



AVATAR
Same Day Surgery

**Patient Guide to
Total Knee Replacement**

**THE
KNEE • HIP • SHOULDER
CENTER**

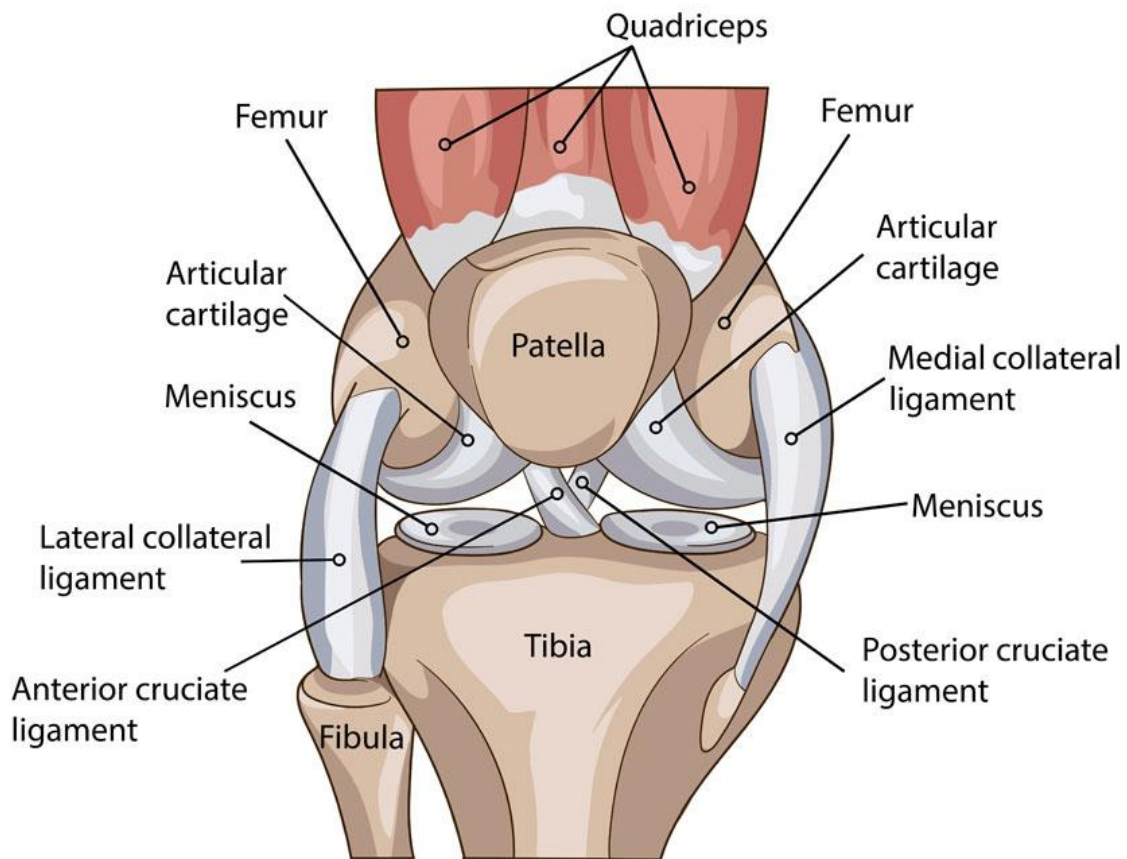
Portsmouth, NH
www.orthopedicsnh.com

Welcome

- Thank you for entrusting your care to us for your knee replacement. As a practice that specializes in joint replacement surgery, we have built a comprehensive program called **AVATAR**[®] that is designed to facilitate the recovery process and improve outcomes.
- Our team of physicians, physician assistants, nurse practitioners and office staff are all highly dedicated to the AVATAR[®] process and to our patients' end result.
- This manual is your guide to the AVATAR[®] knee replacement program and is meant to help you prepare for surgery and maximize your recovery.
- If you have any questions or require further information, please contact us anytime at:
 - Phone: 603-431-5858
 - Email: avatar@kneehipsho.com

ABOUT KNEE ANATOMY?

- The knee consists of three different bones
 - Femur: thigh bone
 - Tibia: shin bone
 - Patella: knee cap
- In addition, there are key tendons and ligaments that move and stabilize the knee during everyday activities



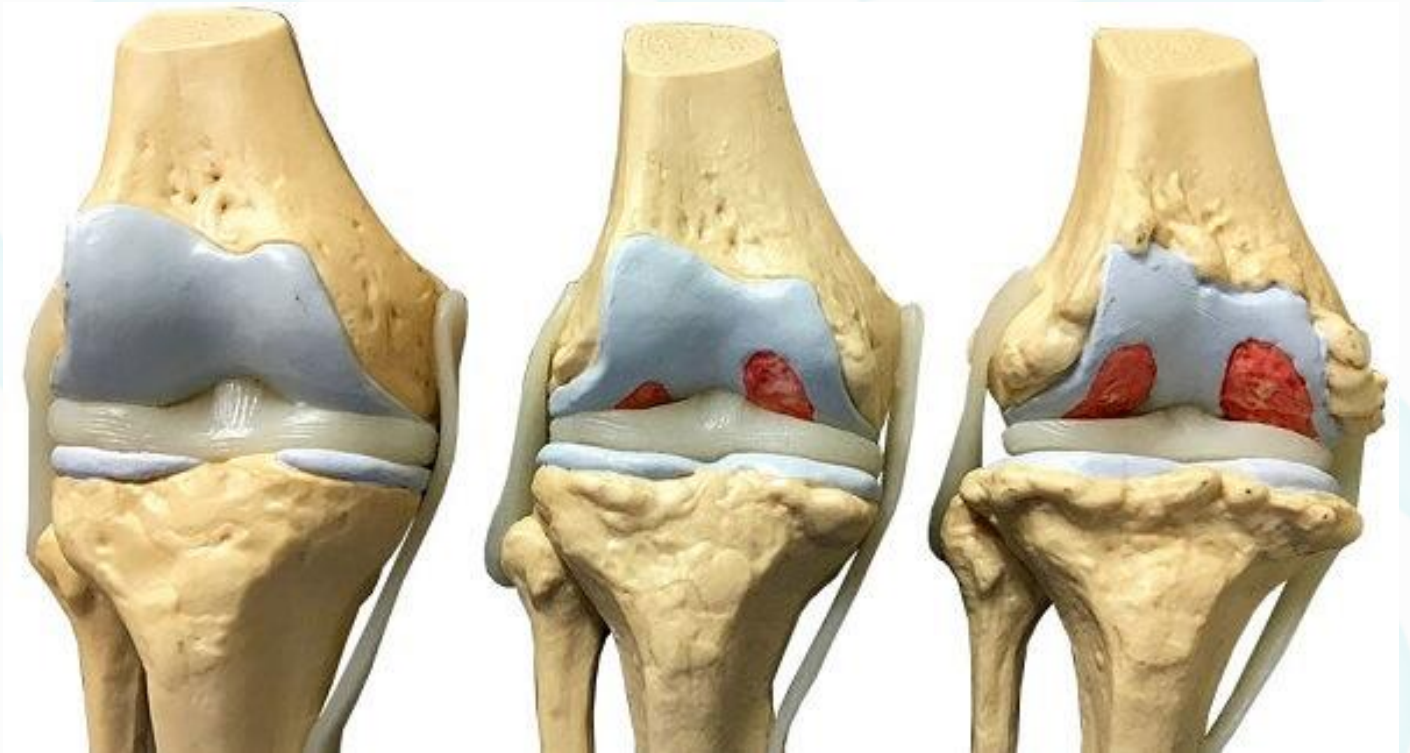
KNEE • HIP • SHOULDER

CENTER

www.orthopedicsnh.com

KNEE ARTHRITIS

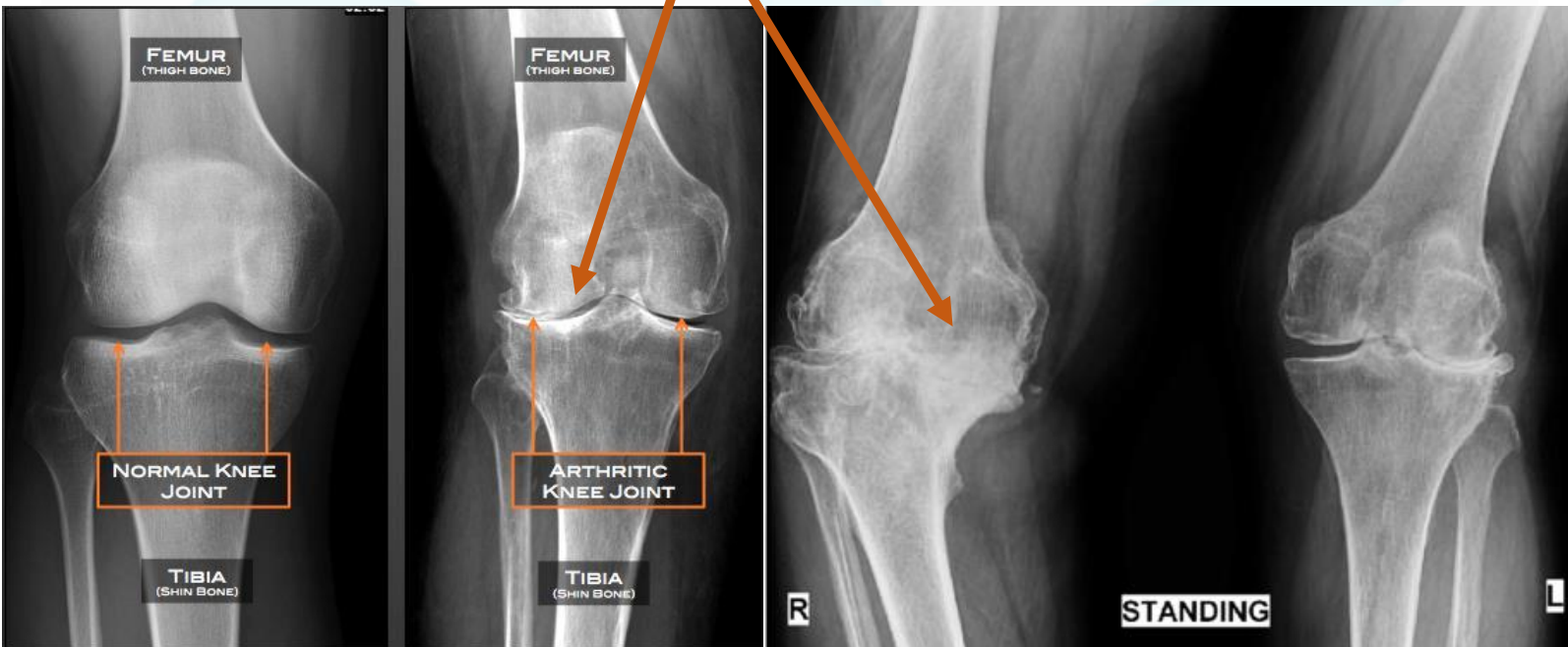
- Knee arthritis occurs when the cartilage that forms the smooth gliding surface of the joint wears away and exposes the underlying bone.



- This results in pain, stiffness, and limb deformity
- Arthritis is a progressive process that worsens with time and has no medical cure

ARTHRITIS X-RAYS

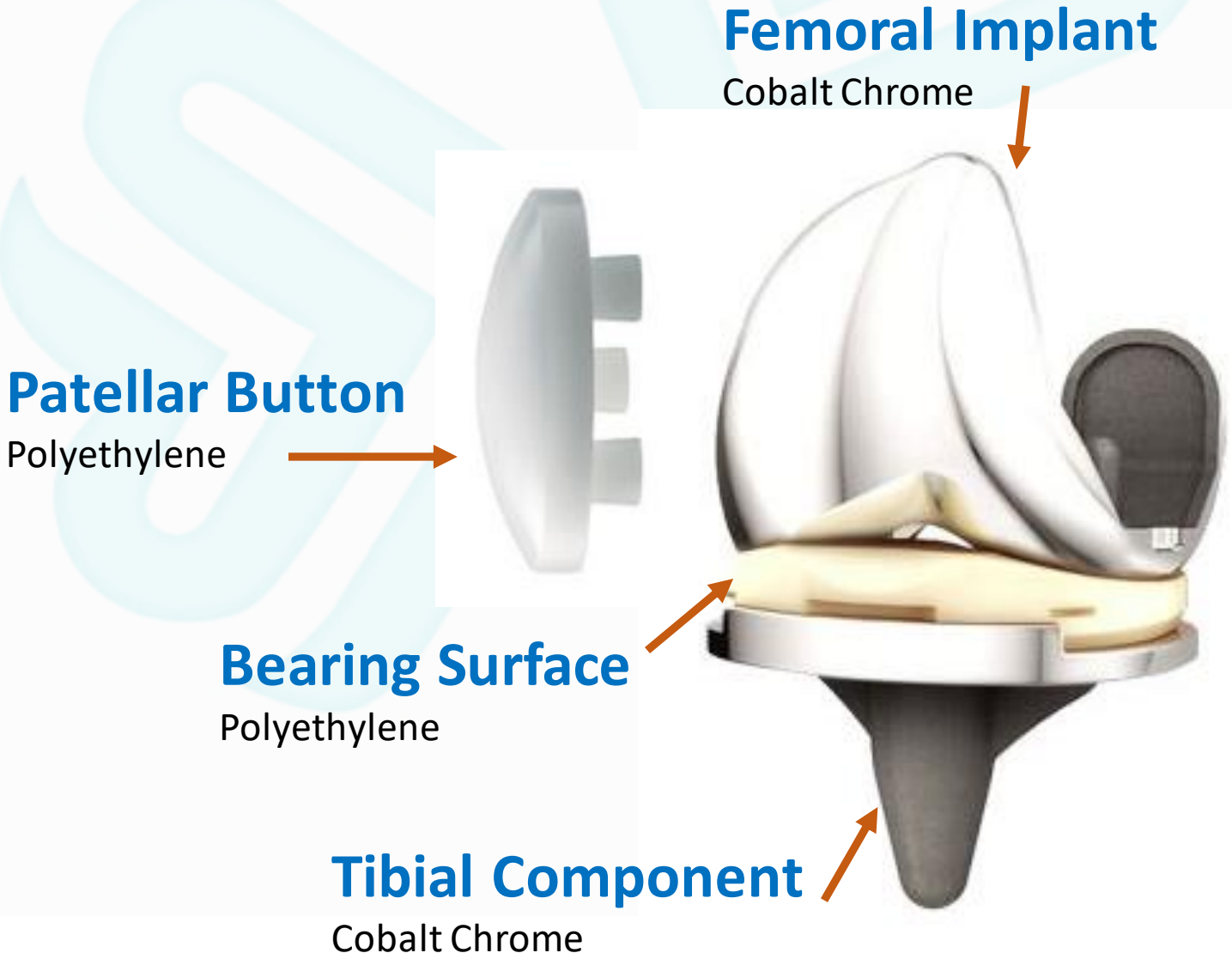
- These images show a normal and an arthritic knee
- The arthritic knee shows narrowing of the space between the femur and tibia due to cartilage wear
- This results in “BONE ON BONE”



- In moderate to severe cases, wear of the bone can also cause deformity as seen in the pictures on the right showing a varus (bow-legged) and valgus (knock-kneed) deformity

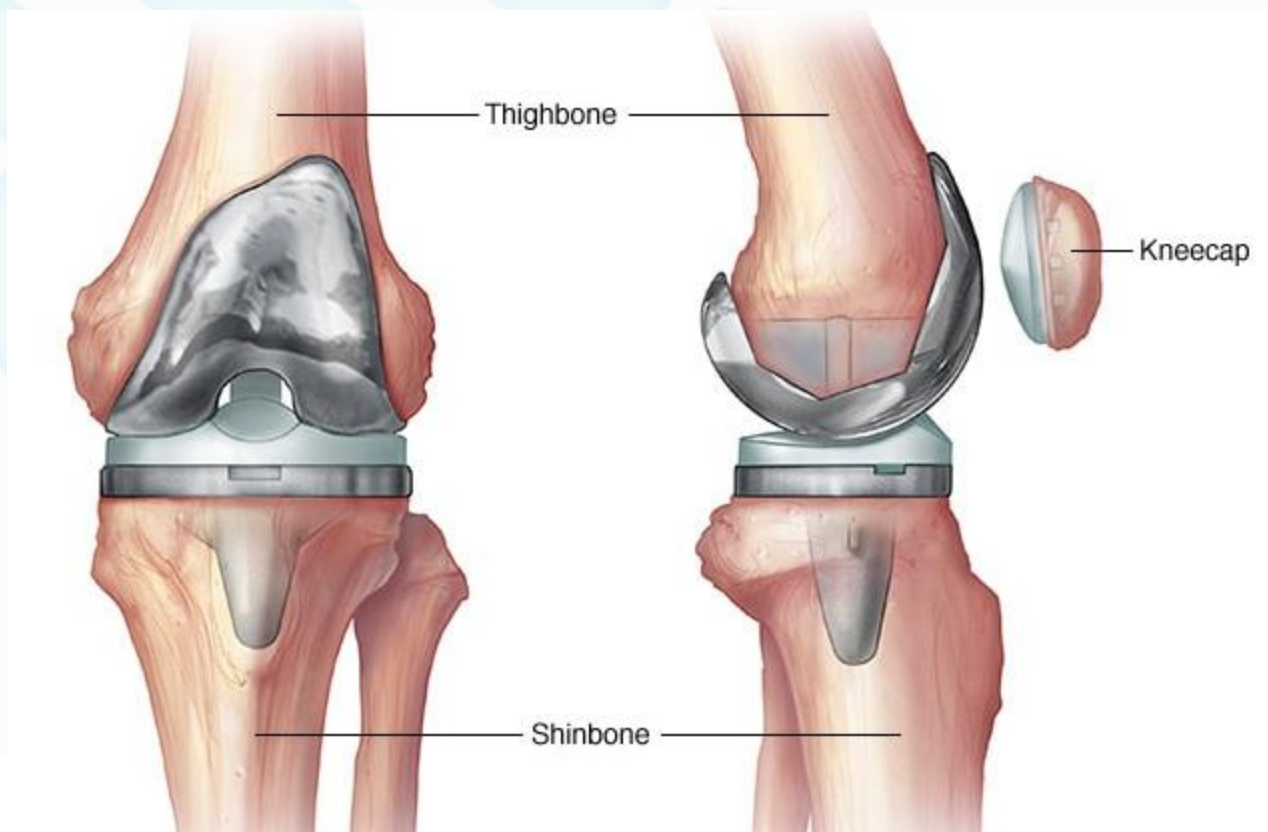
WHAT IS A TOTAL KNEE REPLACEMENT?

- Knee replacement resurfaces the worn joint with implants affixed to the bone.
- The implant consists of 4 pieces



WHAT IS A TOTAL KNEE REPLACEMENT?

- These implants are cemented to the bone after measured cuts are made to ensure proper implant orientation and restoration of limb alignment
- Your surgeon will choose the implant size that is best suited to recreate your anatomy
- Soft tissue balancing may also be done to ensure joint stability throughout a full range of motion



WHO SHOULD CONSIDER A KNEE REPLACEMENT

The following is a general guidelines for when a knee replacement is appropriate

1. The level of pain is moderate to severe and significantly impairs your activity level
2. You find yourself avoiding certain activities that you would otherwise do because of pain
3. You have maximized conservative measures like medications, injections, exercise therapy etc...
4. Your quality of life is sufficiently impaired to warrant the surgery and recovery



THE “TIPPING POINT”

tip·ping point

noun

1. the point at which a series of small changes or incidents becomes significant enough to cause a larger, more important change.

[*Definitions from Oxford Languages*](#)

- The tipping point is the point at which patients decide they no longer want to live with the pain and limitations of arthritis
- This point is different for everyone based on each individual’s threshold for putting up with pain and restriction
- **The Question**
 - Patients often ask, “How do I know it’s time for surgery?”
 - We generally respond – you will know when you reach your tipping point

EXPECTATIONS AFTER KNEE REPLACEMENT

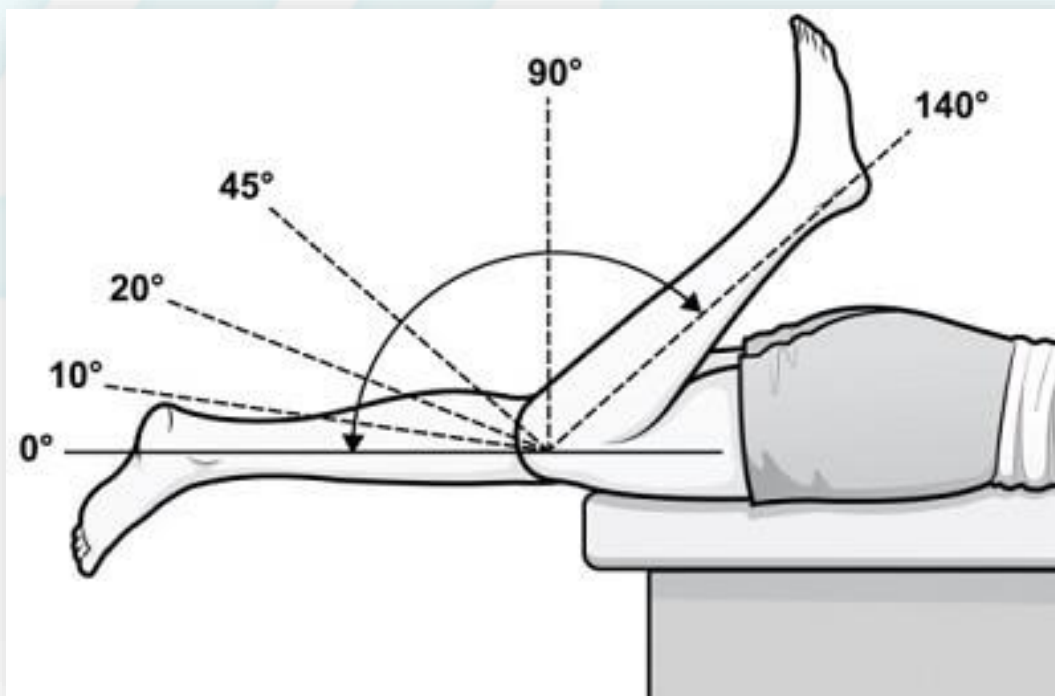
- While advancements in implant design and surgical techniques have improved outcomes and longevity of knee replacement, this operation does not give you back an entirely normal knee.
- **Pain Relief**
 - The main goal of knee replacement is pain relief
 - That said many patients with a knee replacement may have some minor activity related discomfort that should be significantly improved over your preoperative status
 - A small percentage of patients continue to have moderate pain after knee replacement despite what appears outwardly to be a successful surgery
 - The reasons for this continued pain are not always clear but ongoing stiffness is a potential cause



EXPECTATIONS AFTER KNEE REPLACEMENT

• Range of Motion

- A normal knee may have a range of motion from 0° (full extension) to 150° (full flexion)
- An arthritic knee often has a reduced range of motion with some loss of both extension and flexion
- A knee replacement will typically achieve a flexion range of 115-130°
 - Postoperative range of motion can be impacted by preoperative stiffness, surgical factors, genetic factors and success of rehabilitation
 - This range is generally sufficient to perform a majority of daily activities



EXPECTATIONS AFTER KNEE REPLACEMENT

- **Return of Function**

- Knee replacements are very durable and generally permit patients to return to a high level of recreational activity
- Biking, hiking, racquet sports, skiing and other sports are permitted provided patients achieve the necessary level of strength and range to permit this
- Repetitive impact activities such as distance running are generally discouraged
- Kneeling is permitted but some patients find it uncomfortable due to sensitivity of the incision scar
- You should anticipate that should you desire to return to a very high level of recreational activity, you may continue to have some swelling and mild discomfort in the knee after strenuous use.

PATIENT ACTIVATION

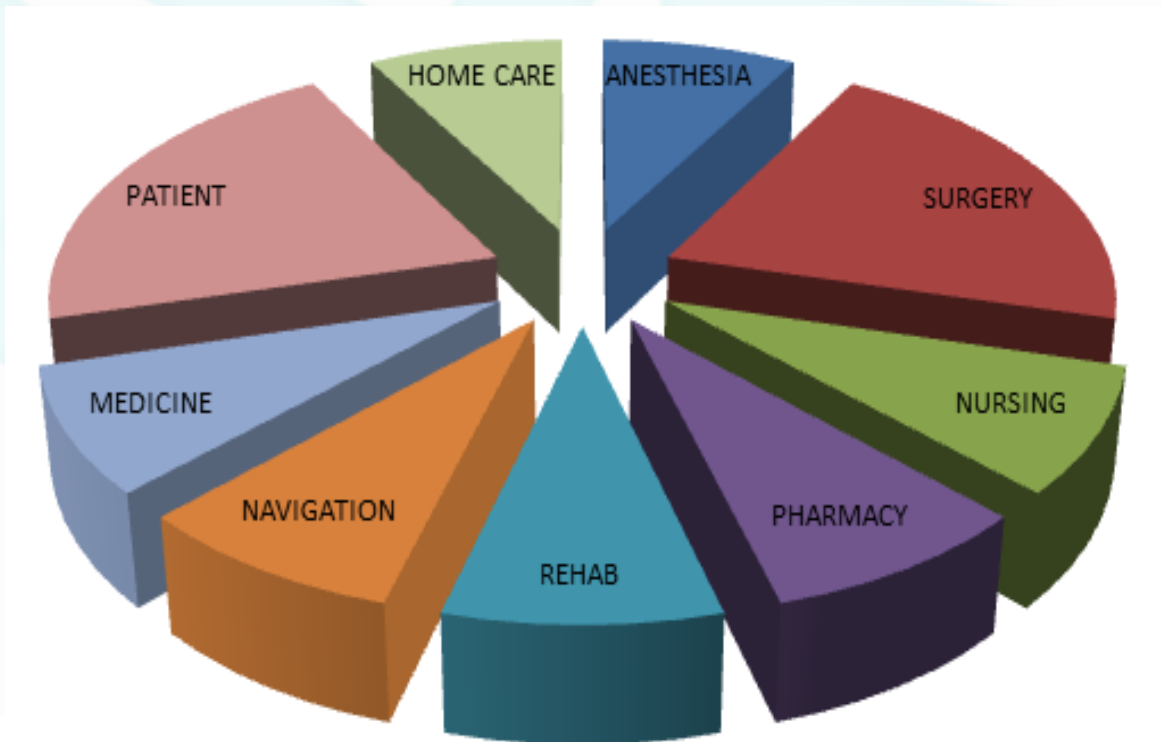
- When patients get actively involved in their preparation and rehabilitation, the chances of a successful outcome are greater
- There is no surgical technique or technology that can compensate for lack of motivation to succeed
- The decision to undergo joint replacement must include a commitment to actively participate in the outcome of surgery
- Joint replacement simply sets the stage for what patients can achieve through persistent dedication to the rehabilitation and recovery process

OWN YOUR OUTCOME

AVATAR®

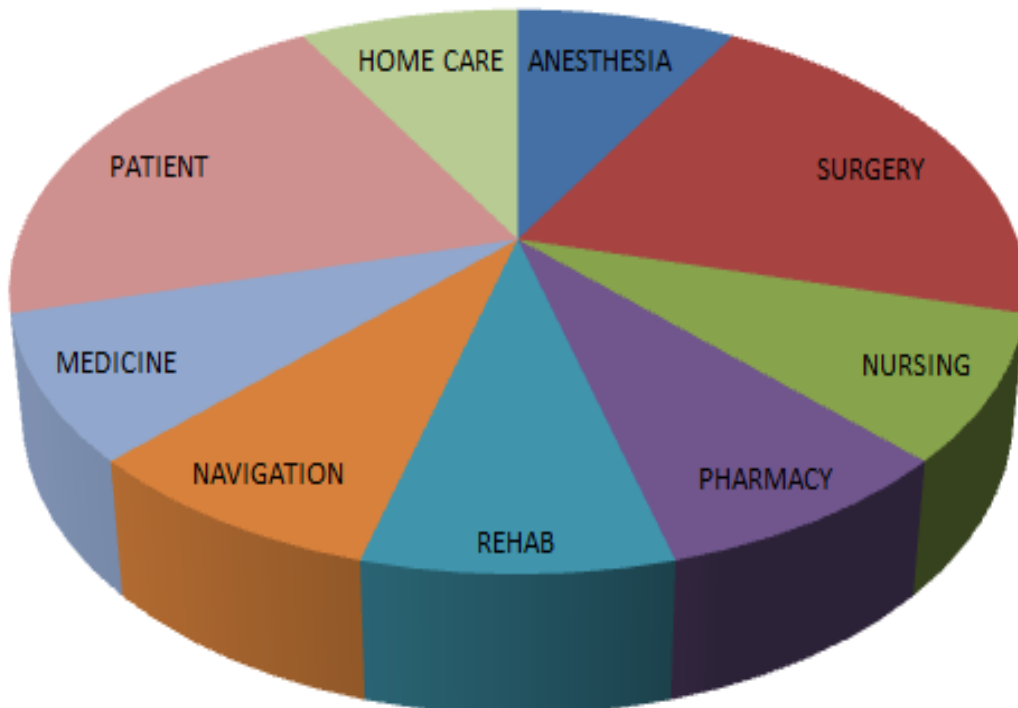
Align Vital Assets To Accelerate Recovery

- Joint replacement surgery is a complex process that involves many aspects of care.
- Surgery is only one asset in this process.
- While a properly performed surgery is important to outcomes, all other assets must also be aligned to ensure the best possible recovery
- AVATAR® is a new approach that uses the best technology and surgical techniques, selects the best professionals (surgical team, anesthetist, physical therapist), and ensures the best pain control



NAVIGATION

- AVATAR® is about customizing each of these assets to a patient's individual needs and putting together a pathway that leads to better quality care and higher patient satisfaction
- Our goal is to help navigate each patient through the entire process and let nothing fall through the cracks
- We have a track record of over 2000 patients who have done better with personalized, customized total joint experience



MY AVATAR®

- *AVATAR® Definition:* the embodiment of a concept or philosophy in a person
- The goal of knee replacement is to restore you to the activities you love and have missed because of arthritis.
- My AVATAR® is who you want to be when your arthritis pain is gone.
- Achieving your AVATAR® takes a commitment on your part to regain strength and function after surgery. This is not automatic.
- Knee replacement simply sets the stage for you to achieve the goals you have for yourself
- Define your AVATAR® before surgery so you can set goals for your new knee

SAME DAY SURGERY

- With the AVATAR® program, an overnight stay in the hospital is no longer necessary for a majority of patients.
- **HOW?**
 - With the use of multimodal pain management, regional nerve blocks, long-acting local anesthetics and medication to limit blood loss, a majority of patients can be dressed, walking, doing stairs and heading home within a few hours after surgery
- **WHO?**
 - Motivated patients who do not have any major health problems that require inpatient monitoring are eligible for same day surgery.
 - After surgery patients have to demonstrate that they are sufficiently recovered to be functional and safe at home
 - Patients are discharged home by an experienced physical therapist, nursing staff and surgical team.
 - A total joint coach/support person must be available to drive the patient home and spend the first 1-2 nights after surgery
- **LESS PAIN**
 - Pain is the major factor limiting rehabilitation after joint replacement. We cannot make surgery “pain-free.” However, by making surgery less invasive, by limiting the use of general anesthesia, and by enhancing our use of regional and local anesthetics, we can accelerate rehabilitation and return of function.
 - An individualized postoperative medication schedule will be developed for each patients using an opioid sparing protocol called multimodal analgesia.

BENEFITS OF SAME DAY SURGERY

- Multiple studies have now demonstrated it is as safe or sometimes even safer to go directly home after joint replacement than to spend 1-3 nights in the hospital
- The following are benefits that our patients have reported
 - Comfort of your own bed leading to better sleep
 - Comfort of your own home leading to less stress
 - Full availability of your coach
 - Home cooked food
 - Better ability to control your pain in real time
 - Better ability to self-manage any medical issues such as diabetes
 - Lower risk of infection
 - Better ability to mobilize since there will not be lines and monitors hooked up to you
 - Less noise and few people coming in and out

COACH

- It is important to have someone who can help you through the entire care episode of joint replacement from preoperative preparation through recovery.
- Your Coach can be a spouse, family member or friend who can assist you, provide a second set of ears, ask relevant questions and motivate you to succeed
- Recruit this person in advance and engage them as part of your care team so they can be part of your success story
- For many people, the process of undergoing joint replacement can be overwhelming and having a critical support person can have a tremendous positive impact

COACHING



PREOPERATIVE PREPARATION

- Getting yourself ready for surgery can improve the process of recovery and the final outcome
- This includes the following:
 1. General health and wellness
 2. Nutrition
 3. Weight control
 4. Prehab exercises
 5. Home preparation
 6. Medical Equipment

PATIENT FACTORS THAT INCREASE SURGICAL RISK

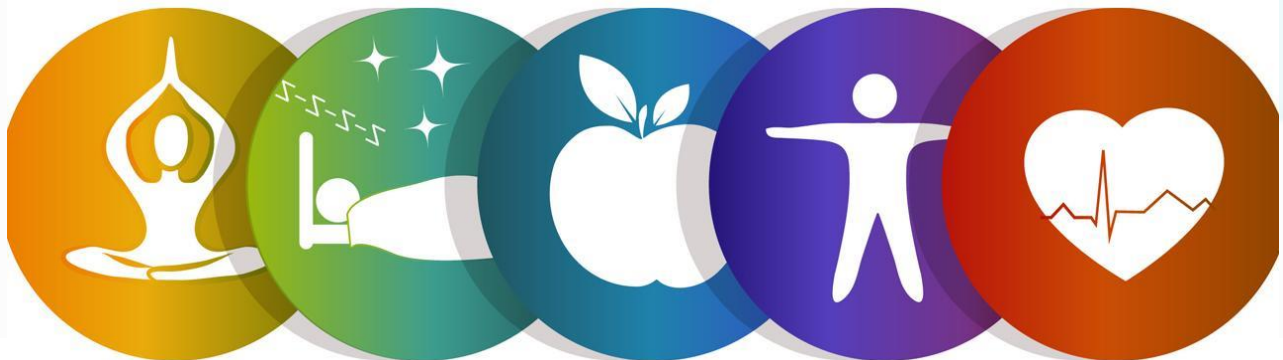
Joint replacement has known risk factors for complications. Some of these can be addressed in advance of surgery through lifestyle change, nutrition and health optimization

- Age >70
- Obesity
- Diabetes
- Heart disease
- Smoking
- Kidney disease
- Liver disease
- Bleeding disorders
- Prior infection or history of MRSA exposure
- Chronic opioid use
- Prior surgery to the same joint
- History of blood clot or pulmonary embolism

Patients should make every attempt to address modifiable risk factors in the weeks prior to surgery by focusing on general health and wellness, nutrition, weight control and management of any medical problems

GENERAL HEALTH AND WELLNESS

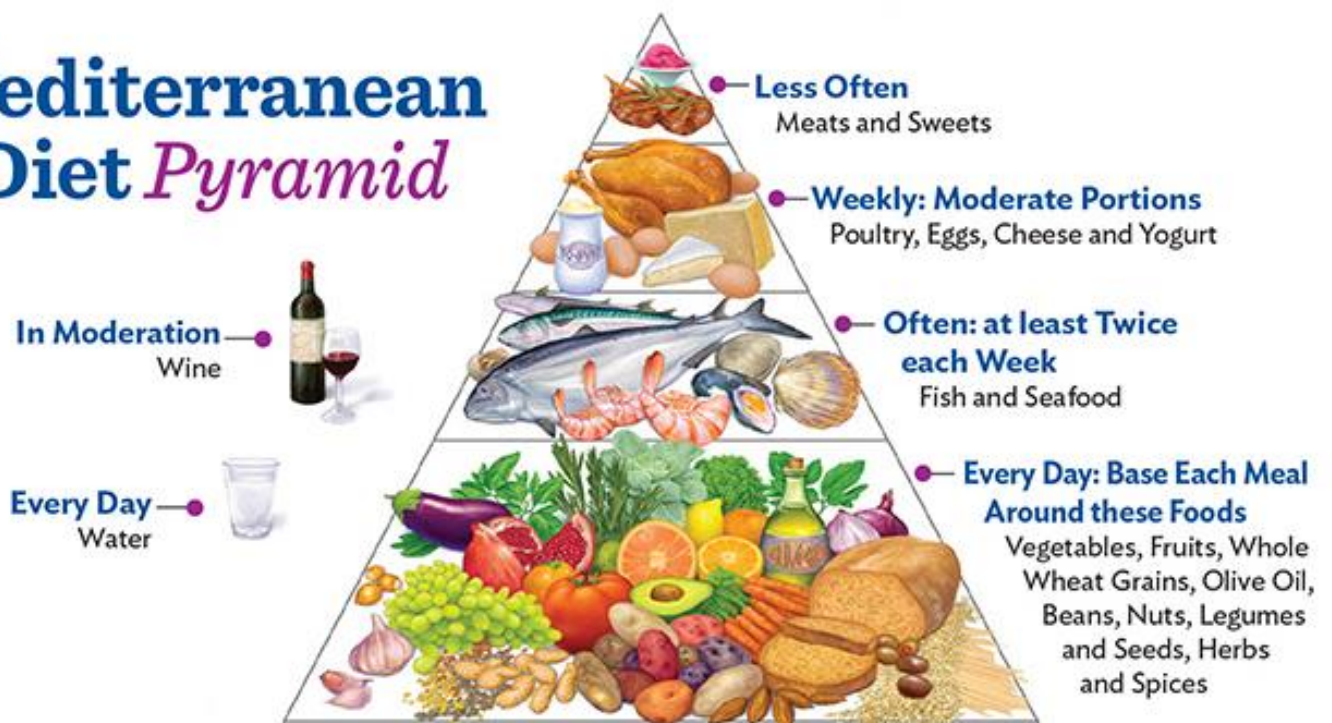
- Improving your general health before surgery can lower the risk of complications
- Any chronic health conditions should be well-controlled.
- Patients with Diabetes should have a Hemoglobin A1c of 7.5 or less
- Regular exercise to improve cardiovascular health and overall strength has a proven benefit
- Patients who smoke should aim to cease or significantly reduce nicotine use 6 weeks prior to surgery
- Alcohol consumption should be minimized in the weeks prior to surgery



NUTRITION

- Improving your nutrition prior to surgery can strengthen your immune system and boost your healing capacity
- It can also improve your bone quality and help strengthen your muscles before and after surgery
- Poor nutrition has been linked to a higher risk of infection
- Consider vitamin and mineral supplementation in the weeks prior to surgery
 - Multivitamin
 - Vitamin D: 2000IU daily
 - Vitamin C: 1000mg daily
 - Zinc 50 mg daily

Mediterranean Diet Pyramid



NUTRITION TIPS

- Eat at least 5 servings of fruits and vegetables every day. Try to consume a variety of colors of produce for additional health benefits. Each color contains different vitamins and minerals.
- Eat more whole grains and legumes (beans and lentils).
 - » Whole grains include brown and wild rice, whole grain noodles, corn, quinoa, oats, and popcorn.
- Try meatless alternatives. In place of meat you can get your protein from eating eggs, fish, poultry, beans, peas, soy-based foods (like tofu or soy milk), nuts/nut butter, and low-fat or fat-free dairy products.
- Keep your sodium intake to less than 2300 milligrams per day.
 - » Avoid adding salt to your food when cooking. Opt for a salt free seasoning or fresh herbs and spices.
 - » Eat freshly prepared meals at home. Processed foods and restaurant foods contain more salt.
 - » When shopping, choose the products with lower sodium content.
- Limit your daily sugar intake. Sugar can be found in honey, syrups, jelly, fruit juice, soda, candy, pastries. Read nutrition labels carefully to avoid products with high sugar content.
- Avoid foods with saturate and trans fats. Foods with unsaturated fats are a better option.
 - » Unsaturated fat is found in fish, avocado, nuts, and oils (sunflower, canola, and olive oil)
 - » Saturated fat is found in fatty meat, butter, ice cream, palm and coconut oil, cream, cheese, and lard.
 - » Trans fats are found in many processed foods, margarines, fried foods, fast food items, pies, cookies, and other dessert. Check nutrition labels.
 - » Boil, steam, or bake food instead of frying.



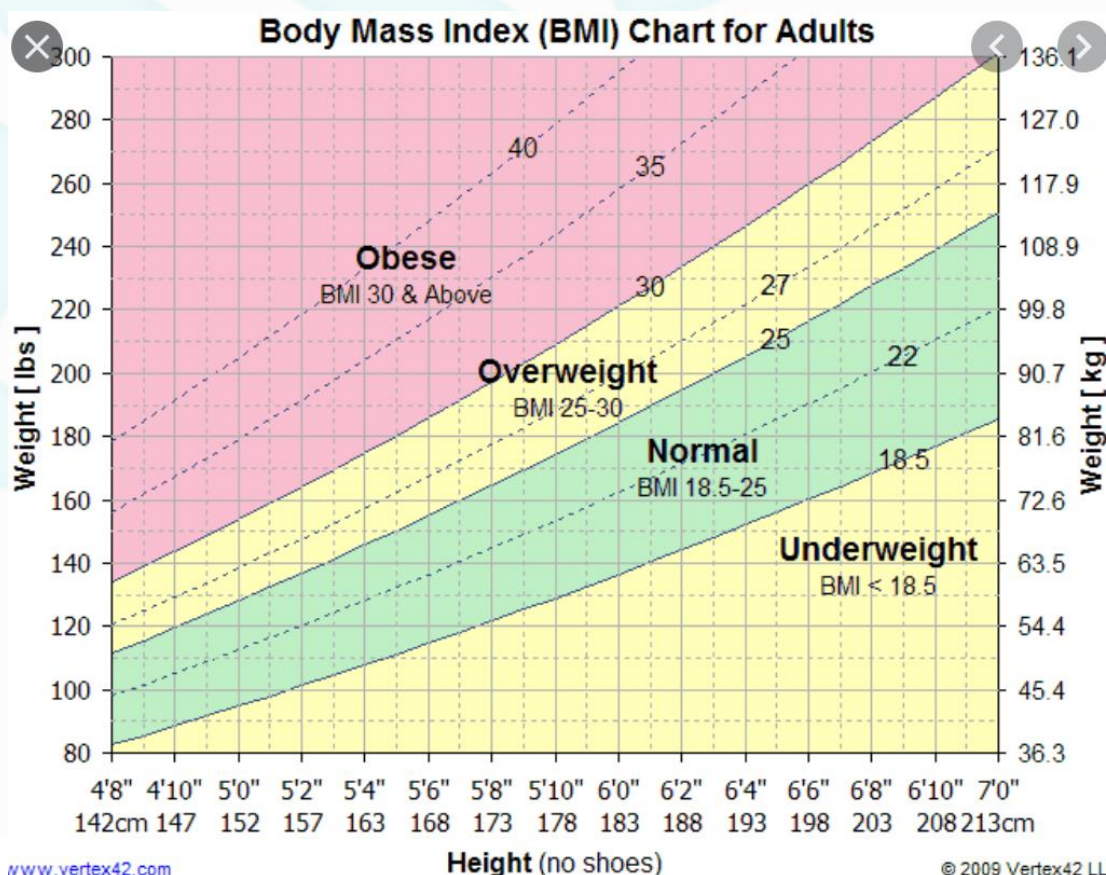
<https://shop.mend.me/products/mend-joint-replacement>

PROTEIN SUPPLEMENTATION

- Protein is key for healing and protein supplementation before and after surgery has several benefits
 - Reduced infection risk
 - Less muscle atrophy before surgery
 - Faster recovery or strength after surgery
- MEND is a supplement designed for joint replacement preparation and recovery and we recommend our patients purchase this and start it 4-6 weeks prior to surgery and continue for 6-12 weeks after surgery

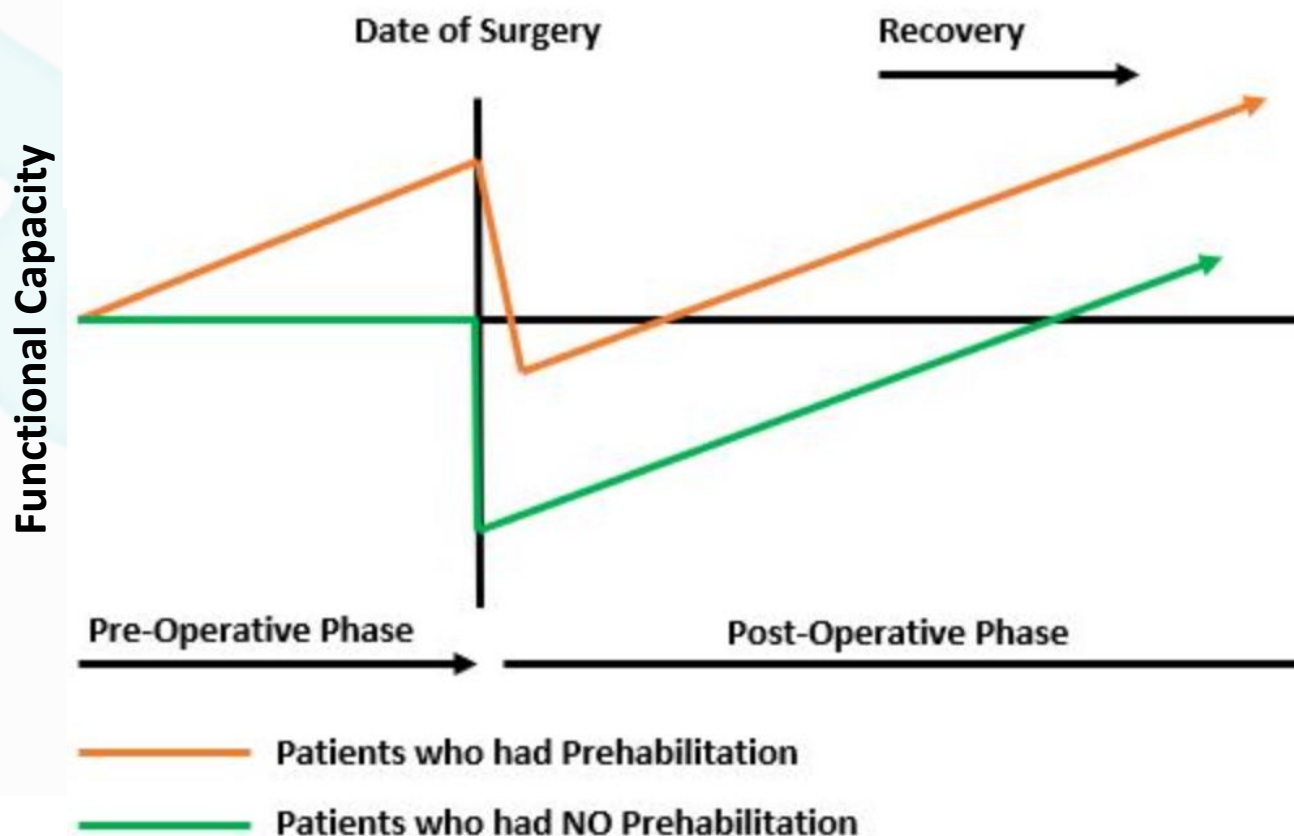
WEIGHT CONTROL

- Studies show that Body Mass Index (BMI) above 40 can raise the risk of infection and other complications
- Efforts to lose weight prior to surgery can improve outcomes and lower risks
- Weight loss can be difficult in the setting of arthritis pain due to difficulty with exercise
- Bariatric surgery (also known as weight loss surgery) is an option that can be explored prior to joint replacement
- Low-glycemic index diets that reduce carbohydrate intake can also be effective



PREHABILITATION EXERCISES

- Exercises to strengthen the leg muscles prior to surgery can jump-start the recovery process
- This can be done either with a home exercise program or as part of a structured therapy program
- Regular performance of these exercises will get you in the mode of exercising after surgery and familiarize you with what to do
- **See our separate booklet for a comprehensive exercise program**



HOME PREPARATION

- **Get your house ready prior to surgery so you can return to a comfortable and safe environment**
- ✓ Carry your cell phone with you at all times in the event of a problem
- ✓ Set up a recovery area with easy access to the kitchen, bathroom, remote control, electronics charging, etc..
- ✓ Move furniture to make clear paths for navigation providing room for use of a walker
- ✓ Remove throw rugs, loose electric cords or any other hazard that might produce a fall risk
- ✓ Put nightlights in areas like the bathroom to make navigation easier at night
- ✓ Stock up on groceries and other essential items like toiletries and any medications you will need
- ✓ Move essential items from low cabinets to waist height to reduce the need to crouch
- ✓ Set up your exercise area
- ✓ Prepare and freeze meals prior to surgery
- ✓ Make your ice packs
- ✓ Pay your bills in advance

MEDICAL EQUIPMENT

- Most patients will start on a walker and progress to a cane within the first days to weeks after knee replacement.
- These devices should be purchased in advance at a pharmacy or online.
- Some patients may consider putting grab bars in their tub shower to assist in balance.
- A shower chair or tub bench may also be helpful for patients with balance issues



- **Please remember to bring your walker on the day of surgery**

MEDICAL CLEARANCE

- You will need to get clearance from your medical doctor for surgery.
- If you see a cardiologist regularly for a heart condition or have a prior history of heart disease, cardiology clearance may be required as well.
- Routine lab work is also required including a nasal swab to screen for staph bacteria in the nose.
- Other testing such as additional lab work or an EKG may be required depending on age or other medical conditions.
- If there are any concerns about your health history that may impact surgery, we may arrange a consultation with the anesthesiologist as well.



MEDICAL CLEARANCE

- **Our surgical schedulers can help to arrange medical clearance and any testing in the weeks prior to surgery**
- If you have any health conditions that are not stable or well controlled at the time of scheduling, your surgery may need to be delayed until your health can be optimized
- This can include
 - Poorly controlled diabetes
 - Unstable heart disease
 - Moderate to severe kidney or liver disease
 - Vascular disease involving the surgical leg
 - Any ongoing infection elsewhere in the body



PREOPERATIVE APPOINTMENT

- You will have an appointment with us about 1 week prior to surgery to:
 - ✓ Review your medical clearance
 - ✓ Review your current medications
 - ✓ Review your lab work
 - ✓ Review preoperative instructions
 - ✓ Discuss pain management strategies
 - ✓ Answer any questions
 - ✓ Review risks and benefits of surgery
 - ✓ Sign consent for surgery
- **Be sure to bring an up-to-date list of your most current medications and dosing to this visit**



PAIN MANAGEMENT

- We cannot make surgery pain free, but our goal is to make the pain tolerable so that you can engage in the exercises necessary to gain motion and strength
- We will customize a strategy for you based on
 - other medications you may be taking
 - a history of prior medication intolerance or allergy
 - any medical conditions that may preclude certain medications
- **If you are treated for chronic pain by a pain management specialist, a clear plan needs to be developed prior to surgery regarding**
 - **who will manage the postoperative period and for how long**
 - **what medications are suggested in addition to baseline pain management**
- See our [*Perioperative Pain Management Guide*](#) for more details

MEDICATIONS TO PURCHASE PRIOR TO SURGERY

- We recommend purchasing the following before surgery so that you have everything set up in advance. These can all be purchased over the counter.
 - Tylenol ES 500mg
 - Enteric-coated Aspirin 325mg
 - Prilosec 20mg (unless you take another antacid like Protonix)
 - Anti-inflammatory medication of choice
 - Ibuprofen 200mg
 - Naprosyn/Aleve 220mg
 - Miralax bottle
 - Colace 100mg

PREOPERATIVE BATHING INSTRUCTIONS

- You will be provided with a bottle of **Hibiclens** antibacterial soap at your preoperative visit
- Start washing with this 3 days prior to surgery in the following manner
 1. Wash your hair and face first with regular shampoo and soap and rinse thoroughly
 2. Move away from the water stream
 3. Apply Hibiclens over your body excluding your face and wait 3 minutes
 4. Rinse thoroughly and do not use regular soap afterwards
 5. Use a clean towel to dry off
 6. Do not apply lotions or creams after use
- **You may shower the morning of surgery**



PREOPERATIVE MEDICATION INSTRUCTIONS

- Start Tylenol ES 2 pills every 8 hours 3 days prior to your surgery.
- **Do not take this the morning of your surgery. The last dose should be the night before**



- You will be given instructions on your other regular medications at the time of your preoperative visit
- If you take any blood thinners such as Coumadin, Eliquis or Xarelto, you will also be given specific instructions on when to take your last dose prior to surgery

PREOPERATIVE DIET INSTRUCTIONS

- **14 DAYS PRIOR TO SURGERY**

- Stop herbal supplements to include Echinacea, Ginseng, Ginkgo, Garlic, Valerian, St John's Wort, Ephedra, Saw Palmetto, Vitamin E

- **8 DAYS PRIOR TO SURGERY**

- Stop any anti-inflammatory medications such as Ibuprofen, Motrin, Advil, Naproxen, Aleve,
- If you take low-dose Aspirin daily, you may continue this

- **DAY BEFORE SURGERY**

- Hydrate well with electrolyte fluid such as Powerade Zero
- **Do not eat any solid food after midnight**

DAY BEFORE SURGERY

LOW FIBER/LOW RESIDUE DIET

- The Low Fiber/Low Residue diet reduces the amount of waste that moves through your gastrointestinal system.
- This is helpful in preparing for surgery and reducing symptoms such as nausea and bloating
- General Rules
 - Avoid any food made with seeds, nuts or raw or dried fruits
 - Avoid whole-grain breads and cereals
 - Avoid legumes (beans, peas and lentils)
 - Do not eat raw fruits or vegetables and remove skins before cooking
 - Avoid tough fibrous meats with gristle
 - Limit milk and milk products
 - Limit foods high in fat

DAY BEFORE SURGERY

LOW FIBER/LOW RESIDUE DIET

Recommended Foods

- **Meat and Other Protein** Ground or tender well-cooked lean meats, poultry, fish, eggs and soy without added fat
- **Grains** Enriched white bread and rolls, white rice, pasta, plain crackers, cream of wheat, Rice Krispies
- **Fruits** Fruit juice without pulp, canned or cooked fruits without skins or seeds, ripe bananas, seedless watermelon and other soft melons, peeled apples
- **Vegetables** Most well-cooked or canned vegetables without seeds and skin, potatoes without skin, tomato sauce, pureed spinach, green beans, carrots, iceberg lettuce
- **Fats, snacks, sweets and condiments** Vegetable oil, butter, margarine, ketchup, mayonnaise, plain cookies and cakes, jello, honey, syrup

DAY OF SURGERY

You can drink clear liquids up to 3 hours before your surgery

Do not eat any solid food on the day of your surgery

Allowed

- Water
- Apple or Cranberry Juice
- Gatorade or Powerade
- Black coffee or tea
- Clear broth
- Ginger ale
- Seltzer
- Jello



Not Allowed

- Milk or dairy products (including in your coffee or tea)
- Citrus juices
- Prune juice
- Any juice with pulp
- Anything not listed in the allowed list

DAY OF SURGERY

- You will receive a call the day before surgery in the late afternoon alerting you what time to report to the hospital
- If your surgery is on a Monday, you will receive the call on the Friday before
- Remember to stop any clear liquids 3 hours prior to the scheduled surgery time
- **What to bring**
 - ✓ Clothes that are easy to don and doff
 - ✓ Closed-toe, slip on shoes
 - ✓ A legal photo identification card
 - ✓ Up-to-date insurance card
 - ✓ Cell phone
 - ✓ Book or other form of entertainment
- **What not to bring**
 - ✓ Valuables such as rings, jewelry, watches. Remove these and leave them at home
 - ✓ Medications

PREOPERATIVE PREPARATION

- First you will check in and register
 - At Portsmouth Hospital, this is inside the main entrance to the left
 - At Stratham Ambulatory Surgery Center or Atlantic Coast Surgical Suites this is in the main waiting area inside the main entrance
- You will then be escorted back to the preoperative holding area where your belongings will be stored, and you will be assigned a room or a bay and change into a gown
- The Same-Day Surgery (SDS) nurse will complete your admission process by reviewing your medications, allergies, surgical preparation, recent health issues and the planned procedure and postoperative course
- An IV will be started for hydration
- The nursing staff will then wash down the surgical site with special anti-septic wipes to help reduce the risk of infection



PREOPERATIVE PREPARATION

- You will be given several medications for “preventive analgesia”
- The anesthesia team will meet with you to discuss their plan and obtain anesthesia consent
- The majority of patients undergoing knee replacement will receive a spinal anesthetic with intravenous sedation
 - The level of sedation allows you to sleep comfortably through the procedure
 - You will awaken quickly after the surgery is concluded
- Your surgeon will see you in the same-day surgery unit to confirm the site of surgery and mark that site.
- Members of the OR staff will recheck and reconfirm the planned procedure and consent and then escort you back to the operating room



SURGICAL TEAM

- In addition to your Drs. King and Parsons, there will be a team of experts taking care of you in the operating room
 - Anesthesia provider
 - Physician-assistant
 - Operating room nurse
 - Surgical technician (aka scrub nurse)
 - Second assistant
- Each member of the team has a dedicated role to ensure your safety
- You will be continuously monitored during the surgery
- Your safety is our #1 Priority



RECOVERY ROOM

- When the surgery is complete, you will be transferred to the Post Anesthesia Care Unit (PACU)
- Here, a specialized PACU nurse will continue to monitor you and care for as you wake up from anesthesia or sedation.
- If you have any discomfort, they can begin to administer medications for this
- A typical stay in PACU lasts about 1 hour but occasionally this may be shorter or longer depending on circumstances



SAME-DAY SURGERY RECOVERY

- If you are planning to go home the same day, you will be transferred back to the same-day surgery area after the PACU
- Here you will continue recover and the following criteria will be evaluated and completed to ensure your safe discharge
 - Your discomfort needs to be well-managed and tolerable
 - You need to have stable vitals signs
 - You need to be able to urinate
 - You need to be able to hold down food and liquid
- Physical and occupational therapy will also work with you and educate you to ensure your safe mobility and ability to manage basic activities of daily living
- This will include stair climbing



DISCHARGE

- Once you have met criteria, you and your caregiver can transition from the facility to home
- You will be wheeled to the car in a wheelchair or in some cases walk there with a walker
- Therapy will assist you in getting in your vehicle and educate you on the best way to enter and exit it.
- Make sure you pump your foot up and down on the way home to keep blood flowing through your leg
- You will be given instructions on continuing the multimodal pain management regimen according to the provided schedule
- Upon return home, we recommend getting promptly into the CPM machine and starting its use
- Rest and relax, particularly for the first night and make sure to stay well hydrated



PAIN MANAGEMENT

- Your care team will go over a tailored pain management program with you at your preoperative visit
- This will take into account any allergies, intolerances or potential medication interactions
- Staying ahead of the pain is paramount to achieving your rehabilitation goals, and our multimodal program is designed to be taken on a schedule
- Further details about pain management after surgery are included in our separate online guide which patients should review.

HEMOVAC DRAIN

- **What is a Hemovac drain and how does it work?**

- A Hemovac drain is used to remove fluids that build up in the knee after surgery. The Hemovac drain is connected to a tube, one end of which is placed inside the knee during surgery. The other end comes out through a small hole in your skin, called the drain site.
- The Hemovac drain removes fluid that builds up in the knee immediately after surgery. If the cannister fills up it can be emptied.

- **How do I empty my Hemovac drain?**

- Empty the drain when it is half full
- Wash your hands with soap and water.
- Remove the plug from the top of the drain.
- Pour the fluid into a measuring cup.
- Clean the plug with an alcohol swab or a cotton ball dipped in rubbing alcohol.
- Put the plug back in without squeezing the cannister.
- Make sure the tubing is not kinked or twisted. Refasten to your clothes.
- Flush the fluid down the toilet. Wash your hands.



- **When is the drain removed?**

- A visiting nurse will remove the drain on postoperative day #2

- **What happens if the drain if comes out by accident?**

- Do not worry, this is not a major problem
- Do not try to put the drain back in
- Cover the drain site with a dry dressing and keep dry for 12 hours.

- **What happens if the tube becomes disconnected from the drain?**

- Clean the end of the tube with alcohol and reinsert it into the drain cannister

CPM MACHINE CONTINUE PASSIVE MOTION

- Stiffness is one of the most common complications following knee replacement and occurs early after surgery when the healing process starts and scar tissue forms
- The CPM is designed to provide continuous motion to the knee for the first 2 weeks after surgery when the risk of stiffness is the highest
- The idea is to never let the knee get stiff by moving it constantly while the healing begins
- The machine will be delivered to your house prior to surgery and set up in the desired location (usually your bed)
- We recommend setting it to a range of -3 extension to 120 flexion and running it at a speed of 3.
- The AVATAR® protocol recommends 16 hours of use per day for the first 2 weeks including 8 hours at night (during sleep) and 2 hours on and off during the day.
- You may start the machine at lower flexion degree to warm up the knee if you have been out of the machine for a while but try to increase to 120 as your knee loosens up.



WOUND MANAGEMENT

- Your incision will be closed with absorbable stitches and covered with steristrips
- There will be a dressing over the incision as well as an ace bandage for compression
- We do not use staples or any other type of suture than needs to be removed.



WOUND MANAGEMENT

- The ace bandage will be removed on Day 2 along with the drain
- The dressing over the incision will stay in place for 5-7 days after which the incision can stay open
- You may shower 6 hours after the drain has been removed
- Do not submerge your knee underwater until cleared by your care team at the 3-week visit.
- The steri strips will slowly begin to peel up from the skin
- Cut the peeled portion with cuticle scissors
- It may take 3-4 weeks for all of the steri strips to come off

PREVENTING INFECTION

- Infections after knee replacement are rare but serious
- Keep your incision covered with a dressing for at least 5-7 days after surgery
- Avoid submersing the incision under water for at least 3 weeks
- Monitor your incision for any drainage and alert our office immediately if this occurs
- Keep soiled clothing away from your incision
- Keep you hands clean at all times during dressing changes.

PREVENTING BLOOD CLOTS

- Blood clots are rare after joint replacement but can happen to anyone
- Risk factors for blood clots include a prior or significant family history of blood clots or pulmonary embolism, a bleeding disorder that increases risk of clotting such as Factor 5 Leiden, and prolonged immobilization
- Blood clots in the leg are dangerous because they can travel to the lungs and cause a pulmonary embolism
- Symptoms include increased calf and thigh pain and swelling, throbbing and increased warmth
- Note that some leg swelling is normal after joint replacement and may vary from patient to patient. If you have any concerns contact our office.

PREVENTING BLOOD CLOTS

- All patients are placed on some form of blood thinner for 30 days after surgery.
- For most people we use Aspirin 325mg twice a day
- For people with a history of stomach ulcer disease or kidney insufficiency we may use Aspirin 81mg twice a day
- Patients already taking blood thinners (such as Eliquis, Xarelto, Plavix or Coumadin) are restarted on their regular medication the day after surgery
- The following steps can lower the risk of blood clots
 - Elevation to reduce swelling
 - Regular exercise and mobilization
 - Ankle pump exercises

VNA SERVICES

- We will arrange a visiting nurse/therapist for the first 1-2 weeks after surgery
- This person will check your vital signs, assess your surgical site, and remove your drain
- They will also work on home exercises and swelling control
- This provider can communicate any concerns to your care team



HOME EXERCISE

- Daily exercise is critical after knee replacement to gain maximal range of motion
- This does not happen automatically but takes motivation and grit
- Frequent stretching exercises in both flexion and extension are key to try to achieve a functional range of motion.
- Our goal is for patients to achieve a motion range from 0-130 degrees
- It may take up to 3 months to get this full range, but the earlier patients achieve motion the better as scar tissue begins to set in with time.



OUTPATIENT PHYSICAL THERAPY

- Outpatient therapy usually starts 1-2 weeks after surgery
- Depending on which knee you had replaced and how your recovery is proceeding, you should expect to arrange transportation for the first few weeks
- Consult with your care team about where you plan to attend outpatient therapy as our office does recommend certain practices who are most familiar with our protocols and goals
- Most patient will attend outpatient PT for 8-12 weeks after surgery to maximize range and strength



MAINTENANCE EXERCISES

- Since you will only be attending outpatient therapy 2-3 days per week, it is essential that you perform daily exercises on the other days
- Full recovery from knee replacement can take up to a year as the healing process matures and patients continue to make gains in motion and strength
- We highly recommend that our patients continue a maintenance exercise program that continues beyond the end of formal physical therapy
- Knee replacement gives patients the platform to achieve their physical goals in returning to activities, but each individual must achieve those goals through persistence and effort

RETURN TO ACTIVITY

- It is important to allow sufficient healing before returning to strenuous activity
- In general, you should wait 8-12 weeks before engaging in strenuous exercise to avoid injury to the soft tissues around the knee
- The early focus should be on maximizing range of motion while strengthening should be a controlled, gradual progression
- Walking and biking are good early, low-stress exercises
- Hiking, skiing, racket sports or anything that requires significant joint loading, impact or agility all require that patients are well-healed and rehabilitated. Check with your care team about return to such activities

POTENTIAL COMPLICATIONS

Stiffness

- A stiff total knee can lead to an unsatisfactory outcome. Avoidance of stiffness by regular use of the CPM, aggressive swelling control and compliance with the exercise program is key.
- Some patient may be genetically prone to form scar tissue, and this may result in stiffness despite one's best efforts to avoid it
- If patients are failing to achieve 100-110 of flexion by 6 weeks after surgery, we recommend a manipulation under anesthesia.
- This is a non-invasive procedure that involves controlled flexion under deep sedation to break up scar tissue

POTENTIAL COMPLICATIONS

Infection

- Infections can occur in 0.5-1% of patients after knee replacement and typically occur either in the first 8 weeks after surgery or years later.
- Risk factors for infection include: morbid obesity, poorly-controlled diabetes, conditions or medications that suppress the immune system, poor nutrition and smoking
- Wound drainage is also a leading cause of infection and should be addressed immediately by alerting your care team
- Signs of infection include increased pain, swelling, redness, fevers and wound drainage
- Infections usually require surgical debridement and treatment with intravenous antibiotics

POTENTIAL COMPLICATIONS

Blood Loss

- Major blood loss is not common after knee replacement and the risk of needing a blood transfusion is less than 4%
- Some blood loss is expected and may lead to some fatigue in the first weeks after surgery which is normal
- Your body will build back its natural blood stores in time
- Damage to major blood vessels at the time of surgery is extremely rare

POTENTIAL COMPLICATIONS

Nerve Damage

- Damage to major motor nerves around the knee is very uncommon
- On rare occasions, patients may have a temporary foot drop after surgery which may be caused by the local anesthetic and usually resolves within 1-2 days
- Some numbness on the outside of the incision is normal and occurs in all total knee replacements. This will be noticeable early after surgery but becomes less so over time

POTENTIAL COMPLICATIONS

Blood Clots

- Blood clots in the leg are rare but do occur after joint replacement
- The best prevention is early mobilization and prophylaxis with blood thinner medications
- If patients develop signs and symptoms that may suggest a blood clot, we will order an ultrasound study to evaluate for this
- Patients who develop a blood clot will need to be treated with anticoagulant medications for up to 6 months
- Alert your care team if you develop increased calf or thigh swelling with pain and warmth

POTENTIAL COMPLICATIONS

Medical Complications

- Surgery is a stress to the body and patients with medical problems such as heart, lung or kidney disease may experience medical complications from surgery
- Optimization of these medical problems before surgery is critical as is customization of the care process to prevent complications
- Make sure your care team is aware of any medical history that may affect your risk and recovery

FREQUENTLY ASKED QUESTIONS

- **How long should I keep a dressing on my knee?:** we recommend keeping a dressing over the incision for at least a week after which the incision can be left uncovered provided it is dry. The steristrips will stay on for a few weeks.
- **When can I shower?:** You can shower 6 hours after the drain has been removed. Try to keep the water from hitting your incision directly
- **When can I submerge my knee underwater?:** We generally advise patients to wait at least 3 weeks for this provided the wound is completely dry with no drainage.

FREQUENTLY ASKED QUESTIONS

- **Why does my new knee click?:** Because the implants are made of hard materials (metal and plastic) you may experience some clicking in the knee during activity which is normal and to be expected. Patients tend to notice this less over time.
- **Is it normal to feel tired or depressed after surgery?:** The stress of surgery and recovery as well as the energy devoted to healing can lead to fatigue and depression for a few weeks after surgery. Sleep disturbance is also common. These are normal occurrences that typically get better after 4-6 weeks.
- **Is it normal to get constipated after surgery?:** Constipation is very common after surgery and is due to a number of factors. High fiber foods and stool softeners can help prevent this. If this persists beyond 5-7 days you may require a suppository or enema.

FREQUENTLY ASKED QUESTIONS

- **My knee feels warm. Is this normal?:** Warmth in the knee replacement is normal and may persist for 6-8 months after surgery. It is a sign of ongoing healing. Ice, topical anti-inflammatory agents (Voltaren gel, Arnicare, Aspercream) can be helpful.
- **How long will my knee be swollen?:** Total knees may have some persistent swelling for a few months after surgery. Continued quad strengthening, icing, soft tissue massage and elevation can help reduce this over time.

FREQUENTLY ASKED QUESTIONS

- **Will I set off the metal detector at the airport?:** Most security systems at airports are surface scanners and not metal detectors. Your knee will not set off a surface scanner, but it will set off a metal detector. If you alert security of your replacement, they will generally just do a light pat down.
- **Are there any forbidden activities after knee replacement?:** Once fully healed, knee replacements are very durable and permit most activities. Repetitive high impact such as distance running may risk earlier wear and is generally discouraged. Shorter running as in racquet sports is fine. Other activities such as skiing, hiking, biking, golfing is permitted.

FREQUENTLY ASKED QUESTIONS

- **How long does recovery take?:** Recovery time may be different for everyone depending on the severity of the arthritis, preoperative range of motion and many other factors such as genetic healing response. In general, it takes 12-18 months to reach maximum recovery, but patients may achieve 75% of this in the first 3 months.
- **Can I kneel on my new knee?:** Kneeling is often uncomfortable on a total knee. Much of the discomfort comes from the healing incision. Kneeling will not damage the implant and generally becomes less bothersome over time

THANK YOU

- Thank you for entrusting your care to our practice
- We take great care to ensure the best possible outcomes for our patients
- Our AVATAR® program has been refined over years of experience with 3 main goals
 - **Less Pain**
 - **Better Function**
 - **Faster Recovery**
- For any specific questions, please reach out to us at avatar@kneehipsho.com