Tumor board workflow: Current practices and the potential for improvement through advanced technologies

Executive summary

Conducted worldwide, tumor boards are a widely utilized approach to providing cancer care based on inputs from multiple disciplines. In many cases, the processes of preparing presentations, conducting tumor board meetings and documenting treatment decisions is suboptimal and non-standardized among specialists.[1] Clinical decision support (CDS) systems have the potential to assist tumor boards in every step of the workflow process, from streamlined data collection and presentation to enhanced documentation that captures not only the decisions made, but the evidence and rationale behind them. They also can help physicians ensure decisions made in the meeting are evidence-based and follow national guidelines for cancer care.

CDS systems and other software tools have not yet been widely embraced in the tumor board setting, so data on their implications are limited. However, research on CDS systems and other software tools in various disciplines suggests that physician adoption is more likely when technology aligns with current workflow and fits the providers' logic of care. In the case of tumor boards, advanced software applications have the potential to create efficiencies and support multidisciplinary decision-making, which may ultimately contribute to the greater goal of improved patient care and treatment outcomes.

This white paper briefly addresses commonly used practices in tumor board workflow, but mainly focuses on the ways technology improves the process. It also offers guidance to hospital leaders and oncology care teams who are evaluating new systems for use in their institutions. Other papers in this series from Roche Diagnostics Information Solutions provide analyses of tumor board benefits and workflow challenges.

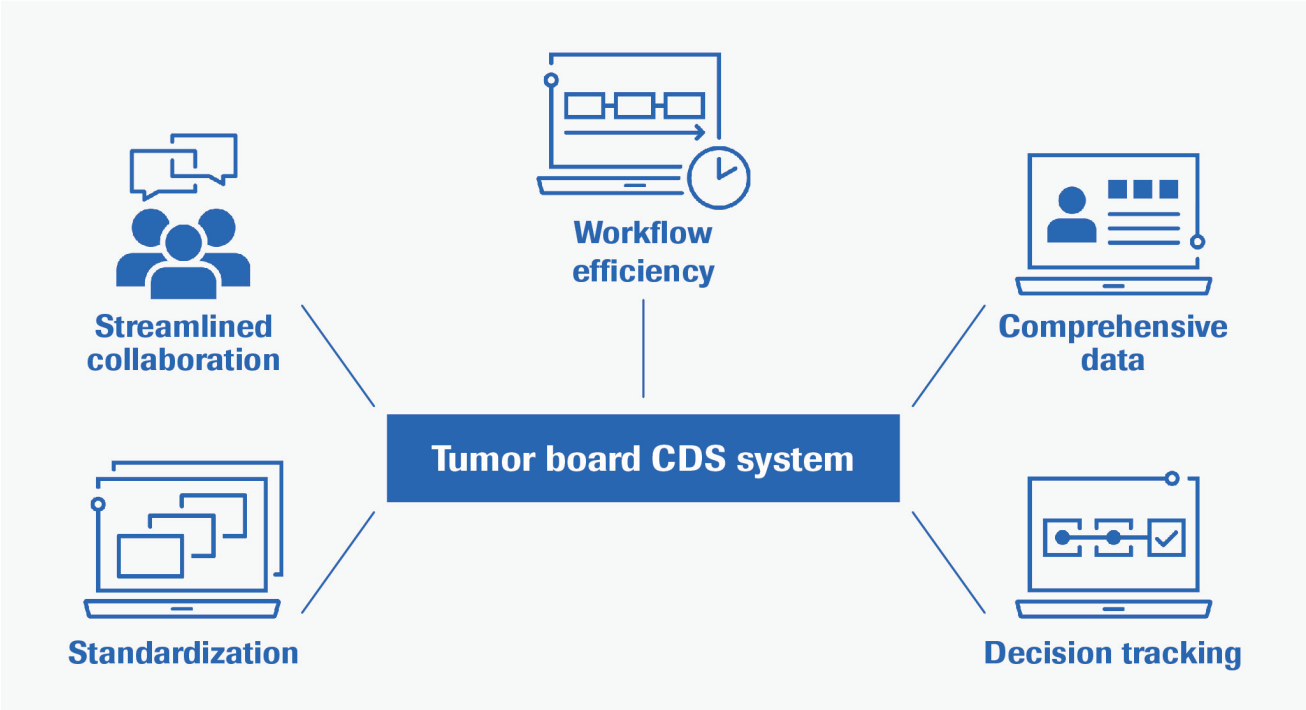
The role of technology in supporting and optimizing tumor board workflow

Health information technology in the form of computerized support for clinical decision-making is creating new opportunities to leverage multidisciplinary input and maximize the value of tumor board meetings as an important component of patient care.[1] CDS systems are sophisticated software platforms in which "individual patient characteristics are matched to formalized guidelines to generate patient-specific recommendations."[2] They include tools designed to enhance decisions in the clinical workflow, which could help tumor boards overcome common challenges.[1,3]

The United States Department of Health and Human Services defines the benefits of CDS as "increased quality of care and enhanced health outcomes; avoidance of errors and adverse events; and improved efficiency, cost-benefit, and provider and patient satisfaction."[3] Yet, the use of CDS systems for tumor board decision-making is relatively new and not widely embraced.[1]

In a 2011 review of published evidence, Patkar et al. explored the potential of CDS technology for tumor boards.[1] In addition to concluding that CDS systems have the potential to assist tumor boards in every step of the workflow process, researchers noted how an advanced CDS system can incorporate national guidelines to aid with making evidence-based clinical decisions, even allowing "clinicians to record their views on guideline recommendations, which can be captured into a hospital or national database for quality audits and informing the ongoing guideline development and update process."[1] Furthermore, they asserted that patient eligibility for clinical research trials could be screened in real-time,[1] potentially leading to the downstream effect of driving higher rates of participation by physicians and patients in investigational cancer therapies.

Potential benefits of a centralized CDS system for tumor boards



Recent research on health information technologies designed to support decision-making in other healthcare disciplines provides a window into the potential implications for tumor boards. In some cases, barriers to leveraging CDS systems to their full potential were found to center around physician adoption and engagement with the new technology.

For example, in 2017 researchers studied the introduction of information and communication technology (ICT) to ward rounds in intensive care units in major teaching hospitals in Sydney, Australia.[4] The authors observed that the doctors' resisted ICT when it did not fit with their "logic of care," which was defined as "resourceful attempts by members of the healthcare team (including the patient) to draw on whatever logics (rationales, goals) work for that particular patient in their particular situation at that particular time (and assumes that 'what works' can change at any moment)."[4] Other barriers included disruption to established routine, improper hardware setup and cumbersome/non-user-friendly software.

In another study, researchers evaluated how well primary care organizations used health information systems and other digital tools to collect, manage and share information. Barriers to using these tools to better integrate care included a lack of interoperability standards among systems, inadequate training on the new technology/system, little support (both from leadership and from a technological standpoint), and a lack of software that met the needs of all clinicians involved.[5]

Based on these findings from other disciplines and tumor board studies referenced throughout this paper, physician adoption is more likely when the technology aligns with and complements current tumor board workflow (as opposed to significantly altering or disrupting it). Physician engagement is also more likely when the technology offers efficiencies for providers that they perceive as a means to increasing value for patients (e.g., discussing more patients without negatively affecting the quality of each discussion, documenting decisions alongside supporting evidence presented at the meetings).

This paper explores commonly used practices in tumor board workflow today and the potential to improve such processes through software technologies. This exploration is guided by four questions, offered for consideration by hospital leaders and oncology care teams who are evaluating software platforms for use with tumor boards in their institutions.

Will the software create a more efficient process for collecting and presenting all relevant clinical data? In current practices, data that comprise a patient's longitudinal medical record are retrieved from a range of disparate sources across multiple specialties. One-by-one and patient-by-patient, each participating specialist must prepare by compiling all information of relevance from his or her specialty. In the absence of a centralized, tumor board-specific software system, current workflow practices commonly involve placing images and data into simple presentation tools (e.g., PowerPoint slides, Google Documents), which are then stored on individual flash drives for sharing at the tumor board meeting.

Kevin Staveley-O'Carroll, M.D., Ph.D., a surgical oncologist and director of The University of Missouri Health Care's Ellis Fischel Cancer Center in the United States, says checklists are one way his organization works to ensure the required information is collected for every type of cancer being discussed at tumor boards. "Sometimes we need more information because there are unusual circumstances," he explained, "but we start with a template in the form of a checklist."[6]

Those checklists, however, are just a starting point for what often becomes a time-consuming data collection task. According to a 2016 study by IBM Research (USA), the structure of electronic health record (EHR) systems do not provide a data collection experience that expedites access to only relevant information. "Necessary facts are not well-organized or easily accessible in a commercial EHR system, and humans tend to perform poorly when the task requires foraging through a long and poorly organized patient record."[7] Speaking from past experience, Dr. Staveley-O'Carroll said the problem of poorly filtered information is also seen in reports compiled from third-party companies. The reports tend to include unnecessary information, requiring the specialists to mine for the pieces of information they do need. Where the process is arduous for people, technologies should be considered for their ability to streamline the steps involved in data collection.

> *"I think the biggest challenge in conducting a tumor board is the lack of a tool that makes it easy. You're using multiple programs and data sources to pull together a presentation to include all the pertinent information. Documenting everything using a standard protocol would be useful."*
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> - Richard Hammer, M.D., Pathologist, University of Missouri Health Care in Columbia, Missouri, United States[9]

While the process of preparing for tumor board presentations can be cumbersome for all participating specialists, it is perhaps most notably time-consuming for pathologists, whose slide images are often not included in the EHR. In a U.S. pilot study on the use of digital pathology for tumor boards in the community hospital setting, pathologists estimated they spent an average of two hours and six minutes preparing for tumor board meetings (without digital pathology); actual times ranged from 15 minutes to three hours and 40 minutes according to timestamps tracked in the eight-week pre-pilot data collection period.[8] For pathologists at academic medical centers and other large institutions, preparation time can be even longer. Richard Hammer, M.D., a pathologist and leader of the hematopathology tumor board at The University of Missouri Health Care, estimated it takes 4-6 hours per week to prepare pathology presentations for tumor board meetings. "We have to take relevant pictures, gather all the pertinent data, and place everything into a slide deck for each patient—it takes a fair amount of time."[9]

Will the software enable more effective and informative tumor board presentations? During the meeting, the presentations should aim to facilitate discussion and collaboration among the tumor board members, ultimately reaching a consensus on proper diagnosis and treatment plan. Engaging all members, including trainees, and encouraging them to actively participate helps to accomplish the group's goals of optimal care delivery and education.[1]

A standardized method for data collection and a centralized location for presentation inputs can reduce inefficiencies present during tumor board meetings, resulting in higher engagement. When each specialist prepares separately and uses a different slide deck or other tool to conduct the presentation, there is greater potential for non-value added time spent accessing the individual presentations when all specialists are gathered. Donald Doll, M.D., medical oncologist and hematologist at The University of Missouri Health Care, says a comprehensive software system that combines all presentations into one platform before the meeting can eliminate time spent waiting for each specialist to access the information needed to deliver his or her presentation.[10]

"Typically, it starts with the leader pulling up the patient's chart in the EHR, followed by a pathologist accessing pictures saved on a flash drive, and a radiologist going back to the EHR to pull up X-rays, CT scans and MRI images. Another clinician may simply have a printout of clinical notes to present, and so on," explained Dr. Doll. "We switch back and forth between systems and portable technologies as we move from one specialist's presentation to the next."[10]

Such suboptimal practices are not uncommon for tumor boards in general. Where software technologies are available to drive more efficient workflow during meetings, such solutions may create opportunities for patients to be better presented and discussed with no delayed therapy decisions, fewer cases deferred to the following week's meeting, and eventually more patients discussed at each meeting.[11]

Will the software support the need to access evidence-based guidelines during the tumor board discussion? Clinical practice guidelines play an important role in tumor boards, serving as a reference for decision-making during the discussion and as a measure of care quality after implementation of the treatment plan. Following these guidelines is also required for multiple accreditations. In a 2014 article titled, "Tumor Boards: Optimizing the Structure and Improving Efficiency of Multidisciplinary Management of Patients with Cancer Worldwide," El Saghir et al. elaborated on the value of high-quality clinical practice guidelines in tumor boards:

> *These include increased ease of coordination of care as the expectations of treatment are predefined, objective, evidence-based, documented, and may*

> *be referred back to on an ongoing basis. Those circumstances in which the care varies from the clinical practice guidelines may be readily identified, and this focuses the attention on those components of care to aid in assuring that the variation in care is medically appropriate and justifiable.*[12]

It is important to have a mechanism in place to make evidence-based guidelines available during the presentation, as well as to include them in the documentation of the therapy decision for future reference. In a study of breast cancer tumor boards, Farrugia et al. measured the impact a standardized documentation template had on adherence to national cancer care guidelines for hormone therapy, chemotherapy and radiation therapy after breast conservation surgery.[13] The authors found that after implementation of the template, "adherence to national practice guidelines improved significantly" on the measures of hormone therapy and radiation therapy; the measure of chemotherapy remained stable. Furthermore, the authors noted, "template implementation at multidisciplinary conferences represents a widely applicable method of improving documented adherence to national guidelines."[13]

In the U.K., national cancer peer review program data "indicate there is significant room for improvement in the conduct of multidisciplinary team meetings," according to a 2011 study on using computerized decision support to improve compliance with evidence-based guidelines at tumor boards.[14] The authors noted that ensuring and documenting adherence to standards is among the more prevalent pragmatic challenges for most tumor boards today, but at the same time, they also found multidisciplinary meetings "provide the best opportunity to actively promote an appropriate and judicious use of the guidelines at the point of care." They further concluded that, when software tools align with the team's workflow, "sophisticated decision support systems can enhance the conduct of [multidisciplinary meetings] in a way that is acceptable to and valued by the clinical team."

Will the software improve the process of documenting the decisions made and the evidence that was used to drive the decisions? Adequately capturing the information presented during the meeting, as well as the discussion, decisions, treatment plans and next steps, is important for ensuring the decisions get fully implemented at the point of care. The patient's oncology care team can refer to these decisions and the rationale behind them later to ensure they are following the prescribed plan. Respondents to an international survey of American Society of Clinical Oncology (ASCO) members suggested that "all discussions should be well documented in patients' medical records, and physicians should provide the [tumor board] with follow-up for each of the patients discussed."[15] Half of respondents said they kept tumor board notes in departmental files, and half kept them in EHRs.[15]

CDS systems and other software tools should be assessed for their ability to improve documentation by connecting the decisions made to the evidence that drove the decisions. A 2010 study of office-based oncologists in Germany revealed opportunities for improvement in documenting tumor board decisions: according to the study's authors, "While multidisciplinary discussions about therapy had taken place in nearly three-quarters [74%] of patient charts analyzed, the tumor board recommendations were only documented in half [52%] of the cases."[16]

Conclusion

CDS systems and other software technologies have the potential to optimize current tumor board operations and support decision making by multidisciplinary oncology care teams. While advanced technologies for facilitating and documenting tumor board discussions are not widely used today, there is a growing body of evidence to suggest their use would provide time-savings for participating specialists and evidence-based support for treatment decisions. Research from other disciplines indicates physician adoption is likely to be more successful if the technology follows a workflow pattern that complements, rather than modifies, the physicians' current workflow for tumor board preparation, presentation and documentation—something hospital leaders and oncology care teams should consider when evaluating technology for use in tumor boards.

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