Current concepts of shared decision making in orthopedic surgery

Kevin Klifto¹ · Christopher Klifto² · James Slover²

Published online: 23 March 2017
© Springer Science+Business Media New York 2017

Abstract

Purpose of review The Shared Decision Making (SDM) model, a collaborative decision making process between the physician and patient to make an informed clinical decision that enhances the chance of treatment success as defined by each patient's preferences and values, has become a new and promising tool in the healthcare process; however, minimal data exists on its application in the orthopedic surgical specialty. Increasing evidence has demonstrated that this once novel idea can be implemented successfully in the orthopedic setting to improve patient outcomes.

Recent findings SDM can be applied without significant increases in the office length. Patients report that a physician that takes the time to listen to them is among the most important factors in their care. When time was focused on the SDM process, there was a direct correlation between the time spent with a patient and patient satisfaction. Patients exposed to a decision aid prior to surgery gained a greater knowledge from baseline to make a higher quality decision that was consistent with their values. Involving family members preoperatively can help all patients adhere to postoperative regimens. Exposing patients to a decision aid can reduce expensive elective surgeries, in favor of non-operative management. Incorporating patient goals into the decision-making process has increased satisfaction, compliance, and outcomes.

Summary SDM is a two-way exchange of information that attempts to correct the inequality of power between the patient and physician. Decision-aids are helpful tools that facilitate the decision-making process. Treatment decisions are consistent with patient preferences and values when there may be no “best” therapy. A good patient–physician relationship is essential during the process to reduce decisional conflict and increase overall patient outcomes.

Keywords Shared decision making · Decision aids · Total joint replacement

Introduction

Shared Decision Making (SDM) is broadly defined as a collaborative effort between the physician and patient to make an informed clinical decision that enhances the chance of treatment success as defined by each patient's preferences and values, when no “best” treatment options are available [1, 2, 3, 4, 5]. SDM is a decision-making process that addresses patient- and family-centered care through effective communication and care coordination [1]. As patient knowledge increases through publicly-accessible resources via the internet, patient education materials, advertisements, and public quality-reporting databases, this patient-centered model of decision making has become more prevalent [3, 6].

Medical treatment decision-making models are categorized by information exchange, discussion of treatment options, and determination of treatment implementation. Several models exist, and these models can be classified as paternalistic, shared, and informed [2]. In addition, intermediate approaches exist to incorporate elements of several of these models, when a single decision-making model is unattainable [3].

This article is part of the Topical Collection on *Orthopedic Health Policy*

✉ James Slover
James.Slover@nyumc.org

¹ Philadelphia College of Osteopathic Medicine, Philadelphia, USA

² NYU Langone Medical Center Department of Orthopaedic Surgery, NYU Hospital for Joint Diseases, 301 East 17th Street; Suite 213, New York, NY 10003, USA

In the paternalistic model, decision-making is dictated by the physician. The one-way flow of professional authority is controlled by the physician, where the patient has no input into the final treatment decision. The informed model is another one-way model on the opposite side of the patient–physician relationship spectrum. Decision-making is deliberated and completed by the patient with no input from the physician. In this model, medical information is presented to the patient from the physician. Following the presented treatment alternatives, the patient determines the treatment option independently of the physician [2, 7].

The shared model is a balance between the paternalistic and informed model. This model ensures the patient and physician share all stages of the decision-making together. The physician educates the patient on various treatment options, and the patient indicates how their preferences and values relate to the options. There is a two-way exchange of information, with a final agreement on the treatment decisions. A key component of the model is the need to develop a strong patient–physician relationship [3•]. Another challenge is to provide adequate quality treatment information for the patient to understand the risks, benefits, and outcomes surrounding various treatment alternatives [2]. SDM aims to correct informational and power asymmetry between physicians and patients by equalizing contributing roles for the patient’s well-being to keep treatment decisions patient centered [8]. Informed consent ethically and legally allows the patient the right to SDM prior to any form of treatment [9]. Incorporating patient goals into healthcare decisions has been shown to increase patient satisfaction, compliance, and outcomes [10–12]. These effects, in turn, drive healthcare providers to be both more receptive to patient preferences and values and more able to practice SDM [11].

Recent studies have demonstrated the need to employ a shared decision-making approach due to varied patient preferences, knowledge, and decision-making practices and capabilities. Studies evaluating decision making in the orthopedic population have demonstrated that differences in age [13], gender [14], ethnicity, socioeconomic status, and social network interactions impact patient knowledge about total joint arthroplasty (TJA) and preferences regarding elective surgery [13, 14]. Minorities and low-socioeconomic status-patients perceive benefits and risks of TJA more negatively than Caucasians or individuals of higher status [15]. A higher education and income are associated with greater knowledge during the decision-making process as well [16•]. In contrast, among patients with similar levels of education, no significant difference in baseline knowledge was reported between Hispanics, Asians, African Americans, and Caucasians [17]. Patients with private insurance were 2.7 times more likely than patients with Medicare to decide on treatment during their initial visit [16•]. Women were less likely to undergo surgery due to concern for inability to perform daily caregiving roles with poor outcomes.

Men appeared to be more willing to consider surgery and undergo the procedure earlier [14]. These differences in patient knowledge, preferences, and decision making may lead to ethnic and social disparities with regards to the treatment options for arthritis, including TJA, highlighting the need for development of a SDM process.

Although patients desire information, studies show that physicians consistently underestimate the amount they wish to receive [18]. Variable levels of patient participation in decision-making still remain, despite knowledge from studies that demonstrate patients’ desire to actively participate [3•, 4, 18–22]. For example, patients with trigger finger or carpal tunnel syndrome were assessed to see what decision-making model they preferred compared to physicians. In both studies, patients preferred to make their own decisions for treatment, while physicians preferred the SDM model [23, 24]. A survey of orthopedic physicians conducted by the American Academy of Orthopedic Surgeons reported that patients who have a physician who “listens to patients” and “spends enough time to listen” were very important qualities. However, only 13.3% of patients thought their physician “spent enough time to listen”, compared with 71.3% of physicians who thought they “spent enough time to listen” to patients during interactions [25]. Studies of musculoskeletal patients have found a direct correlation between time spent with patients and patient satisfaction, especially when additional time was focused on SDM [26, 27]. Therefore, orthopedic surgeons must be knowledgeable on the concept, practice, and current outcome data of SDM practices to improve care delivery; these studies demonstrate the importance of incorporating patient preferences in decision making. [3•, 12].

Patients’ decision aids are tools to facilitate shared decision-making for patients and physicians when there may be no clear treatment option [3•]. These aids provide information on different treatment options and their associated risks and benefits to help with the decision-making process [5, 28]. They may be used before, during, or after a patient’s medical appointment. The patients’ decision aids are designed to provide accurate information about the condition, options, outcomes, and probabilities of different treatment strategies, with the goals of helping clarify patients’ ability to evaluate the outcomes that matter most to them, and guiding patients in the steps of deliberation and communication to make a choice that matches their values.

Patients’ decision aids should not be confused with patient education programs. Patient education programs provide information on treatment that has already been prescribed [29]. Decision aids may bridge the knowledge gap between patients and physicians [30, 31]. The content of these aids may include treatment strategies and outcomes, patient testimonials, and exercises that assist patients in clarifying personal preferences [5, 29, 32, 33]. Experts design each aid specifically based on the medical diagnosis and current efficacious treatment

options. Content includes current evidence from national and international guidelines and publications that requires a comprehensive review by the patient to help facilitate the decision-making process. The design of decision aids should conform to the International Patient Decision Aid Standards [31]. This international collaboration has developed quality criteria for content, development, and evaluation. Multiple studies have assessed the impact of these aids on patient knowledge and the decision making process, outcomes, and clinical work flow [17, 30, 35, 38].

In one study, patients suffering from intervertebral disc herniation, spinal stenosis, or spondylolisthesis either watched or did not watch a decision aid video prior to making a treatment decision. Among those that watched the video, treatment preferences shifted more (37.9 vs. 20.8%, $p < 0.0001$), and a greater certainty was achieved in treatment decisions (26.2 vs. 11.1%, $p < 0.0001$) compared to the group that did not watch the video [34]. In another study, families reported improvement in knowledge gain, satisfaction, and decisional conflict in children with neuromuscular scoliosis [35]. The use of a decision aid compared with usual education for osteoarthritis patients considering total knee arthroplasty demonstrated that patients exposed to a decision aid had higher decision quality based on knowledge (71 vs. 47%, $p < 0.0001$), and the decision was more consistent with their values for option outcomes (56.4 vs. 25%, $p < 0.001$) [36].

Several studies have examined the impact of shared decision making on the decision-making process and treatment choices. A study involving a video compared knowledge and expectations between African American and Caucasian veterans; both groups thought the video was useful for decision-making. However, expectations for African Americans improved from baseline compared with Caucasian patients. This improvement suggests a potential change of baseline decisional disparities between the two groups. Decision conflict scores also decreased from 39.4 to 25.8 ($p = 0.001$), and knowledge of total knee arthroplasty efficacy increased from 31 to 77% ($p = 0.05$) after intervention [37]. Another study involving medically appropriate hip and knee arthroplasty candidates evaluated SDM compared with usual care. The SDM group received a digital videodisk and booklet describing the natural history and treatment alternatives. The group participating in SDM had 58% of patients reach informed consent during the first visit, compared with 33% in the usual care group ($p = 0.005$). The SDM group reported a higher confidence in knowing what questions to ask their physician ($p = 0.034$), asked more appropriate questions ($p < 0.0001$), had a higher satisfaction with the efficiency of visits ($p < 0.0001$), and a higher overall satisfaction ($p < 0.0001$) [38]. Another study found that only 3% of patients with stable ankle fractures preferred treatment with a cast versus a regimen of rest, ice, and use of an ankle brace, emphasizing the importance of patient preferences in treatment decisions [39].

The optimal format for decision aids for each condition is not known, but to optimize the use of decision aids in practice, their development, and use must be practical and clinically useful. A study involving patients with hip or knee osteoarthritis divided them into two groups, both given a program booklet, and one group also was given a videodisk. Both groups improved knowledge and willingness to participate in the decision-making process. However, the addition of the videodisk did not significantly improve patient acceptance or knowledge when compared to the booklet alone; it only increased medical costs [31]. In contrast, a similar study involving surgical candidates with low back pain showed the combination resulted in a larger gain from baseline scores and that patients preferred the videodisk [40]. Other studies have suggested patients prefer videodisk formats as well. [37, 41–44]. Another study compared patients receiving a video decision aid to patients receiving the video decision aid along with health coaching by phone. The addition of health coaching helped more patients make a treatment decision at 2 weeks following the initial visit compared to just the decision aid group (74 vs. 52%, $p < 0.01$). However, at 6 months, surgical interventions and patient satisfaction ratings were similar between both groups. [45] Use of decision aids prior to meeting with the orthopedic surgeon can save time during the patient–physician encounter by allowing patients to be more knowledgeable prior to discussion and redirecting time to other matters in the outpatient clinic [46]. In addition, reduction of decisional conflict may improve patient participation and satisfaction [41]. A study of 141 decision-making discussions on orthopedic surgeries did not require significantly longer office visits when shared decision making was involved [47]. Information on realistic surgical expectations may also decrease the overuse of surgical treatments [28]. Exposing patients to a decision aid compared with usual care reduced the number of major elective invasive surgeries in favor of more conservative options (RR 0.79; 95% CI 0.68 to 0.93; $n = 15$) [48].

There are some significant challenges to the process of incorporating SDM into practice in the orthopedic patient population. Mechanisms and infrastructure for the use of decision aids and SDM in practice need to be developed. Furthermore, patients and physicians need experience and training in the practice of SDM. One study interviewed elderly patients unwilling to undergo TJA and revealed that these patients had difficulty expressing assumptions and expectations for orthopedic surgery, hindering the possibility of using the SDM model in practice [13]. Patients with lower health literacy may be less comfortable having their preferences incorporated into their treatment decisions [49]. Establishing an elderly patient's cognitive function and decisional capacity with dementia is very important for patient consent prior to orthopedic surgery [50]. Using a capacity-adjusted approach to SDM can assess mental function, awareness, orientation, memory, and attention to preoperative and postoperative instructions

and may help obtain true informed consent in this population [50•, 51]. Mentally capable patients undergoing total hip arthroplasty recall only 38% of verbal information and 48% of written information [52]. A similar study in patients with spinal deformity determined a median recall of 45% after a discussion and video, and only 18%, 6 to 8 weeks postoperatively [53]. If cognitive function is impaired, inviting support persons to attend preoperative consultations, providing tailored decision aids and coaching for patients and families, and integrating capacity-adjusted SDM into regular workflow are recommended. Involving family members preoperatively can help all patients adhere to postoperative regimens, because they will most likely be assisting in home patient care [50•]. The use of capacity-sensitive patients' decision aids and cognitive patient assessment prior to the physician visit optimizes limited consultation time for patients with cognitive impairment and can help with these challenges while improving clinical efficiency [50•, 54].

Conclusion

Patient involvement in clinical decision-making is increasing. There is increasing evidence that the use of decision aids and shared decision making can improve patient knowledge and satisfaction, as well as reducing decision conflict regarding treatment decisions. However, challenges to the successful incorporation of shared decision making into orthopedic practice remain, and further research is needed to determine the optimal physician and patient education, decision aids, and workflow modifications to enhance incorporation of shared decision making in orthopedic surgery.

Compliance with ethics guidelines

Conflict of interest All authors declare that they have no conflict of interest.

Human and animal rights and informed consent This article does not contain any studies with human or animal subjects performed by any of the authors.

References

- Smith MA. The role of shared decision making in patient-centered care and Orthopaedics. *Orthop Nurs*. 2016;35:144–9.
- Charles C, Whelan T, Gafni A. What do we mean by partnership in making decisions about treatment? *BMJ*. 1999;319:780–2.
- Slover J, Shue J, Koenig K. Shared decision-making in orthopaedic surgery. *Clin Orthop Relat Res*. 2012;470:1046–53. **Prior comprehensive review of shared decision making in orthopaedic surgery that sets the foundation for an updated review.**
- Arora NK, McHorney CA. Patient preferences for medical decision making: who really wants to participate? *Med Care*. 2000;38:335–41.
- Barry MJ. Health decision aids to facilitate shared decision making in office practice. *Ann Intern Med*. 2002;136:127–35.
- Draeger RW, Stern PJ. Patient-centered care in medicine and surgery: guidelines for achieving patient-centered subspecialty care. *Hand Clin*. 2014;30:353–9. **vii**
- Vranceanu AM, Cooper C, Ring D. Integrating patient values into evidence-based practice: effective communication for shared decision-making. *Hand Clin*. 2009;25:83–96. **vii**
- Charles C, Gafni A, Whelan T. Shared decision-making in the medical encounter: what does it mean? (or it takes at least two to tango). *Soc Sci Med*. 1997;44:681–92.
- Sutherland C, Holleb A. Liability issues. *Cancer*. 1989;64:2694–5.
- Kaplan SH, Greenfield S, Gandek B, Rogers WH, Ware Jr JE. Characteristics of physicians with participatory decision-making styles. *Ann Intern Med*. 1996;124:497–504.
- Frosch DL, Kaplan RM. Shared decision making in clinical medicine: past research and future directions. *Am J Prev Med*. 1999;17:285–94.
- Lavallee DC, Chenok KE, Love RM, et al. Incorporating patient-reported outcomes into health care to engage patients and enhance care. *Health Aff (Millwood)*. 2016;35:575–82.
- Hudak PL, Armstrong K, Braddock 3rd C, Frankel RM, Levinson W. Older patients' unexpressed concerns about orthopaedic surgery. *J Bone Joint Surg Am*. 2008;90:1427–35.
- Karlson EW, Daltroy LH, Liang MH, Eaton HE, Katz JN. Gender differences in patient preferences may underlie differential utilization of elective surgery. *Am J Med*. 1997;102:524–30.
- Hawker GA. Who, when, and why total joint replacement surgery? The patient's perspective. *Curr Opin Rheumatol*. 2006;18:526–30.
- Youn J, Chan V, Belkora J, Bozic KJ. Impact of socioeconomic factors on informed decision making and treatment choice in patients with hip and knee OA. *J Arthroplast*. 2015;30:171–5. **Evaluates patient socioeconomic factors with different barriers that independently influence the shared decision making process.**
- Shue J, Karia RJ, Cardone D, Samuels J, Shah M, Slover JD. A randomized controlled trial of two distinct shared decision-making aids for hip and knee osteoarthritis in an ethnically diverse patient population. *Value Health*. 2016;19:487–93.
- Strull WM, Lo B, Charles G. Do patients want to participate in medical decision making? *JAMA*. 1984;252:2990–4.
- Deber RB, Kraetschmer N, Irvine J. What role do patients wish to play in treatment decision making? *Arch Intern Med*. 1996;156:1414–20.
- Deber RB, Kraetschmer N, Urowitz S, Sharpe N. Do people want to be autonomous patients? Preferred roles in treatment decision-making in several patient populations. *Health Expect*. 2007;10:248–58.
- Levinson W, Kao A, Kuby A, Thisted RA. Not all patients want to participate in decision making. A national study of public preferences. *J Gen Intern Med*. 2005;20:531–5.
- Say R, Murtagh M, Thomson R. Patients' preference for involvement in medical decision making: a narrative review. *Patient Educ Couns*. 2006;60:102–14.
- Doring AC, Hageman MG, Mulder FJ, et al. Trigger finger: assessment of surgeon and patient preferences and priorities for decision making. *J Hand Surg Am*. 2014;39:2208–13. **e2**
- Hageman MG, Kinaci A, Ju K, et al. Carpal tunnel syndrome: assessment of surgeon and patient preferences and priorities for decision-making. *J Hand Surg Am*. 2014;39:1799–804. **e1**

Papers of particular interest, published recently, have been highlighted as:

- Of importance

25. Frymoyer JW, Frymoyer NP. Physician–patient communication: a lost art? *J Am Acad Orthop Surg*. 2002;10:95–105.
26. O'Neill J, Williams JR, Kay LJ. Doctor–patient communication in a musculoskeletal unit: relationship between an observer-rated structured scoring system and patient opinion. *Rheumatology (Oxford)*. 2003;42:1518–22.
27. Dugdale DC, Epstein R, Pantilat SZ. Time and the patient-physician relationship. *J Gen Intern Med*. 1999;14(Suppl 1):S34–40.
28. O'Connor AM, Stacey D, Entwistle V, et al. Decision aids for people facing health treatment or screening decisions. *Cochrane Database Syst Rev*. 2003;CD001431.
29. Molenaar S, Sprangers MA, Postma-Schuit FC, et al. Feasibility and effects of decision aids. *Med Decis Mak*. 2000;20:112–27.
30. de Achaval S, Fraenkel L, Volk RJ, Cox V, Suarez-Almazor ME. Impact of educational and patient decision aids on decisional conflict associated with total knee arthroplasty. *Arthritis Care Res (Hoboken)*. 2012;64:229–37.
31. Ten Have IA, van den Bekerom MP, van Deurzen DF, Hageman MG. Role of decision aids in orthopaedic surgery. *World J Orthop*. 2015;6:864–6.
32. Deber RB. Physicians in. health care management: 8. The patient-physician partnership: decision making, problem solving and the desire to participate. *CMAJ*. 1994;151:423–7.
33. Evans R, Elwyn G, Edwards A. Making interactive decision support for patients a reality. *Inform Prim Care*. 2004;12:109–13.
34. Lurie JD, Spratt KF, Blood EA, Tosteson TD, Tosteson AN, Weinstein JN. Effects of viewing an evidence-based video decision aid on patients' treatment preferences for spine surgery. *Spine (Phila Pa 1976)*. 2011;36:1501–4.
35. Shirley E, Bejarano C, Clay C, Fuzzell L, Leonard S, Wysocki T. Helping families make difficult choices: creation and implementation of a decision aid for neuromuscular scoliosis surgery. *J Pediatr Orthop*. 2015;35:831–7.
36. Stacey D, Hawker G, Dervin G, et al. Decision aid for patients considering total knee arthroplasty with preference report for surgeons: a pilot randomized controlled trial. *BMC Musculoskelet Disord*. 2014a;15:54.
37. Weng HH, Kaplan RM, Boscardin WJ, et al. Development of a decision aid to address racial disparities in utilization of knee replacement surgery. *Arthritis Rheum*. 2007;57:568–75.
38. • Bozic KJ, Belkora J, Chan V, et al. Shared decision making in patients with osteoarthritis of the hip and knee: results of a randomized controlled trial. *J Bone Joint Surg Am*. 2013;95:1633–9. **Results of clinical trial provide evidence supporting benefits to surgeons and patients using shared decision making in orthopaedic practice.**
39. Hutchinson RH, Barrie JL. The effects of shared decision making in the conservative management of stable ankle fractures. *Injury*. 2015;46:1116–8.
40. Phelan EA, Deyo RA, Cherkin DC, et al. Helping patients decide about back surgery: a randomized trial of an interactive video program. *Spine (Phila Pa 1976)*. 2001;26:206–11. discussion 12.
41. Fraenkel L, Rabidou N, Wittink D, Fried T. Improving informed decision-making for patients with knee pain. *J Rheumatol*. 2007;34:1894–8.
42. Adam JA, Khaw FM, Thomson RG, Gregg PJ, Llewellyn-Thomas HA. Patient decision aids in joint replacement surgery: a literature review and an opinion survey of consultant orthopaedic surgeons. *Ann R Coll Surg Engl*. 2008;90:198–207.
43. Spunt BS, Deyo RA, Taylor VM, Leek KM, Goldberg HI, Mulley AG. An interactive videodisc program for low back pain patients. *Health Educ Res*. 1996;11:535–41.
44. Perestelo-Perez L, Perez-Ramos J, Gonzalez-Lorenzo M, Rivero-Santana A, Serrano-Aguilar P. Decision aids for patients facing health treatment decisions in Spain: preliminary results. *Patient Educ Couns*. 2010;80:364–71.
45. Kearing S, Berg SZ, Lurie JD. Can decision support help patients with spinal stenosis make a treatment choice?: a prospective study assessing the impact of a patient decision aid and health coaching. *Spine (Phila Pa 1976)*. 2016;41:563–7.
46. Washington K, Shacklady C. Patients' experience of shared decision making using an online patient decision aid for osteoarthritis of the knee—a service evaluation. *Musculoskeletal Care*. 2015;13:116–26.
47. Braddock 3rd C, Hudak PL, Feldman JJ, Bereckneyi S, Frankel RM, Levinson W. "Surgery is certainly one good option": quality and time-efficiency of informed decision-making in surgery. *J Bone Joint Surg Am*. 2008;90:1830–8.
48. Stacey D, Legare F, Col NF, et al. Decision aids for people facing health treatment or screening decisions. *Cochrane Database Syst Rev*. 2014b;CD001431.
49. Youm J, Chenok KE, Belkora J, Chiu V, Bozic KJ. The emerging case for shared decision making in orthopaedics. *Instr Course Lect*. 2013;62:587–94.
50. • Ho A, Pinney SJ, Bozic K. Ethical concerns in caring for elderly patients with cognitive limitations: a capacity-adjusted shared decision-making approach. *J Bone Joint Surg Am*. 2015;97:e16. **Describes capacity adjusted approaches to shared decision models for patients with cognitive impairment undergoing surgical procedures.**
51. Moskop JC. Informed consent and refusal of treatment: challenges for emergency physicians. *Emerg Med Clin North Am*. 2006;24:605–18.
52. Langdon IJ, Hardin R, Learmonth ID. Informed consent for total hip arthroplasty: does a written information sheet improve recall by patients? *Ann R Coll Surg Engl*. 2002;84:404–8.
53. Saigal R, Clark AJ, Scheer JK, et al. Adult spinal deformity patients recall fewer than 50% of the risks discussed in the informed consent process preoperatively and the recall rate worsens significantly in the postoperative period. *Spine (Phila Pa 1976)*. 2015;40:1079–85.
54. Schillinger D, Piette J, Grumbach K, et al. Closing the loop: physician communication with diabetic patients who have low health literacy. *Arch Intern Med*. 2003;163:83–90.