Chapter 2 - Background and Literature search

This chapter focuses on the current knowledge base of MDTs and MDMs, with particular emphasis on head and neck cancer in the UK. It will help explain the reasoning behind undertaking the research in the first instance, and help identify the questions that should be answered using the research findings.

2.1 Literature Searching

The reasons for performing a literature search have been described by Hart (1998). A literature search is a systematic and thorough search of all published literature in order to identify as many items as possible that are relevant to a particular topic. A literature search can increase personal knowledge of the subject area, can identify work already done or in progress that is relevant to the researcher, prevents duplication of work already done (and avoids accusations of plagiarism), can help avoid errors of previous research, can help the researcher design and choose his/her own methodology, and can aid identification of gaps in the existing area in order to identify unique areas for further research.

The structure to the literature search was to search journals, books, internet, theses, libraries, email lists, academic subject gateways, reports and grey literature, reviews and citation indexes. Given that the subject is medical, the
initial search used common medical journal databases - MEDLINE, PubMed, OVID, EMBASE and CINAHL from 1966 up to and including 2007. The MeSH terms “multidisciplinary”, “team” and “cancer” were used to identify the abstracts of articles of interest. These abstracts were read and the full article acquired if deemed of importance, especially in association with key words such as meeting, cancer conference or tumour board. There were few relevant sources of information retrievable from theses, books, email lists and reports and grey literature, and most of the literature retrieval was based on articles published in medical journals.

Below is a comprehensive description of what is currently known about the workings of MDMs. The description extends to all types of cancer, and not just head and neck due to a paucity of information available, although the emphasis will be on this particular group of cancers for obvious reasons. There is also a description of the importance of multidisciplinary team working in cancer in general, as this was the underlying reason behind the formation of MDMs. The function of the MDMs and the role of each healthcare professional will also be described, although the literature is scarce. Most of the literature on MDMs comes from current opinions of individual experts or a panel of experts. There are several reports of questionnaire surveys of MDM members, but formal qualitative work on the subject has not been substantially undertaken.
2.2 Evidence for the benefit of MDMs and multidisciplinary team working

MDMs are commonplace in Europe, Australasia and North America where they are known as multidisciplinary cancer conferences (MCCs). They were initially introduced because of evidence that adopting a multidisciplinary approach to cancer care was necessary to provide optimal patient care. One of the reasons for this was identified during a comparison of cancer patients' co-morbidities with other non-cancer patients (Ko & Chaudhry, 2002) where the former were shown to have significantly higher incidence of co-morbidities, which were not apparent to the cancer specialist. These patients require the expertise of different specialties in order to provide complete and holistic care. A multidisciplinary approach is therefore suited.

2.2.1 MDT working in healthcare

There are many examples of the benefit of multidisciplinary team working in healthcare in general. Research in the primary care setting has shown that those working within a supportive, well-functioning team benefited from increased team effectiveness (Carter & West, 1999). Complex tasks can be performed more easily especially when professionals within the team were cooperative with each other (Firth-Cozens, 1999). Carter, Garside and Black's editorial (2003) on MDT working sheds some light on the rationale behind the increasing use of teams in the modern NHS. This has mainly occurred because of the development of clinical governance, promoting the development of bigger teams with broader remits and less dominance of the individual. There is also the concept of
corporate responsibility rather than of the individual clinician’s duty of care, which is further reinforced by employment regulations such as the European Working Time Directive. They draw on their own experiences to list several key benefits of MDTs such as increasing the sense of confidence of their patients who become reassured by the knowledge that their treatment is based on the opinions of a group of experts and improved sharing of knowledge amongst team members. In addition communication between individual members of the team is enhanced by more frequent opportunities to speak directly to each other about clinical matters. Discussion of the care of individual patients also leads to a cross fertilization of ideas to other situations and patients, which would not be apparent in one to one clinical management.

2.2.2 MDT working in cancer care

Evidence exists to show how patients with cancer benefit when healthcare workers adopt a multidisciplinary approach. This has been the case in colorectal cancer patients (Blumberg & Ramanathan, 2002). When specialized multidisciplinary units with regular MDMS are in place, overall improvements in efficiency and efficacy have been noted (Shankar, Achuthan & Haray, 2001). A study of gynaecological cancer MDTs showed that the information added by other members of the team made a major impact in 5% of the cases presented, significantly changing patient management (Santoso, Schwertner, Coleman & Hannigan, 2004). Metastatic lung cancer patients were shown to have a better range of treatment modalities open to them when seen at a multidisciplinary
clinic, especially improved access to chemotherapy and palliative therapy (Wong, Rosenthal, deBoer, Green, & Fox, 2004). Clinicians discussing patients with brain cancer found small multidisciplinary teams mandatory in reaching the optimal management plan for their patients, with the vast majority of the team's recommendations being realized within three months (Lutterbach et al., 2005).

Patient satisfaction is increased when they witness teamwork in action as has been noted in breast cancer patients (Gabel, Hilton & Nathanson, 1997). Time taken from diagnosis to treatment was also reduced with the introduction of a MDT clinic, mainly because of a fall in referral times to other specialists, and more efficient information gathering by designated coordinators.

This multidisciplinary approach is uniquely suited in head and neck tumours, given the complex anatomy of the region and range of functional derangements that occur with these particular cancers (Miller & Evans, 2001). One of the first reports of a head and neck MDM was by Friedman and Friedman (1978) where they described a bimonthly meeting consisting of the essential medical, surgical, dental and allied specialists involved in head and neck cancer, with the backup of other specialists if required. The main advantage was a reduction in time for treatment initiation and cost savings from having all specialists available together.
2.2.3 Team Interactions

The interaction between different medical specialties is important especially between medical and surgical oncologists, and multidisciplinary clinics are recognized to improve this relationship (Coates, 2002). The relationship has been highlighted in the management of breast cancer patients, where it was found that having a MDM with oncologists and other clinicians discussing a patient’s treatment options altered the initial sole surgical opinion in nearly half the cases (Chang et al., 2001). Kagan’s (2005) editorial emphasized the benefit of clinicians working together even though their views may be different “to reach a middle ground” and “to convey options that are helpful to the patient and not diametrically opposed”. Another function is to reassure clinicians that their treatment recommendations are shared by other experts in their fields of speciality.

2.2.4 Patient Survival

Patient survival may have also improved as a result of the introduction of MDMs, although there is no evidence to suggest that the improvement is due specifically to the MDM. Patients with ovarian cancer have higher survival rates if they are seen by a multidisciplinary team in a joint clinic rather than by a sole practitioner (Junor, Hole & Gillis, 1994). Head and neck cancer survival rates were shown to have improved after the introduction of the MDM although this was not the only exclusive improvement to the cancer services over the period of the study (Birchall, Bailey & King, 2004).
Reducing the rates of unnecessary procedures has been shown to be a positive effect of the MDM in lung cancer patients. By introducing the input of cardiothoracic surgeons via videoconferencing to their MDT, lung cancer specialists reduced their annual resection rate by 30%, saving over three working weeks of thoracic surgical time over the year (Davison et al., 2004).

2.2.5 Education
MDMs serve as a valuable educational resource, and students from all disciplines are encouraged to attend (Jefferies & Chan, 2004). This is especially the case in cancer care, where diagnosis and treatment are particularly complex (Chao, DeWeese, Juhl, McMasters & Edwards, 2002). There are however published reports on how the educational components of the MDMs might be improved, with some authors suggesting that the general audience may be ignored by the specialists discussing the case (Bakemeier, Beck & Murphy, 1995) and that participant discussion could be improved by the “method of progressive disclosure” (Radecki, Nyquist, Gates, Abrahamson, & Henson, 1995).

2.2.6 Clinical Trials
MDMs facilitate entry of patients into clinical trials. In a London lung cancer centre, the rate of recruitment of lung cancer patients into clinical trials was less than 5% (Magee, Laroche & Gilligan, 2001). After the introduction of a designated lung cancer MDM, the rate increased to 30.7%. The reason behind
this increase was the attendance of research nurses and oncologists at the MDM, allowing patients to be identified there that could potentially be recruited into trials at the following MDT clinic.

2.2.7 Mental health

Mental well-being has been shown to be improved by working in teams. Borrill, West, Shapiro and Rees's study in 2000 looked at the mental health of team members in 406 MDTs from primary and secondary care as well as community mental healthcare teams. They found that better team functioning was associated with better mental health. There is also an indication that mental well-being within cancer groups could be improved by working as a team. Only 15.7% of members of a breast cancer team had evidence of psychiatric morbidity which is significantly lower than that of NHS workers in general (27%; Wall et al., 1997). Whilst this cannot be directly attributable to working as a team, another study has made similar claims (Catt, Fallowfield, Jenkins, Langridge, & Cox, 2005). Of note however is that mental well-being and burnout (as measured by validated questionnaires) varies between teams, whilst leaders of teams and nurses tend to suffer more from emotional exhaustion than others. The study also showed that pathologists and radiologists tend to suffer from low levels of personal accomplishment from working in a team, and this may reflect their peripheral role in most of the team discussions.
2.3 Structure and composition of MDMs

Bradley, Zutshi and Nutting's (2005) postal questionnaire to the clinical leads of head and cancer units in the UK provided information on the service provision of head and neck cancer MDMs in the UK. They reported that the vast majority of meetings were attended by the core members, namely ENT and maxillofacial surgeons, oncologists, radiologists, pathologists and the allied health professionals consisting of cancer nurse specialists, SLTs and dieticians. There was however, less regular attendance of the non-core members (plastic surgeons, restorative dentists, palliative care specialists) which probably reflects the current shortage of these specialists in the UK. They found that most of the MDMs took place before 9am or during lunchtime, perhaps implying that many specialists are not allocated a dedicated session for which to attend. Nearly half of the MDMs had some form of organizational problem, either a lack of MDT co-ordinator, lack of time or money resources or lack of the presence of some of the core members (oncologist, pathologist or radiologist) without whom the MDM seldom functions correctly. Most MDMs lasted an hour, with 67% discussing less than 10 patients, 23% discussing between 10 and 20 patients and only 3 MDMs discussing more than 20 patients.

2.3.1 The allied health professionals

The importance of input of SLTs, dieticians and head and neck nurse specialists in head and neck cancer patients' management is well documented. The majority (59%) of head and neck cancer patients are malnourished at diagnosis
(Guo, Ma & Zhang, 1994). Research has shown that better nourished patients are less likely to develop complications after surgery (Campos & Meguid, 1992) and are better able to withstand chemotherapy and radiotherapy (Brookes & Clifford, 1981; Fietkau, Iro, Sailer & Sauer et al., 1991). Patients benefit from discussing their care pre-operatively with a SLT especially when speech and swallowing are likely to be functionally impaired (Machin & Shaw, 1998). In the UK, 80% of patients are seen pre-treatment by a clinical nurse specialist, 69% by a dietician and 46% by a SLT (Bradley et al., 2005). The roles played by the cancer nurse specialist are many and include coordination of the team's activities and monitoring and progress of individual patients (Fisher, 1994) but interestingly, MDM members may not be fully aware of their role within the team. The role of the cancer nurse specialist was examined using a two part questionnaire in five breast cancer MDMs (Jenkins, Fallowfield & Poole, 2001). Members identified their role and the role of the other MDM members with respect to providing information to breast cancer patients, including the provision of information leaflets. The findings of the study showed that the cancer nurse specialist consistently played a major "unseen" role within the team, especially in discussion of test results, staging investigations and prognosis with the patient. Whilst the role of the cancer nurse specialist may not be appreciated by the rest of the team, another study found the presence of the cancer nurse specialist to be associated with improved quality of clinical care (Haward et al., 2003). Questionnaires were sent to members of half of the breast cancer units in England, to ascertain views on inputs, outcomes and process. They also asked
specifically about the number of patients who required an open biopsy for diagnosis. The results showed that the proportion of nurses correlated with the clinical performance of the group. They were also shown to exert a positive influence on their colleagues and the teams as a whole. An example given was the rates of open biopsies, which tended to be less in teams with nurses. This procedure is less likely to be acceptable to patients, and nurses in their role as patient advocates may have influenced their surgical colleagues to reduce the incidence of this procedure.

The study also advocated a diverse group of professionals to promote reflexivity within the team. This tends to promote discussion, opportunities for learning and improvement in the overall service. It also demonstrated that the longer the team had worked together, the more reliable they were in coordinating together different elements of service delivery – in this case ensuring radiotherapy was instigated post-operatively without significant delay.

2.4 Current opinion on MDMs

There are no studies that formally gauge participants' opinion on MDMs except for questionnaire studies and expert opinions. One such questionnaire on breast cancer MDMs asked 250 breast surgeons about MDM working practices, organization and communication (Macaskill, Thrush, Walker & Dixon, 2005). A reply rate of 61.2% was achieved. Most surgeons attended weekly MDMs, but only 72% of MDMs were held during protected sessions, with the rest taking
place over breakfast, lunch or in the evening. When specifically asked, this was the most likely reason behind the low attendance rate of medical oncologists who were more likely to attend the meeting if it took place during a protected session (71% versus 54%). This was considered to be the most valuable way in which to improve the MDM in 73% of surgeons questioned. The meetings were thought to be educational for trainees in most surgeons’ opinions, but the study did not enquire as to whether there was any educational benefit for the surgeons themselves.

In the USA, MCCs are one of the mandated components for approval of a cancer program by the Commission on Cancer of the American College of Surgeons (American College of Surgeons, 1990). In 1990, 79% of US hospitals participate in MCCs, with approximately 367,000 cases presented annually (Henson et al., 1990). This figure is similar to the UK’s head and neck cancer centres, with 82% of clinical leads running MDMs in their own hospital (Bradley et al., 2005). In the UK significantly more head and neck cancer patients are being treated as part of an MDT rather than by a sole practitioner. A postal survey of the practices of head and neck oncologists in the UK in 2003 showed that more than 90% regularly work as part of a multidisciplinary team as compared to only 56% in 1996 (Birchall, Brown & Browne, 2003). This figure is likely to increase, given the continuing trend toward team working. The vast majority of breast surgeons (98.5%) attend their weekly MDM, implying nearly all of breast cancer patients in the UK are discussed at MDMs (Macaskill et al., 2006).
2.5 Clinical implications of MDMs

The clinical aspects of MDMs were studied in a questionnaire sent out to 93 hospitals in the USA (Guinan, Imperato, Chmiel, Vogelzang & Sylvester, 1997). This investigated the various elements of cases presented at six of their MCCs in breast, lung, colorectal, prostate, ovary, lymphoma, stomach, skin and head and neck cancer. The questionnaire specifically looked at the meeting presentation, clinical aspects, pathology, therapeutic options and quality of life issues. Most of the cases were presented as part of their first course of treatment (45%), and were usually presented by the attending physician (52%). Usually the patient history, physical examination and diagnostic tests were also presented. The histology was presented in the majority of cases (83%) but the tumour staging in the form of the Tumour-Node-Metastasis (TNM) classification was notably lacking in 72% of cases. Quality of life issues were also noted to be discussed infrequently (38%). The study showed that while clinical cases are presented satisfactorily in the most part at MDMs, there is room for improvement, notably in the adequate staging of tumours and discussion of patients' psychosocial issues.

A similar survey was performed specifically for head and neck cancers in Sweden (Stalfors, Lundberg & Westin, 2007). The TNM classification was given to 68% of cases discussed at the MDM, and this decision was subsequently confirmed to have been correct at the time of treatment (approximately 38 days later) in over 98% of cases. A diagnosis and treatment plan was established at
the first meeting in 73% and in a further 14% of cases the treatment plan and diagnosis was correctly decided based on anticipated investigations. The reasons as to why no decision could be made at the first meeting were mainly due to lack of proper radiological imaging (42%), a need for further histological investigation (37%), a combination of both (16%) or uncertainty about cardiovascular status (7%). The majority of cases were adequately presented after the necessary investigations had been performed at a second meeting, with no significant delay in time to treatment. The study showed that although the MDM failed to reach a diagnosis, treatment plan and TNM status in a significant percentage of cases, this did not affect the quality of care the patient subsequently received. Evidently improvements are required to ensure that more cases have had all their investigations prior to their first MDM, however there is still time to perform the necessary investigations without jeopardizing the quality of care given to patients.

In other cancers the clinical advantage of MDMs has been proven. MDMs can contribute significantly to the quality of patient care, provided that full investigative procedures have been undertaken prior to discussion (Davies et al., 2006). This is based on an assessment of the TNM status given to patients with gastro-oesophageal malignancy was undertaken, both at the MDM and after resection. This was then compared to individual methods of radiological staging, such as ultrasound and CT. The findings were that the MDM correctly staged the disease in 98% of cases, significantly superior to other methods of staging alone.
2.6 Running costs

The Government has estimated the cost of running MDMs in England and Wales to be £2.7 million per year (range £2.2 - £3.9 million). There are approximately 55 teams working in head and neck cancer in the UK, giving an estimated cost of running an MDM as £49,000 per year. There are no published figures on the true cost of running an MDM in current literature.

An audit carried out in the UK depicted the typical cost of running a multidisciplinary head and neck cancer service for a tertiary referral centre in the NHS (Corbridge & Cox, 2000). Although the actual cost of running the MDM is not specifically mentioned, the average cost for treating a head and neck cancer patient in a regional centre is approximately £11,450, far higher than the anticipated cost of £853 (this represents the amount paid to the centre by the referring Trust). This shows that cancer care, especially one so dependant on a number of different specialties like head and neck is expensive, and the expected costs of running such a service may significantly underestimate the actual costs eventually incurred.

This issue was examined further in a comprehensive study of the impact of MDMs on workflow in radiology and pathology departments in Ireland (Kane, Luz, O’Briain & McDermott, 2007). The role of the radiologist and pathologist differs from other participants of the MDM in that they often belong to several cancer groups, and so actively contribute to many MDMs. The activities of staff
in the two departments was studied over a month period, with particular emphasis on time spent on meeting preparation and at the meeting itself. Both radiologists and pathologists spent time reporting internal as well as external (i.e. from other hospitals) material, which serves as quality assurance and is necessary to ensure the specialist attending the meeting is in a position to participate in any discussion about it. The main concern arising from the study was the amount of time spent outside of contractual working hours on meeting preparation – up to 20% of allocated resources alone were required for this. It shows that current practice is largely based on goodwill, and recommended that additional staff is required at all levels to cope with the demand. Similarly to Mackaskill et al’s (2006) study on breast cancer MDMs was the finding that a significant number of MDMs took place in lunch or breakfast times, and again it was considered a necessity to allocate protected time for the MDM. Logistical problems were also flagged up, especially with the production of external reports. They encountered significant problems in exchanging and sharing radiological images (although this had improved with the introduction of the Picture Archiving and Communications System) and especially pathological specimens consisting of tissue and cell samples. There was no apparent remedy to this problem that could be identified in the report save for the provision of additional resources.

2.7 Telemedicine

The increasing centralization of cancer services as recommended by the Calman-Hine report (1995) means specialists may have to travel long distances
in order to participate in MDMs. Telemedicine has been used in some countries effectively and has been used by some in the UK to overcome the problems of staff shortages and traveling time (Davison et al., 2004). An English lung MDT was able to enroll the services of a thoracic surgeon using telemedicine which significantly reduced the time between outpatient appointment and surgery. They reported telemedicine to be user-friendly; they were able to establish a close professional relationship with colleagues over the video link and saved 112 hours of thoracic surgical time in travel. Similar results were reported at a Welsh MDT, where healthcare sites and staff are often far apart (Axford, Askill & Jones, 2002). They estimated a saving of £35,000 per annum per MDM without compromising communication or patient care. Telemedicine has also been shown to reduce costs of MDMs in Sweden (Stalfors, Bjorholt & Westin, 2005).

2.8 Failings of MDMs

Whilst the majority of evidence supports the use of MDMs in the care of cancer patients there are examples of where the MDM may not be effective. Lung cancers specialists were asked to predict the survival chances, chances of morbidity and appropriateness of treatment of 50 patients before and after the MDM discussion (Kee, Owen & Leatham, 2004). The MDM did not significantly alter the clinicians’ views of survival chances or morbidity, and in only 26% did the clinicians’ views alter after the MDM discussion. Although this study did not include the actual survival rates in their results, it showed that MDM discussions may not improve decision making in certain situations. This was echoed by
another study looking at outcomes of MDMs in urological cancers (Acher et al., 2005). Over a six month period, 124 cases of urological cancers were presented at 10 MDMs. Individual Consultants gave their opinions on the proposed management plan for each case prior to the MDM; this was then compared with the plan decided on after discussion at the MDM. Consultants also highlighted cases that had the potential to be changed at the MDM ("case changes"). Of 124 cases, only 2 cases had a change in management plan, and these were within the group identified as having potential to be changed. There were only 12 cases overall in the case change group. This study shows the MDM has no significant bearing on the management of urological cancers in the UK. Whether this is because most urological malignancies have fewer controversies in management compared to head and neck cancer is not known. The authors suggest that Consultants are capable of identifying cases that require discussion with other team members; by adopting a targeted approach significant time and monetary savings can be made without adversely affecting patient care.

2.9 Patient Participation

The decision making process at MDMs was examined at an upper gastrointestinal MDM in Bristol (Blazeby, Wilson, Metcalfe, Nicklin, English, & Donovan, 2006). 273 decisions were made at consecutive MDMs over a six month period. Of these 41 (15.1%) were not implemented. The study analyzed the reasons for discordance and found the majority were due to co-morbidity issues (43.9%), patient choice (34.2%) and addition of extra clinical information.
(19.5%). This raises the issue of whether having the patient present at the MDM may save both time and resources. The concept of patient participation was recently piloted in an Australian study (Choy, Chiu, Butow, Young, & Spillane, 2007). They invited 30 breast cancer patients to attend their MDM and obtained the opinions of both patients and MDM members after the experience. This was done by questionnaires including an anxiety survey as well as qualitative analysis of interviews with the patients. The results were largely positive, with education and improved understanding being the most significant aspect. It was noted that a small group of patients chose not to participate in the study. This group of patients tended to be from the lower socio-economic groups and had greater levels of anxiety compared to the participating group. This has to be a consideration before deciding which patients would benefit from attending their MDM. It was also noted that including patients was resource-intensive, and on occasion clinicians had to modify their language in discussing treatment plans— to the benefit of patients but to the detriment of accurate reporting of case specifics. Some patients were also overawed with the large number of people present at the meeting, although they would have preferred to have had more ancillary staff present such as social workers and psychologists.
Conclusion of Chapter 2

The evidence from current literature shows that MDT working in healthcare and cancer care is beneficial for both patients and staff. This is especially the case in cancers of the head and neck, given the necessity of the input from a wide range of healthcare professionals (including the proven value of specialist nurses, dieticians and SLTs). The majority of head and neck units in the UK use MDMs regularly, but as with other MDMs suffer from limited resources, poor organization and lack of staff. The benefits include increased recruitment of patients into clinical trials and improvements to patient survival and satisfaction, mental well-being for health professionals, education and team interactions. Disadvantages are running costs, which have yet to be fully defined, and the problems identified for radiologists and pathologists, who tend to have increased workloads as a direct result of MDMs, without having any of the mental well-being benefits as seen in their colleagues. Other issues are whether the MDM is actually necessary to decide a patient’s treatment options and whether some aspects of patient care are being discussed fully. There is some debate on whether they have a positive impact on patient care at all. Telemedicine may be of use in helping bringing down staff and travel costs, and the concept of patient participation may be part of MDMs in the future.

The evidence specifically for head and neck MDMs is scarce, and is largely based on questionnaire studies and expert opinions. Whilst the Government’s recommendations appear to have been adhered to in the UK, the role and
function of the MDM and of its members have not been clearly defined, nor have many of the issues and potential disadvantages been addressed. Of note, there has been no mention of the contribution (or non-contribution) of some of the healthcare staff who may attend head and neck MDMs and it is these issues which will be explored in the following chapters.