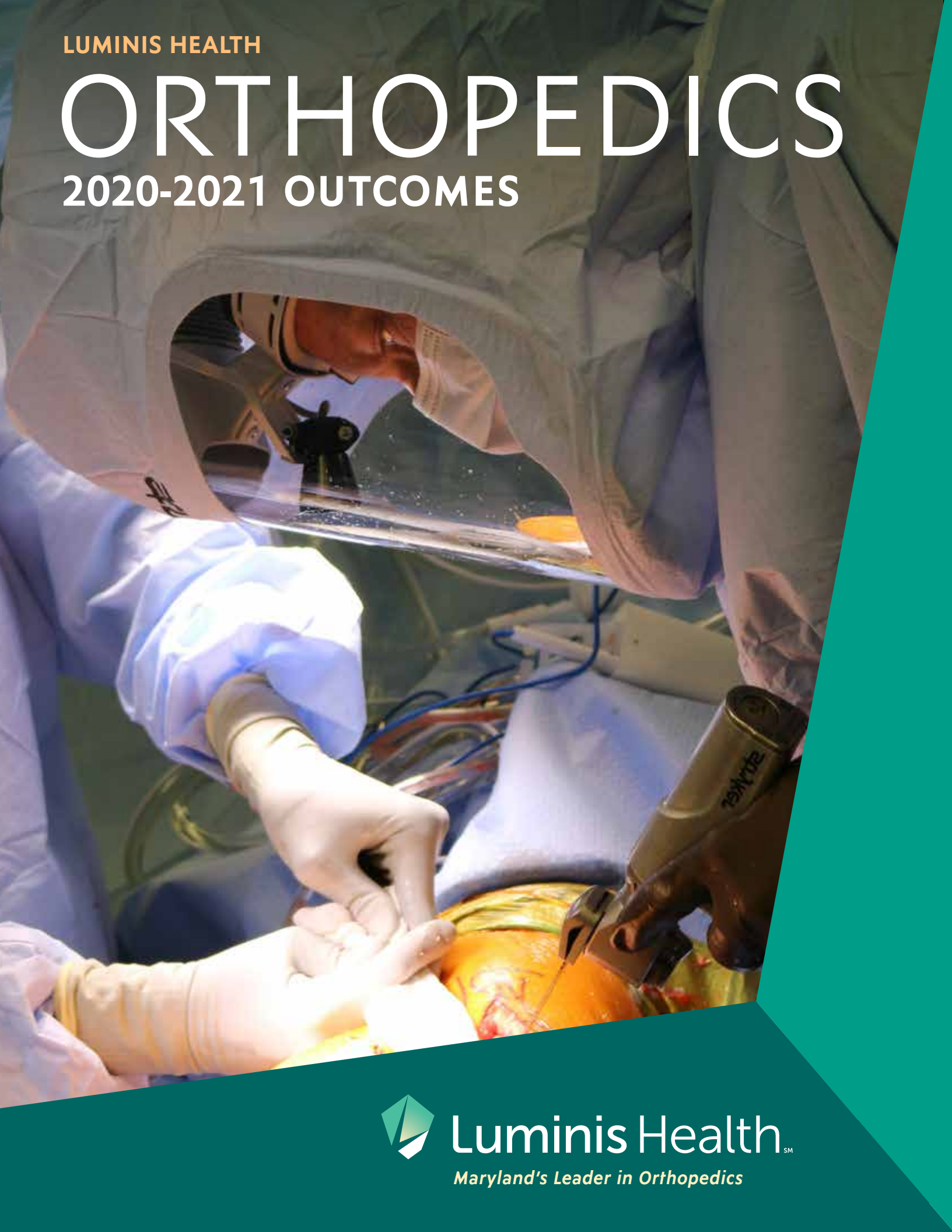


LUMINIS HEALTH

ORTHOPEDICS

2020-2021 OUTCOMES



Luminis HealthSM

Maryland's Leader in Orthopedics

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"Caring for orthopedic patients requires a team-based, multidisciplinary effort. Many of the co-authors and collaborators named in this report include colleagues from nursing, physical therapy, anesthesia, and other specialties. Without them, the high-quality, low cost care we deliver to our patients, and the ability to publish these results would not be possible."

— Jeff Gelfand, MD



Luminis Health Facts & Figures



3 Hospitals

7 Counties

80+ Care Sites



\$1.2
Billion
Operating
Revenue



6,500+
Employees



741

Licensed
Beds



35,406

Inpatient
Admissions



1,430
Volunteers

1,770
Medical
Staff



156,054

Emergency
Visits



\$80 Million
Community
Benefit



A LETTER FROM OUR LEADERSHIP



JEFF GELFAND, MD
Medical Director
Luminis Health Orthopedics

Dear Colleague:

Welcome to the 2020-2021 Luminis Health Orthopedics Outcomes report. Building on the long history of the Anne Arundel Medical Center Orthopedics Outcomes report, this year's work is unlike any other for many reasons. The past two years have been a time of immense change at our institution, as Anne Arundel Health System and Doctor's Community Health System merged to form Luminis Health. Together, the newly formed Luminis Health Orthopedics consists of 66 providers seeing patients at 8 clinic locations. Our team sees over 168,000 patients annually, and has increased access to orthopedic care through the expansion of our OrthoToday programs, which provide same-day and night/weekend appointments, 7 days a week. For patients requiring surgery, we perform nearly 9,000 cases annually across Anne Arundel and Prince George's Counties, including over 3,000 annual surgeries in our two ambulatory surgery centers. Finally, our orthopedic service line is supported by 15 physical therapy practices seeing over 150,000 visits per year. It is undoubtedly an exciting time for Luminis Health Orthopedics to serve patients across Maryland and the Mid-Atlantic region.



KEVIN CROWLEY MS, PT, MBA
Vice President
Luminis Health Orthopedics
and Ambulatory Medicine

It needs no mention that the past two years have also been a time of immense struggle as we continue to deal with the challenges of the Covid-19 pandemic. Like all of you across the country, we have faced the uncertainty of elective surgery cancellations, redeployment to medical units, increasingly complex patients due to delays in care, and the personal toll of the pandemic on our families, our colleagues, and our patients. Despite the immense suffering that has been endured during this period, we are inspired by the collective response of our orthopedic profession to meet the needs of our patients—both at Luminis Health and across the country. In this year's report, we look forward to sharing some of the innovative approaches that were developed in response to our local resource constraints, and hope the lessons learned may translate to sustained improvements in care.

The goal of this report is to demonstrate breadth of research and quality improvement initiatives underway at Luminis Health Orthopedics. From developing a new platform for collecting patient reported outcomes to enabling patients to access new technologies through clinical trials and evaluating interventions aimed at reducing health disparities, our research team is integral to achieving our mission of enhancing the health of the people and communities we serve. Caring for orthopedic patients requires a team-based, multidisciplinary effort. Many of the co-authors and collaborators named in this report include colleagues from nursing, physical therapy, anesthesia, and other specialties. Without them, the high-quality, low cost care we deliver to our patients, and the ability to publish these results, would not be possible. In the pages ahead, please enjoy highlights of the exciting work underway at Luminis Health Orthopedics.

Respectfully,

COVID-19 Response

The COVID-19 pandemic was a driving force behind rapid innovation across the Luminis Health System. The following studies demonstrate three examples of how the orthopedic service line led these efforts. The first profiles our expanded use of wide awake local anesthesia, no tourniquet (WALANT) techniques across the practice to maintain access to care during the height of the pandemic. The second work describes a collaborative effort between the department of surgery and the orthopedic service line to establish a low-resource OR that could be used to maintain access across specialties during this time. Finally, we describe the health system’s work to provide COVID-19 vaccines across our region; an effort led by Kevin Crowley, Vice President of Orthopedics, who served as the health systems’ vaccine incident commander.

RESEARCH PROFILE

Maintaining Access to Orthopaedic Surgery During Periods of Operating Room Resource Constraint: Expanded Use of Wide-Awake Surgery During the COVID-19 Pandemic

Justin J. Turcotte PhD, MBA, Benjamin M. Petre MD, Christopher M. Jones MD, Jeffrey Gelfand MD

As published in *JAAOS Global Research and Reviews*

Introduction: Wide-awake local anesthesia no tourniquet (WALANT) presents a nonstandard anesthetic approach initially described for use in hand surgery that has gained interest and utilization across a variety of orthopaedic procedures. In response to operating room resource constraints imposed by the COVID-19 pandemic, our orthopaedic service rapidly adopted and expanded its use of WALANT.

Methods: A retrospective review of 16 consecutive cases performed by 7 surgeons was conducted. Patient demographics, surgical details, and perioperative outcomes were assessed. The primary end point was WALANT failure, defined as intraoperative conversion to general anesthesia.

Results: No instances of WALANT failure requiring conversion to general anesthesia occurred. In recovery, one patient (6%) required narcotics for pain control, and the average postoperative pain numeric rating scale was 0.6. The maximum pain score experienced was 4 in the patient requiring postoperative narcotics. The average time in recovery was 42 minutes and ranged from 8 to 118 minutes.

Conclusions: The WALANT technique was safely and effectively used in 16 cases across multiple orthopaedic subspecialties, including three procedures not previously described in the literature. WALANT techniques hold promise for use in future disaster scenarios and should be evaluated for potential incorporation into routine orthopaedic surgical care.

DIAGNOSES AND SURGICAL PROCEDURES PERFORMED

DIAGNOSIS	SURGICAL PROCEDURE
Metadiaphyseal fracture of the right radial shaft	ORIF (volar plate)
2 fragment distal radius fracture	ORIF (volar plate)
Unstable trimalleolar equivalent ankle fracture with syndesmotic injury	ORIF (fibular plate) and syndesmotic stabilization
Carpal tunnel syndrome and ulnar neuropathy of the upper extremity	Carpal tunnel and cubital tunnel release
Closed displaced fracture of the clavicle	Superior plating with augmented suture cerclage of comminuted fragments
Complete quadiceps tendon rupture	Quadriceps tendon repair
Distal radius metadiaphyseal fracture	Percutaneous pinning
Ulnar neuropathy	Cubital tunnel release
Intra-articular fracture of the distal radius	ORIF (volar plate)
Displaced third and fourth metacarpal shaft fractures	ORIF (lag screws)
Severe retracted quadriceps tendon rupture	Repair and reconstruction of the quadriceps tendon rupture with V-Y advancement
Closed displaced comminuted fracture of the patella	ORIF (cannulated screw and wire)
Small finger FDP and FDS laceration and radial digital nerve laceration	Small finger flex.or tendon and digital nerve repair
Septic olecranon bursitis	Excision of the bursa
Thigh and knee abscess with cellulitis	Irrigation and debridement of a deep abscess right thigh/ knee
Open extensor tendon laceration	Central slip boutonniere repair

FOP = flexor digitorum profundus, FOS = flexor digitorum superficialis.,
ORIF = open reduction and internal fixation

RESEARCH PROFILE

Development of a Low-Resource Operating Room and a Wide-Awake Orthopedic Surgery Program During the COVID-19 Pandemic

Justin J. Turcotte PhD, MBA, Jeffrey Gelfand MD, Christopher M. Jones MD, Rubie S. Jackson MD, MPH

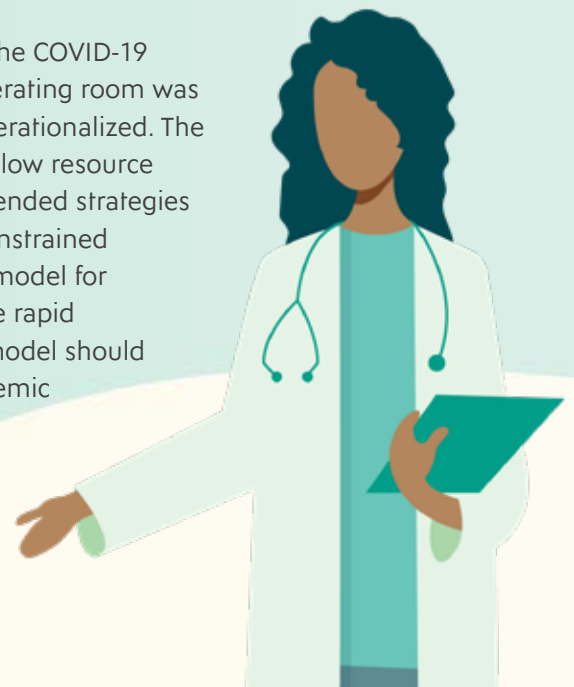
As published in *Surgical Innovation*

Introduction: The COVID-19 pandemic resulted in significant medication, supply and equipment, and provider shortages, limiting the resources available for provision of surgical care. In response to mandates restricting surgery to high acuity procedures during this period, our institution developed a multidisciplinary Low Resource Operating Room (LROR) Taskforce in April 2020. This study describes our institutional experience developing a LROR to maintain access to urgent surgical procedures during the peak of the COVID-19 pandemic.

Methods: A delineation of available resources and resource replacement strategies was conducted and a final institution-wide plan for operationalizing the LROR was formed. Specialty-specific subgroups then convened to determine best practices and opportunities for LROR utilization. Orthopedic surgery performed in the LROR using wide-awake local anesthesia no tourniquet (WALANT) is presented as a use case.

Results: Overall, 19 limited resources were identified, spanning across the domains of physical space, drugs, devices and equipment, and personnel. Based on the assessment, the decision to proceed with creation of a LROR was made. Sixteen urgent orthopedic surgeries were successfully performed using WALANT without conversion to general anesthesia.

Conclusions: In response to the COVID-19 pandemic, a low resource operating room was successfully designed and operationalized. The process for development of a low resource operating room and recommended strategies for operating in a resource constrained environment may serve as a model for other institutions and facilitate rapid implementation of this care model should the need arise in future pandemic or disaster situations.



RESEARCH PROFILE

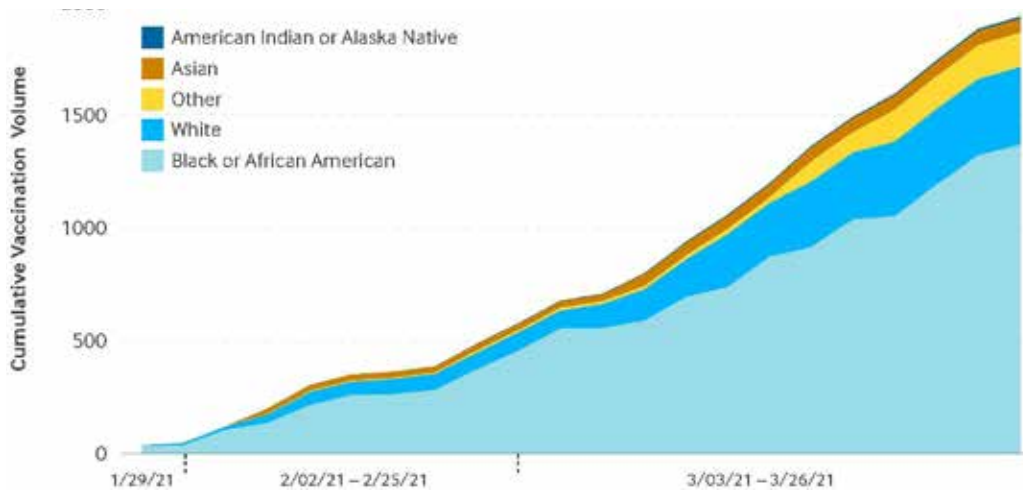
Traversing the Last Mile: A Regional Health System’s Experience with Covid-19 Vaccine Distribution

Justin Turcotte PhD, MBA, Jennifer Harrington MS, MPT, Nikki Yeager MBA, FACHE, Kevin Crowley MS, PT, MBA

As Published in *NEJM Catalyst*

To address the challenges associated with the last-mile logistics of Covid-19 vaccine distribution, Luminis Health implemented a multidimensional approach that focused on building trust, engaging the community, managing demand and vaccination delivery logistics, and coordinating with outside institutions. Using this framework, the system has vaccinated over 70% of its employees and distributed over 64,000 vaccines to the community. In alignment with its guiding principles of safe, equitable, and transparent vaccine distribution, Luminis Health tailored its vaccination campaign to engage racial and ethnic minority communities that have been disproportionately affected by Covid-19. Looking forward, the system has set a goal of vaccinating 500,000 Marylanders over the next 4 months. The successes and areas of opportunities described may serve as a guide for other systems actively distributing Covid-19 vaccines and lead to improved efficiency and effectiveness of future public health initiatives.

COMMUNITY CLINIC CUMULATIVE VACCINATION VOLUME BY RACE



LH AAMC Joint Replacement



PAUL KING, MD

MEDICAL DIRECTOR, THE CENTER FOR JOINT REPLACEMENT

Residency: University of Pennsylvania School of Medicine

Fellowship: Harvard Medical School

Board Certification: American Board of Orthopaedic Surgery



MARC BRASSARD, MD

Residency: University of Alabama Hospital

Fellowship: Beth Israel Medical Center-Petrie Division

Board Certification: American Board of Orthopaedic Surgery



MARK DENZINE, DO

Residency: Philadelphia College of Osteopathic Medicine

Fellowship: Cleveland Clinic

Board Certification: American Board of Orthopaedic Surgery

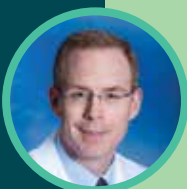


LOUIS RULAND, MD

Residency: University of Virginia Health Sciences Center

Fellowship: Union Memorial Hospital

Board Certification: American Board of Orthopaedic Surgery



JAMES MACDONALD, MD

Residency: Temple University Hospital

Fellowship: Hospital For Special Surgery

Board Certification: American Board of Orthopaedic Surgery



JUSTIN HOOVER, MD

Residency: Palmetto Health Richland

Fellowship: Emory University Hospital

Board Certification: American Board of Orthopaedic Surgery



JAMES YORK, MD

Residency: University of Maryland Medical Center

Board Certification: American Board of Orthopaedic Surgery



GARRETT LYNCH, MD

Residency: University of Kentucky Medical Center

Fellowship: Humana-St. Lukes University of

Louisville Hospital/Jewish Hospital

Board Certification: American Board of Orthopaedic Surgery



11

consecutive years as the busiest joint replacement program in Maryland.

2,015

joint replacements performed in 2021 – the most in Maryland.

88%

of total joint replacements performed as outpatient surgery – the most in Maryland.

87%

of patients with 0 or 1 day length of stay.

96%

of patients discharged home.

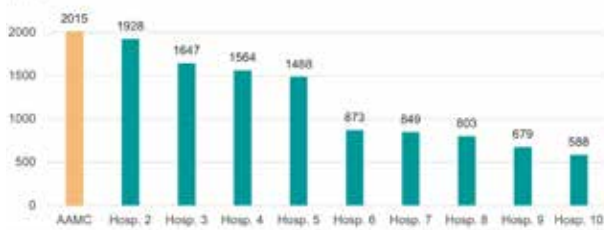
23

published peer-reviewed manuscripts.

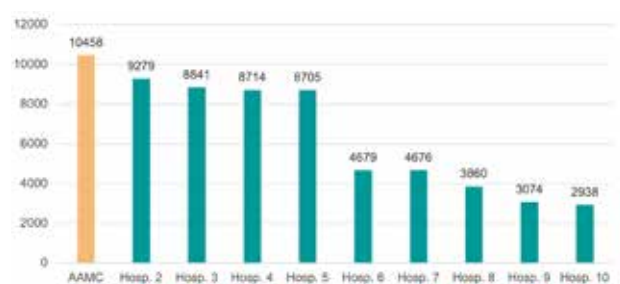
Case Volume

The Center for Joint Replacement at AAMC has been Maryland’s highest volume joint replacement program for eleven consecutive years. Over the past 5 years, we are the only program to perform over 10,000 joint replacements, and we performed 2,015 surgeries in 2021. With the 2018 removal of total knee replacement and 2020 removal of total hip replacement from the Medicare inpatient only list, we have prioritized performing these surgeries as outpatient procedures, an effort that enhances patient satisfaction and saves money for the healthcare system. In 2021, 88% of primary total hip and knee replacements performed at AAMC were done as outpatient surgeries, the most of any high volume (>500 annual cases) joint center in Maryland.

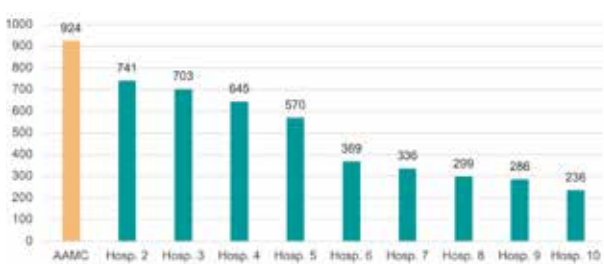
TOTAL JOINT REPLACEMENT VOLUME (FY2021)



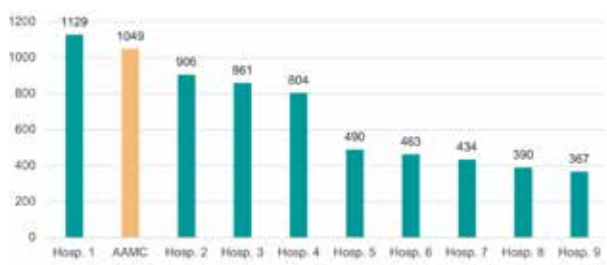
5-YEAR CUMULATIVE TOTAL JOINT REPLACEMENT VOLUME



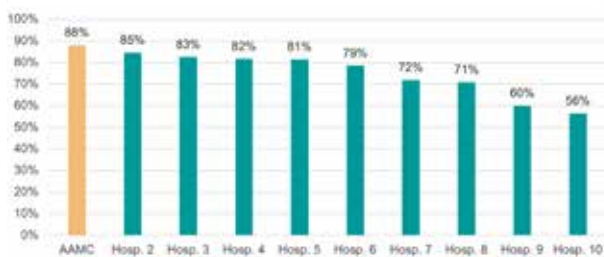
PRIMARY TOTAL HIP REPLACEMENT VOLUME (FY2021)



PRIMARY TOTAL KNEE REPLACEMENT VOLUME (FY2021)



PERCENTAGE OF OUTPATIENT PRIMARY TOTAL JOINTS (FY2021)

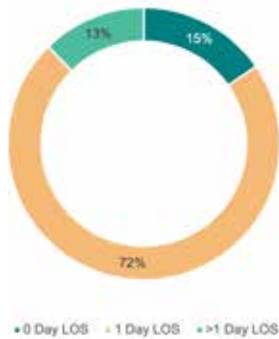


*Volumes include only cases performed at Luminis Health AAMC. ASC cases are not included.

Hospital Outcomes

In 2021, 87% of patients undergoing primary TKR and THR had a hospital length of stay (LOS) \leq 1 day. In addition, only 4% of patients were discharged to skilled nursing facilities, 2% were readmitted within 30 days of surgery, and 2% returned to the emergency department within 30 days of surgery, all outperforming published national averages.

PRIMARY TKR AND THR LENGTH OF STAY DISTRIBUTION (2021)



PRIMARY TKR AND THR DISCHARGE DISPOSITION AND 30-DAY OUTCOMES (2020)



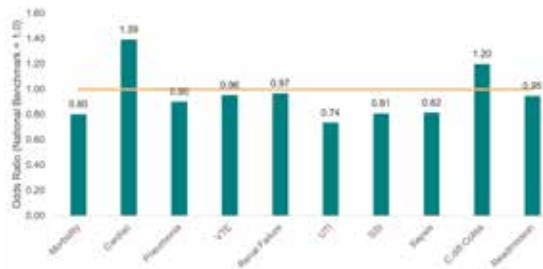
* National benchmark computed as weighted average from previously published studies

National Benchmarks: ACS-NSQIP Outcomes

AAMC participates in the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP), which is the first nationally validated, risk-adjusted, outcomes-based program to measure surgical care and quality. ACS-NSQIP allows valid comparison of outcomes among all 700+ hospitals participating in the program.

The graphs below present our ACS-NSQIP quality measures for patients undergoing total joint replacement. For total hip and knee replacements, AAMC ranked in the top 10% of hospitals nationally on 14 of 20 measures.

THR 30-DAY OUTCOMES VS NATIONAL BENCHMARK (CY2020)



TKR 30-DAY OUTCOMES VS NATIONAL BENCHMARK (CY2020)



These graphs present our performance as odds ratios, which estimate the odds of an event happening at AAMC compared to the estimate of that type of event happening in all 700+ hospitals reporting to the ACS-NSQIP database. An odds ratio of 1.0 means the hospital is performing as expected. A number less than 1.0 indicates the hospital is performing better than expected, while a number above 1.0 is worse than expected.

Financial Outcomes

As part of our mission to provide high quality, low cost care to the patients we serve, we continually aim to decrease the cost of total joint replacement and maximize the value delivered to patients. In 2021, the Center for Joint Replacement offered the lowest average charge primary total hip replacements and third lowest charge total knee replacements in the state. Our average charges of \$17,648 and \$18,244 were 25% and 20% below the state averages of \$23,432 and \$22,679 for total hip and knee replacements, respectively.

PRIMARY TOTAL HIP REPLACEMENT CHARGE PER CASE (FY2021)



PRIMARY TOTAL KNEE REPLACEMENT CHARGE PER CASE (FY2021)



Our average charges for total hip and knee replacements are 20-25% below the state average



RESEARCH PROFILE

Improving Postoperative Outcomes in African American Patients Undergoing TJA

Funding made possible by the J. Robert Gladden Orthopaedic Society

Principal Investigator: Paul King, MD

Past studies have shown that minority races and ethnic groups tend to have poorer outcomes than white patients after total joint arthroplasty. African American patients often remain in the hospital longer than white patients, and when they are discharged, they are more likely to be sent to a skilled nursing facility rather than home. African American patients are more likely to have certain medical comorbidities like diabetes, which are known to increase the risk associated with arthroplasty procedures. With payment models being based on outcomes, orthopaedic surgeons may tend toward selecting patients who are more likely to have a better outcome, which could limit access to care for patients who come with a higher risk.

Paul King, MD, wants to mitigate the health-related disadvantages of minority patient population groups and also improve their outcomes.

Dr. King hypothesized that individualized pre-operative consultation with a nurse navigator would identify potential ways to reduce the time patients spend in the hospital after a total joint arthroplasty (TJA) and increase the likelihood that they can be released home directly after surgery. With funding from OREF and JRGOS, he will conduct a study in which at-risk patients scheduled for TJA receive an individualized nurse navigator (NN) consultation to assist in postoperative planning, coordinate pre- and postoperative specialist referrals, and connect patients with community health resources. Based on prior research, minority patients, patients with multiple comorbidities, those living alone, and those with socioeconomic risk factors are considered at-risk for a suboptimal outcome after TJA and referred to the program. The nurse navigator will assess each patient's needs and guide them to preoperative programs developed specifically to

“We recognize that racial disparities in outcomes among patients undergoing total joint arthroplasty exist; however, few studies have evaluated interventions aimed at reducing these disparities. To improve health equity we must provide additional resources to minority and at-risk patients. By providing additional nurse navigator coordination and access to services for these patients, we hypothesize that the gap in outcomes can be reduced.”

— Paul King, MD

decrease length of hospital stay and increase home discharge following TJA.

To determine if these preoperative efforts, called NN @ PAT, are effective in improving outcomes for minority race and ethnic populations, Dr. King will conduct a retrospective analysis of postoperative outcomes (length of stay, discharge disposition, and rates of complications and readmissions) of at-risk patients in the NN @ PAT program versus the general population of the same time period who were not treated in the program. He will also look at propensity score matched contemporaneous control at-risk patients who were not treated in the program, and a cohort of propensity score matched patients who were treated prior to the implementation of the NN @ PAT program. Finally, he will perform subgroup analyses comparing outcomes between minority and white patients to evaluate whether the program effectively reduced disparities between these populations.

The results of this study will be released in 2022.

RESEARCH PROFILE

The Effect of Neuraxial Anesthesia on Postoperative Outcomes in Total Joint Arthroplasty With Rapid Recovery Protocols

Justin J. Turcotte PhD, MBA, Andrea H. Stone MSN, CRNP, Ruby J. Gilmor BS, Josephine W. Formica, Paul J. King MD

As published in *The Journal of Arthroplasty*

Background: Compared to general anesthesia (GA), neuraxial anesthesia (NA) has been associated with improved outcomes after total joint arthroplasty (TJA). We examined the impact of NA on patient outcomes in an institution with an established rapid recovery protocol.

Methods: This is a single-institution retrospective analysis of 5914 consecutive primary TJA performed from July 2015 to June 2018. Univariate tests and multivariate regression compared length of stay (LOS), transfusion rates, hematocrit levels, discharge disposition, and emergency room returns between patients receiving GA and NA.

Results: Patients receiving NA had a significantly shorter LOS (total hip arthroplasty [THA]: GA 1.74 vs NA 1.36 days, $P < .001$; total knee arthroplasty [TKA]: GA 1.77 vs NA 1.64 days, $P < .001$). Both THA and TKA patients receiving NA were less likely to require transfusion (THA: GA 5.8% vs NA 1.6%, $P < .001$; TKA: GA 2.5% vs NA 0.5%, $P < .001$) and had a higher postoperative hematocrit

(THA: GA 32.50% vs NA 33.22%, $P < .001$; TKA GA 33.57 vs NA 34.50%, $P < .001$). Patients receiving NA were more likely to discharge home (THA: GA 83.4% vs NA 92.3%, $P < .001$; TKA: GA 83.3% vs NA 86.3%, $P = .010$) (THA: NA adjusted OR [aOR] 2.04, $P < .001$; TKA: NA aOR 1.23, $P = .048$) and had significantly lower rates of 90-day emergency room visits (THA: NA aOR 0.61, $P = .005$; TKA: NA aOR 0.74, $P = .034$).

Conclusions: NA appears to contribute to decreased LOS, short-term complications, and transfusions while facilitating home discharge following TKA and THA. These trends are consistent when controlling for patient-specific risk factors, suggesting NA may enhance outcomes for patients with increased age, body mass index, and comorbidities.

	TOTAL KNEE ARTHROPLASTY			TOTAL HIP ARTHROPLASTY		
	GENERAL ANESTHESIA N=1867	NEURAXIAL ANESTHESIA N=1799	SIG.	GENERAL ANESTHESIA N=1029	NEURAXIAL ANESTHESIA N=1219	SIG.
ER visit (%)	134 (7.2)	97 (5.4)	.026	89 (8.6)	62 (5.1)	.001
Readmission (%)	89 (4.8)	67 (3.7)	.118	58 (5.6)	41 (3.4)	.009
Discharge Disposition			.010			<.001
▪ Home	1555 (83.3)	1553 (86.3)		858 (83.4)	1125 (92.3)	
▪ SNF	312 (16.7)	246 (13.7)		171 (16.6)	94 (7.7)	
Preop Hematocrit (%)	40.31 ± 3.87	40.52 ± 3.63	.090	40.14 ± 3.85	40.75 ± 3.51	<.001
Postoperative Day 1 Hematocrit (%)	33.57 ± 3.97	34.50 ± 3.83	<.001	32.50 ± 4.18	33.22 ± 3.81	<.001
Change in Hematocrit	-6.74 ± 2.82	-6.02 ± 2.68	<.001	-7.64 ± 3.19	-7.53 ± 3.00	.405
Tranexamic acid use	1266 (67.8)	1446 (80.4)	<.001	704 (68.4)	1043 (85.6)	<.001
PRBC Transfusion rate	47 (2.5)	9 (0.5)	<.001	60 (5.8)	19 (1.6)	<.001
Number of PRBC units transfused	1.94 ± 0.64	1.78 ± 0.67	.502	2.05 ± 1.05	1.63 ± 0.60	.103

P < .05 in bold. Data are expressed as mean ± SD or n (%)

ASA, American Society of Anesthesiologist; ER, emergency room; SNF, skilled nursing facility; PRBC, packed red blood cells.

RESEARCH PROFILE

Outpatient, Home-Based Physical Therapy Promotes Decreased Length of Stay and Post-Acute Resource Utilization After Total Joint Arthroplasty

Nandakumar Menon MD, Justin J. Turcotte PhD, MBA, Andrea H. Stone MSN, CRNP, Amanda L. Adkins MPT, James H. MacDonald MD, Paul J. King MD

As published in *The Journal of Arthroplasty*

Background: Patients and healthcare systems are increasingly focused on evaluating interventions that increase the value of care delivered. Our objective of this study is to evaluate early post-operative outcomes among those patients who underwent total joint arthroplasty with and without the participation in our piloted Outpatient Physical Therapy Home Visits (OPTHV) program.

Methods: A retrospective analysis of patients undergoing total hip arthroplasty and total knee arthroplasty at a single institution from July 2016 to September 2017 was performed. Matched cohorts were compared according to OPTHV enrollment status.

Results: In total, 1729 patients were included in this study. Two hundred ninety-three patients were enrolled in OPTHV, while 1436 patients received institutional standard care. Patients were matched by gender (56.7% vs 57.7% female, $P = .751$), age (67.75 vs 66.95 years, $P = .167$), body mass index (30.18 vs 30.12 kg/m², $P = .859$), and average American Society of Anesthesiologists score (2.31 vs 2.36, $P = .131$). OPTHV patients had a shorter length of stay (1.39 vs 1.64 days, $P < .001$) and were more likely to discharge to home (89.8% vs 74.7%, $P < .001$). Ninety-day re-admissions (2.7% vs 2.6%, $P = .880$) and emergency room visits (4.1% vs 4.3%, $P = .864$) were equivalent.

Conclusions: OPTHV is a novel program that facilitates discharge home and decreased length of stay after total joint arthroplasty without increasing re-admissions or emergency room visits. Utilization of OPTHV may contribute toward reducing the episode of care costs by reducing utilization of skilled nursing facility and home health services. Further prospective studies are needed to evaluate the effect of OPTHV on the total cost of care and functional outcomes.



RESEARCH PROFILE

The Utility of Frozen Section Histology in Diagnosing Periprosthetic Joint Infection in Revision Total Joint Arthroplasty

McKayla E. Kelly BS, Shreeya R. Bahethi, Mary E. King, Benjamin C. Elstner, Justin J. Turcotte PhD, MBA, Paul J. King MD

As published in *The Journal of Arthroplasty*

Background: Surgeons utilize a combination of preoperative tests and intraoperative findings to diagnose periprosthetic joint infection (PJI); however, there is currently no reliable diagnostic marker that can be used in isolation. The purpose of our study is to evaluate the utility of frozen section histology in diagnosis of PJI.

Methods: Retrospective analysis of 614 patients undergoing revision total joint arthroplasty with frozen section histology from a single institution was performed. Discriminatory value of frozen section histology was assessed using univariate analysis and evaluation of area under the curve (AUC) of a receiver operating characteristic curve comparing frozen section histology results to the 2018 International Consensus Meeting (ICM) PJI criteria modified to exclude the histology component.

Results: The sensitivity of the frozen section histology was 53.6% and the specificity was 95.2%. There was 99.2% concordance between the permanent section and frozen section results. The receiver operating characteristic curve for frozen section yielded an AUC of 0.744 (95% confidence interval 0.627-0.860) and the modified ICM score yielded an AUC of 0.912 (95% confidence interval 0.836-0.988) when compared to the full score. The addition of frozen section histology changed the decision to infected in 20% of “inconclusive” cases but less than 1% of total cases.

Conclusions: In comparison to the modified ICM criteria, intraoperative frozen section histology has poor sensitivity, strong specificity, and acceptable overall discrimination for diagnosing PJI. This test appears to be of particular value for patients deemed “inconclusive” for infection using the remaining ICM criteria.

COMPARISON OF DECISION BETWEEN MODIFIED ICM AND FULL ICM CLASSIFICATIONS.

FULL ICM DECISION	INCONCLUSIVE	INFECTED	NOT INFECTED	TOTAL
Modified ICM Decision				
▪ Inconclusive	30 (4.9)	6 (1.0)	0 (0.0)	36 (5.9)
▪ Infected	0 (0.0)	23 (3.7)	0 (0.0)	23 (3.7)
▪ Not Infected	25 (4.1)	0 (0.0)	530 (86.3)	555 (90.4)
Total	55 (9.0)	29 (4.7)	530 (86.3)	614 (100.0)

Data are expressed as n (%). Percentages included are percent of total (n=614).

RESEARCH PROFILE

Reasons for Revision: Primary Total Hip Arthroplasty Mechanisms of Failure

Grayson Kelmer BS, Andrea H. Stone MSN, CRNP, Justin J. Turcotte PhD, MBA, Paul J. King MD

As published in *Journal of the American Academy of Orthopaedic Surgeons*

Background: This study aimed to examine the major reasons for total hip arthroplasty (THA) failure and temporal patterns in THA revisions.

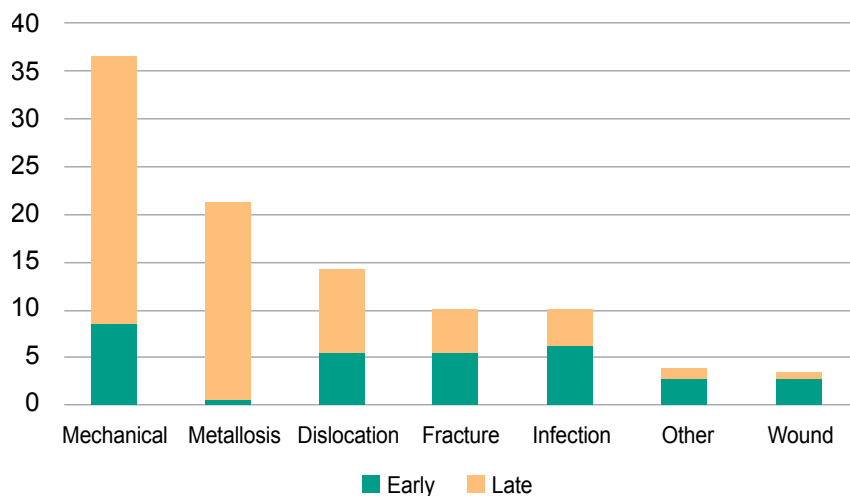
Methods: A retrospective chart review was conducted on 535 revisions performed on 444 THAs from January 2010 to May 2019 at our institution.

Results: The average time to revision THA was 8.38-8.516 years, with 136 cases (30.9%) occurring within 2 years after primary THA. The major mechanisms of failure that resulted in revision surgery were mechanical failure (162, 36.5%), metallosis (95, 21.4%), dislocation or instability (65, 14.6%), periprosthetic fracture (46, 10.4%), infection (44, 9.9%), hematoma or poor wound healing (15, 3.4%), and pain or other (17, 3.8%).

Conclusions: Based on our institutional experience over the past decade, mechanical failure without dislocation, metallosis, dislocation, periprosthetic fracture, and infection are typical reasons patients present for primary THA revision. Revisions within 2 years after primary

THA are more likely to be the result of infection and periprosthetic fracture. Mechanical failure is the most common reason for revision THA overall, and mechanical failure and metallosis are more likely to be the reason revision is necessary 2 or more years after primary THA.

MECHANISM OF FAILURE AS A PERCENT OF EARLY, LATE, AND OVERALL REVISIONS



*Mechanism of failure significantly more prevalent in early revisions ($P < .001$);

**Mechanism of failure significantly more prevalent in late revisions ($P < .001$)

RESEARCH PROFILE

Preoperative Predictors of Same-Day Discharge After Total Knee Arthroplasty

Justin J. Turcotte PhD, MBA, Nandakumar Menon MD, McKayla E. Kelly BS, Jennifer J. Grover DHSc, MS, PA-C, Paul J. King MD, James H. MacDonald MD

As published in *Arthroplasty Today*

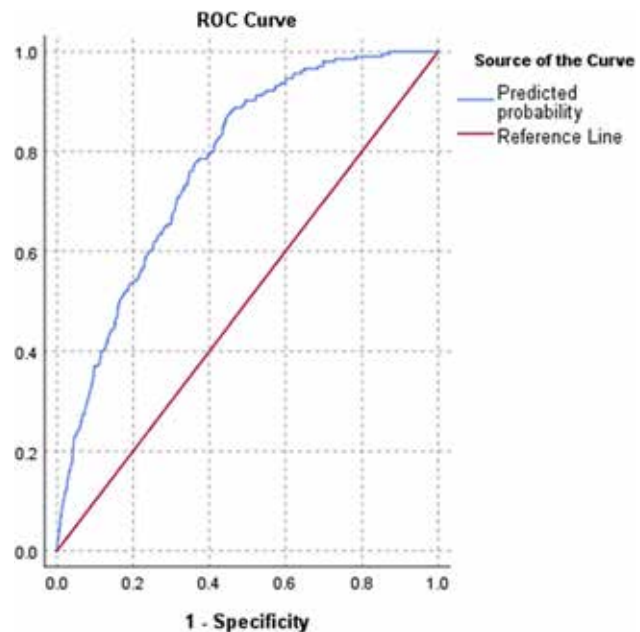
Background: In January 2020, The Centers for Medicare and Medicaid Services (CMS) approved total knee arthroplasty (TKA) to be performed in ambulatory surgery centers (ASCs). This study aims to develop a predictive model for targeting appropriate patients for ASC-based TKA.

Methods: A retrospective review of 2,266 patients (205 same day discharge [9.0%] and 2,061 one day length of stay [91.0%]) undergoing TKA at a regional medical center between July 2016 and September 2020 was conducted. Multiple logistic regression was used to evaluate predictors of same-day discharge (SDD), as these patients represent those most likely to safely undergo TKA in an ASC.

Results: Controlling for other demographics and comorbidities, patients with the following characteristics were at reduced odds of SDD: increased age (OR=0.935, $p<0.001$), BMI ≥ 35 (OR=0.491, $p=0.002$), female (OR=0.535, $p<0.001$), non-white race (OR=0.456, $p=0.003$), primary hypertension (OR=0.710, $p=0.032$), ≥ 3 comorbidities (OR=0.507, $p=0.002$), ASA ≥ 3 (OR=0.378, $p<0.001$). The model was deemed to be of adequate fit using the Hosmer and Lemeshow test ($\chi^2=12.437$, $p=0.112$) and the area under the curve was found to be 0.773 indicating acceptable discrimination.

Conclusions: For patients undergoing primary TKA, increased age, BMI ≥ 35 , female gender, non-white race, primary hypertension, ≥ 3 comorbidities, and ASA ≥ 3 decrease the likelihood of same day discharge. A predictive model based on readily available patient presentation and comorbidity characteristics may aid surgeons in identifying patients that are candidates for same-day discharge or ASC-based TKA.

EVALUATION OF PREDICTIVE MODEL ACCURACY



LH AAMC Spine Surgery

743

surgeries performed in 2021 – the 5th most in Maryland.

21%

lower average charge per case than the Maryland hospital average.

5

quality measures in the top decile nationally including overall morbidity, mortality, cardiac complications, VTE, and sepsis.

12

quality measures outperforming national benchmarks.

12

published peer-reviewed manuscripts.



CHAD PATTON, MD

MEDICAL DIRECTOR,
LUMINIS HEALTH SPINE SURGERY

Residency: University of Vermont Medical Center

Fellowship: University of Utah Orthopedic Center

Board Certification: American Board of Orthopaedic Surgery



ALESSANDRO SPECIALE, MD

Residency: The George Washington University Hospital

Fellowship: Duke University Hospital

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GARY DIX, MD

Residency: University of Calgary-Foothills Hospital

Fellowship: University of Calgary-Foothills Hospital

Board Certification: American Board of Neurological Surgery



BRIAN SULLIVAN, MD

Residency: The George Washington University Hospital

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ROY BANDS, MD

Residency: Yale New Haven Hospital

Fellowship: Hospital of the University of Pennsylvania Union Memorial Hospital

Board Certification: American Board of Orthopaedic Surgery



CHUKWUEMEKA "EMEKA" NWODIM, MD

Residency: Temple University School of Medicine

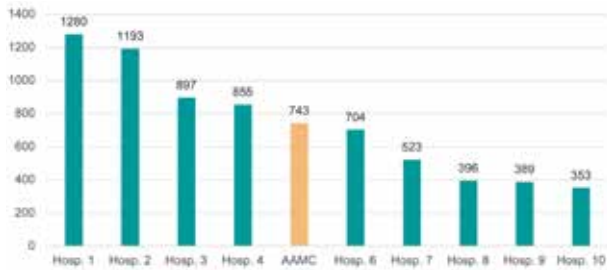
Fellowship: University of Maryland Medical Center

Board Certification: American Board of Orthopaedic Surgery

High Quality, Low Cost Care

The Center for Spine surgery performed 743 cases in 2021, making it the 5th busiest program in Maryland. Using a multidisciplinary approach, the program provides comprehensive care for degenerative and acute spine conditions. This has enabled us to deliver high quality, low cost care as demonstrated by a charge per case 21% lower than the Maryland hospital average, and outperforming national benchmarks in 12 ACS-NSQIP quality measures.

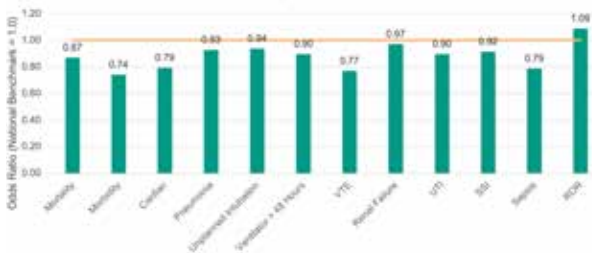
SPINE SURGERY VOLUME (FY2021)



SPINE SURGERY AVERAGE CHARGE PER CASE (FY2021)



SPINE SURGERY 30-DAY OUTCOMES VS NATIONAL BENCHMARK CY2020



*Volumes include only cases performed at Luminis Health AAMC. ASC cases are not included.



RESEARCH PROFILE

Patient Goal-directed Care in an Orthopedic Spine Specialty Clinic

McKayla Kelly BS, Justin Turcotte PhD, MBA, Kerry Lynch BS, Karen Pipkin MS, ACNP-C, FNP-C, Chad Patton MD

As published in *Journal of the American Academy of Orthopaedic Surgeons*

Introduction: Using health-related goals to direct care could improve quality and reduce cost of medical care; however, the impact of these goals for patients with spinal pathologies is not well understood. The purpose of this study is to describe patient-reported goals by provider type and evaluate the impact of patient-provider goal awareness on patient satisfaction and treatment pathway.

Methods: A pilot program was instituted in which all new or existing patients scheduled with either a single spine surgeon or nonoperative spine nurse practitioner were asked to complete a paper survey instrument regarding their goals of care prior to their visit. The patient goals were then discussed between the provider and patient. Univariate and multivariate analyses were performed to evaluate relationships between patient goals, provider seen, diagnosis, and treatment recommendations.

Results: There were 703 respondents to the survey and 416 of those patients were included for subgroup analysis. Patient reported goals varied by provider type. When examining rates of recommended interventions by patient goal, significant differences were observed for 7 of the 13 goal categories. Significant differences in intervention recommendations by provider type existed for physical therapy, medications, MRI, and surgery (all $p < 0.001$). After controlling for other variables, seeing a surgeon, thoracolumbar pathology, and goals of “return to activity or social events I enjoy” and “learn about spine surgery” were significant independent predictors of recommendation for surgery (all $OR > 3$ and $p < 0.05$). This model generated an area under the curve of 0.923 (95% CI: 0.861-0.986), indicating outstanding discrimination in predicting recommendation for surgery. Patient satisfaction scores rose from 91.5% to 92.2%, but this difference was not statistically significant ($p = 0.782$)

Discussion: Specific patient-reported goals vary by provider type and are associated with specific diagnosis and treatment recommendations. Goal-directed care may improve the design of treatment pathways and the overall patient experience.



RESEARCH PROFILE

Structural Allograft Versus Synthetic Interbody Cage for Anterior Cervical Discectomy and Fusion: A Comparison of 1-Year Outcomes From a National Database

Nandakumar Menon MD, Justin Turcotte PhD, MBA, Chad Patton MD, MSc

As published in *Global Spine Journal*

Study Design: Observational cohort study

Objectives: To compare one-year perioperative complications between structural allograft (SA) and synthetic cage (SC) for anterior cervical discectomy and fusion (ACDF) using a national database.

Methods: The TriNetX Research Network was retrospectively queried. Patients undergoing initial single or multi-level ACDF surgery between October 1, 2015, and April 30, 2019, were propensity score matched based on age and comorbidities. The rates of one-year revision ACDF surgery and reported diagnoses of pseudoarthrosis, surgical site infection (SSI) and dysphagia were compared between structural allograft and synthetic cage techniques.

Results: A comparison of one-year outcomes between propensity score matched cohorts was conducted on 3,056 patients undergoing single level ACDF and 3,510 patients undergoing multi-level ACDF. In single-level ACDF patients, there was no difference in one-year revision ACDF surgery ($p=0.573$), reported diagnoses of pseudoarthrosis ($p=0.413$), SSI ($p=0.620$), or dysphagia ($p=0.529$) between structural allograft and synthetic cage groups. In multi-level ACDF patients, there was a higher rate of revision surgery (SA: 3.8% vs. SC: 7.3%, OR=1.982, $p<0.001$) in the synthetic cage group, and a higher rate of dysphagia in the structural allograft group (SA:15.9% vs. SC: 12.9%).

Conclusions: While the overall revision and complication rate for single-level ACDF remains low despite interbody graft selection, synthetic cage implant selection may result in higher rates of revision surgery in multi-level procedures despite yielding lower rates of dysphagia. Further prospective study is warranted.

	STRUCTURAL ALLOGRAFT N (%)	SYNTHETIC INTERBODY SPACER N (%)	ODDS RATIO	ODDS RATIO 95% CI	P-VALUE
Single Level (N = 3056)	1528 (100.0)	1528 (100.0)			
Revision	56 (3.7)	62 (4.1)	1.112	0.769 - 1.607	.573
Pseudoarthrosis	232 (15.2)	216 (14.1)	0.920	0.753 - 1.124	.413
Surgical Site Infection	17 (1.1)	20 (1.3)	1.179	0.615 - 2.259	.620
Dysphagia	177 (11.6)	166 (10.9)	0.930	0.743 - 1.165	.529
Multi-Level (N =3510)	1755 (100.0)	1755 (100.0)			
Revision	67 (3.8)	128 (7.3)	1.982	(1.464 - 2.684)	<.001
Pseudoarthrosis	372 (21.2)	413 (23.5)	1.144	(0.976 - 1.341)	.097
Surgical Site Infection	18 (1.0)	23 (1.3)	1.281	(0.689 - 2.383)	.432
Dysphagia	279 (15.9)	226 (12.9)	0.782	(0.647 - 0.945)	.011

Propensity score matched cohorts, one-year outcomes. Data provided for propensity score matched patient cohorts with single level and multilevel ACDF utilizing structural allograft or synthetic interbody spacer. ACDF – Anterior cervical discectomy and fusion; CI – Confidence interval. Statistical significance with p -value <0.5 in bold.

RESEARCH PROFILE

Racial Disparities in Surgical Outcomes After Spine Surgery: An ACS-NSQIP Analysis

Zachary Sanford MD, Haley Taylor MS, Alyson Fiorentino BS, Andrew Broda BS, Amina Zaidi, Justin Turcotte MBA, Chad Patton MD, MS

As published in *Global Spine Journal*

Study Design: Retrospective cohort study.

Objectives: Racial disparities in postoperative outcomes are unfortunately common. We present data assessing race as an independent risk factor for postoperative complications after spine surgery for Native American (NA) and African American (AA) patients compared with Caucasians (CA).

Methods: The American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) database was queried for spine procedures performed in 2015. Data was subdivided by surgery, demography, comorbidity, and 30-day postoperative outcomes, which were then compared by race. Regression was performed holding race as an independent risk factor.

Results: A total of 4803 patients (4106 CA, 522 AA, 175 NA) were included in this analysis. AA patients experienced longer length of stay (LOS) and operative times ($P < .001$) excluding lumbar fusion, which was significantly shorter ($P = .035$). AA patients demonstrated higher comorbidity burden, specifically for diabetes and hypertension ($P < .005$), while NA individuals were higher tobacco consumers ($P < .001$). AA race was an independent risk factor associated with longer LOS across all cervical surgeries ($b = 1.54, P < .001$), lumbar fusion ($b = 0.77, P = .009$), and decompression laminectomy ($b = 1.23, P < .001$), longer operative time in cervical fusion ($b = 12.21, P = .032$), lumbar fusion ($b = -24.00, P = .016$), and decompression laminectomy ($OR = 20.95, P < .001$), greater risk for deep vein thrombosis in lumbar fusion ($OR = 3.72, P = .017$), and increased superficial surgical site infections ($OR = 5.22, P = .001$) and pulmonary embolism ($OR = 5.76, P = .048$) in decompression laminectomy. NA race was an independent risk factor for superficial surgical site infections following cervical fusion ($OR = 14.58, P = .044$) and decompression laminectomy ($OR = 4.80, P = .021$).

Conclusions: AA and NA spine surgery patients exhibit disproportionate comorbidity burden and greater 30-day complications compared with CA patients. AA and NA race were found to independently affect rates of complications, LOS, and operation time.

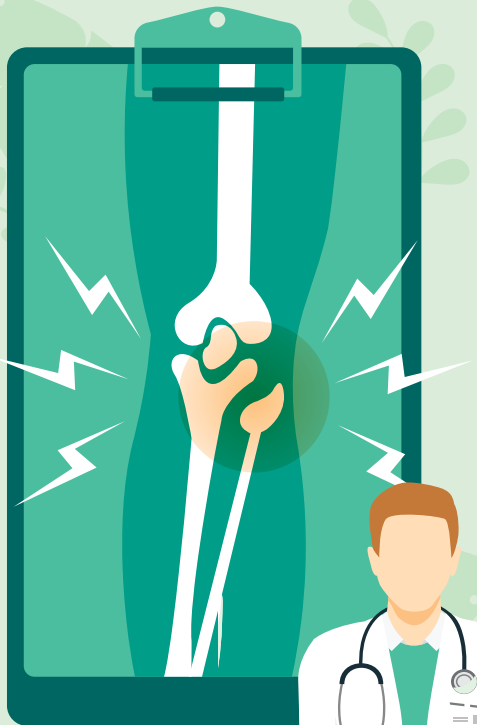
LH AAMC Sports Medicine

1,825

surgeries performed in 2021

7

published peer-reviewed
manuscripts.



BENJAMIN PETRE, MD

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Residency: Johns Hopkins Hospital

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York College of Medicine

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Residency: University of Michigan Hospitals
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Fellowship: University of Wisconsin
Hospital and Clinic

Board Certification: American Board
of Orthopaedic Surgery



JAMES YORK, MD

Residency: University of Maryland Medical Center

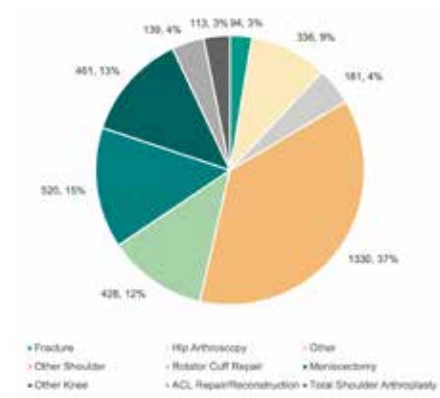
Board Certification: American Board
of Orthopaedic Surgery

Procedure Volume

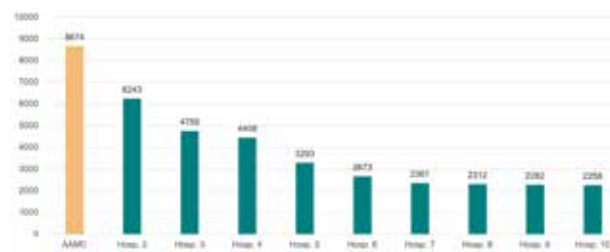
In 2021, the sports medicine program performed 1,825 surgeries including >3,500 procedures to treat a wide variety of pathologies across the upper and lower extremities. With the opening of our ambulatory surgery centers in 2019, we began shifting sports medicine surgery out of the hospital setting to deliver high quality care in the most cost-efficient manner possible.

A unique aspect of our program is the breadth of sports medicine procedures performed including a high volume of arthroscopic hip, knee, and shoulder surgeries. Despite the shift of sports medicine procedures to the ambulatory surgery center setting, LH AAMC has performed 8,674 hospital-based sports medicine surgeries (as defined by Advisory Board) since FY2017, the most in Maryland over the past 5 years.

SPORTS MEDICINE PROCEDURES (FY2021)



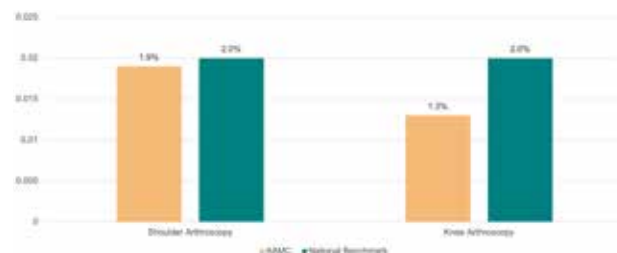
HOSPITAL-BASED SPORTS MEDICINE SURGERY VOLUME 5-YEAR CUMULATIVE OF TOP 10 HOSPITALS



Quality

Arthroscopic shoulder and knee surgeries are the two sports medicine procedures captured in the ACS-NSQIP quality reporting program. In 2020-2021, patients treated at LH AAMC experienced lower 30-day all cause complication rates than the national average for both procedures.

SHOULDER AND KNEE ARTHROSCOPY 30-DAY ALL CAUSE COMPLICATION RATE (CY2020-2021)



Community Involvement

The Sports Medicine team is involved in volunteer community sports coverage at all levels from the weekend warrior to Olympic teams. We are very proud to be selected by the following teams to provide their medical coverage:



DANIEL REDZINIAK, MD

Bowie State, Anne Arundel Community College, Broadneck High School, Annapolis High School



BENJAMIN PETRE, MD

USA Olympic Ski Team, USA Olympic Snowboard Team, Baltimore Orioles, Bowie Baysox AA Orioles affiliate, Annapolis High School



PETER OVE, MD

Bowie State, DeMatha Catholic High School, Severna Park High School



CHRISTINA MORGANTI, MD

Anne Arundel Community College

COMMUNITY EDUCATION

The Sports Medicine team is dedicated to providing educational opportunities to both providers and the community. Highlights of our ongoing annual education activities:

Youth Injury Prevention Seminar (YIPS)

YIPS, an annual conference led by Christina Morganti, MD, aims to educate and update coaches, athletic trainers, parents, physical therapists, midlevel providers and other physicians on the most relevant injury prevention topics and techniques. Recent conferences have focused on topics such as concussions, the opioid crisis and what it means for injured youth, prevention of ACL tears, footwear, and playing surface, etc.

Emerging Concepts in Orthopedic Surgery

Organized by Daniel Redziniak, MD, and Jeff Gelfand, MD, this one-day course is targeted toward orthopedic surgeons, primary care providers, physical therapists, and other allied professionals who want to learn about emerging treatment options for common conditions encountered by orthopedic surgeons. Course lectures include new strategies for treating a range of orthopedic conditions and injuries, and discussion of new procedures compared with alternate management options.

Sports Medicine Fellowship

The AAMC Sports Medicine team was honored to be asked by the Uniformed Services University to take part in teaching their Sports Medicine fellows.

RESEARCH PROFILE

Risk Factors for All-Inside Meniscal Repair Failure With and Without Concurrent Anterior Cruciate Ligament Reconstruction

Justin J. Turcotte PhD, MBA, Alyssa D. Maley PA-C, Sandra B. Levermore PA-C, Benjamin M. Petre MD, Daniel E. Redziniak MD

As published in *The Knee*

Background: This study examines the relationship between meniscus tear presentations and failure rates following all-inside repair in isolation and in conjunction with an anterior cruciate ligament (ACL) reconstruction.

Methods: Eighty seven consecutive patients undergoing all-inside meniscal repair at a single institution from July 2016 to June 2018 were retrospectively reviewed. Details of patient presentation, tear type and location, the presence or absence of simultaneous ACL reconstruction, and surgical repair details were recorded to evaluate the relationship between patient characteristics and the primary endpoint of repair failure.

Results: Patients were followed for an average of 2.7 ± 0.8 years. Three patients (3.4%) experienced 30-day complications including 1 deep vein thrombosis and 2 joint aspirations. Within the study time frame, 15 repairs (17.2%) failed, with 10 (11.5%) failing within one year of the initial procedure; the average time to failure was 12.3 ± 9.0 months. Patients undergoing concurrent ACL reconstruction were less likely to experience repair failure (9.7% vs. 36.0%, $p=.009$), while bucket-handle repairs were more likely to fail during the study period (45.0% vs. 9.0%, $p=.001$). These trends remained after controlling for tear location, body mass index, and number of sutures (ACL reconstruction Odds Ratio [OR]: 0.229, $p=.029$; Bucket-handle OR: 9.400, $p=.003$).

Conclusions: Our findings suggest concurrent ACL reconstruction at the time of meniscal repair is associated with increased repair survival. The all-inside technique may be successfully used across a variety of tear types and locations, although further study of its efficacy in repairing bucket-handle tears is warranted.

MULTIPLE LOGISTIC REGRESSION EVALUATING RISK OF FAILURE

	β	SE	WALD	ODDS RATIO	95% CI LOWER	95% CI UPPER	P-VALUE
Concurrent ACL Reconstruction	-1.472	.676	4.750	.229	.061	.862	.029
Medial Meniscus Repair	.740	.796	.865	2.096	.441	9.969	.352
BMI Over 25	-1.086	.732	2.199	.338	.080	1.418	.138
Two Sutures or Less	-.694	.987	.495	.500	.072	3.456	.482
Bucket Handle	2.241	.765	8.585	9.400	2.100	42.084	.003

RESEARCH PROFILE

Early postoperative pain and opioid consumption after arthroscopic shoulder surgery with or without open subpectoral biceps tenodesis and interscalene block

Justin J. Turcotte, Dimitri M. Thomas, Cyrus J. Lashgari, Sohail Zaidi, James J. York, Jeffrey Gelfand, Benjamin M. Petre, Daniel E. Redziniak

As published in *Journal of Orthopaedics*

Objectives: The addition of open subpectoral biceps tenodesis to arthroscopic shoulder surgery with interscalene block has been anecdotally observed to result in increased postoperative pain. This study aims to evaluate the impact of tenodesis on early postoperative pain and recovery.

Methods: A retrospective review of patients undergoing arthroscopic shoulder surgery with general anesthesia and interscalene block was conducted.

Results: Patients undergoing tenodesis experienced longer OR time, pain numeric rating scale (NRS), and consumed more morphine milligram equivalents (MME) in PACU. After controlling for confounding factors, tenodesis was significantly associated with increased opioid MME consumption in the PACU ($\beta = 1.045$, $p = .028$) and last PACU pain NRS ($\beta = 0.541$, $p = .009$).

Conclusions: Overall, pain scores and narcotic consumption were low after surgery, making these differences potentially clinically insignificant. Further study is required to evaluate whether these trends are consistent among this population.

	NO BICEPS TENODESIS N = 528	OPEN SUBPECTORAL BICEPS TENODESIS N = 176	P-VALUE
OR Time – avg. minutes	108.9 ± 25.9	134.5 ± 29.7	<.001
PACU Recovery Time – avg. minutes	61.03 ± 30.5	61.2 ± 32.4	.966
Last PACU Pain NRS* - avg.	0.84 ± 1.78	1.50 ± 2.14	<.001
PACU MME – avg.	1.55 ± 3.95	2.89 ± 5.74	.004
Block Failure – N (%)	34 (6.4)	19 (10.8)	.058

Significant P-Values in bold

Pain NRS reported for 487 no Tenodesis, and 168 tenodesis patients

OR – operating room

PACU – post anesthesia care unit

MME – morphine milligram equivalents

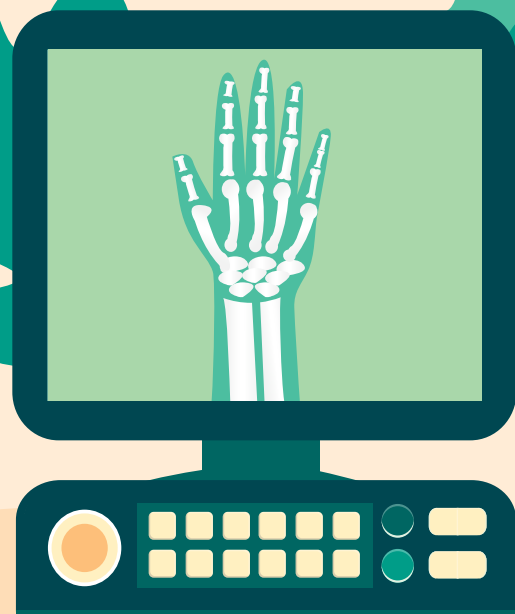
LH AAMC Upper Extremity Surgery

1,564

Surgeries performed in 2021

6

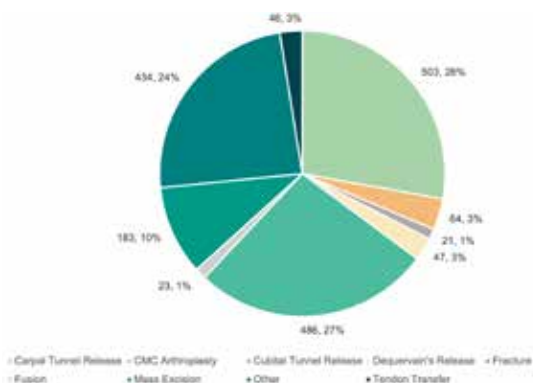
Published peer-reviewed
manuscripts



Case Volume

In 2021, the upper extremity program performed 1,564 surgeries accounting for >2,000 procedures in the hand, wrist, and elbow. Shoulder procedures performed by upper extremity surgeons are captured in the sports medicine volumes previously presented.

UPPER EXTREMITY PROCEDURES (FY2021)



With the opening of our ambulatory surgery centers in 2019, we began shifting upper extremity surgery out of the hospital setting to deliver high quality care in the most cost-efficient manner possible. Therefore, state volume comparisons are unavailable.



JEFFREY GELFAND, MD

Residency: Lenox Hill Hospital
Fellowship: State University of New York College of Medicine
Board Certification: American Board of Orthopaedic Surgery



CYRUS LASHGARI, MD

Residency: Barnes Jewish Hospital
Fellowship: Barnes Jewish Hospital
Board Certification: American Board of Orthopaedic Surgery



CHRISTOPHER JONES, MD

Residency: Union Memorial Hospital
Fellowship: Union Memorial Hospital
Board Certification: American Board of Orthopaedic Surgery



ALEXANDER SHUSHAN, MD

Residency: Boston Medical Center
Fellowship: Tufts-New England Medical Center
Board Certification: American Board of Orthopaedic Surgery

RESEARCH PROFILE

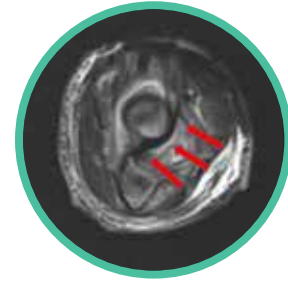
Irreducible Monteggia Fracture Dislocation Secondary to an Entrapped Brachialis Tendon: A Case Report

McKayla Kelly BS, Justin Turcotte PhD, MBA, Alexander Shushan MD, Jeffrey Gelfand MD

As published in *JBS Case Connect*

Case: A 7-year-old male sustained a Monteggia fracture-dislocation. Corrective osteotomy of the ulna was performed to restore proper forearm anatomy and achieve radial head reduction. Recurrent radial head instability was noted post-operatively, and MRI indicated recurrent dislocation of the radial head with, notably, an entrapped brachialis tendon and annular ligament. Open reduction of the elbow was performed. Anatomic reduction of the radiocapitellar joint and full range of motion without instability was achieved.

Conclusions: To our knowledge, this is the first report of persistent radial head instability due to an entrapped brachialis tendon.



Post-operative axial MRI displayed the radial head anterior to the ulna with interposed brachialis tendon (red arrows). Note the normal insertion of the brachialis into the proximal ulna.

Pediatric Monteggia fractures can be difficult to diagnosis and treat; however, restoration and maintenance of ulna alignment and radial head reduction need to be achieved in a timely manner to ensure these patients do not suffer serious long-term complications.



Foot and Ankle Surgery



802

Surgeries performed in 2021

1

Published peer-reviewed manuscripts



EDWARD HOLT, MD

Residency: University of Maryland Medical Center
Board Certification: American Board of Orthopaedic Surgery



DAVID KEBLISH, MD

Residency: National Naval Medical Center-Bethesda
Fellowship: Brigham and Women's Hospital
Board Certification: American Board of Orthopaedic Surgery



ADRIENNE SPIRT, MD, PHD

Residency: Mayo Graduate School of Medicine
Fellowship: University of Washington School of Med/Harborview Medical Center University of Iowa
Board Certification: American Board of Orthopaedic Surgery



ELIZABETH FRIEDMANN, MD

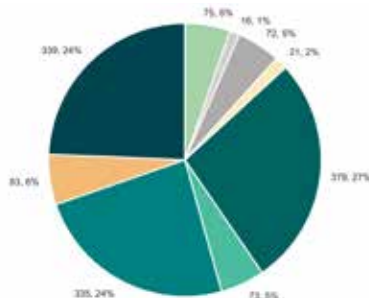
Residency: University of Maryland Medical Center
Fellowship: Campbell Clinic
Board Certification: American Board of Orthopaedic Surgery (Board Eligible)

Case Volume

In 2021, the foot and ankle program performed 802 surgeries including >1,400 procedures for degenerative conditions and acute injuries.

With the opening of our ambulatory surgery centers in 2019, we began shifting foot and ankle surgery out of the hospital setting to deliver high quality care in the most cost-efficient manner possible. Therefore, state volume comparisons are unavailable.

FOOT AND ANKLE PROCEDURES (FY2021)



- Achilles Tendon Repair - Arthroplasty - Bursnectomy - Chellectomy - Fracture - Fluorin - Other - Other Excision - Other Soft Tissue Repair

RESEARCH PROFILE

The Impact of Opioid Prescribing Reduction Interventions on Prescribing Patterns Across Orthopedic Subspecialties

Justin Turcotte PhD, MBA, Kevin Crowley MBA, MS, PT, Stephanie Adams MEd, David Keblish MD, Cyrus Lashgari MD, Chad Patton MD, MS, Benjamin Petre MD, Paul King MD, Jeffrey Gelfand MD

As presented at American Academy of Orthopaedic Surgeons 2020 Annual Meeting

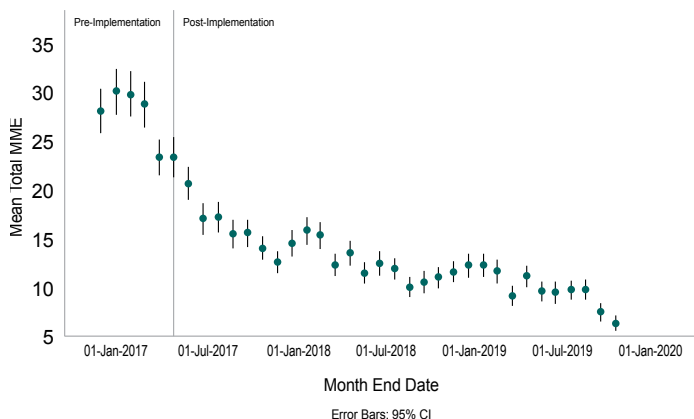
Introduction: The current opioid epidemic and the contributory role of physician overprescribing of narcotics is well described. We present the results of a systematic, multi-phased approach to reducing opioid prescribing implemented at a high volume, multispecialty orthopedic practice.

Methods: A retrospective pre-post study of opioid prescriptions across 386,393 patient encounters was conducted. Multiple prescribing reduction interventions were implemented from April 2017 to April 2018. The primary outcome of average milligram morphine equivalent (MME) per patient encounter was compared between the pre-intervention cohort (patient encounters from November 2016 to March 2017) and the post intervention cohort (patient encounters from April 2017 to October 2019). Additional outcomes assessed included percent of encounters receiving an opioid prescription, compliance with prescribing guidelines and percent of encounters requiring second scripts.

Results: Implementation of the interventions resulted in an average reduction of 15.2 MME per encounter (54.5%) compared to the pre-implementation cohort (Pre: avg. MME=27.9, SD=113.6; Post: avg. MME=12.7, SD=66.1; $p<.001$). The number of pills per opioid prescription was reduced by 13.4 (29.5%) (Pre: avg. pill count=45.5, SD=25.1; Post: avg. pill count=32.1, SD=21.1; $p<.001$), and the percent of patients receiving opioids was reduced from 8.3% to 5.8% ($p<.001$). Prescribing compliance was evaluated for 7,664 surgical encounters, with 98.2% of prescriptions meeting stated guidelines; 5.5% of these encounters required second prescriptions. Of the nonoperative encounters requiring an opioid prescription, 99.5% were deemed compliant, defined as <500 MME per encounter, after implementation of this phase of the protocol in July 2018 ($n=957$), compared to 94.4% of encounters ($n=2,103$) prior to implementation ($p<.001$).

Conclusions: The use of a multi-phase approach effectively reduced the opioid prescribing patterns of a large orthopedic practice and was successful across subspecialties. This approach provides a template that other institutions may use to reduce opioid overprescribing in orthopedic practices.

AVERAGE MME PER ENCOUNTER BY MONTH



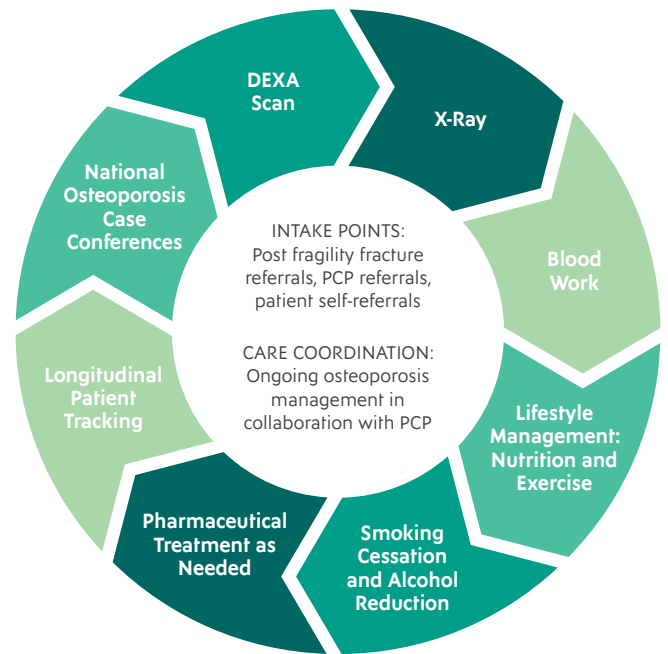
Osteoporosis Program

The Osteoporosis Program at Luminis Health Orthopedics was started initially in 2006 to optimize the initiation of evaluation and management of osteoporosis in a high-risk fracture patient who has suffered a fragility fracture. It has evolved and grown over the years to include all patients where evaluation of bone health is indicated.



CHRISTINA MORGANTI, MD
 MEDICAL DIRECTOR, OSTEOPOROSIS
Residency: SUNY
Fellowship: Johns Hopkins Hospital
Board Certification: American Board of Orthopaedic Surgery

Dr. Christina Morganti, founder, has directed the program since its inception, as a result of her interest in exercise, aging and bone health. This started from her own interest in fitness as well as her research fellowship at the aging center at Tufts University. The program was fortunate to add another practitioner to care for osteoporosis patients, Mandy Fawcett, PA. Mandy has this same passion about bone health and successful aging that is shared with our patients.



Own the Bone

LH Orthopedics participates in the national American Orthopaedic Association Own the Bone program. In fiscal year 2021, the osteoporosis program once again received recognition as an Own the Bone Star Performer. Based on our enrollment in the national registry, this award recognizes institutions that are at least 75% compliant on 5 of 10 Own the Bone prevention measures. Our compliance rates in comparison to national benchmarks are provided on the right.

PREVENTION MEASURE	LH ORTHOPEDICS (%)	ALL SITES (%)
Calcium	100	97
Vitamin D	100	99
Exercise	100	99
Fall Prevention	100	99
Smoking	100	92
Alcohol	100	91
Pharma Recommended	100	74
BMD Testing Recommended	100	90
Patient Letter	100	94
Physician Letter	100	84

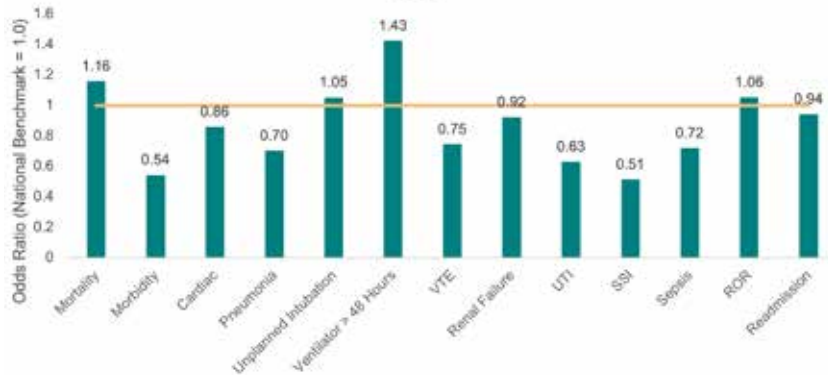
LH AAMC Orthopedics

LUMINIS HEALTH ORTHOPEDICS QUALITY

Under the oversight of our physician-led quality committee, Luminis Health Orthopedics continually monitors the quality of care delivered. Through this group multiple quality improvement initiatives and clinical pathways have been developed to ensure we provide consistent, evidence-based care. The below figure highlights our performance on 30-day quality measures in comparison to national benchmarks as captured by the ACS-NSQIP program. The orthopedic service has received the ACS-NSQIP exemplary designation as a top performer nationally for low rates of overall morbidity, UTIs, and SSIs.

In addition to participating in the NSQIP program, we have implemented a physician self-reporting program using the RL6 platform. Under this initiative, all surgeons are expected to self-report all complications. This data, which is reviewed by our clinical quality committee is essential to building a culture of transparency, learning and continual improvement at AAMC Orthopedics. As evidenced by our utilization of the system, this program has become a widely adopted mechanism for our providers to track and study our patient outcomes.

LH ORTHOPEDICS 30-DAY OUTCOMES VS NATIONAL BENCHMARK (CY2020)



CUMULATIVE QUALITY REPORTING SUBMISSIONS (2018-2021)



LUMINIS HEALTH ORTHOPEDICS PATIENT REPORTED OUTCOMES

Beginning in 2020, we redesigned our patient reported outcomes (PROMs) collection process with a goal of collecting PROMs at every patient encounter. Since launching with our joint and spine services in 2020 and practice-wide in May 2021, we have collected over 35,000 PROMs and now capture this data in over 50% of patient visits. The collection of this data which includes the PROMIS instruments and legacy specialty-specific outcome measures is used in clinical practice to evaluate health status and function at the point of care, and is integral to informing our quality improvement and outcomes research initiatives.

ORTHOPEDICS PROMs CAPTURED BY MONTH



PERCENTAGE OF ENCOUNTERS WITH PROMs BY MONTH



LUMINIS HEALTH DOCTOR'S COMMUNITY MEDICAL CENTER

With the formation of Luminis Health, we are now proud to provide orthopedic services to Doctor's Community Medical Center in Lanham, MD. Our team of 8 providers offers comprehensive surgical and nonoperative treatment options for musculoskeletal conditions. Our team includes board certified sports medicine, total joint replacement, spine, foot and ankle, and upper extremity specialists.



LEONID SELYA, MD

Medical Director, DCMC Orthopedics

Residency: Catholic Medical Center/Brooklyn-Queens

Fellowship: Beth Israel Medical Center

Board Certifications: American Board of Orthopaedic Surgery



MICHAEL V. MILLS, MD

Residency: Howard University Hospital

Fellowship: Norton Leatherman Spine Center



DARLENE JEAN-PIERRE, MD

Residency: Montefiore Medical Center/Albert Einstein College of Med

Fellowship: Medstar Union Memorial Hospital Orthopaedic Sports Medicine



LOIY MUSTAFA, MD

Residency: Howard University

Fellowship: Triangle Orthopedic Associates, P.A.

Board Certifications: American Board of Orthopedic Surgery



J. MICHAEL JOLY, MD

Residency: University of Maryland Medical Center

Board Certifications: American Board of Orthopaedic Surgery



STEPHEN WEBBER, MD

Residency: Howard University Hospital

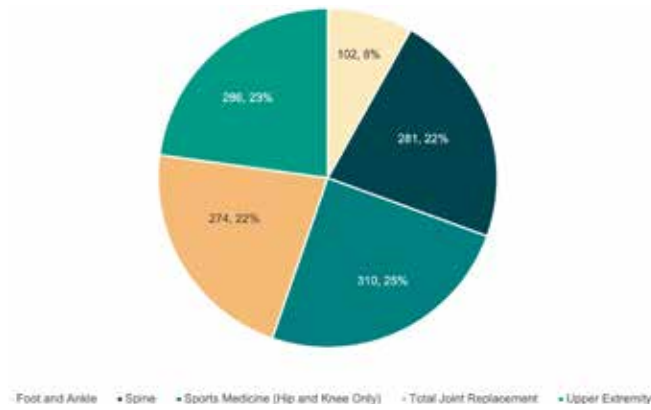
Fellowship: University of California Medical Center

Board Certifications: American Board of Orthopaedic Surgery

Case Volume

In 2021, we performed 1,253 surgeries across the sports medicine (hip and knee), spine, total joint replacement, upper extremity, and foot and ankle services.

LH DCMC SURGINCAL VOLUME (FY2021)



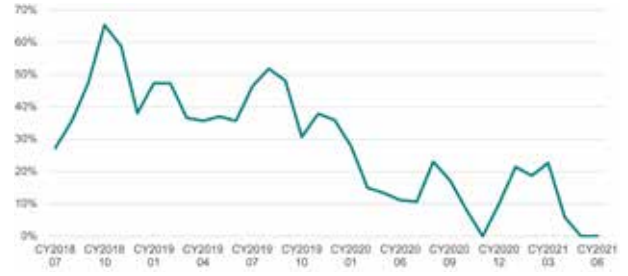
Total Joint Replacement Quality Improvement Initiatives

Beginning in January 2020, the joint replacement team began focusing on standardizing our care pathways through the use of a rapid recovery protocol. To date, this has yielded significant decreases in length of stay and rates of discharge to SNF. From fiscal year 2019 to 2021 our annual rate of 0 or 1 day LOS TJRs increased from 1.8% to 52.0%, and reached a high of 86% in June 2021. Our rate of discharge to SNF reduced from 33.7% and 36.6% in fiscal year 2019 to 16.4% and 6.3% in fiscal year 2021, for THR and TKR patients respectively. In June 2021, we reached a milestone, as no primary TJR patients were discharged to SNF.

PRIMARY TOTAL JOINT REPLACEMENT PERCENTAGE 0 OR 1 DAY LOS (FY2019-2021)



PRIMARY TOTAL JOINT REPLACEMENT PERCENTAGE DISCHARGE TO SNF (FY2019-2021)



Luminis Health Physical Therapy

In addition to our nonoperative and surgical orthopedic services, Luminis Health provides comprehensive physical therapy to our community. Our 15 locations and 119 therapists see over 150,000 annual visits across Anne Arundel, Prince George's, Queen Anne's, and Talbot counties.

Novel Treatments or Modalities offered:

- ④ Active Cupping
- ④ AlterG® Anti-Gravity Treadmill™
- ④ Blood Flow Restriction Training
- ④ Dry Needling
- ④ Graston Technique
- ④ Instrument Assisted Soft Tissue Mobilization (IASTM)
- ④ Kinesio Taping
- ④ Video Gait Analysis
- ④ Golf Assessments
- ④ Return to Sport Group Rehabilitation
- ④ Osteoporosis exercise program development
- ④ Falls Assessments
- ④ Dance Rehabilitation



Specialty Programs:

Aquatic Therapy Program

Locations in Severna Park & Bowie provide hydrotherapy where buoyancy decreases weight bearing and lessens impact on joints and the warm water helps alleviate pain and stiffness.

PT 360 Program

Pre and post-operative home assessments and home physical therapy visits to ensure safety and comfort in one's home.

Specialty providers

Certified Strength and Conditioning Specialist, Orthopedic Certified Specialist, Certified Athletic Trainer, Certified Hand Therapist, Certified Falls Specialist



Education

44 total students across PT, OT, and SLP services in 2021.

Students came from leading national programs including: University of Maryland Baltimore, University of Maryland Eastern Shore, Western Carolina University, George Washington University, Shenandoah University, Old Dominion University, Baylor University, Widener University, Belmont, Anne Arundel Community College, Howard Community College, Methodist University, Howard University, Trinity University, Messiah University, Towson University, Thomas Jefferson, Loyola University, Western New England College, Montgomery College

Orthopedic PT Residency Program (ABPTRFE Accredited)

The 13-month program accepting two residents per year producing expert level orthopedic clinicians who will be qualified to sit for their OCS Exam.

Research

Quality improvement and outcomes research is a core component of our Orthopedic PT Residency program. In 2021, PT residents produced original research that has been accepted leading national conferences and peer-reviewed publications.

Turcotte JJ, Kelly ME, Fenn AB, Grover JG, Wu CA, MacDonald JH. The Role of the Lower Extremity Functional Scale in Predicting Surgical Outcomes for Total Joint Arthroplasty Patients. Poster presentation at APTA Combined Sections Meeting 2022. February 2-5, 2022. San Antonio, TX.

Johnson A, Richardson E, Fowler MB, West M, Turcotte J, Petre B. Elimination of a Postoperative Brace Does Not Increase Complications Following Hip Arthroscopy. Poster presentation at Arthroscopy Association of North America (AANA) Annual Meeting 2022. May 19-21, 2022. San Francisco, CA.

Turcotte JJ, Kelly ME, Fenn AB, Grover JG, Wu CA, MacDonald JH. The Role of the Lower Extremity Functional Scale in Predicting Surgical Outcomes for Total Joint Arthroplasty Patients. Arthroplasty. 2022.



THE CENTER FOR ORTHOPEDIC OUTCOMES AND RESEARCH

The studies and quality improvement initiatives described in this year's outcomes report would not be possible without the support of the team at The Center for Orthopedic Outcomes and Research (COOR). In collaboration with the COOR team, Luminis Health Orthopedics produced 41 manuscripts in leading peer-reviewed journals and presented 26 studies at regional and national meetings in fiscal years 2020-2021. In addition, our team of research coordinators oversees a portfolio of 10 active investigator initiated and industry funded clinical trials with over 200 subjects currently enrolled in studies.

Meet the Team



JUSTIN TURCOTTE, PHD, MBA
DIRECTOR, ORTHOPEDIC AND SURGERY
RESEARCH

S. ELLIOTT HOLBERT, DO
RESEARCH FELLOW

JANE BRENNAN
ORTHOPEDIC CLINICAL RESEARCH ANALYST
(BIostatistician)

LAURA STOCK
RESEARCH FELLOW

M. BROOK FOWLER
SENIOR CLINICAL RESEARCH COORDINATOR

MCKAYLA KELLY
RESEARCH FELLOW (2019-2021)

MICHALINE WEST
CLINICAL RESEARCH COORDINATOR

GRAYSON KELMER
RESEARCH FELLOW (2019-2021)

ANDREA JOHNSON, MSN, CRNP
RESEARCH FELLOW

LH AAMC Philanthropy

Philanthropy plays a large part in supporting Luminis Health Orthopedics. Many programs including The Center for Orthopedic Outcomes and Research rely on philanthropic funding. The generous donations from donors have funded our research fellowship program, which has been in existence since 2016. This unique program offers pre-professional students the opportunity to serve in a full-time research position for one to two years prior to continuing their medical education. To date, 100% of our fellows have received offers to attend medical school, residency, or physician assistant school after completing the program.

The Luminis Health Anne Arundel Medical Center Foundation works to raise money to support Luminis Health Orthopedics. If you are a grateful patient, or family member, and are interested in giving back or helping continue these important programs and many others, please contact Laura George at lgeorge@luminishealth.org or 443-481-4575. A gift of any size can make an impact on care for orthopedic patients in our community.



LH AAMC

Research References & Clinical Trials

Peer-Reviewed Publications

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2. Kelly M, Turcotte J, Shushan A, Gelfand J. Irreducible monteggia fracture-dislocation secondary to an entrapped brachialis tendon: A case report. *JBJS Case Connector* 11(4): e21.00238, 2021
3. Harrison AE, Kozarek JDB, Yeh J, MacDonald JH, Ruiz-Pelaez JG, Barengo NC, Turcotte JJ, King PJ. Postoperative outcomes of total knee arthroplasty across varying levels of multimodal pain management protocol adherence. *Journal of Orthopaedics*, 2021
4. Turcotte J, Gonzales N, Morganti C. Postoperative outcomes of patients undergoing fasciotomy for exercise induced compartment syndrome: A case series. *J Surg Orthop Adv* 30(3): 170-72, 2021
5. Turcotte J, Menon N, Andersen K, Stone D, Patton C. The impact of nurse navigator-led preoperative education on hospital outcomes following posterolateral lumbar fusion surgery. *Orthop Nurs* 40(5): 281-89, 2021
6. Turcotte J, Harrington J, Yeager N, Crowley K. Traversing the last mile: A regional health system's experience with Covid-19 vaccine distribution. *NEJM Catal Innov Care Deliv*, 2021
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8. Karpman M, Menon N, Turcotte J. Polynomial modeling of emergency department arrivals: An analysis of local and national utilization patterns. *Journal of emergency management (Weston, Mass)* 19(2): 189-96, 2021
9. Turcotte J, Crowley K, Adams S, Keblish D, Lashgari C, Patton C, Petre B, King P, Gelfand J. The impact of opioid prescribing reduction interventions on prescribing patterns across orthopedic subspecialties. *J Opioid Manag* 17(2): 169-79, 2021
10. Kelly M, Turcotte J, Aja J, MacDonald J, King P. Impact of intrathecal fentanyl on hospital outcomes for patients undergoing primary total hip arthroplasty with neuraxial anesthesia. *Arthroplasty Today*
11. Turcotte JJ, Gelfand JM, Jones CM, Jackson RS. Development of a low-resource operating room and a wide-awake orthopedic surgery program during the COVID-19 pandemic. *Surg Innov*, 2021
12. Kelmer GC, Turcotte JJ, Dolle S, Angeles J, MacDonald JH, King PJ. Preoperative education for total joint arthroplasty: Does reimbursement reduction threaten improved outcomes? *The Journal of Arthroplasty*, 2021
13. Turcotte JJ, Menon N, Angeles J, Zaidi A, King PJ, MacDonald JH. A rapid recovery protocol applied to total joint arthroplasty reduced readmissions for surgical but not medical reasons over a 5-year period. *HSS Journal*, 2021
14. Kelmer GC, Turcotte JJ, King PJ. Same-day vs one-day discharge: Rates and reasons for emergency department return after hospital-based total joint arthroplasty. *The Journal of Arthroplasty* 36(3): 879-84, 2021
15. Kelly ME, Turcotte JJ, Aja JM, MacDonald JH, King PJ. General vs neuraxial anesthesia in direct anterior approach total hip arthroplasty: Effect on length of stay and early pain control. *The Journal of Arthroplasty* 36(3): 1013-17, 2021
16. Kelly ME, Turcotte JJ, Aja JM, MacDonald JH, King PJ. Impact of dexamethasone on length of stay and early pain control in direct anterior approach total hip arthroplasty with neuraxial anesthesia. *The Journal of Arthroplasty* 36(3): 1009-12, 2021
17. Turcotte JJ, Kelly ME, Aja JM, King PJ, MacDonald JH. Risk factors for progression to total knee arthroplasty within two years of presentation for knee osteoarthritis. *Journal of Clinical Orthopaedics and Trauma* 16: 257-63, 2021
18. Turcotte J, Kelly M, Aja J, King P, MacDonald J. Complication rates and resource utilization after total hip and knee arthroplasty stratified by body mass index. *Journal of Orthopaedics* 24: 111-20, 2021

19. Kelly M, Bahethi S, King M, Elstner B, Turcotte J, King P. P. The utility of frozen section histology in diagnosing periprosthetic joint infection in revision total joint arthroplasty. *The Journal of Arthroplasty*, 2021
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21. Turcotte JJ, Menon N, Kelly ME, Grover JJ, King PJ, MacDonald JH. Preoperative predictors of same-day discharge after total knee arthroplasty. *Arthroplasty Today* 7: 182-87, 2021
22. Turcotte JJ, Maley AD, Levermore SB, Petre BM, Redziniak DE. Risk factors for all-inside meniscal repair failure in isolation and in conjunction with anterior cruciate ligament reconstruction. *The Knee* 28: 9-16, 2021
23. Turcotte J, Callanan M, Buckley B, Zaidi S, Patton C. Conversion of PROMIS global health to EQ-5D health state values in patients undergoing lumbar spine surgery: A psychometric evaluation. *Journal of Orthopaedics* 23: 67-72, 2021
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26. Kelly M, Speciale A, Patton C, Turcotte J. A predictive model of preoperative risk factors for venous thromboembolism after fusion for degenerative conditions of the thoracolumbar spine. *Journal of Orthopaedics* 22: 598-601, 2020
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4. Turcotte J, Kelly M, Menon N, Aja J, MacDonald J, King, P. Impact of preoperative intra-articular injection on infection rates following total knee arthroplasty: An analysis of over 19,000 patients. Virtual Presentation: Southern Orthopaedic Association Annual Meeting 2020; July 22-25, 2020; White Sulfur Springs, WV (converted to virtual meeting due to COVID-19)
5. Menon N, Turcotte J, Speciale A, Patton C. Cortical bone trajectory instrumentation provides favorable outcomes in comparison to pedicle-screws in laminectomy and posterolateral fusion. Virtual Presentation: Southern Orthopaedic Association Annual Meeting 2020; July 22-25, 2020; White Sulfur Springs, WV (converted to virtual meeting due to COVID-19)
6. Turcotte J, Menon N, Aja J, Grover J, King P, MacDonald J. Preoperative predictors of patients requiring inpatient admission for total hip arthroplasty following removal from the medicare inpatient only list. Southern Orthopaedic Association Annual Meeting 2020; July 22-25, 2020; White Sulfur Springs, WV (converted to virtual meeting due to COVID-19)
7. Turcotte J, Taylor S, Petre B, Redziniak D. Patient-reported opioid consumption post partial meniscectomy surgery. Virtual Presentation: Southern Orthopaedic Association Annual Meeting 2020; July 22-25, 2020; White Sulfur Springs, WV (converted to virtual meeting due to COVID-19)

Podium Presentations

1. Kelly M, Dolle S, Menon N, Angeles J, Turcotte J, MacDonald, King P. The impact of a nurse navigator led preoperative course on outcomes following total joint arthroplasty. Podium Presentation: American Academy of Orthopaedic Surgeons 2021 Annual Meeting. August 31-September 3, 2021; San Diego, CA
2. Kelmer G, Kelly M, Turcotte J, King P. Same-day versus one-day discharge: Rates and reasons for ED return after total joint arthroplasty. Podium Presentation: American Academy of Orthopaedic Surgeons 2021 Annual Meeting. August 31-September 3, 2021; San Diego, CA
3. Turcotte J, Stone A, Fowler B, MacDonald, J, Brassard, M, King, P. A dynamic knee extension device improves flexion contracture before total knee arthroplasty: A randomized controlled trial. Virtual Presentation: Southern Orthopaedic Association Annual Meeting 2020; July 22-25, 2020; White Sulfur Springs, WV (converted to virtual meeting due to COVID-19)
8. Turcotte J, Morganti C, Gonzalez N. Postoperative outcomes of patients undergoing fasciotomy for exercise induced compartment syndrome: A case series. Virtual Presentation: Southern Orthopaedic Association Annual Meeting 2020; July 22-25, 2020; White Sulfur Springs, WV (converted to virtual meeting due to COVID-19)
9. Turcotte J, Adams S, Crowley K, Gelfand J. The impact of opioid prescribing reduction interventions on prescribing patterns across orthopedic subspecialties. Podium Presentation: American Academy of Orthopaedic Surgeons Annual Meeting 2020; March 24-28; Orlando, FL (converted to virtual meeting due to COVID-19)
10. Turcotte J, Stone A, Fowler B, MacDonald J, Brassard M, King P. A dynamic knee extension device improves flexion contracture before total knee arthroplasty: A randomized controlled trial. Podium Presentation: Maryland Orthopaedic Association Annual Meeting 2020; February 8, 2020; Annapolis, MD

11. Sanford Z, Broda A, Adkins A, Turcotte J, Patton C. Physical therapy following elective spine surgery promotes earlier return to home with cost savings to hospital and patient. Podium presentation at: Eastern Orthopaedic Association 2019 Annual Meeting; October 16-19, 2019; Palm Beach, FL
12. Broda A, Sanford Z, Turcotte J, Pardo M, Orlov M, Patton C. Implementation and efficacy of a simulated surgical airway training course in expanding house staff readiness for difficult airway patients: A pilot study. A Pilot Study. Podium presentation: American College of Surgeons Washington D.C. Chapter 2019 All Surgeons Day Resident Paper Competition; May 19, 2019; Washington, D.C.
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15. Broda A, Turcotte J, Sanford Z, Patton C. Analysis of the Hierarchical Condition Category (HCC) Score as a predictor for increased risk for complication and resource utilization following spine surgeries. Podium presentation: Congress of Neurological Surgeons Spine Summit 2019 35th Annual Meeting of the Section on Disorders of the Spine and Peripheral Nerves; March 14-17, 2019; Miami, FL
16. Sanford Z, Broda A, Turcotte J, Patton C. Trends in 30 day unplanned emergency department visits following elective spine surgery. Podium presentation: Congress of Neurological Surgeons Spine Summit 2019 35th Annual Meeting of the Section on Disorders of the Spine and Peripheral Nerves; March 14-17, 2019; Miami, FL
2. Turcotte J, Kelly M, Speciale A, Patton C. Risk factors for venous thromboembolism after thoracolumbar surgery: Development of a predictive model based on 52,458 patients from 2016 to 2018. Poster Presentation: American College of Surgeons Quality and Safety Conference 2021. July 12-16, 2021; Virtual Meeting
3. Turcotte J, Kelly M, Aja J, King P, MacDonald J. Complication rates and resource utilization after total hip and knee arthroplasty stratified by body mass index. Poster Presentation: American College of Surgeons Quality and Safety Conference 2021. July 12-16, 2021; Virtual Meeting
4. Kelmer G, Kelly M, Turcotte J, King P. Same-day versus One-day discharge: rates and reasons for ED return after total joint arthroplasty. Poster Presentation: American College of Surgeons Quality and Safety Conference 2021. July 12-16, 2021; Virtual Meeting
5. Kelly M, Dolle S, Menon N, Angeles J, Turcotte J, MacDonald J, King P. The impact of a nurse navigator led preoperative course on outcomes following total joint arthroplasty. Poster Presentation: American College of Surgeons Quality and Safety Conference 2021. July 12-16, 2021; Virtual Meeting
6. Turcotte J, Kelly M, Dolle S, Aja J, MacDonald J, King P. The impact of targeted nurse navigator intervention on outcomes in high-risk patients undergoing total joint arthroplasty: A pilot study. Poster Presentation: American College of Surgeons Quality and Safety Conference 2021. July 12-16, 2021; Virtual Meeting
7. Turcotte J, Kelly M, Speciale A, Patton C. Which patients should be admitted for decompression and instrumented lumbar posterolateral or transforaminal interbody fusion? Poster Presentation: American College of Surgeons Quality and Safety Conference 2021. July 12-16, 2021; Virtual Meeting
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9. Turcotte J, Kelly M, Dolle S, Aja J, MacDonald J, King p. the impact of targeted nurse navigator intervention on outcomes in high-risk patients undergoing total joint arthroplasty: A pilot study. Poster Presentation: American Academy of Orthopaedic Surgeons 2021 Annual Meeting. August 31-September 3, 2021; San Diego, CA

Poster Presentations

1. MacDonald J, et al. Early outcomes of a novel bicruciate retaining knee system: a 2-year minimum retrospective cohort study. British Orthopaedic Association Annual Congress 2021. September 21-24, 2021; Aberdeen, UK

10. Sanford, Z., Keller, E., Broda, A., Turcotte, J., Pipkin, K., Patton, C. Patient goal-directed care in an orthopedic spine specialty clinic. Poster presentation at American Academy of Orthopaedic Surgeons Annual Meeting 2020; March 24-28; Orlando, FL
11. Turcotte, J., Gonzales, N., Morganti, C. Postoperative outcomes of patients undergoing fasciotomy for exercise induced compartment syndrome: A case series. Poster presentation at Maryland Orthopaedic Association Annual Meeting 2020; February 8, 2020; Annapolis, MD
12. Menon, N., Aja, J., MacDonald, J., King, P., Turcotte J. Impact of preoperative intra-articular injection on infection rates following total knee arthroplasty: An analysis of over 19,000 patients. Poster presentation at Maryland Orthopaedic Association Annual Meeting 2020; February 8, 2020; Annapolis, MD
13. Turcotte, J., Adams, S., Crowley, K., Gelfand, J. The impact of opioid prescribing reduction interventions on prescribing patterns across orthopedic subspecialties. Poster presentation at Maryland Orthopaedic Association Annual Meeting 2020; February 8, 2020; Annapolis, MD
14. Broda, A., Sanford, Z., Turcotte, J., Patton, C. Development of a universal risk prediction model for patients undergoing elective cervical and lumbar spine surgery. Poster presented at: American College of Surgeons Quality and Safety Conference; July 19-22, 2019; Washington, D.C.
15. Sanford, Z., Keller, E., Broda, A., Turcotte, J., Patton, C. Impact of comorbid disease on length of hospitalization in spine fusion patients: an hcup-usnis study. Poster presented at: American College of Surgeons Quality and Safety Conference; July 19-22, 2019; Washington, D.C.
16. Sanford, Z., Broda, A., Zaidi, A., Turcotte, J., Patton, C. Trends in thirty day unplanned emergency department visits following elective spine surgery. Poster presented at: American College of Surgeons Quality and Safety Conference; July 19-22, 2019; Washington, D.C.
17. Sanford, Z., Taylor, H., Fiorentino, A., Broda, A., Turcotte, J., Patton, C. Racial disparities in surgical outcomes after spine surgery: an ACS-NSQIP analysis. Poster presentation: American College of Surgeons Quality and Safety Conference; July 19-22, 2019; Washington, D.C.
18. Sanford, Z., Taylor, H., Fiorentino, A., Broda, A., Turcotte, J., Patton, C. Racial disparities in surgical outcomes after spine surgery: an ACS-NSQIP analysis. Poster presented at: AOSPINE Global Spine Congress 2019; May 15-19, 2019; Toronto, CA
19. Broda, A., Sanford, Z., Taylor, H., Zaidi, A., Turcotte, J., Patton, C. Predictive risk factors associated with increased opioid utilization among patients undergoing elective spine surgery. Poster presented at: AOSPINE Global Spine Congress 2019; May 15-19, 2019; Toronto, CA
20. Sanford, Z., Broda, A., Turcotte, J., Patton, C. Predictors of same-day discharge following anterior cervical decompression and fusion (ACDF) surgery. Poster presented at: American Academy of Neurological Surgeons Annual Meeting 2019; April 13-17, 2019; San Diego, CA
21. Stone, A., Adkins, A., Turcotte, J., MacDonald, J., King, P. A pilot physical therapy program increases discharge home and may reduce cost after total joint arthroplasty. Poster presented at: APTA 2019 Combined Sections Meeting; January 23-26, 2019; Washington, D.C.

CLINICAL TRIALS

Currently Enrolling

Smith & Nephew

- Prospective, multi-center, post-market clinical followup study to evaluate safety and performance of the MICRORAPTOR™ Knotless REGENESORB™ Suture Anchor in shoulder and hip repair

PI: Benjamin Petre, MD

- Prospective multi-center study comparing REGENETEN in lieu of standard arthroscopic repair of high-grade (>50%) partial-thickness tears

PI: Daniel Redziniak, MD

KCI (3M)

- Evaluating edema and range of motion using negative pressure therapy vs. standard surgical dressing in bilateral TKA (ENABLE)

PI: Marc Brassard, MD

Firstkind Ltd.

- Cross therapy registry – edema post market clinical follow-up of safety and patient outcomes for subjects undergoing peroneal nerve stimulation by geko™

PI: Paul King, MD

Investigator Initiated

- Pain after Preoperative UltraSound Guided Hip Injections for Total Hip Arthroplasty (PUSH)

PI: Paul King, MD

- Variability in running form of adolescent athletes as measured by video gait analysis

PI: Christina Morganti, MD

Long Term Follow-up

Depuy

- Short, medium and long term survivorship of Attune™ Primary Total Knee Prostheses

PI: Paul King, MD

Smith & Nephew

- prospective, non-randomized, single cohort, multicenter study to evaluate the clinical outcomes of total knee arthroplasty (TKA) using the JOURNEY™ II CR Total Knee System

PI: Jim MacDonald, MD

- Post-Approval study of the R3 BioloX Delta Ceramic Acetabular System – United States

PI: Jim MacDonald, MD

- A prospective, multicenter, post-market clinical follow-up study to evaluate the safety and effectiveness of the JOURNEY II XR Total Knee System

PI: Jim MacDonald, MD

MISSION, VISION, VALUES

The foundation for Luminis Health is its mission, vision, values, and strategic framework. These are the fundamental principles by which we serve, defining both who we are and who we aspire to be. The mission, vision, and values for Luminis Health were derived from both AAHS and DCHS. Our Luminis Health mission, vision, and values foundation defines us, our priorities, and drives us to aspire to the highest level of achievement through a shared understanding of Luminis Health.

Our mission is our purpose, our vision represents our future, and our values serve as our guideposts. Our values are brought to life daily in the behaviors and attitudes we exhibit and the choices and decisions we make. They serve as a beacon to guide Luminis Health in allocating resources, in drafting policies and procedures, and responding to daily and long-term situations.

MISSION

To enhance the health of the people and communities we serve

VISION

LIVING HEALTHIER TOGETHER

- Health and wellness are fundamental to everyone
- We work side-by-side with our community and patients to empower them to take control of their health
- Partnerships and connectivity form the foundation for care
- Evidence-based care is centered around people and family
- Access to care should be refreshingly easy
- Luminis Health will generate a positive impact for all

VALUES

RISE: Respect, Inclusion, Service, and Excellence



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