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Module: Prognostication In Surgery

Learning Objectives

Attitudes	• Gain awareness of common surgeon pitfalls in prognostic communication while engaging in shared decision-making with patients.
Knowledge	• Describe documented usage of clinical decision aids in prognostication for surgical patients.
Skills	• Communicate prognosis in terms of patient values and goals to make clinical recommendations.

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Introduction

Prognostication is fundamental to clinical decision-making and surgical planning. It provides context for which patient and family goals are aligned to medically feasible realities. Without effective delineation and communication of prognosis, patients and families may suffer unnecessary healthcare burden and miss opportunities to complete important life work with the time they have remaining to live.

Prognostication is challenging for physicians across all specialties in medicine. Clinical decision aids and frameworks have been developed and studied to help guide surgical providers in determining and communicating prognosis. These decision aids, combined with a surgeon's knowledge of their patient's and family's unique goals, work synergistically to define an illness trajectory so that patients and their families feel better informed about their care.

Common prognostic challenges in surgery

a. **Physicians tend to overestimate prognosis,** as described in Christakis & Lamont 2000, a landmark article in palliative care. This prospective cohort study included 343 physicians of varying specialties and compared physician estimates of survival for terminally ill patients newly enrolled into hospice with actual patient survival. The study found that only 20% of physician predications fell within 33% of actual survival, and physicians in the upper quartile of practice experience performed the most accurate predictions. 63% of physician estimates were overoptimistic regarding survival, and prognostic accuracy decreased with increased duration of the patient relationship. Decreased time from the physician's last evaluation of the patient was also noted to decrease prognostic accuracy.(1)

   This study highlights that physicians are regularly inaccurate and overly optimistic in their survival predictions, even for patients who have already shifted from disease-directed treatment to comfort-focused care.

b. **Surgeons demonstrate bias in the ability of their interventions to positively impact traumatic brain injury (TBI) outcomes**, as shown in Williamson et al. 2020, a randomized study surveying practicing neurosurgeons. Surgeons were provided with two hypothetical scenarios involving patients with severe TBI and asked for their treatment recommendations. The intervention group received additional evidence-based risk estimates (CRASH and IMPACT neuro-prognostication models) while the control group did not. Prognostic estimates and the likelihood of recommending surgical intervention were widely variable in both groups. Overall, provision of the risk-estimate guide increased the likelihood of surgeons recommending non-operative management. Surgeons were less likely to recommend non-operative management if they believed prognosis was favorable.(2)

This study shows that individual clinical judgment between surgeons for the same acute care surgical scenarios differs greatly, and that when surgeons practice with objective data, they may reconsider the role of surgery in producing positive functional and survival outcomes for patients.

Prognostic estimation tools

a. **The American College of Surgeons (ACS) National Surgical Quality Improvement Calculator (NSQIP)** is a national database-driven clinical decision aid created in 2013. Using patient characteristics such as age and co-morbidities, the NSQIP calculator estimates the risk of complications such as the likelihood of discharge to a facility following a given surgical procedure. This tool is accessible on the internet and facilitates integration of objective patient data into outcomes that matter to providers.(3)

b. **The palliative performance scale (PPS)** is a prognostic tool that encompasses five patient attributes: oral intake, ambulation, consciousness, self-care, and disease activity. The PPS is a useful predictor of short-term mortality and its survival estimates depend on the practice setting and patient population; for example, when matched for PPS scores, cancer patients tend to have shorter survival compared to the general population.(4) Usage of the PPS has been extrapolated to surgical specialties, with one retrospective study of trauma patients age 55 and older showing a PPS score of 80 or less to be independently associated with a probability of 6-month mortality and discharge to dependent care.(5)

c. **The trauma-specific frailty index (TSFI)** is a tool developed for patients over the age of 65 and predicts mortality, major complications, re-admissions, and fall recurrence after discharge.(6) Clinical decision aids such as the PPS and TSFI may assist the surgical provider with the decision to "trigger" initiation of advance care planning or specialty palliative care consultation.

d. **Clinical indicators.** Individual clinical events such as dialysis initiation are also key prognostic indicators. One national database study demonstrated that among nursing home patients, dialysis initiation precipitated substantial functional decline and increased mortality. The study showed that 12 months after dialysis initiation, 58% of patients surveyed had died and only 13% had maintained their pre-dialysis functional status.(7)

e. **The "surprise question"** involves a given clinician asking themselves if they would be surprised if a patient they evaluated died within 12 months. A positive screen should prompt advance care planning for serious illness or specialty palliative care consultation. While easily incorporated into clinical practice, the "surprise question" performs poorly in correlation to actual mortality, particularly in non-cancer illness.(8)

Prognostic communication

a. Physician communication impacts patient understanding of prognosis. Patient understanding of prognosis differs substantially from available data regarding treatment of disease. This was demonstrated in a survey-based study by Weeks et al. 2012, which identified patients with metastatic colorectal and lung cancer. Patients were asked about the perceived purpose of

chemotherapy, with 69% of patients with colorectal cancer and 81% of patients with lung cancer holding inaccurate beliefs that chemotherapy was likely to cure them.(9)

This study highlights the discrepancies in physician and patient understanding of the purpose of treatment and raises concerns that patients may be misled by provider communication of prognosis, impacting their ability to make informed choices about their cancer treatment.

b. **The language that surgeons use in perioperative counseling impacts patient understanding of their illness experience.** Schwartz et al. 2015 performed language analysis of the electronic medical records of patients undergoing spine surgery. Both patients and their surgeons were simultaneously surveyed about their perception of improvement in disability after surgery (for example, improved leg pain). Among the 24% of patients who believed they fared worse post-surgery than their surgeon believed, surgeon language in the chart tended to include "much"-emphasis terms such as "much better" when describing how symptoms would change in the future, and tended to reassure patients that symptoms would improve with time. Predictors of patient-surgeon agreement included usage of positive terms such as "absolutely."(10)

   While no one-size-fits-all method of word selection accounts for patient-surgeon agreement, the study findings indicate that use of ambiguous terms may lead to greater discrepancy in patient-surgeon perceptions of clinical progress.

c. **Family members use a variety of sources outside of physician judgment to form their own Gestalt of the patient's clinical prognosis**. In a mixed-methods study interviewing surrogate decision-makers (SDM's) in several intensive care units, Boyd et al. 2012 highlighted that <2% of SDM's relied exclusively on physician judgment in their perception of patient prognosis. They cited other attributes such as the patient's unique illness history and strength of character as influencing their perceptions.(11)

d. **The best person on the care team equipped to communicate prognosis is context dependent and requires surgeons to utilize their primary palliative care skills**. Barriers to surgeon-led goals of care discussions have been identified and include lack of formal communication training and time-sensitive demands of clinical practice structure (12). Despite this, surgeons have the greatest expertise in their own specialties and increased focus on serious illness communication education equips surgeons to facilitate discussions about prognosis with their patients.

   Several survey-based studies of both specialty palliative care physicians and surgeons have found that both groups believe themselves to be better equipped to lead goals of care discussions for surgical patients with serious illness and favored their own specialty to lead the discussions.(12) Discrepancy has also been identified among different ICU provider roles and their perceived effectiveness of surgical prognostic communication. Aslakson et al. 2010 demonstrated ICU nurse-reported satisfaction with surgeon prognostic communication to be as low as 2%, while surgeon self-reported satisfaction was reported at 90%.(13)

   The current National Consensus Project guidelines suggest specialty palliative consultation for assistance with complex goals of care discussions and difficult to control symptoms.(14) In most

circumstances, reliance on surgeons' primary palliative care skills in prognostic communication is appropriate.

e. **There are surgeon-specific barriers to effective communication of prognosis**. Current literature suggests that surgeons often lack key skills in making treatment recommendations based on what matters most to patients and families. Surgeon-led goals of care discussions often make use of mental models intent on restoring a state of "normalcy" to patients with medical and surgical interventions that may be unlikely or not possible for the individual patient or not within their goals of care.(15) Surgeons also tend to struggle with identifying and utilizing patient values in goals of care discussions. A qualitative analysis of surgeon conversations with frail patients revealed that surgeons frequently missed an opportunity to give unwelcome news, presented treatment options in a menu format as the patient's choice rather than a shared decision, and hesitated to make clinical recommendations on treatment course, deferring to patient autonomy for decision-making.(16) Aslakson et al. 2012 conducted focus groups with surgical intensive care unit (SICU) nurses on barriers to adequate prognostic communication. Non-surgeon observers frequently noted that surgeons struggled when approaching difficult conversations, citing the inability to acknowledge an end-of-life situation.(17)

f. **Multiple strategies have been developed for surgeons to facilitate effective communication of prognosis**. Communications skills curricula that promote self-awareness among surgeons of cognitive pitfalls in assessing and sharing prognosis have been well-received.(18) A well-known decision aid created at the University of Wisconsin is the best-case worst-case (BC/WC) tool. The tool provides a dynamic strategy as a way to illustrate illness trajectory with and without a given intervention using a visual aid that shows how "close" a patient is respectively to the best and worst case scenario on a given day.(19) In one study, the BC/WC tool was taught to practicing surgeons and positively impacted patient and family perceptions of the surgeons' communication clarity.(20)

g. **Many leaders in surgical education have identified the need to improve surgeon skills in prognostic understanding and delivery** and have targeted surgical residency as an optimal setting to hone primary palliative care skills. Some programs have surgical residents complete a formal clinical rotation in palliative care, in which they experience specialty palliative consultation approach to prognostication.(21) Outside of a formal palliative care clinical experience, understanding and delivery of prognosis during serious illness can be taught in structured educational formats such as through integration with regularly scheduled residency didactics.(22)

Conclusion

Surgeons are responsible for many high-stakes clinical decisions across a variety of settings. It is of paramount importance for surgeons to engage with available clinical decision aids and outcomes databases to formulate accurate prognoses, and to be able to avoid known pitfalls in understanding and communication of prognosis.

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Pre/Post Test

Questions

1. Physicians who have known their patients for longer and seen them more recently tend to _____ prognosis.
    a. Underestimate
    b. Overestimate
    c. Precisely estimate
    d. Be unsure of

2. Availability of a patient outcomes risk-estimate tool can impact provider recommendations for surgical intervention by:
    a. Decreasing likelihood of recommending surgery
    b. Being less likely to recommend medical management alone when prognosis is favorable
    c. Providers combining their own personal judgment with risk estimation from the clinical decision-aid tool
    d. All of the above

3. Which of these is not an attribute of the palliative performance scale (PPS)?
    a. oral intake
    b. ambulation
    c. consciousness
    d. ability to perform instrumental activities of daily living (ADL's)
    e. disease activity

4. The "surprise question" entails that a physician asks themselves if they would be surprised if a given patient died within the next ___ months.
    a. 16
    b. 12
    c. 9
    d. 6

Answers

1. B.) Overestimate
2. D.) All of the above
3. D.) ability to perform instrumental activities of daily living (ADL's)
4. B.) 12

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Case Scenarios

Mr. Smith is an 80-year-old male patient with a history of atrial fibrillation on apixaban who was admitted to the ICU at your level I trauma center after sustaining a subdural hemorrhage and multiple bilateral rib fractures in an unwitnessed ground level fall. At the time of his arrival to the trauma bay, he has normal hemodynamics, a Glasgow Coma Scale (GCS) score of 13, and is complaining of difficulty breathing because of pain. Several hours later in the ICU, his GCS acutely declines to 6 and his breathing becomes shallow. He has a current advance directive (AD) which indicates his wishes for full treatment. You plan to discuss intubation and emergent decompressive craniotomy, but before you begin his surrogate decision maker asks you what his prognosis is. What additional information would help you answer the SDM's question and AD form?

Answers:

a. Incorporate his pre-morbid functional status (such as attributes in the palliative performance scale) to help with pre-injury prognosis
b. Utilize decision-aid calculators such as the NSQIP to aid in objectifying outcomes following intervention, such as discharge to dependent care and mortality
c. Understand both what the patient values and defines as an acceptable quality of life in order to determine whether the allowable outcomes for the proposed interventions align with the patient's goals of care

Mr. Smith's SDM decides that a time-limited trial of full treatment is within the patient's goals of care, and partial dependence in activities of daily living (ADL's) would be an acceptable quality of life for him if it meant he would be conscious enough to communicate with his loved ones. If he will be unable to communicate with others and help with at least some of his ADL's, he would not wish to pursue any further interventions. You proceed with a craniotomy, which is uncomplicated from an operative standpoint. Despite being off all sedation, his GCS has only marginally improved from 6 to 7 in the days following the operation. Ten days later, his mental status still precludes safe extubation. Both you and the neurosurgeon agree that his GCS is unlikely to improve and a tracheostomy would be indicated to facilitate ventilator weaning and advancement of his care. Based on your prior discussions with Mr. Smith's SDM, how would you approach a discussion about a tracheostomy with the SDM?

Answers:

a. Confirm the patient's goals and values with the SDM and frame prognosis in terms of those factors
b. State that pursuing a tracheostomy does not seem aligned with the goals of care as described by the SDM and recommend transitioning from disease-directed treatment to comfort-focused care

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Prognostication In Surgery Learner Assessment Form

Content Checklist: Make an "X" if the resident did this without prompting, mark with "✓" if the resident did this only after prompting, and leave blank if this was not done.

_____ Referenced one or more clinical decision aids such as the NSQIP or CRASH calculators as an objective reference to patient outcomes

_____ Recognized clinical prognosis, including following procedural interventions, is impacted by functional status and co-morbidities

_____ Asked about patient values in the process of shared decision-making

_____ Made a recommendation based on clinical appropriateness and the patient's values

_____ Stated that a tracheostomy would likely not be within patient goals of care