

## Northwell Health Adult Reconstruction Service Advances Patient Care

by Giles R. Scuderi, MD, Vice President, Orthopaedic Service Line, Northwell Health

Hospitals are under increasing pressure from patients and insurers to provide quality care safely at a reasonable cost. In order to accomplish this goal, health care providers need to ensure that patients are properly evaluated prior to surgery and are managed appropriately upon discharge. The Northwell orthopaedic program continues to improve the quality of care for the Total Joint Program and patient experience by including preoperative patient optimization. In the past, surgeons would seek medical clearance from the patient's primary care physician, but now orthopaedic surgeons examine risk factors that can be remedied prior to surgery to reduce postoperative complications, decrease unplanned readmissions, reduce the length of stay and improve patients' overall health. In this issue of *Orthopaedic Bulletin*, Jonathan R. Danoff, MD, describes the steps Northwell has taken to optimize patients prior to total joint arthroplasty.

Northwell orthopaedic surgeons are also challenged with the treatment of several conditions that present with joint pain. While degenerative osteoarthritis is a common source of hip pain, osteonecrosis is another condition that can present with varying degrees of symptoms. Osteonecrosis is caused by a disruption to the blood supply to the femoral head by either trauma, certain metabolic conditions or, in about one-third of patients, no known cause. When diagnosed, treatment of the hip pain depends on the patient's condition, degree of bone involvement and the integrity of the femoral

head. Michael Mont, MD, a nationally recognized orthopaedic expert on osteonecrosis, reports on joint-preserving surgery in the treatment of hip osteonecrosis, along with complications of surgery. While joint preservation is preferred, especially in younger patients, severe cases with collapse of the femoral head usually require total hip arthroplasty.

Despite patient optimization, meticulous surgical technique and standardized perioperative clinical pathways, postoperative complications occur. One devastating complication is a postoperative periprosthetic joint infection. This catastrophic complication requires a multidisciplinary approach and draws upon multiple hospital resources. In the case presented by James Germano, MD, in addition to a periprosthetic joint infection, the patient had severe acetabular bone loss requiring the design of a custom acetabular component to address the bone defects.

These case reports document the experiences of Northwell adult reconstruction surgeons. Realizing that total joint arthroplasty has become the standard of care for end-stage arthritis of the hip and knee, and one of the most frequently performed orthopaedic procedures, our surgeons continue to strive to provide safe and effective care efficiently with a patient-centric approach.



Giles R. Scuderi, MD

### Dr. Nicholas Sgaglione

was recently elected as the Chairman of the Journal Board of Trustees for the *Arthroscopy Journal* and *Journal of Arthroscopic and Related Surgery*, the 5th highest impact factor orthopaedic journal.



Nicholas Sgaglione, MD

## How to Identify and Treat Modifiable Risk Factors Prior to Hip and Knee Arthroplasty

by Jonathan R. Danoff, MD, Orthopaedic Surgeon

Preoperative optimization is increasingly recognized as a cost-effective and efficient means of reducing risk while improving outcomes in patients undergoing total joint arthroplasty (TJA). Risks of TJA, including periprosthetic joint infection (PJI), acute blood loss anemia, deep vein thrombosis and hospital readmission, increase cost, with some studies demonstrating PJI to be associated with a greater than \$100,000 cost per episode. Historically, the onus was placed on the medical

consultants to clear the patient for surgery, which involved estimating risk, but little was done to address the individual risk factors. Given the need to reduce costs while improving outcomes in the Comprehensive Care for Joint Replacement and Bundled Payments for Care Improvement initiatives, arthroplasty surgeons have gained a new appreciation for the importance of medical



Jonathan R. Danoff, MD

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optimization prior to surgery and have improved collaborations with the patient and medical consultants to address each comorbidity prior to TJA. Although not all risk factors can be modified, such as rheumatoid arthritis, certain comorbidities that can be addressed include obesity, malnutrition, diabetes mellitus, nicotine use, concomitant infections, anemia, and liver or kidney disease. Morbid obesity affects more than 30 percent of individuals older than age 20 in the United States. Risk of PJI is increased as obesity is associated with longer operative times, need for allogenic blood transfusions and risk of delayed wound healing. BMI >35 kg/m<sup>2</sup> is associated with a PJI odds ratio (OR) 4.2, while BMI >50 kg/m<sup>2</sup> has an OR 21.3.<sup>1-3</sup> Many surgeons use a cutoff value for BMI >40 kg/m<sup>2</sup>, and patient education concerning obesity-related risks and mandated weight loss are suggested before TJA. Surprisingly, morbid obesity is also strongly associated with malnutrition, as patients with BMI >30 kg/m<sup>2</sup> have a 9 percent incidence of hypoalbuminemia and 43 percent incidence of low transferrin.<sup>4</sup> Patients recovering from TJA enter a hypercatabolic state, and patients who are chronically protein/calorie malnourished have an impaired ability to respond to the surgical insult and thus are at risk for delayed wound healing and PJI. Proper evaluation for malnutrition should include ensuring transferrin >200 mg/dl, albumin >3.5 g/dl and total lymphocyte count >1,500/mm.<sup>3,5</sup>

Hyperglycemia (random blood glucose >200 mg/dl) and poorly controlled diabetes mellitus is another risk factor. Associated complications include twofold risk for postoperative hemorrhage and threefold risk for stroke or death.<sup>6</sup> When this disease is chronic and poorly controlled, it is associated with an OR 3.75 for wound complication if the postoperative blood glucose rises >200 mg/dl postoperatively and OR 9.0 for PJI if the preoperative Hb A1c >6.7 percent.<sup>7</sup> Consensus statements indicate that patients at risk should be screened for Hb A1c >8 percent and sliding scale insulin should be utilized in conjunction with oral regimens postoperatively in patients with diabetes as needed to maintain premeal and random glucose levels <140 mg/dl and <180 mg/dl, respectively, although hypoglycemia must be avoided from overly intensive glycemic control.

Recently, surgeons have recognized nicotine use as an important consideration given the link to impaired hemoglobin-oxygen transport and induction of microvascular vasospasm in

healing surgical wounds. Multiple studies conclude that smoking is associated with an increased risk of complication (OR 1.18), deep wound infection (OR 1.47) and reoperation (OR 1.82).<sup>8,9</sup> Smoking cessation is partially protective and can decrease complication risks compared to nonsmokers, near baseline levels. Thus, nicotine avoidance should be encouraged for a minimum of four weeks preoperatively and postoperatively. Smoking cessation can be confirmed via urine cotinine and anabasine levels.

Hidden sources of active infection should also be addressed, including dental infections and symptomatic urinary tract infections. Given the difficulty of establishing large cohorts, studies have not directly linked preoperative dental infections and postoperative PJI, although maintaining oral hygiene is critical. Interestingly, dental abscesses have been found in 23 percent of patients preparing for TJA and separately have been identified as a potential source of hematogenous PJI in 0.04–0.07 percent of cases.<sup>10</sup> Screening is recommended for at-risk patients who use tobacco or narcotics, who do not floss or brush their teeth daily and who have not seen a dentist within the preceding year.<sup>11</sup> Asymptomatic urinary tract infections may not be associated with complications, although patients with dysuria and/or high concentrations of WBC in the urine >100,000 CFUs/ml should be screened with a urinalysis and treated with antibiotics preoperatively, although routine screening in asymptomatic individuals is not recommended.<sup>12</sup>

Risk factors that should be optimized also include chronic renal or liver disease and chronic anemia. The orthopaedic surgeon should consult a nephrologist and/or hepatologist for guidance. Among the most at risk for a complication in patients undergoing TJA are those with end-stage kidney disease who require dialysis, as this population has a >60 percent early complication rate.<sup>13</sup> Separately, anemia, which may result from chronic kidney disease or other etiologies, should also be addressed if the preoperative hemoglobin levels <9 g/dl. Maximizing hemoglobin preoperatively is critical to minimize the need for postoperative allogenic blood transfusions, which can increase infection risk.<sup>14</sup>

In risk stratifying a patient as a candidate for joint arthroplasty, comorbidities must be considered to minimize complication risk. While the preceding discussion does not include all

risk factors, continued vigilance by the orthopaedic surgeon to actively identify and address risk factors preoperatively is of paramount importance, as we seek to improve outcomes for arthroplasty patients.

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# CASE REPORT: Custom Implants in Revision Total Hip Arthroplasty

by James Germano, MD, Orthopaedic Surgeon

An 82-year-old man presented complaining of right hip pain and leg length discrepancy with a substantially shorter right leg. He reports six prior hip operations on the right hip including his most recent revision total hip arthroplasty (THA) about eight months ago. While he has had some relief following his right revision THA, he continued to have daily pain and difficulty ambulating. He also had a prior uncomplicated left THA.

Physical examination revealed 3 cm of shortening on the right lower extremity. The patient walks with a stiff abductor gait, and the right hip has painful limited motion. Radiographs revealed a revision THA, a high hip center and significant heterotopic calcification (Fig. 1). Initial blood work revealed the erythrocyte sedimentation rate (ESR) was 52 and CRP 0.8 mg/dl. Since the serology tests were equivocal, a right hip aspiration was ordered.

Elevated ESR and CRP have about a 95 percent sensitivity rate and 70 percent specificity rate for predicting periprosthetic joint infection.<sup>1</sup> Due to the lack of specificity, current research is looking at IL-6 as a possible better option.<sup>2</sup> Currently, we use serologic markers as a screening tool, then joint aspiration for definitive diagnosis if the labs are concerning, looking specifically at the cell count and percentages of neutrophils. This can increase sensitivity to over 90 percent. In hips, an elevated ESR or C-reactive protein (CRP) with a white cell count >3,000 and neutrophil >80 percent fulfills three of six minor criteria from the new MSIS guidelines.<sup>3</sup> Purulence, positive culture of one specimen, or 5 white blood cells (WBC) per high-power field are the last three criteria. Four of the six or one major criteria are required to confirm infection. The major criteria include a sinus tract or two positive cultures.<sup>4</sup>

In this patient, the initial joint aspiration attempt obtained no fluid, so sterile saline was injected into the joint and reaspiration was performed. While the results of the aspiration

were negative for infection, it was decided to proceed with possible two-stage revision THA. A second aspiration is up to the patient and physician based on their shared decision making and clinical plan. If the patient has a reason for pain and surgery is planned, a second aspiration can be avoided. If the patient has no other cause of pain, a second aspiration is recommended. Bone scan or indium WBC scan are rarely used to evaluate infection due to a high false positive rate; however, they can be obtained if no other cause of pain can be determined.<sup>4</sup>

In this case, a possible two-stage revision was planned, with the final decision made at the time of surgery based upon the clinical appearance and tissue histology. Intraoperative frozen sections help guide the treatment plan. The intraoperative frozen section revealed 20 WBC per high-power field. Due to this finding, we decided to proceed with removal of all the components and insertion of a mobile bearing antibiotic spacer.

Significant acetabular bone loss in the anterior and posterior columns further complicated this case. The prior acetabular component was well-fixed with an augment, but the hip center was high. The acetabular component was easily removed, but an extended trochanteric osteotomy was needed to remove the well fixed femoral stem. When possible, my preference is to use a mobile spacer with antibiotic cement as a temporary implant, but specific techniques must be employed when there is significant acetabular bone loss. Using numerous Steinmann pins that pierce the rim of the liner when the cement is still wet helps stabilize the acetabular construct, and they are easily removed at the second stage (Fig. 2). The well-fixed mobile-bearing spacer allows stretching of the tissues to make the second stage easier and significantly improves the patient function and comfort between the two stages.<sup>5</sup>

The smallest femoral stem was covered with antibiotic cement and used as a temporary fill for the femoral canal. I try to use a femoral

component with a long neck to keep the leg as long as possible and provide stability. In cases of extended trochanteric osteotomy (ETO) with good fixation of the bone fragment, I place a standard-size femoral implant and do not feel one needs to bypass the osteotomy site.

Following surgery, the patient was made toe-touch weight bearing with posterior hip precautions for six weeks. Intravenous antibiotics were given for six weeks based upon the recommendations of the infectious disease consultant. At six weeks with significant improvement in symptoms, the patient was allowed weight bearing as tolerated, but was instructed to use a walker. Based on overall bone damage, some patients are allowed to ambulate with a cane. Once comfortable, the patient was sent for a CT scan of the pelvis with the protocol for designing a triflange acetabular component.

The triflange acetabular component is a custom-designed implant created on a 3D printer. Following the CT scan, a full-size model of the pelvis with a provisional implant is sent to the surgeon for approval. Through an iterative process between the engineers and surgeon, a final design is approved. Once approved, the final implant is fabricated (Figs. 3 and 4).

Exposure and placement of a triflange prosthetic can seem daunting at first. Most of the planning is done prior to surgery with the help of the 3D model. When planning the iliac crest screws, maintain approximately a 45-degree angle on the screws to help facilitate placement. A minimum 56-diameter cup is recommended to accommodate any polyethylene liner including 36 constraint and 40 head for stability. If attainable, a 60 mm cup offers increased polyethylene thickness. The most difficult part of placing the implant is getting exposure of the iliac wing. Here are two

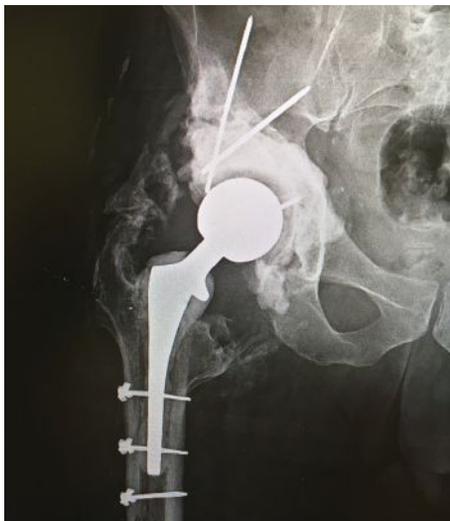


James Germano, MD

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**Figure 1:** Preoperative radiograph showing high hip center of the right total hip



**Figure 2:** Radiograph of mobile-bearing spacer. Notice the K-wires placed through the acetabular cement mantle to prevent dislocation.



**Figure 3:** 3D model of patient hemipelvis and a custom provisional of the planned triflange acetabular component. Notice the lack of anterior and posterior walls and columns.



**Figure 4:** The provisional triflange acetabular component is placed on the 3D pelvic model. The hip center is lower, and the sites for screw fixation are determined. Notice the high position of the screws on the iliac crest.



**Figure 5:** AP radiograph of the pelvis following reimplantation. The hip center and leg length are restored.



**Figure 6:** AP radiograph of the hip showing healed extended trochanteric osteotomy

key points: 1) A Taylor spine retractor has a wide base and small sharp point that sits perfectly on the iliac wing and helps retract the gluteus medius; 2) Excessive retraction of the medius stretches the superior gluteal neurovascular bundle and can tear the vein.

On the femoral side, a Wagner-type stem was placed due to the prior ETO. I prefer modular stems for these complex cases to allow for leg length and offset changes as well as the ability to adjust anteversion (Figs. 5 and 6).

The surgical site was closed in a standard fashion. No drains were used, but antibiotic absorbable beads were placed in all these cases, as infection is the major mode of failure of the implants. The patient was allowed toe-touch weight bearing on postoperative day one and was discharged on postoperative day

five when final cultures returned negative. It is my preference to continue all my second-stage implants on a minimum six months of oral antibiotics if patients tolerate the oral antibiotics without side effects. Depending on the patient's comorbidities I may extend oral antibiotics up to a year or for life.

The patient continues to do well with minimal lateral pain and some stiffness. He had recurrence of heterotopic ossification, as I choose not to use radiation therapy due to the complexity of the case and concern for ingrowth into the iliac wing and dislocation due to the chronic damage to his abductors. He occasionally needs a cane for long distances and takes no medications for pain. He is back to polka dancing, something his wife continually thanks me for.

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# CASE REPORT: Subtrochanteric Hip Fracture Following Core Decompression for Osteonecrosis in a Patient with a Pre-Existing Contralateral Occult Femoral Neck Fracture

by Michael A. Mont, MD; Connor Cole, PA; and Nipun Sodhi, BA

*Further details of this case have been published and can be found here: Berger RJ, Sultan AA, Cole CO, Sodhi N, Khlopas A, Mont MA. Subtrochanteric hip fracture following core decompression for osteonecrosis in a patient with a pre-existing contralateral occult femoral neck fracture. Surg Technol Int. Volume 12.*

## INTRODUCTION

### Osteonecrosis Overview

Several risk factors have been linked to osteonecrosis (ON) disease development. Approximately 80 percent of patients affected by this condition have a history of corticosteroid use and/or alcohol abuse.<sup>1-5</sup> Diagnosis and staging is primarily based on plain radiographs and magnetic resonance imaging (MRI).<sup>2</sup> Treatment options should be based on staging of the lesions.<sup>2,5</sup> For symptomatic pre- and early postcollapse lesions, 1) core decompression, 2) percutaneous drilling, 3) osteotomies, 4) biologics, 5) vascularized bone grafts (VBG) and 6) nonvascularized bone grafts (NVBG) have been utilized in attempts to save the femoral head.<sup>5,6</sup> In cases with collapsed and large lesions, as well as those with acetabular involvement, total hip arthroplasty may be the best surgical treatment to provide pain relief and to restore mobility.<sup>7</sup>

## CASE HISTORY

### Medical and Surgical History

An informed consent was obtained from the patient for using her clinical data. A 62-year-old Caucasian female presented with bilateral hip and groin pain that was exacerbated by walking and rising from a seated position. Her symptoms began six months prior, and she used a cane. She denied any traumatic event. On physical exam, she experienced minimal discomfort with bilateral hip internal and external rotation, hip flexion against resistance, log-roll and axial load.

Her past medical history was significant for osteoporosis, hypertension, type 2 diabetes, transient ischemic attack and idiopathic pulmonary fibrosis. She never smoked and did utilize alcohol. Her body mass index was

19.7 kg/m<sup>2</sup>. The patient's surgical history included a successful right lung transplant five years earlier. Her clinically relevant medications included the following: prednisone 5 mg daily, oral tacrolimus 4.5 mg daily, mycophenolate mofetil 1 gm daily, teriparatide 20 mg subcutaneous injection daily and pentamidine 300 mg inhaled every morning.

### Imaging

Plain radiographs showed patchy sclerosis throughout the femoral heads and an area of linear sclerosis through the right femoral neck. The joint space did not appear narrowed, nor was there evidence of articular surface collapse (Fig. 1). MRI of the pelvis without contrast demonstrated osteonecrosis in the bilateral femoral heads with bone marrow edema (Ficat Stage II). Also identified was an occult, nondisplaced, right femoral neck fracture. Based on the patient's presentation, plain radiographic findings and MRI staging, it was determined that the patient would benefit from left hip core decompression and right hip percutaneous fixation, the latter procedure being prophylaxis against femoral neck displacement.

### Operative Details

The patient was taken to surgery two weeks after her initial consultation. The right hip was treated with three 6.5 mm partially threaded cannulated screws. The left hip was simultaneously addressed with percutaneous drilling-type core decompression using a 3.6 mm Steinmann pin aiming for the center of the osteonecrotic lesion. Care was taken to start the cortical drilling at the lateral metaphyseal cortex to coequal to a point across from the proximal border of the lesser trochanter.

In the recovery area, the patient heard a distinct "pop" as she shifted in bed. She experienced an immediate left groin and thigh pain. A portable plain radiograph of the left hip showed a new subtrochanteric fracture (Fig. 2). The patient was brought back to the operating room and underwent a left hip open reduction and internal fixation with insertion of a long cephalomedullary nail. Intraoperative

fluoroscopic imaging showed satisfactory alignment (Fig. 3), and the patient left the operating room in stable condition. She was discharged home with 50 percent weight-bearing restriction bilaterally.



Michael A. Mont, MD

### Surgical Technique

The underlying principle of core decompression involves relieving pressure in the femoral head, which may slow the healing process or creeping substitution that leads to head collapse. Newer techniques involve multiple smaller 3.4 mm drill holes, decreasing the risk of perioperative fracture.<sup>7-9</sup> Although this procedure has been reported to be highly successful, core decompression can be an independent risk factor for iatrogenic hip fractures especially in patients who are already at risk for developing ON, such as this patient. Due to this interesting balancing dynamic, we present a case report for bilateral hip osteonecrosis requiring bilateral core decompression and associated with a preoperative diagnosis of unilateral occult femoral neck fracture and postoperative development of contralateral subtrochanteric fracture following core decompression.

### Follow-Up

At a six-week follow-up, the patient was pain-free and participating in outpatient physical therapy. Her radiographs from this encounter showed intact hardware, no evidence of disease progression on the right, callus formation on the left and both hips remained in good anatomic alignment (Fig. 4).

### Discussion

Despite following published recommendations, the patient still sustained a subtrochanteric fracture.<sup>5</sup> Given that this fracture occurred in bed while shifting, weight-bearing restrictions would not have helped prevent the fracture. In addition, plain radiographs and MRI did not

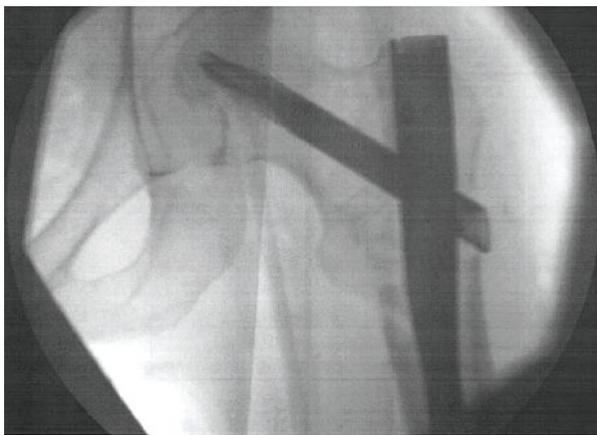
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**Figure 1:** Presenting anterior-posterior X-ray showing patchy sclerosis throughout the femoral heads and an area of linear sclerosis through the right femoral neck



**Figure 2:** Anterior-posterior plain radiograph taken in the postanesthesia care unit showing the new left subtrochanteric fracture and adequate fixation on the right



**Figure 3:** Intraoperative fluoroscopic image showing the well-fixed subtrochanteric fracture using a cephalomedullary nail



**Figure 4:** Plain anterior-posterior radiograph taken at six-week follow-up visit showing adequate bilateral fixation and healing left subtrochanteric fracture

identify a left hip fracture preoperatively and were performed several weeks prior to surgery. There were no traumatic interim events. Considering the patient's history of ON, corticosteroid use, osteoporosis, diabetes and a prior femoral neck fracture, placing her at an increased risk of subsequent fracture, core decompression and prophylactic fixation of the contralateral hip deserved consideration. However, deciding to use prophylactic fixation becomes problematic, since percutaneous pinning would not address an intertrochanteric or subtrochanteric fracture as would a cephalomedullary nail. Additionally, instrumentation comes with its own drawbacks, such as the risk of iatrogenic fracture, articular perforation, symptomatic hardware and expense.

### Recommendations

Prophylactic fixation is suggested on a case-by-case basis and carefully discussed with the patient in the preoperative setting.

Currently there is limited evidence to support prophylactic fixation, and this is an area for future research. We would suggest appropriate perioperative optimization for patients undergoing core decompression from a medical and nutritional standpoint to mitigate the risks of a perioperative fracture. In addition, we suggest that percutaneous pinning is appropriate for nondisplaced femoral neck fractures in the setting of ON. If displacement is identified preoperatively or at the time of surgery, arthroplasty may be considered, as further disruption of the blood supply to the femoral head would likely accelerate collapse.

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# CONNECTED TO CARE — Operation Walk USA, Northwell Health Orthopaedics and Beyond

by Asha Jacob, DPT

Northwell Orthopaedic Institute participates in Operation Walk USA — a nationwide humanitarian endeavor in which orthopaedic surgeons and facilities donate services to those in need of total hip and knee replacement and do not have the financial resources to afford the surgery. Northwell Health has participated in Operation Walk USA since the founding of the program in 2010. This year, what started out with two facilities, three surgeons and four patients quickly evolved into a systemwide effort including commitment from multiple facilities, services and partners to ensure that these patients did not just undergo total joint replacement, but that they would receive the best care Northwell has to offer.

Orthopaedic surgeons Giles R. Scuderi, MD, Matthew S. Hepinstall, MD, and Jonathan Danoff, MD, made the commitment to donate their surgical skills and perform surgeries at LIJ Valley Stream Hospital and Lenox Hill Hospital. This commitment included the entire spectrum of care, from X-rays, presurgical testing and medical clearances, to postoperative rehabilitation including Orzac and Stern Centers for Rehabilitation, Northwell Health home care and STARS. Both Lenox Hill Anesthesiology and North American Partners in Anesthesia donate their services annually as well.

This year's patients were in desperate need of help, some traveling more than two hours to receive care, and others requiring more than

just the usual services offered through the program. Dr. Hepinstall's patient, Richard Murphy of Connecticut, received a total hip replacement and was operated on at Lenox Hill Hospital in December. Dr. Scuderi's patients, Eleticia Turcios, a woman from Inwood, NY, and Ty Peck from Tuckahoe, NY, an athlete suffering from past injuries, both received total knee replacements. Dr. Danoff's patient, Carol Hotaling of New Jersey, was operated on at LIJ Valley Stream, but required significant preparation prior to having her total hip replacement, so much so that the Operation Walk USA window, which occurs annually during the first week in December, was extended through February to coordinate additional care.

Aside from the standard preoperative screening criteria, patients underwent preoperative optimization for pre-existing medical comorbidities. This required recruitment of additional partners and resources to meet the need. Among those who rose to this humanitarian cause were Scott K. Danoff, DMD, who provided the outpatient dental exam, and Dr. Gerardo Romeo, DDS, whose team performed the dental procedures at LIJ Medical Center's Dental Clinic, that were required to prepare Ms. Hotaling for surgery. Medications were covered and coordinated for the patients by the team at LIJ Vivo Pharmacy. Outpatient therapy for Operation Walk USA patients has been provided by Northwell's STARS outpatient



facilities every year, and this year, in addition to STARS, Phelps Department of Physical Medicine and Rehabilitation also participated to accommodate patients in the Northern Region. When asked about the Operation Walk USA initiative, Dr. Scuderi, a member of the Operation Walk USA Executive Board, responded, "As the reach of Northwell Health broadens, so does our capacity to provide needed care for our surrounding communities. Operation Walk USA is a way for us to use our skills to help those incapacitated by hip or knee arthritis and in dire need for surgery. To have the full support and resources of Northwell Health and all its resources behind this humanitarian endeavor ensures we can deliver life-altering outcomes while caring for the complete patient."

TO LEARN MORE about Operation Walk USA, visit the website at [www.opwalkUSA.com](http://www.opwalkUSA.com).

## JPAR Drives Northwell Arthroplasty Systemwide Program

by Alanna Carcich

The Joint Preservation and Restoration (JPAR) Committee vision, parallel with Northwell's vision, is to drive the future of health care, promote wellness and enhance the quality of life for our patients.

The mission of the Joint Preservation and Restoration Committee is to gather key physician resources and administrative resources, utilize expertise and promote evidence-based protocols to improve joint replacement performance across the health system. The intention is to standardize the patient experience throughout Northwell Health and reduce unnecessary variation; deliver a coherent and uniform patient experience; provide consistent alignment of expectations; provide standardized patient education with well-defined proto-

cols; and evaluate institutional and physician outcomes with consistent metrics obtained through integrated data sets. The concept is to bring together the resources of the multiple disciplines participating in total joint replacement and create a care model for all total joint patients across the Northwell Health System. While chaired by a senior orthopaedic service line leader, the team is comprehensive and includes both clinical and administrative leaders representing the majority of the hospitals across all regions of Northwell. With a collaborative multidisciplinary approach, this program may be one of the first to bring together orthopaedic surgeons, internal medicine, anesthesia, postacute services, health solutions, hospital administration, the orthopaedic service line and

research coordinators. With regularly scheduled meetings, the team reviews the clinical outcomes at each of the hospitals within Northwell and tackles ongoing clinical issues through subcommittee work, which ultimately report to the entire team for consensus and implementation of clinical guidelines or protocols. The success of this systemwide program is through collaboration.

Strategies for Success affecting thousands of patients include:

- **Patient education** — class, book and online methods;
- **Standardization** — of order sets, patient education materials, patient mobilization expectations, anesthesia and DVT protocols;

*continued on back page*

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# From the Editor's Desk: A Celebration of Research

The Second Annual Orthopedic Resident and Fellows Research Symposium was held at MEETH on April 19. Residents and Fellows from all the orthopaedic programs across Northwell submitted their research projects for this competitive program. Following presentation of the highest peer-reviewed papers and posters, the following were the award winners:

**First place: Shachar Kenan, MD,** Long Island Jewish Medical Center — 5-aminolevulinic acid tumor paint and photodynamic therapy for chordoma: An in vitro study

**Second place: Andrew Mo, MD,** Lenox Hill — The AO spine thoracolumbar spine injury classification system: Is it useful in the pediatric spine trauma population?

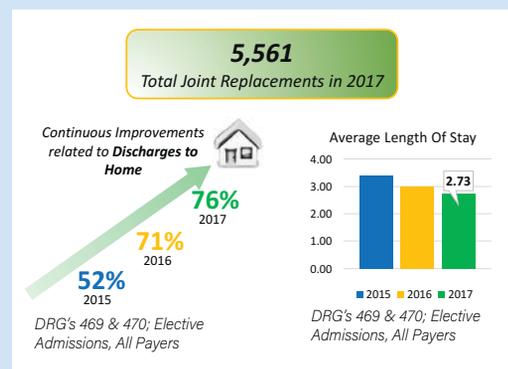
**Third place: Elan Golan, MD,** Maimonides — Alterations in glenohumeral forces following rotator cuff injury and repair

**Poster winner: Susete Carneiro, MD,** Lenox Hill — Quantifying the incidence of component asymmetry in simultaneous bilateral total knee arthroplasty



## JPAR Drives Northwell Arthroplasty Systemwide Program *continued from page 7*

- **Communication** — consistent messaging throughout continuum of care;
  - **Collaboration** — across disciplines and care providers to establish and implement protocols and best practices; and
  - **Oversight** — monitor individual practices and metrics to remove any perceived barriers. Standardized metrics monitored monthly include volume, length of stay, discharge to home, readmission rates and complications.
- Achievements across multiple sites in all regions include:
- Development of evidence-based guidelines for DVT prophylaxis;
  - Reduction of surgical-site infection through preoperative MRSA screening;
  - Standardized discharge instructions and order sets for total knee replacements, posterior total hip replacements and anterior total hip replacements, which have been incorporated into our EMR systems;
  - Development of subcommittees with focus on hip fractures, hospitalists/comanagement program, same-day joints, discharge instructions, protocols and order sets, anesthesia guidelines, postacute services, bundled payments, patient education and outcomes tracking; and
  - Reporting outcome measures for each of the hospitals within the bundle payment



plan (BPCI and CJR) to create a competitive environment for improvement and understanding of institutional, regional and national benchmarks.