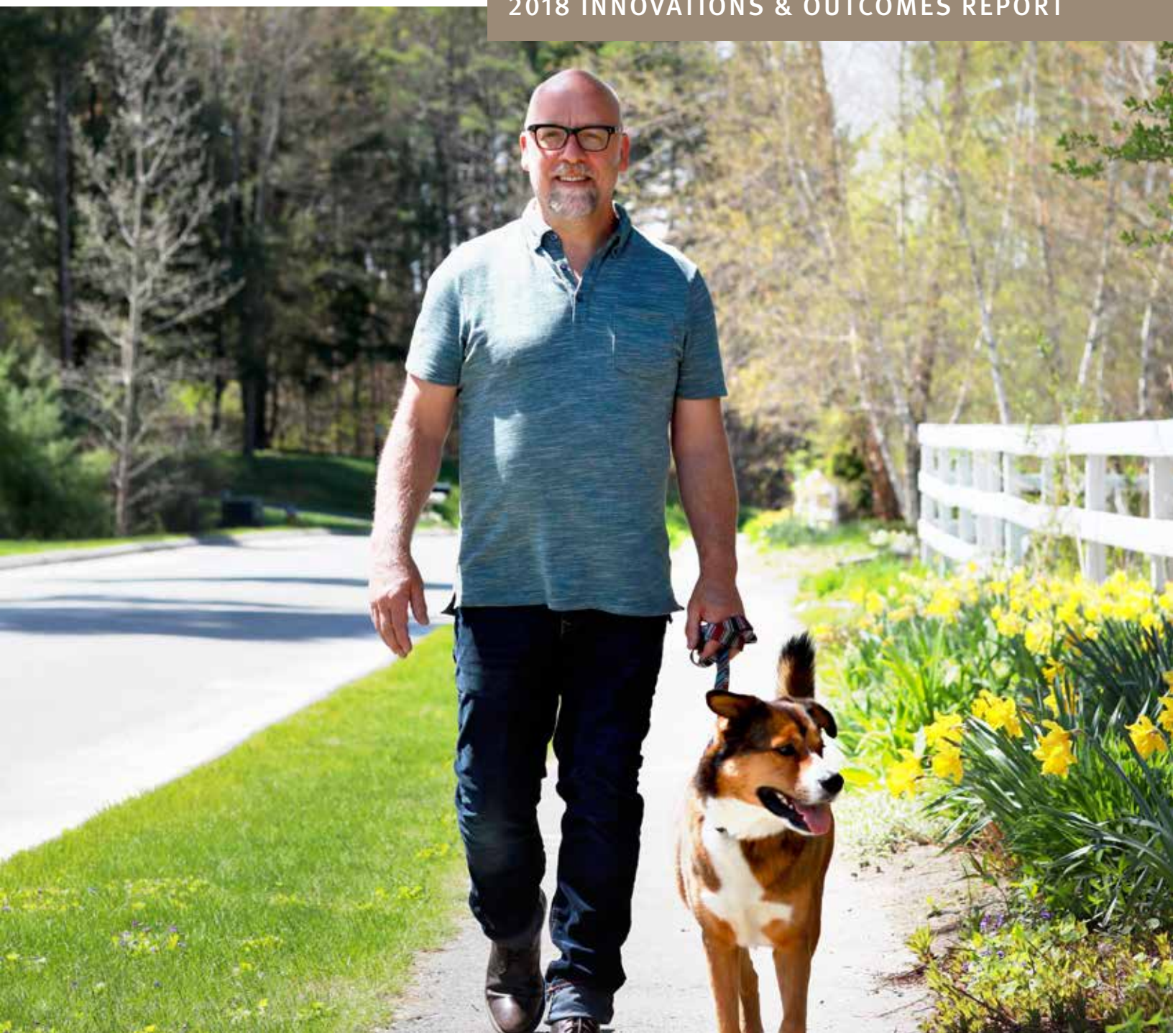
# Orthopedics & Sports Medicine

## 2018 INNOVATIONS & OUTCOMES REPORT

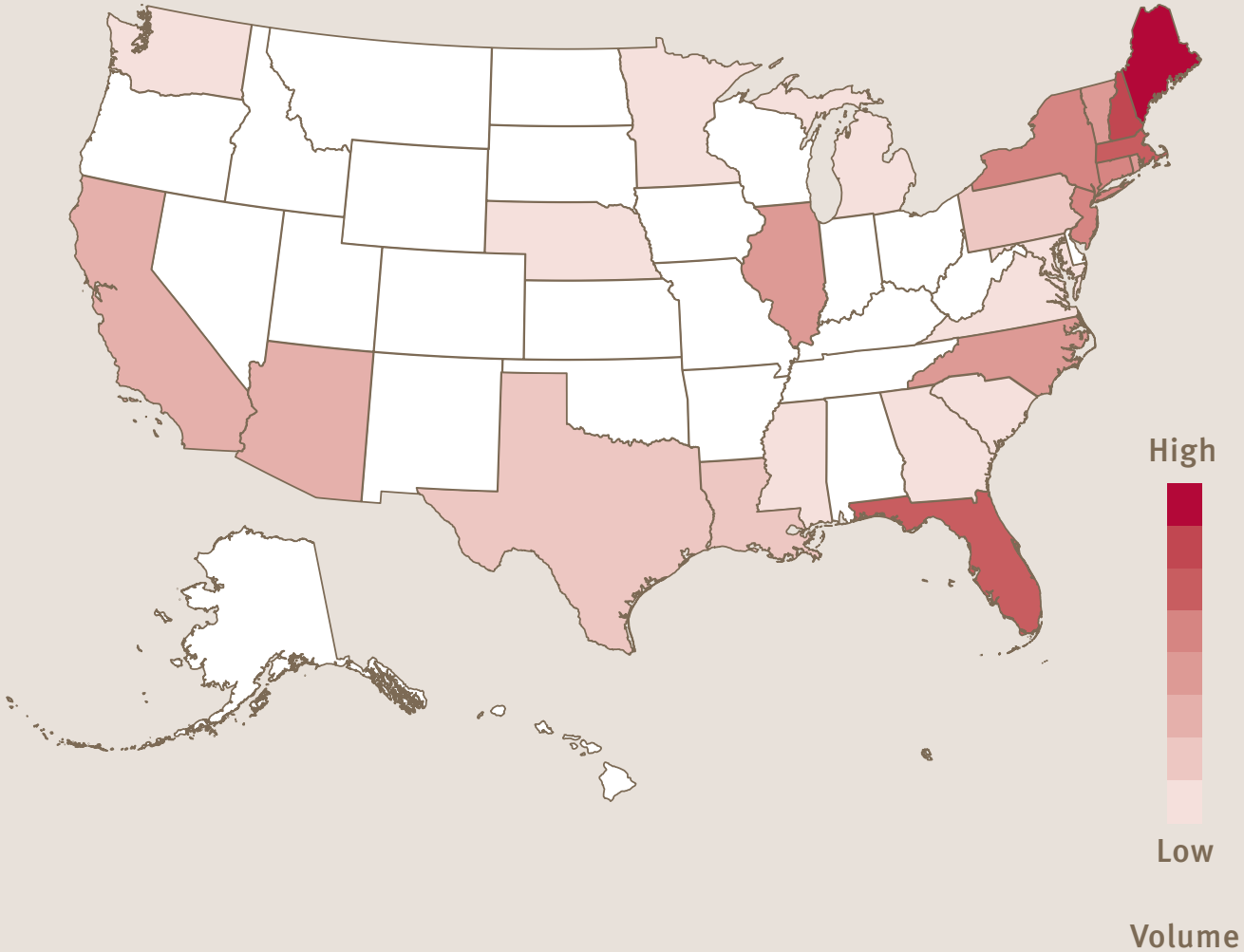


Maine Medical
PARTNERS
Orthopedics & Sports Medicine

*A department of Maine Medical Center*

# Our Reach & Our Roots

All Patients by State 2017




**COVER:** Patient, **Dean Barger,** Falmouth, ME

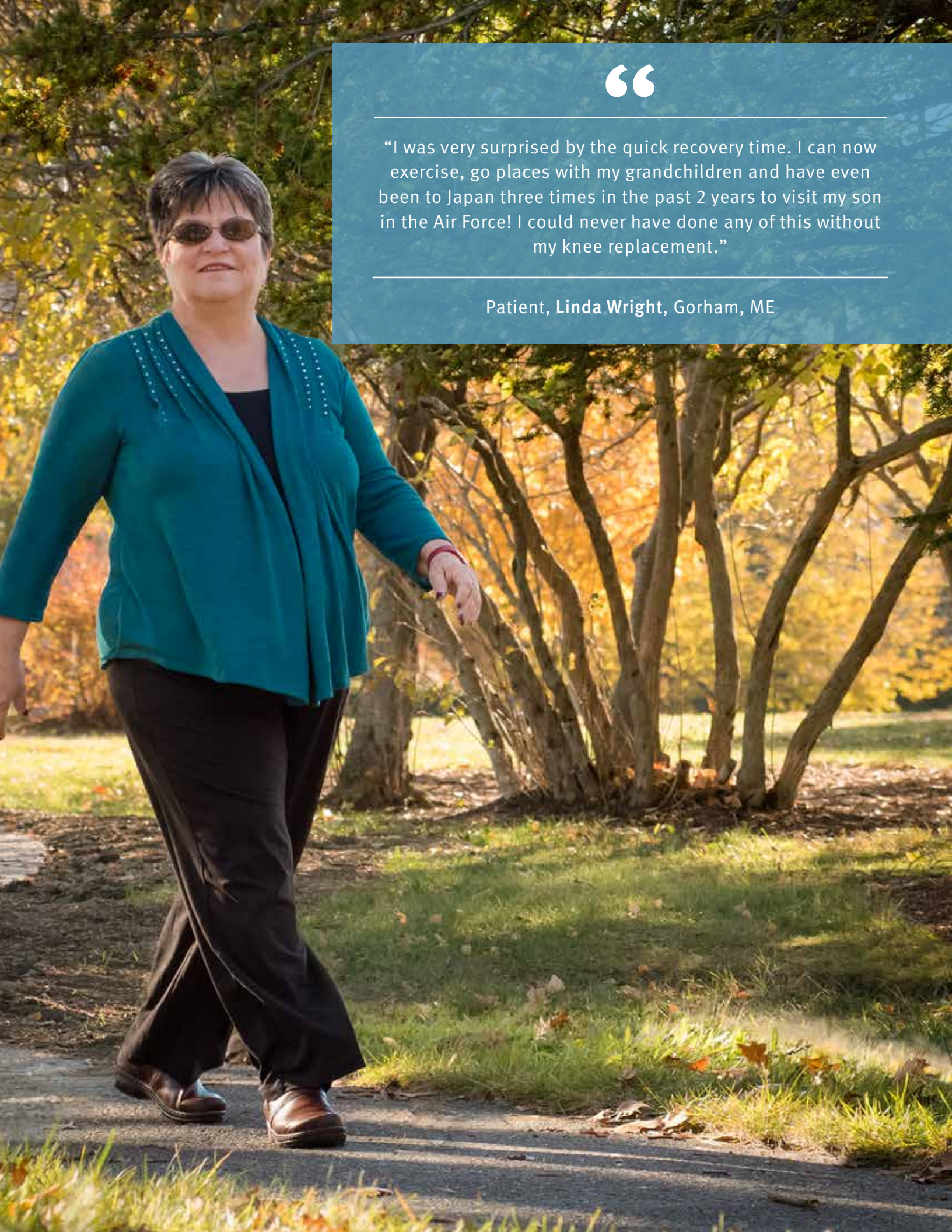
# Introduction

Once again, I am proud to present the annual Innovations & Outcomes Report for Maine Medical Partners — Orthopedics & Sports Medicine. This year, we have expanded the report to include updates from our divisions of Trauma and Sports Medicine. In 2017, we welcomed Dr. Jonathan Watling to our team at Maine Medical Partners after completing his orthopedic training in New York at Columbia and his fellowship in Charlotte with OrthoCarolina.

The results and the initiatives included in this report represent the efforts of a dedicated group of medical professionals striving to give the best care possible. We are continuously trying to improve the experience for patients, the outcomes of surgical intervention, and deliver state-of-the-art care to our community. We are grateful to our patients who participate in ongoing data collection. This gives us the tools to help us improve our results each year. Our team wants to work closely with you and your patients in a


collaborative partnership to provide the best possible care for the patient. We believe that making our outcomes data readily available and comparing them to national or regional benchmarks when available will help both patients and providers choose the best orthopedic care available.

Donald P. Endrizzi, MD
*Chief of Orthopedics, Maine Medical Center*



“

“I was very surprised by the quick recovery time. I can now exercise, go places with my grandchildren and have even been to Japan three times in the past 2 years to visit my son in the Air Force! I could never have done any of this without my knee replacement.”

Patient, **Linda Wright**, Gorham, ME

# 2018 Innovations & Outcomes Report

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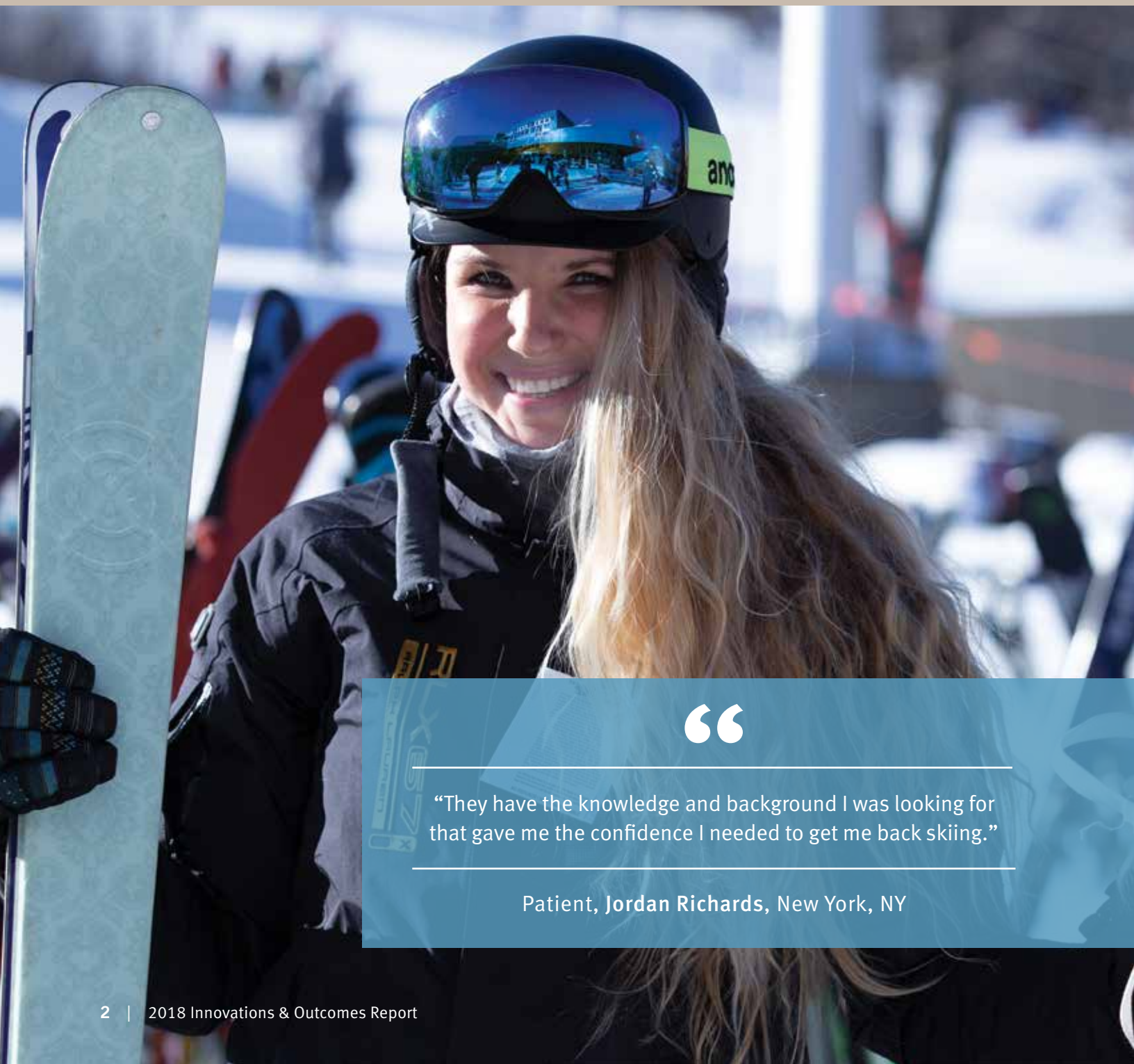
# Sports Medicine



“They have the knowledge and background I was looking for that gave me the confidence I needed to get me back skiing.”

Patient, **Jordan Richards**, New York, NY

# Division of Sports Medicine

We understand that every move counts. As the expert source for individualized attention to sports injuries, we connect our experience with advanced medical technology and supportive care to return our patients back to their busy life.

With over 20 years of experience in orthopedics and sports medicine, Dr. F. Lincoln Avery leads a team caring for people from all walks of life – from local athletes to U.S. Olympic skiers. From concussion management and soft tissue injections, to surgical treatment of knee, hip, and other joint injuries, our sports medicine program is the most experienced team in the state. We treat each patient with a team approach, including clinical staff who are highly qualified, multi-skilled healthcare professionals, dedicated to providing you and your family with the best care in our state-of-the-art facility.

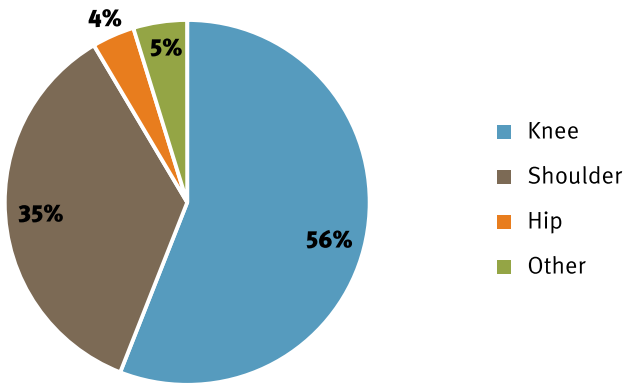
**Our services include:**

- non-surgical fracture management
- muscle strains and joint sprains
- onsite x-ray, sonography
- biologics (e.g. platelet-rich Plasma and Prolotherapy)
- comprehensive sport concussion management
- physical therapy and sports performance
- sports psychology
- OMT and trigger point injections
- pediatric sports medicine
- Percutaneous tenotomy

## Sports Medicine at a Glance

| | |
|---|---|
| Total patients treated (surgical and non-surgical) | 4,167 |
| Total non-surgical sports medicine patients treated | 3,425 |
| Total surgical procedures | 902 |

Sports Medicine Surgeries



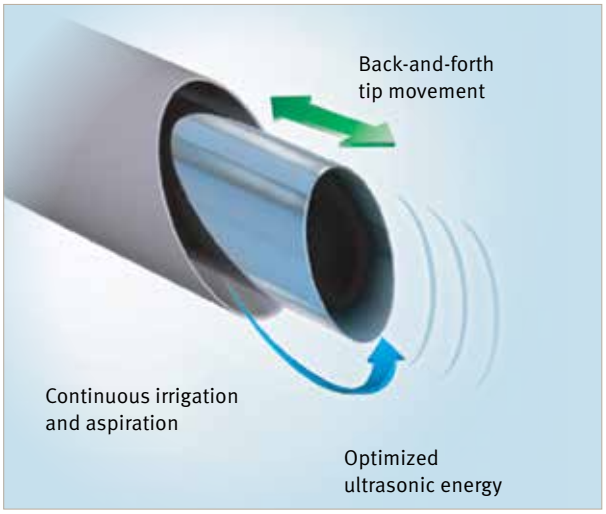
Patient, **Maurice Wesley**, Cape Elizabeth, ME

# New Treatment: Percutaneous Tenotomy Using TENEX Health TX™ Technology

Chronic overuse or trauma can lead to chronic pain, stiffness or inflammation around a tendon or fascial structure called tendinosis or fasciitis. Common structures affected include the plantar fascia, achilles, patellar tendon, elbow and shoulder. Patients who have point tenderness in the tendon or fascia, have failed 3 months of conservative treatment, and whose daily lives are affected are potential candidates for the TENEX Health TX™ procedure. A percutaneous tenotomy or fasciotomy using the TENEX Health TX™ technology coupled with ultrasound imaging identifies and removes the damaged tissue, stimulating a healing response. With this minimally invasive procedure, patients are typically able to return to their activities faster than with traditional open surgery.

**With this minimally invasive procedure, patients are typically able to return to their activities faster than with traditional open surgery.**

**A one-time treatment and outpatient procedure**




*TX MicroTip with optimized ultrasonic energy simultaneously cuts and removes targeted diseased tissue.*

# Athletic Trainers in the Physician Practice

Our medical team is rethinking the role of the certified athletic trainer (ATC) in healthcare. While continuing to provide the traditional services of the profession including supporting competitive teams on the field and in the athletic training room, the role is continually taking on new responsibilities and dimensions. The seven ATCs at our Division of Sports Medicine can be seen on the sidelines of high school and college teams in the greater Portland area. Now you will also find a subset of them in the clinic exam room preparing patients for surgery, in the casting room treating fractures and in the operating room assisting surgeons with orthopedic procedures. This expanding role for ATCs in the physician practice has been put in place at major orthopedic sports medicine facilities around the country including Emory University's School of Medicine, St. Luke's Sports Medicine and the Palmetto Health-USC Orthopedic Center. This healthcare model results in more patient-provider contact time and access and ultimately increases patient satisfaction.

We are also leading the charge in educating a new generation of ATCs in the physician practice through our ATC residency program. Now in its second year, the residency program offers extensive training for ATCs who already have 1-2 years of hands on experience. The educational opportunities available in the residency program include surgical assistance training, exposure to fracture/wound care, experience with imaging technologies, and access to training with providers across orthopedics and sports medicine.

"Having integrated an ATC in my practice has provided an invaluable service to both patients as well as myself. Their expertise in patient assessment, patient education and post-operative care, not to mention hands on surgical assistance in the OR, have all contributed to better and more efficient patient care. Our patients have embraced the concept enthusiastically and appreciate the level of quality care that they receive from these physician extenders. The use of ATC in my practice has been the greatest single addition that I have incorporated in the last 10 years."

— F. Lincoln Avery, MD
*Medical Director, MMP Orthopedics & Sports Medicine, Division of Sports Medicine*

# Physical Therapy

Sports medicine rehabilitation is one of the many specialties that we offer. Located in the same building as the physicians of this practice, the rehabilitation department offers post-operative and non-operative treatment for conditions involving the shoulder, elbow, hip, knee, foot and ankle, and spine. Whether you are returning to professional sports or weekend recreation, our state-of-the-art clinic is fully equipped with an anti-gravity treadmill, a Woodway treadmill, a TechnoBody balance and stabilization system, IASTM tools, Shuttle systems and Life Fitness resistance and cardio equipment, and much more to ensure a fast, optimal and safe recovery after an injury.

Our practice includes four physical therapists and two PT assistants.

In 2017 the PT department treated 742 patients over the course of 6,445 therapy sessions.

**Heather Gillespie, MD,** Sports Medicine Physician, with Portland Red Claws player

**Dirk Kokmeyer,** Physical Therapist, with patient

## Patient Satisfaction Ratings

At the end of clinical appointments we ask our patients to answer questions about their care and their visits to the office. We are very proud of the high-level of patient satisfaction with our providers and staff.

**Percentage of patients who answered "Always" to the following questions:**

| | |
|---|---|
| Was the staff courteous and friendly? | 99.7% |
| When you called in, did the staff give you an appointment within the time frame you needed? | 95.0% |
| Did the provider listen to your concerns during your visit? | 99.8% |
| Was the information the provider gave you easy to understand? | 98.7% |
| Was the provider respectful while addressing your health concerns? | 99.8% |
| Did the care team adequately address your questions and concerns? | 99.1% |

# Trauma & Fracture Care


Patient, **Richard Brunelle**, North Berwick, ME

# Division of Trauma & Fracture Care

Our highly experienced team, lead by Dr. Ray White, is part of MMC's Level I Trauma Program. We're proud to provide expert orthopedic trauma care for patients with complex fractures throughout our region.

Our physicians are fellowship trained in orthopedic traumatology (study of wounds and injuries from trauma) and are certified by the American Board of Orthopedic Surgery. Together, they bring years of experience caring for patients with complicated injuries.

Under the supervision of orthopedic trauma surgeons, our team of physician assistants, nurses, and administrative staff work together to give patients the best possible care. We deliver specialized care for orthopedic traumatic injuries throughout surgery, hospital stay, and office follow up.

**Our services include:**

- surgical fracture treatment
  - » pre-operative evaluation and postoperative care
- non-surgical fracture treatment
- diagnostic testing
- wound care
- application and removal of casts and splints
- orthotics

## Trauma & Fracture Care at a Glance

| | |
|---|---|
| Total patients treated (surgical and non-surgical) | 2,487 |
| Surgical procedures | 1,379 |
| Fracture treatment surgeries | 1,154 |
| Cast room visits | 1,565 |

# Orthopedic Injury and Posttraumatic Stress Disorder

Our providers and staff have initiated a project to address the emotional needs of patients recovering from traumatic orthopedic injury. Our patients have often voiced concerns about struggles related to the event that caused their injury; for example, being afraid to drive after a motor vehicle accident or afraid to leave their house after falling on the ice. Clinically, these emotional and psychological difficulties can fall under the heading of Posttraumatic Stress Disorder (PTSD), a condition in which people continue to have intense, disturbing thoughts and feelings related to a traumatic event long after the event has ended.* PTSD can be common in patients after an orthopedic injury and result in a slower and more difficult recovery.**

The goal of this work is to identify patients struggling with symptoms of PTSD, connect them with community resources available for support and develop workflows and pathways that will provide appropriate and timely support and resources for affected patients. The Orthopedics Division has a designated RN Care Manager who is dedicated to working with patients with special needs or who may encounter challenges when discharged from the hospital.

*American Psychiatric Association https://www.psychiatry.org/patients-families/ptsd/what-is-ptsd

**Bhandari M., Busse, J.W., Hanson, B. P., Leece, P., Ayeni, O.R. & Schemitsch, E.H. (2008). Psychological distress and quality of life after orthopedic trauma Canadian Journal of Surgery, 51(1) 15-22

## Example Questions From PCL-5

| In the past month, how much were you bothered by: | Patients who answered "Quite a bit" or "Extremely" |
|---|---|
| Blaming yourself or someone else for the stressful experience or what happened after it? | 9% |
| Being "superalert" or watchful or on guard? | 11% |
| Trouble falling or staying asleep? | 18% |

We ask patients to fill out the PCL-5, a survey developed by the National Center for PTSD, at a clinic visit 6-12 weeks after their injury. Based on their responses, we are able to reach out to patients with concerning symptoms to offer help and resources.

# Casting Services

The "cast room" at Orthopedic Trauma and Fracture Care provides a wide range of services from whole body casts to finger splinting. The Certified Orthopedic Technologists treat patients of all ages and provide thorough patient education in a supportive atmosphere. Many patients are comforted to know that cast saws are not used to remove casts. The technologists use a functional cast treatment made from a polyester material and specialize in adjustable casts. In addition to clinic-based cast room services, they provide inpatient casting and assist surgeons in the OR for specialized casting needs. Passing on their knowledge, the casting specialists provide ongoing education and training to Sports Medicine Fellows and emergency room staff.

| | |
|---|---|
| **Casts** | |
| Arm/Hand/Wrist | 490 |
| Lower Extremity | 285 |
| Hips | 18 |
| Total Body | 1 |
| **Splints** | |
| Arm/Hand/Wrist | 117 |
| Lower Extremity | 119 |
| **Skin Treatment** | |
| Paste/Unna Boot | 49 |
| **TOTAL** | **1039** |

## Patient Satisfaction Ratings

At the end of clinical appointments we ask our patients to answer questions about their care and their visits to the office. We are very proud of the high-level of patient satisfaction with our providers and staff.

**Percentage of patients who answered "Always" to the following questions:**

| | |
|---|---|
| Was the staff courteous and friendly? | 99.0% |
| When you called in, did the staff give you an appointment within the time frame you needed? | 98.5% |
| Did the provider listen to your concerns during your visit? | 99.7% |
| Was the information the provider gave you easy to understand? | 98.8% |
| Was the provider respectful while addressing your health concerns? | 99.7% |
| Did the care team adequately address your questions and concerns? | 99.0% |

# Developing a Hip Fracture Program

Hip fragility fractures, which typically occur in the older patient population, can result from everyday events such as tripping over a rug or falling from bed. Injuries in this group of patients can present many challenges for the entire healthcare organization. A combination of socioeconomic, demographic, and medical issues converge to have negative effects on length of hospital stay, discharge location from the hospital, readmissions and mortality rates, as well as other factors critical to successful outcomes. Creating a standardized Hip Fracture Program helps to address variation in care, control cost, and maximize outcomes. This project is focused on a variety of benefits to patients, caregivers, and staff, including but not limited to the following:

- Better quality of life after hip fracture for our patients
- Reduced stress and anxiety for the patient and their caregivers
- Standardization of orders, treatments, and expectations by providers, improving nursing care and satisfaction while reducing the opportunity for error
- More streamlined discharge criteria and expectations, which benefits the patient, caregivers, care management, and nursing
- Improved outcomes in specific areas (length of hospital stay, discharge to home, complication rates, time to surgery, readmission rates, and mortality rates in the long term)
- Keeping the time from admission to surgery under twenty-four (24) hours is a critical component in reducing complications and mortality rates in patients with geriatric hip fractures.* Maine Medical Center's average is consistently under 24 hours.

**The average time to surgery for geriatric hip fracture patients is**

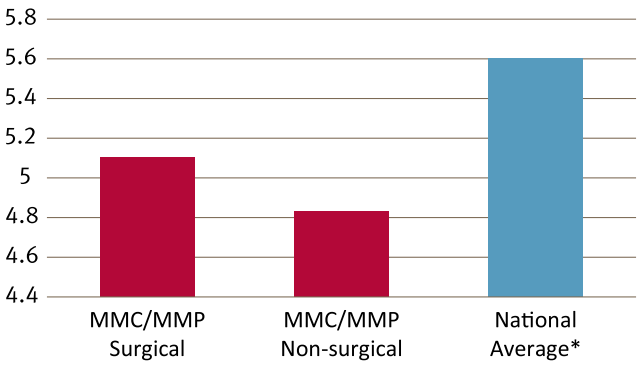
**22.4 hours**

* Dressler D (Reviewing Pincus D et al. JAMA 2017 Nov 28). Timing of Hip Fracture Repair. NEJM Watch. Jan 2, 2018.

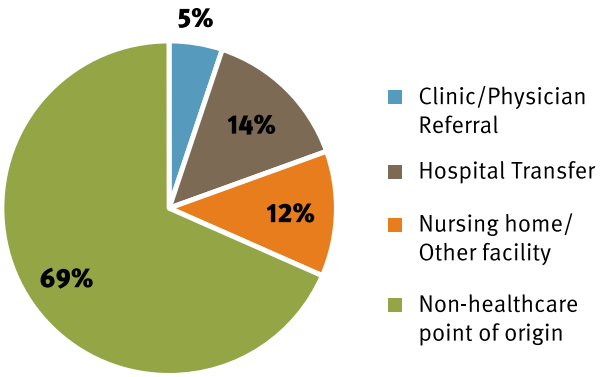
Pincus D et al. Association between wait time and 30-day mortality in adults undergoing hip fracture surgery JAMA 2017 Nov 28; 318:1994.

# Hip Fracture Initiative

## LENGTH OF STAY IN HOSPITAL* (in days)

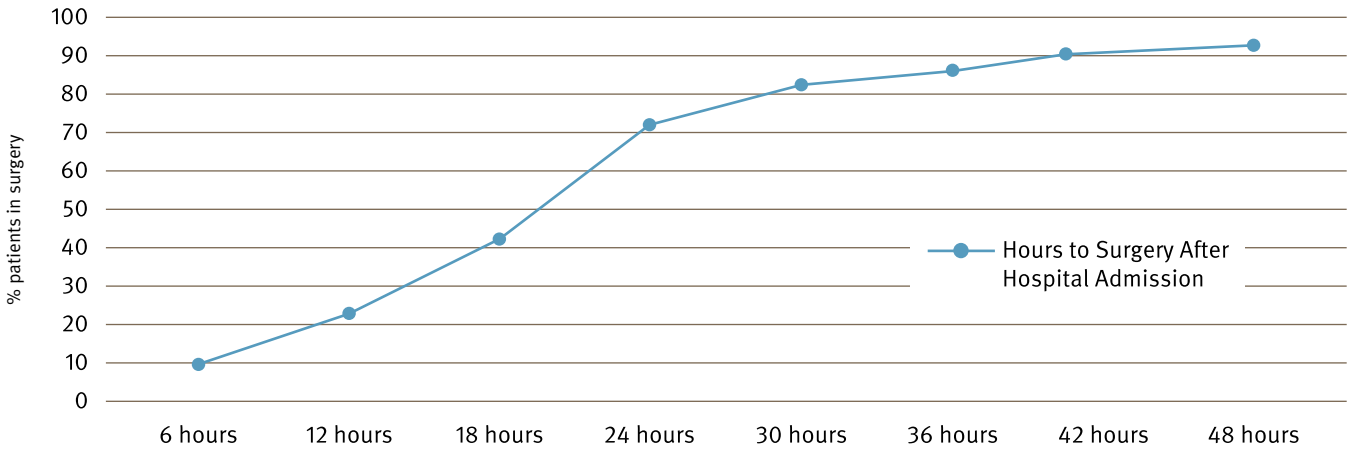



## SOURCE OF HIP FRACTURE PATIENTS




**As a Level 1 Trauma Center, 14% of our patients are transferred to Maine Medical Center from other hospitals because of our ability to care for the complex medical needs of patients as well as providing hip fracture treatment.**

## HOURS TO SURGERY AFTER HOSPITAL ADMISSION** (% patients in surgery)




**Nearly 3/4 of surgical hip fracture patients are in operating rooms within 24 hours of arrival to Maine Medical Center. Research clearly indicates a significant reduction in postoperative complications in hip fracture patients who are in surgery within the first 24 hours of hospital admission. Through the Hip Fracture Initiative, our surgeons are working to increase the number of patients who reach the operating room within this 24-hour window.**


* Basques, B.B., Daniel, D., Golinvaux, N.S., Leslie, M.P. Baumgaertner, M.R., & Grauer, J.N. (2015). Postoperative length of stay and 30-day readmission after geriatric hip fracture: An analysis of 8434 patients. Journal of Orthopaedic Trauma, 29(3), e115-e120.

** Ryan, D.J., Yoshihara, H., Yoneoka, D., Egol, K.A., & Zuckerman, J.D. (2015). Delay in hip fracture surgery: An analysis of patient-specific and hospital-specific risk factors. Journal of Orthopaedic Trauma, 29(8), 343-348.

# Joint Replacement

Patient, **Edward Gervais**, North Yarmouth, ME

# Division of Joint Replacement

Maine's leading knee, hip, and shoulder replacement experts are together at Maine Medical Partners – Orthopedics & Sports Medicine. Our Board certified surgeons offer today's most advanced care for arthritis-affected joints and injuries. In partnership with the Joint Replacement Center at Maine Medical Center (MMC), our team provides expert, world-class orthopedic care right here in Maine.

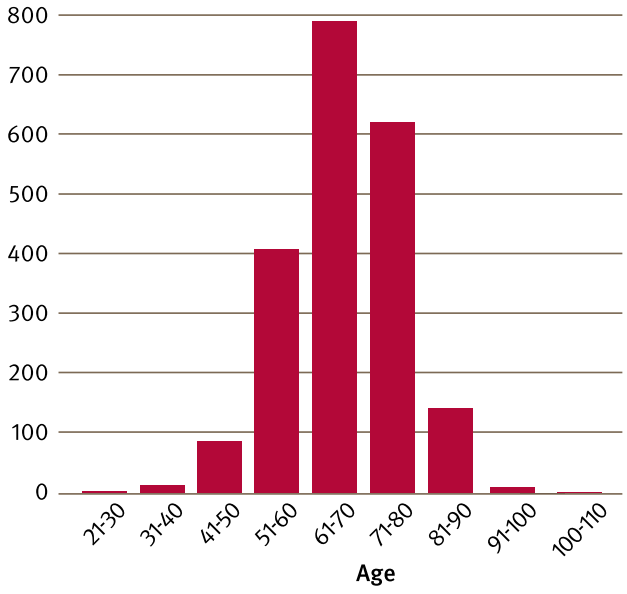
## Joint Replacement at a Glance

| | |
|---|---|
| Board certified surgeons | 7 |
| Joint replacement procedures | 2,172 |
| Hip/Knee Replacement patients who ambulate with physical therapy by the day after surgery | 99% |
| Average hospital stay after hip replacement* | 1.4 days |
| Average hospital stay after knee replacement* | 2.5 days |
| Average hospital stay after shoulder replacement* | 1.4 days |
| Discharged to home after surgery | 87% |

*Primary joint replacement surgeries

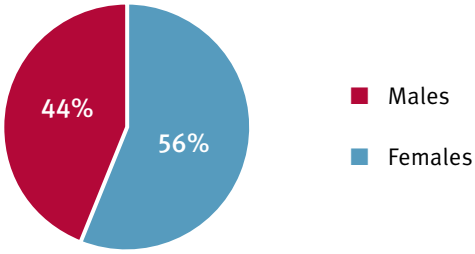
## Joint Replacement Patient Characteristics

### Age Distribution

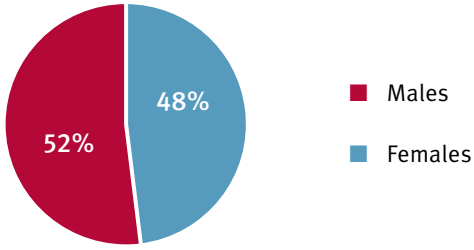



### Gender Distribution

HIP AND KNEE REPLACEMENT




SHOULDER REPLACEMENT




### Procedure Volume

| | |
|---|---|
| **Hip Replacement** | **1075** |
| Primary | 982 |
| Revisions | 93 |
| **Knee Replacement** | **833** |
| Primary Total Joint | 772 |
| Primary Unicompartmental | 39 |
| Revisions | 22 |
| **Shoulder Replacement** | **162** |
| Primary Anatomic | 51 |
| Primary Reverse | 92 |
| Primary Partial | 3 |
| Revisions | 16 |

# Excellence, Patient Outcomes and Research

As performance and patient outcomes are being reported more frequently, patients can see that there is a "bell curve" or distribution of success, with only small numbers of centers consistently offering patients excellent results. We think that our team's dedication to patient care, innovative spirit, medical knowledge, technical skill, and above all, desire and ability to improve, allow us to be one of the top joint replacement programs in the country.

The desire and ability to change for the better is wholly dependent on understanding and reacting to our results in real time. For almost 20 years, data has been collected and examined for outcomes evaluation for a large portion of our joint replacement and fracture patients. Maine Medical Partners — Orthopedics & Sports Medicine next initiated the MMC and MaineHealth Joint Replacement Registry, followed by participation as an early supporter of the American Joint Replacement Registry.

Additionally, our joint replacement surgeons collected not only surgical data, but also patient-reported outcomes. Patient-based questionnaires monitor activity, overall health, and joint-specific pain, stiffness and function, before and after surgery. Long term goals of our observation process include identifying variables that are associated with excellent results; assessing changes that we make to improve the patient experience, and offering patients objective measures of outcome to compare to other programs. Recent innovations such as using mobile activity monitors have also been piloted to improve this process.

Clinically relevant and actionable findings are the motivational force for our outcomes program. Our staff members collaborate with researchers, statisticians, clinicians and students from Maine Medical Center Research Institute, Tufts University School of Medicine, and regional and national research groups. We perform yearly quality improvement research and, in 2018, completed efforts exploring and improving surgical normothermia, anticoagulation protocols and anesthesia optimization.

We strongly believe that the combination of objective data about joint replacement surgery outcomes in conjunction with the desire and resources to improve and innovate through research allows us to offer our patients a state-of-the-art, safe, effective and durable joint reconstruction.

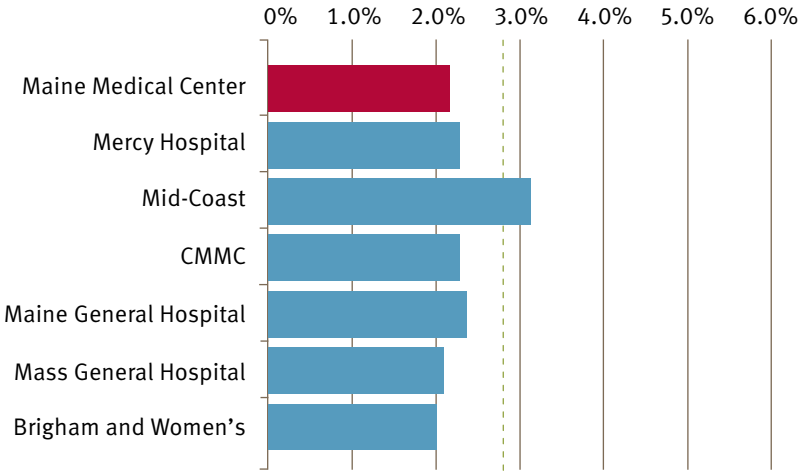
# Surgical Statistics

**The public now has access to unprecedented data around the quality of joint replacement procedures.**

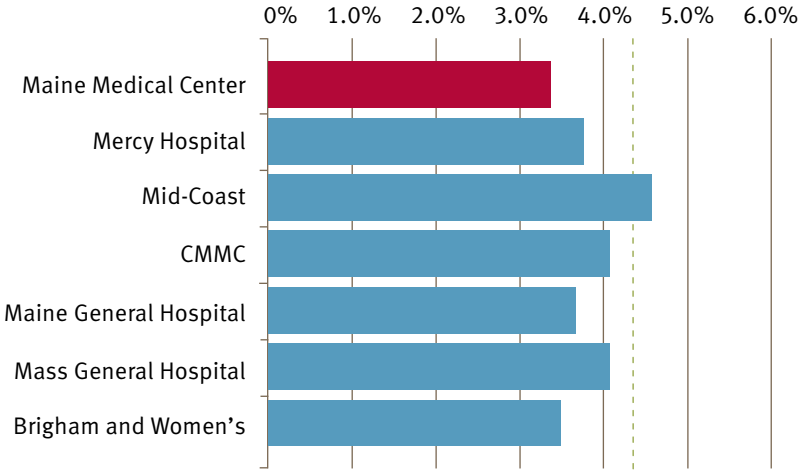
Hospital Outcome of Care measures, which are readily available on the Medicare website, are significant because people who elect to have these surgeries typically research the hospital and physician to learn who has the best outcomes. Also, Medicare has recently begun to adjust hospital reimbursement rates for hip and knee replacement surgeries based on these measures, as it currently does for a number of other procedures.

## Hip and Knee Replacement Patients

### 30-Day Surgical Complications




### 30-Day Readmission Rates




http://www.medicare.gov/hospitalcompare/search.html Accessed: 04/17/2018

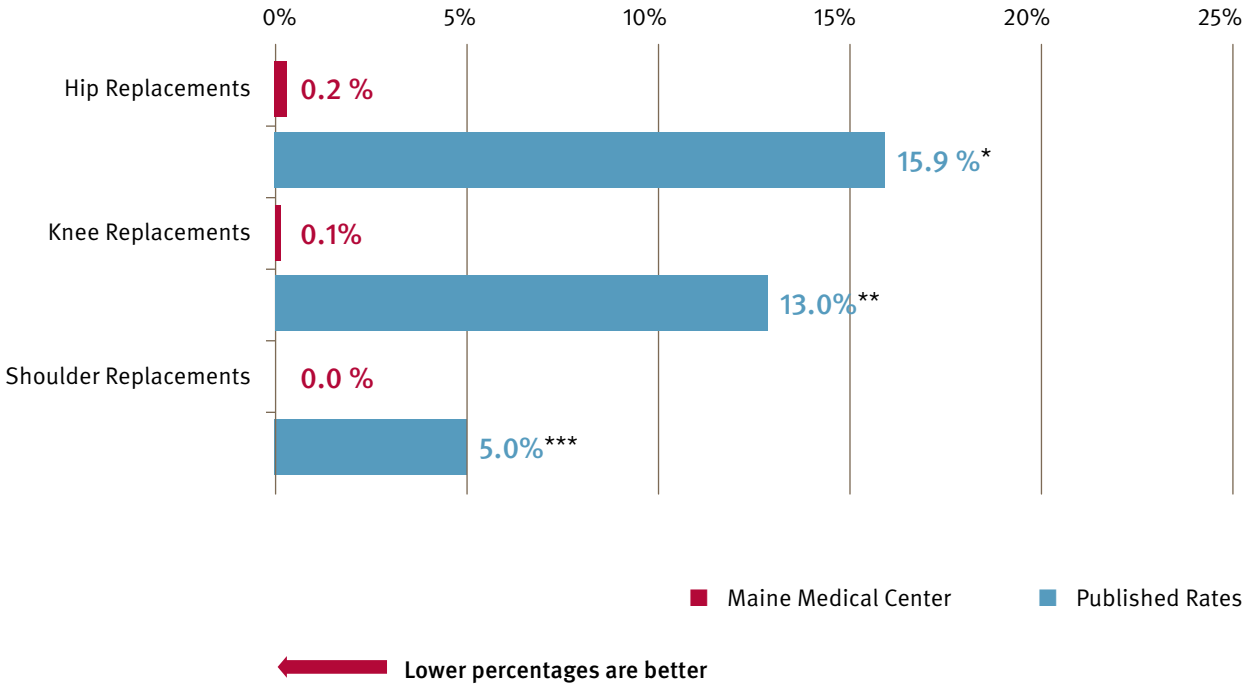
Maine Medical Center | Comparison Hospitals | U.S. National Average

**Lower percentages are better**

## Transfusion Rates

Blood transfusion rates during our joint replacement surgeries are significantly lower than the national average. While blood loss is always a risk with any major surgery, the surgeons at MMP – Orthopedics & Sports Medicine take every measure to minimize this risk through meticulous surgical techniques, state-of-the-art evidenced-based blood conservation protocols, and adherence to strict post-operative vital sign and laboratory value monitoring.

### 2017 Transfusion Rates




* Menendez ME, Lu N, Huybrechts KF, Ring D, Barnes L, Ladha K, Bateman BT. Variation in use of blood transfusion in primary total hip and knee arthroplasties. J Arthroplasty. Vol 31(2) Dec 2016:2757-63.

** Boutsiadis, A., Reynolds, R.J., Saffarini, M. & Panisset, J.C. (2017). Factors that influence blood loss and need for transfusion following total knee arthroplasty. Annals of Translational Medicine, (5)21. 418.

*** King, J.J., Patrick, M.R., Schnetzer, R.E., Farmer, K.W., Struk, A.M., Garvan, C. & Wright, T.W. (2017). Multivariate analysis of blood transfusion rates after shoulder arthroplasty. Journal of Surgical Orthopaedic Advances, (26) 1. 40-47.

# Outcomes From Our Patients' Perspective

**By continually monitoring patient reported outcomes, we're ensuring the best care for our patients.**

Before joint replacement surgery takes place, we ask our patients to fill out a survey with questions about joint pain, function and activity levels. After surgery we ask them to update us during their recovery. We do this because the best way to know how successful a surgery has been is to ask the patient. Here we report our patients' responses to those questions to illustrate how joint replacement is improving their lives.

Shoulder patients are given the American Shoulder and Elbow Surgeons Score survey.* Hip and knee patients answer the Hip/Knee Osteoarthritis Outcomes Score (abbreviated versions) developed by the Hospital for Special Surgery.**

We use national data or published benchmarks from large studies to compare and evaluate our patient outcomes measures. Alternatively, we provide a "Substantial Clinical Benefit" value, which correlates changes in patient reported scores with meaningful changes in activities of daily living.***

* King G.J.W., Richards R.R., Zuckerman J.D., et al. A standardized method for assessment of elbow function, J Shoulder Elbow Surgery, 1999, vol.8 (351-354).

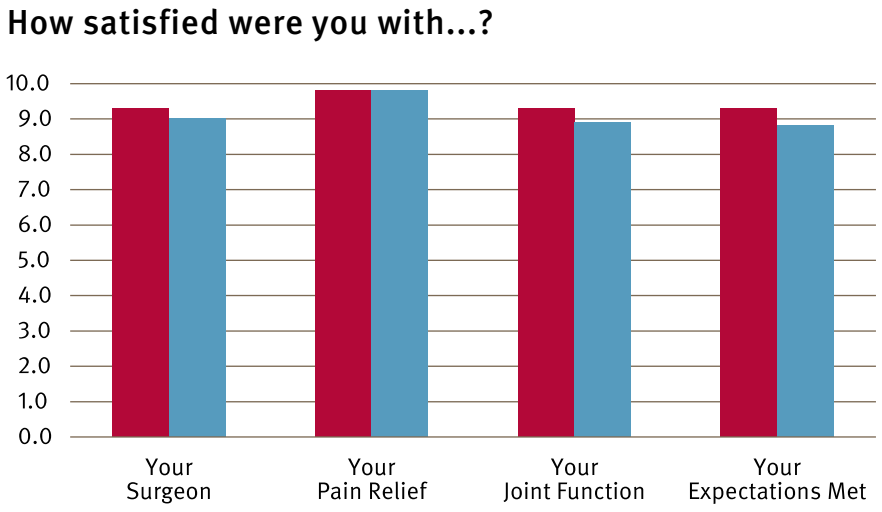
** Lyman S., Lee Y-Y., Franklin P.D., et al. Validation of the HOOS Jr.: A short-form hip replacement survey. Clin Orthopaedics and Related Res, 2016, 474:6, pp 1472-1482.

*** Glassman S.D., Copay A.G., Berven S.H., Polly D.W., Subach B.R., and Carreon L.Y.: Defining substantial clinical benefit following lumbar spine arthrodesis. J Bone Joint Surg Am 2008; 90: pp. 1839-1847

# Hips and Knees

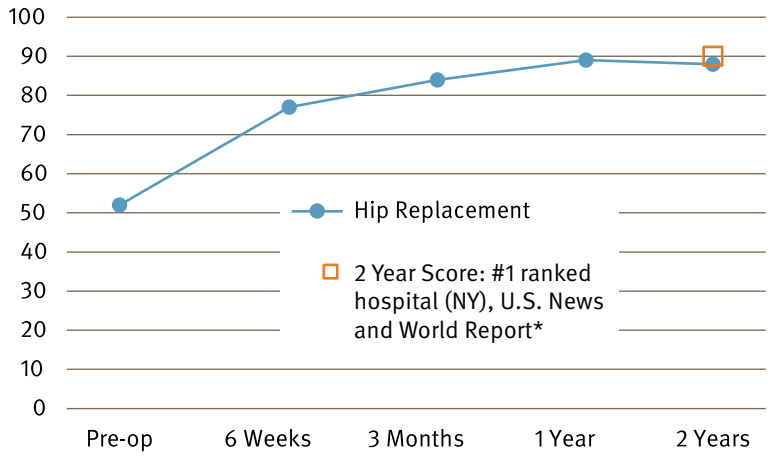
## Patient Satisfaction (1 year post-operative) 0-10 *higher is better*

One of the clearest methods for assessing the success of a surgery is to ask patients how they are satisfied with their surgeon, pain relief, joint function and whether the experience met expectations.



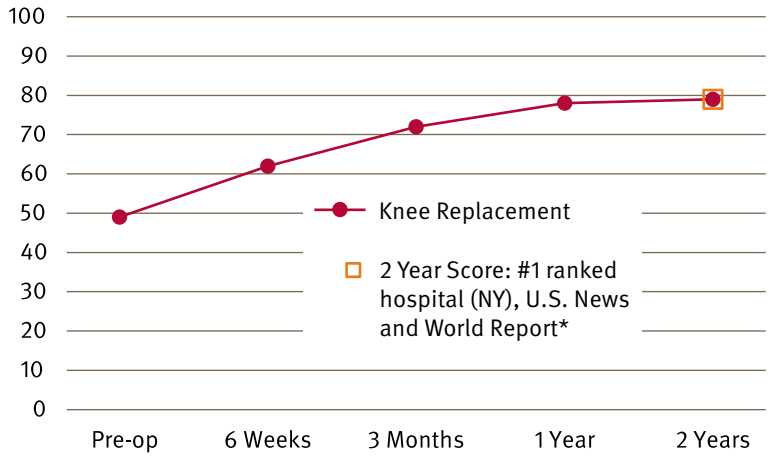
## Hip Osteoarthritis Outcome Score (0-100)*

*0 indicates 'cannot use joint' while 100 indicates 'perfect joint function'*




## Knee Osteoarthritis Outcome Score (0-100)*

*0 indicates 'cannot use joint' while 100 indicates 'perfect joint function'*




**Our patient outcome scores are comparable to scores reported by hip and knee replacement patients at the Hospital for Special Surgery in New York City, rated the #1 Hospital for Orthopedics in the country by U.S. News and World Report.****

*Hospital for Special Surgery-Adult Reconstruction and Joint Replacement Service. Retrieved from: https://www.hss.edu/orthopedic-hip-knee-service.asp

**https://health.usnews.com/best-hospitals/rankings/orthopedics

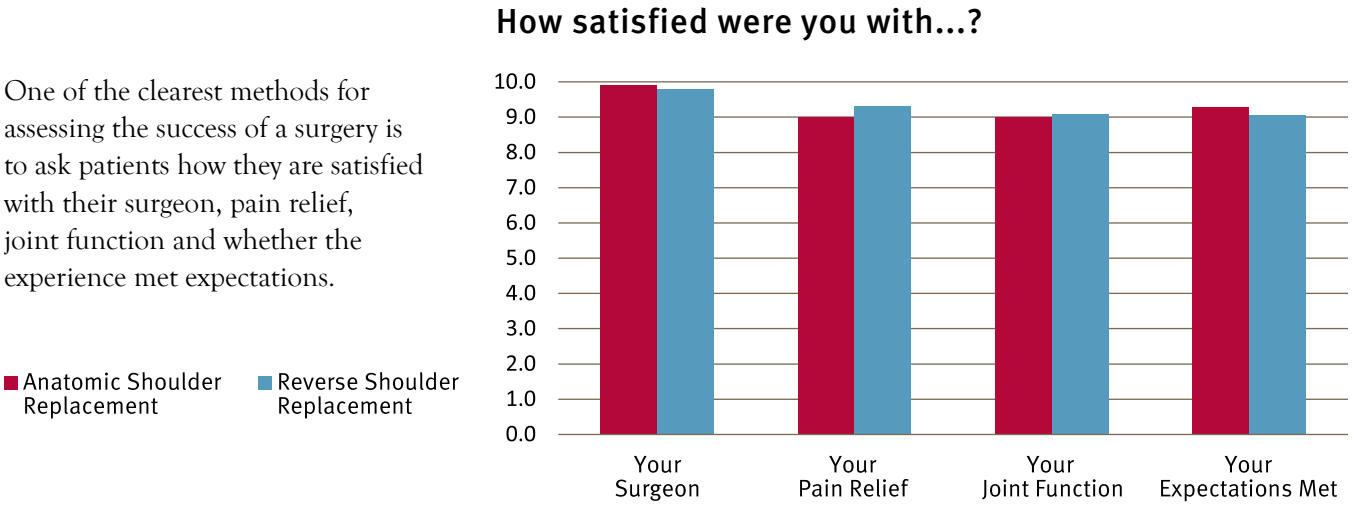
# Shoulders

## MMP Orthopedics & Sports Medicine Welcomes New Shoulder and Elbow Surgeon

**Jonathan Watling, MD,** is an orthopedic surgeon out of our South Portland and Falmouth locations. Dr. Watling received his medical degree from Columbia University College of Physicians and Surgeons and completed his residency in orthopedic surgery at New York Presbyterian Hospital. He completed his fellowship in sports medicine, shoulder and elbow surgery at OrthoCarolina. His clinical interests include shoulder and elbow arthroscopy, complex shoulder reconstruction, complex knee ligament reconstruction, cartilage restoration and upper extremity trauma.

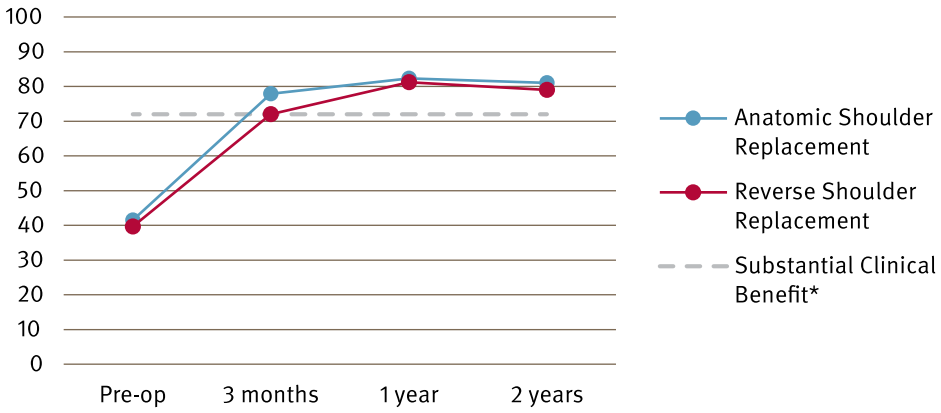
## Patient Satisfaction (1 year post-operative) 0-10 *higher is better*

One of the clearest methods for assessing the success of a surgery is to ask patients how they are satisfied with their surgeon, pain relief, joint function and whether the experience met expectations.



## American Shoulder and Elbow Surgeons Score (0-100)

*0 indicates 'cannot use joint' while 100 indicates 'perfect joint function'*




* Simovitch, R., Flurin, P-H., Wright, T., Zuckerman, J.D. & Roche, C.P. (2018). Quantifying success after total shoulder arthroplasty: the substantial clinical benefit. Journal of Shoulder and Elbow Surgery, 27(5), 903-911.

**Patients report a doubling in shoulder function score 1 year after shoulder replacement surgery.**

# Innovations in Hip and Knee Replacement Surgeries

### Next-Day Knee Replacement

Knee replacement surgery has traditionally been associated with hospital stays averaging three to four days post-surgery. In addition, a subsequent stay in a rehabilitation facility for additional recovery is not uncommon. The staff at MMC Joint Replacement Center has worked to develop a **next-day knee replacement program**, with comfortable discharge home the day after surgery.

The program is a natural evolution of the minimally invasive anterolateral hip replacement that our colleague, Dr. George Babikian introduced at MMC. The success of the total hip replacement program revolves around standardization, reduced trauma to the soft tissues, reduction of variability in all aspects of the episode of care, and a decreased opportunity for dislocation of the hip after surgery. With these successes, we have seen improved quality of outcomes, increased speed of recovery, and ability to send patients home the day after surgery.

We knew we needed to bring this level of patient care and exceptional outcomes to all of our knee replacement patients. A team of us traveled to the Cleveland Clinic to observe a mature next-day total knee replacement program. What we found was a program that was similar to the knee replacement program that exists at MMC with some subtle variations that allow patients to be safely discharged home the day after surgery.

By applying these learnings to minimally invasive partial knee replacement surgery, with a multimodal pain management protocol and post-operative course that includes immediate mobility, we are pleased to say that patients can typically and safely go home one day post partial knee replacement surgery.

**We have seen success with over 97% of our patients going home the day after partial knee replacement surgery and ready to introduce this program to qualified total knee replacement patients.**

We are confident that we can treat and deliver your patients the best possible care and outcomes, and get them back to living their life to the fullest; quickly and pain free.

**Dr. Adam Rana**, Orthopedic Surgeon, with patient

### Simultaneous Bilateral Total Hip Replacement

The ability to perform both right and left hip replacements during one surgery is a procedure we offer to our MMP — Orthopedics & Sports Medicine patients. This surgical method is referred to as "minimally impactful" due to the unprecedented successes in short length of stay, minimization of pain and restrictions, and rapid return to function with avoidance of complications. Once established, it became evident that for the right patient, doing two hip replacements in the same surgery visit was not just possible but beneficial. The right patient is one with severe bilateral hip arthritis — a situation where if one hip were to be replaced, the remaining hip with arthritis would not be functional enough to "protect" the replaced hip.

There is no increase in the mechanical risk to the hips by having two replaced at once in this setting, and a true benefit in the speed of recovery has been observed. The bilateral hip replacement program began in 2008 and to date over 140 of the surgeries have been done. This has been accomplished with great success, with length of stays averaging 2 days, and complication rates far below average for unilateral hips across the country. We are very happy to be able to offer this service to our patients, as a function of the truly minimally impactful nature of the muscle sparing anterolateral hip replacement procedure.

# Setting Expectations

An important part of the decision to undergo elective joint replacement surgery is a meaningful understanding of the steps along the way. Being aware of what is to come during this process and setting realistic expectations, not only improves patient satisfaction with the experience but can affect clinical outcomes as well. Here we outline important steps along the way in the preoperative, hospital and recovery periods of joint replacement surgery to illustrate the pathway that the majority of our patients experience. Of course, each patient's individual needs are of highest importance, but having an expectation of this likely pathway can improve the patient experience and allow preparation for the most successful recovery possible.

# Patient Education

**Janet Dyroff, RN, MS, CHES**
Joint Replacement Center Nurse Educator,
Maine Medical Center

- Live classes offer a full opportunity for patients to interact with a Nurse Educator in a pleasant classroom setting with other patients following similar surgical pathways. Patients and families are encouraged to ask questions and listen to suggestions for preparing their home, details about the day of surgery, advances in pain management and anesthesia. Discharge planning for home care and rehabilitation care, along with answers to your patients' questions about returning to normal activities.
- Live on-line GoToMeeting webinars are offered multiple times each month, covering similar topics as our live classes. Patients have opportunities to ask questions as well.
- Our online recorded video is also available, which offers a shorten version of a patient education class. This is available 24/7 on our education website at mmc.org/jrc.
- Our Nurse Educator is also available to take patients' calls or schedule a personal 1:1 educational discussion to accommodate patients' individual needs as well.

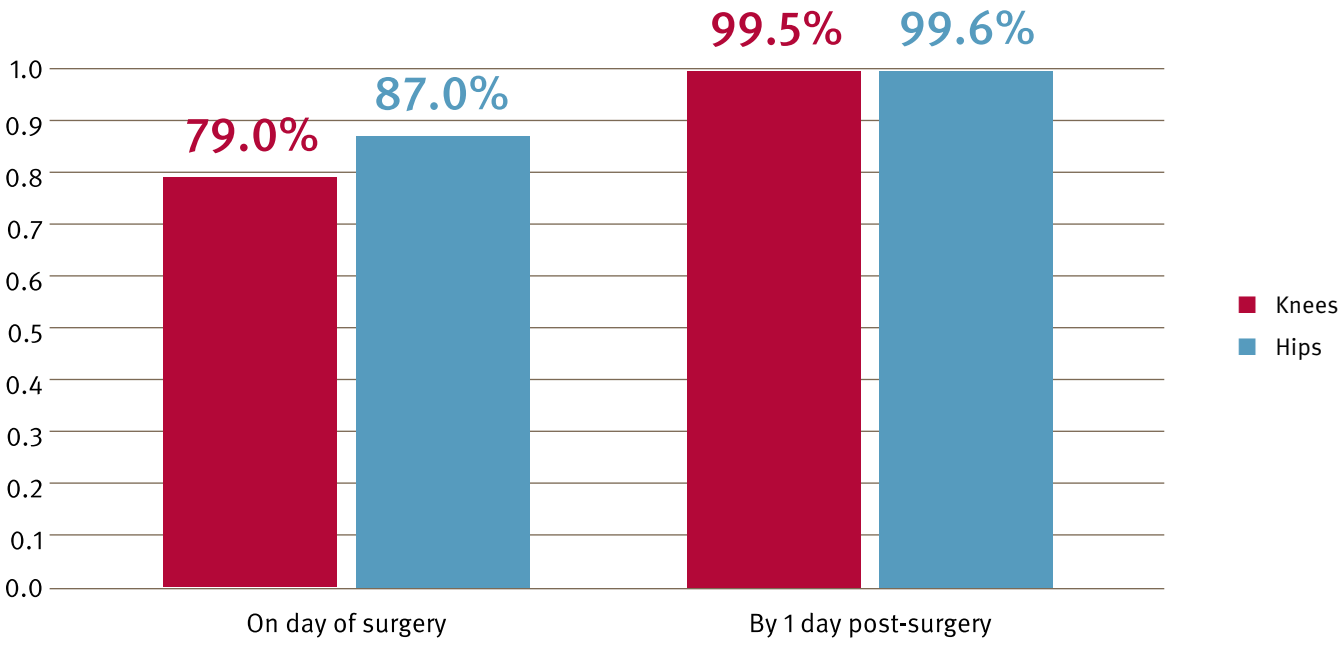
# Early Mobilization

Early mobilization, or standing and walking as soon as it is safe and possible after surgery, may seem surprising to many patients given that they are planning for a major surgical procedure on a hip or knee joint. However, a significant body of research has shown that early mobilization, preferably on the day of surgery, results in improved outcomes for patients who are able to do so. These outcomes include reduced length of stay in the hospital as well as increased muscle strength, range of motion and higher ratings in health-related quality of life during the recovery period.* Surgeons, nurses and physical therapists on the care team coordinate efforts to reach the goal of all patients safely moving and walking as early as the same day as their surgery.

* Guerra, M.L., Singh, P.J. & Taylor, N.F. (2015). Early mobilization of patients who have had a hip or knee joint replacement reduces length of stay in hospital: a systematic review. Clinical Rehabilitation 29(9), 844-854.

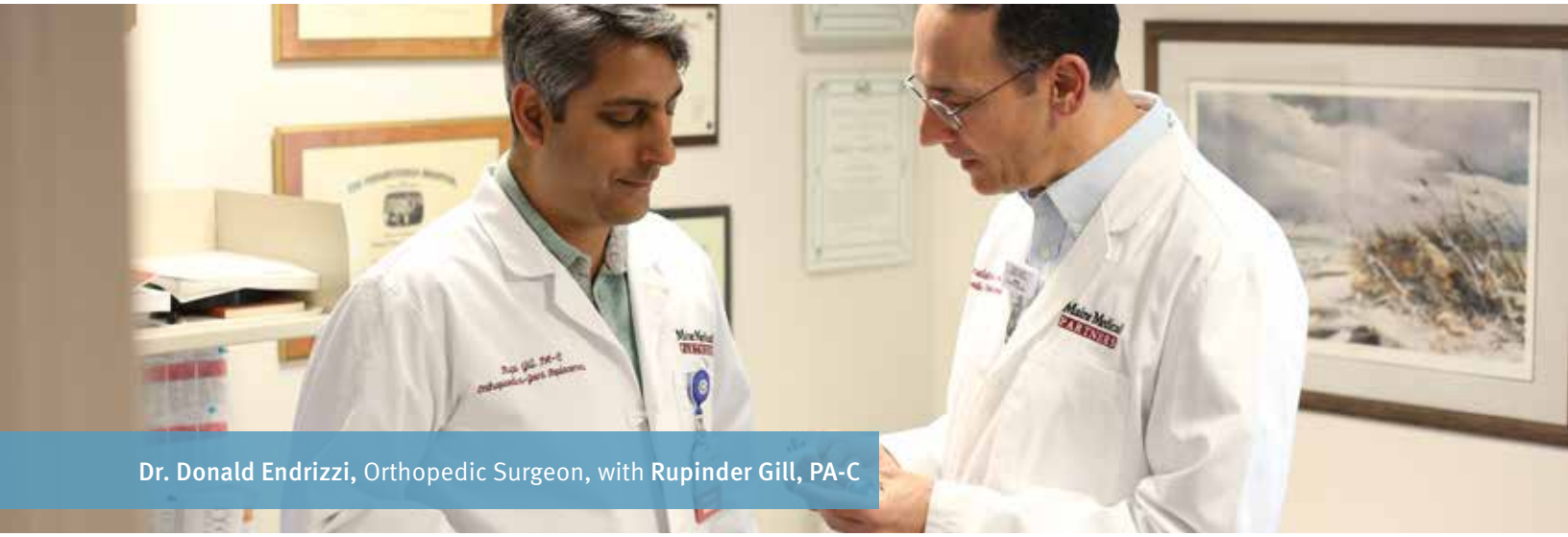
Patient, **Judy Perez**, North Conway, NH

## When are patients up and out of bed after hip and knee replacement surgery?




**By the end of post-operative day 1, nearly 100% of patients have been up and out of bed under the supervision of hospital staff.**

# Pain Management



**Dr. Donald Endrizzi,** Orthopedic Surgeon, with **Rupinder Gill, PA-C**

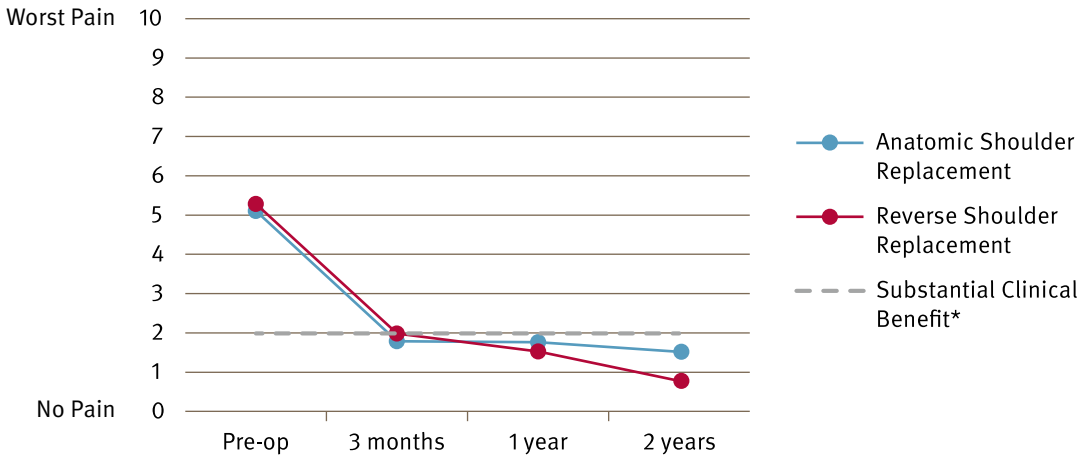
Our philosophy regarding pain management is to take a multimodal approach that addresses each step of the pain pathway to minimize every patient's post-operative pain. To quote the famous French philosopher Jean Jacques Rousseau, "Happiest is the person who suffers the least pain." Our dedication to meticulous soft tissue handling at the time of surgery, utilizing less invasive approaches to the hip, knee and shoulder, targeted local anesthetics and appropriate post-operative pain medications have all shown significant benefits with regards to our patients post-operative experience.

Studies report that superior post-operative pain management results in decreased length of stay at the hospital, earlier mobility in the post-operative setting, improved recovery of function such as range of motion in total knee replacements, decreased narcotic requirements, decreased gastrointestinal complications such as constipation, decreased genitourinary complications, and decreased cardiopulmonary complications such as pneumonia. Pain is a poorly understood, complex phenomenon most likely controlled by neural, cellular, and humoral mechanisms. The pain pathway is initiated by surgical trauma that sends signals to the peripheral nervous system which are then carried to the central nervous system. Our approach for addressing pain targets each step in this pathway.

Surgical trauma in total hip replacement surgery is minimized by performing a muscle sparing minimally invasive approach. Resultant inflammation is then addressed with anti-inflammatory medications, also known as NSAIDs (e.g. Celebrex). In addition, cryotherapy or ice packs are applied to the operative extremity to reduce swelling. Local anesthetics injected at the time of surgery offer pain relief to the peripheral nervous system, while Tylenol and opiates (which are stronger narcotic pain medications) offer decreased pain by acting at the level of the central nervous system.

Our goal and commitment to our patients is to continually improve our peri-operative pain management techniques by way of reduced trauma at the time of surgery, a multimodal pain control program and pre-operative patient education.

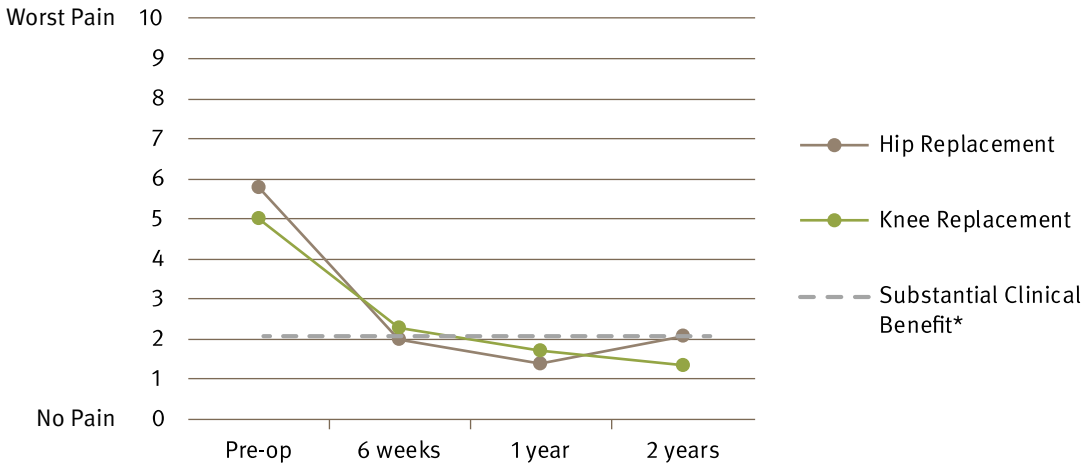
## Pain Scores: Shoulders (0-10)




* Simovitch, R., Flurin, P-H., Wright, T., Zuckerman, J.D. & Roche, C.P. (2018). Quantifying success after total shoulder arthroplasty: the substantial clinical benefit. Journal of Shoulder and Elbow Surgery, 27(5), 903-911.

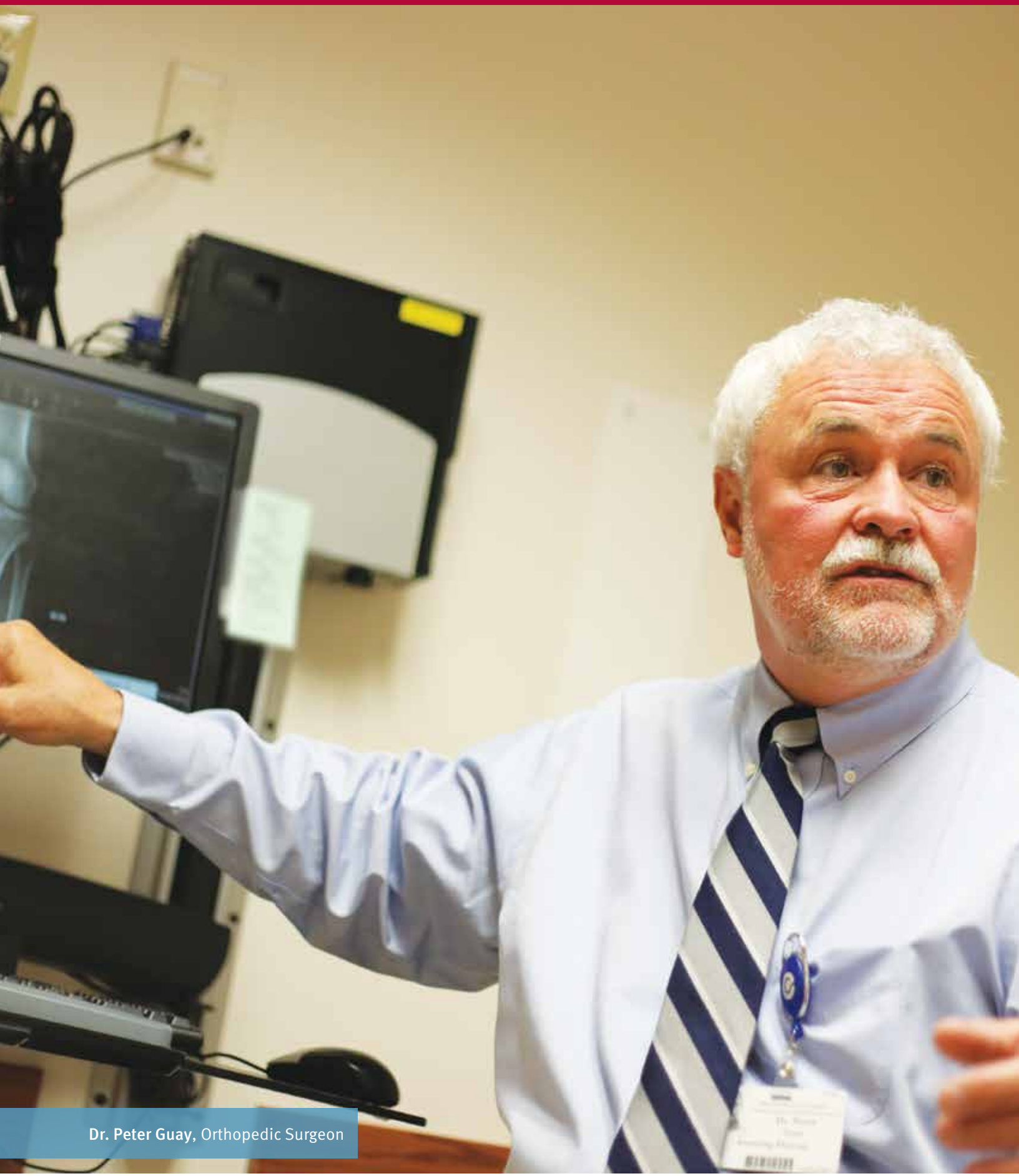
Substantial clinical benefit is the threshold above which patients report receiving substantial improvement due to treatment.

## Pain Scores: Hips and Knees (0-10)




* Substantial clinical benefit is the threshold above which patients report receiving substantial improvement due to treatment.

**By six weeks after joint replacement surgery over 50% of our patients report a pain level of '1' or '0'.**



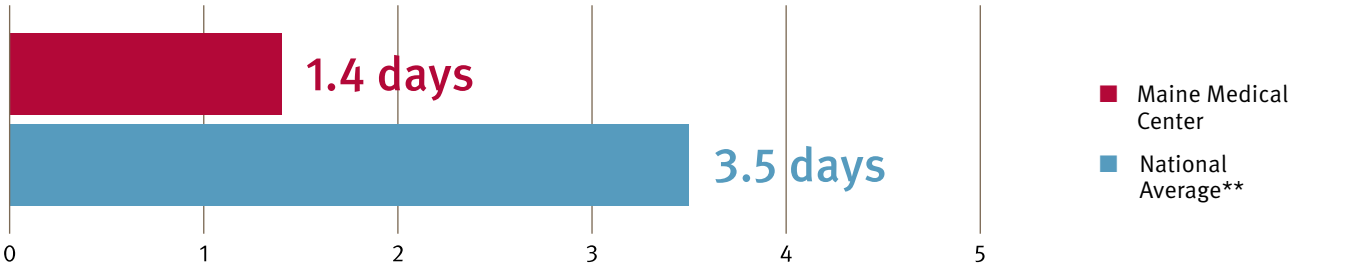
**Dr. Peter Guay,** Orthopedic Surgeon

# Length of Hospital Stay

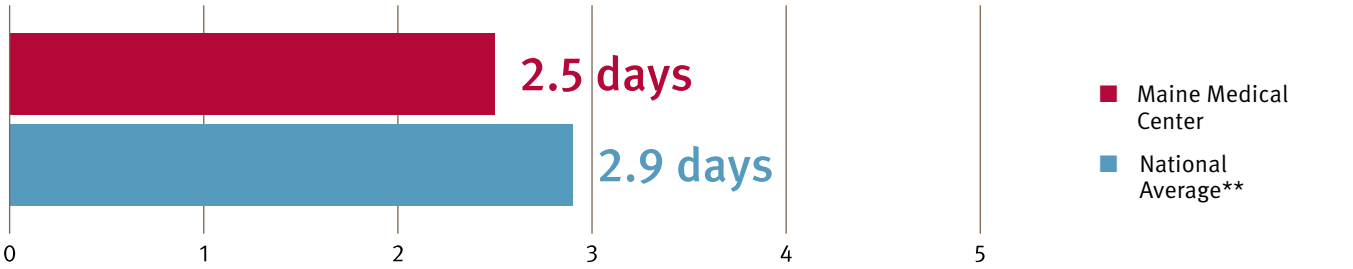
A priority of the teams at MMP – Orthopedics & Sports Medicine, and Maine Medical Center is to return our patients to their homes as quickly as possible, safely and comfortably. Patients with shorter lengths of stay are able to enjoy the familiar surroundings of home and are less likely to develop a hospital-acquired complication.* Additionally, a short stay helps to reduce overall healthcare spending. Our strict adherence to established best-practice pathways for hip, knee and shoulder replacement surgery allows our patients to experience significantly shorter lengths of stay compared to national averages.

## 2017 Length of Stay Averages

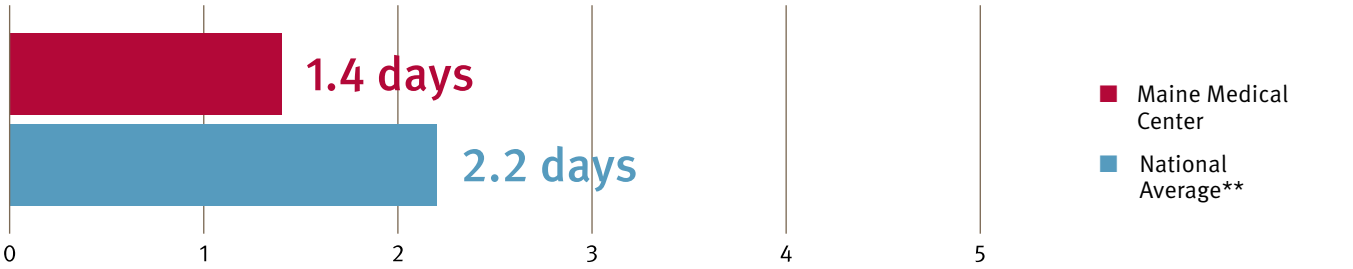
### HIP REPLACEMENT




### KNEE REPLACEMENT




### SHOULDER REPLACEMENT




* Wolf, B.R., Lu, X., Li, Y., Callaghan, J.J. & Cram, P. (2012). Adverse outcomes in hip arthroplasty: long-term trends. Journal of Bone and Joint Surgery, 94 (14) e103(1-8).

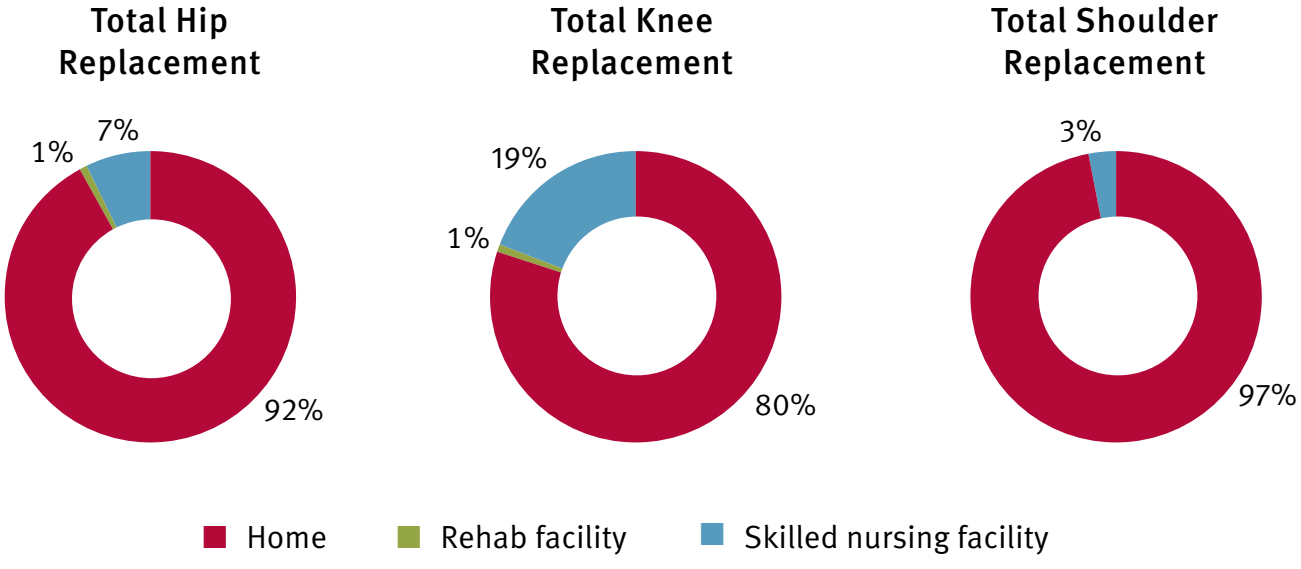
**American Joint Replacement Registry. (2017). AJRR annual report 2017. Retrieved from http://www.ajrr.net/publications-data/annual-reports

Monica Butler RN, with patient during post-operation appointment

# Discharge Location

Where do our patients go after discharge from the hospital? Getting patients back to their families and loved ones is a priority for us because our team understands that patients recover better in the comfort of their own home. Patients discharged home have the option of visiting nurses, in-home physical therapy and in-home occupational therapy visits. We have established this commitment to getting patients home when possible and our commitment shows in the data. We have partnered with home health agencies around the state to develop standardized order sets and rehabilitation protocols, ensuring patients receive consistent, quality care from a variety of home health providers.

## Discharge Location

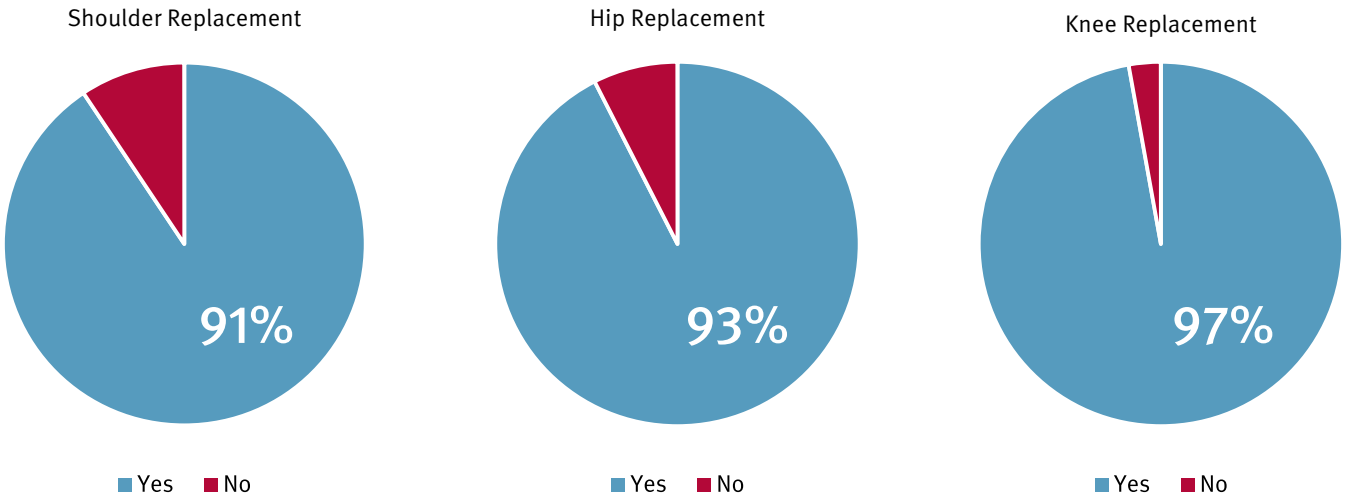


# Return to Work

One of the foremost concerns of joint replacement patients is knowing when they will be able to return to their everyday activities. Here we present data reported to us about how quickly they were able to recover and return to their lives. By 13 weeks post operation 95% of our patients are working again.

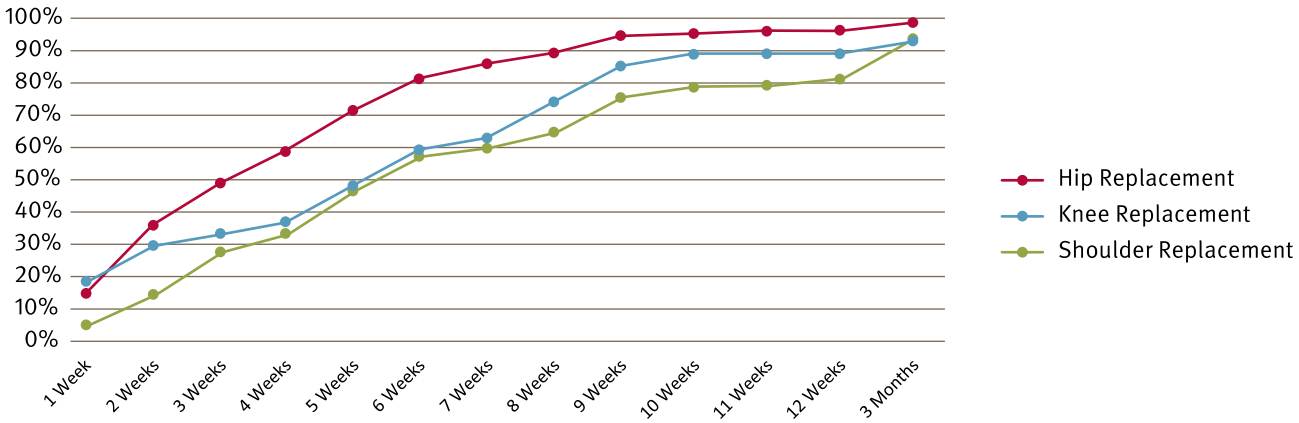
## Return to Work

### Do patients return to work after surgery when they expected to return?




**Half of shoulder patients are back to work by 3 weeks. By 5 weeks half of knee and hip patients have returned to work.**

### When are patients returning to work? *(Cumulative Percentage)*



# Providers

## JOINT REPLACEMENT

### George Babikian, MD

| | |
|---|---|
| Certifications | Orthopaedic Surgery, 1994 |
| Medical School | SUNY at Buffalo School of Medicine, MD, 1981 |
| Residency | SUNY at Buffalo Consortium |
| Fellowship | AO Trauma, Kantonspital, Chur, Switzerland, 1987 |
| Fellowship | Trauma and Critical Care, SUNY at Buffalo |

### Michael W. Becker, MD

| | |
|---|---|
| Certifications | Orthopaedic Surgery, 1992 |
| Medical School | SUNY at Buffalo School of Medicine, MD, 1983 |
| Residency | NewYork-Presbyterian/Columbia University Medical Center, Orthopaedic Surgery, 1988 |
| Residency | St. Luke's-Roosevelt Hospital, General Surgery, 1985 |
| Fellowship | Hospital for Special Surgery, Knee Surgery, 1989 |

### Donald P. Endrizzi, MD

| | |
|---|---|
| Certifications | Orthopaedic Surgery, 1990, recertification 2000, 2010 |
| Medical School | Columbia College of Physicians and Surgeons, 1982 |
| Internship | NewYork-Presbyterian/Columbia University Medical Center, General Surgery, 1982-1983 |
| Residency | NewYork-Presbyterian/Columbia University Medical Center, General Surgery, 1983-1984 |
| Residency | NewYork-Presbyterian/Columbia University Medical Center, Orthopaedic Surgery, 1984-1987 |
| Fellowship | A.S.I.F. Foundation, Regional Kantonspital, Chur, Switzerland, 1987 |

### Peter E. Guay, DO

| | |
|---|---|
| Certifications | Orthopaedic Surgery, 1994 |
| Medical School | University of New England College of Health Professions, DO, 1983 |
| Internship | Brighton Medical Center, Rotating, 1984 |
| Residency | Brighton Medical Center, Orthopaedic Surgery, 1990 |

### Brian J. McGrory, MD

| | |
|---|---|
| Certifications | Orthopaedic Surgery, 1997 |
| Medical School | Columbia College of Physicians and Surgeons, MD, 1989 |
| Residency | Mayo Clinic, Orthopaedic Surgery, 1994 |
| Fellowship | Massachusetts General Hospital, Hip & Knee Replacement, 1995 |

### Adam J. Rana, MD

| | |
|---|---|
| Certifications | Orthopaedic Surgery, 2014 |
| Medical School | SUNY Downstate Medical Center, MD, 2002-2006 |
| Internship | Boston University Medical Center, 2006-2007 |
| Residency | Boston University Medical Center, Orthopedic, 2007-2011 |
| Fellowship | Hospital For Special Surgery, N.Y., Arthroplasty, 2011-2012 |

### Jonathan P. Watling, MD

| | |
|---|---|
| Medical School | Columbia School of Medicine, MD, 2011 |
| Residency | NewYork-Presbyterian/Columbia University Medical Center, Orthopaedic Surgery, 2016 |
| Fellowship | OrthoCarolina Sports Medicine/Shoulder & Elbow Surgery |

### PA-C

| | |
|---|---|
| Evans, Paul | PA-C |
| Gill, Rupinder | PA-C |
| Knowles, Amelia | PA-C |
| Minzy, Courtney | PA-C |
| McKenney, Bingham | PA-C |

### NP

| | |
|---|---|
| Campbell, Melanie | APRN-FNP |
| Dobos, Kathryn | APRN-FNP |
| Jagoutz, Angela | APRN-FNP |
| Stirling, Michelle | APRN-FNP |

## SPORTS MEDICINE

### F. Lincoln Avery, MD

| | |
|---|---|
| Certifications | Orthopaedic Surgery, 1987 |
| Medical School | Dartmouth Medical School, MD, 1980 |
| Internship | Beth Israel Deaconess Medical Center, General Surgery |
| Residency | Beth Israel Deconess Medical Center, General Surgery |
| Residency | Strong Memorial Hospital, Orthopaedic Surgery |

### Krystian W. Bigosinski, MD

| | |
|---|---|
| Certifications | Family Medicine, 2008, Sports Medicine, 2009 |
| Medical School | University of Illinois College of Medicine, MD, 2005 |
| Residency | Swedish Hospital @ Cherry-Hill Family Medicine, Family Medicine |
| Fellowship | Rush University, Sports Medicine, 2009 |

## William W. Dexter, MD

| | |
|---|---|
| Certifications | Family Medicine, 1989, Sports Medicine, 1993 |
| Medical School | Virginia Commonwealth University/Medical College of Virginia, MD |
| Residency | Maine Medical Center, Family Medicine |
| Fellowship | Hennepin County Medical Center, Sports Medicine |

## Heather M. Gillespie, MD, MPH

| | |
|---|---|
| Certifications | Family Medicine, 2006, Sports Medicine, 2007 |
| Medical School | Duke University School of Medicine, MD, 2003<br>University of North Carolina at Chapel Hill, M.P.H. |
| Residency | Thomas Jefferson University, Family Medicine, 2003 |
| Fellowship | Maine Medical Center, Sports Medicine, 2007 |

## Sarah C. Hoffman, DO

| | |
|---|---|
| Certifications | Pediatrics, 2014, Sports Medicine, 2016 |
| Medical School | University of New England College of Osteopathic Medicine, DO, 2011 |
| Residency | A.I. DuPont Hospital for Children and Thomas Jefferson University, Pediatrics, 2014 |
| Fellowship | Drexel University and Hahnemann University Hospital, Sports Medicine, 2015 |

## Kate E. Quinn, DO

| | |
|---|---|
| Certifications | Family Medicine and Osteopathic Manipulative Treatment, 2014,<br>Neuromusculoskeletal Medicine and Osteopathic Manipulative Medicine, 2014<br>Sports Medicine, 2015 |
| Medical School | Philadelphia College of Osteopathic Medicine, DO, 2010 |
| Internship | Florida Hospital, Family Medicine, 2011 |
| Residency | Florida Hospital, Family Medicine and Neuromusculoskeletal Medicine, 2014 |
| Fellowship | Trinity Medical Center, Sports Medicine 2015 |

## Gregory A. Sawyer, MD

| | |
|---|---|
| Certifications | Orthopaedic Surgery, 2016 |
| Medical School | Dartmouth Medical School, MD, 2007 |
| Internship | Brown University School of Medicine, General Surgery, 2008 |
| Residency | Brown University School of Medicine, Orthopaedic Surgery, 2012 |
| Fellowship | Brown University School of Medicine, Orthopaedic Trauma Surgery, 2013 |
| Fellowship | The Steadman Clinic, Sports Medicine, 2014 |

## PA-C

| | |
|---|---|
| DeBiasio, Mark | PA-C |

## PsyD

| | |
|---|---|
| Hatch, Erin | PsyD |

## PT

| | |
|---|---|
| Kokmeyer, Dirk | PT, DPT, SCS, COMT |
| Lasarso, Nicholas | PT, DPT, ATC |
| Collins, Cara | MSPT |
| O'Kelly, Kristin | PT, DPT |

### ATC

| | |
|---|---|
| Carroll, Neil K. | ATC, OTC, PES, SNS, FNS |
| Gabriner, Michael | MSEd, ATC, OTC |
| Daniels, Sarah | MSAT, ATC |
| Spencer, Charles “Tom” | MS, ATC, OTC |
| Chandler, Laura | ATC |

## TRAUMA AND FRACTURE CARE

### Gregory Y. Blaisdell, MD

| | |
|---|---|
| Certifications | Orthopaedic Surgery, 2015 |
| Medical School | Pennsylvania State University College of Medicine, MD, 2007 |
| Internship | University of Washington Medical Center, Surgery, 2008 |
| Residency | University of Washington, Orthopaedic Surgery, 2012 |
| Fellowship | Florida Orthopaedic Institute, GME Office, Orthopaedic Trauma, 2013 |

### Matthew R. Camuso, MD

| | |
|---|---|
| Certifications | Orthopaedic Surgery, 2004 |
| Medical School | Dartmouth Medical School, MD, 1996 |
| Residency | University of Washington, Orthopaedic Surgery, 2001 |
| Fellowship | Harborview Medical Center, Orthopaedic Surgery, 2002 |

### Raymond R. White, MD

| | |
|---|---|
| Certifications | Orthopaedic Surgery, 1983 |
| Medical School | University of Illinois College of Medicine, MD, 1977 |
| Internship | Medical Center Hospital of Vermont, 1978 |
| Residency | Medical Center Hospital of Vermont, Orthopaedic Surgery, 1981 |

### PA-C

| | |
|---|---|
| DeGrandpre, Cheryl S. | PA-C |
| Haynes, Nathan B. | PA-C |
| Hosch, Timothy D. | PA-C |
| Lawhead, Brian A. | PA-C |
| Scichilone, Andrew F. | PA-C |


Maine Medical Center has been recognized for these achievements

Joint Commission
Gold Seal of Approval for both
Hip and Knee Joint Replacement

HIGH PERFORMING HOSPITALS
U.S.News & WORLD REPORT
2018-19
HIP REPLACEMENT

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