Are Patients Satisfied With a Web-based Followup after Total Joint Arthroplasty?

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Received: 2 August 2013 / Accepted: 5 February 2014 / Published online: 22 February 2014
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Abstract

Background A web-based followup assessment may be a feasible, cost-saving alternative of tracking patient outcomes after total joint arthroplasty. However, before implementing a web-based program, it is important to determine patient satisfaction levels with the new followup method. Satisfaction with the care received is becoming an increasingly important metric, and we do not know to what degree patients are satisfied with an approach to followup that does not involve an in-person visit with their surgeons. **Questions/purposes** We determined (1) patient satisfaction and (2) patients' preferences for followup method (web-based or in-person) after total joint arthroplasty.

The institution of one or more of the authors (SJM, DN, RM, JH, RB, JM, and DB) has received, during the study period, funding from Physician's Services Incorporated Foundation (Toronto, Ontario, Canada).

All ICMJE Conflict of Interest Forms for authors and *Clinical Orthopaedics and Related Research* editors and board members are on file with the publication and can be viewed on request.

Each author certifies that his or her institution approved the human protocol for this investigation that all investigations were conducted in conformity with ethical principles of research, and that informed consent for participation in the study was obtained.

This work was performed at London Health Sciences Centre, University Hospital and The University of Western Ontario, London, ON, Canada.

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Methods We randomized patients who were at least 12 months after primary THA or TKA to complete a web-based followup or to have their appointment at the clinic. There were 410 eligible patients contacted for the study during the recruitment period. Of these, 256 agreed to participate, and a total of 229 patients completed the study (89% of those enrolled, 56% of those potentially eligible; 111 in the usual-care group, 118 in the web-based group). Their mean age was 69 years (range, 38–86 years). There was no crossover between groups. All 229 patients completed a satisfaction questionnaire at the time of their followup appointments. Patients in the web-based group also completed a satisfaction and preference questionnaire 1 year later. Only patients from the web-based group were asked to indicate preference as they had experienced the web-based and in-person followup methods. We used descriptive statistics to summarize the satisfaction questionnaires and compared results using Pearson's chi-square test.

Results Ninety-one patients (82.0%) in the usual-care group indicated that they were either extremely or very satisfied with the followup process compared with 90 patients (75.6%) who were in the web-based group ($p < 0.01$; odds ratio [OR] = 3.95; 95% CI, 1.79–8.76). Similarly, patients in the usual care group were more satisfied with the care they received from their surgeon, compared with patients in the web-based group (92.8% versus 73.9%; $p < 0.01$, OR = 1.37; 95% CI, 0.73–2.57). Forty-four percent of patients preferred the web-based method, 36% preferred the usual method, and 16% had no preference ($p = 0.01$).

Conclusions Our results show moderate to high satisfaction levels with a web-based followup assessment. Patients who completed the usual method of in-person followup assessment reported greater satisfaction; however, the difference was small and may not outweigh the

additional cost and time-saving benefits of the web-based followup method.

Level of Evidence Level I, therapeutic study. See the Instructions for Authors for a complete description of levels of evidence.

Introduction

Osteoarthritis is one of the most prevalent chronic disorders in patients in Canada and is a leading cause of pain, physical disability, and healthcare utilization [2]. Total joint arthroplasty is a highly effective treatment option for arthritis. The rate of postoperative complications after surgery is low; however, although most patients will return when they have symptomatic problems, periodic review is important to detect clinically silent issues such as osteolysis to ensure timely treatment if those problems go undetected for longer periods.

A web-based method of conducting followups, including review of radiographs and patient symptoms, would allow surgeons to detect such complications. This method could decrease wait times in orthopedic clinics for new patients waiting for their first consultation with the surgeon and patients undergoing other kinds of visits. A more efficient process, with a shift in resources, also potentially could lead to decreased wait times for surgery. This approach also could reduce patient and caregiver burden by decreasing travel, financial, and time requirements involved with followups.

Before implementing a new treatment or model of care such as a web-based followup, it is important to determine patient satisfaction with the method of followup, as evidence suggests that satisfied patients are more likely to comply with treatment protocols [15, 16], to use health care services [9, 12], and to maintain a relationship with their health care provider [19]. In the current study, we therefore determined (1) patient satisfaction and (2) patients' preferences for followup method (web-based or in-person) after total joint arthroplasty.

Patients and Methods

Study Cohorts

We screened a consecutive sample of patients who had a primary THA or TKA at least 12 months earlier. Consenting patients were randomized to complete either a web-based followup assessment or to come to the orthopaedic clinic for their appointment as per our usual protocol. We

used a computer-generated randomization scheme and stratified by length of time postoperative (1–5 years versus ≥ 5 years) and the distance traveled to the clinic (≥ 100 km versus < 100 km). We included all patients who had received a primary TKA or THA and were at least 12 months postoperative approaching their annual followup. We excluded patients who had revision surgery, patients with osteolysis or previous complications, and identified radiographic issues.

There were 410 eligible patients contacted for the study during the recruitment period, of whom 256 agreed to participate, and a total of 229 patients completed the study (89% of those who agreed to participate, 56% of those potentially eligible; 111 in the usual-care group, 118 in the web-based group). Reasons for nonparticipation included: no computer/Internet access ($n = 100$, 24%), having significant problems or pain ($n = 41$, 10%), and a preference to see the surgeon in person ($n = 56$, 14%) (Fig. 1). The mean age of the patients was 69 years (range, 38–86 years) (Table 1).

This study was approved by our institution's research ethics board, and all patients gave informed consent. The trial was registered with ClinicalTrials.gov (NCT01079572).

Followup Protocols

The web-based patients had their radiographs taken at the radiology facility nearest to their home that was connected to the online diagnostic imaging network and completed several quality-of-life and function questionnaires using an electronic database. Automatic email reminders were sent to the patients 1 week before their appointments. They were emailed the website, a unique username and password, and instructions for completing the online questionnaires.

After a patient completed his or her questionnaires and radiographs, an automatic alert was emailed to the surgeon requesting he review the digital images and online responses. The surgeon indicated when he would like to see the patient in clinic (either immediately, within 1 month, within 6 months) if the patient indicated he or she was having problems or if an important finding warranting clinical intervention was detected on the radiographs. If the patient was having no pain or symptoms and there were no problems observed on the radiographs, the patient was scheduled for his or her next followup at the clinic in 1 year.

An email then was sent to the surgeon's administrative assistant to book an appointment in the specified time frame. An email also was sent to the patient indicating when the surgeon would like to see him or her and

Fig. 1 The flow of participants through the trial is shown.

Table 1. Demographic characteristics of participants

Characteristic	Web based (n = 118)	Usual care (n = 111)
Female	66 (55.5%)	61 (56.0%)
Age (years)*	68.8 (10.0)	66.4 (11.5)
Hip	52 (44.1%)	53 (48.2%)
Knee	68 (57.6%)	58 (52.7%)
Time postoperative (years)*	5.0 (3.4)	5.0 (3.2)
Distance from hospital (km)*	101.3 (119.6)	102.1 (173.3)
WOMAC total score*	82.0 (16.3)	81.6 (19.1)
SF-12 Physical Component score*	43.5 (11.1)	41.7 (11.9)
SF-12 Mental Component score*	54.4 (9.5)	53.3 (10.2)

* Mean (standard deviation).

notifying the patient that they would be contacted to book this appointment.

Patients randomized to the usual-care group had their appointment and radiographs at our orthopaedic clinic, which is our usual protocol. These patients completed the same series of questionnaires as the web-based group on paper before their appointments.

Satisfaction and Preference

All patients completed a satisfaction questionnaire at the time of their followups for the study. Satisfaction was rated on a 7-point scale, ranging from extremely dissatisfied to

extremely satisfied. We asked them to rate their satisfaction level with the care they received at the followup and specifically to consider whether they believed that the visit was sufficient to monitor their progress and identify any issues or complications. Patients also reported their satisfaction with the overall process, in which we asked them to consider all aspects involved with the followup, such as travel, time off work, wait time for radiographs, wait time at the clinic, or using the online database (Appendix 1).

Patients in the web-based group also completed a satisfaction questionnaire at their next annual followup at the clinic (approximately 1 year later). Only patients from the web-based group ($n = 118$) were asked to indicate preference as they had experienced the web-based and in-person followups. We asked patients who rated themselves as anything other than completely satisfied to specify which aspects of the web-based followup led to their dissatisfaction. The patients also indicated which method they preferred and the factors that contributed to that choice (Appendix 2).

Statistical Analysis

We used descriptive statistics to summarize the results from the satisfaction and preference questionnaires. We compared satisfaction levels between the two groups using Pearson's chi-square test.

Results

Satisfaction

Patients in the usual-care group were more likely to be extremely or very satisfied with the followup process than those in the web-based group. Ninety-one patients (82.0%) in the usual-care group indicated that they were either extremely or

very satisfied with the followup process compared with 90 patients (75.6%) who were in the web-based group ($p < 0.01$; odds ratio [OR] = 3.95; 95% CI, 1.79–8.76). Similarly, patients in the usual-care group were more satisfied with the care they received from their surgeon compared with patients in the web-based group (92.8% versus 73.9%; $p < 0.01$, OR = 1.37; 95% CI, 0.73–2.57) (Table 2).

Ninety-three of the 118 patients from the web-based group completed the satisfaction questionnaire at the 1-year in-person visit. The majority indicated that they were satisfied with the web-based followup (29% extremely satisfied, 37% very satisfied, 20% somewhat satisfied). Reasons for dissatisfaction included length of time it took to receive results, difficulty using the online database, inability to ask questions and receive immediate feedback, and ability to see their radiographs in person at their appointments (Table 3).

Preference for Web-based versus In-person Followup

Among patients in the web-based group who had experienced the web-based and the in-person followups and

Table 3. Satisfaction with online followup

Satisfaction level	Web group ($n = 118$)	Response time* Mean (range)
Extremely satisfied	27 (29.0%)	48.4 (0–202)
Very satisfied	34 (36.6%)	49 (0–192)
Somewhat satisfied	19 (20.4%)	63.8 (0–480)
Neither satisfied nor dissatisfied	5 (5.4%)	80.6 (10–292)
Somewhat dissatisfied	6 (6.5%)	49.4 (0–130)
Very dissatisfied	2 (2.2%)	48.5 (11–86)

* Length of time between patient completion of followup and surgeon review.

Table 2. Satisfaction with care from surgeon and followup process

Satisfaction level	Number of patients					
	With care from surgeon			With followup process		
	Web-based group ($n = 118$)	Usual-care group ($n = 111$)	Odds ratio* (95% CI), p value	Web-based group ($n = 118$)	Usual-care group ($n = 111$)	Odds ratio* (95% CI), p value
Extremely satisfied	35 (29.4%)	62 (55.9%)	1.37, (0.73 to 2.57), $p < 0.01$	31 (26.1%)	54 (48.6%)	3.95, (1.79 to 8.76), $p < 0.01$
Very satisfied	53 (44.5%)	41 (36.9%)		59 (49.6%)	31 (33.3%)	
Somewhat satisfied	18 (15.1%)	6 (5.4%)		17 (14.3%)	10 (9.0%)	
Neither satisfied nor dissatisfied	7 (5.9%)	0 (0.0%)		6 (5.0%)	0 (0.0%)	
Somewhat dissatisfied	5 (4.2%)	2 (1.8%)		5 (4.2%)	10 (9.0%)	
Very dissatisfied	1 (0.8%)	0 (0.0%)		1 (0.8%)	0 (0.0%)	

* Comparison of satisfied (defined as extremely or very satisfied) versus not satisfied (defined as somewhat satisfied, neither satisfied nor dissatisfied, somewhat dissatisfied, or very dissatisfied) between groups.

Table 4. Comparison of patients by preference of followup method

Variable*	Preference			No preference (n = 19)
	Web-based (n = 27)	Usual (n = 34)	p value	
Age (years)	69.0 (9.0)	67.9 (9.1)	0.83	67.6 (9.2)
Distance (km)	22.2 (37.7)	18.7 (19.0)	0.20	21.7 (36.3)
Time postoperative (years)	4.8 (3.3)	5.5 (3.4)	0.32	3.7 (3.4)

* Mean (standard deviation).

therefore could comment on preference, there was no difference in patient preference for followup method ($p = 0.82$). Forty-one patients (44.1%) preferred the web-based method, 36 patients (38.7%) preferred the usual clinic followup, and 16 (17.2%) had no preference. The main reasons patients preferred the web-based followup were decreased travel (40%), no wait times (44%), ability to have radiographs in home town (33%), and ability to complete followup from home (29%). For patients who preferred the usual method of followup, the main reasons were that they preferred to see the surgeon in person (43%) and to have their radiographs taken at their surgeon's hospital (28%).

There were no differences in age, distance traveled to the clinic, or length of time postoperative between patients who preferred the web-based followup and those who preferred the usual method of followup, suggesting that none of these factors had an influence on choice of preference (Table 4).

Discussion

Routine followups after total joint arthroplasty are a time-consuming process. The rate of postoperative complications after surgery is low; however, regular review is important to detect clinically important issues. A web-based approach decreases financial and time requirements involved with in-person followups, however it is important to determine if patients also are satisfied with a web-based assessment or if they prefer the usual method of in-person followups. Our results show patients who completed the in-person followup reported greater levels of satisfaction than did patients in the web-based group, although there were no differences in preference for followup method.

This study has some limitations. First, although our satisfaction questionnaire was not validated, we structured our questions based on available evidence regarding patient satisfaction measures [1, 7, 10, 18]. Specifically, a noted weakness of satisfaction measures is that if the question is too general, it will not capture what the patient is considering when reporting their satisfaction. We made our

questions specific by providing instructions regarding what the patient was to consider when rating satisfaction, and allowing the patient to provide reasons for their dissatisfaction (Appendix 1) [1, 7, 10, 18]. In addition, we included seven response options, which is recommended, as scales with 7 points show adequate discriminative ability and test-retest reliability [14]. Another potential limitation is that patients may respond differently depending on the format of the questionnaires; however, we conducted a test-retest reliability study that showed excellent agreement between the electronic and paper versions [13], therefore there is no evidence that the format in which the patient completed the quality-of-life survey introduced any bias to the results. Responder bias is almost always an issue in survey studies, and may have been an issue here. A total of 56% of eligible patients completed the study (229 of 410), and it is impossible to know with certainty that participants were entirely representative of the larger group. Finally, patients in the usual-care group have not experienced the web-based followup and therefore have nothing to compare it with when indicating their satisfaction level. It is conceivable that these patients would be less satisfied with the usual method if they had experienced the conveniences of a web-based followup.

We found that patients were more likely to be extremely or very satisfied with the quality of followup when it was delivered in person rather than using our web-based tool. Previous studies have shown lower patient costs and time required for a web-based or virtual orthopaedic consultation [8, 20], therefore the time and cost-saving benefits may outweigh the lower level of satisfaction with the web-based followup experienced by some patients. The use of telemedicine is becoming popular across numerous healthcare fields, with methods such as video and telephone consultations being used to conduct outpatient assessments. Several studies have shown the feasibility and cost-effectiveness of using telemedicine in orthopaedics [3–6, 8, 17, 20, 21], and similar to our results, they report high levels of patient satisfaction. Mair and Whitten [11] conducted a systematic review of studies that involved a patient-satisfaction measure with telemedicine interventions. They reviewed 32 studies across any discipline and concluded that, although the majority report high levels of patient satisfaction, these studies also had many methodologic deficiencies, such as study design and low sample sizes, that limit the validity and generalizability of their findings.

Although patients in the usual-care group reported higher satisfaction scores compared with the web-based group when asked directly about preference for followup method, there was no statistical difference between the two approaches. A possible explanation for this finding was insufficient sample size, as only patients in the web-based

group who had experience with both types of followup were able to comment on preference. In addition, we allowed patients the option of selecting 'no preference', therefore it is not clear which method these patients would prefer if they had to choose between the two. Good et al. [4] also looked at patient preference in a similar study using Skype review among patients with clavicular fractures. They found that 93% of patients preferred the Skype followup because of the convenience and cost-savings compared with the in-person consultation. The higher preference rates in their study may be attributable to the patient population. The mean age of their patients was 36 years, which suggests that younger patients still in the workforce may be more likely to prefer an electronic method of followup.

Our results show moderate to high satisfaction levels with a web-based followup. Patients who completed the usual method of in-person followup reported greater satisfaction; however, the difference was small and may not outweigh the additional cost and time-saving benefits of the web-based followup method. Future study is needed to determine if the suggested improvements to the web-based system by patients in this study will further increase patient satisfaction with an electronic followup method.

Acknowledgments We thank the participants of this study for their time, patience, and cooperation.

Appendix 1. Satisfaction Questionnaire

1. How satisfied are you with the care you received from your surgeon at this followup appointment? Note: Whether your visit occurred in person or over the internet, please consider whether you felt that the visit was sufficient enough to monitor your progress and identify any issues if there were any.

- ☐ Extremely satisfied
- ☐ Very satisfied
- ☐ Somewhat satisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Somewhat dissatisfied
- ☐ Very dissatisfied
- ☐ Extremely dissatisfied

If not satisfied, please provide further comments as to why you were dissatisfied with your care:

This is completely confidential, and your surgeon will not see your response. Please be as open and honest as possible.

2. How satisfied are you with the overall assessment process (not including the care from your surgeon) at your last followup appointment? Note: Please consider all aspects and events involved in visiting with your surgeon (eg, traveling, time off work, waiting for x-rays, waiting for the doctor, locating a computer, making the computer work, inconveniencing a friend or family member).

- ☐ Extremely satisfied
- ☐ Very satisfied
- ☐ Somewhat satisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Somewhat dissatisfied
- ☐ Very dissatisfied
- ☐ Extremely dissatisfied

If not satisfied, please select which factors contributed to your dissatisfaction (Check all that apply):

- ☐ Travel distance
- ☐ Travel time
- ☐ X-ray wait time
- ☐ Clinic wait time
- ☐ Time taken off work
- ☐ Caregiver time
- ☐ Computer access
- ☐ Computer use
- ☐ Other, please specify:

3. How would you rate your joint **PAIN** today, compared to your **PAIN** at your last followup visit?

- ☐ Better
- ☐ The same
- ☐ Worse

If better, how much better?

- ☐ Almost the same, hardly any better at all
- ☐ A little better
- ☐ Somewhat better
- ☐ Moderately better
- ☐ A good deal better
- ☐ A great deal better
- ☐ A very great deal better

If worse, how much worse?

- ☐ Almost the same, hardly any worse at all
- ☐ A little worse
- ☐ Somewhat worse
- ☐ Moderately worse
- ☐ A good deal worse
- ☐ A great deal worse
- ☐ A very great deal worse

4. How satisfied are you that your joint replacement surgery addressed your **PAIN**?

- ☐ Extremely satisfied
- ☐ Very satisfied
- ☐ Somewhat satisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Somewhat dissatisfied
- ☐ Very dissatisfied
- ☐ Extremely dissatisfied

5. How would you rate your joint **FUNCTION** today compared to your last followup visit?

- ☐ Better
- ☐ The same
- ☐ Worse

If better, how much better?

- ☐ Almost the same, hardly any better at all
- ☐ A little better
- ☐ Somewhat better
- ☐ Moderately better
- ☐ A good deal better
- ☐ A great deal better
- ☐ A very great deal better

If worse, how much worse?

- ☐ Almost the same, hardly any worse at all
- ☐ A little worse
- ☐ Somewhat worse
- ☐ Moderately worse
- ☐ A good deal worse
- ☐ A great deal worse
- ☐ A very great deal worse

6. How satisfied are you that your joint replacement surgery addressed your concerns with being able to **FUNCTION** as you would like?

- ☐ Extremely satisfied
- ☐ Very satisfied
- ☐ Somewhat satisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Somewhat dissatisfied
- ☐ Very dissatisfied
- ☐ Extremely dissatisfied

Appendix 2. Satisfaction with Online Followup

1. How satisfied are you with your online follow up? Note: Please consider whether you felt the visit was sufficient enough to monitor your progress and identify any issues you had, if any.

- ☐ Extremely satisfied
- ☐ Very satisfied
- ☐ Somewhat satisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Somewhat dissatisfied
- ☐ Very dissatisfied
- ☐ Extremely dissatisfied

If not completely satisfied, please provide further comments as to why you were dissatisfied with your care:

Please be as open and honest as possible.

2. Which method of followup do you like better?

- ☐ Online followup
- ☐ In person at the clinic (usual care)
- ☐ No preference

3. Please select the factors that contributed to your preferred choice of followup

Online followup (check all that apply):

- ☐ Decreased travel distance
- ☐ Decreased travel time
- ☐ No clinic wait time
- ☐ X-ray in home town/less wait time
- ☐ Less time taken off work
- ☐ Can complete followup from home/work
- ☐ Easy-to-use online database
- ☐ Other, please specify:

Usual method of followup (check all that apply):

- ☐ Prefer to see surgeon in person
- ☐ Prefer to have X-ray done at University Hospital
- ☐ No computer/internet access
- ☐ Difficulty using online database
- ☐ Other, please specify:
- ☐ Other, please specify:
- ☐ Other, please specify:

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