

RESEARCH ARTICLE

Protocols for Management of Underserved Patients Undergoing Arthroplasty: A National Survey of Safety Net Hospitals

David N. Bernstein, MBA, MA; Hao-Hua Wu, MD; Harry E. Jergesen, MD

Research performed at Institute for Global Orthopaedics and Traumatology, Zuckerberg San Francisco General Hospital and Trauma Center, San Francisco, California, USA

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Abstract

Background: Although it has been shown that perioperative protocols enhance arthroplasty care and safety, it is not known how prevalent their use is in safety net hospitals, which operate with a mandate to treat the poor and underserved. Understanding the elements currently included in standard perioperative arthroplasty protocols at various institutions may help guide future interventions and policy aimed at improving underserved patients' outcomes.

Methods: In this cross-sectional study, safety net hospitals were asked to complete a survey over the phone, via email or in person regarding existence and elements of perioperative management protocols for total hip arthroplasty (THA) and total knee arthroplasty (TKA). Implementation barriers were also addressed. Specifically, survey questions sought to determine the total yearly number of arthroplasty procedures performed at each institution and better understand, among other elements, the following: presence of preoperative pain management protocols, inpatient care pathways, use of social workers and involvement of physical therapy services. Descriptive statistics were calculated and reported.

Results: Over 90% of safety net hospitals performing arthroplasty utilized regional anesthetic techniques, inpatient clinical care pathways and inpatient physical therapy. However, 16.7%, 20.0%, 23.3% and 73% lacked social services, anesthesia preoperative clinics, inpatient pain management protocols and preoperative sobriety pathways, respectively.

Conclusion: Barriers to receiving arthroplasty care included lack of qualified surgical personnel and concerns about surgical risk in vulnerable patient populations. These findings suggest that further effort is warranted to expand and improve arthroplasty care for the underserved to ensure safety and high quality outcomes.

Level of evidence: IV

Keywords: Arthroplasty, Health Equity, Protocols, Safety net hospital

Introduction

In high-resource settings, total hip arthroplasty (THA) and total knee arthroplasty (TKA) have been found to be very effective surgical procedures in improving

quality of life, reducing pain, and improving function (1-3). The introduction of care pathways and pain management protocols in particular have provided a

Corresponding Author: Harry E. Jergesen, Institute for Global Orthopaedics and Traumatology, Orthopaedic Trauma Institute, San Francisco, CA, USA
Email: Harry.Jergesen@ucsf.edu



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systematized approach to arthroplasty, resulting in cost reductions, fewer complications, reduced length in hospital stays, and improved self-reported outcomes (4-9). For instance, it has been suggested that hospitals with pain management protocols for arthroplasty, such as use of peripheral nerve blocks with non-opioid analgesics, have led to fewer side effects and less opiate use among their patients (10, 11). In addition, availability of inpatient social services and physical therapy protocols have been shown to decrease length of hospital stay and improve self-reported patient satisfaction (1). Hospitals with a high volume of arthroplasty invariably employ more of these management protocols to ensure improved outcomes (12, 13).

Although it is clear that perioperative protocols enhance arthroplasty patient care, it has been suggested that safety net hospitals, institutions that have a mandate to treat the underserved, may lack the resources or motivation for standardizing care (12-14). Information from the authors' own safety net hospital, for example, has revealed that outpatient social service support, preoperative patient education, and a dedicated orthopaedic inpatient unit with care protocols are lacking for arthroplasty patients (13). Such deficiencies may well jeopardize safety and outcomes for patients treated at safety net institutions. Despite evidence that care management protocols are of benefit and that there are challenges to providing them in safety net hospitals, no studies have yet been done to survey the management protocols of safety net hospitals in the United States to provide a national perspective. The purpose of this study is to determine the prevalence of arthroplasty management protocols within safety net hospitals and to identify barriers for implementation of such protocols at these institutions. The authors of this study hypothesize that a significant proportion of safety-net hospitals will not report having formalized perioperative protocols in place for patients undergoing arthroplasty, a factor that may lead to poorer surgical outcomes.

Materials and Methods

In this institutional review board (IRB) exempt, cross-sectional study, safety net hospitals located in the US were asked about the existence of perioperative management protocols for arthroplasty and their barriers for implementation. Hospitals in the National Association of Public Health and Hospitals (NAPH) listing that had at least 100 beds were included in this study (15). Hospitals that did not have a mandate to serve the poor, were less than 100 beds in size, did not respond after seven attempts at communication or did not perform arthroplasty procedures were not included.

Data from each hospital was collected via a REDCap survey form administered either through electronic mail or phone call [Appendix 1]. Demographic information that may affect surgical outcomes, including hospital region as determined by percentage of arthroplasty procedures performed on safety net patients, and total number of THA and TKA procedures per year, were extracted (7, 8, 12, 16, 17). In addition, the use

of preoperative pain management, inpatient care pathways, and postoperative management protocols, including the use of social worker and physical therapy services, were also determined. One representative from each hospital who was qualified to describe arthroplasty services at their respective institution was interviewed (e.g. charge nurse, patient coordinator, orthopaedic surgeon, etc.). The interview began with one of the authors asking the individual if s/he was willing to answer a brief scientific survey regarding arthroplasty at safety net hospitals. If the individual was unwilling to do so, the individual was thanked and no additional data was gathered. If the individual obliged, the survey questions were asked one by one and answers recorded. When a protocol was not found to be in place, the authors asked for reasons why that may be; answers were recorded.

As the goal of this study was to determine if steps had been taken at safety-net hospitals to at least begin the process of developing protocols for arthroplasty management, additional details of protocols at each institution were not gathered. A hospital was considered to have patient management protocols if the qualified individual reported it when answering the survey. If an interviewee was unaware or unsure of the presence of such processes, a second individual at that institution was asked to verify whether or not the institution had protocols in place.

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Data Analysis

Descriptive statistics were used to report all data. Non-parametric variables were summarized as counts or proportions, and continuous variables with normal distribution were described by mean and standard deviation.

Results

Out of 92 safety net hospitals eligible for the study, 49 (53.3%) responded to the survey. Nineteen of the 49 responding hospitals (38.8%) did not offer arthroplasty services for their patients. Of the thirty hospitals that did offer THA and TKA, 11 (36.7%) performed less than 150 procedures per year [Table 1]. Arthroplasty procedures at these hospitals were all supervised by a fellowship trained surgeons (100%), and almost all patients (96.7%) were treated with a clinical care pathway, a standardized care developed by each institution for their arthroplasty patients. Over 90% of arthroplasty patients treated in these safety net institutions had access to regional anesthesia techniques and to inpatient physical therapy management. However, only 25 of the 30 hospitals (83.3%) offered social services, 24 (80%) offered a preoperative anesthesia evaluation clinic, and 23 (76.7%) utilized an established pain management protocol. Of particular interest was the finding that only 26.7% of hospitals had a preoperative sobriety pathway in place for arthroplasty patients with active substance abuse.

Table 1. Safety Net Hospital Survey Results	
Perioperative Management Protocols for Arthroplasty Procedures	Safety Net Hospitals that Perform Arthroplasty (n=30)
Arthroplasty Procedures/Year	
0-50	0 (0%)
51-100	5 (16.7%)
101-150	6 (20.0%)
>150	19 (63.3%)
Arthroplasty procedures supervised by fellowship-trained surgeon?	30 (100%)
Regional anesthetic techniques?	27 (90.0%)
Anesthesia preoperative clinic?	24 (80.0%)
Inpatient pain management protocols available?	23 (76.7%)
Sobriety pathway?	8 (26.7%)
Social services?	25 (83.3%)
Inpatient clinical care pathway?	29 (96.7%)
Inpatient physical therapy?	29 (96.7%)

Two key reasons were presented to the authors when certain perioperative protocols were found not to exist at various safety-net hospitals that did, in fact, provide arthroplasty care. First, monetary resources were a major limitation. In order to develop evidence-based protocols and have the appropriate staffing in place, significant funds are needed. Many safety-net hospitals reported not having the necessary financial resources. Second, numerous safety-net hospitals described the challenges surrounding change at medical institutions as being a barrier to protocol development. While a handful of institutions did note that protocols were in different stages of development, many suggested that there was no set timeline for implementation.

Issues in Institutions Where Arthroplasty is Not Offered

For safety net hospitals that did not offer arthroplasty, several themes emerged. First, several hospitals reported that the large volume of trauma prevented the scheduling of routine elective procedures, such as THA and TKA. Second, emphasis on the care of orthopaedic trauma patients resulted in a dearth of qualified arthroplasty personnel. Finally, several hospitals cited concerns about the risks of arthroplasty surgery in their particular patient populations and the absence of mechanisms to address such risks.

Discussion

The survey conducted in this study is unique in that it is designed to define, in broad terms, the current status of elective THA and TKA in our nation's safety net hospitals. Many of the hospitals contacted (43 of 92, 46.7%) were unable or unwilling to provide information about their practices, despite having been queried on numerous attempts. Data obtained from institutions that responded to the survey suggest that

there exist gaps in both the availability and the quality of care offered. Almost 40% of these hospitals with a mandate to provide care for the underserved do not offer THA and TKA due to lack of surgical personnel, resources, and institutional support. Instead, patients are either referred elsewhere for their arthroplasty procedures or, alternatively, are provided nonoperative treatment (e.g., non-steroidal anti-inflammatory drugs [NSAIDs]), even in the presence of severe disease. Those patients who were referred elsewhere for their THA and TKA procedures frequently could not be followed postoperatively by their outside surgeons due to medical insurance issues.

Of the safety net hospitals offering THA and TKA, the large majority reported utilizing inpatient care protocols, regional anesthesia, and inpatient physical therapy services. However, the large majority (73.3%) reported having no sobriety pathways designed to mitigate the risks of substance abuse. In addition, many do not have available inpatient pain management protocols nor comprehensive social services.

A major short-coming in the current study is the relatively low response rate to the survey, despite its brevity. When contacted by telephone, personnel from non-responding institutions cited various reasons for not participating, such as heavy workloads, lack of interest in public health research, and concerns about confidentiality. Thus, further studies will be needed to determine whether this study's findings are representative of practices in the remainder of US safety-net hospitals. A second short-coming is that this study's survey did not characterize the patient populations being served by the institutions. Different patient populations have different needs; patient-centered medicine requires developing protocols and processes that, while based in evidence, are tailored

to specific populations. Finally, we did not collect information on patient outcomes in those hospitals that did and did not offer arthroplasty treatment.

In a recent commentary on arthroplasty care in safety-net hospitals, Arlas and Jergesen identified common challenges faced by arthroplasty patients in safety net populations such as poverty, undiagnosed or undertreated psychiatric disease, and substance abuse (13). Using their own hospital as an example, these authors highlighted challenges in creating optimal arthroplasty practices. For example, the lack of a dedicated orthopaedic inpatient unit resulted in difficulties in the standardization of care protocols and in the coordination of staff roles. Of particular interest is the finding that most hospitals in the survey that offer arthroplasty care lack protocols for dealing with heavy opiate use and substance abuse, both of which have been linked to higher surgical risk and poorer outcomes in arthroplasty (18). One study, for example, found that alcohol misuse was an independent risk factor for poorer postoperative outcomes in patients undergoing primary THA and TKA, leading to longer hospital stays and surgery related complications (18). Of further importance is that other care protocols routinely utilized in better resourced settings often were not present: about a fifth of the surveyed hospitals had no pre-operative anesthesia evaluation program, no post-operative pain management protocols, and no comprehensive perioperative social services. All of these have been shown to enhance arthroplasty outcomes (16, 17).

There are few reports on THA and TKA outcomes in safety-net hospitals. One recent study has shown that, when compared with a university population, safety-net patients undergoing THA and TKA had a higher incidence of early complications, particularly deep infections, and of reoperations (12). Clearly, if arthroplasty procedures are undertaken in vulnerable safety-net populations, heightened efforts are warranted to mitigate the surgical risks. These authors' survey findings suggest that arthroplasty care in safety net hospitals may well benefit from added scrutiny to assess the availability of care, the quality of care being given, and the surgical outcomes.

Patients who seek care at safety net institutions may not have adequate access to arthroplasty services. In those institutions that offer arthroplasty, many appear not to have in place perioperative care protocols that have been shown to optimize surgical outcomes. Future work can compare and contrast specific differences within perioperative protocols at different institutions. Also, additional research can track and compare outcomes (e.g., complication rate, mortality rate, patient-reported function, pain and depression outcomes, etc.) across safety net institutions to further solidify best practices to ensure safety and care equality. This must be ensured not only in these vulnerable populations in the US but across the globe. Overall, further effort is warranted to expand arthroplasty care for the underserved and to identify opportunities to improve care processes in the safety net institutions where care is given.

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David N. Bernstein MBA MA
University of Rochester School of Medicine & Dentistry,
Rochester, USA

Hao-Hua Wu MD
Orthopaedic Surgery Resident: Institute for Global
Orthopaedics and Traumatology, Orthopaedic Trauma
Institute, San Francisco, CA, USA

Harry E. Jergesen MD
Institute for Global Orthopaedics and Traumatology,
Orthopaedic Trauma Institute, San Francisco, CA, USA

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Arthroplasty Survey; UCSF Department of Orthopaedic Surgery

Please complete the survey below.

Thank you!

Please indicate the zip code of your hospital

Are elective hip and knee arthroplasties done in your hospital?

- Yes
 No

If no, please indicate which of the following reasons best explain this policy:

- No available arthroplasty surgeons
 Not considered a necessary service given the mission of your institution
 No available funding
 Considered too risky
 Inadequate demand
 Lack of institutional support
 Other

If other reason, please indicate why:

Please estimate the percentage of arthroplasty procedures performed on a safety net population in a given year:



(Place a mark on the scale above)

Are these procedures done or directly supervised by arthroplasty specialists?

- Yes
 No

How many primary hip and knee arthroplasties are done in your hospital per year?

- < 50
 51-100
 101-150
 > 150

Are regional anesthetic techniques (peripheral nerve blocks, spinals, epidurals) available for your arthroplasty patients?

- Yes
 No

Does your hospital have an anesthesia preoperative clinic for your patients to assess and manage risk from co-morbid medical conditions?

- Yes
 No

Are there inpatient pain management protocols for arthroplasty patients?

- Yes
 No

Do you employ a supervised sobriety pathway for patients with substance abuse who require joint replacement?

- Yes
 No

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Are social services available to ensure adequate housing for your patients after surgery?

Yes
 No

Does your hospital have inpatient clinical care pathways for arthroplasty?

Yes
 No

Does your hospital have physical therapy protocols for hip and knee arthroplasty?

Yes
 No

Are post-discharge home nursing and physical therapy available to your patients?

Yes
 No

Any additional comments?
