

Collecting Patient-Reported Outcomes For Total Joint Replacement

Key Results:

- ✓ 98% patient activation rate
- ✓ 97% patients engaged with post-op digital check-ins
- ✓ 69% PRO survey response rate for Hip Replacement
- ✓ 75% PRO survey response rate for Knee Replacement
- ✓ 43% patients self-reported avoiding at least 1 phone calls

“SeamlessMD has been an integral part of our digital transformation for total joint replacement patients – helping us improve the patient experience through interactive patient education, remote patient monitoring and automated PRO data collection. This technology enables outstanding patient care by collecting valuable patient-reported outcomes data for continuous quality improvement.”

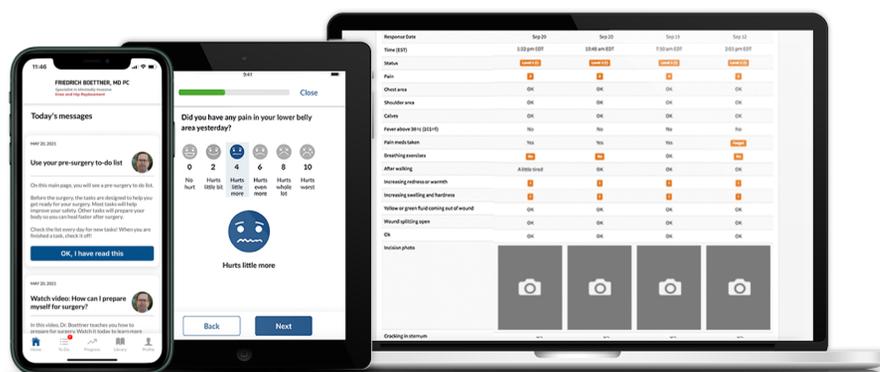


Friedrich Boettner, MD
Orthopedic Surgeon,
Hospital for Special Surgery

Every year, over 1.1 million patients in the United States and Canada undergo total joint replacement surgery. Bundled payment programs emphasize improved quality while decreasing costs, such as CMS’ Comprehensive Care for Joint Replacement (CJR) model which bundles payment for hip and knee replacement surgery. These models also require the collection of Patient-Reported Outcome (PRO) data - self-reported measures that come directly from patients - to more accurately inform therapeutic choices, reimbursement decisions, and health policy. However, collecting PROs for high volume procedures such as hip and knee replacements can be a difficult task to perform, with some studies claiming that >20% of PRO data collection goes missing as a result of inconsistent administration of PRO surveys.

Dr. Friedrich Boettner, an orthopedic surgeon and specialist in minimally invasive knee and hip replacement at the Hospital for Special Surgery (HSS), recognized the shift to value-based care and identified several areas of improvement that could be solved using technology. Specifically, the need for more comprehensive patient education, remote patient monitoring, and more effective methods for collecting Patient-Reported Outcomes (PROs) than traditional paper-based surveys.

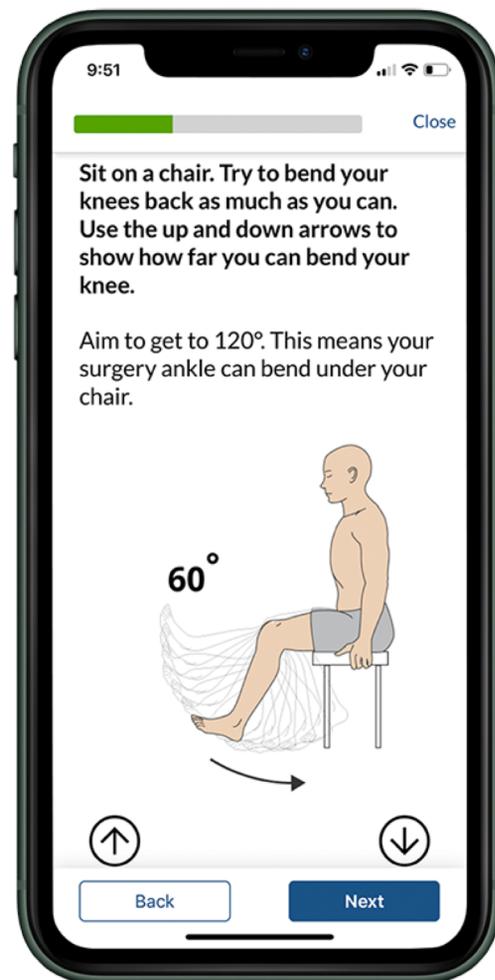
A Technology-Driven Solution Led by the Interdisciplinary Team to Enhance Patient Care



Digital Patient Engagement across multiple devices

Dr. Boettner partnered with SeamlessMD, a leading Digital Patient Engagement platform, to guide patients more effectively before and after Total Hip and Knee Replacement surgery. SeamlessMD enabled Dr. Boettner and his team to:

- Engage patients with a mobile and web-enabled, virtual companion – guiding them from pre-op preparation through post-op recovery;
- Deliver evidence-based surgery-specific pathways in the form of multimedia education, reminders and tasks;
- Collect validated Patient-Reported Outcomes surveys such as HOOS Jr, KOOS Jr, VR-12 and High-Activity Arthroplasty Score (HAAS);
- Monitor patient compliance, symptoms and recovery progress (e.g. knee range-of-motion, pain levels, incision photos, etc.);
- Automate patient self-care guidance via smart algorithms and workflows (e.g. education for how to manage low-risk issues or when to escalate to a provider); and
- Receive alerts and monitor dashboards to identify when a patient's health status changes, enabling the care team to intervene sooner;



Example knee range of motion survey question

Comprehensive Patient Education Delivery and Effective PRO Data Collection

Through SeamlessMD, Dr. Boettner and the care team were able to deliver comprehensive patient education, including in-depth video content, to help set patient expectations before and after surgery - for example, key recovery exercises to assist with recovery. Furthermore, SeamlessMD automated the collection of validated PRO survey data specific to total hip and knee surgery, including:

- Knee injury and Osteoarthritis Outcome Score (KOOS Jr);
- Hip disability and Osteoarthritis Outcome Score (HOOS Jr);
- Veterans RAND 12 Item Health Survey (VR-12);
- High-Activity Arthroplasty Score (HAAS);

“My concern when I left the hospital was that I was on my own for a month... That was a very scary feeling for me! Having this app helped me feel connected and safe, if that makes sense. I knew I was still in your radar and would have help at any time it was needed. I can't put a price tag on the peace of mind that gave me, because that too, is part of the healing process. I am very grateful for all of my medical attention and will be highly recommending Dr. Boettner and his team to everyone!”



Knee Replacement Patient
Hospital for Special Surgery

Results

1. Patient Activation & Engagement & Satisfaction:

Metric	Result
Patients enrolled on SeamlessMD	224
Patients who activated their accounts on SeamlessMD	98%
Patients engaged with post-op digital check-ins (e.g. symptom & recovery tracking)	97%
% Patients who recommend SeamlessMD	91%
Patients said SeamlessMD helped them feel more confident at home after surgery	93%
Patients said SeamlessMD helped them feel less worried at home after surgery	89%
% Patients who report that Seamless prevented at least 1 phone call to the surgeon's office	43%

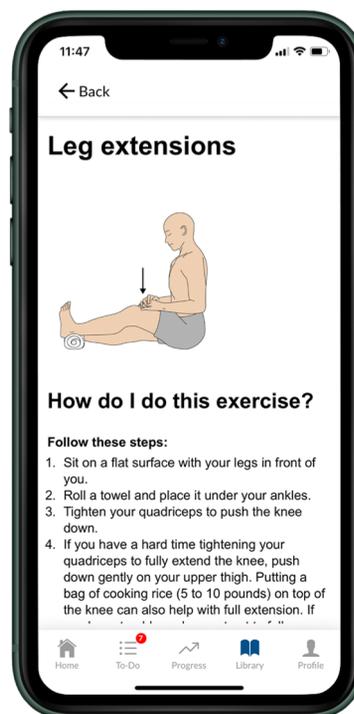
2. PRO Survey Response Rates:

Survey collection time points	Response Rate	Survey collection time points	Response Rate
Hip PRO surveys	69%	Knee PRO surveys	75%
15 days pre-op	75%	15 days pre-op	74%
28 days post-op	75%	28 days post-op	83%
2 months post-op	56%	2 months post-op	67%

"I found it helpful to have the daily check-ins and Dr. Boettner's videos to support my recovery. I appreciated how closely my progress after surgery was being monitored. I have spoken to several people who had a TKR and after surgery felt they were completely alone in going through the slow and painful process of recovery. I am grateful."



Hip Replacement Patient
Hospital for Special Surgery



Example education illustration



Example pain scale