



ORTHOPEDICS

ANNUAL REPORT 2017 / 2018



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LEADING THE WAY FOR BEST PRACTICES IN ORTHOPEDICS

At Sentara, we pursue brilliance in Orthopedics — an ongoing mission we took to the next level in 2017. We focused last year on honing the way we do things, to make our care as effective as possible. We've continued on that path in 2018.

To us, seeking excellence and leading the way on best practices requires a certain tenacity and curiosity. We care deeply about delivering high quality care and doing what's right for our patients, so we're reviewing the value we provide and backing it up with clinical research.

Our pursuit of brilliance has driven our growth and helped us achieve recognition for our orthopedic services.

We're humbled and honored to have won a 2017 Sentara CEO Award for our ExpressTrack option for patients who undergo hip and knee replacement at Sentara OrthoJoint Center® locations. The CEO Award is the highest recognition a project can receive within Sentara Healthcare. ExpressTrack – the first program of its kind in Virginia – prepares our joint replacement patients to return home sooner.

We opened our first Sports Medicine Centers at Sentara Albemarle Medical Center, Sentara RMH Medical Center and Sentara Martha Jefferson Hospital, enabling us to help individuals of all ages and fitness levels return to the activities they love, stronger than ever.

Additionally, Sentara Northern Virginia Medical Center opened a Sentara Back & Neck Center. And we launched our first back and neck care center of excellence at a skilled nursing facility.

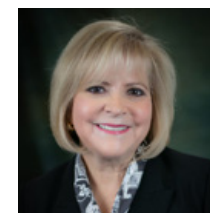
Finally, the orthopedic services at Sentara Leigh Hospital earned a new designation — the Orthopedic Hospital at Sentara Leigh. The designation fits because of the hospital's consistently high quality and volume.

Our growth has enabled us to help more people experience a better quality of life. Our patient volumes show that people look to us as their

destination of choice for high quality orthopedic care. We help thousands of patients every year find pain relief and regain function so they can live the lives they enjoy. We consider it a true honor and responsibility to be entrusted with the health and lives of so many.

We enjoy engaging with patients at community walks that celebrate those who had joints replaced at our Sentara OrthoJoint Center® locations. Each participant earns a medal. Walking with the participants, we get to listen to their stories and experience the love and excitement after they accomplish a goal some of them never thought possible.

Knowing our patients trust us with their care – their lives – gets us up every morning. The passion behind our work is what pushes us to do what's best and what's right for our patients no matter what. This report is about them, as they bring to life how we're pursuing brilliance in orthopedics.



Carole S. Guinane, RN, MBA, CPHQ
Sentara Orthopedic Services
Vice President



Jack L. Siegel, MD
Sentara Orthopedics High Performance Team (HPT)
Chairman

SENTARA HEALTHCARE

12 ACUTE CARE HOSPITALS

- 7 in Hampton Roads
- 1 in Northern Virginia
- 2 in the Blue Ridge
- 1 in South Boston
- 1 in Northeastern North Carolina



Sentara Albemarle Medical Center
Elizabeth City, NC
182 Beds



Sentara CarePlex Hospital
Hampton, VA
224 Beds
Orthopaedic Hospital at Sentara CarePlex
Hampton, VA
18 Beds (included in Sentara CarePlex Hospital license)



Sentara Halifax Regional Hospital
South Boston, VA
192 Beds



Sentara Heart Hospital
Norfolk, VA
112 Beds (included in Sentara Norfolk General Hospital license)



Sentara Leigh Hospital
Norfolk, VA
250 Beds
Orthopedic Hospital at Sentara Leigh
Norfolk, VA
48 beds (included in the Sentara Leigh Hospital license)



NORTH CAROLINA



Sentara Martha Jefferson Hospital
Charlottesville, VA
176 Beds



Sentara Princess Anne Hospital
Virginia Beach, VA
174 Beds



Sentara Norfolk General Hospital
Norfolk, VA
525 Beds



Sentara RMH Medical Center
Harrisonburg, VA
238 Beds



Sentara Northern Virginia Medical Center
Woodbridge, VA
183 Beds



Sentara Virginia Beach General Hospital
Virginia Beach, VA
276 Beds



Sentara Obici Hospital
Suffolk, VA
176 Beds



Sentara Williamsburg Regional Medical Center
Williamsburg, VA
145 Beds

SENTARA HEALTHCARE AT A GLANCE



Nearly 28,000 members of the team



Four medical groups

With more than 1,000 physicians and advanced practice clinicians at 222 locations



12 acute care hospitals



Advanced imaging and diagnostic centers



Nursing and assisted-living centers



Home care and hospice



Optima Health Plan

Serving 500,000+ Members



Sentara College of Health Sciences



Sentara Quality Care Network

A Clinically Integrated Network

VISION FOR UNIFYING ORTHOPEDICS

To unify Sentara Orthopedics, all providers affiliated with our health system follow two key goals: collaboration and consistent adoption of evidence-based best practices and innovations. We deliver orthopedic services across the continuum of care and consistently achieve excellent outcomes marked by:



ACCOMPLISHMENTS IN ORTHOPEDICS AT SENTARA

At Sentara Orthopedics, we strive to stay on the leading edge of orthopedic care. We focus on delivering the latest, highest-quality treatment options to help people live the lives they want.

In 2018, we continued to pursue brilliance in a number of ways. This ongoing endeavor is reflected in our outcomes data and growth, as well as the awards and honors we've received along our journey.

Clinical Quality and Safety

- We've shortened length of stay for back and neck and fracture care patients. Five of the nine hospitals that house a Sentara Back & Neck Center surpassed the goal for length of stay. For fracture care, both hospitals met the target or came within 10 percent of the target.
- We've lowered readmission rates at many of our hospitals. Of the seven hospitals with a Sentara Back & Neck Center, seven lowered readmissions. Seven Sentara hospitals and the health system overall lowered readmissions below the target.
- Four of 11 Sentara hospitals that house a Sentara OrthoJoint Center® met the readmission target, including the Orthopedic Hospital at Sentara Leigh, which performs the most joint replacements.

- We've improved the discharge-to-home rate in nine of 11 hospitals with a Sentara OrthoJoint Center. More patients are leaving our hospitals healthy and going directly home instead of to another facility for continued care.
- Fewer patients across Sentara experienced blood clots following orthopedic surgery. Five of our 12 hospitals that offer orthopedic surgery saw one case or none.
- In collaboration with Sentara Life Care, we established criteria for designating centers of excellence within our health system's nursing facilities. Centers of excellence are specialized programs within existing Sentara sites that provide expertise and comprehensive care. Programs at the nursing facilities include back and neck and fracture care.



More patients
are leaving our
hospitals healthy
and going directly
home instead of to
another facility for
continued care.

GROWTH

Additional Centers and Services

- The Orthopedic Hospital at Sentara Leigh opened as the first dedicated orthopedic hospital in South Hampton Roads, Virginia. The Orthopedic Hospital at Sentara Leigh and the Orthopaedic Hospital at Sentara CarePlex are the only two orthopedic hospitals in the Hampton Roads region.
- We opened our first Sports Medicine Centers at three hospitals: Sentara Albemarle Medical Center, Sentara RMH Medical Center and Sentara Martha Jefferson Hospital.
- The Orthopedic Hospital at Sentara Leigh opened the first Sentara Hand Specialty Center.
- To offer more convenient options for patients in need of joint replacement, we expanded the Sentara OrthoJoint Center® to two new locations: Sentara Albemarle Medical Center and Sentara Martha Jefferson Hospital.
- Sentara Northern Virginia Medical Center opened a Sentara Back & Neck Center.
- Sentara Princess Anne Hospital, Sentara Virginia Beach General Hospital and the Orthopedic Hospital at Sentara Leigh each opened a Sentara Foot & Ankle Center.

- Sentara Williamsburg Regional Medical Center opened a Sentara Outpatient Rehab Center Mobility Park. This park gives joint replacement patients a place to practice walking on various surfaces.
- To meet the needs of student-athletes, Sentara RMH Medical Center is now offering athletic training services at James Madison University.

Higher Volumes

- The number of orthopedic cases rose 3 percent from 2016 to 2017. System orthopedic patient volumes grew by 334 cases – up 1.44 percent from the target and up 4.11 percent from 2016.
- The following subspecialties recorded increases: joint replacement (9 percent), spine (5 percent), foot and ankle (4 percent), and trauma (1 percent).
- Fracture Care Program cases increased by 1 percent.

New Physicians in 2017 and 2018

Orthopaedic Hospital at Sentara CarePlex

- Dr. Robert Mason (shoulder, elbow, hand and wrist) – Tidewater Orthopaedics

Orthopedic Hospital at Sentara Leigh

- Dr. John McGuigan (hand and wrist) – Sentara Hand Surgery Specialists
- Dr. Ted Shuff (ortho spine) – Atlantic Orthopaedic Specialists

Sentara Albemarle Medical Center

- Dr. Jessica Wilczek (podiatry) – North Carolina Foot & Ankle
- Dr. John McGuigan (hand and wrist) – Sentara Hand Surgery Specialists

Sentara Obici Hospital

- Dr. Geoffrey Wright (joint replacement) – Sports Medicine & Orthopaedic Center
- Dr. Nicolai Baecher (hand and upper extremity) – Sports Medicine & Orthopaedic Center
- Dr. Robert Marroquin (podiatry) – Sentara Podiatry Specialists

Sentara Norfolk General Hospital

- Dr. Shannon Clark (neuro spine) – Sentara Neurosurgery Specialists

Sentara Northern Virginia Medical Center

- Dr. Ehsan Jazini (ortho spine) – MedStar Orthopaedic Institute
- Dr. Bayo Shonuga (hand and wrist) – Nova Orthopedic & Spine Care
- Dr. Bulent Yapticilar (neuro spine) – Nova Neuroscience, PLLC
- Dr. Joseph Watson (neuro spine) – Cerebrum MD

Sentara Princess Anne Hospital

- Dr. Scott Grabill (total joints) – Sports Medicine & Orthopaedic Center
- Dr. Anthony Cavallo (podiatry) – Sentara Podiatry Specialists
- Dr. Jeff Laurent (neuro spine) – Jordan-Young Institute
- Dr. David Vincent (neuro spine) – Jordan-Young Institute
- Dr. Lisa Grant-McDonald (podiatry) – Dr. William Grant Foot & Ankle
- Dr. Scott Carrington (podiatry) – Bayview Physician Services

Sentara RMH Medical Center

- Dr. George Zimmerman (joint replacement) – Sentara RMH Orthopedic Center

Sentara Virginia Beach General Hospital

- Dr. James Brennan (neuro spine) – Sentara Neurosurgery Specialists
- Dr. Shannon Clark (neuro spine) – Sentara Neurosurgery Specialists

Sentara Williamsburg Regional Medical Center

- Dr. Zachary Tan (ortho spine) – Hampton Roads Orthopaedics Spine & Sports Medicine

FOCUS ON PATIENTS AND FAMILIES

- We sponsored a successful annual Sentara Colonial Half Marathon and 5K. The event also included a shorter walk for Sentara OrthoJoint Center® patients. The walk celebrates those who underwent joint replacement within the past year at Sentara Williamsburg Regional Medical Center and the Orthopaedic Hospital at Sentara CarePlex. The 2017 walk drew 120 patients.
- The Orthopedic Hospital at Sentara Leigh hosted a 1K walk for its joint patients.
- We educated 4,660 patients in preoperative classes across Sentara Orthopedics.

AWARDS AND HONORS

- Truven Health Analytics named Sentara Leigh Hospital one of the top 25 teaching hospitals in the United States on its 100 Top Hospitals for 2017 list.
- iVantage Health Analytics and The Chartis Center for Rural Health named Sentara Halifax Regional Hospital one of the Top 100 Rural and Community Hospitals in the United States.
- Sentara Orthopedics won a 2017 Sentara CEO Award for our Express Track option, available at Sentara OrthoJoint Center® locations for hip and knee replacement. The CEO Award is the highest form of recognition a project can receive within Sentara.

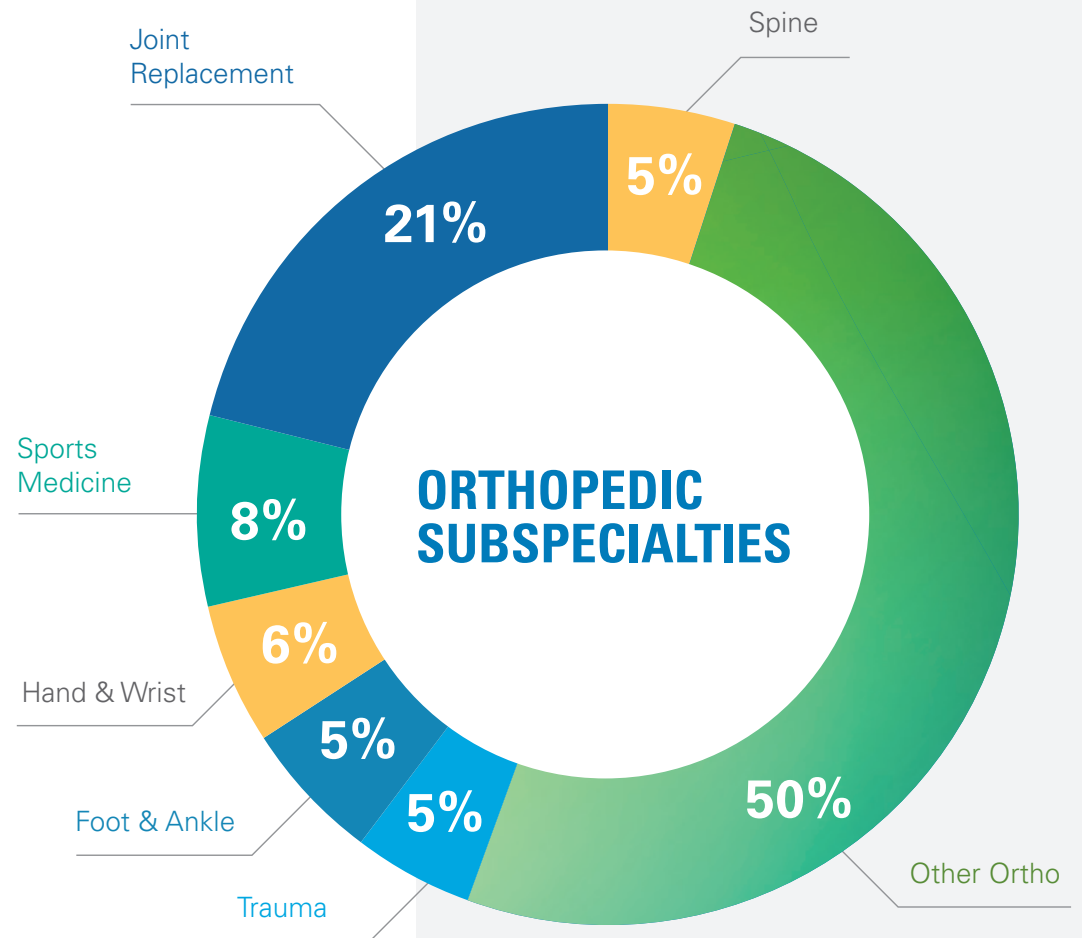
SENTARA ORTHOPEDIC CENTERS OF EXCELLENCE AND SURGICAL PROGRAMS

	Orthopedic Hospital at Sentara Leigh	Sentara Princess Anne Hospital	Sentara Virginia Beach General Hospital	Sentara Obici Hospital	Sentara Norfolk General Hospital	Orthopaedic Hospital at Sentara CarePlex	Sentara Williamsburg Regional Medical Center	Sentara RMH Medical Center
Sentara OrthoJoint Center® (SOJC)	✓	✓	✓	✓	✓	✓	✓	✓
Sentara Back & Neck Center	✓	✓	✓	✓	✓	✓	✓	✓
Sentara Sports Medicine	✓	✓	✓	✓		✓	✓	✓
Sentara Fracture Care	✓	✓	✓	✓	✓	✓	✓	✓
Sentara Hand Specialty Center	✓	✓	✓	✓	✓	✓	✓	✓
Sentara Foot & Ankle Center	✓	✓	✓	✓	✓	✓	✓	✓
Express Track	✓	✓	✓	✓		✓	✓	✓

✓ Orthopedic Centers of Excellence

✓ Surgical Programs

Sentara Martha Jefferson Hospital	Sentara Northern Virginia Medical Center	Sentara Halifax Regional Hospital	Sentara Albemarle Medical Center
✓	✓	✓	✓
✓	✓		
✓	✓	✓	✓
✓	✓	✓	✓
✓	✓	✓	✓
✓	✓	✓	✓
✓	✓		



DIFFERENTIATED ORTHOPEDIC CARE AT SENTARA

At Sentara, our commitment to clinical quality and safety, customer centricity and growth and innovation is evident in the level of patient care we deliver in our communities. It is distinctive as we challenge ourselves to be the best. We strive for excellence, promote teamwork and collaboration, and actively pursue and adopt the latest care techniques and technologies.

85%

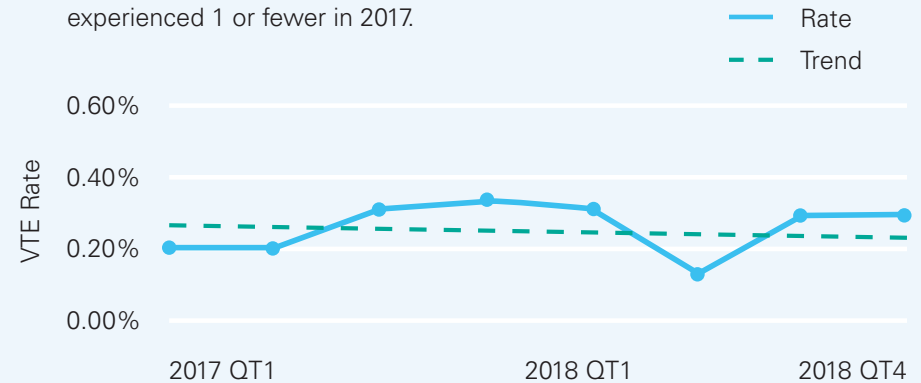
of patients going home directly after joint replacement surgery to recover, a positive increase of 9% from 2016 to 2017.

FOCUS ON PATIENT OUTCOMES

Our mission depends on the care we deliver, so we measure outcomes in as many ways as possible — often beyond what is mandated. We share the resulting data with physicians and other providers across our system, not only to regularly review our performance but also to learn, grow and innovate.

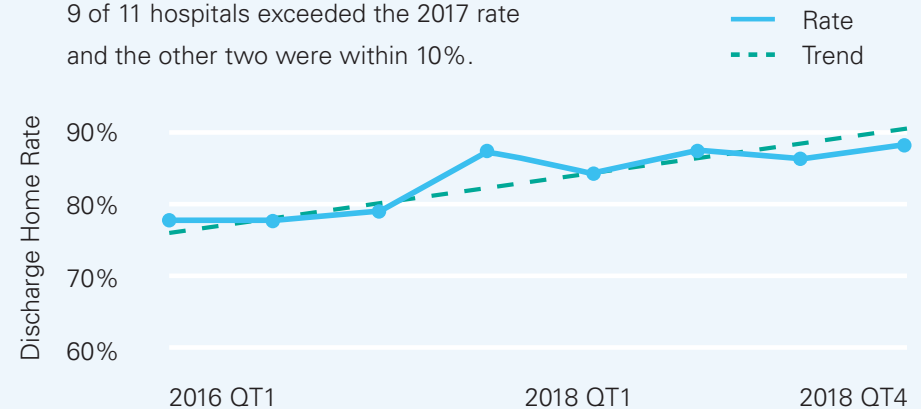
Systemwide Venous Thrombosis Emboli (VTE) Rate

The system experienced a reduction in Orthopedic VTEs, 5 hospitals experienced 1 or fewer in 2017.



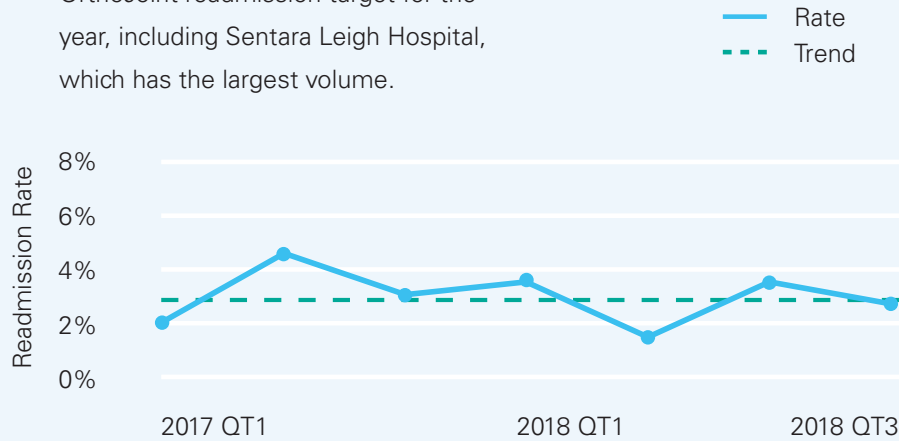
Discharge to Home Rate

9 of 11 hospitals exceeded the 2017 rate and the other two were within 10%.

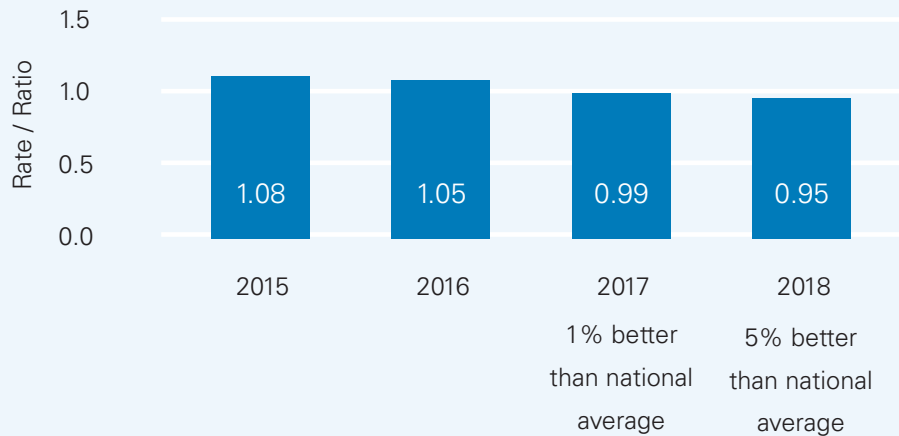


Reduction in Readmissions

Four Sentara hospitals met the OrthoJoint readmission target for the year, including Sentara Leigh Hospital, which has the largest volume.



Reduction in Length of Hospital Stay Continues



COMMITMENT TO THE BEST PATHWAYS FOR CARE

Physicians throughout the regions work with clinical and operational leaders at Sentara to identify and evaluate the best protocols. With an eye toward consistency across the system, they implement those improvements that are backed by data and meet or exceed national standards and show an improvement for patient outcomes.

0.3%
 Sentara showing a favorable postoperative venous thrombosis event rate by .3% compared to VA, MD & NC rate.

DEDICATION OF THE ORTHOPEDIC HIGH PERFORMANCE TEAM (HPT)

The Ortho HPT tracks goals and measurements across our system, to improve quality in a consistent and coordinated manner. We share information with the orthopedic providers in our communities, so they can compare their performance to their peers. A shared goal of helping patients heal faster with better protocols and discharging them home when ready has led to fewer hospital readmissions. It also celebrates the surgeons and team members each month for their excellent work in the local and national field of orthopedics.



AWARDS & NATIONAL RECOGNITION

The dedication of our staff and community physicians has helped Sentara in earning a national reputation for exceptional patient outcomes and innovative care. Sentara is continually recognized as one of the most progressive and integrated healthcare organizations in the nation. We have earned a multitude of awards and accolades for our orthopedic care.

ANTHEM BLUE CROSS AND BLUE SHIELD, BLUE DISTINCTION CENTER+ AWARD

Hip and Knee Replacement Recognition was awarded to eight Sentara hospitals across the system:

Sentara CarePlex Hospital

Sentara Leigh Hospital

Sentara Martha Jefferson Hospital

Sentara Northern Virginia Medical Center

Sentara Obici Hospital

Sentara RMH Medical Center

Sentara Virginia Beach General Hospital

Sentara Williamsburg Regional Medical Center

To learn more, visit bcbs.com/blue-distinction-center/facility.

ANTHEM BLUE CROSS AND BLUE DISTINCTION CENTER DESIGNATION

Spine Surgery recognition was awarded to five Sentara hospitals:

- Sentara CarePlex Hospital+**
- Sentara Leigh Hospital**
- Sentara Norfolk General Hospital+**
- Sentara Princess Anne Hospital+**
- Sentara Virginia Beach General Hospital+**

+ indicates Blue Distinction Center+

TWO SENTARA HOSPITALS ON IBM WATSON HEALTH 100 TOP HOSPITALS LIST

Both Sentara Leigh Hospital and Sentara Williamsburg Regional Medical Center were recognized among the IBM Watson 100 top hospitals by IBM Watson Health (formerly known as Truven Health Analytics). Sentara Leigh Hospital was also included on the 2017 list and in 2018, also received an additional 100 Top Hospitals Everest Award that is given to hospitals for rate improvement over five years. Sentara Leigh Hospital was one of only 13 Everest Award winners.

U.S. NEWS & WORLD REPORT 2018

Five Sentara hospitals ranked in “Best Hospitals” Edition:

Sentara Norfolk General Hospital

ranks #1 in Hampton Roads, and #3 in Virginia with several High Performing programs that include Orthopedics.

Sentara Princess Anne Hospital ranks #2 in Hampton Roads, and #9 in Virginia.

Sentara Leigh Hospital ranks #3 in Hampton Roads, and #13 in Virginia, recognized with High Performing programs in Orthopedics, Knees and Hips (home to the Orthopedic Hospital at Sentara Leigh).

Sentara Williamsburg Regional Medical Center is tied for #4 in Hampton Roads, and ranks #14 in Virginia.

Sentara CarePlex Hospital ranked #6 in Hampton Roads, and ranks #20 in Virginia. This is its first time to achieve a state and regional ranking. Recognized for High Performance programs in Hips and Knees and home to the Orthopaedic Hospital at Sentara CarePlex.

Watson Health™
15 TOP
HEALTH SYSTEMS
2018



HEALTHGRADES NAMES TOP HOSPITALS FOR PATIENT SAFETY AND PATIENT EXPERIENCE

Patient Safety

Sentara CarePlex Hospital

Sentara RMH Medical Center

Sentara Williamsburg Regional Medical Center

Patient Experience

Sentara CarePlex Hospital

Sentara Leigh Hospital

Sentara Martha Jefferson Hospital

Sentara Princess Anne Hospital

Sentara Williamsburg Regional Medical Center

The full list of winners can be found at

healthcareitnews.com/node/537874.

Healthgrades also publishes a Patient Experience Award list that it also says represents the top 15 percent of facilities when it comes to patient experience based on the facility's Hospital Consumer Assessment of Healthcare Providers and Systems surveys to gauge how highly patients rank them. According to Healthgrades, the awarded hospitals represent the top 15 percent in the nation.

NURSING MAGNET® ACCREDITATION IS HELD BY EIGHT SENTARA HOSPITALS

Sentara Healthcare has eight current designated Magnet® hospitals:

**Sentara Martha Jefferson Hospital
(2006, 2011, 2016)**

**Sentara Norfolk General Hospital
(2008, 2014)**

**Sentara Williamsburg Regional Medical
Center (2014)**

Sentara RMH Medical Center (2014)

Sentara Leigh Hospital (2015)

Sentara Princess Anne Hospital (2016)

Sentara CarePlex Hospital (2017)

Sentara Obici Hospital (2018)

Sentara Virginia Beach General Hospital is actively on its journey to Magnet® designation.

As of July 2018, there are 477 Magnet® organizations worldwide with 22 in Virginia. All of these hospitals have earned this recognition for quality patient care, nursing excellence and innovations in professional nursing practice.

HOSPITAL COMPARE

In 2017 Hospital Compare recognized Sentara Leigh Hospital as “Better than the National Average” for both hip and knee post-surgical complications. Hospital Compare has information on the quality of care at more than 4,000 Medicare-certified hospitals. This can be used to compare the quality of healthcare across the country at medicare.gov.

SENTARA RECOGNIZED AS ONE OF AMERICA’S BEST EMPLOYERS

Sentara Healthcare has been recognized as one of the best employers in the nation - not just in health care but across all industries. The recognition by Forbes is a testament to the work and commitment of everyone within the Sentara community and a direct reflection of how we value our members of the team. We are proud to be among some of the nation’s most respected organizations and grateful to our talented team as they live our mission to improve health every day.



Financially Responsible Care

In 2016, Sentara joined in partnership with CMS to better manage and improve the health of hospitalized Medicare patients. This initiative, BPCI (Bundled Payments for Care Involvement) is a voluntary program offered by CMS to improve the care and costs for patients over a 90-day time period following discharge from the hospital.

Patients are provided services at no additional cost that help them to coordinate their care and control their healthcare costs. This covers care while the patient is in the hospital and extends through the recovery after the patient is discharged from the hospital.

Participating patients continue to have the right to choose their healthcare provider. The total joint replacement BPCI (program) has seen some impressive results.

The data below reflects a portion of the Medicare population that meets the criteria for BPCI:



5.7%

Readmissions declined to 5.7% from a baseline of 10.8%.



35.2%

Referrals to Skilled Nursing Facility reduced to 35.2% as compared to baseline of 55.5%.



85.1%

Referral to Home/Home Care increased to 85.1% compared to baseline of 53.6%.

TEAM APPROACH TO CARE

The spectrum of orthopedic care is wide and highly specialized. While the navigators, nurses, orthopedic surgeons and therapists are the most visible components of orthopedic treatments, it takes the expertise of many additional clinical providers to offer the comprehensive care that we as a system demand and patients deserve. We have taken the opportunity to recognize some additional members of the team that contribute throughout the clinical experience to make our excellent patient outcomes a priority.

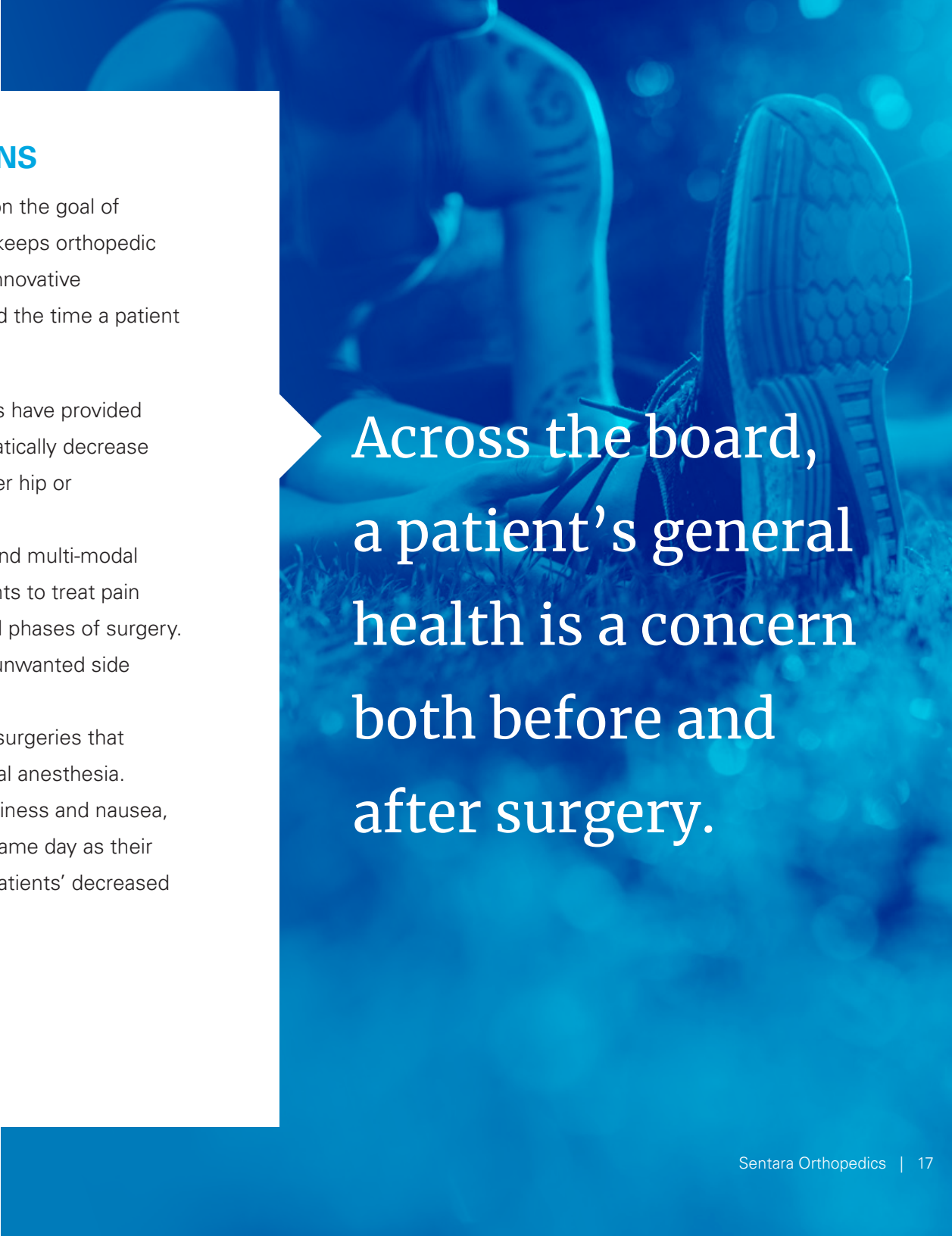
“WELL” BEFORE SURGERY

Across the board, a patient’s general health is a concern both before and after surgery. For elective/scheduled surgeries, a designated Pre-Anesthesia Surgical Screening (PASS) can identify potential health issues and create a plan to manage the health issue that could affect, or even delay, surgery. For elective surgeries, patients are advised to expect a call from the PASS Nurse for a health interview. In some areas a primary care physician or nurse practitioner may provide this screening. This pre-screening done before anesthesia provides an additional layer of safety, and another opportunity to help patients to be at their most optimal health before anesthesia and surgery.

ANESTHESIA AND MEDICATIONS

Both anesthesiologists and pharmacists focus on the goal of providing optimal pain control in a manner that keeps orthopedic patients comfortable and safe. Their open and innovative approaches to patient care have directly reduced the time a patient needs to be hospitalized.

- Advances in long-lasting local anesthetics have provided newer anesthesia options that can dramatically decrease postoperative pain and recovery time after hip or knee replacement.
- The focus on perioperative pain control and multi-modal analgesia allows the use of multiple agents to treat pain before it starts, and continues through all phases of surgery. This can help to avoid narcotics and the unwanted side effects they can cause.
- Surgeons at Sentara are moving toward surgeries that use regional anesthesia instead of general anesthesia. Regional anesthesia results in less grogginess and nausea, and patients can be up and moving the same day as their surgery. The results are showing in our patients' decreased length of stays.



Across the board,
a patient's general
health is a concern
both before and
after surgery.

PHYSICAL REHABILITATION

With the skilled inpatient therapy team, an overwhelming majority of joint replacement patients are up and walking the day of surgery, hastening recovery and allowing discharge directly to home. However, for patients who require short-term skilled rehabilitation therapy, Sentara offers the full continuum of care with seven locations, including Sentara Rehabilitation & Care Residence in Chesapeake which opened in the spring of 2017. Designed to feel more like home, this innovative household model of care features 120 private rooms, 40 of which are for short-term rehabilitation

in the Great Bridge Pavilion. This dedicated area for rehabilitation provides personalized care, therapy seven days a week, low noise practices, and 24/7 dining. Some of the conditions treated are orthopedic procedures (hip, knee and joint replacements), post-surgery recovery, pulmonary impairments (COPD, pneumonia, etc.), cardiac conditions, fall-related injuries, neurological conditions and strokes. The Sentara Neurosciences and Orthopedic teams partnered with Sentara Rehabilitation & Care Residence to develop a Center of Excellence program for our back and neck patients. Through this partnership, the acute and post-acute care teams have developed a comprehensive and planned course of treatment for these patients.

SPECIALISTS IN HOSPITAL CARE: HOSPITALISTS

Throughout Sentara facilities, surgeons have the resources to include a full-time hospitalist or other primary care physician to consult with any orthopedic patient in need of additional medical attention while hospitalized for an orthopedic procedure. Whether a medical issue develops following a procedure or it is a previously known comorbidity, the team rallies to manage the patient's care. It's part of the emphasis to keep patients at their optimal health to promote recovery as well as prevent readmission for a medical issue that could have been addressed while the patient was in our facility.



IMPROVING THE PATIENT EXPERIENCE

The success and expansion of Sentara Orthopedics is a direct result of our dedication to improving the patient experience. We've implemented countless measures to improve both overall care and treatment — from the initial consultation to postoperative care and beyond. Our orthopedic teams constantly set the standard for excellence in our regions and beyond.

- Implementing the Sentara Fracture Care program and our commitment to operations for hip fracture patients within 24 hours: We know the dedication of the orthopedic surgeons and staff to this benchmark of care significantly lowers mortality rates and blood clots (DVTs), with most patients up the day of surgery.
- Standardizing nationally proven best practices at the 11 Sentara OrthoJoint Center® locations: This effort began in 2011 and continues to evolve and show excellent patient outcomes, fueled in part from the patient interaction and education.
- Using a comprehensive protocol for infection prevention and MRSA screening: Coupled with pre-surgery screenings for anemia and malnutrition, this protocol has significantly improved patient outcomes by lowering infection rates.
- Establishing and adopting DVT (deep vein thrombosis) prophylaxis protocol within each Sentara OrthoJoint Center® and systemwide: This protocol has been associated with significant reductions in the postoperative formation of clots in blood vessels (thrombosis) that can lead to severe complications and even death.

RAPID RECOVERY PROTOCOLS

Sentara orthopedic care teams continue to evaluate methods of care that help patients to recover more quickly. Along with the surgical precision and innovation, there are numerous practices that are effective in helping our patients' progress through recovery and back to enjoying everyday activities:

- Preoperative education to prepare patients and their caregivers to set expectations and goals for recovering from surgery.
- Encouraging patients to be at their best physical health prior to any elective surgery by stopping smoking, starting pre-surgery exercises to strengthen muscles for recovery after surgery, and preparing the home as a clean, healthy place to recover.
- Exchanging addictive opioids for multi-modal pain management, including non-addictive pain medications, day of surgery physical therapy that gets patients up and moving, and an attentive care team that helps patients to keep ahead of post-surgical pain. When pain is at a tolerable level, patients are more able to move, participate in therapy and reduce the risk of developing a blood clot.
- Something as simple as having elective surgery patients to wear their own clothes in the hospital gives patients the sense of normalcy that motivates them to get up and moving.



SURGICAL AND PROCEDURAL INNOVATIONS

The care teams at Sentara Orthopedics strive to improve patient care by developing, adopting and implementing the most sophisticated and proven techniques, technologies and protocols. Our commitment to advancement in orthopedic care ensures an exceptional patient experience. Our innovative approach is multifaceted.

MINIMALLY INVASIVE INNOVATIONS

Our goal for orthopedic care is to not only restore our patients' function but to also improve their quality of life. One of the many ways we do this is by offering more procedures that are minimally invasive, with reduced risk, minimized pain, shorter hospital stays and faster recovery.

All-Arthroscopic Rotator Cuff Repair for Even the Most Complex Tears

Although arthroscopic rotator cuff repair was introduced over 15 years ago, the procedure has evolved to the point where even the largest and most complex cases can be repaired by this less invasive technique. With arthroscopy, the surgeon uses an endoscope to operate through a small incision while a camera sends images to a high-definition monitor. Now surgeons who practice at Sentara surgical centers are able to perform repairs on virtually all tear sizes and types. With the latest innovative techniques in arthroscopic repair, if a tear is able to be fixed, it can be done through the scope in a less invasive fashion.

Arthroscopic rotator cuff repair, which requires special training, allows orthopedic surgeons to not only access and see places in the shoulder through a less invasive approach but

to also fix problems – often much better than the prior traditional open repairs. Our experience and expertise allow us to perform arthroscopic procedures on a wider range of patients. We no longer say the tear is too large to repair arthroscopically. Additionally, for years we have been performing the latest innovative techniques, such as arthroscopic superior capsular reconstruction, for a subset of rotator cuff tear patients who are good candidates.

Patients benefit from less pain in recovery due to the less invasive approach while surgeons can actually see better, compared to open rotator cuff surgery. Arthroscopic rotator cuff repairs are performed as outpatient procedures, so patients do not need to be admitted to

As part of a large arthroscopic rotator cuff repair group (267 patients) that underwent outpatient all-arthroscopic rotator cuff repair (including what are considered “massive” tears) we asked patients if they would go back and have their surgery all over again.

96.2% - 97.9%

of patients, depending on their age, said yes, they would have their surgery over again.

The study by Jordan-Young Institute was approved by the Eastern Virginia Medical School Institutional Review Board. All patients had a minimum of two years post-op since their surgery.

the hospital. Patients routinely undergo the procedure with regional anesthesia, avoiding intubation and heavy general anesthesia.

Navigation for Fracture Fixation

When a bone breaks, a doctor needs to reset it by bringing it back into alignment and stabilizing it. Depending on the severity of the fracture, the doctor may need to make an incision. Severe fractures might also require surgical fixation – wires, nails, screws or plates – to hold the bone in place.

There is now a minimally invasive method for treating these severe fractures. Orthopedic surgeons can use a specialized camera and continuous X-ray imaging (fluoroscopy) to guide fixation as they work through a needle-size incision. This percutaneous approach enables surgeons to safely navigate tight spaces inside the body, reducing risk to surrounding structures and limiting blood loss.

JOINT REPLACEMENT INNOVATIONS

We are seeing an increased demand for joint replacements – a surgery known to potentially improve quality of life. At Sentara Orthopedics, we are constantly working to innovate so that these procedures are available to, and successful for, our most complex patients.

Navigation for Shoulder Replacement

Shoulder replacement is challenging — the joint is very complex and hard to access because of its structure and location deep in the body. Shoulder implants also need appropriate placement for joint stability and long-term surgical success.

Replacement is even more difficult for patients with trauma, a fracture or a congenital abnormality in the shoulder, for two reasons:

- These factors limit the surgeon’s view of the implant area.
- The complexity places these patients at higher risk for significant complications.

To address the challenges of complex shoulder cases, orthopedic surgeons at Sentara now use computer navigation. It gives them a 3D view of the implant area and confidence knowing they are operating in the precise location.

Custom 3D Implants for Complex Reconstruction

While patients with complex foot or ankle problems may require joint replacement, “off-the-shelf” implants do not always correct the problem.

A new technology allows orthopedic surgeons to customize implants to specific needs, avoiding the possibility of amputation and providing a more durable option. These stronger implants help patients who have been told they are too heavy for joint replacements to last.

Micro Implants for Shoulder and Hip Replacement

Orthopedic surgeons need to make room in the femur for the stems of hip implants, and in the humerus for the stems of shoulder implants.

But new smaller implants for hips and shoulders contain half the amount of metal as traditional implants. Orthopedic surgeons are tracking outcomes and finding that this allows them to remove less bone during surgery.

IMPLANT FOR GREAT TOE ARTHRITIS

Arthritis in the big toe causes cartilage to wear down, leading to joint pain. Historically, orthopedic specialists have treated this condition by “welding” together the bones forming the joint — reducing pain and increasing stability but constraining motion.

This constraint makes shifting weight onto the ball of the foot painful, if not impossible. A range of activities are affected, from squatting, kneeling and standing on toes to wearing high heels, playing sports, running, and doing yoga and Pilates.

Patients now have a constraint-free option for relief: a synthetic implant that mimics human cartilage but does not transfer feelings of pain or pressure. Called Cartiva®, it is made of contact lens material and placed after an orthopedic surgeon removes the focal area of arthritis.

In addition to maintaining motion, Cartiva offers reliability, durability and is bone sparing. Should patients still need fusion in the future, they retain the amount of intact bone needed for surgery.

From a sample of 15 of the earliest Cartiva patients at Sentara, patients experienced about a 10-degree improvement in range of motion. The average pain score at follow-up (typically around five months) was reported as less than one on a 10-point scale (10 being the most pain). None of the patients needed revision surgery, demonstrating the implants' success.



CLINICAL RESEARCH

Throughout Sentara Healthcare, we continually embrace the value of groundbreaking clinical research and the difference it can make in patient care. Orthopedic surgeons practicing at Sentara facilities continue to pursue knowledge and improvement by conducting clinical trials and research. They do so through their own local work and through national collaborations. These surgeons present their findings at national association meetings and publish in peer-reviewed medical journals and medical conferences. Most importantly, their findings help shape best practices in orthopedics.

Review Academic Publications on page 56 or online at SentaraOrthoAnnualReport.com.



CASE STUDIES: FITBIT AND KNEE REPLACEMENT OUTCOMES

Wearable activity trackers help follow total knee arthroplasty recoveries in real-time. It's a pressing question for many of our patients: "How soon can I get back to my normal activities after a knee replacement?" At Sentara Orthopedics, we now have real data to back up our response.

Traditionally, physicians have asked their patients a series of questions before and after joint replacement that focused on physical ability. Answers to these "yes" or "no" questions rarely provide a full picture, though, for two reasons: Patients do not always accurately recall or report how well they have been doing. And they must choose from a limited number of set responses.

With those challenges in mind, we studied whether fitness trackers — in this case, the Fitbit Flex — could provide data for greater specificity and objectivity. Forty patients undergoing knee replacement at Sentara Martha Jefferson Hospital wore a Flex starting at least a week before surgery. They continued for six weeks after, a standard point for evaluating whether previous activity levels have been reached.

The Fitbits recorded our patients' physical activity through the number of steps taken, distance walked and calories burned. By starting the study before surgery, we captured a baseline for each patient that we could continuously reference during recovery.

At the end of the study, the results showed that, on average, patients had not returned to their baseline levels six weeks after surgery and needed more time. Study results also backed previous research showing that on average, men recover faster than women, as do patients 70 and under.

Perhaps more importantly, we showed that wearable technology can provide a significant benefit for recovery. Not only are the devices affordable and widely available, but they can also quantify individual progress with continuous, objective measurements, set against a baseline.

In other words, they can help manage expectations and provide a clearer look at what's really going on during recovery. Physicians, patients and caregivers can then plan and adjust. Establishing reasonable goals and providing better ways to meet them means our patients are happier and healthier.

“At Sentara Orthopedics, we’re always measuring and self-assessing. After all, that’s the goal of research.”

Megan Swanson, MD
Orthopedic Surgeon
Co-Chair, Sentara Orthopedics High Performance Team



ON THE ROAD TO RECOVERY

Most literature recommends that patients undergoing right knee replacement wait at least four to six weeks to drive. At Sentara Orthopedics, we've learned that you can get behind the wheel much sooner — at least if you get your surgery with us.

We know that patients can't drive immediately afterward — the effects of surgery slow brake reaction time to the point that safety is compromised. Still, we wondered how long patients needed to wait. We started testing brake reaction time before and after surgery using a driving simulator at Sentara Martha Jefferson Hospital. We've found that most patients return to their preoperative brake reaction time just a week after surgery.

Sentara Colonial Half Marathon and 5K with William & Mary

In 2018 more than 700 runners participated in the 40th annual race to benefit the College of William & Mary track, field and cross-country programs. The annual Sentara OrthoJoint 1Mile Walk was also included in the Colonial Half Marathon event with more than 100 past joint replacement patients, their coaches and family members from Sentara Williamsburg Regional Medical Center and the Orthopaedic Hospital at Sentara CarePlex.

The Annual Sentara OrthoJoint Center® 1K Walk

For the past several years, Sentara has invited past joint replacement patients, their coaches and family members to participate in annual strolls at the campuses of the Orthopedic Hospital at Sentara Leigh and the Orthopaedic Hospital at Sentara CarePlex.

OUTPATIENT HIP AND KNEE REPLACEMENT

At Sentara Healthcare, we strive to make our patients as comfortable as possible during their stays in our facilities. But we also recognize that they'd prefer to recover at home, and that as long as they're healthy enough to do so, that's the best place for them. So we work to get them home as soon as possible following a procedure.

Sentara hospitals have embraced the Express Track program that prepares patients for a shorter stay. Patients that meet criteria are given the option to go home the next day or even the same day of surgery.

That quality of life includes the tendency of people to sleep better where they're most comfortable, in their own beds. Not only does sleep support a healthy immune system, but it also helps the body recognize physical pain and assists with recovery.

CARESENSE COLLECTS FUNCTIONAL OUTCOMES

Aging baby boomers are living longer than past generations and staying active, spurring demand for joint replacements to relieve joint pain. At Sentara Orthopedics, we take great pride in providing efficient, effective and appropriate joint pain care. This is a mission made easier by our ability to track and collect patient outcomes and performance through a new digital platform.

Called CareSense, the tool helps identify those who may benefit from joint replacement and then evaluates improvements in their lifestyle after surgery. It also helps physicians recommend care options based on survey results and track patients' progress after surgery.

For patients, CareSense allows them to communicate their pain and functionality levels in a standardized survey format. It maximizes the time they can spend with the doctor. And it informs and empowers them.

At its core, CareSense involves a couple of steps:

- Patients arrive for an initial joint pain evaluation and fill out a brief survey on an electronic tablet while they sit in the waiting room. The survey asks how well they can perform activities such as rising from a chair, and how much pain they feel doing so. There are multiple surveys used to address the pain and functionality for specific joints.

- Physicians can use these surveys to help guide care options, reviewing the results with the patient during office visits. Physicians also have the ability to compare preoperative to postoperative pain and functionality levels of their patients. By jump-starting the conversation, CareSense helps physicians make the most effective use of time with their patients and focus on care.

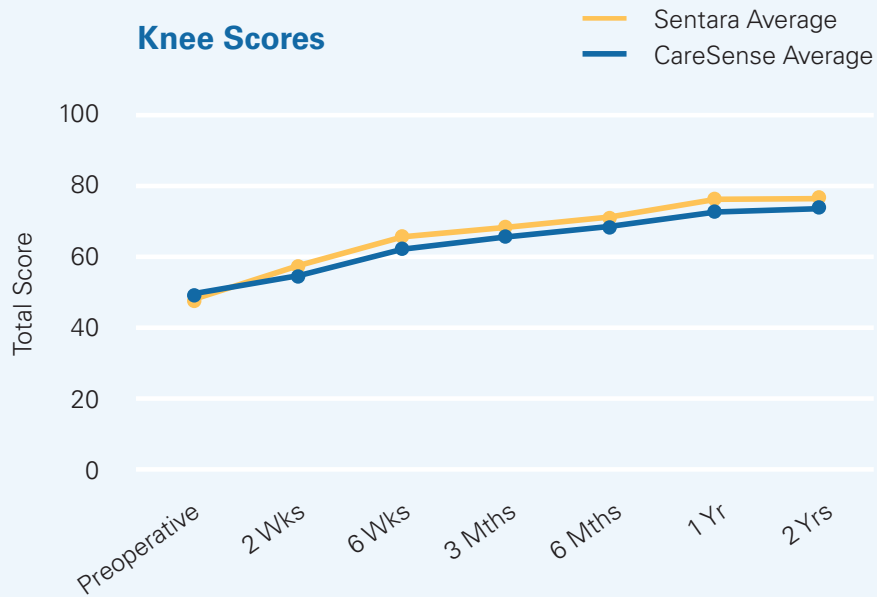
POWERFUL TOOL FOR JOINT REPLACEMENT INNOVATION

After the initial evaluation, patients who pursue a joint replacement fill out the survey at periodic time intervals following their operation. Those who decide during their visit not to pursue a joint replacement do not complete additional surveys.

CareSense goes beyond just saving time when asking about pain and functionality. Physicians can compare responses to those of other patients they have seen in their practice. This comparison helps with decision making and managing patients' expectations. It can even inspire patients about how surgery and recovery might go.

Finally, CareSense encourages patient engagement throughout joint replacement care. We believe that engagement leads to empowerment. And that empowerment promotes better health and a better quality of life.

CareSense is just one of the many ways that we at Sentara Orthopedics are improving health every day.

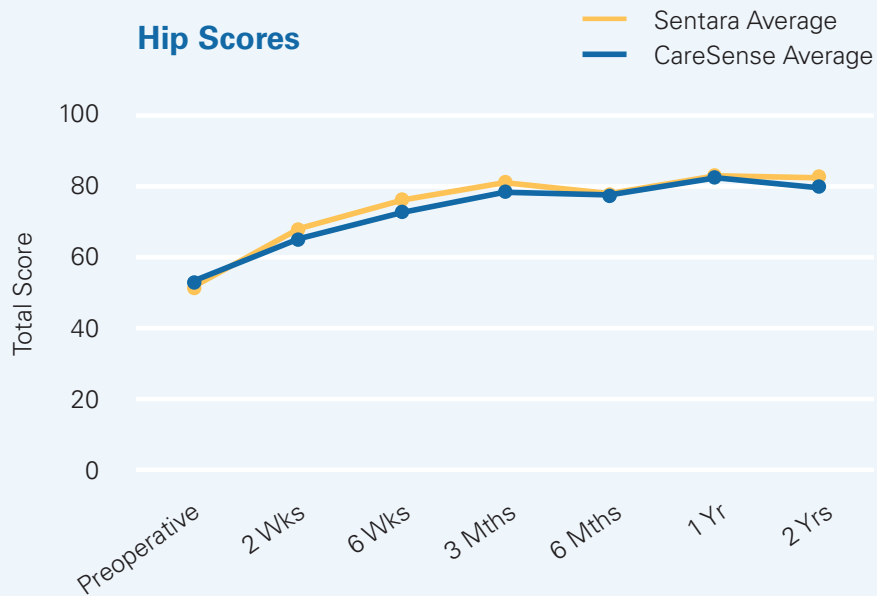


Sentara Survey Stats

Interval	Count	Sentara Avg	CareSense Avg
Preoperative	1277	47.4	48.4
2 Weeks	1048	59.1	57.5
6 Weeks	842	66.7	65.3
6 Months	873	71.7	71.1
1 Year	807	76.5	74.0
2 Years	456	76.9	74.2

Better Outcomes

Follow up at two-year postoperative, the Sentara knee replacement patient average is 76.9, 3.57% higher than CareSense average of 74.2.



Sentara Survey Stats

Interval	Count	Sentara Avg	CareSense Avg
Preoperative	529	47.3	48.2
2 Weeks	453	68.2	65.9
6 Weeks	418	76.5	74.2
6 Months	281	78.7	80.0
1 Year	510	82.0	84.4
2 Years	141	81.5	80.2

Better Outcomes

Follow up at two-year postoperative, the Sentara Hip patient average is 81.3, 3.63% higher than the CareSense average of 78.4.

SENTARA ORTHOJOINT CENTER®

With almost 8,000 joint replacements in 2017, each Sentara OrthoJoint Center® has a singular focus: the needs of orthopedic surgical patients undergoing hip or knee replacement. These 11 centers concentrate their efforts on a dedicated team approach involving nurses, anesthesiologists, surgeons, physical therapists and home care. This centered approach improves both patient care and outcomes.

PROGRAM LOCATIONS



- Surgeons at Sentara performed 7,929 joint replacements in 2017
- Reduction in readmission rate
- Increase in discharge to home rate
- Newly designed systemwide Sentara OrthoJoint Center® Hip and Knee Joint Replacement Guidebook for Patients and Families offers an interactive handbook to know what to expect before and after surgery

Sentara OrthoJoint Center® continues to offer a unique joint replacement experience. Patients having joint replacement at Sentara grew 9 percent in 2017 (over 2016 volume).

A dedicated Orthopedic Patient Navigator at each facility offers to patients the extra benefit of an informed and individualized joint replacement experience.

The patient navigator helps foster open lines of communication among the patient, the patient’s family and the care team before, during and after surgery. With education being such an active component for joint replacement patients, the navigators continuously look for additional ways to keep their patients and the coaches informed on the latest clinical information.

10,000
Over 10,000 people participated in pre-surgery joint replacement education.

This has resulted in the team of navigators developing and implementing several innovative patient-focused materials:

- Ten Ways to Recover at Home: a two-sided document developed to help patients and their surgeons appreciate the advantages of being able to be discharged from the hospital directly to the comforts of home for a continued recovery. This is now included in the patient and family guidebook. This document has since been adapted for other patients outside of orthopedic care.
- Patient Commitment: choosing to have elective orthopedic surgery does come with a commitment from the patient — and a coach — to do their best to learn what they can do to have the very best outcomes. This document bullets out the simple things that can optimize the experience and recovery.

DANCING ONCE AGAIN

PAM MASON

"I was in excruciating pain for three years and had to rely on a cane, walker or wheelchair. Getting around at my job and going to church to sing was a challenge. When I finally had a hip replacement, it was time to have fun again – taking my grandchildren to the park to play, going to dinner and dancing with my husband. He told the doctor, 'Thank you for giving me my wife back!'"

A portrait of Darnell Barksdale, a middle-aged Black man with a mustache, wearing a blue polo shirt. He is smiling slightly and looking towards the camera. The background is a colorful, abstract pattern of geometric shapes in shades of red, orange, yellow, and brown.

DOUBLE KNEE REPLACEMENT RELIEVES ALL THE PAIN

DARNELL BARKSDALE

“When my wife wanted to go for a walk during our beach vacation, I hesitated because of my knee pain. A friend who is a nurse later saw me walking and urged me to get help. I decided to have both of my knees replaced at the same time. I was so happy to return home in only two days and begin my pain-free life.”

- Stop Light Discharge Poster: with hospital stays after surgery becoming shorter, when patients are discharged to home, they need to know the guidelines for what is normal, what symptoms need to be discussed with a healthcare provider and what needs immediate attention. This is also a part of the patient and family guidebook.

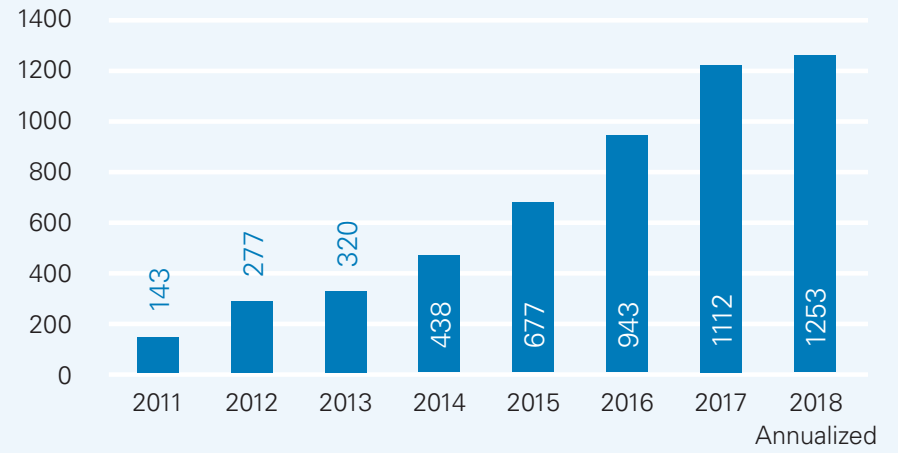


Online educational video was developed to offer 24/7 online access to patients and their families about the Sentara OrthoJoint Center® joint replacement experience. It is available at SentaraOrthoJointCenter.com/video.

Direct Anterior Hip approach continues to be a growing choice among patients looking to have a hip replacement.

There are several techniques used by orthopedic surgeons to perform joint replacements for hips. The direct anterior approach for hip replacement is one minimally invasive option that uses a frontal (anterior) approach to replacing the joint. This option for hip replacement continues to grow at Sentara facilities.

Anterior Approach Volume



COMMITMENT TO THE PATIENT EXPERIENCE

Patient Navigators

Sentara Patient Navigators are nurses with specialized training in orthopedics, helping them provide an extraordinary level of patient care in their role as liaisons between the patient, the physician and the hospital. The patient navigator assesses patient needs and provides personal, individualized care for each and every patient in the Sentara OrthoJoint Center® and the Sentara Back & Neck Center.

There are orthopedic/spine patient navigators at each Sentara OrthoJoint Center® and Sentara Back & Neck Center.

Sentara patient navigators see patients multiple times and serve as a touch point for the patient and the patient's family. They help ensure that patients are properly prepared to undergo surgery. Their assistance may include:

- Preparing patients for surgery at a preoperative class. Patients learn about preoperative cleansing to minimize bacteria on the skin and lessen the chance of infection.
- Understanding each patient's medical history and risk factors (making sure, for example, that a patient's diabetes is being properly managed).

- Coordinating all aspects of a patient's care while in the hospital and after they leave. Responsibilities include arranging group physical therapy, providing discharge instructions and following up after the hospital stay.
- Collaborating with the surgeons and other team members to continuously improve the patient experience.
- Evaluating patient care and looking for ways to improve patient outcomes.
- Conducting studies to see if simple changes can offer advantages for patients or their families.



SENTARA ORTHOJOINT CENTER® EXPRESS TRACK OPTION

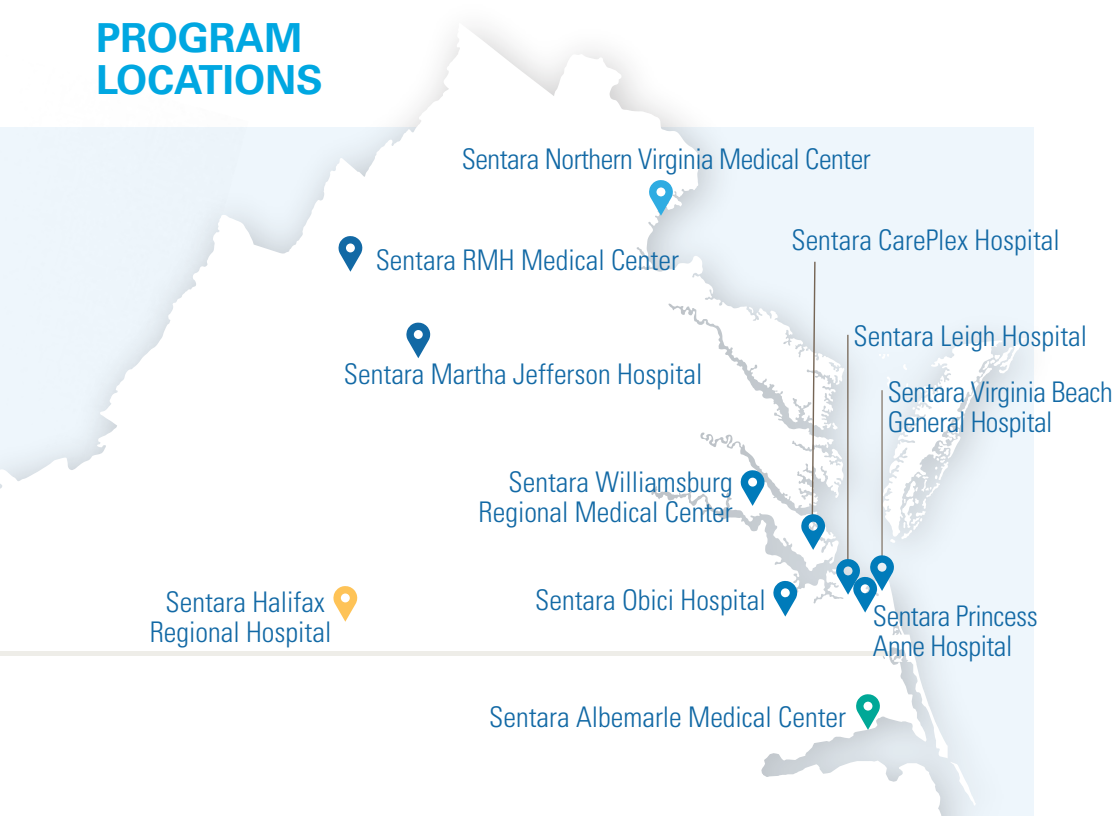
The trend of shorter length of stays fueled the increased expansion of patients electing to have a one-night length of stay in the hospital following joint replacement surgery. This option was initially offered at two locations in 2014. Now more patients are finding that they are fully prepared to return home

to complete their recovery the next day or even the same day of their joint replacement surgery. Moreover, many are finding that an outpatient surgery may be an option that may save time and cost of a hospital stay. In preparation for this shift in a shortened length of stay, all 11 hospitals with a Sentara OrthoJoint Center® are now also Express Track locations.

Highlights of the Express Track:

- Healthy patients interested in a shorter hospital stay are pre-screened by the surgeon before surgery.
- Selected patients agree to prepare themselves and their coaches for an expedited recovery.
- Pre-surgery education is imperative in setting expectations.
- Strengthening exercises are recommended before surgery.
- In 2018, the CMS classified knee replacement as an outpatient surgery. The health screening assessment and the education and other elements of the Express Track has made an easier transition for joint replacement patients to be prepared for same day and next day discharge home.
- In 2018, Sentara hospitals with a Sentara OrthoJoint Center® all offer Express Track services.

PROGRAM LOCATIONS





HOPPING ON THE EXPRESS TRACK

MICHAEL MORRIS

“My left knee was replaced a year before my right one. I chose the Express Track program for the second replacement and was out of the hospital in under 24 hours. I was ahead of schedule in recovery, too, with less swelling, so I was able to be active much faster. I walk miles a day for my job, so that was important to me.”

Express Track helps healthy patients recover more quickly after joint replacement. Getting patients up and walking the same day of surgery and aggressive physical therapy are key components to the success of the Express Track program.

It combines the high quality care of the Sentara OrthoJoint Center® with a shortened hospital stay. Patients leave the hospital the day after or even the day of their joint replacement surgery and continue recovering in the comfort of their own home. They have the option to be visited there by our expert team of home care providers.

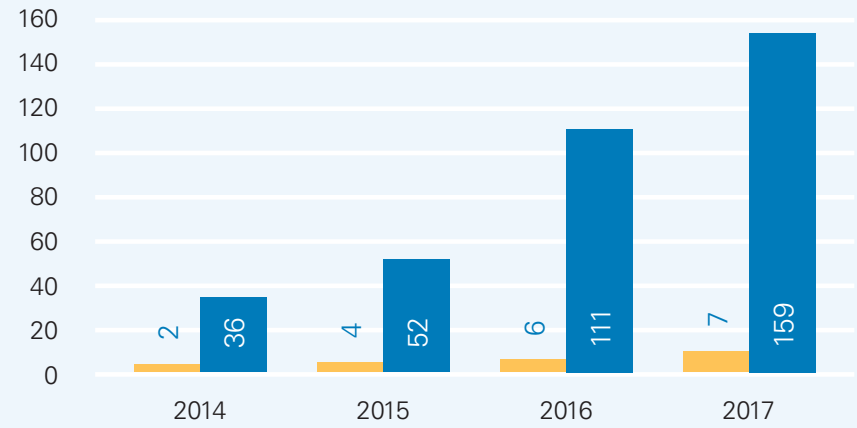
Express Track is an optional program that requires a commitment on the part of the patient. To prepare for Express Track, patients receive preoperative education and information, including the Sentara OrthoJoint Center® Hip and Knee Joint Replacement Guidebook for Patients and Families, a best practices guidebook that calls

out the advice specific to Express Track patients and lets them know what to expect. The guidebook also provides patients with both preoperative and postoperative exercises and manages their expectations regarding recovery.

Sentara Orthopedics won a 2017 Sentara CEO Award for our Express Track option, available at Sentara OrthoJoint Center locations for hip and knee replacement. The CEO Award is the highest form of recognition a project can receive within Sentara.

Express Track Growth

■ Sentara Locations
■ Patients



2017 CEO AWARD: EXPRESS TRACK

In early 2018, the multidisciplinary team responsible for the development and implementation of the Express Track was honored by receiving the Sentara highest quality of care recognition with the 2017 CEO Award.



SENTARA BACK & NECK CENTER

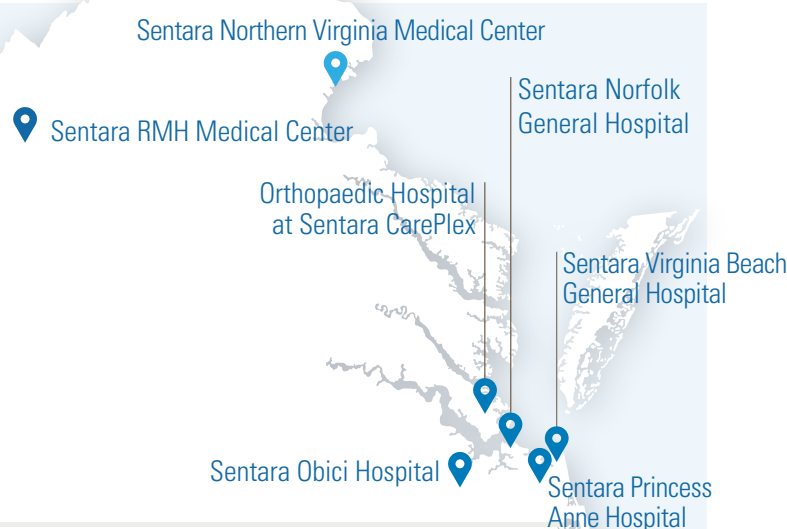
The Sentara Back & Neck Center provides seamless, coordinated back and neck care. This care is now available at seven Sentara hospitals.

This specialized center brings together an experienced team of expert orthopedic spine surgeons and neurosurgeons, as well as nurses and therapists with special training in orthopedics and spine care.

This approach results in better communication and improved patient care. The Sentara Back & Neck Center continues to distinguish itself by providing exceptional care:

- Dedicated Spine Patient Navigators provide seamless, personalized care and education before and after surgery.
- Staff focus and special training: the nursing staff and physical therapists have a unified focus on back and neck care, and many are specially credentialed in orthopedics. This focus and expertise results in higher patient satisfaction with their care and outcomes.
- Preoperative classes set patient expectations and increase patient ambulation rates (return to walking) after surgery.
- The translated Spanish version of the Sentara Back & Neck Center Patient Guidebook offers the opportunity for greater understanding of patient education.
- Patient Commitment: choosing to have elective back or neck surgery does come with a commitment from the patient and a coach to do their best to learn what they can do to have the very best outcomes. This document bullets out the simple things that can optimize the patient experience and recovery.

PROGRAM LOCATIONS



- An online video offers patients and their family members 24/7 availability to see what they can expect during their Sentara Back & Neck Center experience: [SentaraBackNeckCenter.com/video](https://www.SentaraBackNeckCenter.com/video).
- Stop Light Discharge Poster: with hospital stays after surgery becoming shorter, when patients are discharged home, they need to know the guidelines for what is normal, what symptoms need to be discussed with a health care provider and what needs immediate attention.

5%

Over 1,808 people choose Sentara for spine care, a 5% growth in 2017.

FREED FROM DEBILITATING BACK PAIN IN TEN MINUTES

BEATRIZ GUTIERREZ DE MESA

“It all started when I suddenly felt a sharp pain in my back. It traveled down my left leg, making everyday tasks impossible. I couldn’t stand. I couldn’t sit. I had to hold onto the walls and furniture for support. I tried physical therapy and painkillers. Though the painkillers helped some, I knew I couldn’t take them forever. I had an MRI and X-rays, which revealed a cyst on the nerves in my lower back. Later, using X-ray imaging guidance, the doctor performed a 10-minute facet injection procedure to rupture the cyst. I came into the hospital barely able to walk, and when I left, I was walking like nothing had ever happened to me.”

BACK ON HER FEET: FROM BROKEN ANKLE TO NEW IMPLANT

DEBBIE ENNIS

"I had been through a great deal, losing my husband in an accident and suffering my own injuries. When my surgeon suggested a total ankle implant and tailored it to my body, he gave me back the ability to walk comfortably. Now I wear a FitBit in my job as a nurse supervisor, and it tracks me walking five miles a shift."



SENTARA FOOT & ANKLE CENTER

The Sentara Foot & Ankle Center has continued to grow and flourish in the Hampton Roads area. In early 2018, three new Sentara Foot & Ankle Centers opened for patients to access: Sentara Virginia Beach General Hospital, Sentara Princess Anne Hospital and the Orthopedic Hospital at Sentara Leigh. All five Sentara Foot & Ankle Centers have prepared educational materials and clinical protocols for standards of care. Standard metrics are reviewed to assure not only the highest

quality of care but also the results of the treatments that can greatly improve the quality of care for patients suffering with foot and ankle pain.

Foot treatments have greatly improved over the years, allowing foot surgeons to offer new options to provide relief from foot and ankle pain. Sentara Foot & Ankle Centers provide both inpatient and outpatient foot and ankle services from both orthopedic foot and ankle surgeons and podiatrists.

Innovative procedures include:

- Surgical procedures that allow immediate or early weight bearing after surgery.
- Total ankle replacements for injury, arthritis or deformity.
- New, less invasive procedures for great toe arthritis (see Innovations page 22).
- The Sentara Foot & Ankle Centers are dedicated to foot and ankle health, including education, diagnosis, therapy and surgery. Community seminars continue to draw large crowds of people interested in improving the health of their feet and ankles.

PROGRAM LOCATIONS



A man with a beard and a blue cap is smiling and looking towards the camera. He is wearing an orange polo shirt with white stripes. The background shows a golf course with a lake and trees.

A FASTER RECOVERY MEANS **MORE** **SPRING FUN**

BENJAMIN DOYLE

“I fractured bones in my right hand falling off a ladder just as the good weather was starting, and I didn’t want to miss out on summer fun with my sons and step-daughters. We’re very active. My surgeon was progressive in his treatment, safely speeding up my recovery process. I was out golfing and boating weeks before I thought I ever would!”

SENTARA HAND SPECIALTY CENTER

CARE FOR PATIENTS FROM THE FINGERTIPS TO THE ELBOW

Throughout the regions, orthopedic surgeons who specialize in hand extremities offer patients exceptional care for injuries, deformities, sports injuries, fractures, osteoarthritis and other conditions. With improved techniques, hand surgeons have more options to offer patients for treatment of their hand pain. Most hand procedures are performed on an outpatient basis and patients are able to recover at home.

The basis for the Sentara Hand Specialty Center is to offer the full continuum of care, from diagnosis to recovery. In early 2017, after years of planning, the first of its kind Sentara Hand Specialty Center was opened at the Orthopedic Hospital at Sentara Leigh. Patients in Hampton Roads now have a one-stop array of services including surgeon office visits, X-rays, diagnostics, outpatient surgery and procedures on-site, and hand specialty physical therapy. The basis for the Sentara Hand Specialty Center is to offer the full continuum of care, from diagnosis to recovery. For emergency hand injuries, care from hand specialty orthopedic surgeons is available 24/7 through the adjacent Emergency Department at Sentara Leigh Hospital.

In late 2018, orthopedic fellowship-trained hand surgeons began covering hand emergencies on a 24/7 basis for residents seeking emergency hand care at Sentara CarePlex Hospital in Hampton and Sentara Williamsburg Regional Medical Center in Williamsburg.

Patient care protocols and educational materials are provided to help patients understand their condition, the planned treatment and the proper care for the best recovery. As with all Sentara clinical care, patient outcomes are measured and reviews that confirm patients are benefiting from the care provided.

PROGRAM LOCATION



Orthopedic Hospital
at Sentara Leigh

SENTARA FRACTURE CARE

Patients who have experienced a fracture require a different level of coordinated care. Most commonly, this care begins with an unplanned visit to the Emergency Department. The orthopedic teams recognized that the care and outcomes of fracture patients could be improved with a program that provides a defined care path and standards for fracture patients. In 2015, the now-named Orthopedic Hospital at Sentara Leigh launched Sentara Fracture Care, the first and only program of its kind in the region. In 2016 it was implemented at Sentara Princess Anne Hospital. Collectively, these programs have offered this specialty care to 2,688 patients.

Non-surgical methods for patient care, including injections and physical therapy, are evaluated prior to exploring surgical options.

If surgery is required, Sentara Fracture Care provides completely integrated care emphasizing the patient and family perspective, from the Emergency Department through discharge.

PROGRAM LOCATIONS



Orthopedic Hospital at Sentara Leigh
Sentara Princess Anne Hospital



Reduced length of stay for all fracture patients **by half a day.**

7%

fewer complications than national average. (Truven Expected)

Sentara Fracture Care uses specific treatment protocols for fractures, ensuring patients receive prompt and effective care. This shortens the hospital stay and makes an overall better hospital experience for patients and their families.

A comprehensive patient guidebook is provided to Sentara Fracture Care patients and their families to share helpful information about caring for them as well as information for staying safe once the patient returns home for recovery.

For patients who require extended rehabilitation therapy, Sentara Life Care provides the short-term care continuum that completes recovery allowing patients to return home.



SENTARA THERAPY CENTERS

CONTINUING TO GROW

Sentara strives to help patients achieve their personal goals for rehabilitation. Patients recovering from surgery, injury or illness can count on over 45 conveniently located Sentara Therapy Centers to provide high quality therapy care, including spine therapy, lymphedema care (therapy to reduce fluid retention and tissue swelling), sports medicine, manual therapy, aquatics, comprehensive rehabilitation programs with physical, speech and occupational therapies, and other subspecialty clinical disciplines.

Located in communities throughout Virginia and northeastern North Carolina, Sentara Therapy Centers partner with YMCAs to offer services inside of these facilities to improve the health of our local communities. In 2017 Sentara Therapy Center - Edinborough opened in Chesapeake. The center is located in an outpatient campus that also offers a combined family and pediatric practice.

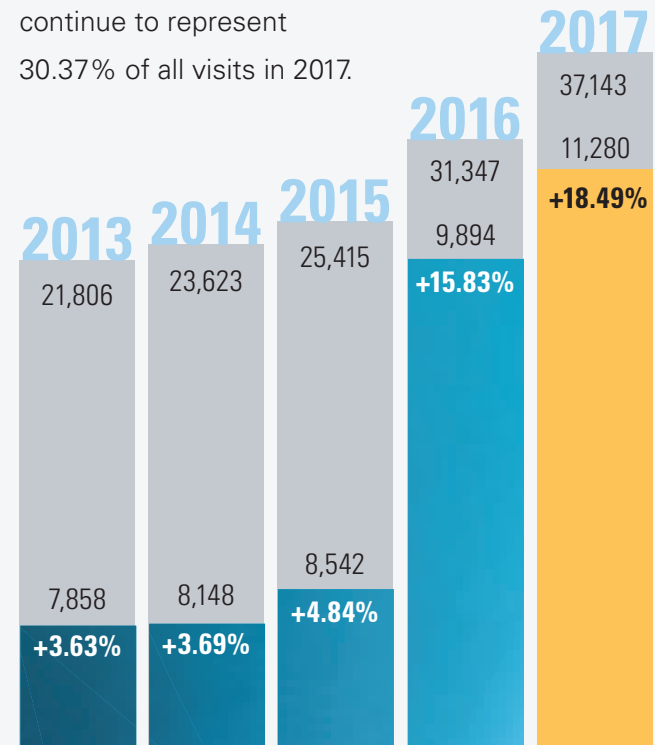
In 2018, a new Sentara Therapy Center opened in the Mathews YMCA, two new centers opened in Virginia Beach locations and a new center opened in the Kitty Hawk area of North Carolina. Sentara Northern Virginia Medical Center opened the first Sentara Therapy Center in their market in later 2018.

DIRECT ACCESS TO PHYSICAL THERAPY SERVICES

The Virginia law now allows direct access, where patients can begin therapy services without a physician referral. This new access is empowering people to connect with a physical therapist for guidance in restoring and maintaining a healthy body.

Sentara Therapy Visit Volumes

(compared to total number of ortho visits)
Orthopedic Therapy visits continue to represent 30.37% of all visits in 2017.





BACK ON HER FEET

ANN LOWERY

"After an operation and rehab for my broken pelvis, I still felt uneasy standing and walking. I attended the S.A.F.E. program and learned about balance and strength exercises. I was real proud of what I could do, and I feel confident caring for myself."

SENTARA SPORTS MEDICINE

When you hear the term sports medicine, you may think that it's medical care for professional athletes or younger people in competitive sports. While that is often true, sports medicine is really for everyone. Physical activity can increase your chances of living longer.

Throughout the regions, teams of sports medicine specialists are helping people of all ages to be active and able to do the everyday activities of life — whether it's running a marathon or just walking the dog.

Sports medicine representatives from across the regions evaluated successful sports medicine programs across the country as well as consumer research. Their goal was to create criteria for a comprehensive sports medicine program that includes both non-surgical and surgical orthopedic physicians, physical therapists, athletic trainers and other sports injury prevention and treatment professionals.

Sentara offers both surgical and community sports medicine services throughout Virginia and northeastern North Carolina. Whether through early adoption of surgical techniques, a commitment to minimally invasive surgeries or providing a point of contact for local athletic trainers, Sentara is proud of a regional presence in orthopedics and sports medicine.



Sentara RMH Medical Center

Sentara Martha Jefferson Hospital

THREE SENTARA SPORTS MEDICINE CENTERS

In early 2017, Sentara Albemarle Medical Center became the first to meet the established criteria for a Sentara Sports Medicine Center. Sentara RMH Medical Center quickly followed to establish the next Sentara Sports Medicine Center. Sentara Martha Jefferson Hospital completed construction on its new Sentara Sports Medicine Center in late 2017 and opened in early 2018.

Sentara Albemarle Medical Center

COMMUNITY SPORTS MEDICINE PROGRAMS

- The athletic trainers throughout the regions provide a link between the athletic community and surgeons. Sentara is a leading presence within the Blue Ridge, Hampton Roads and northeastern North Carolina communities, connecting orthopedic physicians and surgeons, orthopedic physical therapists and local athletic trainers.

- The Concussion Clinic provides rapid evaluation to monitor any concerning symptoms associated with concussions. Sentara doctors perform cognitive testing and help prescribe post-concussion care, including vestibular (balance) rehabilitation.
- Sentara RMH Medical Center sponsors an annual sports medicine two-day conference that is designed for physical therapists and athletic trainers. As Sentara is committed to specialized care and continuing education, this conference can be expanded to other regions.

“I tore my meniscus in July during drills, and I didn’t want to miss the football season. Our team doctor ordered a specialized brace that took some of the force off the tear, and I played all season while working with an athletic trainer to strengthen the muscle around my knee. Finally in December, I decided to have the tear repaired. Everything went so well that I only missed a few days of school.”



GETTING
ATHLETES
BACK IN
THE GAME

SABIAS FOLLEY

SURGICAL SPORTS MEDICINE

The Orthopedic Hospital at Sentara Leigh has been recognized in the community for offering advanced outpatient sports surgery options for athletes of all types. Patients have traveled throughout the country to seek their surgical experience. The surgeons participate in national research and are thought leaders in the industry. For example, their research on arthroscopic rotator cuff repair showed even complex cases can be repaired with this less invasive procedure. For details about this innovative technique, visit page 21-22 to learn about this procedure and outcomes of the research study by Jordan Young Institute and Eastern Virginia Medical School.

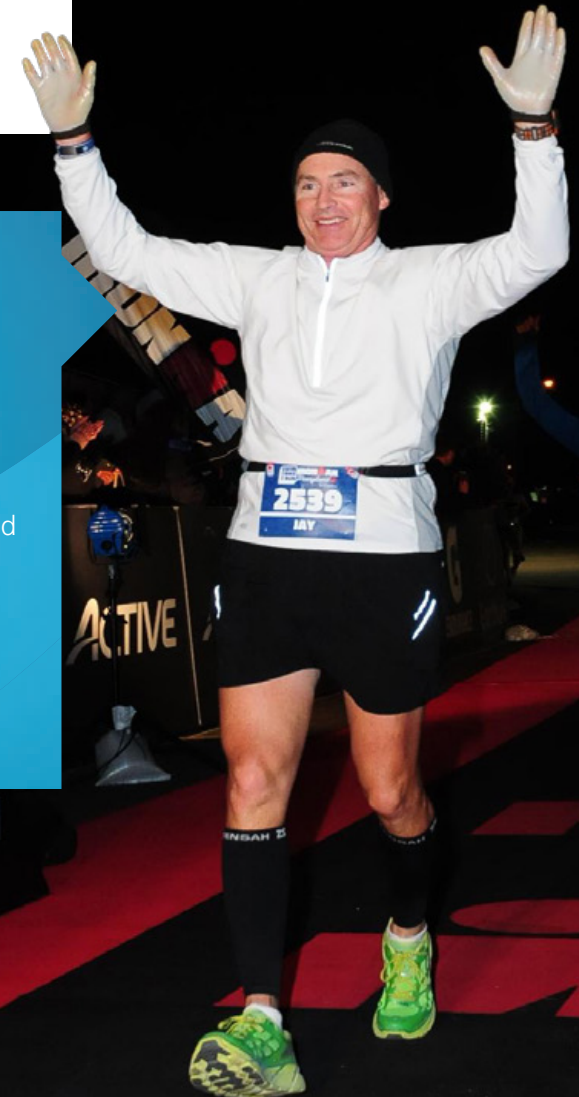
INNOVATIVE SHOULDER TREATMENT

Across the country, shoulder reconstruction is growing in the treatment of arthritis and fractures of the shoulder. Innovative shoulder care is offered throughout Sentara facilities. Subspecialty trained orthopedic surgeons offer personalized patient care with a commitment to using

PERFECT PICTURE FINISH

JAY MEARS

"I run, swim and bike, and wanted to compete in an Ironman, 2.4 miles of swimming, 112 miles of bike riding and 26.2 miles of running. Somehow I hurt my right arm, and I couldn't train. I returned to the same orthopedic surgeon who had performed rotator cuff surgery on my left arm. With his help, I was ready for the Ironman 10 months later. I crossed the finish line well before the deadline and raised my arms in celebration."

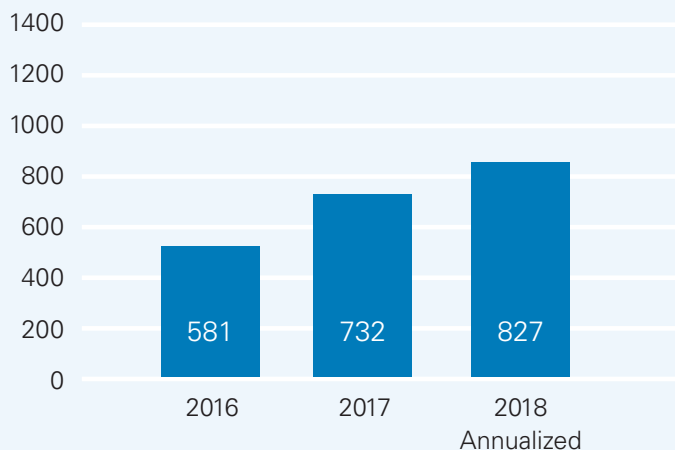


the most minimally invasive interventions possible, including the latest arthroscopic techniques.

At several facilities surgeons use minimally invasive, arthroscopic reconstruction for certain (glenoid) bone defects. This muscle-sparing approach leaves the subscapularis largely intact.

Orthopedic surgeons practicing at Sentara are among a handful trained in the use of the intramedular small incision technique for clavicle fracture. This technique requires less stripping of the periosteum (a specialized connective tissue that covers all bones), resulting in less pain and quicker recovery times.

Shoulder Replacement Volumes Continue to Grow at Sentara



Orthopedic surgeons who practice at Sentara facilities also share their time and talents throughout the regions, serving as team physicians for local schools, colleges and sports teams. Athletic trainers also provide their sports medicine services in communities across the regions.



Professionals

- Admirals Hockey
- Tides Baseball



Colleges

- Bridgewater College
- Eastern Mennonite University
- Elizabeth City State University
- Hampton University
- James Madison University
- Newport News Shipbuilding
Apprentice School
- Old Dominion University
- Virginia Wesleyan University



Schools

- Augusta County High Schools
- Booker T. Washington High School
- Gates County High School
- Harrisonburg City High School
- Hampton Public Schools
- Mathews County High School
- Norfolk Public Schools
- Norfolk Collegiate School
- Page County High Schools
- Rockingham County Public Schools
- Pasquotank Public Schools
- Southampton High School

ORTHOPEDIC TRAUMA

In Virginia, the process of trauma designation is entirely voluntary. It is meant to identify those hospitals that make a commitment to providing a higher level of care for injured patients and who welcome public acknowledgment of that capability. The Virginia standards are reviewed and updated based on changes in the national standards, as well as the evolving needs of the Virginia Trauma System.

ORTHOPEDIC TRAUMATOLOGY

No one can predict when an accident may happen. Similarly, orthopedic trauma surgeons (traumatologists) cannot predict the types of injuries their patients may have sustained in an accident or the types of care that will be needed. Orthopedic traumatology is much more than just surgical intervention. While the initial focus is on fracture care, it extends to soft tissue infections, ruptured tendons, and multiple system involvement. Each trauma patient has a unique plan of treatment, starting with the most urgent issues and continuing as a more long-term relationship with their orthopedic traumatologist. Follow-up care sometimes lasting 12 to 18 months after the initial trauma intervention.

For patients with multiple trauma injuries, pain management is critical for healing. Multi-modal pain control options, beginning at the initial trauma assessment, work to help patients reduce the use and side effects of opioids and narcotics.



Sentara Norfolk General Hospital is designated a Level I Trauma Center, the highest level of trauma care.



Sentara Virginia Beach General Hospital is designated a Level III Trauma Center.

Sentara Norfolk General Hospital is designated a Level I Trauma Center, the highest level of trauma care.

Sentara Virginia Beach General Hospital is designated a Level III Trauma Center.

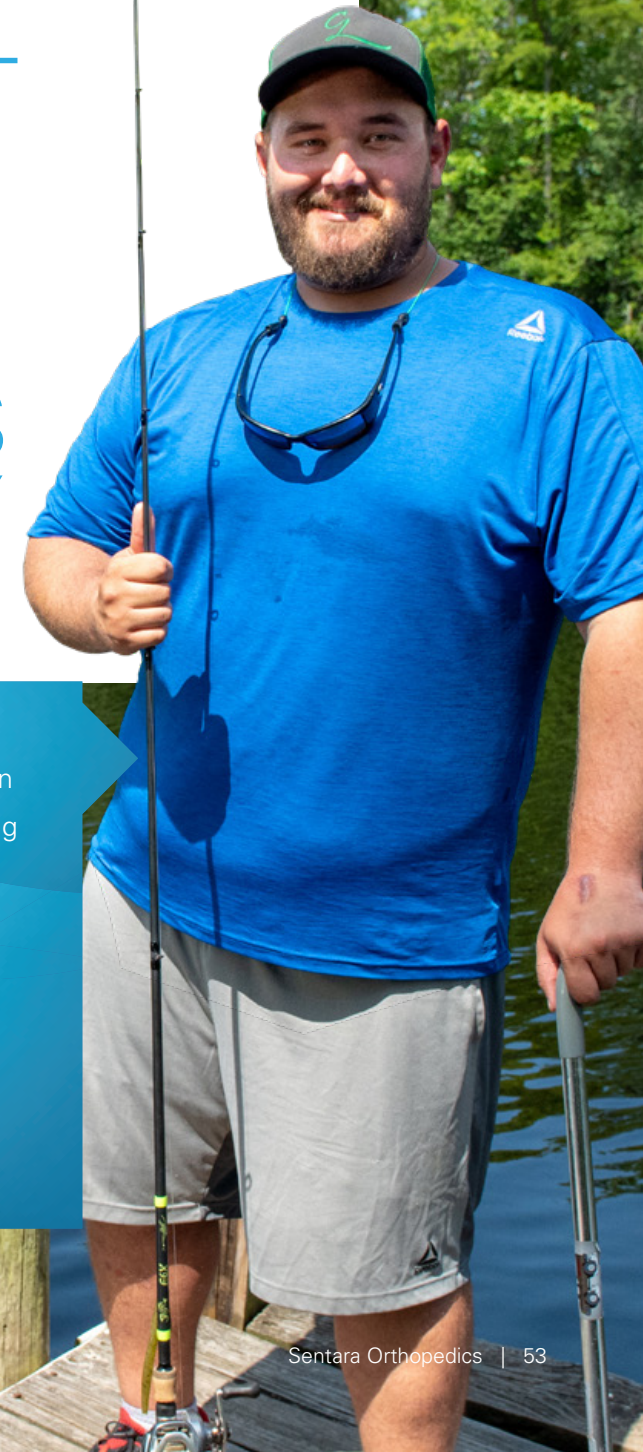
Trauma patients don't choose their orthopedic surgeon as you would for an elective orthopedic procedure. The good news for orthopedic trauma patients is the assurance that Sentara has already recruited the most skilled and experienced orthopedic traumatologists that are on call 24/7 at the two trauma centers, Level I Sentara Norfolk General Hospital and Level III Sentara Virginia Beach General Hospital. These surgeons also provide consultation for complicated orthopedic cases and some elective orthopedic procedures.

The goal is to restore the health of a trauma patient and make it possible for them to return to work or other activities of life.

THE CAR CRASH THAT CHANGED LIVES: A PATIENT SHARES HIS RECOVERY

JORDAN SANDERLIN

"I was a passenger in our work truck when we were hit head-on by someone speeding at 90 MPH. After three months in the hospital and seven surgeries on my arms, hands, hips, legs and feet, I've been able to return to fun activities like fishing. With more therapy, I'll be back at my job lifting heavy containers in a few months."



ORTHOPEDIC, NEUROSURGICAL AND PODIATRY GROUPS PROVIDING CARE IN PROGRAMS REPRESENTED IN THIS SENTARA ORTHOPEDIC ANNUAL REPORT

ALBEMARLE REGION NORTH CAROLINA

- Active Foot & Ankle Center
- Coastal Albemarle Orthopedics
- Richard C. King, DPM
- Sentara Orthopedic & Sports Medicine Specialists, Division of Albemarle Physician Services

BLUE RIDGE REGION VIRGINIA

Charlottesville

- Albemarle Orthopaedics
- Central Virginia Foot and Ankle Laser Center
- Charlottesville Hand Surgery
- Charlottesville Orthopaedic Center
- Christopher B. Stewart, DPM, PC
- Foot & Ankle Specialists of the Mid-Atlantic, LLC

- Michael Goldman, DPM
- Sentara Martha Jefferson Orthopedics
- The Podiatry Group
- Thomas L. Schildwachter, MD
- Virginia Foot & Ankle Surgical Associates

Harrisonburg

- Harrisonburg Foot and Ankle Clinic
- Hess Orthopedics & Sports Medicine
- Sentara RMH Orthopedics and Sports Medicine
- Sentara RMH Back & Neck Center
- Valley Plastic Surgery

HALIFAX REGION VIRGINIA

- Sentara Southern Virginia Orthopedics
- The Foot and Ankle Clinic

HAMPTON ROADS REGION VIRGINIA

Southside

- 1 Foot 2 Foot Center
- Atlantic Foot & Ankle Center
- Atlantic Orthopaedic Specialists
- Bayview Physicians Group
- Coastal Podiatry
- Dr. William Grant Foot & Ankle
- Family Foot & Ankle Care
- Glasson Sports Medicine
- Jordan-Young Institute
- Neurosurgical Specialists
- Neurosurgical Associates
- Norfolk Foot & Ankle Group
- Oceana Sports Medicine & Orthopaedic Center
- Persons Orthopaedics
- Robert W. Sullivan, DPM
- Sports Medicine and Orthopaedic Center
- Sentara Hand Surgery Specialists
- Sentara Neurosurgery Specialists
- Sentara Orthopaedic Trauma Specialists
- Sentara Podiatry Specialists
- Virginia Institute for Sports Medicine

Peninsula

- Affiliated Podiatrists
- Ambulatory Foot & Ankle Center
- Hampton Roads Foot and Ankle Specialists
- Hampton Roads Orthopaedics and Sports Medicine
- Tidewater Foot and Ankle
- Tidewater Orthopaedics Associates
- Tidewater Physicians Multispecialty Group
- Williamsburg Podiatry

NORTHERN VIRGINIA REGION VIRGINIA

- Bull Run Foot Clinic
- Dynamic Foot & Ankle Center
- Family Orthopedics & Sports Medicine
- Fredericksburg Orthopaedic Associates
- Ghassem Nejad, MD
- Medstar Georgetown Orthopaedic Institute
- NoVa Orthopedic & Spine Care
- NoVa Neuroscience
- Potomac Podiatry Group
- Washington Orthopedic & Spine Institute
- Woodbridge Foot & Ankle



2017-2018 ACADEMIC PUBLICATIONS

KEVIN BONNER, M.D.

Publications

Berman DC, Rogers KM, Griffin JW, Bonner KF. Gender Disparity Between Absolute Versus Relative Size of Condylar Chondral Defects: An MRI Analysis of Knee Surgery; March 20, 2018. DOI <https://doi.org/10.1055/s-0038-1646932>.

Mistry JB, Bonner KF, Gwam CU, Thomas M, Etcheson JI, Delanois RE. Management of Injuries to the Medial Patellofemoral Ligament: A Review. *J of Knee Surgery* 2017; DOI <https://doi.org/10.1055/s-0037-1604142>.

Meeks BD, Meeks NM, Froehle AW, Wareing E, Bonner KF. Patient Satisfaction After Biceps Tenotomy. *The Orthopaedic Journal of Sports Medicine* 2017, 5(5), DOI: [10.1177/2325967117707737](https://doi.org/10.1177/2325967117707737).

Bonner KF, Mannino A. An Alternative Technique to Avoid Injury to the Medial Femoral Condyle when Reaming the Femoral Tunnel during ACL Reconstruction: *Arthroscopy Techniques*. 2017 Feb 6;6(1):e149-e155.

Rogers KM, Berman DC, Griffin JW, Bonner KF. Gender disparity between donor sites of the trochlea used for autologous osteoarticular transfer: An MRI analysis. *J of Knee Surgery* 2019.

Textbook & Chapter Contributions

Serbin PA, Griffin JW, Bonner KF. Meniscus Repair of the Anterior Third: The Outside-In Option. Chapter in *Orthopedic Techniques in Sports Medicine*: Edited by: L McIntyre and R Hunter. Due for publication 2018/2019.

Aflatooni JO, Griffin JW, Bonner KF. Articular Cartilage Restoration in the Multiple Ligament Injured Knee. Chapter in *The Multiple Ligament Injured Knee 3rd Ed.* Edited by Gregory C Fanelli. Due for publication 2018/2019.

Boniello M, Robinson SP, Bonner KF. Osteochondral Allograft Transplantation. Chapter 31: *Insall and Scott Surgery of the Knee Textbook*. 6th ed. Edited by W. Norman Scott; Elsevier, Churchill, & Livingstone. Philadelphia, PA. 2017: 442-453.

Proceedings of National Meeting Research Presentations

Lee JH, Wilson CG, BS, Refugia JM, Tsang TE, Bonner KF. Younger patients are less satisfied following rotator cuff repair despite having smaller tears. Poster presentation Virginia Orthopaedic Society 71st Annual Meeting. Apr 2018. Accepted for presentation to 2019 AAOS.

Francis MP, Maghdouri-White Y, Sori N, Kemper N, Nelson C, Wriggers H, Petrova S, Bonner KF, Arnoczky S, Bruder S. Collagen Microfiber-Based Tissue Engineered Device (TEND) with High Void Promotes In Vivo Tendon Regeneration. Accepted for podium presentation Orthopedic Research Society; March 2019.

Churchill JL, Krych AJ, Lemos MJ, Redd M, Bonner KF. Don't throw it away! A case series of successful repair of articular cartilage fragments in the knee. Podium presentation Annual Meeting Arthroscopy Association of North America 2018. Chicago, IL.

Aflatooni JO, Meeks BD, Froehle AW, Bonner KF. Biceps Tenotomy versus Tenodesis: Patient reported outcomes and satisfaction. Podium presentation Annual Meeting Arthroscopy Association of North America 2018. Chicago, IL.

Serbin PA, Griffin JW, Bonner KF. Single-Stage Revision Anterior Cruciate Ligament Reconstruction Using Fast-Setting Bone Graft Substitute. Poster presentation Virginia Orthopaedic Society 71st Annual Meeting. Apr 2018.

Proceedings of Academic Teaching

2018, Orthopaedic Summit & Evolving Techniques; Las Vegas, NV. Knee Sports Co Chair, Presenter, Faculty Panel Member and Moderator. Lecture: Use Of Quick Setting Bone Graft Substitutes In Revision ACL Surgery. Panel Member: All You Need To Know About The ACL Through Cases. Section Moderator: biologics, cartilage & the future of orthopaedic surgery. Lecture: Marrow stimulation in the knee (Biocartilage). Lecture: State of the Art Arthroscopic Meniscal Repair.

2018, Arthroscopy Association of North America Knee & Shoulder Course; Rosemont, IL. Master Instructor and Presenter. Lectures: Root Repairs: My Decision – Making and Technical Pearls, Practical Strategies in the Management of Articular Cartilage Pathology, Technique Options in Cartilage Surgery (Marrow Stimulation thru OA Allografts), ACL Graft Selection: Evidence - Based Recommendations. Moderator: Patella Instability, Maltracking and Pain: A Case–Based Presentation.

2018, Sports Medicine Symposium; World Series of Surgery; Chicago, IL. Presenter and Moderator. Lecture: ACL Outcomes: Are We Doing Better? Moderator: ACL Session / Case Presentation.

2018, Arthroscopy Association of North America Annual Meeting; Chicago, IL. Presenter, Moderator Panel Member. Panel Member: Clinical Case Panel complex knee injuries. Moderator: Live meniscus transplant surgery. Lecture: Debate - Medial Meniscus Root Tear in a 52 Year-old woman. Panel member: Clinical Case Panel - Controversies in Articular Cartilage Cases. Panel member: “Ask the Experts” Interactive Session for Knee.

2017, Orthopaedic Summit and Evolving Techniques; Las Vegas, NV. Presenter and Panel Member. Debate Lecture: Treatment of articular cartilage defect in a 28 Year-Old Basketball Player. Lecture: The Failed Microfracture in a 41-Year-Old Weekend Warrior: What I Do Next. Debate Lecture: Optimal ACL graft choice in 33 year old women. Pro: Hamstring Autograft is the Way to Go! Co Moderator with Kevin Wilk: Guest Surgeon Panel- ACI, MACI, Osteochondral Allografts, Failed Microfracture: I am Just the Therapist! What To Do? What Does It All Mean?

2018, Arthroscopy Association of North America Comprehensive Knee Course 804: Rosemont, IL, Instructor.

2017, Arthroscopy Association of North America, Advanced Comprehensive Knee Ligament Course and Related Surgery, APEx Series; Rosemont, IL. Instructor and Presenter. Lectures: Proximal ACL Avulsions: Can we Repair?, Management of Articular Cartilage Injuries in the Knee Ligament Injured Patient, Proximal and Distal Extensor Mechanism Realignment Procedures.

2017, Arthroscopy Association of North America; Advanced Decision-Making and Treatment of Articular Cartilage and Meniscus, APEx Series; Rosemont, IL. Presenter. Lecture: Marrow Stimulation: What is State of the Art? Expert Case Panel Member.

2017, Arthroscopy Association of North America Annual Meeting; Denver, CO. Scientific Session Moderator and Instructional Course Coordinator Knee Ligament, ICL 208. Ask the Experts Interactive Session - Knee Ligaments: How We Handle Them on Opposite Sides of the Pond.

National Committee

2018-2019 Chairman Education-Arthroscopy Association of North America.

JOSEPH GONDUSKY, M.D.

Gondusky J. Perfecting Component Placement in Anterior Approach Total Hip Arthroplasty. Vumedi Video 2015.

Video Presentation, American Association of Hip and Knee Surgeons (AAHKS) Annual Meeting 2017, Dallas TX

Gondusky J, Lee GH. The Anterior Approach for Conversion Hip Arthroplasty: Surgical Technique and Considerations. Accepted pending revisions American Journal of Orthopedics.

Southern Orthopaedic Association Annual Meeting 2017, Poster Presentation

Virginia Orthopedic Society (VOS) Annual Meeting 2018, Poster Presentation

Video Presentation, American Association of Hip and Knee Surgeons (AAHKS) Annual Meeting 2017, Dallas TX

Video Presentation, American Academy of Orthopedic Surgeons (AAOS) Annual Meeting 2018, New Orleans LA

Gondusky J, Simultaneous Bilateral Anterior Approach Total Hip Arthroplasty. Vumedi Video 2017.

Video Presentation, American Association of Hip and Knee Surgeons (AAHKS) Annual Meeting 2017, Dallas TX

Miller L, Gondusky J, Kamath A, Boettner F, Wright J, Bhattacharaya S. Does Surgical Approach Affect 90-day Postoperative Outcomes in Total Hip Arthroplasty: A Systematic Review with Meta-analysis. Journal of Arthroplasty April 2018, 33(4): 1296-1302.

Miller L, Gondusky J, Kamath A, Boettner F, Wright J, Bhattacharaya S. Influence of Surgical Approach on Short-term Complication Risk in Primary Total Hip Arthroplasty: Systematic Review and Meta-analysis. Acta Orthopaedica Feb 2018, Vol 89; 289-294.

American Association of Hip and Knee Surgeons (AAHKS) Annual Meeting, Dallas, TX, November, 2017. Author, Three Video Presentations on Anterior Approach Hip Replacement.

American Academy of Orthopedic Surgeons Annual Meeting, New Orleans, LA, March 6-10, 2018. Presenter, Orthopedic Video Theater #15; Anterior Approach for Conversion Hip Arthroplasty

Virginia Orthopedic Society (VOS) Annual Meeting, West Virginia, April 20-22, 2018. Poster Presentation: Gondusky J, Lee GH. The Anterior Approach for Conversion Hip Arthroplasty: Surgical Technique and Considerations.

WILLIAM P. GRANT, DPM

Lias M. Grant-McDonald, DPM, William P. Grant, DPM, FACFAS, Jeffrey Yates, BS. Emerging Concepts in Beaming for Charcot. Podiatry Today 2017 March 23; Vol 30, Issue 3.

JUSTIN W. GRIFFIN, M.D.

Publications

Bernardoni E, Frank RM, Veera SS, Griffin JW, Waterman BR, Shewman E, Cole BJ, Romeo AA, Verma NN. Biomechanical Analysis of All-Suture Anchor Fixation for Rotator Cuff Repair. Orthop J Sports Med. 2018 Jul 27;6(7 suppl4): doi: 10.1177/2325967118S

Zuke WA, Agarwalla A, Go B, Griffin JW, Cole BJ, Verma NN, Bach BR, Forsythe B. The Lack of Standardized Outcome Measures Following Lower Extremity Injury In Elite Soccer: A Systematic Review. Knee Surg Sports Traumatology Athroscopy. 2018 Oct 26(10):3109-3117.

Griffin JW, Collins M, Leroux TS, Cole BJ, Bach BR, Forsythe B, Verma NN, Romeo AA, Yanke AB. The Influence of Bone Loss on Glenoid Version Measurement: A Computer-Modeled Cadaveric Analysis. Arthroscopy. 2018 Aug;34(8):2319-2323. doi: 10.1016/j.arthro.2018.03.019

Erickson BJ, Chalmers P, Waterman B, Griffin JW, Romeo AA. Performance and Return to Sport in Elite Baseball Players and Recreational Athletes Following Repair of the Latissimus Dorsi and Teres Major. Journal of Shoulder and Elbow Surgery. Accepted May 2017.

Basques BA, Erickson BJ, Leroux T, Griffin JW, Frank RM, Verma NN, Romeo AA. Comparative Outcomes of Outpatient and Inpatient Total Shoulder Arthroplasty: An Analysis of the Inpatient Medicare Dataset. The Bone and Joint Journal. 2017 Jul;99-B(7):934-938. doi: 10.1302/0301-620X.99B7.BJJ-2016-0976.R1. PMID: 28663400

Griffin JW, Cvetanovich G, Kim J, Leroux TS, Bach BR, Cole BJ, Nicholson G, Verma NN, Romeo AA. Biceps Tenodesis is a Viable Option for Management of Proximal Biceps Injuries in Patients Less than 25 Years of Age. *The Orthopaedic Journal of Sports Medicine*. March 2017. DOI: 10.1177/2325967117S00116

Burrus MT, Kurkis GM, Conte EJ, Griffin JW, Werner BC, Hart JM, Diduch DR. Equivalent Outcomes for Patients Following Trochleoplasty as a Primary or Revision Patellar Stabilizing Procedure. *Orthop J Sports Med*. 2017 Jul; 5(7 suppl6): 2325967117S00389. Published online 2017 Jul 31.

Mahkni E, Hamamoto, JT, Higgins, JD, Patterson T, Griffin, JW, Romeo, AA, Verma, NN. How Comprehensive and Efficient are Patient Reported Outcomes for Rotator Cuff Tears? *The Orthopaedic Journal of Sports Medicine* 5(3). March 2017. DOI: 10.1177/2325967117693223

Erickson BJ, Basques BA, Griffin JW, Taylor SA, O'Brien SJ, Verma NN, Romeo AA. The Effect of Concomitant Biceps Tenodesis on Reoperation Rates After Rotator Cuff Repair: A Review of a Large Private-Payer Database From 2007 to 2014. *Arthroscopy*. 2017 Mar 20. pii: S0749-8063(17)30104-4. doi: 10.1016/j.arthro.2017.01.030. PMID: 28336230

Saltzman BM, Collins MJ, Leroux TS, Arns, TA, Griffin JW, Romeo AA, Verma NN, Forsythe B. Arthroscopic Repair of Isolated Subscapularis Tears: A Systematic Review of Technique-Specific Outcomes. *Journal of Arthroscopic and Related Surgery*. 2017 Apr;33(4):849-860. doi: 10.1016/j.arthro.2016.10.020. Epub 2017 Jan 9. Review. PMID: 28082063

Proceedings of National Meeting Research Presentations

Bernardoni E, Frank RM, Veera SS, Griffin JW, Waterman BR, Shewman E, Cole BJ, Romeo AA, Verma NN. Biomechanical Analysis of All-Suture Anchor Fixation for Rotator Cuff Repair. *American Orthopaedic Society for Sports Medicine San Diego 2018*

Serbin AP, Griffin JW, Bonner KF. Single Stage Revision Anterior Cruciate Ligament Reconstruction Using Fast-Setting Bone Graft Substitutes. *Virginia Orthopaedic Society 2018*.

Carstensen SE, Burrus MT, Cancienne JM, Kurkis G, Griffin JW, Diduch DR. Manipulation Under Anesthesia and Lysis of Adhesions Affords Similar Flexion as those Without Stiffness After Sulcus Deepening Trochleoplasty: A Prospective Study. Podium Presentation *American Academy of Orthopaedic Surgeons 2018*. New Orleans LA.

Berman DC, Rogers KM, Griffin JW, Bonner KF. Gender Disparity Between Absolute Versus Relative Size of Chondral Defects: An MRI Analysis. *Virginia Orthopaedic Society 2018*.

Griffin JW, Basques B, Leroux TS, Frank RM, Verma NN, Romeo, AA. Thirty and Ninety-Day Readmission Following Total Shoulder Arthroplasty: A Critical Analysis of Rate, Risk and Reason for Readmission. Podium Presentation. *Canadian Orthopaedic Association Annual Meeting 2017*. Ottawa, Canada.

Leroux TS, Basques B, Griffin JW, Frank RM, Cole BJ, Verma NN, Romeo AA. Preoperative Narcotic Use Among Patients Undergoing Total Shoulder Arthroplasty: An Analysis of Trends and Influence on Post-Operative Length of Stay, Complications, and Readmission. *Canadian Orthopaedic Association Annual Meeting 2017*. Ottawa, Canada.

Leroux TS, Basques B, Frank RM, Griffin JW, Nicholson GP, Cole BJ, Romeo AA, Verma NN. Outpatient Total Shoulder Arthroplasty: A Population-Based Study Comparing Adverse Event and Readmission Rates to Inpatient Total Shoulder Arthroplasty. Podium Presentation. *Canadian Orthopaedic Association Annual Meeting 2017*. Ottawa, Canada.

Leroux T, Basques BA, Frank RM, Griffin JW, Verma NN, Romeo AA. Complication, Reoperation, and Readmission Rates Following Rotator Cuff Repair: A Comparative Study of Open Versus Arthroscopic Rotator Cuff Repair. Podium Presentation. *Canadian Orthopaedic Association Annual Meeting 2017*. Ottawa, Canada.

Frank RM, Basques B, Leroux T, Griffin J, Thorsness R, Verma NN, Provencher MT, Romeo AA. Complications Following Anterior Shoulder Instability Treatment: Bankart Repair Versus Latarjet. *11th Biennial International Society of Arthroscopic, Knee Surgery and Sports Medicine Congress*. June 4, 2017. Shanghai, China.

Frank RM, Lee S, Griffin JW, Cole BJ, Nicholson GP, Verma NN, Romeo AA. Does Prior Shoulder Surgery Negatively Impact Shoulder Arthroplasty Outcomes? *11th Biennial International Society of Arthroscopic, Knee Surgery and Sports Medicine Congress*. June 5, 2017. Shanghai, China.

Frank RM, Lee S, Leroux T, Griffin JW, Verma NN, Cole BJ, Nicholson GP, Romeo AA. Does Sex Impact Outcomes Following Shoulder Arthroplasty? 11th Biennial International Society of Arthroscopic, Knee Surgery and Sports Medicine Congress. June 8, 2017. Shanghai, China.

Frank RM, Meyer MA, Poland S, Leroux T, Griffin JW, Hannon CP, Verma NN, Romeo AA, Cole BJ. Long-Term Clinical Outcomes after Microfracture of the Glenohumeral Joint: Minimum 7-year Follow-Up. Podium Presentation. American Orthopaedic Society of Sports Medicine Annual Meeting 2017. Toronto, Canada.

Burrus MT, Kurkis GM, Conte EJ, Griffin JW, Werner BC, Hart JM, Diduch DR. Equivalent Outcomes for Patients Following Trochleoplasty as a Primary or Revision Patellar Stabilizing Procedure. Poster Presentation at the American Orthopaedic Society of Sports Medicine Annual Meeting 2017. Toronto, Canada.

Burrus MT, Cancienne JM, Kurkis GM, Carstensen SE, Griffin JW, Diduch DR. Trochleoplasty is a Viable Option for Patellar Instability in Patients with Severe Trochlear Dysplasia: Early Outcomes Analysis of the US Experience. Poster Presentation at the American Orthopaedic Society of Sports Medicine Annual Meeting 2017. Toronto, Canada.

Frank RM, Lee S, Griffin JW, Cole BJ, Verma NN, Nicholson GP, Romeo AA. Does Prior Shoulder Surgery Negatively Impact Shoulder Arthroplasty Outcomes? Podium Presentation. Arthroscopy Association of North America Annual Meeting 2017. Denver, Colorado.

Leroux T, Basques BA, Frank RM, Griffin JW, Verma NN, Romeo AA. Complication, Reoperation, and Readmission Rates Following Rotator Cuff Repair: A Comparative Study of Open Versus Arthroscopic Rotator Cuff Repair. Podium Presentation. Arthroscopy Association of North America Annual Meeting 2017. Denver, Colorado.

Griffin JW, Cvetanovich G, Kim J, Leroux TS, Bach BR, Cole BJ, Nicholson G, Verma NN, Romeo AA. Biceps Tenodesis is a Viable Option for Management of Biceps Tendinopathy in Patients Less than 25 years of age. Podium Presentation American Academy of Orthopaedic Surgeons/ American Orthopaedic Society for Sports Medicine Annual Meeting Specialty Day Presentation 2017. San Diego, CA.

Weber AE, Saltzman B, Griffin JW, Cvetanovich G, Cole BC. Management of Large Chondral Defects in the Knee: Options and Decision-Making. Scientific Exhibit. American Academy of Orthopaedic Surgeons Annual Meeting 2017. San Diego, CA.

Frank RM, Lee S, Griffin JW, Cole BJ, Verma NN, Nicholson GP, Romeo AA. Does Prior Shoulder Surgery Negatively Impact Shoulder Arthroplasty Outcomes? Podium Presentation American Academy of Orthopaedic Surgeons Annual Meeting 2017. San Diego, CA.

Basques BA, Erickson BJ, Leroux T, Griffin JW, Frank RM, Verma NN, Romeo AA. Outpatient versus Inpatient Total Shoulder Arthroplasty: Analysis of the Medicare Dataset. Podium Presentation American Academy of Orthopaedic Surgeons Annual Meeting 2017. San Diego, CA.

Griffin JW, Cvetanovich G, Kim J, Leroux TS, Bach BR, Cole BJ, Nicholson G, Verma NN, Romeo AA. Biceps Tenodesis is a Viable Option for Management of Biceps Tendinopathy in Patients Less than 25 years of age. Podium Presentation American Academy of Orthopaedic Surgeons Annual Meeting 2017. San Diego, CA.

Leroux T, Basques BA, Frank RM, Griffin JW, Verma NN, Romeo AA. A Population-Based Study Comparing Trends in Utilization and Complications Following Open and Arthroscopic Long Head of Biceps Tenodesis. Podium Presentation American Academy of Orthopaedic Surgeons Annual Meeting 2017. San Diego, CA.

Leroux T, Basques BA, Frank RM, Griffin JW, Romeo AA, Verma NN. Complication, Reoperation, and Readmission Rates Following Rotator Cuff Repair: A Comparative Study of Open Versus Arthroscopic Rotator Cuff Repair. Podium Presentation American Academy of Orthopaedic Surgeons Annual Meeting 2017. San Diego, CA.

Nicholson, GP, Griffin JW, Kupfer N, O'Donnell PO, Virk M, Thorsness R. Glenoid Bone Grafting in Reverse Total Shoulder Arthroplasty: Graft Size and Position Classification. Podium Presentation American Academy of Orthopaedic Surgeons Annual Meeting 2017. San Diego, CA.

Burrus MT, Kurkis GM, Conte EJ, Griffin JW, Werner BC, Hart JM, Diduch DR. Equivalent Outcomes for Patients Following Trochleoplasty as a Primary or Revision Patellar Stabilizing Procedure. Poster Presentation at the American Academy of Orthopaedic Surgeons Annual Meeting 2017. San Diego, CA.

Burrus MT, Cancienne JM, Kurkis GM, Carstensen SE, Griffin JW, Diduch DR. Trochleoplasty is a Viable Option for Patellar Instability in Patients with Severe Trochlear Dysplasia: Early Outcomes Analysis of the US Experience. Podium Presentation. American Academy of Orthopaedic Surgeons Annual Meeting 2017. San Diego, CA.

Books, Monographs, and Textbooks

Griffin JW, Romeo AA. Arthroscopic Debridement and Biceps Tenotomy & Tendodesis. Operative Techniques in Orthopaedic Surgery. Shoulder and Elbow Controversies. Ed Christopher Schmidt. 2018

Griffin JW, Romeo AA. SLAP Lesions and the Biceps in Baseball Players. In Ahmad Ed. Baseball Sports Medicine. Wolters, Klower Health: Medical Practice. November 2018

Aflatooni J, Griffin JW, Bonner KF. Articular Cartilage Restoration in the Multiple Ligament Injured Knee. In The Multiple Ligament Injured Knee: A Practical Guide to Management 2nd ed. Gregory C. Fanelli, Editor. 2018

Proceedings of Academic Teaching

Physical Examination of the Shoulder. Department of Physical Medicine & Rehabilitation Grand Rounds. 2018. Norfolk, VA

Pectoralis Major and Teres Major Repair. Arthroscopy Association of North America (AANA) Annual Fellow Course. Shoulder Faculty 2018. Chicago, IL

Surgical Management of Biceps Tendon Pathology. Arthroscopy Association of North America (AANA) Annual Fellow Course. Shoulder Faculty 2018. Chicago, IL

Rotator Cuff Case Based Learning. American Orthopaedic Society of Sports Medicine (AOSSM) Annual Meeting 2018. Moderator. Chicago, IL

Complications in Shoulder Surgery Case Based Panel. Mid Atlantic Shoulder and Elbow Society (MASSES) Annual Meeting. Washington, DC

Bone Loss in Reverse Total Shoulder Arthroplasty. American Shoulder and Elbow Surgeons (ASES) Annual Meeting 2018. Chicago, IL

Arthroscopy Association of North America Knee & Shoulder Course. Shoulder Faculty 2018. Associate Faculty. Rosemont, IL.

STEPHEN GUNTHER, M.D.

Gunther, SB. Shoulder Replacement with Inset Glenoid Fixation: 6-10 year results, Sierra Cascade Trauma Society, Beaver Creek, Colorado. February 3, 2017.

Gunther, SB. Disruptive Technology in Shoulder Surgery, Sierra Cascade Trauma Society, Park City, Utah, February 1, 2018.

Program Moderator/Co-director: Twentieth Century Orthopedic Annual Meeting, Woodstock, Vermont, August, 2017.

Sports Medicine Update & Current Concepts, Martha Jefferson Hospital Grand Rounds, Charlottesville, Virginia, May 16, 2018.

Current Research & Planned Presentations/Teaching

Long-term Results of Total Shoulder Replacement Surgery with Inset Glenoid Fixation for Shoulder Arthritis with deficient glenoid bone.

Pending submission to Journal of Shoulder and Elbow Surgery

AANA Arthroscopy Teaching Course Faculty, December, 2018.

APEx Associate Instructor

815 Foundations in Arthroscopy

DAVID LEVI, M.D.

Levi D, Horn S, Carnahan D, Levin J. Is Severe Episodic Low Back Pain a Sign of Discogenic Etiology? Pain Medicine 2018;19(7):1334–39.

Levi D. Subdural Extra-arachnoid Flow Pattern Visualized In a Contralateral Oblique View During a Cervical Interlaminar Epidural Steroid Injection. Pain Medicine 2017;18(6):1177-1182.

Levi D. Disruption of a Lumbar Zygapophyseal Joint Synovial Cyst with Intrathecal Flow. Pain Medicine 2017;18(8):1605-23.

MICHAEL Q. POTTER, M.D.

Potter MQ, Rodner C. "Wrist Fusions and Reconstructions." Weiss AP, ed. The ASSH Textbook of Hand and Upper Extremity Surgery, Second Edition, 2018.

Polydactyly of the Hand.

Comer, Garet C.; Potter, Michael; Ladd, Amy L. J Am Acad Orthop Surg. 2018 Feb 1;26(3):75-82. doi: 10.5435/JAAOS-D-16-00139.

RICHARD J. MYERS, M.D.

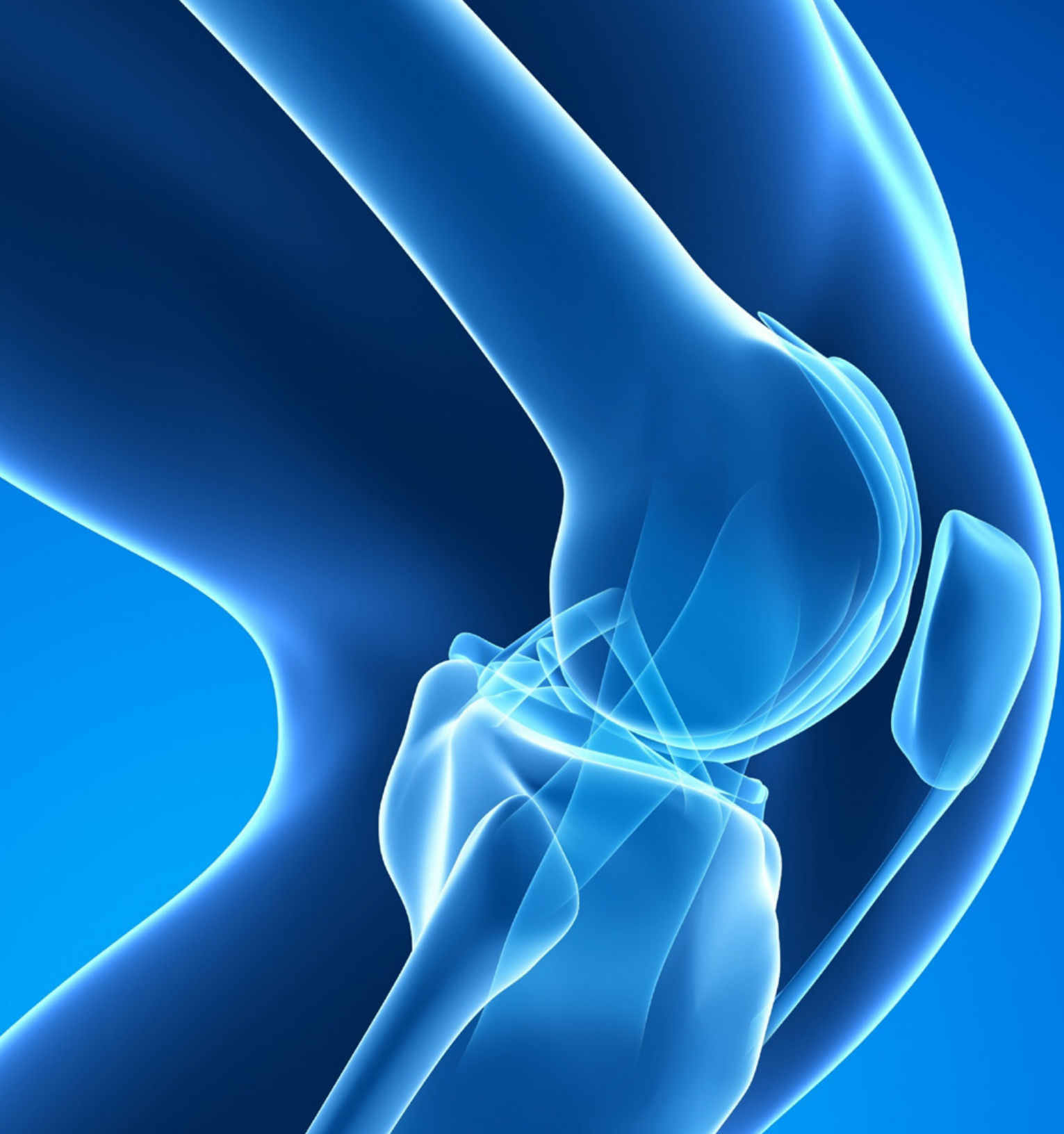
Myers R, Kim H, Hsieh AH, O>Toole RV, Sciadini MF. When Should We Change Drill Bits? A Mechanical Comparison of New, Reprocessed, and Damaged Bits. J Orthop Trauma. 2017. May; 31(5):281-286. DOI: 10.1097/BOT.0000000000000812.

DAVID A. VINCENT, M.D.

Vincent DA, Thomas A. Lumbar Minimally Invasive TLIF. Resident and Fellow's Guide to Spine Surgery: a procedural guide to surgical excellence. Thieme. (In publication- release 2019).

Nayar G, Blizzard DJ, Wang TY, Cook S, , Vincent DA, Karikari IO. Pedicle screw placement accuracy using ultra-low radiation imaging with image enhancement versus conventional fluoroscopy in minimally invasive transforaminal lumbar interbody fusion: an internally randomized controlled trial. J Neurosurg Spine. 2018

**More Academic Publications online
at SentaraOrthoAnnualReport.com.**



COMMUNITY OUTREACH



ORTHOPAEDIC HOSPITAL AT SENTARA CAREPLEX

The Orthopaedic Hospital at Sentara CarePlex participates in many events throughout the community including the Peninsula Agency on Aging Wellness Café at the Community Forum on Aging Event. Our display focused on activities and exercises to maintain healthy joints.



ORTHOPEDIC HOSPITAL AT SENTARA LEIGH

The Orthopedic Hospital at Sentara Leigh hosted the third annual Sentara OrthoJoint Center® 1 Mile Stroll with over 100 community members joining the celebration as patients were able to show off their new joints.



SENTARA ALBEMARLE MEDICAL CENTER

Sentara Albemarle Medical Center supported EMS/AT training in their community. Dr. Jared Miller provided eight different scenarios in which four student athletes played the patient role and the ATs had to assess them and correctly identify the illness/injury and follow proper protocols along with EMS. To add authenticity to the training, the Nightingale Regional Air Ambulance made a surprise landing on the football field.



SENTARA HALIFAX REGIONAL HOSPITAL

On May 19, 2018, Sentara Halifax Regional Hospital, Sentara Southern Virginia Orthopedics and Sentara Dominion Health Medical Associates participated in the Sentara Wellness Day 5k and Fun Run at Halifax County High School in South Boston, Virginia. There were many exciting booths and vendors for visitors to explore and 75 individuals completed the 5k race. Educational materials were available to the public, as well as orthopedic models, giveaways and refreshments.



SENTARA MARTHA JEFFERSON HOSPITAL

In 2017, Sentara Martha Jefferson Hospital introduced a quarterly Reunion Brunch for its joint replacement patients. Several weeks after patients have been discharged, they are invited to join orthopedic nurses and physical therapists for a brunch to let us know how we can improve.



SENTARA NORFOLK GENERAL HOSPITAL

Nightingale nurses from Sentara Norfolk General Hospital provide education to the community. Nightingale often provides emergency transportation and care for trauma orthopedic and spine patients.

COMMUNITY OUTREACH



SENTARA NORTHERN VIRGINIA MEDICAL CENTER

Sentara Northern Virginia Medical Center encouraged community members to “Get Back in the Game” during their Sentara Orthopedics Night with the Potomac Nationals minor-league baseball team.



SENTARA OBICI HOSPITAL

Orthopedic surgeon at Sentara Obici Hospital, Dr. Geoffrey Wright, was interviewed for a Facebook posting before a community seminar at Sentara BelleHarbor. He shared information on joint health with the attendees at the seminar and a Facebook audience.



SENTARA PRINCESS ANNE HOSPITAL

The Sentara OrthoJoint Center® at Sentara Princess Anne Hospital hosted a community education event where Dr. Scott Grabill, a board-certified orthopedic surgeon, spoke on osteoarthritis and joint pain. This event, held at Sentara Edinburgh, educated over 50 attendees on ways to improve bone and joint health.



SENTARA RMH MEDICAL CENTER

At Sentara RMH Medical Center, Dr. Frank Cuce spoke at the semiannual Ortho 101 Seminar for Total Joint Replacements. This is open to the public with approximately 30-40 in attendance. This seminar helps people to know when is the appropriate time to get a total joint replacement.



SENTARA VIRGINIA BEACH GENERAL HOSPITAL

Orthopedic nurses and surgeons from Sentara Virginia Beach General Hospital made bronze sponsor donations and walked in the "5K: A Run for Kendra" in honor of a special friend.



SENTARA WILLIAMSBURG REGIONAL MEDICAL CENTER

At Sentara Williamsburg Regional Medical Center, recent joint replacement patients and their coaches enjoy a Reunion Lunch to celebrate their new joints and the ability to enjoy life again.

SPECIAL THANKS

PHYSICIAN LEADERS ON THE SENTARA HEALTHCARE ORTHOPEDIC HIGH PERFORMANCE TEAM

Jack Siegel, M.D. <i>Chairman</i>	Orthopedic Hospital at Sentara Leigh
Megan Swanson, M.D. <i>Co-Chairman</i>	Sentara Martha Jefferson Hospital
Dana Adkins, M.D.	Sentara Norfolk General Hospital
Daniel Cavazos, M.D.	Sentara Williamsburg Regional Medical Center
Michael Chung, M.D.	Sentara Medical Group
Frank Cuce, M.D.	Sentara RMH Medical Center
Jim Dowd, M.D.	Orthopedic Hospital at Sentara Leigh
Bryan Fox, M.D.	Sentara Obici Hospital
John Hall, M.D.	Sentara Martha Jefferson Hospital
Michael Holtz, DPM	Sentara Medical Group
Ryan Jander, M.D.	Sentara Northern Virginia Medical Center
Jonathan Mason, M.D.	Orthopaedic Hospital at Sentara CarePlex
Blake Moore, M.D.	Sentara Princess Anne Hospital
Richard Myers, M.D.	Sentara Norfolk General Hospital
Patrick O'Connell, M.D.	Sentara Virginia Beach General Hospital
Bernardo Ordonez, M.D.	Sentara Norfolk General Hospital
Mesfin Shibeshi, D.O.	Sentara Halifax Regional Hospital
Khoa Vo, M.D.	Sentara Albemarle Medical Center

SERVICE LINE LEADERS

Torie Bashay	Sentara Halifax Regional Hospital
Julie Billingsley	Sentara Northern Virginia Medical Center
Dianne Boone	Sentara Obici Hospital
Michele Carroll	Orthopedic Hospital at Sentara Leigh
Amanda Colley	Sentara Virginia Beach General Hospital
Beth Davis	Sentara Williamsburg Regional Medical Center
Margaret Deanes	Sentara Albemarle Medical Center
Abby Denby	Sentara Martha Jefferson Hospital
Shannon Ferguson	Orthopaedic Hospital at Sentara CarePlex
Keisha Jackson	Sentara Halifax Regional Hospital
Judy Jenkins	Sentara RMH Medical Center
Samantha Kern	Sentara Princess Anne Hospital
Kelly Lamping	Sentara Norfolk General Hospital
Jennifer Smiley	Sentara Martha Jefferson Hospital

SERVICE LINE SUPPORT PROFESSIONALS

Charity Anderson	Process Improvement
Aimee Barnes	Strategic Planning
Jacqueline Butler	Infection Prevention
Judy Cole	Materials Management
Robin Crane	Marketing/Customer Development
Alyssa Fisher	Sports Medicine and Outpatient Rehab
Cathy Gray	Materials Management
Victoria Gray	Administrative Support

Jessica Grippo	Finance
Christine Hall-Reichert	IT Support
Kathleen Hardesty	Acute and Post-Acute Rehabilitation
Angie Honeycutt	Sentara Martha Jefferson Hospital
Julie Lineberger	Performance Improvement
Jamie Marsh	Sports Medicine and Outpatient Rehab
Blair Miles	Materials Management
Marley Nacey	Finance
Michelle Packer	Sentara Medical Group
Maureen Ryu	Sentara Enterprises
Kelly Shaner	1-800-Sentara
Andrew Sharp	Decision Support
Chris Tagliente	Pharmacy
Bernadette Varnes	Sentara Life Care
Alan Wilson	Sports Medicine and Outpatient Rehab

ORTHOPEDIC AND SPINE PATIENT NAVIGATORS

Christina Angstadt	Sentara Princess Anne Hospital
Shannon Brown	Sentara Halifax Regional Hospital
Whitney Busby	Sentara Norfolk General Hospital
Anna Donahoe-Mick	Orthopedic Hospital at Sentara Leigh
Cathy Garcia	Orthopaedic Hospital at Sentara CarePlex
Rachel Haywood	Sentara Virginia Beach General Hospital
Ann Phillips	Orthopedic Hospital at Sentara Leigh
Leslie Scott	Sentara Albemarle Medical Center

Tracey Stallard	Sentara Obici Hospital
Connie Summy	Sentara Martha Jefferson Hospital
Tonya Turner	Sentara RMH Medical Center
Ada Vega-Diamantis	Sentara Northern Virginia Medical Center
Rita Wade	Sentara Williamsburg Regional Medical Center

SPECIAL RECOGNITION TO:

Howard Kern	Chief Executive Officer
Michael V. Gentry	Chief Operating Officer
Mary Blunt	Senior Vice President
Terrie Edwards	Corporate Vice President
Carole Guinane	Vice President, Sentara Orthopedic Services
Michele Carroll	Director, Sentara Orthopedic Services
Tyler Bennett	Manager, Sentara Orthopedic Services

GLOSSARY OF TERMS

We have provided this glossary for those readers who may not be familiar with some of the medical terms used in this annual report.

ACL (anterior cruciate ligament): The ligament in the knee that joins the upper leg bone and the lower leg bone

Anterior: Refers to the front

Anterior approach hip replacement (also see Jiffy Hip*): Minimally invasive hip replacement surgery using a frontal (anterior) approach

Arthroplasty: A surgical procedure that restores joint function

Arthroscopic (surgery): A minimally invasive surgical procedure used to diagnose and treat joint problems

Cupron antimicrobial technology: Copper-infused patient linens, thought to reduce infections and the need for antibiotics

DVT (deep vein thrombosis): A clot that lodges in a blood vessel

Embolism: Blood clot that becomes lodged in a blood vessel and blocks it

Fellowship: Advanced medical training

Glenoid: The part of the shoulder where the shoulder blade (scapula) connects to the upper arm bone (humerus)

Holistic care: An approach to wellness that accounts for the physical, emotional and psychological needs of a patient

Hypotension: Low blood pressure

Incision: A cut made in order to perform surgery

Intramedullary: Referring to the inside of a bone

Jiffy Hip* (also see anterior approach hip replacement): Minimally invasive hip replacement surgery using a frontal (anterior) approach

MAKOplasty®: Robot-assisted technology for partial knee, total knee replacement, and total hip replacement surgeries

Minimally invasive: Refers to a surgical procedure that only requires a small incision

MRSA (methicillin-resistant staphylococcus aureus): A strain of antibiotic-resistant bacteria that is difficult to treat and can affect many parts of the body

Multi-modal analgesia: Incorporating different pain control techniques to more effectively manage pain, with fewer side effects

Musculoskeletal (MSK) radiologist: A doctor who specializes in the imaging and diagnosis of problems relating to muscles, bones and joints

NAVIO®: Robot-assisted tool for partial knee replacement

Orthopedics: The branch of medicine dealing with the skeletal system

Osteoarthritis: Joint stiffness and joint pain caused by loss of cartilage over time

Patient Navigator: Specially trained orthopedic nurse that provides guidance and education for orthopedic patients and their families

PE: Pulmonary embolism, when a blood clot breaks loose and travels to the lungs

Perioperative pain control: Pain management before, during and after surgery

Periosteum: Specialized connective tissue that covers all bones

Posterior: Refers to the rear

Prophylaxis: A preventive treatment

Quadriceps: The four muscles that cover the front of the thigh

Regional anesthesia: A type of anesthesia administered to only part of the body

RN: Registered nurse

Subchondroplasty: A joint-preserving surgical procedure for chronic knee pain

Subscapularis: The triangular muscle that extends from the shoulder to the upper arm

Subspecialty: A highly specific area of expertise

VTE: Venous thromboembolism is the formation of blood clots in the vein including DVT and PE





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