KNOWLEDGE TRANSLATION

Multidisciplinary management of cancer patients: chasing a shadow or real value? An overview of the literature

J.M. Croke MD* and S. El-Sayed MD*

ABSTRACT

Purpose
Multidisciplinary cancer conferences (MCCs) are designed to optimize patient outcomes. It appears intuitive that MCCs are essential to clinical decision-making and patient management; however, it is unclear whether that belief is supported by evidence. Our objectives were to assess the currently published literature addressing the impact of MCCs on clinical decision-making and patient outcomes.

Methods
Ovid MEDLINE was searched from 1950 to June 2010 using these keywords: “multidisciplinary/interdisciplinary/clinical meeting$conference$/round$/ team$,” “decision making,” “neoplasms$cancer$/oncology/tumor conference$/board$/meeting$,” “multidisciplinary/interdisciplinary cancer conference$/meeting$.” All trials, guidelines, meta-analyses, reviews, and prospective and retrospective studies were included.

Results
The keywords retrieved 595 abstracts, and 30 manuscripts were obtained. Most of the studies assessed the impact of MCCs on clinical decision-making rather than on patient outcomes.

Conclusions
Available evidence supports the belief that MCCs significantly influence clinical decision-making and treatment recommendations. In contrast, scant evidence suggests that MCCs improve patient outcomes. Unfortunately, the current literature is substantially heterogeneous and therefore does not allow for firm conclusions.

KEYWORDS
Multidisciplinary clinical conferences, tumour boards, clinical decision-making, patient outcomes, cancer management

1. INTRODUCTION
Since the early 1990s, significant advances have been made in cancer management. Increased specialization within disciplines and more sophisticated treatment techniques have increased the complexity of patient care. As a result, patient management has become very multidisciplinary in nature, leading to the concept of multidisciplinary cancer conferences (MCCs). The MCCs bring together various members of the health care team involved in a patient’s care, including physicians (oncologists, radiologists, surgeons, pathologists), nurses, social workers, dieticians, physiotherapists, and occupational therapists. The conferences are designed to enhance patient management and to optimize outcomes through inter- and intra-disciplinary discussions. The MCCs take various forms, from multidisciplinary clinics to roundtable discussions. Most clinicians would recognize MCCs as beneficial; however, a question remains: Do they improve patient outcomes? Additionally, the “fear factor” risk associated with enforcing a “wrong” decision, together with the subsequent potential legal implications, must not be disregarded. Moreover, most MCCs are not standardized; many variations exist.

The objective of the present study was to conduct a literature overview to assess the evidence for an impact by MCCs on clinical decision-making and patient outcomes.

2. METHODS
The literature was searched for evidence about the impact of MCCs on clinical decision-making, patient management, and overall outcomes. Ovid MEDLINE
was searched from 1950 to June 2010, in all languages, using these keywords: “multidisciplinary/interdisciplinary/clinical meeting$/conference$/round$/team$,” “decision making,” “neoplasms$/cancer$/oncology/tumo(u)r/conference$/board$/$meeting$,” “multidisciplinary/interdisciplinary/cancer conference$/meeting$.”

The search was carried out by the authors with the help of an expert librarian from our institution who specializes in literature searches. All trials, clinical practice guidelines, meta-analyses, reviews, and prospective and retrospective studies were included. All published articles were scrutinized and critically appraised to assess the study type (retrospective or prospective), sample size, adequacy of data for a critical appraisal, valid methodology, clear endpoints (restricted to assessing the impact of MCCS on patient outcomes), and follow-up of patients to allow for valid analyses. The chosen articles had to have been peer-reviewed.

3. RESULTS

The keywords used in the search retrieved 595 abstracts. Those abstracts were winnowed to include only those that addressed the impact of MCCS on clinical decision-making, patient management, and clinical outcomes. Thirty abstracts were extracted. The full manuscripts for all thirty were obtained, including reports of twenty-six studies, one meta-analysis, and three reviews. The twenty-six studies and the meta-analysis were organized and analyzed by sub-site (for example, head-and-neck cancers, gastrointestinal cancers, and so on), and the review articles1–3 were set aside to be separately evaluated.

No randomized controlled studies have evaluated MCCS. The other studies were categorized according to cancer sub-site, and the highlights are presented in the subsections that follow.

3.1 Head-and-Neck Cancers

Two of the retrospective studies evaluated MCCS in head-and-neck cancer.

Nguyen et al. reviewed 225 patients with locally advanced head-and-neck cancer to identify how treatment outcomes were affected by MCC recommendations. All patients were present and examined by members of the MCC, and treatment recommendations were presented to the patients at that time. Of the 225 patients, 12 did not follow the MCC recommendations (3 decided against treatment, 9 sought a second opinion). Survival rates at 3 years were 70.2% for patients treated with postoperative radiotherapy and 73.5% for patients treated with chemoradiation. The authors concluded that MCCS provide optimal patient care.

Birchall et al. compared 2-year survival in two cohorts of patients with head-and-neck cancer before (n = 566) and after (n = 727) implementation of a standards document (South and West Audit of Head and Neck Cancer i and ii). Their goal was to examine whether head-and-neck cancer care had improved after publication of the Calman–Hine report, which proposed a framework for providing cancer services in the United Kingdom. They found that patients assessed at MCCS experienced improved 2-year survival when compared with patients who were not so assessed (p = 0.03).

3.2 Gynecologic Cancers

The literature search found five studies in the area of gynecologic cancers. Table 1 presents highlights of those studies.

Three studies evaluated the impact of MCCS on patient management8–10. Those studies all showed that patient discussion at MCCS altered diagnoses, translating into changes in patient management in an important number of cases. For example, a retrospective study of 509 patients by Cohen et al. assessed the role of MCCS in patient management in a tertiary gynecologic oncology service. They found that the diagnosis was altered in 9% of the cases discussed. Similarly, Gatcliffe and Coleman found that treatment alterations were made in 53 of 153 patients, which corresponded to changes in patient care in more than 8% of cases. Santos et al. retrospectively analyzed 459 patients and found that case discussion at a weekly MCC led to changes in patient management in 23 cases (5%).

3.3 Genitourinary Cancers

Two of the located studies evaluated MCCS in genitourinary malignancies.

A prospective study found evidence against the use of MCCS11. Acher et al. assessed the impact of review at a MCC on patient management to determine whether the meetings improved outcomes in urologic cancer. They found that in only 2 of 124 cases did clinical management change as a result of team discussion. They concluded that MCCS make no difference with respect to clinical management in most cases (>98%).

A retrospective study of 87 patients set out to determine whether review by a central MCC (compared with management by a local team) affected decision-making12. Those authors demonstrated that, for bladder cancer cases, review by a central MCC led to changes in management in 21% of cases (4/19).

3.4 Gastrointestinal Cancers

The search found six studies involving patients with gastrointestinal malignancies. Table 11 summarizes those studies. Four articles were prospective, and two, retrospective.
Two studies evaluated whether recommendations made by MCCs are implemented. One study of colorectal cancer cases found that recommendations were implemented in 90% of cases; the other, involving upper gastrointestinal malignancies, produced similar findings, with recommendations not being carried out in 15% of cases. The main reason for discordance was patient-related factors (for example, problems with comorbidity).

Another prospective study by Pawlik et al., involving 203 pancreatic cancer patients, concluded that cases reviewed by MCCs led to changes in patient management in 23.6% of cases (48/203). However, the authors did not assess whether the changes in management affected patient care and survival.

One retrospective study assessed the impact of MCCs on patient survival. Stephens et al. compared the outcomes of patients (n = 67) undergoing R0 esophagectomy under the care of a multidisciplinary team (MDT) with outcomes of patients receiving treatment from independent surgeons (n = 77). They found that patients managed by MDTs had a significantly lower operative mortality (5.7% vs. 26%, p = 0.004) and were more likely to survive 5 years (52% vs. 10%, p = 0.0001). Although the study was retrospective in nature, it was one of the only publications to provide evidence that MCCs can improve patient outcomes.

### 3.5 Breast Cancers

Three retrospective studies in the area of breast cancer have assessed the impact of MCCs.

In 1997, Gabel et al. compared 339 patients seen before (n = 162) and after (n = 177) the implementation...
of a multidisciplinary breast cancer clinic. Time between diagnosis and the initiation of treatment declined significantly with the initiation of a multidisciplinary clinic (42.2 days vs. 29.6 days, \( p < 0.0008 \)). Furthermore, this study was the only one to assess patient satisfaction, finding that it significantly increased (\( p < 0.001 \)) after implementation of the MCC.

Chang et al.\(^{20}\) conducted a retrospective analysis of records for 75 breast cancer patients, comparing treatment recommendations made before and after a multidisciplinary assessment. Multidisciplinary assessment led to disagreement with the previous treatment recommendations made by outside physicians in 43% of cases.

Newman et al.\(^{21}\) evaluated the impact of a MCC on the surgical management of breast cancer. They analyzed the medical records of 149 breast cancer patients who were referred to a multidisciplinary breast cancer clinic and found that, after radiology and pathology had been reviewed, and after input had been received from other clinicians (surgeons, medical oncologists, radiation oncologists), changes in recommendations with respect to surgical management occurred in 77 of 149 cases (52%). The authors concluded that MCCs provide valuable additional information that does affect clinical decision-making.

### 3.6 Lung Cancers

Four studies, including one systematic review, have evaluated MCCs in lung cancer. A prospective study by Leo et al.\(^{22}\) of 344 patients found that patient discussion at MCCs led to discordance in 15 cases (4.4%). A trend toward shorter survival was associated with that discordance, although the trend was nonsignificant (\( p = 0.07 \)). Another study comparing survival in two groups of patients (before and after implementation of a multidisciplinary team) found that median patient survival increased after team implementation (3.2 months vs. 6.6 months, \( p < 0.002 \)). In contrast, one prospective study involving 50 patients concluded that MCCs do not improve the overall quality of clinical decision-making\(^{24}\). Participants in the Northern Ireland Regional Lung Cancer Team at the Belfast City Hospital provided their opinions on patient management before and after discussion at their MCC. In 39% of cases (87/221), the initial recommendation offered before discussion at the MCC differed from the final group recommendation. However, in 50 cases, the treating physician did not follow the MCC’s recommendation. The authors therefore concluded that the impact of team discussion was not significant.

Coory et al.\(^{25}\) conducted a systematic review assessing the effectiveness of MCCs in lung cancer. Of the sixteen studies that met the review inclusion criteria, only two reported that MCCs led to an improvement in survival. The authors concluded that the current evidence for MCCs is stronger for changing patient management than for affecting survival. Although MCCs affect clinical decision-making, the results do not necessarily translate into improvements in patient care and overall survival.

### 3.7 Brain Cancers

Only one retrospective study has looked at the impact of MCCs on patients with brain tumours. Lutterbach et al.\(^{26}\) reviewed 1516 patients discussed at 259 brain tumour boards. They found that 91% of tumour board recommendations were implemented, and they concluded that interdisciplinary care was necessary for patients with benign skull-base tumours, gliomas, and brain metastases.

### 3.8 Miscellaneous Cancers

Two retrospective studies assessing the value of tumour board conference recommendations with respect to various cancer sites have been published. Both found that recommendations by a tumour board are generally implemented (84% in one study and 66% in the other\(^{27,28}\)).

Multidisciplinary clinics have also been studied in areas outside of oncology. A prospective study of 345 patients with amyotrophic lateral sclerosis was conducted over a 5-year period to determine the impact of a multidisciplinary clinic on survival\(^{29}\). The authors found that, compared with patients who attended a general neurology clinic (\( n = 262 \)), patients who received care at a multidisciplinary clinic (\( n = 82 \)) had a better prognosis (median survival was 7.5 months longer, \( p < 0.0001 \)).

### 4. DISCUSSION

A MDT is considered a “group of people of different health care disciplines, which meets together at a given time (whether physically in one place or by video or teleconferencing) to discuss a given patient and who are each able to contribute independently to the diagnostic and treatment decisions about this patient”\(^{1} \). The concept of MCCs arose from MDTs; they are also sometimes called multidisciplinary tumour boards or case conferences.

An MCC provides an environment in which physicians and other health care professionals can discuss relevant diagnostic, pathologic, and therapeutic aspects of patient care. The form of the MCC varies, from roundtable discussions involving team members without the patient present, to a more hands-on approach in which the patient is present and is examined by team members. Moreover, as noted earlier, MCCs are now considered to be an integral part of the management of oncology patients in many tertiary care centres.

Much of the information regarding the role and functions of a MCC has come from Europe. In
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the United Kingdom, MCCS have existed since the Calman–Hine report in 1995, which recommended that all cancer patients be assessed by surgeons who work with other specialists as part of MDTs. Legislation was initiated after cancer survival was compared between European countries and the results showed that outcomes were worse in the United Kingdom. Currently, MCCS in the United Kingdom operate under the National Health Service, and today, more than 80% of cancer patients in England are assessed by a MDT, compared with only 20% of patients a decade earlier. But have outcomes improved since the report?

Birchall et al. and many others have compared outcomes of cancer patients before and after implementation of the team approach and found that patients assessed at MCCS experienced improved survival compared with patients who were not so assessed. Whether the improvement is solely a result of discussion at the MCCS is unknown; many confounding variables—such as patient heterogeneity and advances in diagnosis and treatments, among others—were not accounted for. Welch et al. addressed that issue, doubting that the improvement in patient survival over time is a valid measure of success.

Mandates for multidisciplinary assessment also currently exist in Australia and the United States. The Commission on Cancer of the American College of Surgeons makes MCCS mandatory for the accreditation of hospitals responsible for providing multidisciplinary cancer care. Most recently in Canada, Cancer Care Ontario developed a position paper articulating a proposed set of MCC standards and guidelines. This undertaking started after survey results showed that few Ontario hospitals had established cancer conferences. The new guidelines direct the development of MCCS and identify key components of their structure and function. The primary function is to “ensure that all appropriate diagnostic tests, all suitable treatment options, and the most appropriate treatment recommendations are generated for each cancer patient discussed prospectively in a multidisciplinary forum.” Secondary functions include providing a forum for continuing education, developing standardized patient management protocols, and contributing to clinical trials and to linkages between regions to ensure appropriate and timely referrals.

Today, MCCS are becoming more diverse, and participation by video link from remote centres is increasing. Potential advantages include increased attendance from off-site clinicians and lesser preparation time. Unfortunately, variables such as technical problems and accuracy of participation are also introduced. Several studies have investigated the utility of telemedicine in MCCS and have found favourable results. Chekerov and colleagues developed an online tumour conference as a pilot project to improve clinician acceptance of MCCS and found that 92% of participants felt that the forum presented an optimal opportunity for extensive scientific discussions and exchange. Furthermore, 72% of participants were pleased with their technical support. The authors concluded that online MCCS are feasible and save time.

Our results show that most studies evaluating MCCS considered the topic of clinical decision-making. Most agreed that MCCS provide a valuable forum for team discussion and frequently lead to changes in treatment recommendations. Discordance was related primarily to patient factors (such as patient wishes and comorbidities). Interestingly, one study showed that discordance was associated with a lower survival rate, although the difference was nonsignificant. That result highlights the potential medicolegal implications that may arise as a result of incomplete information. Additionally, two studies concluded that MCCS do not have a significant impact on clinical decision-making and that they are therefore not mandatory in patient care.

A limited number of studies assessed impact of MCCS on patient outcomes. The common conclusion drawn was that multidisciplinary clinics and MDTs are associated with improved survival. For example, a retrospective study involving lung cancer patients found an improvement in median survival with the introduction of a MDT (3.2 months before implementation vs. 6.6 months after implementation, p < 0.002). The design and objectives of these publications are diverse and therefore the extraction of conclusions is hindered by many confounding variables.

Our literature review shows that MCCS are important to clinical decision-making and patient management because they provide an opportunity for health care professionals to review cases, re-evaluate radiology and pathology reports, and discuss various treatment options. There is also strong evidence to show that MCCS significantly influence clinical decision-making. In contrast, the published literature provides little evidence that MCCS actually improve patient outcomes or survival. Although it is plausible that they do, a well-designed prospective study has to be carried out to provide proof of principle.

Our overview of the published literature on MCCS had a narrow objective and is limited by a paucity of evidence, lack of standard criteria to allow for meaningful comparisons between studies, variable endpoints and follow-up periods in the various studies, clear selection bias, and some difficulties in justifying the conclusions in some publications based on the data presented.

In sum, there is a perceived and well-supported growing impact of MCCS in the clinical decision-making
process. The influence of the MCCs on patient outcomes (including survival), although plausible, cannot be supported by the available evidence or our experience. It is also impossible to ignore other confounding factors such as early diagnosis because of screening, advancements in technology and treatment techniques, increasing resources, and awareness on the part of patients.

Despite the increasing number of publications addressing the value of MCCs, the available data are weakened by the heterogeneity and vagueness of the studies and their ill-defined endpoints and large number of confounding variables. As a result, firm conclusions cannot be drawn. As patient care increasingly moves away from individual approaches to group and multidisciplinary practice, it is necessary to be conscious of the potential drawbacks. Thus, it must be ensured that the perceived value of MCCs is supported by strong evidence. It is also imperative that the necessary resources be made available to facilitate these conferences.

5. CONCLUSIONS

The published literature supports the belief that, in many cases, MCCs lead to changes in diagnoses and physician management decisions. However, no strong prospective evidence yet supports the view that they improve patient outcomes. Furthermore, because of the current paucity of data, it is difficult to evaluate the potential negative impact that these conferences may have clinically. Prospective trials with strict guidelines that will evaluate the role and impact of MCCs on patient outcomes are needed and must be carried out.

6. CONFLICT OF INTEREST DISCLOSURES

The authors have no disclosures.

7. ACKNOWLEDGMENT

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8. REFERENCES


Correspondence to: Samy El-Sayed, Radiation Oncology, The Ottawa Hospital, 501 Smyth Road, Ottawa, Ontario K1H 8L6.
E-mail: sel-sayed@toh.on.ca

* Division of Radiation Oncology, The Ottawa Hospital Cancer Centre, Ottawa, ON.