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Surgeons' Preoperative Work Burden Has Increased Before Total Joint Arthroplasty: A Survey of AAHKS Members

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ABSTRACT

Background: Implementation of rapid recovery protocols and value-based programs in total joint arthroplasty (TJA) has required changes in preoperative management, such as optimization, education, and coordination. This study aimed to quantify the work burden associated with preoperative TJA care. **Methods:** Two web-based surveys were distributed to surgeon members of the American Association of Hip and Knee Surgeons. The first questionnaire (265 respondents) consisted of questions related to preoperative patient care in TJA and the associated work burden by orthopedic surgeons and their financially dependent health care providers. The second survey (561 respondents) consisted of questions related to relative change in preoperative patient care work burden since 2013.

Results: Greater than 98% of survey respondents reported providing some level of preoperative medical optimization to their patients. The mean amount of reported time spent by the surgeon and/or a qualified health care provider in preoperative activities not included in work captured in current procedural terminology or hospital billing codes was 153 minutes. The mean amount of reported time spent by ancillary clinical staff in preoperative activities was 177 minutes. Most surgeons reported an increase in work burden for total knee (86%) and total hip (87%) arthroplasty since 2013, with a large portion reporting a 20% or greater increase in work (knee 66%, hip 64%).

Conclusion: To provide quality arthroplasty care with marked reductions in complication rates, lengths of stay, and readmissions, members of the American Association of Hip and Knee Surgeons report a substantial preoperative work burden that is not included in current coding metrics. Policy makers should account for this time in coding models to continue to promote pathway improvements.

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Utilization of total hip and knee arthroplasty has increased over the last decade and is expected to continue to rise as the population of the United States ages [1]. In an effort to contain costs and improve care for the growing number of arthroplasty patients, perioperative protocols have evolved significantly. These protocol changes were encouraged by Bundled Payment models and other value-based programs and have led to substantial changes in postoperative total joint arthroplasty (TJA) care. These changes have promoted shorter length of hospital stay, decreased utilization of post-acute care facilities, decreased complications, and

increased patient satisfaction [2–4]. In return, these effects have led to a massive reduction in health care system costs [5].

To obtain these overall positive effects on TJA care, health care providers have implemented several changes in their preoperative protocols. These changes include increased focus on patient screening protocols, increased medical optimization, and increased patient education [6–10]. Under current models, providers can quantify work spent during office appointments with the patient using evaluation and management codes. Work performed from the day before surgery through 90 days after the procedure is quantified through the American Medical Association Relative Value Scale Update Committee. Several studies have quantified the amount of time associated with perioperative and postoperative care [9,11–13]; however, a large portion of the team's efforts to optimize a patient's clinical outcome occurs between the clinic visit

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when the decision for surgical treatment is made and the day before the surgical date. This work, given its fragmented nature, is not easily quantified through evaluation and management codes or the Relative Value Scale Update Committee process and has yet to be addressed in the literature.

Although the work burden of these preoperative optimization protocols has not yet been quantified, the improved outcomes, shorter length of hospital stay, reduced readmission rates, and episode cost savings in alternative payment models after TJA are a direct result of increased preoperative care coordination. The purpose of this study was to quantify the work burden, in health care provider minutes, associated with preoperative TJA care, in the setting of modern low-complication, rapid discharge protocols.

Materials and Methods

Two web-based surveys were developed by the authors and administered using SurveyMonkey, a survey platform for online data collection and analysis. The first questionnaire consisted of questions related to preoperative patient care in TJA and the associated work burden by orthopedic surgeons and their financially dependent health care providers. The second survey consisted of questions related to relative change in preoperative patient care work burden since 2013. The preoperative period was defined as any time from the office visit where the patient elected to pursue total hip arthroplasty or TKA up to the day before surgery. Unless otherwise noted, the questions were specific to total hip and total knee arthroplasty patients with Medicare, who are often older and have more medical comorbidities than a privately insured patient cohort. For questions involving work (ie, time) involved in preoperative care, the questions specifically stated to not include work captured in other current procedural terminology (CPT) or hospital billing codes. Surgeons were asked to quantify their individual time and that of qualified health care providers (physician assistants [PAs] and/or nurse practitioners [NPs]). Work performed by ancillary clinical staff including nurse navigators, surgical optimizers, medical assistants (MAs), and surgery schedulers was tracked separately.

A link to the surveys was distributed to all members of American Association of Hip and Knee Surgeons. For the first survey, 265 surgeons responded corresponding to a response rate of 8.3%. For the second survey, 561 surgeons responded corresponding to a response rate of 20%.

The responses were anonymous. Statistical analyses were performed with SPSS (IBV v23.0, Chicago, IL) and Excel (Microsoft, Redmond, WA). Descriptive statistics including mean, standard deviation, and median values were reported for all continuous variables. Percentiles and sample size were reported for categorical variables.

Results

Preoperative Optimization Involvement

Survey respondents were asked questions regarding preoperative optimization for patients scheduled for TJA. Greater than 98% (260/265) of survey respondents reported providing at least some level of preoperative medical optimization to their patients. Of the 98%, the majority (79%, 209/265) provide optimization for all patients, and 19% (51/265) provide it for those with elevated risk factors.

For the patients who receive preoperative optimization, the treating surgeon was involved in the care 81% (211/261) of the time. Additional health care providers involved include the surgeon's PA or NP (51%, 132/261), and other clinical staff such as a registered

nurse (RN) or MA (41%, 107/261). Of note, 94% (247/264) of survey respondents do not bill Medicare for any preoptimization services.

Amount of Time in the Preoperative Setting

Survey respondents were asked to quantify the amount of time spent by the surgeon and/or a qualified health care provider (eg, PA, NP) on planning, preparation, optimization, and care coordination activities prior to the day before surgery. The mean amount of time reported spent in preoperative activities not included in work captured in CPT or hospital billing codes was 153 minutes (Table 1). The median time spent in preoperative activities was 110 minutes (range: 12–735 minutes). The largest proportion of preoperative time was spent in activities such as screening and risk assessment of comorbidities (mean: 20 minutes, median: 15 minutes, range: 0–180) and patient education (mean: 34 minutes, median: 20 minutes, range: 0–240). Additional time spent in the preoperative setting by the surgeon and qualified health care provider is reported in Table 1.

Survey respondents were asked to quantify the amount of time spent by the clinical office staff (eg, RN, licensed practical nurse (LPN), MA, and scheduler) on planning, preparation, optimization, and care coordination activities prior to the day before surgery. The mean amount of time reported spent in preoperative activities not included in work captured in CPT or hospital billing codes was 177 minutes, with a median time of 125 minutes (range: 20–395 minutes). The largest proportion of preoperative time was spent in activities such as a preoperative education class (mean: 32 minutes, median: 10 minutes, range: 0–60 minutes) and obtaining prior authorization (mean: 28 minutes, median: 30 minutes, range: 0–60 minutes). Additional time spent in the preoperative setting by the clinical staff is reported in Table 2.

Changes in Work Burden

Survey respondents were asked to compare changes in preoperative work burden in TJA patients since 2013. Ninety-four percent (511/541) of survey respondents reported an increase in work related to preoperative optimization programs for primary TJA. The vast majority of surgeons (87%, 467/539) reported an increase in the amount of preoperative work to safely execute shorter length of stays for primary total hip arthroplasty, compared to work for a traditional 3-night hospitalization (Fig. 1). Sixty-four percent (346/539) of surgeons reported a 20% or greater increase in the work burden, whereas only 11% (59/539) reported no change in work burden, and 2.4% (13/539) reported a decrease in work burden. Similar results were seen for preoperative work burden for TKA, with 86% (465/540) reporting an increased in work burden, and 66% (355/540) reporting a 20% or greater increase in work burden (Fig. 2).

Table 1
Preoperative Time Spent by Surgeon and Qualified Health Care Professional^a.

Preoperative Activity	N	Mean	Median
Screening and risk assessment of comorbidities	260	20 (22)	15
Shared decision-making, goal setting	260	18 (17)	15
Patient education	260	34 (37)	20
Medical interventions, referrals, and consults	255	22 (37)	15
Follow-up visits, reassessment	256	29 (33)	20
Discharge planning	254	19 (16)	15
Enter data into prospective longitudinal outcome databases or registries (eg, NSQIP, AJRR)	220	11 (17)	10
Total	261	153	110

^a Physician assistant or nurse practitioner; time (minutes); mean (SD).

Table 2
Preoperative Time Spent by Clinical Staff^a.

Preoperative Activity	N	Mean	Median
Select date with patient and family; schedule surgery in OR scheduling system	256	21 (16)	15
Obtain prior authorization	248	28 (20)	30
Schedule and/or confirm appointments for evaluation by appropriate consultants (eg, PCP, cardiology, neurology, dentist, vascular surgery, endocrinology, etc.)	254	21 (18)	15
Schedule preoperative assessment with anesthesia	243	9 (12)	5
Schedule preoperative appointment with physical therapy	241	7 (10)	5
Schedule preoperative appointment with case manager and/or social worker	234	5 (8)	5
Schedule preoperative education class(es)	248	8 (8)	5
Coordinate and schedule final clearance assessment	239	13 (13)	10
Staff 1-2 h education class attended by multiple patients	224	32 (41)	10
Phone calls, e-mails, or other communications with patient, family, and other providers to coordinate preoperative visits and optimization	252	19 (18)	15
Phone call to patient or family to review preparation and instructions (eg, NPO, medications, antibiotic shower)	245	13 (12)	10
Total	256	177	125

^a Registered nurse, licensed practical nurse, medical assistant, scheduler; time (minutes); mean (SD).

Discussion

Advances in total hip and knee arthroplasty perioperative protocols in the last decade have led to dramatic decreases in hospital length of stay, patient complications, readmissions, and costs on the health care system. Implementation of these protocols has required additional preoperative design and management, such as optimization, education, and coordination, typically outside of the traditional scope of preoperative TJA care. In this study, we attempted to determine the preoperative work burden associated with these improved care pathways for TJA. We report a median time of 110 minutes for the surgeon, PA, and/or NP, for preoperative activities not included in CPT or hospital billing codes, and a median time of 125 minutes for other clinical staff (RN, LPN, MA, and scheduler). Most surgeons reported an increased preoperative work burden since 2013, with most stating a 20% or greater increase in time.

A number of studies have demonstrated that TJA in the United States is moving toward reduced length of stay and reduced utilization of post-acute care facilities [2,10]. Studies have also shown that these changes are associated with decreased complications and improved outcomes [3,10,14,15]. There have been a number of

important protocol changes that have allowed for these developments. Preoperative optimization protocols have allowed us to identify patients at higher risk for complications, longer length of stay, and discharge to skilled nursing facilities and implement protocols to address these risk factors. Bernstein et al. showed that implementation of optimization protocols led to decreases in length of stay without affecting 90-day complications, which led to significantly lower cost utilization [8]. In a similar study, Kim et al. demonstrated lower 30-day and 90-day readmission rates using a standardized preoperative optimization tool [9].

Preoperative education has also been a critical factor in value-based care models and rapid recovery protocols. Yoon et al. showed that implementation of a one-on-one preoperative education program led to significant decreases in length of stay [6]. Jones et al., using a patient education program consisting of a multidisciplinary team instructing patients on the care pathway, details of surgery, and expected discharge goals, also demonstrated its ability as a safe and effective method of reducing length of stay for total knee arthroplasty patients [7].

This study demonstrates that these changes required increased work and resources by the surgeon and the associated clinical staff beyond what is currently valued in the CMS current preservice

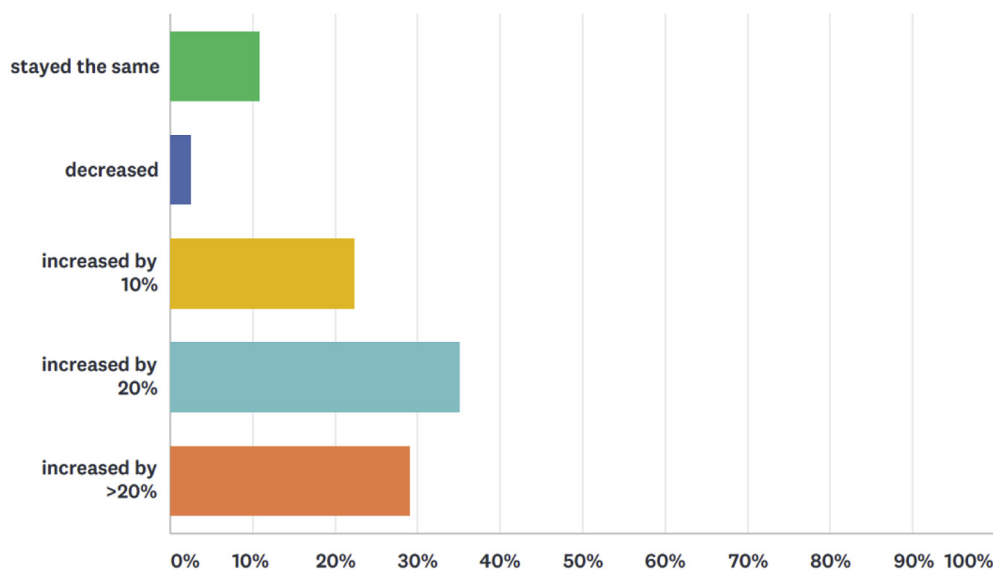


Fig. 1. Change in the amount of work required to safely execute short lengths of stay for primary total hip arthroplasty patients.

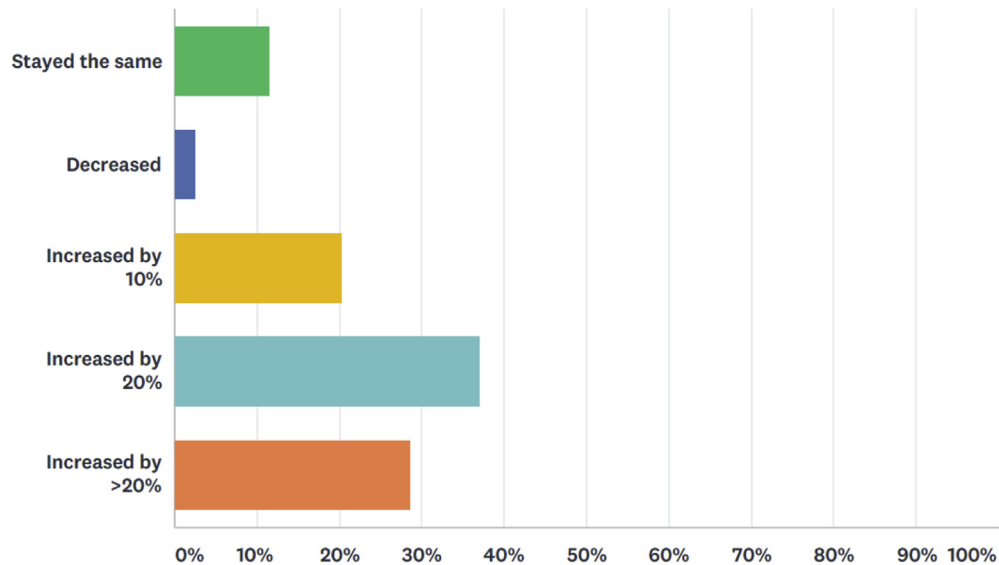


Fig. 2. Change in the amount of work required to safely execute short lengths of stay for primary TKA patients.

package time of 40 minutes. In a study by Shah et al, they show the effect of rapid discharge protocols on the postoperative work burden [16]. They reported a significant burden of work shifted from the hospital to the surgeon and his team. Our study demonstrates that similar changes are happening in the preoperative setting.

There are inherent limitations to a survey study. Survey respondents may overestimate or underestimate their responses, particularly in regard to time spent. It can be difficult for respondents to accurately quantify amount of time spent per patient for themselves and their providers. However, we believe that it is clear from that survey response that there has been an increase work burden as a result of the perioperative protocol changes. Further studies are needed to determine more precisely the amount of additional time required for these rapid discharge protocols to run effectively. Another limitation of the study was that respondents were allowed to skip questions, allowing for incomplete questionnaires. As noted in the study by Kongsved et al., although not ideal, this is a common occurrence in internet questionnaires, and the data can still be reported [17].

As quantified by surgeon respondents in this survey study, there has been an increasing work burden associated with the changes in perioperative rapid recovery protocols in total joint replacement because of accelerated discharge and the move toward value-based payments. These changes have led to significant preoperative and postoperative time burden increases on both clinical providers (surgeons, NPs, and PAs) and clinical staff (RN, LPN, MA, and schedulers), which is not compensated in the traditional payment models. Overall, episode-based, rapid recovery, and accelerated discharge protocols have led to improved outcomes, decreased complications, reduced readmissions, and significantly reduced cost, which seems to come at the expense of increased uncompensated surgeon and surgeon team time commitments. For these changes to be sustainable, and to continue to promote pathway improvements, policy makers and compensation models should account for this increased work burden.

Value-based payment models and perioperative rapid recovery protocols in TJA have led to significant time burden increases on clinical providers and staff.

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