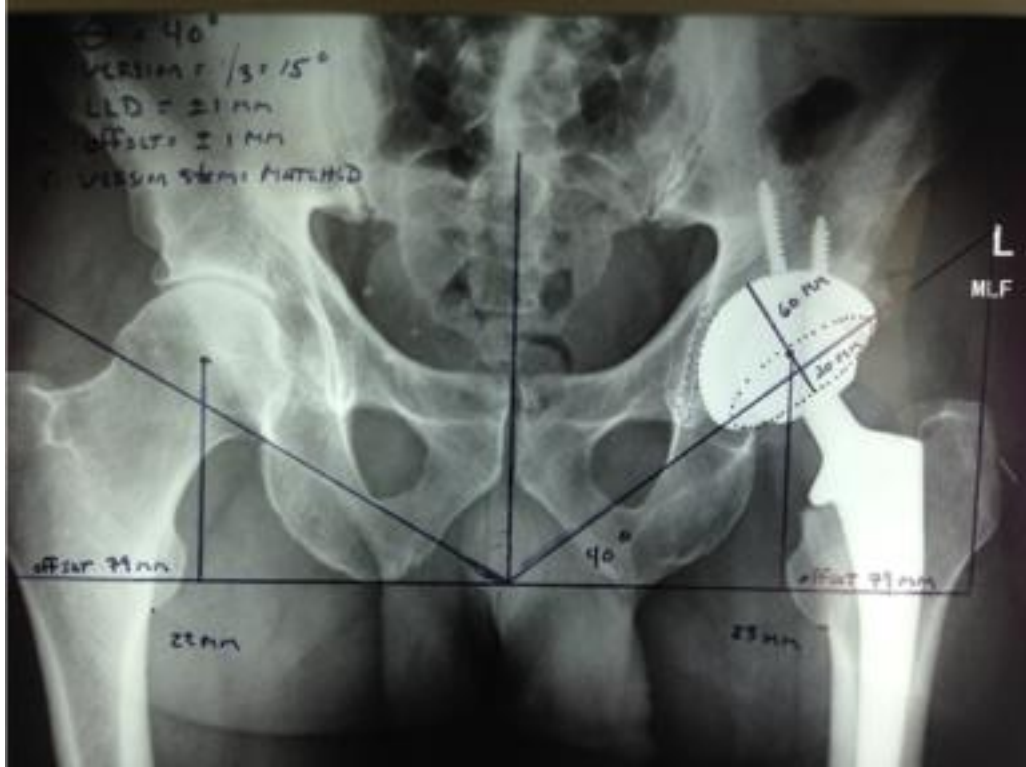


Joint Replacement Surgery at Mammoth Hospital



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The Multi-Disciplinary Joint Replacement Team at Mammoth Hospital:

“Cura Personalis” Treating the Whole Patient

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

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

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

26 With all of this in mind, having your joint replacement surgery at Mammoth Hospital
27 increasingly seems to be the obvious choice. Board Certified and Fellowship trained
28 Orthopaedic Surgeon Michael M. Karch, M.D. and his Arthroplasty Specialty Surgical Team have
29 been successfully performing Knee and Hip replacement surgeries at Mammoth Hospital since
30 2003 and continue to expand the Joint Replacement Program for the entire Eastern Sierra inter-
31 mountain communities. Karch, who Co-invented innovative technology for the operating room
32 called Smart Medical Devices, Inc., has served as a physician for the United States Ski and
33 Snowboard Teams since 2003 and is Internationally known for Humanitarian Mass Casualty
34 Response and Teaching, heads the Mammoth Hospital's Multi-Disciplinary Joint Replacement
35 Program.

36 **The "Cura Personalis": Treating the whole person:**

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

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

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

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

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

97 **One Joint At A Time**

98

99 Narcotic (opioid) pain medication is a critical and rising health concern in American Medicine
100 and especially for post-operative surgical patients. In 2015, the Associated Press reported that
101 more Americans died from physician-prescribed narcotics (52,000) than did in either motor
102 vehicle accidents (37,000) or firearm-related deaths (36,000). Prevention of this dangerous
103 problem is a forefront issue for the Mammoth Hospital Multi-Disciplinary Joint Replacement
104 Team. Dr. Karch and colleagues, Brian Gilmer, M.D. of the Mammoth Orthopaedic Institute,
105 Jennifer Harkins, M.D. of the Mammoth Anesthesia Department and resident physician, Xander
106 Parisky, M.D., critically looked at a consecutive cohort of these joint replacement patients
107 compared to a control and recently published their results in the peer-reviewed scientific
108 journal, *Progress in Orthopedic Science*. Using novel approaches to post-operative pain control
109 initiated by Karch at Mammoth Hospital in 2013, the local authors showed a 66% reduction of
110 Morphine Equivalents (Narcotic Pain Medication) in the post-operative period, a significant
111 reduction of hospital length of stay from a National average of 3.4 days to Mammoth Hospital’s
112 average of 1.1 days and a significant reduction in Visual Analog Pain Scales at the time of
113 discharge from National Average of 2.44 to 0.88 at Mammoth Hospital following knee and hip
114 replacement surgery. Importantly, the group showed a 30-day hospital re-admission rate of
115 0.8% compared to national average of 4% and a 90-day re-admission rate of 0.9% compared to
116 a national average of 7%. Using the A.A.N.A Surgical Outcomes Systems (Arthrex, Inc) analysis
117 software, statistics show that post-operative patients at Mammoth Hospital are well controlled
118 in their pain (both as an inpatient and also as an outpatient), despite a dramatic reduction in
119 narcotic use. These patients do better, with regards to pain control, than national averages but
120 consume significantly lesser amounts of dangerous opioids. But also, this data importantly
121 reflects the success of the comprehensive preventative work done ahead of time by the Multi-
122 Disciplinary Joint Replacement Team to ensure a smooth and safe transition from the hospital
123 to the home environment in the early post-operative period. The “Cura-Personalis” theory
124 works with numbers to prove it.

125

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

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

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

144 According to the Centers for Disease Control, in the United States alone, approximately
145 480,000 deaths per year are attributable to smoking. Further, smoking costs the United States
146 approximately \$170 billion in direct medical costs and an additional 156 billion in lost
147 productivity. Specific to total joint replacement patients, smoking is directly related to
148 increased rates of infection, increased re-admission rates, increased total complication and
149 surgical failure rates and consequently, is a major contributor to overall National Health care
150 expenditures. Smoking cessation (both prior to and also after surgery) is one of the primary
151 goals of the Multi-Disciplinary Joint Replacement Team and is headed by Monica Delson, RN.
152 Monica identifies and works with patients on alcohol, smoking and drug cessation prior to
153 surgery. Simply put, patients are delayed from having joint replacement surgery at Mammoth
154 Hospital until they quit smoking and using illicit drugs and also reduce their alcohol intake to
155 less than two drinks per day as all have been shown to be independent variables causing
156 increased rates of infection. Just like Casey, Monica’s work has proven effective in the long run
157 as the Multi-Disciplinary Joint Replacement Committee has shown in yet-to-be published data
158 that greater than 70% of patients who were smokers before surgery have now quit indefinitely
159 after surgery at two-year follow-up. This achievement has far-reaching impacts for personal,
160 community and public health at large. Results like these matter and are recognized as effective
161 strategies to both improve public health and reduce national health-care expenditures thru
162 less-expensive, more long-lasting, preventative techniques. In addition to being a “Low
163 Volume” hospital where less patient and family traffic represent less bacteria brought in from
164 the outside, Mammoths’ elevation of 8000 feet present a challenge to even the most ardent of

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

181

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

183 The Direct Anterior Total Hip Arthroplasty.

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

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

225

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

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

258

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