



AVATAR

Enhanced Recovery After Total Shoulder Replacement



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What is AVATAR?

Avatar is defined as the incarnation or embodiment of an idea, concept or philosophy. We believe that joint replacement surgery can change people's lives by restoring comfort and function when quality of life and activities have been compromised by arthritis pain. Our program is designed to help patients achieve their own Avatar of a better life, enjoying things again that have been dampened by pain, stiffness and weakness.

AVATAR stands for Alignment of Vital Assets To Accelerate Recovery. This is our care pathway for joint replacement that represents the culmination of many years' experience and effort in trying to improve and perfect the recovery process after surgery. AVATAR is a comprehensive program that starts weeks before surgery and extends through the first several months of the recovery period. Through improved patient preparation for surgery to optimal anesthetic and pain management techniques, to specific therapy goals, we have been able to shorten the recovery process for a majority of patients leading to better outcomes with less pain. By helping patients navigate their way through the critical steps of preparation, surgery and recovery, this program allows 60-70% of patients to return home safely the day of surgery without having to spend several nights in the hospital.

In the following pages we will review the benefits of same day surgery and carefully designed program that allows people to successfully undergo outpatient shoulder replacement.

Rationale:

The main reason that patients have historically stayed in the hospital after joint replacement surgery is pain management. Major advancements in this area along with a better understanding of pain pathways in the body have enabled physicians to design care pathways that allow more rapid recovery and significantly improved postoperative comfort. Limiting the postoperative pain response has major advantages including: less stress on the body, less inflammation in the joint, better mental outlook for recovery, and improved early motion and function. Being in control of one's own recovery also empowers patients to take control of their own successful outcome.

Advantages of Same-Day Surgery:

Many people undergoing joint replacement surgery are otherwise healthy and do not have medical problems that need to be actively managed around the time of surgery. Hospitals are home to many medically sick patients whose germs and bacteria can be transmitted between rooms and people by skin, clothing and instruments. Hospital beds are uncomfortable making sleep difficult. This is further compounded by care protocols which necessitate that nurses check vital signs every few hours. Finally, nurses must administer medications on predefined schedules that may conflict with a patient's normal schedule from home.

Going directly home after surgery allows patients to return to the comfort of their own home where they can control all aspects of the postoperative care without being subject to a hospital-defined protocol. There are also tremendous psychological benefits to being in a more comfortable environment which includes the recognition that you do not need to be in a hospital after surgery.

Who is a candidate?

Most patients are safe to return to their home environment provided they have someone there to help care for them for the first few nights. Patients who live by themselves can plan to have family or friends available to help.

Patients who elect to go home must be motivated and prepared. Advance preparation is key for success and this will be outlined below. This includes physical preparation for surgery as well as preparation of the home. Just like an athletic event, we think of surgery as something you should train your body for to maximize outcomes.

Who is not a good candidate?

The following are situations where patients may elect to stay in the hospital for 1-2 nights

- Patients who live alone who are unable to arrange to have someone stay with them after discharge from the hospital
- Patients with medical conditions that may require monitoring after surgery such as chronic obstructive pulmonary disease (COPD), or congestive heart failure.
 - Note: we strongly recommend that these problems be optimized prior to surgery and if these medical problems are poorly controlled, surgery itself may be contraindicated due to undue risks for complications
- Patients who have had significant issues with pain control, including patients currently on regular doses of narcotic pain medication may have difficulty with immediate postoperative pain control. In this situation, an overnight stay may be indicated to ensure adequate pain management and observation
 - Note: there is abundant literature demonstrating that patients who are on long standing narcotic pain medications for chronic pain do not do as well with after joint replacement surgery. We strongly recommend that patients consider weaning off all narcotics prior to surgery or significantly reduce the amount that they regularly take as adequate pain control after surgery can be extremely difficult when patients have a large tolerance to the medications used for postoperative pain management.

How Do We Do It?

Adequate pain control is really the key to going home along with good general overall health. We cannot make surgery “pain-free.” However, we can make it entirely tolerable with our multimodal pain pathway. By preparing your body for surgery, following our pain management pathway, and using advanced perioperative regional and local anesthetic techniques, you can be sufficiently comfortable in your own environment whereby a hospital overnight is not necessary. We individualize the postoperative medication schedule and tailor it based on any potential reaction to existing medications patients may be on. By creating a customized schedule for each patient, we can manage pain far better than in the past.

We use a regional nerve block called an interscalene block. This is placed by the anesthesiologist just prior to surgery and provides complete numbness to the shoulder for 12-18 hours after surgery. We also inject the surgical field with a medication called Exparel. This is a local anesthetic that lasts for up to 72 hours and provides ongoing comfort when the block wears off. These measures in combination with the use of different oral medications provide ample pain control in a majority of patients. The use of a multimodal pain management pathway also helps patients avoid the use of heavy narcotic pain medications which can have negative side effects.

Preparation

- ***Weeks Before Surgery***

- Get yourself into the best possible physical shape
 - Reduce alcohol intake
 - Try to lose weight if you are overweight
 - Eat foods high in protein and low in carbohydrates
 - Take vitamins including a multivitamin, vitamin D and vitamin C
- Address any chronic medical problems that may increase your risk of complications
- Stop smoking: smoking can impair wound healing and raise the risk for a postoperative infection
- Prepare your home
 - Make meals in advance that can be frozen or plan to have friends prepare meals
 - Set up an area where you can recover that includes easy access to a bathroom, a supply of water and entertainment like television or reading
 - Remove any throw rugs that may present a fall risk
 - Make sure you have clothing that will be easy to don and doff after surgery. Baggy shirts or shirts that zip or button in the front may be easiest
 - Get your ice packs ready. Make these in a ziplock freezer bag with 1 part rubbing alcohol and 3 parts water. Make 3-4 of them so you can alternate them

- ***Days Before Surgery***

- Get your prescriptions filled so that all your postoperative needs are ready
- Make sure you have a good bowel regimen as pain medication can be constipating (Miralax, Colace, Prune Juice, high fiber foods)
- Stock up your refrigerator so that you will not have to go shopping for anything immediately after surgery.
- Buy some hand sanitizer as good hand hygiene can help prevent infections.
- Starting 5 days prior to your surgery, start showering with Hibiclens. This is available at your pharmacy and is an antibacterial wash.
 - Start by washing your hair first
 - Then apply Hibiclens to your body except your face. Make sure to wash your arm pits, groin and any skin folds
 - Turn off the water and leave the Hibiclens on your skin for 2 minutes
 - Then rinse and dry off with a clean towel.
- Clean your sheets and towels so you will have a fresh environment to return home to

- **The Day and Night Before Surgery**

- Hydrate yourself well. Gatorade or Powerade make good hydration drinks as they contain electrolytes. **You can drink clear liquids up to 3 hours before surgery**
- Nothing to eat after midnight the night before your surgery. Do not eat foods high in fat content or processed foods. Eat a nutritious meal with complex carbohydrates
- You will receive a phone call from Surgical Services with instructions on when to arrive at the hospital.
- Try to get a good night's sleep

Pain Management

This is perhaps one of the most important element of being able to return home the day of surgery. There are 4 phases to pain management: Preoperative, Perioperative, Intraoperative, and Postoperative

- **Preoperative**

- Stop taking any anti-inflammatory medications (Motrin, Aleve, Ibuprofen, Naprosyn, Voltaren, etc..) one week prior to surgery
- Start Tylenol Extra Strength 1000 mg (2 pills) every 8 hours 3 days prior to surgery. For example, if your surgery is on Monday, start this on Friday and take it 3 times a day through Sunday night. Do not take the Tylenol the morning of surgery as you will receive it intravenously in the hospital.

- **Perioperative:** After you arrive at the Same Day Surgery Check-in Unit, you will be given medications for what is called pre-emptive analgesia. These medications are designed to block the pain prior to surgery. These medications include:

- Tylenol 1000 mg IV
- Celebrex 400 mg orally
- Dexamethasone 10 mg IV
 - **Note:** Patients with a sulfa allergy may cross react to Celebrex and it may be withheld in these cases.
 - Patients with diabetes may not receive Dexamethasone because it may raise blood sugar
- Nerve Block: in the preoperative holding area, you will undergo an ultrasound guided interscale block. This will anesthetize the entire arm so that you experience no pain at all for the first 12-18 hours.
 - If patients have significant breathing problems, we may choose not to do the block.

- **Intraoperative:**

- Exparel is time release Bupivacaine (numbing medicine) and works for 48-72 hours. While it does not provide complete pain relief, it makes the postoperative pain quite manageable. By the time the Exparel wears off in 2-3 days, usually the acute pain has subsided to a level where oral medications are sufficient.
- Exparel also reduces the rebound pain that can otherwise occur when the block wears off

- **Postoperative:** We use a program called multimodal pain management. It involves taking several different medications on a routine schedule. Each medication blocks a different pain pathway and the combination works in a synergistic fashion to reduce post-surgical pain to a level that is manageable for patients. The medications include:
 - Tylenol Extra Strength 1000 mg (2 pills) every 8 hours
 - Antinflammatory Medication
 - Alleve (Naproxen, Naprosyn) 440mg (2 pills) twice a day **OR**
 - Ibuprofen (Motrin, Advil) 800 mg (4 pills) every 6 hours
 - **Note:** Alleve and Ibuprofen should not be taken together
 - Tramadol (Ultram) 50 mg (1 pill) every 6 hours
 - Oxycodone 5-10 mg (1-2 pills) every 4-6 hours as needed
 - **Note:** the idea of this multimodal program is to minimize the amount of narcotic pain medication need to manage postoperative pain as these narcotics have many potential side effects including sedation, constipation and potential for addiction.
- **Bowel Regimen:** Surgery and pain medications can cause constipation. We strongly recommend that patients start a bowel regimen 2 days prior to surgery and continue through the early postoperative period. This includes Miralax and Colace. These can be purchases over the counter at a pharmacy. High fiber foods and prune juice are also effective in reducing constipation. If you develop significant constipation that does not respond to these recommendations, then Milk of Magnesium and Glycerin suppositories may be necessary to help stimulate bowel activity.
- **Stomach Protection:** surgical stress and anti-inflammatory medications can sometimes cause stomach irritation. We recommend patients take an antacid starting 2 days prior to surgery and continuing through the first 2-3 weeks after surgery. If already on such a medication, patients can continue their normal dose. Patients not on any such medications can purchase Prilosec over the counter in the pharmacy. The recommended dose in one 20mg pill daily.

Infection Prevention

Infections after joint replacement surgery can be a devastating complication and prevention is the best treatment. This also includes a multimodal treatment regimen outlines as follows.

- **Preoperative:** We recommend taking a shower using Hibiclens soap daily for 5 days prior to surgery per the instructions above. You can also take a shower on the morning of surgery.
- **Intraoperative:** You will receive intravenous antibiotics during your surgery. We irrigate the surgical field with Irrisept which is an antibacterial wash. We also place antibiotic powder in the wound prior to closure. Finally, we cover the wound with a waterproof dressing impregnated with silver which acts as an antibacterial surface.
- **Postoperative:** You will be given a prescription for antibiotic for 72 hours after surgery. Usually this is Doxycycline 200 mg twice a day. Do not change your dressing unless it is saturated with blood. If you do, make sure your hands are clean. We recommend using a hand sanitizer like Purell.
- **Note:** Risk factors for infection include obesity, smoking, poorly controlled diabetes, poor nutrition, multiple prior surgeries, a prior history of infections, chronic kidney disease and

immune suppressive medications like steroids. Some of these risk factors like obesity, smoking and poor diabetes management are ones in the patient control and we recommend if you have any of these risk factors that you consider modifying them in advance of surgery through measures like weight loss, smoking cessation or consultation with an endocrinologist to improve your diabetes care.

Dressing Care

- The dressing placed at the time of surgery is called an Aquacel dressing. This is generally water proof. It should not be removed unless there is significant saturation of the dressing material. If there is minor spotting that does not increase over time, we recommend keeping the dressing in place.
- The dressing should be keep in place for 7 days unless otherwise instructed
 - If there is dressing saturation, we recommend changing it to a clean dry dressing. This sometimes requires daily dressing changes if there is persistent drainage
 - If you have persistent drainage, please alert our office.
- You may take a shower after 48 hours but keep the water out of direct contact with the dressing and let it hit you from the other side.

Going Home

- **Home Day 1 (Day of Surgery):** your support person will drive you home and be with you overnight. You can be up an around as tolerated. Go slow and pace yourself. Stay well hydrated and eat healthy foods as tolerated. It is normal to not have much of an appetite early on but try to get some nutrition in you as the body needs energy to heal. Follow the medication schedule to stay ahead of the pain. Keep the drain in place unless it otherwise falls out.
- **Home Day 2 (Day after Surgery):** the drain stays in place. If it falls out do not worry about it. Continue to pace yourself, eat well and stay hydrated. You will be seen by a visiting nurse or therapist to guide you through the exercises. Try to do the exercises 5 times daily to prevent your shoulder from getting stiff. Pendulums and table slides are good for the purpose.
- **Home Day 3:** your drain will be removed today. Six hours after drain removal you may shower. Keep the Aquacel dressing in place. Use clean towels to dry off. Continue your daily exercise program. You may increase your activities as tolerated. You may remove the sling when you are sitting and put the arm in a position of comfort. Wear the sling when you are up and about.

Other General Instructions

- Sleep is important after surgery as the body needs adequate rest to heal. Many people find it more comfortable to sleep in a reclined position at the beginning although this is not necessary. If you have a Barcalounger type chair you may wish to sleep in this for the first week or two. Otherwise you can prop yourself up on several pillows in bed. You may also lie flat on your back if you are comfortable this way. We do not recommend sleeping on the operative side for at least 8 weeks.
 - You should wear your sling at night for the first 3 weeks after surgery and sometimes it can be helpful to prop a pillow under your arm and elbow to help support it in bed.
- Nutrition is also critical for healing. We recommend continued use of multivitamins as well as supplemental Vitamin D (2000 mg daily) and Vitamin C (1500 – 2000mg daily) for the first 6 weeks. In addition, diets high in protein provide building blocks for healing. Try to eat healthy and nutritious food and avoid processed food with empty calories or those with high sugar content. If you have diabetes, it is very important that you continue to carefully control your blood sugar after surgery as poor glucose control can heighten infection risk.

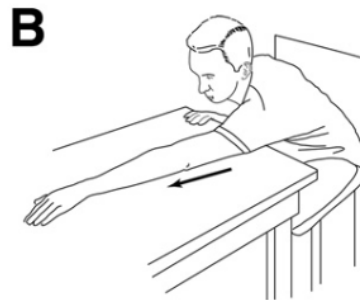
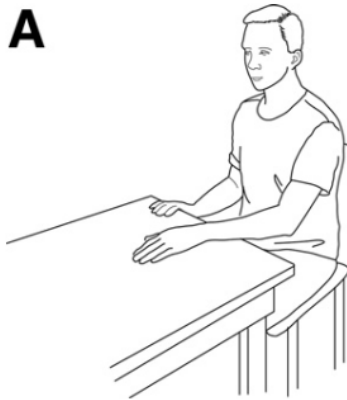
Physical Therapy

- Therapy after shoulder surgery is critical to restore range of motion and activate the rotator cuff which gets weak from chronic shoulder arthritis. There is no substitute for hard work and patience. The shoulder unconsciously develops bad habits to compensate for the stiffness and pain that occur with arthritis and it can take much time and work to break these habits and restore normal patterns of muscle control.
- While home physical therapy can be a good option for the first few days to a week after surgery, we recommend getting into outpatient physical therapy quickly to maximize the early recovery.
 - It is a good idea to establish in advance of surgery which physical therapist you wish to work with. Not every physical therapist is experienced in treated shoulder replacements and we have several that we recommend based on having treated many of our prior patients successfully.
 - Once you have established who you wish to work with after surgery, let them know the date of your operation and schedule your outpatient visits in advance.
- Home exercises are critical to prevent early stiffness of the shoulder. Once stiffness sets in, it can be difficult to overcome. Doing the pendulum exercises and table slides at least 5x/day starting immediately after surgery is mandatory to keep the operated shoulder limber.
- Therapy progresses in stages starting with gentle range of motion for the first 6 weeks and then adding light strengthening. It is critical to comply with the restrictions and not overdo to exercises or you may risk damaging the repair. The time to get things right is the first time.
- It takes approximately 3 months to be sufficiently healed that we lift most the restrictions. You will not have recovered all your range of motion and strength by this time. It can take up to a year plus of continued maintenance exercises to maximize your function after surgery. While you may only do formal physical therapy for 8-12 weeks after surgery, you will be given home exercises and it is critical that you continued to do them a few times a week if you wish to get the most out of your recovery.

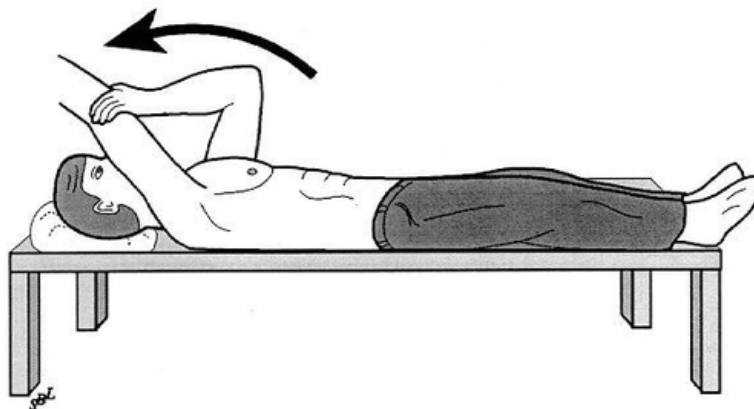
Home Exercise Program

SHOULDER PENDULUM:

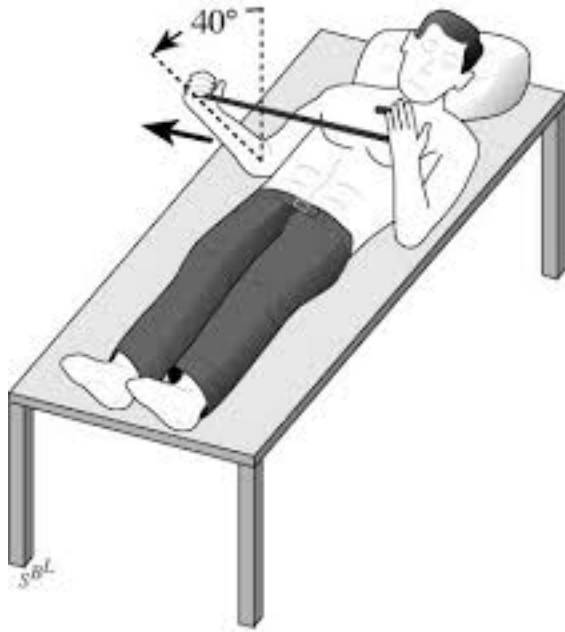
Bend at your waist with your surgical side hand hanging down and your other arm supporting your upper body on table. Relax your arm completely until it feels "heavy." Swing your arm forward and backward, back and forth across body, and in circles. Repeat 5 -10 times each direction.



A: Place your operated arm on a table with a towel under your elbow and forearm.
B: lean forward, sliding your arm across the table allowing your shoulder to forward flex



Lay on a flat surface like a bed. Use your unoperated arm to raise your operated arm overhead. You may past vertical (arm pointed at ceiling) to the level shown in this picture. Make sure to support the arm through the full range.



Lay on a flat surface like a bed. Keep your operated elbow by your side. Use a stick/cane/golf club to push your hand away from your side to about 40 degrees as shown. This is slightly less than halfway to flat on the table.



Isometric shoulder external rotation

To perform the isometric shoulder external rotation :

- + Stand with involved arm at side with hand against wall or door frame as shown.
- + Push hand outward.
- + Do not hold breath.
- + Maintain the contraction for few seconds and release.
- + Repeat for 10 times.

FAQs

- **When can I drive after surgery?** We recommend that you not use the operated arm for any activities like closing or opening the door, seatbelt or steering. You can drive when you are off narcotic pain medications if you are comfortable operating the vehicle largely with your good arm.
- **When can I take off the sling?** If you are sitting, you may remove the sling and put your operated arm in a comfortable resting position in your lap or on an arm rest. When you are up and about you should wear the sling for 3-4 weeks. Similarly, you should wear it for 3-4 weeks in bed at night to protect the arm while asleep. When you are out in public places where there is risk for injury from other people, we recommend wearing the sling for 6-8 weeks depending on your comfort level.
- **When can I get the incision wet?** The postoperative dressing is waterproof and stays on for 1 week. We allow people to shower 48 hours after surgery. Try to keep the water out of direct contact with the dressing. Do not submerge the incision underwent such as bathtub, pool, hot tub, lake or ocean for at least 3 weeks assume your incision is well healed with no drainage.
- **Nausea:** This is a common side effect from anesthesia and pain management. Try to avoid eating fatty foods and acidic foods. Eat in small quantities and avoid lying flat. If nausea persists, we can call in some medication to suppress it.
- **Safety:** Be careful not to trip and fall. Prior to surgery remove anything in your house that may be a fall risk. In the winter months, take extra precautions in slippery conditions.
- **Fever:** Fever after surgery is common and is often from some fluid buildup in your lungs. Deep breathing exercises can help this. Persistent fever above 101°F a few days after surgery may be concerning and you should let the office know.
- **Constipation:** this is a common side effect of pain medications. Being on a good bowel regimen is important. This can be started prior to surgery by a few days, including high fiber foods. If you have persistent constipation beyond 3 days, we recommend treating with laxatives like Milk of Magnesium.
- **Drainage and Wound Problems:** we use absorbable stitches and skin glue to close the wound. In general, there should be no drainage. However, occasionally blood will find a hole and leak out. Mild drainage that stops in the first day or two is okay. Persistent drainage is worrisome due to the risk for infection. If you have persistent drainage, call immediately. We will likely start you on antibiotics and carefully monitor your wound. Occasionally, if drainage persists, we need to wash out the incision and reclose it.

- **Dressing Care:** the surgical dressing should stay on for 1 week unless it becomes saturated and a new bandage needs to be placed. If this is the case, the dressing should be changed if there is any persistent drainage so that it remains dry. Once the original Acquacel dressing is removed, you can leave the incision open to the air. The skin glue will slowly flake off over time.
- **Swelling:** some swelling and discoloration of the arm is normal. You may see bruising tracking down the inside of your arm and sometimes into your chest wall as well. This is normal. If you develop significant swelling in your hand, elevate your arm above your heart by lying flat and propping it up on several pillows. Repeat as necessary to relieve the swelling.

