathem 2004; Kee, Owen, Leathern 2007). There is also evidence that some MDT members are unsure of their roles, and there is discrepancy between members expectations of the roles of others compared with individuals perceptions of their own role (Jenkins, Fallowfield & Poole 2001). A lack of multidisciplinary awareness and unclear role boundaries have also been associated with negative effects on employee well being and health (Catt et al 2005).

The following section discusses the findings in relation to the specific components that have been found to be critical in terms of establishing effective MDTs.

3.5 Critical components of an effective multidisciplinary team

A number of organisational elements appear critical to the success of a MDT. It has been suggested that, from the perspective of logistics, multidisciplinary care requires a centre-based approach where patients can go to the one institution to receive all the different types of care they need and where information and patient records are shared between specialists and health professionals (Strusowski 2006; Tripathy 2003). Although going to one location for all treatment and care may be ideal, it is not always possible especially for people residing in regional and remote areas who desire to have a much as their treatment as close as possible to home. Consequently, one of the current challenges facing policy makers and practitioners is how to ensure that all people diagnosed with cancer have their treatment and care planned by an appropriate MDT and this requires a somewhat different (networked) approach and a preparedness to explore novel technologies (Kunkler et al 2005; Zorbas et al 2003).

Regardless of the model of MDT (centred-based or networked), economies of scale need to be created so that savings in terms of costs can be achieved through shared patient records (Strusowski 2006; Tripathy 2003). In terms of reduction of costs and conflict, sharing equipment and staff between MDTs, and setting down clear protocols for this is also essential (Penson et al 2006; Tripathy 2003). A uniform multidisciplinary fee schedule may also be beneficial and realistic financial models and business development plans need to be developed (Tripathy 2003).
Structure and leadership

In terms of structure and leadership, a high degree of clarity regarding decision making authority and accountability is required (Firth-Cozens 2001). Leadership roles must be clearly defined, and individual and shared accountabilities must be clearly delineated (Connor, Pont & Conway 2002; Ponte et al 2007). Good team leaders are thought to be essential to patient safety and quality of care (Firth-Cozens 2001; Flessig et al 2006). They need to encourage full participation and feedback should be given to team members on successes and failures (Flessig et al 2006). Individual roles should be meaningful and rewarding, contributions should be identifiable, shared objectives should be made clear, and mutual respect encouraged (Flessig et al 2006; Kim & Toge 2004). Several papers mention the need for mature leadership and a democratic environment where open and constructive discussion is encouraged (Connor, Pont & Conway 2002; Ruhstaller et al 2006). Finally, successful conflict resolution strategies need to be in place (Penson et al 2006).

Delivery evidence based care

Additionally, a standardised approach to care is essential to ensure that each patient receives the right work-up and treatment recommendations in accordance with evidence based, consensus approved guidelines (Chang, 1998; Ruhstaller et al 2006). There needs to be clear communication protocols whereby patients and their family can have clear and comprehensive information regarding symptoms, diagnoses, treatment plans and options, and outcomes (Penson et al 2006).

Governance

It is also important to conduct regular meetings. It is recommended that MDTs should convene regularly to discuss diagnosis and treatment and provide timely feedback to patients (Chang, 1998; Ruhstaller et al 2006). Such meetings may also serve to review treatment outcomes and build on past learnings (Ruhstaller et al 2006). Meetings are advised to begin with a presentation of the patient, their medical history and investigation pathways, with a leader to direct and ensure discussion remains relevant and concise (Ruhstaller et al 2006; Strusowski 2006). This ensures that early referrals can be made to dieticians, physiotherapists, occupational therapists and social workers, plans for discharge can be discussed, and information can be shared more easily (Jeffries & Chan 2004; Strusowski 2006). Maintaining open discussion on different treatment approaches and outcomes is required to ensure that MDTs remain in line with best practice (Firth-Cozens 2001). Consensus based decision making is recommended using evidence based guidelines (Tripathy 2003). It is suggested that MDTs develop an evidence base where none exists through clinical trials, cross discipline training and awareness, and qualified peer review (Tripathy 2003). All decisions and consensus reached in meetings should be carefully documented (Ruhstaller et al 2006).

Administration

Much of the literature also suggests there should be dedicated members of the team whose sole purpose is to support the coordination and administration of the MDT. Specific recommendations advocate that administrative support ensures that meetings run smoothly and help to coordinate teams (Flessig et al 2006). Further, it is recommended that administration processes be standardised and have clear protocols to follow. Further, it is advised that clinical information management systems be introduced to facilitate the coordinator and support function (Tripathy 2003).

Strusowski (2006) recommends that cancer care coordinators (CCCs), registered nurses or masters prepared nurses should be an essential part of the MDT. Similarly, Seek and Hogle (2007) suggest that Nurse Navigators are a critical component to the success of MDTs and note that they are becoming a trend in cancer care in the USA. Their role should be to coordinate and develop a plan of care with physicians and staff, schedule and coordinate appointments, tests and procedures, disseminate information to physicians, and provide information and education to patients and family members related to treatment and participate
in discharge planning (Strusowski 2006). Further, they should assist in patient education regarding clinical trials, assist family and patients to access support services and support groups in the community, provide information and access to community and internet-based resources, communicate with lay caregivers throughout the treatment processes, provide post-treatment follow up to patients and family members, and conduct staff education as required (Strusowski 2006). The role is multifaceted, but the primary purpose and focus should be on the support and care for patients. In summary, CCCs and Nurse Navigators integrate all aspects of care - without them (or some similar role) the benefits of multidisciplinary teams may not accrue to patients. Indeed, having a role such as this appears to address many of the drawbacks or problems that can arise when establishing an MDT.

Evaluation

Ongoing evaluation and assessment appears also to be of importance. It is recommended that the effectiveness of the MDT is assessed on an ongoing basis through patient and staff satisfaction, operational efficiency and productivity, and clinical quality and safety measures, such as clinical audits (Ponte et al 2007). It is also advised that evaluation efforts look beyond the numbers to assess what is going on within the team and take into account the processes as well as the outcomes (Firth-Cozens 2001).

3.6 Australian context and MDTs

Owing to the vast dispersion of the Australian population, the challenge in establishing MDTs is how to ensure equity of care for rural and remotely located Australians (Zorbas et al 2003). It may not be feasible to conduct weekly face to face meetings in Australia as they do in the United Kingdom, as surgeons are often thousands of kilometres apart and in different states (Zorbas et al 2003). Telemedicine may represent one way to overcome such problems and barriers - teleconferences and videoconferences could be held in a ‘virtual team’ situation, to enable collaboration, cooperation, knowledge sharing and equity of care (Kunkler et al 2005; Zorbas et al 2003).

In recognition that one single model of healthcare is not feasible in Australia, a set of five key elements or principles were set out by Zorbas et al (2003) to facilitate the provision of multidisciplinary care. The five key elements are the team, communication, full access to the range of therapies, standards of care and involvement of the patient. Each principle is outlined in more detail below.

The team

- The patient and his/her GP should be part of the core team, which should also consist of a minimum number of specialists most relevant to the patients’ health concern (Zorbas et al 2003).
- While there should be a core team, the team maybe expanded to ensure that the patient has access to a full range of treatment options and alternatives (Boyle et al 2005; Zorbas et al 2003). Therefore strong referral networks should be established to ensure that MDTs can be expanded to include specialist services where necessary (Boyle et al 2005; Zorbas et al 2003).

Communication

- A framework for communication should be established that facilitates interaction and there should be dedicated case conference meetings (Boyle et al 2005; Zorbas et al 2003). There is a need to move away from discipline specific acronyms and jargon and towards a common language (Boyle et al 2005).
- Not all cases will necessarily require team discussion - protocols should be developed that identify when a case may not require multidisciplinary team discussion (Zorbas et al 2003).
**Full therapeutic range**

- The geographic location of the patient should not impair their care, nor limit their choice of treatments. Nor should the size of the medical institution delivering the care impact on the range of treatment options for patients (Zorbas et al 2003). Systems need to be established that ensure equitable access to services.

**Standards of care**

- There should be guidelines put in place and all clinicians should operate within these (Zorbas et al 2003).
- Treatment plans should consider the individual circumstances of the patient and should be acceptable to the patient (Zorbas et al 2003).
- Only once all information and results are available and all information provided should any discussion or decisions be made in regards to the patient (Zorbas et al 2003).
- Where a particular illness or health issue is rare (low incidence), then formal collaborative links should be made to larger centres to support the treatment of patients and ensure quality of care (Zorbas et al 2003). Systems need to be developed to ensure exchange of knowledge and expertise between smaller and larger medical institutions (Zorbas et al 2003).
- Professional development activities are essential, as is the maintenance of standards of best practice.

**Involvement of the patient**

- Patients should be encouraged to actively participate as part of the multidisciplinary team. This includes having input into treatment planning (Connor, Pont & Conway 2002; Ruhstaller et al 2006; Zorbas et al 2003).
- Patients should be informed of the comprehensive range of treatment alternatives. Specifically, the benefits, risks, side effects and complications of all treatment choices should be clearly outlined.
- Appropriate literature should be provided to the patient to assist him/her to make a decision regarding treatment and it should be pitched at the right level (taking into consideration her age, education level, language, culture etc).
- Information and assistance should be provided in relation to access to support services.
- It is important to keep the patient informed regarding ongoing collaboration and discussion between members of the team regarding their treatment (Connor, Pont & Conway 2002).
- Patients should feel that their treatment is coordinated, not fragmented (Zorbas et al 2003).

In recognition of the importance of, and challenge in, establishing MDC is the Australian context, the Australian Government Department of Health and Ageing recently funded the NBCC to conduct a National Demonstration Project of Multidisciplinary Care (2002). The aim of this demonstration project was to provide further insight into strategies for implementing MDC in Australia, using breast cancer as a model.

The Principles of Multidisciplinary Care developed by the NBCC for the project provide a definition of multidisciplinary care that is flexible and allows for variation in implementation according to cancer type and the location of service provision. In final project report also puts forward a number of recommendations to promote multidisciplinary as an integral part of a national policy for cancer care.

The NBCC also recently developed Multidisciplinary Meetings for Cancer Care: A guide for health service providers (NBCC, 2005b), based on the experiences of the sites that participated in the NBCC Demonstration Project, a related observational study, input from a multidisciplinary working group and other national and international evidence. The guide
focuses on MDT meetings for all cancers and assumes that a decision has been taken by the users to implement such meetings. The guide is not intended to be prescriptive, but instead provides health service providers and multidisciplinary team members with ideas and tools to improve MDTs at the local level. It would be useful for groups wishing to implement new MDT meetings, as well as for teams that want to improve the efficiency and effectiveness of existing processes.
Section 4. Discussion

In reviewing the available evidence on MCNs and MDTs, the limitations of empirical research on modes of delivery of cancer care must be taken into consideration. Randomised controlled studies are rare in this field, and most studies tend to be observational and retrospective in design.

4.1 Managed clinical networks

MCNs address many of the problems that have been identified in the traditional delivery of health services, including: poor coordination and collaboration between health services; changing roles for health professionals; and the need for greater efficiencies, improved access, more equitable service provision, better use of limited resources and quality patient-centred care (Baker 2002; Baker and Lorimer 2000; Scott & Hofmeyer 2007). More specifically, MCNs aim to develop locally delivered, quality assured care, through the managed integration of, and cooperation between, formerly separate clinical services (Woods 2001a). Their major focus is on actively involving patients in service design and building seamless services around the patient’s journey to ensure the best treatment gets to the right patient, at the right time, in the most appropriate place and is delivered by the most qualified and skilled professional with the greatest resources (Baker 2002; Conner 2001; Woods 2001a 2001b).

There is a marked absence of empirical research studies on MCNs. The paucity of this literature makes it difficult to draw conclusions whether MCNs do lead to improved outcomes. Nevertheless, theoretical and conceptual discussions, and available empirical studies suggests that although establishing a MCN is a difficult process, requiring much effort and cost, if sufficient planning and organisation occurs, MCNs should result in improved coordination and collaboration between services and better care outcomes (eg Hamilton et al 2005; Tolson, McIntosh, Loftus & Cormie 2007).

The MCN literature also suggests that networks should possess a set of core principles and characteristics, broadly categorised into four main areas: management and structure; patient orientation and involvement; evidence based practice and continued professional development; and reporting requirements. Other key success factors associated with MCNs appear to be a clear vision and statement of purpose and structure, lateral orientation, developing a strategy for working within existing organisations and also across these, carefully considering geographic and demographic issues, and focussing on new management and governance models (Shortell, Gilles & Anderson, 1994).

4.2 Multidisciplinary teams

A key element of MCNs is multidisciplinary care and MDTs (Baker 2002; Collins 2000; Woods 2001a). Multidisciplinary care can be defined as “an integrated team approach to health care in which medical and allied health care professionals consider all relevant treatment options and develop collaboratively an individual treatment plan for each patient” (NBCC, 2005b, p. 2). MDTs involve a team approach to the provision of healthcare by all relevant medical and allied health professionals that can offer a range of patient education programs, psychosocial support programs, and rehabilitative programs in addition to treatment services (Chang, 1998; Zorbas et al 2003). Individuals and specialists from a MDT meet with the patient then with each other to discuss the particular case and individual factors in order to debate the diagnosis and conclude the best course of care (Flessig et al 2006; Seek & Hogle 2007).

Various models and frameworks of multidisciplinary working have been applied to a range of illnesses, including breast cancer (Shuster et al 2000; Tripathy 2003; Zorbas et al 2003), thyroid cancer (Tuttle et al 2005), lung cancer (Seek & Hogle 2007) and a range of other cancers (Selby et al 1996).
Most but not all the studies reviewed have shown an improvement in outcomes as a result of a coordinated multidisciplinary approach to care for cancer patients (eg Chang, 1998; Carter, Garside & Black 2005; Maleshkin & Zalcberg 2006; Seek & Hogle 2007) - the advantages of multidisciplinary teams broadly fall into three areas: benefits to patients, benefits to healthcare practitioners and professional development, and improvements to systems, processes and protocols. Further, those studies that do not support using MDTs have not reported any adverse outcomes from their use (eg Acher et al, 2005; Kee, Owen & Leathem 2004; Kee, Owen, Leathem 2007).

There is also strong evidence from the one RCT and several strong observational studies that conventional care alone is inadequate for patients with cancer (eg Gabel, Hilton & Nathanson, 1997). The results presented from the successful studies support the use of MDTs in improving patient satisfaction, patient management, decision making and clinical outcomes. While these studies have not employed the most rigorous methodology, the accrued evidence appears to confirm the value of a multidisciplinary approach to cancer care. The evidence also supports frameworks and guidelines developed by such organisations as NHPAC, NBCC, the Cancer Council and WHO which advocate a multidisciplinary approach to cancer care.

A number of organisational elements appear critical to the success of a MDT, including: clear Terms of Reference, especially in relation to shared objectives, leadership roles, decision making authority, accountability, conflict resolution strategies and communication with patients (Connor, Pont & Conway 2002; Firth-Cozens 2001; Penson et al 2006; Ponte et al 2007; Tripathy 2003); a uniform multidisciplinary fee schedule (Tripathy 2003); standardised and evidence based guidelines and protocols (Chang, 1998; Ruhstaller et al 2006); regular meetings (Chang, 1998; Ruhstaller et al 2006); adequate administrative support (Flessig et al 2006); standardised administrative processes and clinical information management systems (Tripathy 2003); and ongoing evaluation and assessment through patient and staff satisfaction, operational efficiency and productivity, and clinical quality and safety measures (Ponte et al 2007). A set of five key elements or principles for MDTs in the Australian context have also been put forward by Zorbas et al (2003). These five key elements are the team, communication, full access to the range of therapies, standards of care and involvement of the patient.

Despite the many advantages and potential benefits of MDTs, a number of challenges associated with setting up MDTs have also been discussed in the literature. These challenges should be taken into consideration when establishing a MDT. There are a range of strategies that could be employed to minimise the likelihood of such challenges occurring, for example by explicitly addressing the following issues in the Terms of Reference for MDTs: the teams purpose and expected outcomes; core and non-core members; decisions making processes; who has prime responsibility for communicating MDT recommendations to patient and their family; who will chair the MDT and be responsible for time management issues; who will provide the coordination and administrative support for the MDT; and how the MDT will be funded etc.

4.3 Conclusion

Cancer has a major impact on the Australian community, and is the leading cause of premature death and disability in Australia. Cancer incidence rates have increased by 26% from 1993 to 2003 (AIHW 2007). This rate is predicted to continue to rise as a result of our ageing Australian population and the fact that the risk of most cancers increases with age. Therefore, it is important that early detection and treatment occurs in the aim to improve the survival rate of people with cancer. The accumulated evidence supports multidisciplinary approaches to cancer care, such as MCNs, as a potential new way of working. When appropriate guidelines are followed MCNs will enable the provision of quality care for patients with cancer, as well as their relatives and carers. It should also be noted that MCNs offer particular advantages in the Australian context because they provide scope for linking rural health care services and providers with metropolitan cancer services. Establishing these connections and promoting MDTs through Cancer Australia’s CanNET program will help to ensure that all Australians have access to best evidence based cancer care, regardless of where they live.
Appendix A. Additional policies and frameworks about cancer control

National Cancer Prevention Policy 2007-09 (The Cancer Council Australia, 2007)

The Australian Cancer Network (ACN) aims to improve cancer management in Australia by linking professional bodies and societies with an interest in cancer. Established in 1994 by The Cancer Council Australia and the Clinical Oncological Society of Australia, ACN develops and disseminates evidence-based clinical practice guidelines for the prevention, diagnosis and management of cancer, which are used in Australia and internationally. More recently ACN has been working on improving the quality of cancer care by producing publications on accreditation of cancer services, credentialing of clinicians and implementation of guidelines. Guidelines are available for melanoma, colorectal cancer, cancer genetics, prostate cancer, non-melanoma skin cancer, lymphoma and lung cancer. These are approved by the National Health and Medical Research Council. Recommendations for the pathology reporting of breast cancer are also available.

The Cancer Council’s major policy document is the National Cancer Prevention Policy, published every three years. The National Cancer Prevention Policy 2007-09 advocates a concerted and comprehensive national approach to the prevention of cancer. It offers clear recommendations on how Australia can reduce the estimated 106,000 new cases of cancer diagnosed each year. The Cancer Council Australia’s National Cancer Prevention Policy 2007-09 aims to provide a blueprint for optimal cancer prevention and early detection in Australia for 2007-09, drawing on the latest evidence and exploring the impact, risk factors, policy context and effective interventions. It also provides an opportunity to reflect on the 2004-06 period.

The first section outlines a strategic approach to reducing preventable risk factors relating to: tobacco, ultraviolet radiation, diet, physical activity, obesity/overweight and alcohol. The second section discusses areas where population screening may be an effective approach to reducing the burden of disease.

The policy makes specific recommendations for national action by governments and non-government organisations, including programs and strategies to reduce the incidence of cancer. It does not provide information about cancer prevention for individuals.

Taking Action Locally: Eight steps to putting cancer guidelines into practice (National Institute of Clinical Studies, 2006).

ACN’s Guideline Implementation Steering Committee has also produced a handbook in association with the National Institute of Clinical Studies (NICS) called Taking Action Locally: Eight steps to putting cancer guidelines into practice (2006). Widely distributed, it provides support for clinicians and clinical managers implementing evidence-based guidelines as part of everyday practice.

The handbook shows lead clinicians and health service managers how to provide world-best practice in cancer care. Australian and international experiences were used to develop a guide that uses helpful tips and leads readers to other sources of information on each of the topic areas covered. The suggested steps apply to any health service providing cancer care - public, private, metropolitan or rural.

The guide:

- Is designed to provide lead clinicians and health service managers with practical advice on how to improve cancer care locally to be in accord with national best practice.
- Will be most useful in settings where the organisation wants to offer patients world-best practice, and where vital clinical data is carefully recorded and continuously reviewed so changes in practices can offer new insights.
• Draws upon Australian and overseas experience in introducing and sustaining improvements in cancer care.
• Covers the issues that need to be considered when developing a local action plan for quality improvement.
• Provides answers to typical questions asked by those charged with implementing clinical practice guideline recommendations.

**NSW Cancer Plan 2007-2010** (Cancer Institute NSW, 2006)

The Cancer Institute NSW was established in July 2003 through the *Cancer Institute (NSW) Act 2003* as a direct response to the need to decrease the burden of cancer on our society. The Cancer Institute NSW has the statutory mandate to substantially improve cancer control in NSW and as a result decrease the devastating impact of cancer on individuals, their families and our broader society. The Cancer Institute NSW is Australia’s first government supported cancer control agency. The Cancer Institute NSW has four goals:

1. Increase cancer survival
2. Reduce cancer incidence
3. Improve the quality of life of cancer patients and their carers
4. Provide expert advice to patients, the public, health care professionals and the Government.

The NSW Cancer Plan 2007-2010 will focus on five high priorities most likely to improve cancer results. These are:

- Priority 1  Preventing cancer
- Priority 2  Detecting cancer early
- Priority 3  Improving cancer services and professional education
- Priority 4  Accelerating improvement through research
- Priority 5  Relevant data and information

These priorities will be addressed by networking expertise and by collective action.

**Achieving Best practice Cancer Care: A guide for implementing multidisciplinary care** (Victorian Metropolitan Health and Aged Care Services Division, 2007).

The Australian Better Health Initiative, which is a partnership between the states and territories and the Australian Government, aims to refocus the health system to promote good health and decrease the burden of chronic disease. Among its five priorities, the initiative aims to improve the coordination and continuity of care for people with chronic diseases, including cancer. A key aspect of this initiative is improved communication and integration between care services. This relates directly to the development of coordinated care and multidisciplinary care for cancer patients across Victoria.

The purpose of the multidisciplinary care policy is to:

- promote the development of a multidisciplinary approach in health services providing care to people with cancer
- promote linkage of multidisciplinary teams to other teams and to individual practitioners within and between the Integrated Cancer Services (ICS).

Statewide consultation and discussion with ICS informed the development of this policy.

**Integrated Cancer Services**

In 2004, eight ICS were established with funding to support the development of integrated care and defined referral pathways for the populations they serve. The ICS are the platform
through which improvements in cancer service delivery and patient care is being implemented.

**Patient Management Frameworks**

The Patient Management Frameworks (PMFs) are a guide to the optimal care management of patients in each tumour stream. They are intended to improve patient outcomes by facilitating consistent care based on evidence and best practice across the state. Multidisciplinary care is one of the key principles that support the seven identified steps of the patient journey. Further information about the PMFs can be found at [www.health.vic.gov.au/cancer](http://www.health.vic.gov.au/cancer).

**Clinical excellence in cancer care** provides a vision for how high-quality cancer services need to be delivered. It describes the key principles and practices necessary for the effective monitoring, management and improvement of cancer services across Victoria. The model incorporates six clinical dimensions that are critical to improving the safety and quality of care, one of which is continuity and care coordination - this can also be viewed at [www.health.vic.gov.au/cancer](http://www.health.vic.gov.au/cancer).

**Draft Cancer Services Plan 2008-2010** (ACT Health, 2006)

The ACT Health Cancer Services Plan 2007-2012 (ACT Health, 2006) provides the framework for the future delivery of comprehensive cancer care to the people of the ACT and South East New South Wales.

The plan focuses on further developing a multidisciplinary and integrated model of care for people with cancer. A person with cancer and their carers will experience a complex array of interactions with a range of clinical and support services, inside and outside of those services provided by the ACT Health Capital Region Cancer Service. The plan provides a framework for strengthening the links between those services so that the patient journey is as integrated and easy to navigate as possible. It recognises the central role played by a person’s General Practitioner in the coordination of care and the need for stronger links and support for General Practitioners.

The establishment of these linkages will be underpinned by an integrated information technology and information management strategy for cancer services detailed in the plan.

The plan also recognises the importance of prevention and screening and the integration of cancer research and teaching with clinical care, and proposes the establishment of a comprehensive cancer care centre in the ACT.

In addition to enabling comprehensive care integrated with cancer research, this centre will position the ACT as an attractive workplace for a scarce skilled workforce that will need to grow and develop in line with projections of demand for cancer care.

The objectives of the plan are to:

- Provide a framework for the provision of a comprehensive cancer service.
- Strengthen the patient centred focus of cancer services.
- Develop a focus on the assessment of performance in the provision of cancer services.

Challenges and priorities identified include:

- Developing an integrated and comprehensive patient centred cancer service for the ACT and region.
- Implementing priorities of national and local policies, strategies and frameworks.
- Embracing advances in pharmaceuticals and in clinical and information technology, where appropriate.

The ACT Health Cancer Services Plan 2007-2012 (ACT Health, 2006) is also underpinned by the ACT Health Clinical Services Plan 2005-2011 (ACT Health, 2004), which provides a
framework for the development and provision of public hospital and community health services for the people of the ACT. It sets a number of goals and initiatives for cancer services:

- The cancer stream will facilitate early diagnosis, improved outcomes and more seamless access to care across the spectrum of cancer-related services;
- Services expansion initiatives will include increased chemotherapy and radiation oncology services. Performance indicators to be achieved as a result a reduction of patient flows to other states for radiation oncology treatment, 100 percent of people requiring urgent radiotherapy service receiving those services within 48 hours, and 100 percent of people requiring semi-urgent services receiving treatment within standard timeframes;
- Development of specific service plans for cancer-related services including radiation and medical oncology services.
Appendix B. Overview of empirical research studies for managed clinical networks

| Aims of the study | To produce models to estimate the impact of introducing clinical networks and the 2001 British Association of Perinatal Medicine standards to the delivery of neonatal care. Particularly to assess the impact of introducing clinical networks and meet the BAPM standards over several years |
| Patient population | Information was gathered on a geographically defined population. All neonatal admissions for Trent resident infants at or before 32 weeks gestation between 1 January 1998 and 31 December 1999 |
| Study design | A modelling exercise was carried out based on survey data collected in 1998 and 1999 on neonatal intensive care activity. Three models were investigated: (a) the current care provision; (b) a network where three lead centres provided the intensive care for the region; (c) a network where six lead centres provided the intensive care for the region |
| Outcome measures | Over all costings, staffing levels, and cot requirements were calculated for each model. Data collected by questionnaire on staffing levels and cot availability. Data on staffing levels and cot availability were used to calculate current care provision costings |
| Results | The current cost of running the service is approximately £33.35 million. Estimates for the introduction of a three centre model range from £37.31 to £43.40 million. Equivalent figures for the six centre model were: £36.32 to £42.62 million. Approximately 370 and 230 babies a year would be involved in transfer in the three and six centre models respectively. This is in contrast with 374 and 368 urgent transfers that actually took place in 1998 and 1999 respectively. |
| Conclusions | Although there are risks to the introduction of networks for neonatal intensive care, they also have the potential to place the service on a more sound footing than ever before. The models of care presented in this study produced very similar results, both resulting in a significant increase in both the funding and staff requirements. The costs associated with the introduction of managed clinical networks and meeting BAPM standards of care are not excessive considering the outcomes. |

<p>| Aims of the study | To assess the significance of broader developments of changing managerial practice within the NHS. To specifically assess the developing theory of network-based organisations; to empirically assess the significance of these developments for managerial practice; and to consider organisational and managerial implications. |
| Patient population | Approximately 70 respondents from different functions and agencies across nine purchasing organisations (including headquarters) which were nominated by experts at the Department of Health as reputed to be at the ‘leading edge’ of development across the country. Therefore the data may not be typically reflective of practice in the NHS, rather practice at its evolving ‘leading edge’. |
| Study design | Initial literature review studying the management by networks phenomenon (1994-1995) within the NHS. Conclusions following the literature review were tested using a semi-structured interview pro forma. Followed by 4-5 interviews with Head Quarters of the nine purchasing organisations, as well as observational visits to innovative localities |
| Outcome measures | Semi structured interviews: Whether there is a movement towards network-based forms of organisation in the |</p>
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<tr>
<th>Results</th>
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<tr>
<td><strong>Network based management involves:</strong></td>
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<tr>
<td>Less reliance on established functional hierarchies, more reliance on network based styles of working</td>
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<td>Formation of active organisation development functions</td>
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<td>Multidisciplinary approach as opposed to uniprofessional</td>
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<td>Increase in diversity, pace, and complexity of employee tasks (sometimes resulting in a lack of clear structure)</td>
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<td>More informal modes of communication</td>
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<td>Health commissions are 'looser', with less direct control</td>
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<td>Greater emphasis on developing external communication and two way dialogue with the public</td>
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<tr>
<td>Network-based forms of management are highly time consuming, and could potentially deliver very little</td>
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<tr>
<td>There is a need to build a broad base of support when trying to progress major plans</td>
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<td>Networks require the alignment of incentives at an agency level so that decision makers cooperate</td>
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**Role of the CEOs:**

- Build and maintain networks: Through staff selection and development, external contacts, and meta-level management of the network through negotiations with key partners.
- Give the networks strategic direction, reinforce core purposes and tasks, ensure corporacy
- To institutionalize strategic alliances; movement from reliance on interpersonal trust to inter-organisational trust

In terms of human resource strategy several key networking attributes and skills were identified as being necessary:

- Strong interpersonal, communication and listening skills
- An ability to persuade
- A readiness to trade and engage in reciprocal rather than manipulative behaviour
- An ability to construct long term relationships

<table>
<thead>
<tr>
<th>Conclusions</th>
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<tbody>
<tr>
<td>Network-based styles of management should now be seen as of substantial and rising importance within NHS purchasing organisations when assessed against both hierarchical and market-based forms of management.</td>
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<tr>
<td>Networks are seen as diffuse and polycentric in nature, with many networks and sources of leadership interacting simultaneously.</td>
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<tr>
<td>In the case of the NHS, clinical networks exercise an important role in inter-organisational communication and managerial networks in the highly professionalized and politicized public system.</td>
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<tr>
<td>However, network based styles of management should not be seen as a universal panacea. Important to be aware of managerial problems and challenges of network based organisation:</td>
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<tr>
<td>Ensure clarity of purpose in networks</td>
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<tr>
<td>Questionable sustainability of networks. Networks are time consuming to create and maintain, but could collapse if not seen as delivering or a key player pulls out.</td>
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<tr>
<td>Need to operate with an open system in terms of opening up networks and introducing new players</td>
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<tr>
<td>Mutual orientation and reciprocity emerged as key concepts, requiring a different management approach based on negotiation.</td>
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<tr>
<td>Networking with external stakeholders is now a key managerial skill</td>
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### Authors

### Aims of the study
To investigate the set up and operation of a Managed Clinical Network for cardiac services and assess its impact on patient care.

### Patient population
A total of 202 patients aged less than 76 years admitted to hospital with a confirmed myocardial infarction one year pre and one year post network establishment were the participants for the outcome evaluation. Participants for the economic evaluation consisted of 202 myocardial infarction patients from the time of hospital admission to 6 months post discharge.

The process evaluation involved interviews with 14 participants, including senior managers, general practitioners, nurses, cardiologists and members of the public.

### Study design
Comparative, single case before and after study of clinical indicators of quality of care and costs, with concurrent process evaluation.

**Three-level framework:**
1. Process evaluation of the network set-up and operation through a documentary review of minutes; guidelines and protocols; transcript of fourteen semi-structured interviews with health service personnel.
2. Outcome evaluation: interrupted time series analysis of clinical data of patients’ one year pre and one year post network establishment.
3. Economic evaluation: interrupted time series analysis to evaluate the transaction costs of the set-up and operation of the network and the resource costs of the clinical care of patients from time of hospital admission to 6 months post discharge.

### Outcome measures
**Process evaluation measures:**
- Network set up and operation
- Documentary review of minutes, guidelines, protocols, interview transcripts

**Main outcome evaluation measures:**
- Differences between indicators of quality of care targeted by network protocols.
- Data were abstracted from hospital and general practice case sheets

**Economic evaluation measure:**
- Differences in National Health Service resource use
- The resource costs per patient incorporated all NHS costs from time of hospital admission to 6 months post discharge and included both costs in primary and secondary care.

### Results
Despite early difficulties, the network was successful in bringing together clinicians, patients and managers to redesign services, exhibiting most features of good network management. The role of the energetic lead clinician was crucial, but the network took time to develop and ‘bed down’. Its primary “modus operand” was the development of a myocardial infarction pathway and associated protocols. Of sixteen clinical care indicators, two improved significantly following the launch of the network and nine showed improvements, which were not statistically significant. There was no difference in resource use.

### Conclusions
The Managed Clinical Network made a difference to ways of working, particularly in breaching traditional boundaries and involving the public, and made modest changes in patient care. However, it required a two-year “set-up” period.

Managed clinical networks are complex initiatives with an increasing profile in health care policy. This study suggests that they require energetic leadership and improvements are likely to be slow and incremental.
Aims of the study

To evaluate the South East Scotland Cancer Network (SCAN). The evaluation of the SCAN network has three purposes. To evaluate:
1. To what extent the SCAN network is meeting its objectives.
2. If the principles and concepts of MCN developed alongside SCAN are consistent with it.
3. To develop indicators that would allow SCAN to continue to evaluate its ongoing performance.

Patient population

10 leading managers and officials responsible for cancer services policy and the management of SCAN using a purposive sample method. The chosen represented the most senior managers and clinicians for cancer services and the management of SCAN: The Scottish executive (1), the chair and management team of SCAN (3), area representation (2 from each region), Clinicians (4), Management (4).

Study design

Used elements of the Theories of Change approach to evaluation. Semi-structured interviews were conducted as part of the baseline information gathering.

Outcome measures

Semi-structured interviews, addressing:
- Long term objectives (10years+)
- Interim objectives (2-3years)
- Interventions to achieve these
  - The extent that they are consistent with the core principles of MCNs

Results

There was considerable agreement on the long-term purpose of the network and the mechanisms for achieving these. Three long-term objectives emerged: Equity (access and quality of care), survival, and patient experience.
Less agreement on interim objectives and interventions.
There were a few interviewees that raised leadership of the network as an issue and questioned the sustainability of the network as well as highlighting possible conflicts of interest.
There was general consensus that improving the management and organisational development of the network would help deliver equity, improve survival rates, and improve patient care/experience.
Many of the views expressed in the interviews are consistent with the core principles of MCNs. These highlight the importance of: a patient centred approach, quality assurance programs, the existence of a continuing audit, multidisciplinary involvement and working, continuous professional development, provision of peer support and review, and clear structure and objectives.

Conclusions

The introduction of an MCN is a complex organisational change. To be able to evaluate its success or otherwise it is essential to first establish the explicit objectives and processes of change. This initial phase of the evaluation has highlighted a high degree of agreement in the expected outcomes of the network, amongst those responsible for its management.
It has also highlighted some disagreement and tension as to the direction and nature of the network for which the management group must establish a consensus.
Management of the networks may need “strong product champions and innovators”.

Authors

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<tr>
<td>Aims of the study</td>
<td>Investigation of the three regional cancer MCNs that have been established in Scotland: North of Scotland Cancer Network (NoSCAN); South East Scotland Cancer Network (SCAN) and West of Scotland Cancer Network (WoSCAN).</td>
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<tr>
<td>Patient population</td>
<td>Questionnaire: MCN cancer site-specific group members. Interview and focus group: 9 participants took part in the focus groups (5 nurses, 2 pharmacists, 1 allied health professional, 1 health service manager). They were selected on basis of geography and professional background. 199 participants completed the questionnaire (75 from NOSCAN, 45 from SCAN, 70 from WOSCAN). 119 (60%) of respondents has over 15 years MCN experience. Interview number not specified.</td>
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<tr>
<td>Study design</td>
<td>Three phases: focus group, survey questionnaire, individual interviews</td>
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</table>
| Outcome measures | Focus group: The skills that may be important to enhance collaboration between professionals associated with MCNs, any associated training needs, possible approaches to delivery of training solutions.  
Questionnaire: Self-report ranking of importance in competence in 25 core skills falling into interpersonal, organisational and analytical skill categories to identify training needs.  
Semi-structured interview: Explored in greater depth the questionnaire responses and the concepts introduced in the focus group. |
<p>| Results | In the focus group, participants cited the most important skills as being, ‘communication’, ‘influencing’, ‘negotiation’, ‘team-working’ and ‘leadership’. All but one of the pre-defined people skills made it into the top 10 core skills of all 25 skills listed. With regard to administration/organisational skills, there were some differences by profession. Doctors ranked ‘delegation’ as most important, while nurses and AHPs both frequently ranked ‘accountability’ and ‘written reporting’ as having high importance, compared with lower rankings 54% and 45% respectively for doctors. ‘Designing/implementing change’ emerged as the strongest weighted training need. Gaps between competence and highly important interpersonal skills notably included ‘conflict resolution’, ‘negotiation’, ‘influencing people’, and ‘motivating people’. This aside, most subjects agreed that individuals involved in networks had varied prior experience and education. Therefore, training needs would depend more on the individual than the profession. |
| Conclusions | There was strong consensus amongst professionals regarding the key non-clinical skills for working in MCNs. This suggests that many skills are generic and required by all professionals involved in MCNs. Responses reflect a recognition that interpersonal skills in particular are highly important. The strongest training needs identified appeared to relate to a desire for interpersonal skills that help staff to work in challenging and dynamic situations: managing change; conflict resolution; negotiation; influencing people. Subjects recognized that they were working across traditional organisational and professional boundaries. To maximize its potential, any training should ideally take place in a multi-professional environment and would require the support of all stakeholders. |</p>
<table>
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<tr>
<th>Author</th>
<th>Lin Y-J (2007). Integration of primary community care networks (PCCNs): Examination of governance, clinical, marketing, financial, and information infrastructures in a national demonstration project in Taiwan <em>BMC Health Services Research</em>, 7, 90 – 105</th>
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<tr>
<td>Aims of the study</td>
<td>To profile the individual members in Taiwan’s primary community care networks (PCCNs) so to study the nature and extent to which their network infrastructures have been integrated among the members (clinics and hospitals) within individual PCCNs.</td>
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<tr>
<td>Patient population</td>
<td>928 clinic members that belonged to a clinic which had been part of PCCNs for more than one year (based on 2003-2005 Taiwan PCCN list). 59.6% response rate. 239 clinics in the Taipei region, 165 in the northern region 241 in the central region, 108 in the southern region, 150 in the Kao-Ping region, and 15 in the eastern region of Taiwan.</td>
</tr>
<tr>
<td>Study design</td>
<td>This study was aimed at providing descriptive analyses to map the partnership development. To understand the actual integration actions done by network members, the theoretical concept employed by network partnerships were described and then the derived mail out survey instrument was developed.</td>
</tr>
<tr>
<td>Outcome measures</td>
<td>Questionnaire: Items covered the network working infrastructures: governance, clinical, marketing, financial, and information integration in PCCNs</td>
</tr>
<tr>
<td>Results</td>
<td>Over all, the PCCNs’ members had higher involvement in the governance infrastructure, which was usually viewed as the most important for establishment of core values in PCCNs’ organisation design and management at the early integration stage. In addition, it found that there existed a higher extent of integration of clinical, marketing, and information infrastructures among the hospital-clinic member relationship than those among clinic members within individual PCCNs. The financial infrastructure was shown the least integrated relative to other functional infrastructures at the early stage of PCCN formation.</td>
</tr>
<tr>
<td>Conclusions</td>
<td>There was still room for better integrated partnerships, as evidenced by the great variety of relationships and differences in extent of integration in this study.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Authors</th>
<th>Richardson A, Stizia J, Cotterell P (2005). ‘Working the system’ Achieving change through partnership working: an evaluation of cancer partnership groups <em>Health Expectations</em>, 8, 210-220</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aims of the study</td>
<td>To investigate the characteristics and achievements of cancer partnership groups (designed to facilitate user involvement in the planning and delivery of local cancer services) in the 34 cancer networks in England and to explore the influence that such groups had on local cancer services.</td>
</tr>
<tr>
<td>Patient population</td>
<td>Telephone survey completed by 30 cancer networks with an active Partnership Group in England. 6 of the 30 networks were subsequently recruited to take part in face-to-face interviews. Groups were selected in an attempt to gain a wide variety based on location, ethnic diversity, group age, and group activeness. 23 group members were recruited (12 service users, 11 NHS staff) also 6 staff who were non-group members for an ‘external perspective’.</td>
</tr>
<tr>
<td>Study design</td>
<td>Exploratory small-scale qualitative study employing a structured telephone survey, face to face interviews and documentary analysis. The processes of data analysis and interpretation were iterative. Thematic analysis of interviews.</td>
</tr>
<tr>
<td>Outcome measures</td>
<td>Mapping exercise of partnership group activity, in terms of composition, structure, activities, achievements, barriers, challenges of partnership groups: Phone interview with partnership group representative Review of documentary evidence Case site accounts: Face to face semi-structured interviews with patients and healthcare professionals in 6 cancer networks to investigate: participants involvement in partnership groups, views on group: effectiveness, influence on NHS services</td>
</tr>
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</table>
### Results

**Characteristics of partnership groups:**

Partnership groups were established in the majority (88%) of cancer networks. Typically these groups were at network level (83%), had been established for a median of 21 months (range: 6 months to 8 years) met once every 2 months (83%), and were populated with both service users and health care professionals.

**Five common achievements and activities were identified:**

- Establishment of the group itself;
- Acting as a ‘reference’ group for consultation;
- Networking and representation on other groups;
- Patient information and communication; and
- Proactive influencing.

The large majority of groups had developed quite substantial portfolios of projects, with a clear focus being the improvement of local services and the ‘patient experience’. These activities progressed in terms of scale and complexity with the growth in a group’s knowledge, expertise and confidence. **Successful groups tended to show the following characteristics:**

- Established for more than 2 years
- Well organised with systems in place to conduct communications and business between meetings
- A chairperson with actual leadership skills and who showed commitment to the group,
- A highly-committed and active core group of members
- Tangible support for the group

### Conclusions

Activities progressed in scale and complexity as groups evolved, with retrospective data demonstrating that groups were evolving organically over time. In consideration of this, when gauging the impact of involvement strategies it would therefore be important to subscribe to broad indicators of success that include both process and outcome measures. There are currently no agreed criteria by which to judge the success or failure of these groups.

### Authors


### Aims of the study

To examine a realistic evaluation design in the establishment of a new managed clinical network (MCN) approach to implementing a guideline concerned with pain management for cancer patients (SIGN 44).

### Patient population

Three older men, their families, and the doctors and nurses providing direct care participated, along with 13 members of the network management group from a rural primary care setting in Scotland.

### Study design

The study was planned around three evaluation points over the first year starting with the initial MCN model and ending with the third refinement. Actual evaluation points occurred at 6, 11 and 15 months. At each stage, case studies were developed to build a patient-centered account of care experiences from stakeholder interviews (patients, family carers, direct care giving health professionals) to permit identification and description of observed or actual CMOs. The findings from the account of care (actual CMOs) were then fed into an implementation and progress review to enable discussion, reflection and refinement by the Network Executive. Findings from patient-centred case studies fed into realistic evaluation interviews with the management group.

### Outcome measures

At each stage, steps were taken to identify the context, mechanisms and outcomes (CMOs) associated with the version of the model under scrutiny. Patient-centred accounts (qualitative interviews, conversational interviewing with patients and carers, semi-structured with health professionals) addressed main themes and links to care provision, and evidence and detail of observed context-mechanism-outcomes.
### Implementation progress review

*Three group sessions with the Network Executive addressed:*

- Progress made in establishing the MCN at an operational and strategic level.
- Feedback based on the account of care with time for discussion and comment.
- Reflection on what was working, for whom and under what circumstances
- Agreement of development priorities.

### Analysis of implementation and progress review data:

- Contextual elements
- Process variables
- Expected care outcomes
- Actual care outcomes

### Results

**Evaluation point 1**

The first version of the MCN was clearly influenced by SIGN 44 and included network meetings and promotion of collaborative relationships among Primary Team members.

**Account of Care 1**

Patient unwilling to engage in pain management tool. Professionals viewed introduced changes positively, through effective in improving pain management.

**Implementation Progress Review 1**

There was a need to compromise on ideas, which was felt to be disheartening. Group reaction was disappointment at evidence suggesting unsatisfactory pain management.

**Evaluation point 2**

The second version of the model included an improved education programme and means to provide information, role development, and pharmacist involvement. Rolled over to include 3 general practices.

**Account of Care 2**

All interviewees were positive in their appraisal of the MCN, outcomes were generally better in terms of pain control than at point 1.

**Implementation Progress Review 2**

- 8 Network Executive Members participated.
- Positive about feedback on care account
- Disappointed by the slow pace to recruit practices and need to frequently compromise on plans
- Realisation of the necessity to develop mechanisms to revise and update practitioner knowledge, or provide means to access rapid advice
- A local champion was needed to motivate the adoption of the MCN model in practices.
- A need to be creative in ensuring that practitioners put time towards the development process
- Accumulating evidence from audit and clinical data of better pain management and symptom control, and increased knowledge through better patient education.
- Professionals experienced: Improved team working, enhanced communication, increased knowledge, greater satisfaction, reflective practice, increased commitment to evidence based care.

**Evaluation point 3**

Another general practice was added to the MCN (total 4).

Several new resources had been developed for patients, and education sessions had been condensed.

A care manual had been drafted, improvements made to multidisciplinary team documentation and communication systems.

A member of the Network Executive work had taken on a coordinating role.
### Account of Care 3
Professionals found pain assessment tool useful, but the patient found it difficult. The audit feedback provided a means to find a suitable method of pain management for the patient.

### Implementation Progress Review 3
11 members of the Network Executive Group participated. Revealed the complexity of interdisciplinary development. Role function changes for the district nursing team and community pharmacist hastened progress. Consensus that all discipline perspectives on models of care were valid as they are working towards the same goal.

### Conclusions
The Network Executive Group had to constantly reappraise progress and set short-term achievable goals. It was found that coordination, leadership and strategic support were critical to progress, and such progress was evident at each evaluation point. The study demonstrates that better care outcomes can be achieved with the establishment of MCNs, but in this particular example it has been as a consequence of considerable practitioner effort. The cost benefit of such practitioner effort should be carefully appraised by others planning similar initiatives. The use of partnership models with experts in education and practice development should be considered and may expedite the process.

The collaborative approach nurtured by the realistic evaluation framework was found particularly helpful and there was consensus that the evaluation had become integral to the intervention itself. The reflective processes promoted through participation in the external realistic evaluation enabled the group to reflect and plan more objectively than perhaps they would have done otherwise. It has proved a facilitative approach to inform ongoing refinements.
## Appendix C. Overview of empirical research studies for managed clinical networks

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<tbody>
<tr>
<td>Aims of the study</td>
<td>To examine the changes in management in a District General Hospital resulting from review at MDT Meetings in our unit</td>
</tr>
<tr>
<td>Patient population</td>
<td>124 urological cancer patients</td>
</tr>
<tr>
<td>Study design</td>
<td>Prospective study of patients receiving care from a MDT team. Team consisted of three urological consultants, a lead clinician, pathologist, radiologist, oncologist, 2 urological nurse practitioners and junior staff. 10 meetings were analysed prospectively over a period of 6 months. Before the meetings consultants completed a form stating their proposed management and whether they thought this would be changed after discussion. At the meeting histological, radiological and clinical data were reviewed and a collective decision about the optimal treatment was made.</td>
</tr>
<tr>
<td>Outcome measures</td>
<td>Changes in management resulting from case review to pathology or radiological reports were recorded.</td>
</tr>
<tr>
<td>Results</td>
<td>Two of 124 cases had their clinical management changed as a result of the meeting. These were identified (amongst 10 others) as potential ‘change cases’ prior to the meeting. Four changes were made to histological reports and 1 to radiology; none of these affected clinical management.</td>
</tr>
<tr>
<td>Conclusions</td>
<td>Discussion of cancer cases at MDT Meetings made no difference to the clinical management in over 98% of cases. Consultants correctly identified cases requiring discussion, indicating patients that will benefit can be filtered by consultants in advance. This has the potential to reduce the considerable costs involved without affecting patient care.</td>
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<tr>
<td>Aims of the study</td>
<td>This study aimed to evaluate team decision-making in upper gastrointestinal cancer. Specifically, to investigate if MDT decisions are actually implemented.</td>
</tr>
<tr>
<td>Patient population</td>
<td>300 consecutive MDT treatment decisions were recorded for patients with oesophageal, gastric, pancreatic and peri-ampullary tumours at a Bristol hospital between October 2003 and March 2004. 27 did not meet inclusion criteria, and 2 more did not have information available on final treatment. Therefore, N=271, 172 male, age range 26-98, M=68.7.</td>
</tr>
<tr>
<td>Study design</td>
<td>Observational study which evaluated treatment decisions by anticipating that MDT decisions made under the best circumstances with relevant information and experts available will lead to treatment decisions that are implemented in almost 100% of situations</td>
</tr>
<tr>
<td>Outcome measures</td>
<td>Examined concordance between MDT decisions and treatment implementation. Implementation of MDT decisions was investigated by examining hospital records. Where decisions were implemented it was recorded as concordant, if the decision changed it was recorded as discordant. Reasons for changes in MDT decisions were identified through examination of hospital notes and reasons for change in management plan were identified and classified as: patients’ choice, co-morbid health issues, new clinical information unavailable to the MDT, or no apparent reason.</td>
</tr>
<tr>
<td>Results</td>
<td>273 decisions were studied and 41 (15.1%) were discordant (not implemented), Looking at the reasons for discordance, 18 (43.9%) were due to co-morbid health issues, 14 (34.2%) related to patient choice and 8 (19.5%) decisions changed when more clinical information was available. Discordant decisions were more frequent for patients with pancreatic or gastric carcinoma as compared to oesophageal cancer.</td>
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## Conclusions

Team working represents a potentially powerful lever for change in healthcare and the need to develop high performing teams is widely acknowledged. Systems for evaluating effectiveness of teams, however, are immature and methods to monitor performance, team working and outcome are required. Results show that monitoring concordance between MDT decisions and final treatment implementation is useful to inform team decision-making. For upper gastrointestinal cancer, MDTs require more information about co-morbid disease and patient choice to truly optimize the implementation of multi-disciplinary expertise.

### Authors

### Aims of the study
The aims of the assessments carried out with MDT members were (1) to describe team members information giving roles, (2) to identify the strengths and weaknesses of communication within oncology MDTs in terms of members information giving roles and (3) to assess team members mental health and compare it with previously published data.

### Patient population
Five breast, three colorectal and two gynaecology multidisciplinary cancer teams ranging in size from eight to 21 members, recruited from England, Scotland and Wales. Each team identified their own regular members; one study stipulation was that all must be attendees at the weekly MDT meetings.

### Study design
Observational, multi-questionnaire based studying analysing MDT communication.

### Outcome measures
Team members completed the Informational Roles Questionnaire (IRQ) (Jenkins *et al* 2001): measuring healthcare professionals’ perceptions of their own role and their awareness of their colleagues’ roles in providing information to the patient during their treatment and care.

Team members were also asked to indicate whether they and which of their colleagues have a regular role in discussing patient problems in each of five areas of psychosocial concern: (1) physical, (2) functional, (3) sexual, (4) social and (5) emotional well being.

Also completed two measures of psychological well being; the 12-item GHQ-12: a self-report questionnaire specifically designed to screen for nonpsychotic psychiatric disorder. And the MBI: a self-report questionnaire used to measure the effect that working closely with people in an emotionally demanding role has on a person’s mental health.

### Results
The information giving roles of the surgeon, oncologist, radiologist and clinical nurse specialist were well recognised by their colleagues; however, other team members’ roles were more ambiguous and less well understood. The clinical nurse specialist provided the broadest information coverage for patients. Few professional groups regularly informed patients about clinical trials and family history and the clinical nurse specialist was often the only person to deal with patients’ sexual well being, consequently these areas are likely to receive poor coverage. Probable psychiatric morbidity in teams ranged from 5 to 27%. High levels of emotional exhaustion were particularly apparent in team leaders and nurses and feelings of low levels of personal accomplishment were prevalent in the histopathologists and radiologists.

### Conclusions
It seems reasonable to assume that effective MDT working will provide benefits to patients and healthcare professionals working in cancer teams. Evidence has started to accrue showing that certain outcomes are improved but the current study suggests benefits are not always consistent, that advantages do not inevitably result from the adoption of a multidisciplinary approach and that there is room for improvement. Putative benefits to patients and healthcare professionals from multidisciplinary team working may not be realised without investment in team training.
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<tr>
<td><strong>Aims of the study</strong></td>
<td>This study reviews the applicability of the multidisciplinary approach to the management of patients with breast cancer in a private hospital</td>
</tr>
<tr>
<td><strong>Patient population</strong></td>
<td>579 consecutive patients undergoing breast cancer surgery were studied. Patients receiving neoadjuvant chemotherapy or who had metastatic disease at presentation were excluded. Mean age 48.6 years.</td>
</tr>
<tr>
<td><strong>Study design</strong></td>
<td>Demographic and operative details, pathology, and recommended adjuvant therapy were discussed and recorded in the weekly multidisciplinary breast conference involving breast surgeons, pathologists, and radiation and medical oncologists</td>
</tr>
<tr>
<td><strong>Outcome measures</strong></td>
<td>Demographic information, preoperative investigation/clinical presentation, operation details, pathologic staging (especially the prognostic or predictive parameters), and the outcomes, recommendations for adjuvant treatment.</td>
</tr>
<tr>
<td><strong>Results</strong></td>
<td>A self-discovered breast lump (80%) was the most common presentation, whereas screening mammography accounted for only 12.2%. The accuracy of preoperative mammography, ultrasonography, fine-needle aspiration cytology, and core biopsy were 66.5%, 80.7%, 89.4%, and 98.9%, respectively. Mastectomy was performed in 49.3% of patients, of whom 22.0% underwent immediate reconstruction. Eighty-five percent of patients underwent concomitant axillary surgery, comprising either sentinel node biopsy (49.9%), sentinel node biopsy followed by axillary dissection (38.7%), or axillary dissection alone (11.4%). Adjuvant hormonal therapy, chemotherapy and radiotherapy were recommended in 62.4%, 51.2%, and 64.9% of patients, respectively.</td>
</tr>
<tr>
<td><strong>Conclusions</strong></td>
<td>The complexity of modern breast cancer treatment and abundance of new clinical and basic research studies make it difficult for surgeons to stay abreast of the rapid evolving field of breast cancer management. Multidisciplinary teamwork is essential for optimizing decision-making about adjuvant treatment interventions in such patients. The multidisciplinary approach represents an efficient, cost-effective way to care for women with breast cancer and allows treatment by various specialists working and communicating with each other.</td>
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<tr>
<td><strong>Aims of the study</strong></td>
<td>Aimed to test the effect of the multidisciplinary approach to management for patients with breast cancer.</td>
</tr>
<tr>
<td><strong>Patient population</strong></td>
<td>75 women with newly diagnosed breast carcinoma. Median age = 49 years (26-82 age range) 83% (62) were self-referred or referred from community hospitals.</td>
</tr>
<tr>
<td><strong>Study design</strong></td>
<td>Consecutive patients were examined in consultation in a multidisciplinary cancer centre (January-June, 1998) They were evaluated by a MDT consisted of a medical oncologist, surgical oncologist, radiation oncologist, pathologist, diagnostic radiologist, and occasionally a plastic surgeon. A comprehensive history and physical examination were performed, and relevant mammograms, pathology slides, and medical records were reviewed.</td>
</tr>
<tr>
<td><strong>Outcome measures</strong></td>
<td>Outside treatment recommendations received by the patient were recorded and compared with the Breast Cancer Evaluation Centre panel’s consensus recommendation.</td>
</tr>
<tr>
<td><strong>Results</strong></td>
<td>For the 75 patients, the multidisciplinary panel disagreed with the treatment recommendations from the outside physicians in 32 cases (43%), and agreed in 41 cases (55%)</td>
</tr>
<tr>
<td><strong>Conclusions</strong></td>
<td>Breast carcinoma diagnosis and treatment requires the coordinated services of multiple medical specialists. To have available the service and consultation from multiple specialties in one location at one time facilitates the discussion of management strategies and reduces the chance of oversight that may occur when only one medical discipline is involved. The current study demonstrates that there is an objective benefit</td>
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to the patient from a multimodality breast carcinoma program. Decisions made by MDT are more likely to be in accord with evidence-based guidelines than those by individual clinicians. This multidisciplinary program provided important second opinions for many patients with breast carcinoma.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Choy ET, Chiu A, Butow P, Young J, Spillane A (2007). A pilot study to evaluate the impact of involving breast cancer patients in the multidisciplinary discussion of their disease and treatment plan <em>Breast</em>, 16, 178-189</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aims of the study</td>
<td>Aim to investigate the feasibility and acceptability of direct patient involvement in the MDT meeting and treatment planning.</td>
</tr>
<tr>
<td>Patient population</td>
<td>29 breast cancer patients. Control group: 7, Intervention group: 23. Inclusion criteria were: age older than 18 years; demonstrated proficiency in English; patient being aware of biopsy-proven breast cancer diagnosis; and surgical management as first line management. Exclusion criteria included: past history of breast cancer; breast cancer requiring pre-operative nonsurgical management; prior experience with any forms of cancer-related treatment; and mentally incapable of giving informed consent. 17 members of the MDT completed questionnaires.</td>
</tr>
<tr>
<td>Study design</td>
<td>Consecutive breast cancer patients presenting for surgery were invited to attend the weekly MDT meeting. Control: patients who declined involvement in an MDT meeting completed the questionnaires alone. Intervention: consecutive breast cancer patients presenting for surgery were invited to attend the weekly MDT meeting. Patients completed questionnaires before and after the meeting, and participated in a tape-recorded interview with the breast care nurse after the meeting. Members of the MDT also completed a short survey at the end of the study.</td>
</tr>
<tr>
<td>Outcome measures</td>
<td>Primary outcome measures: difference in patients’ anxiety levels before and after attending the multidisciplinary meeting; and the extent of their decisional conflict and their satisfaction with their level of involvement, understanding and decision-making. Secondary outcome measures: the perceptual and practical impact on the clinical interaction and management planning by the medical and paramedical members of the multidisciplinary team and the practicality of patient attendance at multidisciplinary meetings</td>
</tr>
<tr>
<td>Results</td>
<td>The anxiety scale demonstrated that meeting attendance did not increase anxiety for patients who came to the meeting. There were no demonstrated differences in either the over-all anxiety levels or anxiety reduction between both groups of patients at each assessment point. However, there was a significant reduction in the mean anxiety score for control patients. The study failed to demonstrate that meeting attendance increased patients’ access to information, understanding of the process of medical decision-making, ability to be involved in decision making and ease in actually reaching a decision. The majority of the participating clinicians agreed that the involved patients showed increased understanding of their disease and treatment plans. The multidisciplinary team were either for the most part supportive or neutral of the idea of patient involvement.</td>
</tr>
<tr>
<td>Conclusions</td>
<td>The study did not have sufficient power to detect a difference in some of the main outcomes discussed. However, patient attendance at the breast multidisciplinary meeting was shown to be potentially acceptable to both patients and health professionals, without unduly raising patient anxiety. Further work is needed in evaluating the intervention, perhaps with some modifications, in a larger well designed randomised trial.</td>
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<tr>
<td>Aims of the study</td>
<td>The aim of this study was to describe the activity of a lung cancer multidisciplinary clinic (MDC) and examine whether this model of clinical practice results in adherence to best-practice guidelines.</td>
</tr>
<tr>
<td>Patient population</td>
<td>431 patients referred to a lung cancer MDC for the management of known or suspected thoracic malignancy. Mean age at diagnosis 68 (range 22-92 years) 70.1% men.</td>
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<tr>
<td>Study design</td>
<td>Prospective observational analysis of demographic and clinical data. Demographic and tumour information was collected on all patients referred to the service, with the full dataset collected on those patients subsequently diagnosed with primary lung cancer. For normally distributed data parametric testing was used and results summarized by calculating mean values and standard deviations. Descriptive statistics were used to summarise the demographic data collected.</td>
</tr>
<tr>
<td>Outcome measures</td>
<td>Patient characteristics, smoking and occupational exposures, clinical parameters, tumour characteristics, treatment methods and survival. Patient information collected to assist with clinic systems audit includes referral source by postcode, diagnostic and treatment timeline and compliance with prospectively identified measurements of optimal lung cancer management.</td>
</tr>
<tr>
<td>Results</td>
<td>There was a high rate of adherence to international guideline recommendations concerning timely lung cancer diagnosis, staging and treatment implementation. Similarly, there was adherence to selected key evidence based recommendations for lung cancer management contained in national guidelines.</td>
</tr>
<tr>
<td>Conclusions</td>
<td>Within a MDC, patients receive timely diagnosis, staging and treatment according to evidence-based guideline recommendations. In this study we find that patients managed through a lung cancer MDC are processed rapidly and are more likely to receive tissue confirmation of malignancy and active treatment than patients managed through traditional services. Whereas MDC do deliver good-quality cancer care, it would appear that there is no equal access to these services across the states of Australia</td>
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<tr>
<td>Aims of the study</td>
<td>To assess current staging accuracies for individual modalities and to investigate the influence of the MDT on clinical staging accuracies and treatment selection for patients with gastro-oesophageal cancer.</td>
</tr>
<tr>
<td>Patient population</td>
<td>118 patients. Median age: 65 years, 78% male. Eligible patients: those newly diagnosed with gastric or oesophageal cancer and who were deemed suitable for surgical resection by the MDT were studied</td>
</tr>
<tr>
<td>Study design</td>
<td>Patients were assessed by a MDT comprising specialist esophago-gastric surgeons, gastroenterologists, medical and radiation oncologists, radiologists, pathologists, dieticians, clinical nurse specialists, researchers and trainee medical/surgical staff. Clinical and pathological information was collected prospectively on all patients. Patients then followed a staging algorithm. The histopathological stage was recorded for every patient following the completion of each individual staging modality. Patients were discussed at the weekly MDT meeting and, with all staging data available, the MDT agreed on a final over-all clinical stage to inform treatment.</td>
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<tr>
<td>Outcome measures</td>
<td>Staging accuracies for individual modalities (Computerised Tomography, Endoscopic Ultrasound, Laparoscopy/Laparoscopic ultrasound) Consequences of treatment selection resulting from using results from individual staging modalities alone.</td>
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</table>
| Results | The MDT stage was more accurate than each individual staging modality for T and N staging for both gastric and oesophageal cancers and was better for the assessment of nodal disease than each individual modality. Over-all staging accuracy as determined at the MDT meeting was increased and resulted in only 2/118 (2%) patients being undertreated.
### Conclusions
The MDT stage represents a true consensus opinion where each modality has an equal contribution. By using the final clinical stage as agreed at the MDT, only two patients were ‘under-treated’. The MDT has been shown to significantly improve staging accuracy and as a result ensures that correct management decisions are made for the highest number of individual patients. This provides support for its widespread adoption in all centres treating patients with malignant disease of the esophageus and stomach, if not all other cancers.

### Authors

### Aims of the study
To assess the benefits of using telemedicine for MDT meetings for lung cancer.

### Patient population
62 Patients with lung cancer at a general district hospital were presented to a cardiothoracic centre in London via teleconferencing.

### Study design
Observational comparative study over a one year period. Two hospital sites were equipped with videoconferencing systems. In a one year period 28 MDT meetings were held. The initial decision or diagnosis made at the first MDT meeting, were compared with the final decision after introduction of telemedicine MDT over a 1 year period.

### Outcome measures
Resection rate 3 years before and after introduction of telemedicine MDT meetings. Time between first clinic visit and surgery for patients before introduction of teleconferenced MDTs, and after.

### Results
The further investigations that were agreed at the telemedicine MDT meetings led to a 30% increase in the number of patients having resections. The decision to proceed with thoracic resection for lung cancer was made at the first telemedicine MDT meeting for 13 of the 15 patients (87%) who went on to have the procedure. The mean time from first being seen in the clinic to surgery was reduced from 69 to 54 days. Estimated that the telemedicine meetings saved over three working weeks of thoracic surgical time during the year by decreasing amount of travel time.

### Conclusions
Telemedicine thus offers a solution to the problem of following the recent guidelines requiring more thoracic surgical input into MDTs.

### Authors

### Aims of the study
Conducted three trials to test the feasibility of improving access to multidisciplinary clinical discussions through videoconferencing. Exploring technical, organisational and social factors that may impact.

### Patient population
16 specialists involved in the treatment of breast cancer were surveyed. 14 Clinicians participated in the videoconferencing trail. 26 attended at least one meeting. Attendees included 12 surgeons, four radiologists, four medical oncologists, three radiation oncologists, two nurses and one pathologist. Median of eight participants attended face to face meeting, and ten attended the videoconferences during the study period.

### Study design
Invitations were sent to clinicians identified as being involved in treatment of breast cancer in south-west Sydney region. Twelve consecutive weeks of face-to-face multidisciplinary breast clinical meetings were studied. Following this, 12 consecutive weeks of videoconferences were observed. An anthropologist and a linguist studied the differences in interpersonal interactions between the face-to-face meetings and the videoconferences. Pre and post trial questionnaire sent to specialists.

### Outcome measures
The number of meetings held, the duration of the meetings, the number and specialization of participants, the number of patients discussed, the number of hospital sites connected by videoconference, the number of cancellations and the reason for cancellation, technical problems experienced and comments were recorded. Analyses of how clinicians work together, interact, exchange information, and solve problems for clinical meetings in face-to-face format or videoconferencing format.
## Results

Over all, respondents favoured the format of face-to-face meetings over videoconferencing. The face-to-face meetings allowed a shared negotiation of uncertainty, confirmed familiarity through joking and displayed a cohesive choreography. There was resolution across specialisations, equality among participants, open-ended communication, and multiple ways of knowing. In contrast in the videoconference uncertainty was not acknowledged, no joking, there was within-specialisation resolution, centre dominance, there was closed-didactic communication, and more use of formal scientific evidence.

## Conclusions

The analysis presented above shows that a number of issues would need to be addressed to ensure that the introduction of technologies such as videoconferencing do not obstruct, but rather facilitate, multidisciplinary initiatives. While videoconferencing did not serve to increase attendance, it is useful in improving access to meeting for those who are motivated to attend. Although, consideration needs to be given to the social changes that may occur as a result of introducing new technology and to consider how best to address these changes.

## Authors


## Aims of the study

To examine the treatment and survival of patients with non-small-cell lung cancer before and after the introduction of a multidisciplinary team.

## Patient population

243 patients with inoperable non-small-cell lung cancer. Control: N=117 in 1997 before introduction of MDT. 66% Male. 21 less than 60 years, 96 more than 60 years old. Intervention: N=126 in 2001 after introduction of MDT. 60% male. 23 less than 60 years, 103 more than 60 years old.

## Study design

Comparative study. Information was abstracted from the case notes by a specially trained research nurse (LMF) Data for the year 1997 prior to the introduction of a multidisciplinary team were collected retrospectively and those for 2001 were collected prospectively. Comparison between groups of patients (1997 and 2001)

The multi-disciplinary team consisted of two respiratory physicians, two surgeons, a medical oncologist, a clinical oncologist, a palliative care physician, a radiologist and a specialist respiratory nurse.

## Outcome measures

Patient details, including age, sex, extent of deprivation, tumour type, stage and type of treatment were obtained from the patient’s records. The extent of deprivation was defined using the Carstairs Index. Patients were staged in accordance with the American Thoracic Society TNM classification on the basis of clinical findings, chest X-ray, and, where appropriate, bronchoscopy, liver ultrasound, isotope bone scan and computerised tomography of the thorax. Measured treatment received and median survival.

## Results

In 2001 23% of patients received chemotherapy treatment compared with 7% of patients in 1997. In 2001, 44% of patients received palliative care only compared with 58% of patients in 1997. On follow-up, 116 of the 117 patients diagnosed in 1997 had died compared with 116 of 126 patients diagnosed in 2001. Median survival was significantly higher in patients treated in 2001 compared with those treated in 1997.

In the present study, the introduction of a multidisciplinary team was associated with a change in the treatment of patients with inoperable NSCLC. In particular, more patients received chemotherapy and fewer patients received palliative care only. The introduction of a multidisciplinary team was associated with an increase in the proportion of patients being staged, presenting with stage IIIb disease and receiving chemotherapy. The results of the present study appear to confirm the value of a multidisciplinary approach to the management of patients with inoperable NSCLC.
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<tr>
<td>Aims of the study</td>
<td>To assess whether the development of a multidisciplinary breast cancer clinic was effective in offering consultation and support for newly diagnosed breast cancer patients.</td>
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<tr>
<td>Study design</td>
<td>Randomized controlled trial. Two patient groups were compared. Each of the groups was analysed by retrospective chart review (control) and by patient questionnaires (intervention)</td>
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<tr>
<td>Outcome measures</td>
<td>Patient groups were evaluated according to disease stage, type of treatment rendered, and the time from diagnosis to treatment. Each of the groups was analysed according to timeliness of treatment (measured as days between diagnosis and the start of definitive local therapy) and patient satisfaction. To assess satisfaction, questionnaires were mailed to all patients in both the control and the MDBCC group.</td>
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<td>Results</td>
<td>Improvements in patient satisfaction, such that the MDBC encouraged involvement of patients’ families and friends and by helping patients make treatment decisions. The time between diagnosis and the initiation of treatment was also significantly decreased (42.2 days vs. 29.6 days).</td>
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<tr>
<td>Conclusions</td>
<td>The MDBC was initially designed in an effort to provide supportive, coordinated and convenient care for newly diagnosed patients. The results of the current study have shown that patients are please with this clinic model and that more timely care is provided.</td>
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<tr>
<td>Aims of the study</td>
<td>To systematically evaluate the effectiveness of cancer teams.</td>
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<tr>
<td>Patient population</td>
<td>72 breast cancer teams in England were studied (548 members in six core disciplines), stratified by region and caseload. 113 breast surgeons, 122 breast nurses, 108 radiologists, 92 oncologists, and 113 pathologists. The mean age was 45.5 years (SD = 8.1). Of these 252 were female (46.5%), and six did not give their gender. Only 61 were included in the analyses involving clinical performance. The sample of 61 teams was very similar (98 breast surgeons, 104 breast nurses, 97 radiologists, 82 oncologists, and 100 pathologists) with a mean age of 45.4 years (SD = 8.2). Of these 220 were female (46.3%) and again six did not give their gender.</td>
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<td>Study design</td>
<td>Observational study. Each part of the inputs–processes–outputs model was tested in turn. For the inputs–processes and inputs–outputs components, the inputs were split into similar types of variable and entered into a stepwise regression analysis to identify possible effects on the outcome. Factors that were identified as significant were entered together in a ‘second-level’ stepwise regression, to identify only genuinely important relationships. A similar procedure was used for the processes–outputs part of the model, except that processes were not used to predict self-reported effectiveness. Other questions involved aggregation of responses from particular occupational groups within teams.</td>
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<td>Outcome measures</td>
<td>Information about team constitution, processes, effectiveness, clinical performance, and members’ mental well-being was gathered. Information on team inputs was obtained from the basic team questionnaire and from individual questionnaires. Team process was assessed for seven categories of team working. Four were from the Team Climate Inventory (TCI; West and Anderson, 1996), an established measure based on the theoretical model (West et al., 1998). Three further dimensions were included to test a greater range of team functioning. These were: reflexivity, team innovation, and leadership. Team Outcomes were assessed in three ways: self-reported effectiveness, clinical performance, and mental well-being. Self-reported effectiveness was derived from the individual questionnaires in which each core member rated their team across a range of dimensions. Expert advice and documented evidence were used to identify suitable markers to assess teams’ clinical performance, with at least one measure for...</td>
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each key area of activity. These data were collected for 1 year’s activity of the team. Diagnosis: proportion of patients attending hospital more than twice to achieve diagnosis, and proportion who had a biopsy to achieve diagnosis. Therapy: proportion of patients who received conservation surgery, radiotherapy, and chemotherapy. Clinical innovation: Clinical innovation: patients aged under 70 years, who received induction chemotherapy; entering patients into any of nine open national clinical trials, and routine measurement of oestrogen receptor status. Team member well-being was assessed using a standard psychological measure, the General Health Questionnaire GHQ-12 (Goldberg, 1972)

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<td>Two input variables, team workload and the proportion of breast care nurses, positively predicted over-all clinical performance in multivariate analysis using a two-stage regression model. There were significant correlations between individual team inputs, team composition variables, and clinical performance. Some disciplines consistently perceived their team’s effectiveness differently from the mean. Teams with shared leadership of their clinical decision-making were most effective. The mental well-being of team members appeared significantly better than in previous studies of cancer clinicians, the NHS, and the general population. Higher breast cancer workload predicted better clinical performance.</td>
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<td>This study established that team composition, working methods, and workloads are related to measures of effectiveness, including the quality of clinical care. Multidisciplinary teams have been repeatedly identified as central to the delivery of cancer services. They provide the principal mechanism to ensure that the expertise of each relevant discipline and professional group are brought together, contributing to, and participating in, decisions on the management of all patients with a particular cancer type. This study demonstrated that a number of the characteristics of breast teams affected their clinical performance and effectiveness.</td>
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<tr>
<td>Jenkins VA, Fallowfield LJ, Poole K (2001). Are members of multidisciplinary teams in breast cancer aware of each other's informational roles? <em>Quality in Health Care, 10,</em> 70-75.</td>
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<th>Aims of the study</th>
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<tr>
<td>To conduct a commissioned survey of multidisciplinary breast team members’ expectations of their own and each other's roles in providing different kinds of information to women with breast cancer</td>
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<th>Patient population</th>
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<td>Health professionals from five multidisciplinary breast care centres within a Sussex health authority. 64 individuals identified as members of their local MDTs. The MDTs ranged in size from six to 19 members. All teams contained at least one surgeon, oncologist, specialist breast care nurse, radiologist, and radiographer. The bigger teams included clinic, ward, and chemotherapy nurses and a trials coordinator</td>
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<th>Study design</th>
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<td>Comparative, questionnaire based survey with five multidisciplinary breast care teams from the Brighton, Eastbourne, Hastings, Haywards Heath, and Worthing hospitals.</td>
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<th>Outcome measures</th>
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<td>The main outcome measure: Interdisciplinary awareness of informational roles played by different team members. A two part questionnaire was designed specifically for use in this project by the authors. Part 1 established health professionals' views of the areas in which they considered themselves to have major responsibility when providing information to patients. Part 2 revealed each team member's views of their colleagues' informational roles</td>
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<th>Results</th>
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| There were discrepancies between MDT members' expectations of the roles of others compared with individuals' perceptions of their own role. The largest number of discrepancies between expected and perceived major roles occurred for the specialist breast nurses in most information areas other than in the discussion of psychosocial issues. Their role in the discussion of test results, staging investigations, and prognosis was underestimated by three of the five teams. The clinic nurses also perceived themselves as having a major role in discussions about tests and psychosocial concerns which was not acknowledged by other team members. In addition, some of the informational roles claimed by the radiologists and the radiographers appeared to go unrecognised by the majority of their teams. There was some confusion surrounding the discussion of family history and clinical trials. In four of the five teams the surgeon was
CanNET literature review

<p>| Conclusions | The results of the team survey suggest that, in most cases, health professionals fulfilled the roles expected of them by the team, with two or three individuals identified as the main providers of information for each topic. However, many more professionals were involved in major discussions without the team's knowledge. The professional consistently playing a major &quot;unseen&quot; role was the breast nurse specialist. Discrepancies such as these reveal a lack of interdisciplinary awareness and were far more common than completely failed role expectations. The finding causes some concern as it may suggest that an individual is unsure of his or her role and so compensates by trying to cover all the information areas. A failure by the team to outline clear role boundaries can lead to burn out in some individuals or feelings of being undervalued. |
| Aims of the study | To establish whether treatment recommendations made by clinicians concur with the best outcomes predicted from their prognostic estimates and whether team discussion improves the quality or outcome of their decision making. |
| Patient population | Lung cancer team clinicians completed pre- and post-discussion questionnaires for 50 newly diagnosed patients. The cases were recruited as a convenience sample between December 1999 and January 2003. |
| Study design | Observational, comparative design of one MDT team. Clinicians completed pre- and post-discussion questionnaires eliciting their views on prognosis and treatment. In addition, for comparison, the treatment path down which the patient ultimately proceeded (the product of the group discussion) was also recorded. |
| Outcome measures | For each patient/doctor pairing, a decision model determined the expected patient outcomes from the clinician’s prognostic estimates. The difference between the expected utility of the recommended treatment and the maximum utility derived from the clinician’s predictions of the outcomes (the net utility loss) following all potential treatment modalities was calculated as an indicator of quality of the decision. The proportion of treatment decisions changed by the multidisciplinary team discussion was also calculated. |
| Results | There was no change in net utility loss before and after multidisciplinary team discussion. Team discussion did not improve the quality of decision making over all. In only 23 of 87 instances (26%) in which an individual specialist’s initial treatment preference differed from the final group judgment did the specialist finally concur with the group treatment choice after discussion. In those cases where they did change their mind, they reverted to the group determined choice in only 62% of cases. However, given the modest power of the study, these findings must be interpreted with caution. |
| Conclusions | This study does not support the theory that team discussion improves decision making by closing a knowledge gap. Although, whilst these findings are useful to highlight a neglected area of health services research, they cannot be generalized beyond this specific lung cancer team. |</p>
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<tr>
<th>Authors</th>
<th>Kee F, Owen T, Leathem R (2007). Offering a prognosis in lung cancer: when is a team of experts an expert team? <em>J Epidemiol Community Health</em>, 61, 308-313</th>
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<tr>
<td>Aims of the study</td>
<td>Two main questions are addressed in this study: whether multidisciplinary team discussion changes prognostic accuracy of individual clinicians; and whether team discussion improves the accuracy of the team’s aggregated prediction</td>
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<tr>
<td>Patient population</td>
<td>A convenience sample of 50 cases of newly diagnosed primary lung cancer was recruited between December 1999 and January 2003. The cases reflect the referral practices of the physicians and were selected according to availability of pathology and radiology reports in advance of the scheduled meeting.</td>
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<tr>
<td>Study design</td>
<td>A real-time study of 50 newly diagnosed patients discussed by a regional lung cancer team was undertaken. A case proforma informed the completion of a pre-discussion questionnaire by each team member, seeking prognostic predictions at specific time points. This was repeated after team discussion. Medical notes were reviewed at 6 months to establish actual survival status.</td>
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<td>Outcome measures</td>
<td>To study the impact of team discussion, participants’ views on each case were elicited before and after the discussion of clinical findings and management options. For this purpose, a research nurse abstracted the necessary clinical details and transcribed them on to a printed proforma which was circulated. Views of the participating clinicians were sought with an accompanying questionnaire which they completed before attending the meeting. Immediately after case discussion, the participants individually completed an identical questionnaire, again eliciting their views on prognosis and rating their confidence in the accuracy of the prediction they had made.</td>
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<tr>
<td>Results</td>
<td>Group discussion did not significantly change the accuracy of survival predictions for any one clinician, but the team as a whole performed better after case discussion. There is a wide variation in the range and accuracy of prognostic predictions made by individual clinicians, with no consistent improvement after team discussion.</td>
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<tr>
<td>Conclusions</td>
<td>Cancer teams and individual members in these teams may learn more about how to improve their care if they record and monitor how the multidisciplinary team meeting affects the accuracy of their prognostic judgments and treatment choices</td>
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<tr>
<td>Aims of the study</td>
<td>To assess the impact of the multidisciplinary evaluation of lung cancer patients. To analyse the concordance between the proposed and administered treatment, the delay of treatment, and the 1-year actuarial survival for patients</td>
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<tr>
<td>Patient population</td>
<td>344 patients. All patients with a clinical diagnosis of lung cancer presented at the Nice thoracic oncology group (GOTHa) weekly meeting for a 1-year period starting on July 1 2003.</td>
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<td>Study design</td>
<td>1-year comparative prospective study on patients to verify the advantages of the multidisciplinary approach.</td>
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<td>Outcome measures</td>
<td>The reason for multidisciplinary evaluation was recorded for each patient (diagnosis, first treatment, two or more treatments, adjuvant treatment after surgery, follow-up) Patients entering multimodality protocols were discussed at the GOTHa meeting after each therapeutic step. Three parameters were arbitrarily chosen to test the efficacy of GOTHa activity: treatment concordance, treatment delay, long-term survival. After the multidisciplinary discussion, the physician who first presented the case was contacted 2 months later to verify the concordance and the delay of treatment and thereafter every 2 months to check the patient’s status and possibly the cause of death.</td>
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<tr>
<td>Results</td>
<td>Treatment decision was made at the first multidisciplinary discussion for 164 patients (47.6%), at the second presentation for 112 patients (32.6%), at the third presentation for 51 patients (14.8%), and later for 17 patients (5%). At follow-up, discordance between the planned and administered treatment was recorded in 15 patients (4.4%). Seven patients (2%) refused the proposed treatment. Over all 1-year actuarial survival rate for the entire population was 51.4%. For patients who received RCP treatment, a</td>
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longer survival time was recorded as compared to discordant cases, but the advantage was not statistically significant

**Conclusions**

In conclusion, the efficacy of the GOTHa multidisciplinary management was confirmed, with a discordant rate of less than 5% and a delay of treatment of 4 weeks considered to be acceptable. Furthermore, a periodic survival evaluation of the population as a whole could provide additional useful information for multidisciplinary groups.

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<td><strong>Aims of the study</strong></td>
<td>The aim of this study was to assess surgeons’ views and their current commitments to multi-disciplinary breast meetings</td>
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<td><strong>Patient population</strong></td>
<td>136 registered members of the British Association of Surgical Oncology</td>
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<td><strong>Study design</strong></td>
<td>Two hundred and fifty questionnaires were posted out to surgeons registered with the British Association of Surgical Oncologists. Response rate 61.2%, but only 136/153 used.</td>
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<td><strong>Outcome measures</strong></td>
<td>The anonymous questionnaire contained 12 questions related to MDT meetings. The questions covered issues including frequency and timing of meetings, attendance, patients covered in discussion, organisation and communication.</td>
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<td><strong>Results</strong></td>
<td>There was variability in which patients were discussed in MDT meetings, and in many centres not all patients with cancer were discussed before surgery. Suggestions for improvement of MDT meetings included more time on protected sessions (72.8% in favour), time to prepare for meetings (29% in favour), allocation of a designated coordinator (30.9% in favour) and attendance of oncologists for the whole meeting (over 35% in favour) The majority of Breast MDT meetings were held at breakfast, lunch or the evening. There was variable attendance with a significant percentage of both clinical and medical oncologists not being present for the whole meeting. A quarter of units did not discuss patients with breast cancer before operation.</td>
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<tr>
<td><strong>Conclusions</strong></td>
<td>This study shows that there is a need to improve provision for MDT meetings and to produce guidelines for these meetings. There is a need for more detailed advice with regard to organisation and running of MDT meetings to ensure that all patients with breast cancer can reap the potential benefits of having all aspects of their management discussed at appropriately staffed MDT meetings.</td>
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<tr>
<td><strong>Aims of the study</strong></td>
<td>To examine our experience with patients evaluated at our breast tumour board and to determine the impact this had on the surgical recommendations compared with those received prior to review by the multidisciplinary tumour board.</td>
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<tr>
<td><strong>Patient population</strong></td>
<td>149 patients with a diagnosis of breast cancer. All patients in this study had undergone an initial evaluation, breast imaging and interpretation, biopsy, and recommendations for treatment at outside facilities, and had presented for second opinions.</td>
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<tr>
<td><strong>Study design</strong></td>
<td>Comparative study of patient outcomes. Examined consecutive patients referred to a multidisciplinary breast cancer clinic over a 1-year period with a diagnosis of breast cancer Patients medical records were reviewed retrospectively for alterations in radiologic, pathologic, surgical, and medical interpretations and the effect that these alterations had on recommendations for surgical management.</td>
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<tr>
<td><strong>Outcome measures</strong></td>
<td>Changes in surgical management based on review of breast imaging, pathological interpretation changes after consultation, changes in management based on review of the pathology, and changes in recommended surgical management after tumour board review.</td>
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### Results

A review of the imaging studies resulted in changes in interpretations in 67 of the 149 patients studied (45%). This resulted in a change in surgical management in 11% of patients. Review of the pathology resulted in changes in the interpretation for 43 of the 149 patients (29%). Thirteen patients (9%) had surgical management changes made solely as a result of pathologic reinterpretation. In 51 patients (34%), a change in surgical management was recommended after discussion with the surgeons, medical oncologists, and radiation oncologists that was not based on reinterpretation of the radiologic or pathologic findings. Over all, a second evaluation of patients referred to a multidisciplinary tumour board led to changes in the recommendations for surgical management in 77 of 149 of those patients studied (52%).

### Conclusions

The data from the current study revealed that greater than half (77 of 149 patients) of the patients evaluated at a breast cancer tumour board over the course of 1 year had changes in their recommended surgical treatment made based on radiographic, pathologic, and/or clinical interpretation. The results of the current study demonstrate that the multimodality approach and multidisciplinary review can provide important additional information, allowing expert opinion and recommendations, resulting in changes in patient management.

### Authors


### Aims of the study

The aim of this study was to improve the efficiency of the MDT process for head and neck cancer, and develop and evaluate a database system designed to reduce delays in treatment.

### Patient population

226 and 187 patients were discussed at 11 and 10 weeks before and after introduction of database.

### Study design

A systems analysis of the MDT process was undertaken to identify bottlenecks delaying treatment planning. The MDT process was then audited. A revised process was developed and an Intranet-based data management solution was designed and implemented. The MDT process was re-evaluated to complete the audit cycle. The authors designed and implemented a trust-wide menu-driven database with interfaces for registering and tracking patients, and automated worklists for pathology and radiology. The MDT was audited for 11 and 10 weeks before and following the introduction of the database.

### Outcome measures

The systems analysis of the head and neck MDT process. This was accomplished through direct observation, and stake-holder surveys using the Delphi process. An audit was undertaken to assess the performance of the MDT meeting over an 11-week period, identifying sources of recurring and potential decision-making delays within the system. The performance of the MDT was re-assessed over a further 10-week period following implementation of the database. Both cycles of the audit focused on ‘incomplete MDT episodes’. The proportion of these episodes was compared between the 11 weeks preceding, and the 10 weeks following the introduction of the database using Fisher’s Exact test. The impact of incomplete MDT episodes on overall workload was compared between the two periods using the Mann-Whitney U-test.

### Results

The database significantly improved cross-specialty co-ordination, leading to a highly significant reduction in the number of patients whose treatment planning was delayed due to unavailability of adjunctive investigations ($P < 0.001$). This improved the over-all efficiency of the MDT by 60%.

### Conclusions

Modern delivery of cancer care through patient-centred multidisciplinary teams (MDT) has improved survival. This approach, however, requires effective on-going co-ordination between multiple specialties and resources and can present formidable organisational challenges. A simple, trust-wide database reduces treatment planning delays in a sizeable proportion of head and neck cancer patients with minimal resource implications. This proposed approach is not specific to head and neck oncology, and could be adopted by other multidisciplinary teams.
### Authors

### Aims of the study
To evaluate the feasibility and effectiveness of a structured, multidisciplinary intervention targeted to maintain the over-all quality of life (QOL), which is more comprehensive than psychosocial distress, of patients undergoing radiation therapy for advanced stage cancer.

### Patient population
103 participants were recruited from the Mayo Clinic Rochester’s adult advanced cancer patients who were scheduled to undergo radiation therapy. Eligibility criteria included a diagnosis within the last 12 months, an expected survival time of at least 6 months, a 5-year survival probability of no more than 50% (as routinely determined by the primary radiation oncologist), and a treatment recommendation of radiation therapy of at least 2 weeks.

### Study design
A randomized, stratified, two-group, controlled clinical trial was undertaken to compare the efficacy of a structured multidisciplinary intervention with standard care in maintaining over-all QOL of patients with advanced cancer undergoing radiation therapy.

### Outcome measures
The eight 90-minute sessions addressed the five domains of QOL including cognitive, physical, emotional, spiritual, and social functioning. The primary end point of maintaining over-all QOL was assessed by a single-item linear analog scale (Linear Analog Scale of Assessment or modified Spitzer Uniscale) QOL was assessed at baseline, week 4 (end of multidisciplinary intervention), week 8, and week 27.

### Results
Of the 103 participants, over-all QOL at week 4 was maintained by the patients in the intervention (n=49), whereas QOL at week 4 significantly decreased for patients in the control group (n =54) This change reflected a 3-point increase from baseline in the intervention group and a 9-point decrease from baseline in the control group (P = .009). Intervention participants maintained their QOL, and controls gradually returned to baseline by the end of the 6-month follow-up period.

### Conclusions
Although intervention participants maintained and actually improved their QOL during radiation therapy, control participants experienced a significant decrease in their QOL. Thus, a structured multidisciplinary intervention can help maintain or even improve QOL in patients with advanced cancer who are undergoing cancer treatment.

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### Authors

### Aims of the study
The purpose of the questionnaire was to identify the presence and the roles and responsibilities of colorectal multidisciplinary team coordinators (MDTCs) in England and Wales.

### Patient population
A total of 128 out of 180 (71%) questionnaires sent out to hospital trusts in England and Wales were returned. Ninety out of 128 (70%) respondents indicated that they had a designated colorectal MDTC (group A), and all of these completed their questionnaire fully.

### Study design
Questionnaires were sent to the colorectal MDTC, or equivalent, in all 180 NHS hospital trusts in England and Wales where colorectal cancer surgery is performed. Further contact and reminders were sent out 2 and 4 months following the meeting to hospitals, which had not yet replied.

### Outcome measures
The questionnaire was designed to determine the background and previous training of the individual for the role of MDTC. Questions regarding their role within their local MDT, and the working pattern of the MDT itself were included.

### Results
Seventy-one per cent of trusts now have a dedicated MDTC, whereas in 2002, only 40% had one. 87% of MDTCs had a job description, many stated that they held responsibility for several MDTs, and had additional roles. MDTCs generally keep their
information on databases (83%), but these differ, and are not coordinated with data entry into the national colorectal cancer database of the Association of Coloproctology of Great Britain and Ireland. In only 26 trusts does the MDTC communicate decisions to primary care, and the patients seem almost completely excluded from this process. Video-conferencing did not appear to occur. Many MDTCs were specialist nurses not clerical or administrative staff which represents an inappropriate use of scarce resources.

**Conclusions**

Databases are in widespread use to record the findings and activities of MDT Meetings, but there is a great plurality of form. An effective MDTC with a single robust database will be the key to facilitating communication between MDTs within networks and be the key to achieving cancer waiting time targets with useful audit, thereby improving patient care.

| **Authors** | Stalfors J, Lundberg C, Westin T (2007). Quality assessment of a multidisciplinary tumour meeting for patients with head and neck cancer Acta Oto-Laryngologica, 127, 82-87 |
| **Aims of the study** | To assess the quality of MDT meetings, based upon how often can a diagnosis, TNM-classification, and treatment plan be established after the first MDT meeting, reasons for failure, how often the TNM-classification altered at treatment start, and whether patient attendance affect decision quality. |
| **Patient population** | 329 patients presented at MDT meetings from October 1998 to September 1999. Five patients were excluded from analyses because they were presented at MDT meetings only for the purpose of reviewing results of their treatment, leaving 324 for analyses. |
| **Study design** | All patients presented at the MDT meetings from October 1998 to September 1999 were prospectively included in the present study. A protocol was designed to facilitate registration of relevant data for the study. Data were collected prospectively and consecutively in the protocol and included such information as presenting clinic, method of presentation, diagnosis, TNM classification, staging and treatment plan agreed upon at the conference. |
| **Outcome measures** | Data collected on how often a diagnosis, TNM classification of the tumour was reached based on the workup presented at the initial presentation of the patient, the reasons for failures to arrive at a diagnosis, TNM classification and staging of the tumour, whether the TNM classifications and treatment plans specified at the MDT meeting were still valid at treatment start, and the time interval between the MDT meeting and treatment start, and whether the quality of the decisions reached were affected by whether the patients personally attend the MDT meeting. |
| **Results** | In this study 236 of 324 patients (73%) had their diagnosis and treatment plan established at the first meeting and were thus regarded as successes, but 88 (27%) patients needed complementary workup before a diagnosis or treatment plan could be established and were regarded as failures. Of these failures, a diagnosis and treatment plan could be decided in 43 out of 88 patients based on anticipated results of complementary investigations. The decisions made at the MDT meetings have a high validity. The lack of opportunity to perform palpation at the MDT meetings does not seem to endanger the quality of the decisions, provided the physician performing the palpation is qualified for the task. |
| **Conclusions** | The results indicate that there is a need and a possibility to establish more effective routines for the workups of patients to be presented at the MDT meeting. This study indicates that although the quality of decisions made at the MDT meetings is good, there is a need to improve the quality of the workups. The validity of diagnoses and treatment plans are not jeopardized by the waiting period between the MDT meeting and treatment start. |
**Authors**  

**Aims of the study**  
To compare the outcomes of patients undergoing R0 esophagectomy by a MDT with outcomes after surgery alone performed by surgeons working independently in a UK cancer unit.

**Patient population**  
Control group: 342 consecutive patients diagnosed with esophageal cancer, 77 of these underwent surgery with curative intent (Median age =60, 50 male.)  
Treatment group: 185 consecutive patients diagnosed with esophageal cancer managed by the MDT, 67 of these patients underwent surgery with curative intent (Median age = 61, 47 male)

**Study design**  
An historical control group of 77 consecutive patients diagnosed with esophageal cancer and undergoing surgery with curative intent by six general surgeons between 1991 and 1997 (54 R0 esophagectomies) were compared with a group of 67 consecutive patients managed by the MDT between 1998 and 2003

**Outcome measures**  
Clinical and pathological information was gathered retrospectively (prior to 1995) and prospectively. Cumulative survival was calculated by the life table method of Kaplan and Meier. Differences in survival times between groups of patients were analysed by the log rank method:  
- Patterns of referral of patients diagnosed with esophageal cancer  
- Preoperative staging  
- Details of global treatment modalities utilized  
- Chemotherapy associated morbidity and mortality  
- Operative morbidity and mortality  
- Details of pathological response to neoadjuvant therapy  
- Cumulative survival  
- Outcomes related to individual consultant surgeon’s teams

**Results**  
The proportion of patients undergoing open and closed laparotomy and thoracotomy decreased from 21% and 5%, respectively, in control patients, to 13% and 0% in MDT patients. MDT patients had lower operative mortality than control patients, and were more likely to survive 5 years.

**Conclusions**  
Multidisciplinary team management and surgical subspecialization improved outcomes after surgery significantly for patients diagnosed with esophageal cancer.

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**Authors**  

**Aims of the study**  
To look at the national coverage, composition and discussion of breast cancer MDTs in England.

**Patient population**  
Responses were obtained from the lead surgeons of 134 breast units, representing 70% of units which submit National Cancer Waiting Times data.

**Study design**  
All breast units in England both symptomatic and screening were sent a questionnaire.

**Outcome measures**  
Attendance of core members at MDT meetings; Percentage of patients discussed with a treatment plan; Private patients discussed; Reconstructive surgery.

**Results**  
The majority of core members of the breast MDT attend weekly meetings to discuss the multidisciplinary management of patients with breast cancer, although attendance by medical oncologists and reconstructive breast surgeons is limited.  
Three MDTs never had a radiologist present and 3 never had a pathologist present at the MDT meeting. Most breast MDTs have a meeting coordinator to collect case notes, radiographs and pathology reports to facilitate the meeting. Seventy-nine out of 134 teams discuss every cancer patient and 118 also discuss private patients. Twenty-seven teams record the outcome of the MDT meeting electronically, 32 teams book surgery, 16 radiotherapy and 15 book chemotherapy direct from the MDT meeting.
**Conclusions**  
Most patients with breast cancer in England are cared for by a multidisciplinary team and have their treatment widely discussed before formulating a treatment plan. Most units find the MDT coordinator an essential part of organising and running the MDT meeting. Regular pathology or radiology input is crucial to MDTs.
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