Kinematically Aligned Total Knee Replacement
Patient Education Guidebook

STEPHEN M. HOWELL, MD

Adventist Health Lodi Memorial
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Section 1: Overview of Adventist Health Lodi Memorial

Introduction
We are delighted that you chose Adventist Health Lodi Memorial and Dr. Stephen Howell to perform your kinematically aligned total knee replacement surgery. Our staff will provide you with a personalized experience designed to meet your needs and exceed your expectations. Please review the information in this Patient Education Guidebook, as it is intended to:

- Prepare you, family members, and caregivers for your knee replacement surgery
- Introduce you to Adventist Health Lodi Memorial and resources available to you
- Educate you about preparing at home before surgery, personalized treatment during your hospital stay, and preparing for discharge to home
- Reduce anxiety by reviewing proven methods for managing nausea, discomfort and constipation
- Provide a list of equipment for your use at home
- Instruct you on activities and exercises, managing swelling, and safe techniques for moving, dressing, and bathing
- Provide a convenient place to store all handouts provided at pre-surgery appointments

Visit DrSteveHowell.com to download an electronic version of the Guidebook to your computer, tablet or mobile device that is easily shared with family and friends who might help take care of you.

Directions and Contact Information

ADVENTIST HEALTH LODI MEMORIAL

Medical Center
975 S. Fairmont Ave.
Lodi, CA 95240
Main phone number: 209-334-3411

Directions to Hospital:
From the North on 99 Follow CA-99 South toward Fresno. Take Exit 264B. Turn right on Kettleman Lane. Drive 2 miles and turn right on Ham Ln. The hospital is less than a mile on the right.

From the North on I5 Follow I5 South towards Lodi. Exit CA-12 East to Lodi and turn left onto Hwy 12 after exiting the freeway. Drive 5.9 miles and make a left on Ham Ln. The hospital is less than a mile on the right.

From the South on 99 Follow CA-99 North towards Lodi. Take Exit 264A. Turn left on Kettleman Ln. Drive 2 miles. Turn right on Ham Ln. The hospital is less than a mile on the right.

Sacramento Office – Orthopedics
Adventist Health Physicians Network
Medical Office – Orthopedics
8120 Timberlake Way, Suite 112
Sacramento, CA 95823
916-689-7370

Lodi Office – Orthopedics
Adventist Health Lodi Memorial
Medical Office – Orthopedics
1235 W. Vine St, Suite 22
Lodi, CA 95240
209-334-8535
CONTACT INFORMATION
Pre-Admitting Nurse _______ 209-339-7502
Patient Financial Services ___ 209-339-7543
Orthopedic Nurse Navigator __ 209-339-7870

To register for Dr. Howell’s Pre-Surgery Educational Class on Kinematically Aligned Total Knee Replacement, please call 209-339-7870.

ADDITIONAL LODI MEMORIAL SERVICES/RESOURCES
Adult Day Services _______ 209-369-4443
Fitness Center ____________ 209-333-3011
Home Care Services _______ 209-333-3131
(after hours _______________ 209-334-3411)
Outpatient Rehabilitation Services
Physical, Occupational,
Speech Therapy _____________ 209-333-3136

HOTELS NEAR THE HOSPITAL
Wine and Roses
4-star hotel 2.9 miles (9 min) from the hospital
2505 W. Turner Rd.
Lodi, CA 95242
209-334-6988

Hampton Inn & Suites – Lodi
2-star hotel 2.2 miles (8 min) from the hospital
1337 S. Beckman Rd.
Lodi, CA 95240
209-369-2700

Holiday Inn Express – Lodi
2-star hotel 2.4 miles (8 min) from the hospital
1337 E. Kettleman Ln.
Lodi, CA 95240
209-210-0150

To view additional lodging options and learn more about Adventist Health Lodi Memorial, visit DrSteveHowell.com.

In-Hospital Dining
Adventist Health Lodi Memorial visitors can choose from a number of meal options.

Vineyard Café
Full cafeteria offering breakfast, lunch, dinner and snacks
Monday-Friday 7 a.m. – 6:30 p.m.
Saturday-Sunday 7 a.m. – 2 p.m.

Vineyard Express
Coffee bar with grab-and-go meal options
Monday-Friday 6 a.m. – 1 p.m., 3 – 9 p.m.
Saturday-Sunday 2:30 – 9 p.m.

In-Room Dining
Visitors staying with a patient are welcome to order meals from an ambassador. The meal tray will be delivered with the patient’s food. Guest meals can be paid for by cash, check or credit card in the Vineyard Café or Vineyard Express.
Components of the Orthopedic Team

**Hospital**
At Adventist Health Lodi Memorial, we are committed to providing you with the best care and experience for you and your family. Your care team is made up of many dedicated individuals who will work with you to make your stay at our hospital pleasant and your transition back home as smooth as possible.

**Orthopedic Surgeon**
Your orthopedic surgeon, Dr. Stephen Howell, is a world-renowned expert in the treatment of arthritic disorders of the knee. He will work with you to provide you the most advanced care. Learn more about Dr. Howell at DrSteveHowell.com.

**Physician Assistants**
Tom Carmody, PA-C, an orthopedic specialist who has been working alongside Dr. Howell for many years, will assist in surgery and follow you throughout your hospital stay.

Manpreet Gill, PA-C, An orthopedic specialist who works alongside Dr. Howell in surgery and his Orthopedic office’s to guide you through your surgical process.

**Anesthesiologist**
Your Anesthesiologist will guide you through your surgical experience, managing your discomfort, any medical conditions and vital functions during surgery and recovery room.

**Nursing Team**
Our nursing staff will be here to meet your needs 24 hours a day during your hospital stay. Nurses will assist you with your recovery and work with the rest of the team to make your stay as pleasant as possible.

**Physical and Occupational Therapists**
Therapists will instruct and assist you with your mobility and exercises for bending and straightening your knee after surgery, provide tips for safely performing activities of daily living, and teach you how to manage swelling of the knee.

**Care Management Team**
(or Discharge Planners)
During your stay, our Care Management team will:
· Answer questions regarding discharge
· Plan and coordinate your discharge with nurses and physical therapists
· Obtain approval from your insurance company for a walker
· Arrange a Home Care nurse and physical therapist in the few instances they are needed

**Chaplain**
Our chaplains are specially trained to serve your spiritual needs upon request, as well as those of your family, regardless of your denomination.
Section 2: Introduction to Knee Arthritis and Kinematically Aligned Total Knee Replacement

What is Arthritis of the Knee?
The cause of osteoarthritis of the knee is cartilage wear that often results in severe pain, stiffness, loss of knee motion, a bowed or knock-kneed deformity at the knee, and a limp. The loss of cartilage narrows the space between the femur and tibia and patella and is referred to as “bone on bone” contact on radiographs. Knee replacement surgery restores a smooth joint surface like the healthy knee by replacing worn surfaces with femoral, tibial and patella implants made of metal and plastic.

Who Might Benefit from a Total Knee Replacement?
The goal of total knee replacement is to improve the patient’s function in daily life. The ideal candidate is someone who has difficulty walking short distances, shopping, getting in and out of a car, ascending and descending stairs, and doing recreational activities such as gardening, tennis, golf, biking, bowling, and hiking. Pain in the knee should be present for three months or more and persist after a trial of anti-inflammatory agents, weight loss, exercises, injections, and/or the use of a knee brace or cane. A patient who has knee pain for a month or two or who walks a mile or two a day is not ready for total knee replacement.

Why You Should Consider a Kinematically Aligned Total Knee Replacement
The surgical technique of ‘kinematic alignment’ naturally aligns your knee by custom positioning the implants to the native joint line of your knee like it was before arthritis developed (see figure). Dr Howell developed the ‘calipered’ technique for performing kinematic alignment in 2009. Calipers are used to adjust the thickness of the small portions of bone that are removed until they are within 0.5 mm of the thickness of the replacement parts, which restores the native joint line more accurately than robotic surgery. He performs over 550 per year.
Legend: A right femur (composite of four images on left) and kinematically aligned total knee arthroplasty (composite of three images on right) show the relationships of the three kinematic axes of the knee with respect to the native joint lines of the distal and posterior femoral resections and the position of the implants. The flexion axis of the tibia is the green line, the flexion axis of the patella is the magenta line, and the longitudinal rotational axis of the tibia is the yellow line. All three axes are parallel or perpendicular to the native joint lines. We use a series of ten caliper measurements of bone resections and positions to restore the native joint line (https://www.youtube.com/watch?v=VW9-GdUYBcs).

Patients are interested in a kinematically aligned total knee replacement because three meta-analyses, three randomized trials, and a national multicenter study showed that patients treated with kinematic alignment reported significantly better pain relief, function, bending of the knee, and a more normal feeling knee than patients treated with the traditional or average mechanical alignment. The many benefits of a kinematically aligned total knee replacement include more accurate implant alignment than robotic or navigated knee replacement, use of a minimally invasive surgical (MIS) exposure, low risk of infection from short anesthetic and surgical time (approximately 40 minutes), negligible risk of blood transfusion, a hospital stay of one night for 90% of patients, and a low risk of readmission within 30 days of surgery. The kinematically aligned implants survived 10-years without another knee operation in 97.5% of patients, which means that most patients over 60 will not likely need a reoperation for a worn-out or loose implant in their lifetime.
Section 3: Initial Office Visit

Assessment of the Severity of Arthritis
At our initial office visit, we will assess the severity of your limitations and disability based on your history, physical examination, treatments, and a review of your radiographs. You will answer questions on an iPad that compute patient reported function scores including the Oxford Knee Score. These scores are used to measure the severity of your knee arthritis before surgery and the pace of your recovery after the surgery. We will educate you about kinematically aligned total knee replacement and what to expect after the surgery. This Patient Education Guidebook and information online at DrSteveHowell.com are comprehensive resources for you to learn about total knee replacement that you can share with your family, friends, and personal coach.

Design and Material of a Total Knee Replacement
In the office, you will examine a life-size model of a normal knee and a knee with the implants used to replace your knee. The femoral and tibial implants are made of stainless steel and high-density polyethylene plastic. They are cemented onto the bone like a dentist cements a crown on a tooth. A plastic button is cemented on the underside of the knee cap (not shown). The cement quickly sets in 10 minutes, which enables the patient to put full weight and walk on their knee within an hour of surgery. Because the implants are made of plastic and metal, they may click or make noise when they contact each other. Although a small amount of clicking is normal, the frequency becomes less as the swelling subsides in the knee and is not a sign of a loose implant.

Take the Oxford Knee Score: A Reliable Indicator of Preoperative Disability and Pace of Recovery After Knee Replacement
The Oxford Knee Score asks 12 questions that assess patient function before and after total knee replacement. Twenty points is the average score for patients before total knee replacement ²,7,15. Forty-eight points is the score of a normal knee. Patients with a 25 point or lower Oxford Knee Score often benefit from a total knee replacement. Take the Oxford Knee Score online at DrSteveHowell.com.

The preoperative Oxford Knee Score helps predict and assess the pace of recovery after knee replacement. At five to six weeks when recovery is at 50% and the average Oxford Knee Score is 32 points, which is 12 points better than before surgery. Most patients are walking without a cane and driving their car ¹⁵. At three months, recovery is 70% with most patients engaging in recreational activities such as gardening, tennis, golf, biking, bowling, and hiking. At six months, recovery is 90% with an average Oxford Knee Score of 42, which is 22 points better than before surgery ²,¹¹.

The process for undergoing total knee replacement can be broken down into several steps, which includes preparing for knee replacement surgery, care the day of surgery, care in the hospital after surgery, and care at home that enables rapid recovery.
Section 4: Preparing for your Knee Replacement Surgery

Scheduling the Surgery
The timing for total knee replacement depends on the patient’s needs. There is never a rush, as waiting a few months or even a year rarely affects the outcome. Surgery can be scheduled on the day of your initial visit or after your visit by calling Dr. Howell’s office (916-689-7370 or 209-334-8535). Calling 6-8 weeks in advance often gets the surgery date you request.

· Schedule an appointment with your family physician or internist as soon as you schedule your surgery. When you have a history of heart disease, please also see your cardiologist. Instruct each office to fax 1) a form titled ‘Assessment of Patient’s Risk for Knee Surgery’ signed by the physician (not a physician assistant) 2) an EKG, and 3) a copy of the consultation to Dr. Howell’s office at 916-688-5610.
· We will give you a laboratory order for blood tests, which you should complete within three to four weeks prior to surgery. When convenient, use an Adventist Health laboratory as the lab results are directly linked to your electronic health record (call 209-339-7897 for locations and hours of operation).
· You may continue to take anti-inflammatory medicine, if needed, and aspirin until the day of surgery.
· Stop all Herbals and supplements at least one week before surgery. Specific agents with known risk in the perioperative period include: Echinacea, Garlic, Gingko, Ginseng, Kava, St. John’s Wort, and Valerian.
· If you are taking a blood thinner or anticoagulant medication, PLEASE ask your cardiologist, internist, or family physician who prescribed it, to specify the number of days you should discontinue prior to your surgery. From a surgical perspective, we prefer stopping Coumadin (warfarin) 5 days before surgery. We prefer stopping Eliquis (apixaban), Xarelto (rivaroxaban), Pradaxa (dabigatran), or Pletal (clopidogrel) 2 days before surgery. We prefer stopping Plavix (clopidogrel) or Brilinta (tricagrelor) 7 days before surgery. You may continue to take aspirin up to the date of surgery.
· If you are taking medication for rheumatoid arthritis consult with your rheumatologist as to when to stop medication before surgery and when to restart after surgery.
· Please review the entire Patient Education Guidebook.

Attend a Pre-Surgery Educational Class on Kinematically Aligned Total Knee Replacement
Call 209-339-7870 or email (rodriggm@ah.org) Orthopedic Navigator Gail Rodriques, RN to sign up to attend the free Pre-Surgery Educational Class on Kinematically Aligned Total Knee Replacement. For your convenience, the class is held multiple times each month. When arriving at Adventist Health Lodi Memorial Medical Center to attend the class, please bring your coach and enter through the main lobby which faces Ham Lane. If you cannot find close parking, have your coach drop you off at front entrance before parking the car. Check in at the information desk to the right and you will be escorted to the classroom.

Adventist Health Patient Outcomes Assessment Tool
You are encouraged to complete the electronic assessment tool sent to you via email. The assessment is a tool used to measure the quality of your recovery. We ask you to take the assessment before your surgery, as it gives us a baseline measurement of how you are functioning. We will then ask you to repeat the assessment at least three months and one year after your surgery, which allows us to compare the results and make sure you are recovering properly.
Checklist of Things to Bring to the Hospital

- Personal items – glasses, dentures, hearing aids, toiletries, insurance cards, photo ID and a detailed list of your medications (Cell phones and charging cords are okay.)
- Clothing items – Clean loose-fitting pants or shorts with elastic waist and ability to view the knee (no metal zippers/buttons/snaps and no elastic at the ankles), non-skid shoes with a back (no flip-flops, Crocs are okay), and a light robe.
- Specific medications only if directed to do so
- Advance Healthcare Directive/Healthcare Power of Attorney if you have one
- A front-wheeled walker when you use one at home (If you don’t have one, we will provide one.)
- This Patient Education Guidebook

PLEASE DON’T BRING: Bottles that contain prescription medication (unless otherwise directed), jewelry, large amounts of money, or keys. You may use a credit card or write a check when you need to make a co-pay on the day of admission.

Choose a Personal Coach

Select a family member, friend, or caregiver as your personal coach to assist you during your preparation and recovery from your knee replacement surgery. The state-of-the-art patient rooms at Adventist Health Lodi Memorial have a comfortable pull-out sleeper chair for a family member or coach and a private bathroom with walk-in shower.

Prepare your Home

Plan on having your coach stay with you for the first one to two weeks to help, until you are able to perform activities of daily living independently and safely. Purchase and prepare your meals ahead of time. We will teach you to walk up and down stairs before discharge so that you could use a bedroom on the second floor, but it is not encouraged for the first few weeks. Consider making up a temporary bedroom on the first floor close to a bathroom.

Checklist for Reducing the Risk of a Fall

- Check each room and conceal electric cords and store small objects on the floor that can catch a toe.
- Place a phone or your cell phone in easy reach.
- Install nightlights for late night trips to the bathroom.
- Use a cushion to raise the seat in a low chair or a chair that sits higher, which has a firm back and arm rest will help you stand more easily.
- Consider installing hand rails on stairs inside and outside your house.
- If you have pets, you may consider boarding them for a few days after your return home.

Follow the Advice of the Pre-Admitting Nurse

Expect a phone call from a pre-admitting nurse at Adventist Health Lodi Memorial within one week prior to surgery. You may also call (209) 339-7502 within one week of your scheduled surgery. They will review and update your health history, medications, and allergies, and confirm the date and time of surgery. When speaking with the pre-admission nurse, you may request a visit with an anesthesiologist to review your health history and risks prior to surgery.

The nurse will instruct you to arrive at the hospital approximately 2 hours before surgery. The following list is helpful to review in advance of your surgery.

- Have an accurate list of your medications including the name, dose and frequency you take them.
- Remember the time you are told to arrive at the hospital.
- Do not eat, drink fluid or chew gum starting at midnight before your surgery. (Your surgery will be canceled when these instructions are not followed.)
- NEW: You may have sips of water, no more than 4 oz up to 5:30 a.m. the morning of surgery.
On the day of surgery, take only those medications that the nurse or physician instructed you take for hypertension, seizures, Parkinson's disease, indigestion, thyroid problems or depression with a sip of water (no orange juice, coffee, or food).

Expect to stay in the hospital one night. You may go home at about noon the following day after your education course on caring for yourself after discharge.

Administer Special Cleansers to Reduce Infection Before Surgery
Most patients that develop a postoperative wound or knee infection had high concentrations of bacteria on their skin and in their nose and mouth before surgery. At the time of your office visit, we will give you a free cleaning kit that kills bacteria. Or you can get one when you attend the pre-surgery education class. The kit contains chlorhexidine (CHG) soap and (5) one-time use wash mittens for scrubbing your entire body during a shower, povidone-iodine (PI) swabs for painting the inside of the nose, and antiseptic oral rinse swabs for wiping your mouth and teeth. Let us know when you have an allergy to any of these agents, and we will prescribe a different agent. Beginning five days before surgery, place clean sheets on your bed (first night only is necessary), scrub your body, paint the inside of your nose, and swab your mouth and teeth with these antibacterial agents, as directed. Performing this cleansing protocol each day reduces the risk of infection significantly 18,19,20,21. After each shower, be sure to dry yourself with a clean towel and wear a fresh set of pajamas to bed each night. During these five days, do NOT shave the leg that is to be operated upon and do not apply skin moisturizers, body lotions, perfumes, or powders anywhere on your body.

Ways to Reduce the Risk of Postoperative Knee Infection
- **Dental care**: all dental work, including cleaning, must be completed prior to your surgery. You must call the surgeon's office if any dental problems arise prior to your scheduled date.
- **Clean Hands**: Hand hygiene is very important. You will notice caregivers using alcohol-based hand sanitizer when entering your room. We encourage the use of the hand sanitizer by your visiting family and friends to reduce the spread of bacteria that cause infection.
- **Illness**: If you become ill with a fever, cold, sore throat, flu, or any other illness, please let Dr Howell's office know as soon as possible so that they can exchange your spot with another patient requesting an earlier surgery date.
- **Skin Rash**: Broken skin or rashes should be reported to your surgeon.
- **Shaving**: It is very important that you do not shave your leg or use any hair removal products anywhere near the surgical area for FIVE days prior to surgery. Studies show an increased risk of surgical site infection associated with shaving. This is attributed to the microscopic cuts in the skin that allow bacteria to enter. We will use a clipper to remove hair from the skin in the preoperative area if needed prior to surgery.
- **Stop Smoking**: Not smoking for six weeks prior to surgery lowers the risks of knee infection and poor wound healing. Smokers have a higher risk of developing post-operative infections and with delayed wound healing. Smoking deprives the body of the much needed oxygen required to repair and build cells. Oxygen helps to reduce the risk infection in open wounds and is the foundation for rebuilding of the skin tissues.
- **Special Safety Notice for Pet Owners**: Do not let your pet touch or lick your incision site in any way. Avoid sleeping with your pet, and do not allow them onto your bedding for five days before your surgery and until your first post-op appointment. Always wash your hands after touching your pet and before you touch your incision or bandage.
- **Manage Your Blood Sugar**: If you are a diabetic, control your blood sugars to maintain hemoglobin A1c below 7.0. The risk of wound complications is more than three times higher for patients who have high blood glucose before and after surgery, and for those with poor long term diabetes control.

Arrange Transportation Home from the Hospital
Plan for someone to drive you home around noon on the day after surgery, which is the day of discharge for 90% of patients.
Section 5: Care the Day of Surgery

Check in at Adventist Health Lodi Memorial Medical Center
Arrive at the hospital at the time instructed by the pre-admitting nurse. Enter the building at the Outpatient Services entrance located on Vine St. between Ham Ln. and South Fairmont Ave. Park in the outpatient services lot right in front of the entrance. If you require assistance, use the phone located at the bottom of the entrance ramp. Check in at the registration window and you will be directed to the pre-operative area. Please note: This entrance is locked to entering between the hours of 6:00 p.m. and 5:30 a.m.

Care in the Pre-Operative Area (Ambulatory Procedure Unit)
One family member or friend can stay with you while you are being prepared for surgery in the pre-operative area. You will wash your body with warm cloths containing a special cleanser (Chlorhexidine) and apply nasal and oral disinfectants. Within 1-2 hours of the surgery, we will start an intravenous (IV) line and infuse two antibiotics to reduce the risk of infection. One of the antibiotics (Vancomycin) may cause itching or flushing of the upper body, which is reduced by giving you Benadryl. We will also infuse either Toradol, or Ofirmev (acetaminophen) for discomfort. Sequential compression devices will be applied to compress the calf area of your lower legs to reduce the risk of blood clots. You will be asked by Dr. Howell which knee is to be operated on and he will draw the course of the skin incision and write his initials above the knee cap in large letters for everyone to see.

Your anesthesiologist will visit you in the pre-operative area. Your medical history will be reviewed, and the options, benefits, and risks will be discussed with you. Because kinematically aligned total knee replacement has a relatively short surgical time of approximately 50 minutes, the preferred anesthetic is a general in which you are put to sleep. Let the anesthesiologist know whether you are prone to nausea. They are experts at administering the right combination of medications to reduce the risk of post-operative nausea.

Your family and friends may stay in the surgical waiting room. Dr. Howell or the physician assistant will speak to the family about 75-90 minutes from the time you leave the pre-operative area.

Care in the Operating Room
We use a sequence of 10 caliper measurements within 0.5 mm that accurately position the implants and balance the ligaments of the knee (watch a video online at https://www.youtube.com/watch?time_continue=125&v=1QAs-IJNUc0). An antibiotic (Vancomycin 1 gm) is added to the cement that binds the implants to the bone to reduce the risk of infection. Two medicines that numb the knee for 12-18 hours (Maracaine and Toradol) and one medicine that reduces the risk of bleeding (Tranexamic acid) are injected into the knee just before applying the dressing.

Care in the Recovery Room
Your stay in the recovery room is 60-90 minutes where you are closely monitored by a specialized nurse, as you recover from the effects of anesthesia. Your nurse will monitor your blood pressure, heart rate, respiratory rate, oxygen saturation and assist with managing any discomfort you experience. Oxygen may be administered through a soft tubing placed in your nose. Sequential compression devices will be used around your lower legs to reduce the risk of blood clots. Ice therapy will begin.

Medical Consultant
A medical consultant evaluates each patient on the day of admission. The medical consultant is an expert in the treatment of heart disease, lung disease, high blood pressure and diabetes. Although medical problems after knee replacement are not common, the swift recognition and treatment by a medical consultant minimizes complications.
Section 6: Care in the Hospital
After Surgery

Spotless, Quiet, Comfortable Private Room
From the recovery room, we will take you to a private room equipped with a walk-in shower, pull-out sleeper bed, flat screen TV and WiFi. Your family will be notified of your room number as you are being transferred. We encourage one family member, friend, or your personal coach to spend the night with you. You can eat when you feel hungry. Let the nurse know if a special diet is needed. Usually, within an hour after arrival to your private room, you begin ambulating short distances with Physical Therapy. If you should need to use the restroom prior to this the certified nurses aides and RNs may assist you.

Managing Discomfort
Our goal is to make you as comfortable as possible during your hospital stay and throughout your recovery so you can walk and care for yourself. The nurse will ask you to rate your discomfort on a scale of 0-10, with 10 being the worst. The nurse will administer intravenous or oral medication, along with monitoring your vital signs and sedation, until your discomfort is reduced to your tolerable level. Always eat a little something when taking oral pain medication. Complete relief of discomfort has drawbacks as it can compromise your breathing and make you nauseated.

During your hospital stay, you will receive intravenous doses of an anti-inflammatory medication called Toradol, or Ofirmev (acetaminophen) when you cannot take anti-inflammatory medications. These treat discomfort very effectively. When you tolerate liquids, the nurse will administer oral pain medication. Anti-nausea medicine can be requested when your stomach feels ‘queasy’. Discomfort in the upper thigh area of the operated leg is normal and is a result of the tourniquet used to prevent blood loss during the surgery. It will resolve itself within a week or so after surgery.

Managing Swelling and reducing the risk of blood clots
We will elevate your legs above your heart on a bolster, which decreases swelling and discomfort and promotes bending and straightening your new knee. The use of a bolster restores better knee motion and is more comfortable than a constant-passive motion machine or CPM. We encourage this bolster under your surgical leg or both legs, while in bed. At night if you are unable to sleep this way, you may ask the nurse to remove the bolster, as sleep is more important. You may also lay on your side for comfort. When you are awake, frequently pump your ankles up and down to reduce the risk of blood clots. When you are asleep, sequential compression devices compress the calf area of your lower legs to reduce the risk of blood clots, which are common.
Managing Constipation
Pain medication frequently causes constipation. Consider taking a stool softener such as over the counter Colace or Metamucil starting the day before the surgery. If you become constipated in the hospital, let your nurses know. They have a variety remedies that you can also use at home.

Day After Surgery
This morning is a busy one: Early in morning you will change into your own clothes. (loose fitting sweat pants or shorts with no metal). You will be escorted to the Radiology department via wheelchair for CT scans of both knees. We strongly encourage your coach is with you the entire morning for education and note taking. Physical Therapy will spend more time with you, teaching dressing changes, ambulating with walker, bending and straightening surgical leg exercises, learning how to get in and out of shower and car, along with managing stairs. Dr. Howells Physician assistant will make rounds and ready you for discharge with valuable information. You and your coach will attend a group education class for discharge around 11:00 am and most patients are feeling well enough to go home after lunch.

Section 7: Activities and Exercises that Rehabilitate your Knee

It is important to begin rehabilitating your total knee replacement within a few hours after surgery. Because the implants are cemented to your bone, you can place all your weight on your new knee. Physical and occupational therapists will teach you how to get in and out of bed, straighten and bend your knee, walk down the hall with a walker, go up and down stairs, and take care of yourself while recovering at home. You recover faster when you get out of bed and use the bathroom rather than staying in bed and using a bedpan. Activate the call light at your bedside to notify a nurse, aide, or therapist to assist you. Patients who can get in and out of bed, walk 50 feet with a walker, climb stairs, and feel ‘peppy’ are discharged home. Ninety percent of our patients prefer to stay one night in the hospital.

Sitting Exercise for Bending the Knee
1. Sit on the edge of a bed or chair.
2. Place the ankle of your non-surgical leg in front of the ankle of the surgical leg.
3. Use the non-surgical leg to bend the surgical knee until you feel a stretch and no discomfort.
4. Hold this bend while slowly counting to 10 and then relax.
5. Repeat your bend of the non-surgical knee to bend your surgical knee until you feel a stretch and mild discomfort.
6. Slightly increase bend for an additional 10 seconds.
7. Repeat this cycle of stretches 5 to 10 times every time you walk.

Sitting Exercise for Straightening the Knee
1. Sit on the edge of a bed or chair and place the heel of your surgical leg on a chair in front of you.
2. Push on the front of the thigh (arrow) to move the back of the knee down towards the floor.
3. Hold this position while slowly counting to 10 and then relax.
4. Repeat this stretch 5 to 10 times every time you walk.
Getting Out of Bed

1. Use the non-surgical leg to shift your body to one edge of the bed. (Figure 1)
2. Use your elbows and hands to help you sit up. (Figure 2)
3. Bring your legs over the edge of the bed to sit up. (Figure 3)
4. Reverse these steps to get back into bed.

Standing Up and Walking with a Walker

We will contact your insurance company to provide a walker if you don’t have one.

1. Use your arms to slide your body to the edge of the chair while keeping your surgical leg out in front of you. (Figure 1)
2. Push up using the armrests and the non-surgical leg for support. (Figure 2)
3. Transition hands from arm rests to your walker, one at a time. (Figure 3)
4. Reverse this process to sit down, reaching back for the armrests and slowly lowering yourself.
5. When walking with a walker, first advance the walker, then step forward with your surgical leg, then step forward with your other leg, supporting some of your weight with your arms on the walker as needed.
Climbing Stairs
1. To climb stairs, grasp the railing and place the foot of the non-surgical leg on the next step and extend the knee. (Figures 1, 2)
2. Next, lift the foot of the surgical leg up to the same step. (Figures 2, 3)
3. When going down stairs, step down with the surgical leg then follow with the non-surgical leg. (Figure 4)
   When no railing is available, use a cane in one hand for support.

Transferring In and Out of a Bath Tub
1. If you only have a tub/shower combo bathroom set-up, consider buying a bath tub bench. (Available on Amazon for approx. $60.) (Figure 1)
2. Sit down on the tub bench with your back facing the tub. (Figure 2)
3. Pivot into the tub and lift each leg one at a time over the side of the tub. (Figures 3, 4)
4. Reverse these steps to get out of the bath tub.

Transferring In and Out of a Stall Shower
1. If you have a walk-in shower at home, consider buying a shower chair. (Available on Amazon for approx. $30.)
2. Enter and exit the stall shower using a side-step technique. (Figures 1, 2)
3. Sit on the shower chair when you wash up.
4. Consider adding slip-resistant bath mats and wall-mounted grab bars for stability.
Going Up and Down a Curb with a Walker

1. When going up a curb step, get as close to the curb with your walker as possible.
2. Lift the walker and place it on top of the curb and check that the four legs of the walker are secure. (Figure 1)
3. Step up with your non-surgical leg, lean forward on the walker, and step up with your surgical leg. (Figures 2, 3)
4. Go down the curb by lowering the walker to the ground and step down with the surgical leg followed by the non-surgical leg. (Figure 4)

Transferring In and Out of a Vehicle

1. Park the car several feet away from the curb to allow entry from a level surface.
2. Move the passenger seat as far back as it can go to maximize leg room, and recline the seat back.
3. Back up to the car, reach back for the seat. (Figure 1)
4. Gently sit on the car seat while keeping your surgical leg straight and in front of you. (Figure 2)
5. Slide back, pivot into the seat and face forward bringing one leg at a time into the car. (Figures 3, 4)
Section 8: Learning What to Do at Home in the First Four Weeks After Surgery

We invite all patients and their coaches to attend a group physical therapy class before discharge home. The therapists will teach you exercises and best practices to increase mobility, manage discomfort and take care of your incision.

Discharge Medications and Instructions
The physician assistant will provide a prescription for pain medication at discharge as needed. The nurse will confirm any new discharge medications are ready at your pharmacy, provide discharge instructions (written and verbal), and answer any questions before you leave.

Bathing and Wound Care
Keep the incision covered with a sterile dressing. You will change the dressing each day using 2 sterile 4” x 8” adhesive dressings until the staples are removed 12-14 days after the surgery. You can purchase these dressings online for approximately $15-$30. (Amazon.com: Covidien 7541 Telfa Adhesive Island Dressing, Sterile 1’s in Peel-Back Package, 4” x 8” Pack of 25 or a similar Sterile Island Gauze Dressing 4” x 8” Box of 25). Once dressing has no drainage, wait 24 hours and you may begin showering. After each shower, apply new dressings. Don’t soak your knee in a bath tub, hot tub, or swimming pool. Bruising, swelling, blistering, redness, and warmth around the knee are normal after knee replacement.

If moderate drainage does not stop within 72 hours of the surgery, call Dr. Howell’s office (916-689-7370 or 209-334-8535).

We will give you a staple removal kit to take home. At 12-14 days post-surgery, have your skin staples removed at Dr. Howell’s Sacramento or Lodi office or at your local primary care office when it’s more convenient (take your kit with you). After staples are removed, leave the steri-strips on, until they fall off. Twenty-four hours after the removal of the staples you can swim, use the hot tub, and place lotions and creams on your incision. An incision with an uneven edge can occur from inadvertent rotation of the staples during insertion. The unevenness gradually disappears within 3-4 weeks.

Reducing the Risk of Blood Clots
Patients who can take anti-inflammatory medicines will be treated with chewable low dose aspirin 81 mg two times a day (one with breakfast and one with dinner) for 28 days after the surgery.

Patients who can’t take aspirin or anti-inflammatory medicines or were prescribed a blood thinner such as Pradaxa (dabigatran), Xarelto (rivaroxaban), Eliquis (Apixaban), or Coumadin (warfarin) before surgery will be treated with Coumadin for twenty-one days after surgery. The pharmacists from the Adventist Health Lodi Memorial outpatient pharmacy monitor the prescription of the daily dose of Coumadin based on a sliding dosage scale with use of an INR laboratory result (call 209-333-3009 with questions).
The INR laboratory result is obtained from a blood sample drawn every three or four days by either a visiting nurse or outpatient lab. The sliding dosage scale recommends Coumadin:

- 5 mg daily when the INR is < 1.5
- 2.5 mg daily when the INR is between 1.5 and 2.0
- None when the INR is > 2.0

Twenty-one days after surgery this Coumadin protocol is discontinued. For patients using an anticoagulant other than Coumadin before surgery, they are to notify their primary care physician or cardiologist and ask them to restart and manage the pre-surgery anticoagulant beginning three days after discontinuing Coumadin. For patients using Coumadin prior to surgery, they are to notify their primary care physician or cardiologist and ask them to manage the Coumadin dosage and monitor the INR beginning twenty-one days after surgery.

If you are on Plavix (clopidogrel) or Brilinta (ticagrelor) before surgery you will be advised at discharge when to restart these after surgery (usually two weeks).

**At Home Activity Guidelines and Exercises**

The goal in the first four weeks is to gain knee motion, manage swelling, and avoid strengthening exercises. Please follow the guidelines below, as other exercises and activities are distracting and counter-productive.

- Every hour you are awake, take a short walk.
- After the walk, sit on the sofa or end of the bed and perform the bending and straightening exercises described in Section 6 for 3-5 minutes
- When not walking, lie on the bed or sofa and elevate your leg 1½-2 feet above your heart on a bolster or pillows as described in Section 6.
- Consider buying an DMI Ortho Bed Wedge (available on Amazon for approx. $30) or EZ UP Pillow (available on Amazon or see flyer from class for approx. $50).
- Don’t sit in a chair or recliner until the knee easily bends past a right angle or 90 degrees.
- When you overdo it, elevate the leg on the bolster, ice the knee, and rest for the remainder of the day.
- When you walk safely without the walker, discard it.

**Prone exercise for straightening your knee after removal of staples**

1. Apply a 2 to 5-pound weight around your ankle of your surgical leg.
2. Turn on your stomach and slide toward the edge of the bed.
3. Hang your knee cap and lower leg off the bed.
4. Let gravity straighten your surgical knee and hold for 1-2 minutes.
5. When discomfort is felt flex your knee 10 degrees.
6. Repeat straightening and bending your knee 20 times.
7. Repeat this cycle 3 times per day until your limp disappears.

**Managing Discomfort and Constipation**

Take the oral pain medication as prescribed every 6 hours as needed and gradually taper off over the first week or two. If you can take Advil or Aleve, then take these anti-inflammatory medications to decrease your use of the oral pain medication. Addiction from a short course of pain medication for a few weeks is rare. Continue taking over the counter Colace to soften your stools and reduce the risk of constipation. When needed, add the use of prunes, Metamucil, or milk of magnesia.

**Follow-Up Visit at 5–6 Weeks to Assess the Pace of Recovery**

The following are signs of a good pace of recovery at five to six weeks:

- Straightening the knee to 0 degrees
- Bending the knee from 90 to 110 degrees
Walking without the walker or cane
Climbing stairs
Driving the car

At five to six weeks, your recovery should be 50% and your Oxford Knee Score should have improved to 32. It is normal to sense swelling, redness, warmth, stiffness, soreness, and numbness on the outside of the incision. Patients with difficulty straightening and bending their knee before surgery take longer and work harder to regain motion than patients who have full motion. At three months, recovery is about 70% and you may return to recreational activities such as gardening, tennis, golf, biking, bowling, and hiking. At six months, recovery is about 90%. The pace of recovery is best assessed by comparing improvements in your function between four-week intervals rather than day to day.
Section 9: Answers to Frequently Asked Questions

Q: How long does a total knee replacement last?
A: There is a 90% chance that at 20 years your knee will still be working well without another operation.

Q: When can I drive a car?
A: You can drive a car when you are not taking the pain pills and you feel safe behind the wheel. If you get into an accident, then the cause should be a judgment error and not an inability to maneuver the car.

Q: When can I play golf?
A: You can return to golf at your own pace. Begin putting and chipping, then progress to the short irons and then to the driver.

Q: Does the feeling of stretching when bending the knee ever cause the wound to split open?
A: No, we close your wound in three layers, with three sets of sutures and staples. Feel confident that when straightening and bending the knee that the wound is secure.

Q: When will the swelling and pain disappear in my knee?
A: Swelling is normal and will gradually subside over 3-4 months. Elevation and short frequent exercises for a few minutes are the best ways for managing swelling. Forceful exercising for long periods of time keep the knee swollen even with elevation. You are the best determinant of what your knee will let you do. Once the swelling subsides, the pain will too.

Q: When will the warmth and redness disappear in my knee?
A: Warmth and redness in the knee is normal and will gradually subside over 3-4 months. It does not indicate an infection and is caused by increased blood supply, which brings a high concentration of nutrients to help heal the knee.

Q: Why is there occasionally clicking or noise in the knee when I use it?
A: Contact between the metal and plastic tibial and femoral implants causes clicking and is more frequent when the knee is swollen and does not indicate that the parts are loose or broken. The frequency and loudness of the noise becomes less as the swelling subsides in the knee.

Q: Will my total knee replacement set off the metal detectors at airports, stadiums, and government buildings?
A: Yes, it will. Expect to get patted down. Presenting a card showing you had a knee replacement does not help.

Q: Is a total knee replacement like a normal knee?
A: About 30% of patients report their knee with the kinematically aligned total knee replacement is normal, while others notice a difference. Those that notice a difference do sense the knee is better than before surgery.

Q: Can I kneel on my knee to do household chores and garden?
A: Kneeling will not hurt the knee; However, without practice it may make your knee hurt. Try kneeling on a foam pad. Patients that kneel frequently have less pain.
Q: I have heard that I might need antibiotics when I have dental work or other surgical procedures?

A: The American Dental Association no longer recommends the prophylactic use of antibiotics before dental procedures. Their 2015 recommendation is included here for you to share with your dentist. Additional information can be found online: http://www.ada.org/en/member-center/oral-health-topics/antibiotic-prophylaxis

Management of patients with prosthetic joints undergoing dental procedures

Clinical Recommendation:
In general, for patients with prosthetic joint implants, prophylactic antibiotics are not recommended prior to dental procedures to prevent prosthetic joint infection.

For patients with a history of complications associated with their joint replacement surgery who are undergoing dental procedures that include gingival manipulation or mucosal incision, prophylactic antibiotics should only be considered after consultation with the patient and orthopedic surgeon.* To assess a patient’s medical status, a complete health history is always recommended when making final decisions regarding the need for antibiotic prophylaxis.

Clinical Reasoning for the Recommendation:
- There is evidence that dental procedures are not associated with prosthetic joint implant infections.
- There is evidence that antibiotics provided before oral care do not prevent prosthetic joint implant infections.
- There are potential harms of antibiotics including risk for anaphylaxis, antibiotic resistance, and opportunistic infections like Clostridium difficile.
- The benefits of antibiotic prophylaxis may not exceed the harms for most patients.
- The individual patient’s circumstances and preferences should be considered when deciding whether to prescribe prophylactic antibiotics prior to dental procedures.

* In cases where antibiotics are deemed necessary, it is most appropriate that the orthopedic surgeon recommend the appropriate antibiotic regimen and when reasonable write the prescription.

Section 10: References

Section 11: Notes

Blank space is provided for the purpose of taking notes.