Original Article

The development of a decision aid to elicit treatment preferences for displaced femoral neck fractures

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Abstract

Background: Decision aids help physicians convey information to patients and enable patients to be involved in the decision-making process. There is a lack of use of decision aids in the orthopedic literature. The purpose of this study was to develop a decision board to elicit preferences for treatment of displaced femoral neck fractures in patients over 60 years old.

Materials and Methods: We developed a decision board presenting descriptions and potential outcomes and complications of two treatment options, hemiarthroplasty (HA) and internal fixation (IF), for displaced femoral neck fractures. Five orthopedic surgeons evaluated the face and content validity of the decision board and 10 volunteers completed "scope tests" to determine the comprehensibility. We then presented the decision board to 108 study participants faced with the scenario of sustaining a displaced femoral neck fracture. Participants stated their preference for operative procedure and described the reasons for their choices.

Results: The decision board achieved good face and content validity. All participants in the scope tests appropriately switched their preference to the other modality when probabilities were altered. Most participants found the decision board easy to understand and helpful in making an informed decision. Also, most participants were satisfied with the amount of information presented and with the use of the decision board as a decision making tool. Sixty-one participants (56%) chose IF as their operative procedure of choice quoting less blood loss, shorter operative time, and less invasiveness as the top factors that contributed to this choice. Participants who preferred HA (44%) did so primarily due to the lower re-operation rate.

Conclusions: The decision board is a useful and reliable tool to inform patients about the treatment options for displaced femoral neck fractures. They should be utilized by surgeons to incorporate patients' preferences into the decision-making process.

Key words: Decision aid, decision board, femoral neck fracture, hemiarthroplasty, internal fixation

Introduction

As the paradigm in medicine shifts to evidence-based decision-making and the literature remains comprised of an abundance of often conflicting evidence providing patients with unbiased and accurate information can be challenging. Therefore, strides and innovative techniques must be taken to develop and implement resources that can assist physicians in conveying information to patients.[1]

Decision boards are visual aids that helps physicians convey information to patients in an unbiased fashion, and in turn, enables patients to reveal their true preference.[2] There is little evidence in the orthopedic literature detailing the effectiveness of decision aids in clinical practice.[3] However, there is an increasing interest in these tools as evidenced by a recent survey of 272 orthopedic surgeons in the United Kingdom which found that most surgeons perceived decision aids to be a 'good idea' or an 'excellent idea' for elective hip and knee replacements.[3] Decision aids are also proving useful in the management of patients with chronic pain due to osteoarthritis as they enable patients to elicit their concerns prior to a surgical consultation.[4]

Treatment of displaced femoral neck fractures is one of the most important, yet controversial, topics in the orthopedic literature. These fractures constitute a medical, social, and economic challenge for the healthcare system and result in a substantial impairment of independence and quality of life, a 30% annual mortality rate and healthcare costs exceeding nine billion dollars per annum.[5-7] The optimal treatment

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Access this article online	
Quick Response Code:	Website: www.ijoonline.com
	DOI: 10.4103/0019-5413.91631

of these fractures in patients older than 60 years old, and especially those between 60 and 80 years is controversial. Available options include total hip arthroplasty (THA), hemiarthroplasty (HA) and internal fixation (IF). IF can be performed with less operative time and blood loss than HA, but is associated with higher complication rates (25% to 57%) and consequently higher reoperation rates (18% to 57%).[8-10] Complications of HA (such as dislocations and prosthetic loosening) are less common, resulting in a reoperation rate of 0% to 23%.[9] Most orthopedic surgeons, however, favor HA relative to IF and THA in the older patient population.[11]

When two or more treatment options exist with different potential benefits and limitations, clinicians should incorporate patients' values and beliefs into the decision-making process.[12] To our knowledge, no investigators have attempted to measure patients' preferences for the management of displaced femoral neck fractures. Therefore, we designed a decision board to convey descriptions of different treatment options (HA and IF), their expected outcomes and potential complications to non-physicians. Our objective was to develop a decision board to help surgeons inform patients and elicit preferences about treatment options for displaced femoral neck fractures in the elderly.

Materials and Methods

We followed the accepted methodology for the development of a decision board[2,13-19] and ensured that the board fulfilled the CREDIBLE Criteria[20] for assessing the quality of decision aids. A systematic review was conducted to identify randomized controlled trials and meta-analyses examining the treatment of femoral neck fractures. We searched MEDLINE (1966 to January 2005) with the following terms: *Femoral neck fracture* AND *prosthesis* OR *fixation*. No language restriction was applied. The bibliographies of all retrieved publications were reviewed for additional relevant articles. The article titles and abstracts were assessed to determine if the study involved treatment of displaced femoral neck fractures with either prosthetic replacement or internal fixation. We abstracted data from eligible studies regarding the treatment groups, interventions, duration of hospitalization, functional outcome, and rates of complications (blood transfusion, superficial and deep infections, reoperation, and mortality rate). We identified 16 randomized controlled trials and 2 meta-analyses of randomized trials. We updated the meta-analysis by Masson *et al.* to include three randomized controlled trials published after that meta-analysis.[21-23]

A focus group composed of five orthopedic surgeons, an orthopedic resident, and an expert in decision board development was assembled to determine what information should be included in the decision board. Based on their recommendations, we included background about femoral neck fractures, a description of the two treatment options (IF and HA), and their respective outcomes and risks.

Decision boards have been extensively tested and shown to be valid, reliable, and easily administered tools.[2,17,24] Our decision board was pre-tested on five healthy volunteers to check for clarity of language. The layout of the board and some wording of the options were changed as recommended by the pre-testers. Five academic orthopedic surgeons reviewed the decision board to assess the face and content validity of the board and provide suggestions. The comprehensibility of the decision board was tested on 10 healthy volunteers using "scope tests" which consisted of changing the information on the decision board and determining whether the preferences changed in a predictable manner. For example, if a respondent chose IF, we increased the probability of patients who would need blood transfusions in the IF group from 2% to 20% (close to the HA group) and reassessed the preference again. We predicted that the participant's preference would change to HA when we reduced the benefits of IF. Similarly, if a respondent chose HA initially, the probability of patients who would need another operation within one year in the HA group was increased from 12% to 30% (close to the IF group) and then the preference was reassessed again. We expected a switch of preference with this change in information.

The decision board consisting of a description of the procedures,[10] the expected outcomes, and the possible risks [Figure 1]. We used the terms "metallic screws" and "metallic ball" to avoid bias by introducing the words "fixation" and "replacement". We presented the outcomes as probabilities with uncertainty using the phrase, "out of 100 patients who will have this procedure, a certain number will develop the complication indicated". An optional card about risks of blood transfusion, published by our institution, was supplied upon request [Figure 2].

We evaluated the decision board in a clinical practice setting. Approval was obtained from the ethics boards of two hospitals (one community-based and one university-based). Participants were healthy volunteers over the age of 18 and were excluded if they had previously suffered a femoral neck fracture since their choice may be biased towards (or against) the treatment option that they previously received. These participants were mainly selected from orthopedic or fracture clinics at the two hospitals.

A total of 108 participants were recruited and presented with the following hypothetical scenario: "You are a 65 year old who slips on ice while walking. You are taken to the nearest hospital and after careful physical and radiographic

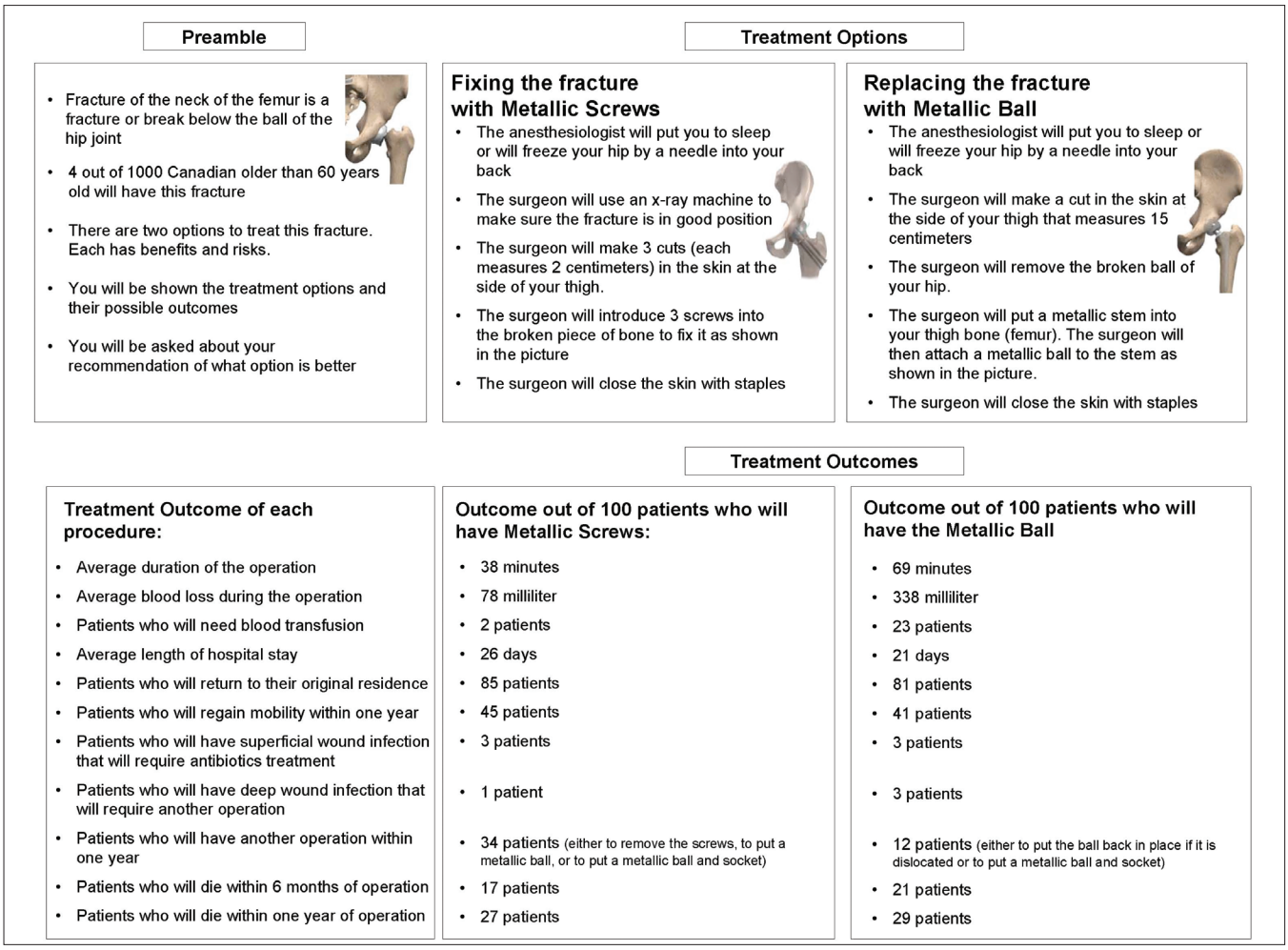

Figure 1: An illustration of the decision board

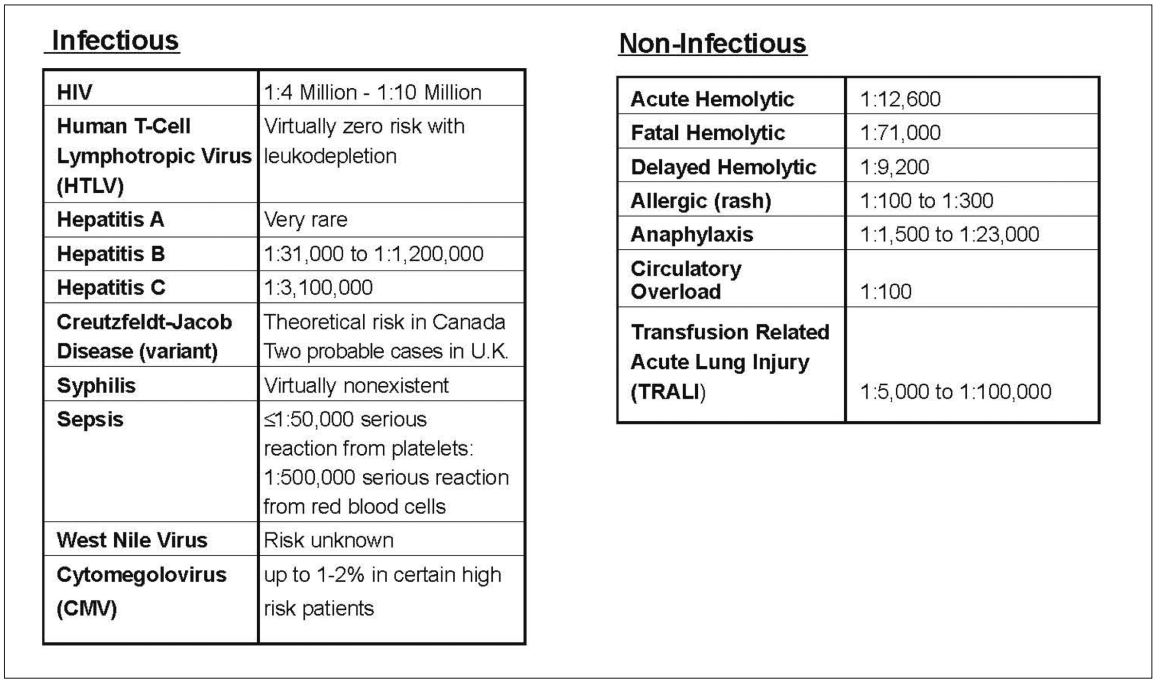

Figure 2: An illustration of the cards containing the risks of transfusion which were given to participants upon request

examinations, you are told you have a femoral neck fracture (a fracture of the long thigh bone at the hip level). The orthopedic surgeon tells you that there are two treatment options for this type of fracture." We then presented the decision board to each participant, highlighting the treatment options, expected outcomes, and possible risks of each.

Participants were asked for their preference of treatment option. We insured that those participants who chose IF were aware that reoperation might mean that they would require HA. This was explicitly stated on the decision board and was verbally mentioned in the interview as well in most cases. Then, they were asked to rate the strength of their choice on a 7-point scale (1- I definitely prefer the metallic ball option; 4- I am indifferent; 7- I definitely prefer the metallic screws option). The reason for choosing a specific option was recorded for each respondent.

When the interview was over, the participants completed a questionnaire on socio-demographic variables (gender, age, race, educational level, occupation, and income), previous history of fractures, and an evaluation for the acceptability and satisfaction of using the decision board as a tool to provide information about treatment options and their risks and benefits. Acceptability of the decision board was assessed by asking participants questions about how well they understood the decision board, its usefulness in helping them make a decision, and whether they would recommend it for others. Satisfaction was assessed in regards to the amount of information provided, the use of the decision board as a method to present material, and the use of the decision board as a decision-making tool.

For each study, we calculated the mean differences for continuous outcomes. When possible, we pooled the estimates from individual trials based on sample size. Group data were summarized in terms of frequencies and percentages.

Results

All five orthopedic surgeons agreed with the content of the decision board and no further suggestions were offered. Of the 10 participants in the scope tests, 6 (60%) chose IF and 4 (40%) chose HA. All participants appropriately switched their preference to the other modality when the probabilities were altered.

Generally, interviews took 15-20 minutes to administer. Eighty-three percent participants completed the acceptability and satisfaction questionnaire. Of those, 94% reported that the decision board was easy to understand, 93% indicated that the decision board helped them make a decision, and 89% recommended that the decision board should be used with others. Ninety-two percent participants stated that they were satisfied with the use of the decision board as a method for presenting information, 81% were satisfied with the amount of information presented, and 82% were satisfied with the use of the decision board as a decision-making tool.

The mean age of participants was 44.1 years (range, 18 to 78 years); 20% were older than 60 years, 70% had some postsecondary education, and 41% were female [Table 1].

Out of the 108 participants, 61 (56%) chose IF as their preferred treatment of choice. Less blood loss (61%), shorter operation time (34%), less mortality (20%), and less invasiveness (20%) were the main factors that contributed to the choice of IF as the preferred treatment option [Table 2]. Ninety-four percent of the participants who chose HA (44%) stated that lower re-operation rate was the chief reason for their choice [Table 3].

Out of the 20 participants over the age of 60, 11 (55%) chose IF as their preferred treatment option. The reasons for preferring IF relative to HA in participants over 60 years old were less blood loss (63%), shorter operation time (36%), less mortality (9%), and less invasiveness (9%) [Table 2]. All of those who preferred HA did so because of the reoperation rate [Table 3].

Table 1: Participants' demographics

Demographic category	HA (*n*=47) (%)	IF (*n*=61) (%)	Total (*n*=108) (%)
Gender			
M	26/44 (59)	32/55 (58)	58/99 (59)
F	18/44 (41)	23/55 (42)	41/99 (41)
Age			
<60 years	34/43 (79)	44/55 (80)	78/98 (80)
>60 years	9/43 (21)	11/55 (20)	20/98 (20)
Education level			
High school	14/44 (32)	15/54 (28)	29/98 (30)
Some post-secondary	30/44 (68)	39/54 (72)	69/98 (70)
Income			
$0 - $40,000	12/38 (32)	22/51 (43)	34/89 (38)
$40,000 - $80,000	23/38 (60)	24/51 (47)	47/89 (53)
>$80,000	3/38 (8)	5/51 (10)	8/89 (9)

Table 2: Participants' cited reasons for preferring IF

Reasons for choosing IF	All participants (*n*=61) (%)	Participants >60 years (*n*=11) (%)
Less bleeding	37 (61)	7 (63)
Shorter operative time	21 (34)	4 (36)
Less mortality	12 (20)	1 (9)
Less invasive	11 (20)	1 (9)
Less infection	10 (16)	1 (9)
Better mobility	6 (10)	
Cosmetic	3 (5)	

Table 3: Participants' cited reasons for preferring HA

Reasons for choosing HA	All participants (*n*=47) (%)	Participants >60 years (*n*=9) (%)
Less reoperation	44 (94)	9 (100)
Shorter hospital stay	5 (11)	

Discussion

There has been a calling in the orthopedic literature to change the surgeon-patient encounter. Bryant *et al.*[25] proposed and encouraged increasing communication between surgeons and patients to promote patient participation in decision-making. They suggested an increased use of decision aids in the clinical setting to facilitate the presentation of all available treatment options and their respective potential benefits and risks.[25]

Tools like the decision board have been tested extensively and found to be valid, reliable, and easy to use. Many studies have shown that decision boards improve patients' knowledge as well as ability to participate in decision making.[2,17,20,24] Increasing patients' involvement in their care changes patient behavior and increases compliance with treatment.[26,27] O'Connor *et al.*[28] recently carried out a systematic review of 55 randomized controlled trials evaluating the efficacy of decision aids compared to no aid, usual care, or an alternative intervention. The review illustrated that patients who used a decision aid had greater knowledge and less decisional conflict due both to feeling uninformed and feeling unclear about personal values. Furthermore, decision aids reduced the proportion of patients who were passive in the decision-making process.[28] Other studies also showed that patients in the decision board group were more satisfied with decision making following the consultation compared with patients in the conventional consultation group.[16]

This study demonstrates that this decision board is a valid and reliable tool to use for eliciting treatment preferences for displaced femoral neck fractures. The majority of participants found the decision board to be a highly acceptable method as it was easy to understand and enabled them to make an informed decision. Patients were also satisfied with the decision board as a method for presenting information, the amount of information presented to them, and using the decision board as a decision-making aid.

This decision board analysis also found that over half of the participants preferred IF relative to HA for the treatment of displaced femoral neck fractures. The main cited factors for this preference were less blood loss, shorter operative time, lower mortality, and less invasiveness. Although we ensured that participants were aware that reoperation for IF may mean having to undergo HA (or THA) with all its risks, most participants still thought that the previously mentioned factors outweigh the potential risks of reoperation.

However, it is important to note that the mean age of our participants was 44.1 years which is considerably younger than the targeted population (patients over 60 years old). Although a sub-analysis of the results showed that 55% of participants over the age of 60 years still preferred IF relative to HA, yet the preferences of our younger population may be different than preferences of patients above 60 years old. Furthermore, the material in our decision board was based on the data that was available from our literature review-up to January 2005. There have been a large number of recent studies that demonstrate different outcomes for the two treatment options (HA and IF). For example, the latest Cochrane review concluded that there was no difference in mortality rates between IF and HA.[29] Furthermore, many newer studies have evaluated pain scores, functional outcomes, and quality of life improvements after IF or HA. These studies demonstrated a significant increase in functional outcome and quality of life scores for HA relative to IF.[30,31] These factors are likely to influence patients preferences and choices and may change the conclusions of this part of the study. Therefore, it would be important to perform this decision board analysis with updated data and outcomes to patients above 60 years old to evaluate their preferred treatment option for displaced femoral neck fractures.

Nevertheless, this study displays that non-physicians' preferences can be divergent from that of physicians and hence raise the possibility that patients' preferences may also diverge from their physicians. Surgeons might underestimate patients' preference for a less invasive surgery. Many studies have demonstrated the gap in the communication between patients and physicians when it comes to decision-making and choosing treatment options. For example, there is a significant difference between the thresholds of physicians and patients for the risk of excess bleeding deemed acceptable with antithrombotic therapy and the amount of reduction in risk of stroke thought necessary to justify warfarin treatment.[32] Patients are willing to accept a much higher risk of bleeding for an associated reduction in risk of stroke compared to physicians. Furthermore, cancer patients are willing to accept intensive treatment with severe side effects for a much smaller chance of a benefit in terms of cure compared with doctors or nurses.[33]

There are several strengths to this study. We followed rigorous, well-defined methodology to develop and validate the decision aid. We used one-on-one interviews to ensure that all participants understood the questions being asked and provided their true preference. We demonstrated that the decision board is a valuable tool for inquiring about

patients' preferences and incorporating it into the decision-making process.

As mentioned, the sample of participants provides the main limitation to this study. Ideally, we would have involved real patients with femoral neck fractures at the point of decision making rather than relying on healthy members of society. However, at our institution and at most other centers, the decision to perform HA or IF in this patient population is at the discretion of the treating surgeon and most surgeons have strong opinions regarding the optimal treatment modality. Thus, we could not administer the decision board and elicit preferences in patients with femoral neck fractures since they would not be offered the two treatment options in practice. Testing the decision board in a clinical setting and eliciting actual patients' preferences at the time of decision making is a research priority. In order to do this, a system would have to be set up whereby patients over the age of 60 years who suffer a displaced femoral neck fracture are asked about their preferred treatment option through the decision board with surgeons in that institution that are willing to offer the patient the option which they chose. However, since some surgeons may not be equally skilled in both techniques, the patient's choice may require moving to another surgeon.

Participants were given the option of choosing either IF or HA. A do-nothing alternative was not considered in this study because it is not an ethically acceptable option for displaced femoral neck fractures unless the patient has circumstances preventing operative treatment. Moreover, THA was not considered because until recently it was less commonly performed in this population and was reserved for patients with pre-existing osteoarthritis of the hip and it usually requires surgeons with specialty training which represent a small number of surgeons treating displaced femoral neck fractures.

In conclusion, this study demonstrates that our decision board effectively elicited preferences for the treatment of displaced femoral neck fractures and patients were highly satisfied and found the decision board acceptable as a decision making aid. With the debate regarding the surgical treatment of displaced femoral neck fractures unresolved and controversial, patients must become informed and involved in the decision making process. The decision board developed in this current study can help orthopedic surgeons.

References

1. Haynes RB, Devereaux PJ, Guyatt GH. Physicians' and patients' choices in evidence based practice. BMJ 2002;324:1350.
2. Levine MN, Gafni A, Markham B, MacFarlane D. A bedside decision instrument to elicit a patient's preference concerning adjuvant chemotherapy for breast cancer. Ann Intern Med 1992;1171:53-8.
3. 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.
4. Stacey D, Hawker G, Dervin G, Tomek I, Chochran N, Tugwell P, *et al*. Management of Chronic Pain: Improving shared decision making in osteoarthritis. BMJ 2008;336:954-5.
5. Melton LJ 3rd. Hip fractures: A worldwide problem today and tomorrow. Bone 1993;14:S1-8.
6. Papadimitropoulos EA, Coyte PC, Josse RG, Greenwood CE. Current and projected rates of hip fracture in Canada. CMAJ 1997;157:1357-63.
7. Ray NF, Chan JK, Thamer M, Melton LJ 3rd. Medical expenditures for the treatment of osteoporotic fractures in the United States in 1995: Report from the National Osteoporosis Foundation. J Bone Miner Res 1997;12:24-35.
8. Lu-Yao GL, Keller RB, Littenberg B, Wennberg JE. Outcomes after displaced fractures of the femoral neck. A meta-analysis of one hundred and six published reports. J Bone Joint Surg Am 1994;761:15-25.
9. Bhandari M, Devereaux PJ, Swiontkowski MF, Tornetta P 3rd, Obremskey W, Koval KJ, *et al*. Internal fixation compared with arthroplasty for displaced fractures of the femoral neck. A meta-analysis. J Bone Joint Surg Am 2003;85-A:1673-81.
10. Masson M, Parker MJ, Fleischer S. Internal fixation versus arthroplasty for intracapsular proximal femoral fractures in adults. Cochrane Database Syst Rev 2003;2:CD001708.
11. Bhandari M, Devereaux PJ, Tornetta P 3rd, Swiontkowski MF, Berry DJ, Haidukewych G, *et al*. Operative management of displaced femoral neck fractures in elderly patients. An international survey. J Bone Joint Surg Am 2005;87:2122-30.
12. Guyatt GH, Haynes RB, Jaeschke R, Cook D, Green L, Nayler D, *et al*. Introduction: The philosophy of evidence-based medicine. In: Guyatt GH and Rennie D (editor). Users' Guides to the Medical Literature: A Manual of Evidence-Based Clinical Practice. Chicago: American Medical Association; 2002. p. 3-12.
13. Whelan T, Levine M, Gafni A, Sanders K, Willan A, Mirsky D, *et al*. Mastectomy or lumpectomy? Helping women make informed choices. J Clin Oncol 1999;17:1727-35.
14. Whelan T, Gafni A, Charles C, Levine M. Lessons learned from the Decision Board: A unique and evolving decision aid. Health Expect 2000;3:69-76.
15. Whelan T, Sawka C, Levine M, Gafni A, Reyno L, Willan A, *et al*. Helping patients make informed choices: A randomized trial of a decision aid for adjuvant chemotherapy in lymph node-negative breast cancer. J Natl Cancer Inst 2003;95:581-7.
16. Whelan T, Levine M, Willan A, Gafni A, Sanders K, Mirsky D, *et al*. Effect of a decision aid on knowledge and treatment decision making for breast cancer surgery: A randomized trial. JAMA 2004;292:435-41.
17. Matthews DC, Birch S, Gafni A, DiCenso A. Willingness to pay for periodontal therapy: Development and testing of an instrument. J Public Health Dent 1999;59:44-51.
18. Matthews D, Rocchi A, Wang EC, Gafni A. Use of an interactive tool to assess patients' willingness-to-pay. J Biomed Inform 2001;34:311-20.
19. Matthews D, Rocchi A, Gafni A. Putting your money where your mouth is: Willingness to pay for dental gel. Pharmacoeconomics 2002;20:245-55.
20. O'connor AM, Stacey D, Entwistle V, Llewellyn-Thomas H,

Rovner D, Holmes-Rovner M, *et al.* Decision aids for people facing health treatment or screening decisions. Cochrane Database Syst Rev 2003;2:CD001431.
21. Parker MJ, Khan RJ, Crawford J, Pryor GA. Hemiarthroplasty versus internal fixation for displaced intracapsular hip fractures in the elderly. A randomised trial of 455 patients. J Bone Joint Surg Br 2002;84:1150-5.
22. Roden M, Schon M, Fredin H. Treatment of displaced femoral neck fractures: A randomized minimum 5-year follow-up study of screws and bipolar hemiprostheses in 100 patients. Acta Orthop Scand 2003;74:42-4.
23. Tidermark J, Ponzer S, Svensson O, Soderqvist A, Tornkvist H. Internal fixation compared with total hip replacement for displaced femoral neck fractures in the elderly. A randomised, controlled trial. J Bone Joint Surg Br 2003;85:380-8.
24. Whelan TJ, Levine MN, Gafni A, Lukka H, Mohide EA, Patel M, *et al.* Breast irradiation postlumpectomy: Development and evaluation of a decision instrument. J Clin Oncol 1995;13:847-53.
25. Bryant D, Bednarski E. Gafni A. Incorporating patient preferences into orthopaedic practice: Should the orthopaedic encounter change? Injury 2006;37:328-34.
26. Greenfield S, Kaplan SH, Ware JE Jr, Yano EM, Frank HJ. Patients' participation in medical care: Effects on blood sugar control and quality of life in diabetes. J Gen Intern Med 1988;3:448-57.
27. Greenfield S, Kaplan S, Ware JE Jr. Expanding patient involvement in care: Effects on patient outcomes. Ann Intern Med 1985;102:520-8.
28. O'Connor AM, Bennett CL, Stacey D, Barry M, Col NF, Eden KB, *et al.* Decision aids for people facing health treatment or screening decisions. Chochrane Database Syst Rev 2009;8:CD001431.
29. Parker MJ, Gurusamy K. Internal fixation versus arthroplasty for intracapsular proximal femoral fractures in adults. Cochrane Database Syst Rev 2006;4:CD001708.
30. Frihagen F, Nordsletten L, Madsen JE. Hemiarthroplasty or internal fixation for intracapsular displaced femoral neck fractures: Randomised controlled trial. BMJ 2007;335:1251-4.
31. Keating JF, Grant A, Masson M, Scott NW, Forbes JF. Randomized comparison of reduction and fixation, bipolar hemiarthroplasty, and total hip arthroplasty. Treatment of displaced intracapsular hip fractures in healthy older patients. J Bone Joint Surg Am 2006;88:249-60.
32. Devereaux PJ, Anderson DR, Gardner MJ, Putnam W, Flowerdew GJ, Brownell BF,*et al.* Differences between perspectives of physicians and patients on anticoagulation in patients with atrial fibrillation: observational study. BMJ 2001;323:1218-22.
33. Slevin ML, Stubbs L, Plant HJ, Wilson P, Gregory WM, Armes PJ, *et al.* Attitudes to chemotherapy: Comparing views of patients with cancer with those of doctirs, nurses and general public. BMJ 1990;300:1458-60.

How to cite this article: Alolabi B, Shirali J, Bajammal S, Karanicolas PJ, Zlowodzki M, Gafni A, *et al.* The development of a decision aid to elicit treatment preferences for displaced femoral neck fractures. Indian J Orthop 2012;46:22-8.

Source of Support: Nil, **Conflict of Interest:** None.