



Modern clinical decision-making in total joint arthroplasty

Emmanuel Edusei, Afshin A. Anoushiravani, James Slover

Department of Orthopaedic Surgery, NYU Langone Medical Center, Hospital for Joint Diseases, New York, NY, USA

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Correspondence to: James Slover, MD, MSc. Department of Orthopaedic Surgery, NYU Langone Medical Center, Hospital for Joint Diseases, 301 E 17th St., New York, NY 10003, USA. Email: James.slover@nyumc.org.

Abstract: Patients and physicians continue to work together to make complex medical decisions. Healthcare providers continue to make efforts to enhance the different decision-making models and tools available to improve this process. While decision-making models such as paternalistic and informative, may have their advantages, shared decision-making (SDM) has proven to be the current ideal approach, resulting in increased patient satisfaction. In addition, technological advancements offer further opportunities for patients and surgeons to implement innovative decision-making models. In this review, we will define the three decision-making models and discuss the potential for modern tools available to increase information available for patients and enhance the communication between patients and physicians allowing for more informed clinical decisions, using total joint replacement as an example.

Keywords: Decision-making; shared decision-making (SDM) orthopaedics; total joint arthroplasty (TJA); value-based care

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Introduction

Over the past decade, the process of clinical decision-making and the patient-physician relationship have continued to evolve. Much of this evolution has been brought about by legislation encouraging greater use of decision-making models. Historically, patients have not had an active role in medical decision-making, but as patients are increasingly expected to take on a more active role in medical decision-making and care, healthcare providers have implemented patient-centric methodologies promoting SDM models (1). This shift has been facilitated by the increasing amount of information available to patients through the internet, patient education applications, and public quality reporting instruments (2). Moreover, with the changing climate in medicine, there is particular interest in patient satisfaction and compliance with prescribed interventions (3-5). Patients are now increasingly expected to take actions to improve their health and reduce risks associated with surgical

procedures (6). This engagement is sometimes referred to as patient activation. In this review, we will describe the three decision-making models, describe factors influencing modern clinical decision making in orthopaedic surgery, and describe the role of patient activation.

Decision making models

There are three commonly described types of decision-making models: paternalistic, informative, and SDM (*Table 1*) (7). The paternalistic decision-making model is one in which physicians make treatment decisions for patients (7). The paternalistic model assumes that the patient and physician have aligned interests. In this model, physicians make healthcare decisions for patients independent of their unique preferences (1,7). In contrast, the informed decision-making model equips patients with the necessary objective facts regarding disease state, available diagnostic and therapeutic interventions so that

Table 1 The assumptions unique to each decision-making model (7)

Decision-making model	Definition	Assumptions
Paternalistic	Physician-patient interaction ensures that patients receive the interventions that best promote their health and well-being. The physician determines the treatment plan—presenting the patient only with information deemed necessary by the physician	The goals and objectives of care are the same for both the patient and physician
Informative	Physician provides the patient with all relevant information (disease state, diagnostic, and therapeutic interventions), so that the patient may select the treatment course, they would like to proceed with. The physician executes the selected intervention(s)	A clear distinction between medical facts and patient values. The physician retains the objective facts, while the patient retains all the value
Shared	The physician presents the medical information such as the disease state, available diagnostic and therapeutic interventions, but also, the physician helps align medical interventions with the patient's goals and values	The physician and patient require an effective means of communication

an informed decision can be made by the patient (7). The physician's role is only to disseminate the information and implement the selected treatment pathway (7,8). The SDM is similar to the informative decision-making model in that the physician presents all clinically relevant information. However, the patient and the physician also aligns treatment modalities with the patients' health goals and personal values, and treatment decisions are made together, as a team (4,5,7).

SDM

The concept of SDM is not a new one. It was envisioned more than 30 years ago by a Reagan-era Presidential Commission promoting the integration of 'shared decision-making' as a way of improving communication and informed consent in healthcare (9). However, it was not until the passage of the Patient Protection and Affordable Care Act (ACA) of 2010, which authorized the Center for Medicare and Medicaid Innovation (CMMI) to test SDM models designed to better inform patients' of medical decision-making, that efforts to institute it became mandated. Numerous randomized trials have consistently demonstrated the effectiveness of SDM models within healthcare. A recent Cochrane review of 115 studies indicated that patients who used decision making aids had less decisional conflict regarding their disorder, more active role in decision making, and a greater likelihood of receiving care aligned with their values (10). Thus, if SDM models are properly implemented, as suggested by the Institute of Medicine (11), healthcare providers and patients may expect improved outcomes

and higher patient compliance.

Patient activation

It has become increasingly apparent that patients must take steps to optimize their health and outcomes associated with surgical and medical procedures. A major barrier to the implementation of SDM has been patient activation, or an individual's propensity to engage in adaptive health behaviors (12). If the SDM healthcare strategy is to be, successfully implemented patient activation is necessary. This is particularly true in orthopaedic care, which requires a high degree of patient-directed interventions, such as occupational and physical therapy participation. A study by Andrawis and colleagues (12) reported that total joint arthroplasty (TJA) candidates with higher preoperative patient activation were associated with better pain relief, reduced symptoms, and higher satisfaction following surgery. In another report, a national expert consensus panel and patient focus group feedback indicated that if the four stages (*Table 2*) of patient activation are implemented, healthcare costs may be reduced (13,14). In addition, patients can modify behavior or treat comorbid conditions reducing risks associated with elective orthopaedic procedures. If these recommendations are followed, patients may expect superior outcomes, higher satisfaction rates, lower healthcare costs, while also achieving a better understanding of their healthcare needs. Thus, the patient and orthopaedic surgeon should promote patient activation as part of the SDM model with the aim of improving the quality and reliability of orthopaedic care delivered.

Table 2 Four stages of patient activation (13)

Patients should believe their role is essential
Patients must have the confidence and knowledge necessary to take action
Patients should take action to improve one's health
Patients should stay engaged in their treatment course even when under stress

Implementation of SDM in TJA

SDM requires effective delivery of information pertaining to the disease state, as well as the risks and benefits associated with diagnostic and therapeutic interventions. Physicians must strategize on how to deliver treatment information so that patients are able to make informed decisions using the validated patient-centered instruments designed to optimize patient outcomes in both the pre- and post-operative setting. It is important that patients and physicians understand the purpose behind each instrument so that they can be used to enhance the evaluation and decision making process.

Risk-stratification instruments are being increasingly used with SDM models. However, many of these tools are difficult for patients to interpret [e.g., Charlston Comorbidity Index (CCI) and American Society of Anesthesiologists (ASA) score]. It is crucial that preoperative screening instruments be interpretable to patients and realistic to implement within the clinical setting. Several risk calculators, including the American Joint Replacement Registry's (AJRR) Total Joint Risk Calculator (15), are available and allow orthopaedic surgeons and patients to more precisely calculate an individual patient's risk profile for certain complications (e.g., infection and mortality) when undergoing specific procedures. These instruments provide clinicians with a 'teachable moment' further enhancing the patient-physician relationship, while strengthening the SDM process. These risk stratification calculators may also provide the patient with the opportunity they need to institute risk reduction behaviors optimizing their health status. Most importantly, health benefits achieved during the preoperative medical optimization process may provide the patient with the necessary knowledge and tools for long-term healthy living. One such example may be patient participation in a tobacco cessation programs prior to elective TJA resulting in decreased short-term risks associated with surgery, and perioperative and long-

term benefits if the behavior is continued. The SDM model enables physicians to solicit patient buy-in enabling patients to vest in their own care through the modification of risk factors and improvement in their overall health.

Advantages and disadvantages of SDM

Several studies have evaluated the effects of SDM in orthopaedic patients. In a study by Bozic and colleagues (16), two cohorts of patients were randomized to either a SDM intervention or the standard of care. The SDM cohort received decision-making aids consisting of digital video discs and booklets, whereas the control cohort received information regarding the surgeons' practice. The study demonstrated that the use of SDM with decision-making aids benefited both patients and surgeons, enhancing informed decision-making, patient confidence and satisfaction. A recent study by Sepucha and colleagues (17) demonstrated that orthopaedic patients who met SDM criteria had significantly higher improvements in disease-specific and overall quality of life. In addition, these patients were more likely to be satisfied with the treatment, reported less regret with the selected treatment course, and were satisfied with the level of pain relief. Another study by Stacey and colleagues (18) demonstrated that in patients with osteoarthritis considering TJA, the implementation of SDM and collection of PROs in the clinical setting is feasible, improves decision quality, and patient knowledge. These studies demonstrate that SDM can be practically implemented within the clinical setting and have a positive impact on patients and the decision making process.

Despite these positive outcomes, there are some potential disadvantages, which warrant further investigation. The costs associated with designing and implementing decision-making aids (e.g., pamphlets, digital video discs, and electronic applications) can be considerable, especially within the confines of a small group practice. Additionally, many of the decision-making instruments require the collection of unique patient reported outcomes (PROs) over the duration of treatment. These PROs may consist of questions pertaining to the patient's perception on: quality of life, functional ability, and perception of pain. The data obtained through these PRO instruments must then be stored in a retrievable manner. Thus, requiring institution-wide implementation of advanced electronic medical record (EMR) systems further straining resources (19). Perhaps the most significant drawback associated with SDM is that quality metrics are difficult to

compile and objectively evaluate. Yet, as medicine continues to shift from a pay-for-service to a performance-based system, payers will request that providers document SDM practices and the PROs corroborating these decisions (20). In spite of the challenges, patients who participate in SDM consistently select more conservative interventions and are more invested in improving health behaviors and modifying risks prior to surgery; potentially reducing episode of care costs, improving PROs, and satisfaction (20-22).

Innovative approaches at implementing SDM

Many innovative patient-centered programs have been developed to educate and optimize TJA candidates. Several technology platforms take advantage of smart phones and wearable devices to connect patients and their care teams via streamlined electronic applications. Through these applications, patients communicate and provide clinical information in real-time. Moreover, built in tactile sensors and scheduled administration of PROs can track progress, notifying clinicians if patients are not progressing as expected. Through these innovative decision-making aids, orthopaedic surgeons are now able to remotely monitor patients, and ensure clinical goals are achieved while maintaining patient autonomy and strengthening the physician-patient relationship through the integration of real-time data. However, prior to the widespread implementation, further studies are needed to determine how these resources can be best allocated as well as the optimal platforms for implementing these emerging technologies.

Conclusions

As the healthcare system continues to evolve, it is crucial that clinicians, patients, and payers work together enhance patient activation and decision-making. SDM instruments and technological advances provide an important opportunity for achieving these aims and should continue to be explored in order to optimize patient and physician decision-making.

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Footnote

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/aoj.2017.05.09>).

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Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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