



# Measuring the quality of multi-disciplinary thoracic oncology care

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**Abstract:** As a result of the rapid acceleration in new treatment advances in thoracic oncology, coordination and tailored selection of treatment modalities has become complex. This increasing complexity mandates multidisciplinary input and coordinated management. However, quality of care in the domain of multidisciplinary thoracic oncology has yet to be purposefully defined, and as a result the science of performance measurement has yet to be applied to this area. In this review we discuss the role of multi-disciplinary care in thoracic oncology, and outline its definitions as proposed in the literature. We review various metrics of quality in complex multidisciplinary thoracic oncology care, and future directions for quality and performance measurement.

**Keywords:** Multidisciplinary care; oncology; quality measurement; tumor board

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## Introduction

While there has been an undeniable acceleration of advances in thoracic oncology in the fields of surgery, radiation oncology, and medical oncology, coordination and tailored selection of treatment modalities has become increasingly complex. As more therapeutic options become available, the standard-of-care for early stage, locally advanced, and metastatic lung, esophageal, and pleural malignancies is continually evolving. This ongoing state of change requires the development of robust, multi-disciplinary care approaches to facilitate effective, often individually tailored, treatment plans.

While increasing complexity in both disease presentation and therapeutic options mandate multidisciplinary input, time pressures on clinicians required to provide such care have also increased (1). Hence, it is imperative to ensure that these processes are as effective and efficient as possible. Complex, multidisciplinary oncology care—like that required for the treatment of thoracic malignancies is

an area in which quality of care has yet to be purposefully defined and thoroughly measured. Performance measurement is a burgeoning area within healthcare in general, but implementing measurement principles in this domain is a particular challenge because much of thoracic oncology care requires precise coordination of complex care from multiple specialties and which spans the range of curative to palliative care. Here, we discuss the role of multi-disciplinary thoracic oncologic care, metrics of quality, and future directions.

## What is multidisciplinary care?

Multidisciplinary care is commonly understood to represent a model of healthcare delivery which is comprised of coordinated care delivered by groups of appropriate specialists. Multidisciplinary teams in thoracic malignancies, typically include thoracic surgeons, radiation oncologists, pathologists, thoracic radiologists, medical oncologists, and palliative care specialists. This paradigm of care is

widely advocated by professional groups and supported in clinical guidelines (2). Similarly, patient advocacy efforts also frequently focus on promoting multidisciplinary care as a counterweight to the variability and uncertainty in care decisions often encountered by patients. This is especially true for those patients with rare cancers such as advanced thymoma or mesothelioma. However, the discrete operational characteristics of multidisciplinary care delivery are only vaguely described in the literature.

The classic example of multidisciplinary care is the tumor board meeting, in which physicians of representative specialties discuss cases requiring complex management. Typically, cases are presented and a consensus management plan arrived upon as a result of the discussion by the physicians in attendance. The value of these groups has been most discretely measured in terms of changes made to patient diagnostic or therapeutic management plans (3). While these tumor boards certainly do add value in these tangible domains, they may also aid in clinical trial consideration and recruitment (4). This is not necessarily limited to the academic environment, as community hospital tumor boards frequently serve as the mechanism to facilitate referral to tertiary or quaternary care centers.

### Defining the quality of multidisciplinary care

Defining quality in complex thoracic oncology care is an open question. What, precisely, does quality care look like, and from whose perspective? For the purposes of this article, we will focus on specific measurement strategies and techniques for performance measurement that may be applicable to the measurement of the care delivered by teams treating patients with thoracic malignancy.

The first task in measuring the quality of multidisciplinary care is to define it. Osarogiagbon proposes 4 key factors that must be present to meet the definition of multidisciplinary care: the clinical interaction must be prospective, so that opportunity remains for the interdisciplinary engagement to influence the care and outcomes of the individual patient; key members of the thoracic oncology care delivery team must be engaged; accurate data must be presented and reviewed; and a robust framework for communication must be established (2,5).

With these 4 key factors defined, the structure of the actual care delivery environment can vary based upon the local context in which care is delivered. For example, whether clinicians of various specialties interact with patients in a co-located clinic, by conference without direct

patient involvement, or virtually, is less important. Granular aspects of the function of the multidisciplinary team (MDT) can then be measured—for example, measurement of tumor board performance via a basic checklist to ensure that essential personnel are present and the critical elements of the history, pathology and radiology studies are available for review. The incorporation of all relevant patient information in the MDT discussion is a particular strength of this multidisciplinary approach to care, allowing for individualization of treatment decisions. For example, the presence of comorbid conditions frequently influences treatment recommendations (6). Hence, accurate information regarding all aspects of the patient's medical history, not merely focused information regarding the oncologic problem are necessary for the MDT to make appropriate treatment recommendations.

### Measuring quality

With the framework of multidisciplinary care defined, the focus next shifts to determining how to measure the quality and performance of these functional units. Benchmarking, whereby multidisciplinary units of similar constitution and function are compared, has yet to be applied to the assessment of multi-disciplinary care. Single specialty efforts to benchmark outcomes, by contrast, are well developed in thoracic surgery, especially for short-term surgical outcomes such as 30-day mortality (7).

Efforts to directly measure multi-disciplinary care have to this point been lacking. Most studies of the process and outcomes effects of multidisciplinary care have been retrospective; either non-comparative or pre-post intervention studies. Process outcomes, such as timeliness of care, or utilization of appropriate staging modalities, have dominated 'hard' outcomes such as survival, presumably due to their relative ease of capture and short-term measurement in retrospective data. Further, some authors question the applicability of survival as an appropriate outcome, especially for palliative patient populations. Studies of tumor boards, by contrast, have focused on their impact in increasing utilization of guideline concordant care (3,6,8-10). Indeed, the proportion of treatment decision changes made as a result of multidisciplinary review has been proposed as a quality metric. Vinod and colleagues found that guideline concordance with respect to the recommendations concerning surgery, radiation and chemotherapy only approached 70% on average, with recommendations for surgery where guidelines would

recommend it in only 60% of examined cases. Deviations largely arose as a result of advanced patient age, comorbidity and performance status (9). Patient-centered outcomes, which are as important, if not more so in patients with cancer, are also largely unstudied in thoracic oncology. One preliminary qualitative study has shown high satisfaction with clinic co-location of services for lung cancer patients (11).

One approach to analyzing and measuring the quality of multi-disciplinary thoracic oncology care is to break the care elements down into the specialty blocks which comprise the care team. For example, surgical resection rates for early stage disease, or the proportion of patients undergoing lymph node staging have been suggested as possible endpoints (2). While a great deal of progress has been made in the measurement of surgical quality in isolation, measurement of quality in other domains of thoracic oncology, such as radiation, medical oncology and palliative care are less well defined. Even within specialties such as surgery where outcomes and quality have been studied extensively, they have largely been limited to broad perioperative domains such as mortality, complications and readmissions (7). While certainly more feasible, measuring the quality of one domain in isolation gives a narrow picture of the breadth of care that is provided by multidisciplinary teams. Far more complex is the measurement of the interaction between specialists and the function of multidisciplinary cancer conferences in assuring guideline-concordant and high quality care (3). Some initial attempts to measure these interactions have demonstrated potentially meaningful gaps in quality. Rajaram and colleagues found significant underutilization of adjuvant chemotherapy following surgical resection in a national study (12). Credentialing groups such as the Commission on Cancer have incorporated quality measures into the review paradigm for programs, but the areas that perform most poorly related to the transition of care from one specialist to another (13). These interactions are what we believe provide for the best care in complex cases, and yet their outcomes remain nebulous. Overall survival seems an obvious starting point, but even then, it only applies to the fraction of patients treated curatively and misses a large proportion of care provided by all specialties dealing with thoracic cancers, many of which are done within a palliative framework.

### Future directions of multidisciplinary care

While the landscape of multidisciplinary care has certainly evolved in the last decade, the current era in thoracic

oncology demands perhaps the greatest level of integration. The advent of immunotherapy, improvements in radiation techniques, and developments in the safety and efficacy of surgery have thrown into question traditional treatment paradigms and created many areas of uncertainty. Virtual tumor boards may aid in extending the benefits of multidisciplinary care for these situations to patients in remote areas (14), while “mini tumor boards” have been proposed for patients in low- and middle-income countries (10). Clearly, patient-centered outcomes such as quality of life and satisfaction are an area in need of greater attention and research, and what impact multidisciplinary care has on these important measures of healthcare efficiency and efficacy must be investigated. Demonstrating the utility of multidisciplinary care in terms of increased efficiency, or timeliness of care, may help to motivate the uptake of the multidisciplinary approaches, building on the work of Osarogiagbon and colleagues, particularly for the idea of co-located clinics (2). One of the main questions that future studies will need to answer is the relative effectiveness of clinic co-location, which has the advantage of multidisciplinary input while the patient is being evaluated, versus organ-specific tumor boards which occur after the individual evaluations have taken place. Lastly, while these tumor boards are clearly important on an individual level, the impact of multi-disciplinary models on a population-level has not been evaluated, but is likely significant. Measuring the benefits of these approaches, while challenging, is key to engaging clinicians in a way that is relevant to their clinical practice.

### Conclusions

In an era of rapid changes in thoracic oncology, clinician engagement in multidisciplinary care is more important than ever. Although the concept of measuring the function of multidisciplinary groups is intrinsically appealing, the definition, structure and relevant outcomes for such groups remain largely undefined. Despite the challenges, however, progress is being made especially with respect to the development of relevant patient-centered outcomes, which are critical for the measurement of care quality in the majority of advanced staged lung cancer patients. While measurement of impact remains a challenge, multidisciplinary care represents a platform for quality improvement and knowledge translation that is more critical than ever in the complex and evolving field of thoracic oncology.

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## Footnote

*Conflicts of Interest:* The authors have no conflicts of interest to declare.

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