Leveraging Technology to Support Same Day Discharge in the Total Joint Population

A retrospective analysis of patient reported outcomes and procedure satisfaction following TJA in the ASC and Hospital Setting

Contents

Introduction

Over the past few years, Total Joint Arthroplasty (TJA) has been trending toward shorter hospitalizations and same day discharge (SDD), with a 47% increase in elective outpatient TJA between 2012 and 2015. It is expected that the number will continue to rise, with a projected 77% growth in elective outpatient TJA in the next 10 years[1]. The increase in outpatient TJA has potential for cost savings, with the average cost for a knee and hip replacement across the country at $30,249 and $30,685 respectively in the inpatient setting, versus $19,002 and $22,078 in the outpatient setting[2]. As of January 2020, total hip arthroplasty (THA) has been excluded from the Inpatient Only List (IPO), following total knee arthroplasty (TKA) in January 2018, with the procedures becoming safer and more standardized with complication rates down 36% and 23% in the outpatient setting between 2013 to 2017[2]. For providers, CMS is encouraging site neutrality, giving the option on where to perform procedures with reimbursement rates in ambulatory surgery centers (ASCs) increasing 2.7% in 2020.

The outpatient setting for joint replacement, compared to the inpatient setting, is beneficial for patients with reduced risk of infection and deep vein thrombosis (DVT), higher satisfaction from recovering at home, and comparable or lower complication rates (ER visits, Readmissions, Revision Surgeries). However, this leaves providers with less face-to-face interaction with patients, requiring a multi-disciplinary redesign to maintain patient safety and outcome quality. In the past decade, there has been a rapid growth in the utilization of technology for remote patient monitoring to act on information received as a part of the treatment plan to optimize patients in the preoperative space, and allow providers to continue to track healthcare data on a patient once discharged.

The purpose of this whitepaper is to showcase how Northside Hospital utilizes technology to support their same day discharge program, and analyze patient reported outcome data trends between the hospital and ASC setting. Northside Hospital, a non-profit community hospital in Georgia, started their multidisciplinary same day discharge joint replacement program in 2015. Their ASC, Advanced Center for Joint Surgery (ACJS), opened in mid 2018. In this whitepaper, we retrospectively reviewed methods of implementing this program through leveraging technology, and outcomes following surgery for analysis.

Methods

Preoperative Optimization

It is imperative that during the shift to same day discharge, patient safety and satisfaction is not hindered. With less time in the hospital setting, adequate patient preparation is critical to ensure a successful and safe discharge. Technology can be utilized to scale preoperative education and optimization efforts. Different tools have been assessed to determine patient readiness for same day discharge, however no one tool has proven to be the single most clinically relevant and standardized. In general, patients undergoing same day discharge should be healthy, active, and at low risk for medical or surgical complications. Technology can be leveraged to assist with patient selection and provide additional education if patients do not meet initial criteria (i.e. weight loss program, smoking cessation education). Technology can also be leveraged to provide education on patient expectations. When patients arrive for surgery, they should understand anesthesia, medications, discharge instructions, and how to communicate with their care team if needed. By providing consistent educational content in a rapid and absorbable way, patients can be optimized and prepared for same day discharge.

Multidisciplinary Approach

Health systems across the country are evaluating and improving the objective value that they're providing to patients as programs shift to emphasize value-based care. Value-based care models revolve around how efficiently providers can improve patient quality of care through reducing readmissions and improving patient outcomes. In order for this to happen, care coordination needs to occur through a multi-disciplinary approach between nurses, physical therapists, physicians, anesthesiologists, and other healthcare team members. Through technology, care team members are empowered to have information at their fingertips and create a standardized workflow at their organization. This also allows providers to have clear and consistent messaging to the patients in order to improve quality of care and patient satisfaction.

Alerting off Patient Responses

Understanding patient outcomes is imperative and obtaining this information in real-time allows for actionable insights on patients at critical moments in their care. Alerting off outcomes is an automated feature for providers to be notified if patients aren't tracking appropriately during recovery. By integrating outcomes collection with a care platform, providers can better leverage data for real time clinical decision-making. For example, Northside Hospital has implemented a range of motion outcome alert at 14 days postoperative – a critical interval for clinicians to know how patients are recovering. From 4-6 weeks on, it becomes difficult to gain ROM and any poor movement patterns are increasingly difficult to correct. If a patient isn't achieving 90 degrees of knee flexion, close to 0 degrees knee extension, or doesn't feel like they're progressing in their recovery, immediate clinical follow up, and often a referral to outpatient PT, is warranted.

PROM Collection

Patient reported outcome measures (PROMs) are collected and utilized as patients report back to the care team on their own health status. Patients have the ability to give feedback on their care and recovery and enhance communication with their provider. This aggregated data can be used to gauge patient progress and also provides important insights on outcomes and can be utilized to iterate on standardized protocols and improve shared decision-making to support same day discharge.

Supporting Outcomes

Methods

A retrospective review was conducted on 2,319 primary total joint arthroplasty cases at a single institution over a one-year period from May 2018 through May 2019. 179 TJA cases (115 THA, 64 TKA) were performed at the ambulatory surgery center, and 2,140 (977 THA, 115 TKA) in the hospital setting. Patients completed the Knee Injury and Osteoarthritis Outcome Score (KOOS Jr), Hip Injury and Osteoarthritis Outcome Score (HOOS Jr), Veterans RAND 12 Item Health Survey (VR-12), Pain, and Procedure Satisfaction preoperatively, 12 weeks, 6 months, and 1 year postoperatively. Emergency Department, Urgent Care, and Readmit were also collected at 90 days postoperative. All demographics and outcome measures were collected via Force, an online patient recovery management program (New York, NY).

Results

At baseline, patients undergoing primary total joint arthroplasty at the ASC had similar BMI, laterality, and preoperative patient reported outcome measures (Table 1 and 2). There were significant differences in baseline age (58.84 vs 68.65, $p<0.01$) and gender (53% vs 43% male, $p=0.01$). There were no differences in KOOS Jr., VR-12 physical component score or mental component score at 12 weeks, 6 months, or 1 year in patients undergoing TKA (Table 4). There were no significant differences in HOOS Jr. at 12 weeks or 6 months, VR-12 PCS at 12 weeks, or VR-12 MCS at 12 weeks, 6 months, or 1 year. ASC patients had significantly better HOOS Jr. Scores at 1 year, and VR-12 PCS Scores at 6 months and 1 year postoperative (Table 5). There was no difference in patient satisfaction, or readmissions rates.

Limitations

There were significantly more procedures performed in the hospital setting, and procedures performed in the ASC were significantly younger. Further analysis is needed to adjust for baseline differences.

Conclusion

Preliminary results show that providers can maintain patient reported outcomes, patient satisfaction, and patient safety to support the shift to same day discharge in the ambulatory surgical setting. Further research is needed to determine if these trends hold as more cases shift to an ASC setting. By leveraging technology, Northside Hospital was able to optimize and prepare patients for this shift, standardize their multidisciplinary approach, and review and analyze patient reported outcomes for evidence-based care clinical decision making.

Appendix

Figures and Tables:

Table 1: Baseline Demographics

	Cases	Gender (% Male)	Age	BMI	Laterality (% Right)
ASC	179	53%	58.84	29.25	47%
Hospital	2140	43%	68.65	29.33	53%
p value		0.01	p<0.01	0.86	0.09

Table 2: Baseline Patient Reported Outcome Measures in Total Knee Patients

TKA	KOOS, JR. Score Preoperative	VR12 Score PCS Preoperative	VR12 Score MCS Preoperative
ASC	52.49	33.99	54.36
Hospital	53.75	32.59	54.14
p value	0.41	0.22	0.88

Table 3: Baseline Patient Reported Outcome Measures in Total Hip Patients

THA	HOOS, JR. Score Preoperative	VR12 Score PCS Preoperative	VR12 Score MCS Preoperative
ASC	53.93	32.27	50.11
Hospital	54.21	31.60	51.34
p value	0.85	0.46	0.30

Table 4: Outcomes Following Total Knee Arthroplasty

Procedure Location	KOOS, JR. Score at 12 weeks	KOOS, JR. Score at 6 months	KOOS, JR. Score at 1 year
ASC	72.10	76.17	79.37
Hospital	72.42	76.83	79.08
p value	0.84	0.72	0.88

Procedure Location	VR12 Score at 12 weeks PCS	VR12 Score at 12 weeks MCS	VR12 Score at 6 months PCS	VR12 Score at 6 months MCS	VR12 Score at 1 year PCS	VR12 Score at 1 year MCS
ASC	43.54	54.36	44.63	56.00	47.54	57.39
Hospital	41.34	55.59	44.95	56.35	45.20	56.90
p value	0.06	0.32	0.79	0.76	0.06	0.66

Table 5: Outcomes Following Total Hip Arthroplasty

Procedure Location	HOOS, JR. Score at 12 weeks	HOOS, JR. Score at 6 months	HOOS, JR. Score at 1 year
ASC	86.35	89.41	91.66
Hospital	84.06	87.92	88.78
p value	0.10	0.30	0.05

Procedure Location	VR12 Score at 12 weeks PCS	VR12 Score at 12 weeks MCS	VR12 Score at 6 months PCS	VR12 Score at 6 months MCS	VR12 Score at 1 year PCS	VR12 Score at 1 year MCS
ASC	46.45	55.50	49.64	54.72	49.77	54.64
Hospital	44.64	55.77	47.07	56.03	47.25	55.72
p value	0.06	0.77	0.01	0.15	0.02	0.25

Table 6: Procedure Satisfaction

Procedure Location	TKA	THA
ASC	4.48	4.69
Hospital	4.41	4.55
p value	0.64	0.16

About Force

Force Therapeutics is a powerful, episode-based digital care platform and research network designed to help clinicians intelligently extend their reach. Our platform leverages video and digital connections to directly engage patients at every step of the care journey – from the point of surgery scheduling, to post-op recovery and beyond. Backed by the insights of more than 60 leading healthcare centers across the country, Force is proven to drive more effective recovery, lower costs, and achieve better patient outcomes.

References

1 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5685972/pdf/12178_2017_Article_9451.pdf

2 https://www.bcbs.com/the-health-of-america/reports/planned-knee-and-hip-replacement-surgeries-are-the-rise-the-us

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