

Perspective

Functional recovery following hip and knee arthroplasty: subjective vs. objective assessment?



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Total hip arthroplasty (THA) and total knee arthroplasty (TKA) are high-volume and costly procedures and have been deemed to be successful operations to reduce pain and improve patient-reported outcomes (PROMs). Over recent years, fast-track (or enhanced recovery) pathways have led to patients recovering faster in hospital, and they are now often discharged between 0 and 2 days after surgery (1).

The problem

Although earlier achievement of discharge criteria is well documented in enhanced recovery programs, more is to be understood about how patients recover in the early period after discharge. Historically, conventional outcome measurements after THA and TKA focused on implant survivorship. Later, PROMs were promoted and are valuable for large population assessments, because they are patient oriented, easy to perform at scale, and cheap. However, they may have limitations when looking in more detail at specific outcomes in specific patient groups (2), and analyzing limiting factors for recovery. In addition, they are well known to have a ceiling-effect problem, and therefore lack the capacity to understand the true activity levels of higher performing individuals. Nevertheless, PROMs are recommended for perioperative quality assessment in enhanced recovery pathways (3) and mandated for THA and TKA in several countries.

In contrast to PROMS, several objective assessment methods, including new technologies, have been introduced to assess early functional recovery. Such methods include functional performance tests (such as walking, sit to stand, and stair test), and activity monitoring devices (such as pedometers, watches, and step-monitoring applications on smartphones). Notably, in the early recovery period, discrepancies between PROMs and objective measures of functional performance and physical activity have consistently been found (4-9).

Subjective vs. objective assessment?

Further to this, at 6–12 months postoperatively, activity levels are disappointingly low in some patients (despite improvement in PROMs). Around 20% of patients are reported as being socially isolated (10,11), and between 5% and 20% of all patients report persistent pain after THA and TKA, respectively (12). These findings at 6 months should not be surprising, given the increasing number of studies that demonstrate how functional recovery in the first 12 weeks after surgery is delayed compared with patient-reported recovery. In both THA and TKA, postoperative step count (7,8) and performance in functional tests (that assess walking, stair climbing, and lower limb strength) (4-6,9) have not been found to improve in correlation with the improvements to functional activities reported by patients in PROMs at the same timepoint. Interestingly, similar reductions to post-discharge activity levels (measured via wearable technologies) in the early recovery period are also seen in other general surgery procedures such as pulmonary (13) and cardiac (14) surgery.

This objective assessment, which confirms that physical activity levels decline postoperatively in patients following THA and TKA, or at best remain the same, leads to some important and wider socioeconomic health implications. This is because increased physical activity levels are known to decrease the risk of all-cause morbidity and mortality. This is an important factor, given the typical age of THA and TKA patients, and the common medical comorbidities that they have (such as hypertension, obesity, cardiovascular disease, and diabetes) (15). Such conditions are of course known to benefit from and be managed better through regular and increased physical activity levels.

Consequently, there are known increased societal costs for in-hospital care and rehabilitation of patients even after fast-track THA and TKA (16,17). Thus, further consideration of

limiting factors for early functional recovery following THA and TKA is required. Whilst patients are not traditionally expected to immediately return to full functional activities, we must consider which patients are slower to do so, why this is so, and which factors are modifiable so that patient recovery is expedited and improved.

Current challenges in defining recovery

We must therefore identify what a normal post-surgical recovery trajectory looks like, and there have been recent efforts using PROMs to do this in both TKA and THA (18–20) as well as on pain trajectory (21). This data and findings are important and begin to characterize patient recovery profiles into “slow” and “fast” recovery responders. However, in this context, the previously reported differences when using PROMs vs. actigraphy and physical performance tests in the early postoperative stages has been highlighted and calls for all further research to utilize actigraphy and physical performance tests (such as walking, sit to stand, and stair-climbing tests) as primary outcome measures. Indeed, the need to specifically assess the limiting factors for reduced early physical function after THA and TKA within the 6–12 weeks postoperatively is required so that a baseline can be established, and future interventional studies can be appropriately designed and powered.

Such studies will need to have wide inclusion criteria, as quantifying functional recovery will require known preoperative factors such as pain status, inflammatory status, frailty, relevant comorbidities (e.g., diabetes, anemia, etc.), medications (e.g., opioids, polypharmacy, antidepressants), cognitive dysfunction, psychological status, socioeconomic status, and unrealistic expectations of recovery, in order to define the most influential (and potentially modifiable) factors in determining recovery trajectories. This especially applies to improved assessment of the relationship between post-discharge pain and functional recovery (22).

New technologies

The importance of identifying what a “normal” post-surgical recovery trajectory looks like for different groups of patients will be important for the assessment of new and often expensive surgical technologies (such as robotic surgery). The use of robotic surgery for THA and TKA is predicted to grow significantly over the coming years (23), as it is an attractive concept to both surgeons and patients. However, it currently comes with a high cost, and the proposed advantage of a quicker postoperative recovery is yet to be proven with physical performance outcome measures that are both sensitive and specific.

The way forward

In summary, the in-hospital recovery benefits of fast-track or enhanced recovery programs remain undisputed. Consequently, the focus should now be on the pathophysiology and

reasons for delayed functional recovery in the early (6–12 weeks) post-discharge recovery period. Such data is required to define future multidisciplinary strategies to improve the expected benefits from the surgical intervention.

Conflicts of interest

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