

Joint Replacement Surgery at Mammoth Hospital



The Multi-Disciplinary Joint Replacement Team at Mammoth Hospital: “Cura Personalis” Treating the Whole Patient

Ancient fountains of youth don't really work and neither do crazed diets nor hair dyes...on some level, we all know this. Let's face it, getting older is a part of life that none of us can avoid. Unfortunately, as we get older, so do all of our parts, including our joints. This presents a serious problem for those of us who enjoy living, working and recreating in the mountains. With the rising number of people in our country living past the age of 65, the rate of joint replacement surgery is expected to increase by 400% by the year 2025. So an obvious question for all of us living in the Eastern Sierra is, "When it gets too painful to walk, play or just function, where should we go to have our surgery?"

In the past, that answer would have seemed easy; for the best outcome, one has to travel to a large city hospital where this surgery is done every day. But in today's world, there is more and more evidence to suggest that bigger is not necessarily better. In May of 2016, a peer-reviewed article was published in the Journal of the American Medical Association where researchers looked at the outcomes for common procedures done at large hospitals as opposed to smaller,

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critical access hospitals similar to Mammoth Hospital in Mammoth Lakes, CA. What the researchers found was interesting and pertains to all of us who live in the Eastern Sierra. Not only were there no differences in surgical outcomes between patients operated on in large versus small institutions, but overall, there were less serious complications, less infections, and less Medicare expenditures when procedures were done at smaller facilities. Additional bonuses of staying local include less travel time, reduced travel expenditures, a personalized approach to health care and improved patient satisfaction.

With all of this in mind, having your joint replacement surgery at Mammoth Hospital increasingly seems to be the obvious choice. Board Certified and Fellowship trained Orthopaedic Surgeon Michael M. Karch, M.D. and his Arthroplasty Specialty Surgical Team have been successfully performing Knee and Hip replacement surgeries at Mammoth Hospital since 2003 and continue to expand the Joint Replacement Program for the entire Eastern Sierra inter-mountain communities. Karch, who Co-invented innovative technology for the operating room called Smart Medical Devices, Inc., has served as a physician for the United States Ski and Snowboard Teams since 2003 and is Internationally known for Humanitarian Mass Casualty Response and Teaching, heads the Mammoth Hospital's Multi-Disciplinary Joint Replacement Program.

The "Cura Personalis": Treating the whole person:

The Multi-Disciplinary Joint Replacement Team is a novel, team-based approach to health care jointly initiated approximately 18 months ago by Karch, Kurt Smith, M.D., a Mammoth Hospital Anesthesiologist, who was the brainchild behind coordinated pre-surgical evaluation at Mammoth Hospital, and Mammoth Hospital Chief Medical Officer, Craig Burrows, M.D. The theory plays on the concept of "Cura Personalis", a Latin motto taken from Karch's Alma Mater, Georgetown University School of Medicine. This roughly translates to: "To take care of the whole person." In this comprehensive approach to health care, not only is a potential joint replacement patient evaluated by an Orthopaedic Surgeon before surgery, but importantly, he or she is also evaluated by a number of different specialty professionals including those in Internal Medicine, Anesthesia and Psychiatry, a Physician's Assistant, specialty-trained nurses, a registered nutritionist, a physical therapist, an orthopaedic technologist, an athletic trainer for pre and post-surgical strength development, a surgical scheduler, a case/social worker and a specialist in medical insurance and finance. In this way, between the time the patient presents to the clinic and the actual date of surgery, the specialty team spends weeks to months prior to surgery, focusing on the specific needs of each individual patient. The joint replacement patient is looked at from a number of different professional viewpoints, all working to improve the recognized metrics that are known to contribute to the overall success and satisfaction of a surgical candidate. Specifically, weight loss, nutrition, improving muscle tone, flexibility and

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balance, sleep abnormalities, smoking, drug and alcohol cessation and psychiatric well-being are all addressed BEFORE surgery in order to ensure the best surgical outcome AFTER surgery. The complexities of medical insurance and payment plans are also solved with the help of a dedicated specialist in these fields. Individual plans for Skilled Nursing or Home Health assistance are arranged for the patient ahead of time at the monthly Multi-Disciplinary team meeting in which every patient file, three months before and three months after surgery, is individually and comprehensively reviewed by the group. After three months of intense physician and committee follow-up, all joint replacement patients are then followed up on two year intervals. In this wide-scoping view, it is not just the “joint” that needs replacing, it is the whole person, the “Cura Personalis” that is comprehensively addressed.

In order to care for the whole person effectively, the Multi-Disciplinary Team must function like a small army. Within the Multi-Disciplinary Joint Replacement Team, a pre-operative clearance sub-group, led by Physician Assistant, Jim Bold, PAC works to make sure that all tests, X-rays and studies are coordinated with Dr. Karch in an efficient manner. Importantly, in addition to actual patient care in the pre and post-operative period, Mr. Bold works with the industry manufacturer to make sure that specialized components for either the hip or knee replacement are ordered based on pre-operative size templating. In this sense, Dr. Karch and Mr. Bold are responsible for the overall coordination of each patient case and the technical aspects of each surgical case. Cardiac monitoring, diabetic glucose control, kidney and pulmonary functions are monitored by the physician internist team of Craig Burrows, M.D., Sean Park, M.D. and David Araya, M.D. and one of the three staff anesthesiologists. Tina Allec, R.N., Heather Tindall, R.N. and Suzan DeBono, R.N. evaluate all of the health clearances and nursing parameters and, with the assistance of the social worker/case coordination team co-lead by Mona Logan, R.N. and Terri Eckert, R.N., coordinate specific patient needs with regards to aftercare prior to the operation. After all this is completed, Leticia Bravo, works with the patient to schedule an appropriate surgical time and date. This date is then coordinated with Brian Hilliard, RN, head nurse on the Mammoth Hospital inpatient ward to fall on the specific “Joint Weeks” of each month. Joint Week is the second week of each calendar month dedicated to performing all hip and knee total joint replacement surgeries consecutively in order to maximize efficiency of staffing, instrumentation and resources. During Joint Week, the inpatient ward nurses meet daily on the Internist-led “Multidisciplinary Ward Rounds” in order to provide continuity of care and complete a Coordinated Care Plan for each individual patient. This daily plan is then conveyed to the patient and family both verbally and also visually on a “White Board” which is hung at eye level in each patient’s room. Once a month, during each Joint Week, the entire Multi-Disciplinary Team at large, in addition to Senior leadership led by Gary Myers, Melanie Van Winkle and Kathleen Alo, R.N. of the Hospital Administration, meets for approximately 2 hours to discuss the progress of every single patient from three months before thru three months after surgery. This forum is co-led by Dr. Karch from an Orthopaedic standpoint and Dr.

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Burrows from an Internal Medicine perspective. From top to bottom, communication and efficiency, though a systems-based approach, is the Modus Operandi of this group. The “whole” patient view is emphasized and “Cura Personalis” is at work again.

Results That Matter: Improving The “Whole Person” and “Whole Community”

One Joint At A Time

Narcotic (opioid) pain medication is a critical and rising health concern in American Medicine and especially for post-operative surgical patients. In 2015, the Associated Press reported that more Americans died from physician-prescribed narcotics (52,000) than did in either motor vehicle accidents (37,000) or firearm-related deaths (36,000). Prevention of this dangerous problem is a forefront issue for the Mammoth Hospital Multi-Disciplinary Joint Replacement Team. Dr. Karch and colleagues, Brian Gilmer, M.D. of the Mammoth Orthopaedic Institute, Jennifer Harkins, M.D. of the Mammoth Anesthesia Department and resident physician, Xander Parisky, M.D., critically looked at a consecutive cohort of these joint replacement patients compared to a control and recently published their results in the peer-reviewed scientific journal, *Progress in Orthopedic Science*. Using novel approaches to post-operative pain control initiated by Karch at Mammoth Hospital in 2013, the local authors showed a 66% reduction of Morphine Equivalents (Narcotic Pain Medication) in the post-operative period, a significant reduction of hospital length of stay from a National average of 3.4 days to Mammoth Hospital’s average of 1.1 days and a significant reduction in Visual Analog Pain Scales at the time of discharge from National Average of 2.44 to 0.88 at Mammoth Hospital following knee and hip replacement surgery. Importantly, the group showed a 30-day hospital re-admission rate of 0.8% compared to national average of 4% and a 90-day re-admission rate of 0.9% compared to a national average of 7%. Using the A.A.N.A Surgical Outcomes Systems (Arthrex, Inc) analysis software, statistics show that post-operative patients at Mammoth Hospital are well controlled in their pain (both as an inpatient and also as an outpatient), despite a dramatic reduction in narcotic use. These patients do better, with regards to pain control, than national averages but consume significantly lesser amounts of dangerous opioids. But also, this data importantly reflects the success of the comprehensive preventative work done ahead of time by the Multi-Disciplinary Joint Replacement Team to ensure a smooth and safe transition from the hospital to the home environment in the early post-operative period. The “Cura-Personalis” theory works with numbers to prove it.

Following the initiation of the Multi-Disciplinary Joint Replacement Team in 2015 where patients are optimized before surgery in order to reduce complications and improve outcomes

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after the procedure, infection rates at Mammoth Hospital dropped to 0.0% in 2016 from an already low rate of 1.4% in 2015. With the National Quality Improvement Program (NQIP) reporting the national average of 2.1% infection rate for primary joint arthroplasties, Mammoth Hospital offers a statistically safer environment for joint replacement surgery as compared to larger institutions with higher documented infection rates.

Why is this? Specifically, members of the Multi-Disciplinary Joint Replacement Committee are tasked with educating patients and optimizing individual patient risk factors which are known to affect post-operative infection rates. Casey Piercey, RD, CSSD, a registered dietician works with pre-operative patients on nutrition, weight loss and diabetes control, all of which are known contributors to post-operative infection. Her goal is to reduce patients Body Mass Index to a level below 35 which has been shown to be statistically significant in reducing the risk of post-operative complication. More importantly, in the "Cura-Personalis" approach to treating the whole patient, Casey's work is instilling vital education by teaching healthy eating and lifestyle behaviors which then allow a patient (and their family members) with a new joint replacement to keep the weight off and stay healthy for the long-term. Casey's work has obvious, wide-scoping ramifications on the improved health of our entire community.

According to the Centers for Disease Control, in the United States alone, approximately 480,000 deaths per year are attributable to smoking. Further, smoking costs the United States approximately \$170 billion in direct medical costs and an additional 156 billion in lost productivity. Specific to total joint replacement patients, smoking is directly related to increased rates of infection, increased re-admission rates, increased total complication and surgical failure rates and consequently, is a major contributor to overall National Health care expenditures. Smoking cessation (both prior to and also after surgery) is one of the primary goals of the Multi-Disciplinary Joint Replacement Team and is headed by Monica Delson, RN. Monica identifies and works with patients on alcohol, smoking and drug cessation prior to surgery. Simply put, patients are delayed from having joint replacement surgery at Mammoth Hospital until they quit smoking and using illicit drugs and also reduce their alcohol intake to less than two drinks per day as all have been shown to be independent variables causing increased rates of infection. Just like Casey, Monica's work has proven effective in the long run as the Multi-Disciplinary Joint Replacement Committee has shown in yet-to-be published data that greater than 70% of patients who were smokers before surgery have now quit indefinitely after surgery at two-year follow-up. This achievement has far-reaching impacts for personal, community and public health at large. Results like these matter and are recognized as effective strategies to both improve public health and reduce national health-care expenditures thru less-expensive, more long-lasting, preventative techniques. In addition to being a "Low Volume" hospital where less patient and family traffic represent less bacteria brought in from the outside, Mammoths' elevation of 8000 feet present a challenge to even the most ardent of

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bacteria. Further, as part of the Multi-Disciplinary Joint Replacement Team, anti-infection specialist, Margy Klammer, RN ensures these low infection rates with the use of state-of-the-art hand-washing education and hygiene modules for both patients and hospital staff alike. Margy and her team perform routine swabbing and testing of all surfaces, ensure the integrity of body exhaust space suits for surgical personal, regulate negative-pressure, laminar air flow in the operating rooms, and prescribe and monitor anti-bacterial nasal spray for all surgical patients. In addition, Margy researches the most up-to-date practices of peri-operative antibiotics, antibiotic laden fluids used within the operative case and special ionic-based “battery” dressings that covers the skin after the operation in order to kill any residual bacteria around the incision for 7 days after surgery. The ethical core of the Multi-Disciplinary Joint Replacement Team believes that there is a “right” way and a “wrong” way of performing Joint Replacement Surgery. While any surgeon at any institution can replace joints as one would a motor vehicle part, curing one patient at a time, as a “whole patient” rather than as a part, affects the “whole” individual, and therefore his or her entire community, in a positive way. This can only be accomplished through the use of a multi-talented, efficient team committed to this higher purpose.

Innovative Surgeries to Match the Goals of the “Whole Person”:

The Direct Anterior Total Hip Arthroplasty.

Keeping in line with the theory of the “Cura Personalis”, a surgeon should perform the surgery that best matches the goals and lifestyle of each, individual patient. Although total hip replacement surgery remains one of the most successful operations in orthopedic surgery with regards to patient satisfaction surveys, there are still inherent problems with the traditional posterior surgical approach that may cause problems in the immediate and long term post-operative course. Dislocation of the components, leg length discrepancies, pain and loss of power as well as early wear and breakdown of the components requiring expensive revision hip surgery are among the most commonly cited problems with hip replacement surgery. Recently, minimally invasive and tissue sparing procedures have gained attention as patients demand shortened recovery times, accelerated rehabilitation, and a return to a higher level of function. This is especially true in patients that place physically high demands on their hip such as those cyclist, climbers, skiers, ranchers, workers and mountaineers found in the Eastern Sierra. In an effort to constantly improve surgical outcomes, the Direct Anterior Approach to the hip was introduced to the United States from Europe as a way to possibly improve on these outcomes, reduce rehabilitation times and reduce the complications associated with the more traditional approaches to the hip.

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Currently, about 20% of surgeons in America have adopted this new approach for some of their hip replacement surgeries and only about 10% have converted to this approach 100% of the time. Due to its obvious benefits to patients such as those in the Eastern Sierra, Dr. Karch was an “Early Adopter” of this technique and began performing Anterior Approach Total Hip Arthroplasties in 2006 at Mammoth Hospital. The Arthroplasty Surgical Specialty Team at Mammoth Hospital, led by Jaymee Davis, BSN, RNFA, CNOR, CPHQ, and Chris Wiley, CST, lead surgical technician, have undergone specialized didactic and cadaver-based training in Anterior Approach surgery. Today, after 11 years of using this technique, this procedure can be done at Mammoth Hospital in approximately 75-90 minutes with 86% of patients staying in the hospital less than 24 hours. According to outcomes data collected by the team, Anterior approach patients undergoing surgery at Mammoth Hospital show a dislocation rate of less than 1% which is a dramatic reduction from the National Average of 4% as seen with a traditional posterior approach and slightly better than national averages for the Anterior Approach. Most importantly, due to the supine (lying flat on back) position of the patient in the Direct Anterior Approach, the pelvis can be made symmetric on the specialized Pro-Fix operating table, which was designed specifically for the Anterior Approach, and intraoperative fluoroscopy (live x-ray) can be accurately used to place components within +/- 1mm or +/- 1 degree of perfect anatomic position. The Fluoroscopic guidance allows components to be reproducibly placed within accepted angles and measurements which decrease the overall incidence of leg length discrepancies and component wear as compared to the traditional posterior approach and adds to the overall longevity of the implant. Taking the initiative to consistently be on the cutting edge of innovation and technology is the responsibility of both the surgeon and the surgical team if one accepts the premise of the “Cura-Personalis”, treating the “Whole Person” as a unique entity in order to improve and maximize patient satisfaction and surgical outcomes.

After the Anterior approach to the hip, patients leave the hospital full weight bearing with no restrictions of their movement, no braces nor night pillows and no restrictions on their activities. The majority of patients return to work within one to two weeks and frequently, are hiking and skiing within two months of their operation. This outcome, of course, has as much to do with the operation as it does with the last component of the Multi-Disciplinary Team, the Physical Therapy Department which is led by Karilyn Myers, PT and encompasses both Mammoth Hospital inpatient and outpatient clinics as well as the Bishop outpatient facility. Karilyn demands a patient-focused and literature-based approach to be taken by this massive team of 20 licensed Physical and Occupational Therapists and Physical Therapy Assistants. In addition to sessions directed towards improving gait, strength and balance before surgery, patients are seen within a few hours after surgery and required to walk. As published in the

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Journal of Arthroplasty Fall 2016, being seen by a physical therapist the day of surgery rather than the traditional “next day” has been shown to dramatically decrease hospital length of stay, decrease the risk of fatal blood clots and improve early outcomes. In this sense, hours matter and early movement is important for active patients who live and work the Eastern Sierra. With hip and knee replacement surgery, new and advanced physical therapy protocols are constantly evolving to match changing technology and these advancements are led by supervisors Lorraine Koenig, PT in Mammoth and Chris Matteson, PT, OCS, ATC in Bishop. Not only does the physical therapy team focus on the traditional modalities of range of motion and gait mechanics, this group intensively works on balance and strength, both of which, in recent peer-reviewed, scientific articles have shown to contribute to overall improved outcomes and early return to activities of daily living as well as return to higher demand activities. Further, as demonstrated by the outstanding done work by Brian Dennison, DPT, OCS, CSCS, FAAOMT, Olympic-style powerlifting techniques are incorporated into the post-therapy regimen at Snowcreek Spa and Fitness Center in Mammoth Lakes in order to build super-strength and take the patient beyond normal expectations and allow them to participate in what we call “normal” activities for the Eastern Sierra. Whereas the average patient in other areas of the country might be satisfied with golfing or walking through the mall after surgery, Brian and his fellow therapists at Mammoth Hospital and Bishop outpatient clinics recognize that Eastern Sierra residents simply demand more. Again, the “Cura Personalis” theory at work as members of the Multi-Disciplinary Joint Replacement Team recognize that each patient is an individual with unique life-style demands, goals and expectations.

The “Cura-Personalis”, treating the “whole person” approach to Joint Replacement Surgery is novel and is seen in few, if any hospital centers, large or small, within the United States. Two-year, long term follow up data are currently being collected through the Surgical Outcomes Survey software (Arthrex, Inc.) in order to publish these results in peer-reviewed scientific literature. The Multi-Disciplinary Joint Replacement Team at Mammoth Hospital capitalizes on the talents and skillsets of a wide-variety of health professionals, all focused on improving the outcome of one, unique patient at a time. Mammoth Hospital may be small in size, but is a giant when it comes to being the “Tip of the Spear” with regards to implementing innovative technology and protocols in order to give patients the best possible outcome. From many different perspectives, the best option for hip or knee joint replacement surgery may very well be right here in our own back yard. And with a new joint and less pain, residents of the Eastern Sierra can focus on adding years to their life and life to their years!