

MACI KNEECAP CARTILAGE REPAIR WITH TIBIAL TUBERCLE OSTEOTOMY

Your First Two Weeks After Surgery

Your surgery is done, and now the recovery starts. This guide walks you through the first two weeks, from the day of surgery until **your PA visit at 2 weeks** (your follow-up with our physician assistant). Keep it somewhere handy. It answers most of the questions patients call us about. Your medicines are covered in the separate **Medication Guide** that comes with it.

YOUR PLAN AT A GLANCE

WEIGHT ON YOUR LEG	Toe-touch only for 6 weeks (about 10 to 15 pounds, for balance), with two crutches at all times
BRACE	Locked straight whenever you are standing, walking, or sleeping, through 6 weeks. Off only for bending exercises and washing
BENDING	Step by step, and never past the limit: no more than 45° by day 5, 60° by 1 week, 75° by 3 weeks, then up to 90° until the 6-week X-ray
STRAIGHTENING	Fully straight is a top priority. Never rest with a pillow under your knee
KEY RULE	Toe-touch only until the 6-week X-ray shows the bone has healed
MEDICINES	No anti-inflammatory medicines for 6 weeks (ibuprofen, naproxen, meloxicam, Celebrex, Voltaren gel). Keep taking your 81 mg aspirin
PHYSICAL THERAPY	Starts 5 to 7 days after surgery , 2 visits a week
SHOWERING	Starting 48 hours after surgery, with the incision covered. No baths, pools, or hot tubs for at least 4 weeks
FOLLOW-UP	Your PA visit at 2 weeks
QUESTIONS	(425) 656-5060 , day or night

What We Did

Cartilage is the smooth, slippery layer that covers the ends of your bones. It has no blood supply, so it **cannot heal itself**. A cartilage defect (a damaged spot) is like a pothole in a road: the edges fray, but the hole never fills in on its own. Yours was on the back of your **kneecap (the patella)** or in the **groove it glides in (the trochlea)** on the front of your thigh bone. Your kneecap was also not tracking well in its groove, which put extra wear on the damaged spot.

MACI means **your own cartilage cells, grown in a lab and put back on a patch**. At your first, smaller surgery, we took a tiny sample (a biopsy) of healthy cartilage. A lab grew those cells into millions of new cartilage cells on a thin, flexible patch. **In this surgery, we put them back**. Through a small incision on the front of your knee (a mini-open incision), we prepared the damaged area, cut the patch to fit it exactly, and held it in place with a natural tissue glue (fibrin glue).

We also did a **tibial tubercle osteotomy (TTO)**. The tibial tubercle is the bump on the front of your shin bone where the kneecap tendon attaches. We cut that bump free, moved it to a better spot, and held it with screws. This lets your kneecap glide in the right track and takes pressure off the new cartilage. The bone cut heals like a broken bone, which takes about **6 weeks**. An X-ray at 6 weeks tells us when it is ready for weight.

Over the next 12 to 18 months, the cells mature into firm new cartilage and bond to the bone. **Right now the patch is very fragile.** For the first 6 weeks it is mostly water, held mainly by the glue. Pressure or grinding can loosen it. Gentle motion without weight helps it heal. That is why the rules below matter, even when your knee feels good. **Respecting the biology of healing is just as important as effort in PT.**

Two things are healing at once: the new cartilage and the bone cut. For now, the bone cut sets the rules. It needs you to stay toe-touch only, and bending too far too soon pulls on the screws through the kneecap tendon. That is why bending follows a set schedule. This is a little different from a TTO alone. The new cartilage on your kneecap also needs protecting, so your bending climbs in smaller steps and you sleep with the brace locked straight.

Your three jobs for the next two weeks

- **Protect the bone cut and the new cartilage.** Toe-touch only, with two crutches. Brace locked straight whenever you're up and while you sleep.
- **Keep the knee fully straight, and bend exactly on schedule.** Do not go past 45° by day 5, 60° by 1 week, or 75° by 3 weeks, and no more than 90° until the 6-week X-ray.
- **Wake up your quad** (the big muscle on the front of your thigh). Swelling shuts it off. Ice, elevation, and quad exercises turn it back on.

Day by Day

What to do, and what to expect, from the day of surgery to your PA visit.

DAY 0

The Day of Surgery

Goal: Rest, ice, elevate, keep the knee straight, and toe-touch only.

Rest today. The main goal is to **prevent swelling and pain** and get your recovery started. **Icing and elevation** are the two best ways to do that.

- **Toe-touch only:** your foot may rest on the floor for balance, about 10 to 15 pounds, but no more. Your crutches carry your weight. Use two crutches every time you are up.
- **Keep the knee straight.** When lying in bed or on the couch, put a pillow **under your calf**, not under your knee. The knee should rest fully straight. This position is uncomfortable at first, but it is the most important position for your recovery.
- **Ice right away.** While you are lying down, you can unbuckle the brace and put the ice machine pad directly over the ACE wrap. The dressing protects your skin. Use it 20 minutes on, 20 minutes off. Buckle the brace back on, locked straight, before you get up.
- **Avoid sitting with your leg down or moving around too much** today. Both increase swelling and pain.
- **Your leg will feel heavy.** Have someone help you move it, or loop a towel around your heel to lift it.
- **Ankle pumps:** point and flex your foot 20 times every hour you are awake. This keeps blood moving in your calf and lowers the risk of blood clots.

Your nerve block

Before surgery you had a **saphenous nerve block**, numbing medicine placed near a nerve on the inside of your thigh. It numbs the inside of your knee and shin and usually wears off **12 to 24 hours** after surgery. Pain often climbs the first night as it fades. **Take your pain medicine before bed on the first night, even if you feel fine.** It is much easier to stay ahead of pain than to catch up to it. Numb skin can't feel when it is getting too cold, so **never put ice directly on bare skin.**

Before bed tonight

- ☐ Pain medicine taken
- ☐ Ice machine on, leg elevated on a pillow under the calf
- ☐ Ankle pumps done
- ☐ Brace on and locked straight for sleep
- ☐ Crutches next to the bed, and a clear path to the bathroom

DAY 1

The Day After Surgery

Goal: Take off the bulky dressing, refit the brace, and start gentle bending.

1 Remove the bulky dressing

Undo the brace straps and remove the ACE wrap. **Save the ACE wrap.** Under it are gauze pads. Some dried blood on the gauze is normal. Throw the gauze away. Your incision was closed with **dissolving stitches under the skin** and a layer of **skin glue** on top. **Leave the glue alone.** Cover the incision with a clean, dry gauze pad as needed and rewrap the ACE wrap loosely. **No creams, lotions, or ointments** on the knee for 4 weeks.

If the gauze is soaked through or the incision is actively dripping, call **(425) 656-5060**.

2 Refit the brace

Put the brace back on, **locked straight**. It will feel loose now that the bulky dressing is off. Undo the Velcro and shorten the straps to snug it up. If a strap or hinge rubs on the incision, wrap the ACE wrap between your skin and the brace.

3 Start bending your knee

Bending is important, but after a TTO it follows a schedule to protect the screws.

- Take the brace off and lie on your back in bed.
- Use your hands to pull your thigh up toward you, letting your heel slide along the bed. Then use your hands or a towel to gently pull your shin toward your thigh.
- Follow the schedule, and **do not go past it**: up to **45° (half of a right angle) by day 5**, **60° by 1 week**, and **75° by 3 weeks**, then up to **90°, no more, until your 6-week X-ray**. Your therapist will measure it.
- To straighten, put your other foot under your heel and lower the leg slowly. Repeat several times a day.
- **CPM machine**: If you were given a CPM machine (a machine that slowly bends and straightens your knee), use it as instructed, within your bending schedule.

The two positions for your knee

Your knee should be in one of two positions: **out straight, or working on motion**. The most comfortable position is "slightly bent," with a pillow under the knee. **Avoid that position**. Either keep the leg straight or work on bending.

4 Wake up your quad

- **Quad sets**: With your leg straight, tighten the muscle on the front of your thigh by pushing the back of your knee down into the bed. Hold 6 to 10 seconds, then relax. Do 10, **every hour you are awake**.
- **Straight-leg raises**: With the brace locked straight, lift the leg 6 to 12 inches off the bed and hold for 10 seconds. You may not be able to do this at first. Your strength will come back.
- **Electrical stimulation (NMES)**: A small device that makes the quad muscle contract. Your therapist provides it and starts it at PT. No home unit is needed.

Your brace: locked straight, day and night

For the first **6 weeks**, the brace stays **locked straight** whenever you are standing, walking, or sleeping, even once your leg feels strong. Take it off only for your bending exercises and to wash. After the 6-week X-ray, the brace is opened a little at a time over weeks 7 and 8. **The crutches go first and the brace second. Sleep with it on**, and keep the leg straight on a pillow under the calf.

DAYS 2–7

The Rest of the First Week

Goal: Toe-touch only, knee straight, bending on schedule, quad firing, physical therapy started.

- **Knee straight when resting. Quad sets every hour** you are awake, straight-leg raises several times a day.
- **Toe-touch only, with two crutches at all times.**

- **No standing exercises yet.** All your exercises are done lying down or seated.
- **Start physical therapy 5 to 7 days after surgery.** Bring your PT prescription and protocol.
- **Shower starting 48 hours after surgery**, with the incision covered (see the FAQ).
- **Swelling peaks around days 2 and 3**, and bruising may creep down your shin to your ankle. Both are normal. Keep icing and elevating.
- **Start cutting back the narcotic pain medicine** as the pain allows. See your Medication Guide.

WEEK 2**Until Your PA Visit**

Goal: Still toe-touch, bending on schedule, quad getting stronger.

- **Keep the knee fully straight.** This stays a top priority.
- **Bending:** keep following the schedule. **No more than 60°** at the start of week 2, working up to **no more than 75° by 3 weeks.**
- **Toe-touch only** until the 6-week X-ray shows the bone has healed.
- **Brace:** still locked straight for standing, walking, and sleeping.
- **School or desk work:** many people are ready around 2 weeks, if they can keep the leg up.
- **Keep going to PT** and doing your home exercises.

Your PA visit at 2 weeks

We will check your incision, your motion, and your strength, review how PT is going, and answer your questions. Write your questions down as they come up, and bring this guide and your brace.

Managing Pain

Your medicines are explained on the separate **Medication Guide** that comes with this packet. Medicine is only one of the tools you have. These have been shown to lower pain and the amount of narcotic medicine people need:

- **Ice, elevation, and taking your Tylenol on schedule.** These are your best tools for pain and swelling. Take the Tylenol every 8 hours for the first 2 weeks, even if you feel okay.
- **No anti-inflammatory medicines for 6 weeks** (ibuprofen, naproxen, meloxicam, Celebrex, or gels like Voltaren). They can slow bone and cartilage healing. Keep taking your 81 mg aspirin.
- **Mindfulness meditation** has been shown to help with pain after surgery. Guided meditations are free at mindfulness-for-pain.mindful.org.
- **Listening to music** lowers pain levels and the need for narcotic pain medicine after surgery.
- **Accept that some pain is part of healing.** Your body sends blood flow and energy to the areas that hurt, and that is part of recovery. After the first couple of days, our goal is a pain level of about **6 out of 10 with medicine**. "Zero pain" is not the goal.

Expect pain to be worst on days 2 and 3. Most patients feel pretty good the day of surgery because of the numbing medicine used during surgery. Then things get sorer before they get better. This is normal and it passes. Without an anti-inflammatory, some people need the narcotic a little longer. Call us during business hours before you run out.

Constipation

Narcotic pain medicine commonly causes constipation. Try these in order:

1. Cut back on the narcotic pain medicine if your pain allows.
2. Drink plenty of water and other decaf fluids.
3. Eat dried prunes or drink prune juice.
4. Take Senna (Senokot), an over-the-counter laxative.
5. Add Miralax, a stronger over-the-counter laxative.
6. If you have not had a bowel movement in 5 days, call the office.

Your Ice Machine

If you have an ice machine (most of our patients have the **Breg Polar Wave**), **use it a lot**. It is one of the most effective tools you have for swelling and pain, especially in the first two weeks.

- **Use it 20 minutes on, 20 minutes off**, as often as you can while you are awake.
- **Day of surgery:** Put the pad on right over the ACE wrap and bandage. The dressing protects your skin.
- **Compression is fine from day one.** If your machine has a compression setting, use it. Cold plus compression controls swelling better than ice alone.
- **After the bulky dressing comes off:** Always keep a thin layer (a t-shirt, pillowcase, or the ACE wrap) between the pad and your skin. Check your skin each time you take the pad off.
- **Keep the leg elevated while icing.** Ice works best when the leg is above your heart.
- **No ice machine?** Bags of ice or frozen peas wrapped in a thin towel work well, on the same 20 minutes on, 20 minutes off schedule.

Eat to Heal

What you eat has a **direct effect on how well and how fast you recover**. After surgery your body breaks down muscle to get the building blocks it needs for healing. Good nutrition lets it rebuild instead.

- **Protein:** Aim for 1.6 to 2.0 grams per kilogram of your ideal body weight each day. Most people eat far less. A protein shake is an easy way to close the gap when your appetite is low.
- **Creatine:** 10 grams a day. It helps muscle energy and lowers inflammation, and it is one of the most studied and safest supplements. Let your other doctors know you take it, since it can raise a kidney number (creatinine) on blood work.
- **Vitamin D:** 2,000 to 5,000 IU a day. Important for bone healing and your immune system.
- **Vitamin C:** 500 mg twice a day. Your body needs it to make collagen, the protein that holds tendons, ligaments, and your repair together.
- **Collagen peptides:** 10 to 20 grams a day, taken with the vitamin C.
- **Water:** 8 to 10 glasses a day. Well-hydrated patients have less pain, nausea, and fatigue.

The full nutrition guide is at merrittsurgery.com/surgeries/nutritional-optimization

Is This Normal?

Use this page to decide whether to wait it out, call us, or call 911.

OK NORMAL

NORMAL — expected after surgery

- **More swelling on days 1 to 3** than on the day of surgery
- **Bruising** that spreads down the shin, calf, ankle, and even the foot over the first week (gravity pulls it down)
- Some **bloody fluid** on the bandage for the first 24 to 36 hours
- A **low fever up to 100.5°F** for the first 2 to 5 days. Deep breaths help bring it down
- **Numbness** around the incision and nearby skin. It usually improves, but can take 6 to 12 months
- A **warm** knee for several weeks
- Trouble sleeping, low energy, or feeling down for a few days

CALL CALL US

CALL US — (425) 656-5060

- **Temperature of 101.5°F or higher**, or shaking chills
- **Redness that spreads** away from an incision, or drainage that is cloudy, smells bad, or soaks the gauze
- Any drainage that **starts or continues after day 4**
- **Calf pain or swelling that keeps getting worse**, especially if it is only in one leg
- Pain that is **not controlled** by your medicines
- Nausea or vomiting that keeps you from keeping down fluids or medicine
- **Unable to urinate** for 8 hours after surgery
- **Black or tarry stools**, vomiting blood, or bleeding that won't stop
- **Foot that is numb, tingling, cold, or pale** and doesn't improve after loosening the brace and wrap

911 EMERGENCY

CALL 911

- **Chest pain**
- **Shortness of breath** or trouble breathing
- Coughing up blood
- Fainting or passing out
- **Very sleepy, hard to wake up, or slow or shallow breathing** (possible narcotic overdose)
- Swelling of the face, lips, or throat, or a widespread rash (allergic reaction)

Don't see an answer to your question here?

Call our office at **(425) 656-5060**, day or night
Learn more at **merrittsurgery.com**

Frequently Asked Questions

How much weight can I put on my leg?

Toe-touch only for 6 weeks: your foot may rest on the floor for balance, about 10 to 15 pounds, but no more. Your crutches carry your weight. The bone cut heals like a broken bone, and weight too early can shift it or loosen the screws. At 6 weeks we take an X-ray. If the bone has healed, you start adding weight, and most people are off crutches around 8 to 10 weeks.

When do I need the brace?

Locked straight whenever you are standing, walking, or sleeping, through 6 weeks. Take it off only for your bending exercises and to wash. After the 6-week X-ray, the brace is opened a little at a time over weeks 7 and 8. You stop using it only after you are off crutches.

Why can't I bend my knee as far as it will go?

When you bend, the kneecap tendon pulls on the bump of bone we moved. Until it heals, too much pull can stress the screws. So bending follows a step-by-step schedule: **no more than 45° by day 5, 60° by 1 week, and 75° by 3 weeks, then up to 90° (a right angle) until your 6-week X-ray.** Don't push past them.

When can I use a stationary bike?

After 3 weeks, your therapist may start you on a stationary bike. Only rock the pedals back and forth, within your bending limit. Full turns of the pedals come later, once you are allowed to bend past 90°.

When can I shower?

Starting **48 hours after surgery.** Sit on a shower chair or bench, and keep to toe-touch only. Take the brace off while seated. Cover the incision with a waterproof cover or plastic wrap taped at the edges so it stays dry until your PA visit. Pat the knee dry, then put the brace back on, locked straight, before you stand. **No baths, pools, or hot tubs for at least 4 weeks,** until the incision is fully healed.

Do I need to change the bandage? Do stitches come out?

Use a clean, dry gauze pad over the incision as needed, held with the ACE wrap. Change it if it gets wet or dirty. **Don't pick at or peel the skin glue.** All your stitches dissolve, so **nothing needs to be removed.** We will check the incision at your PA visit.

How do I do stairs on crutches?

"Up with the good, down with the bad." Going up, step up with your non-surgery leg first, then bring the crutches and surgery leg up. Going down, put the crutches and surgery leg down first, then step down with your good leg. Your surgery foot may only toe-touch the step. Brace locked, handrail whenever there is one. Many people find it easier to go up and down on their bottom at first.

When can I drive?

Right knee: not until you are off crutches, out of the brace or it is unlocked, off all narcotic pain medicine, and able to brake hard. That is usually about 8 to 10 weeks. **Left knee (automatic car):** usually 2 to 4 weeks, once you are off all narcotic pain medicine. There is no set date, and it is not up to your surgical team to release you. You must be a safe, unimpaired driver, so use good judgment.

When can I go back to school or work?

Desk work or school is often possible around 2 weeks, if you can keep the leg up and get around safely on crutches. Jobs with standing, walking, or lifting take much longer, at least until the bone has healed and you are walking without crutches. We'll plan it together.

Can I travel or fly?

Long car rides and flights raise the risk of blood clots, so avoid them in the first two weeks. After a bone cut, the clot risk is higher, so this matters even more. If you must travel, do ankle pumps every hour, keep taking your aspirin, and let us know first.

How do I get a refill?

Call **(425) 656-5060** during business hours, Monday through Friday, a day or two before you run out. Narcotic pain medicine cannot be refilled after hours or on weekends. You can also ask at your PA visit.

YOUR MEDICATION GUIDE

Cartilage and Osteotomy

After surgery you go home with a small team of medicines. **Each one has a specific job**, and they work best together. This guide explains what each medicine is for, how to take it, and when to stop. Your prescription labels have your exact doses. If anything here differs from your label, follow the label and call us.

No anti-inflammatory medicines for 6 weeks

- Anti-inflammatory medicines can slow **bone and cartilage healing**. Do not take ibuprofen (Advil, Motrin), naproxen (Aleve), meloxicam, celecoxib (Celebrex), diclofenac, or anti-inflammatory creams and gels such as Voltaren.
- This includes any anti-inflammatory you usually take. You should have stopped it 7 days before surgery. We will talk about restarting it at your 6-week visit.
- **Keep taking your 81 mg aspirin** (unless we gave you a different blood thinner plan). It is a low dose that prevents blood clots, and it is part of your plan.
- Many cold, flu, and sleep medicines contain ibuprofen or naproxen. Check the label, or ask your pharmacist.

Your Medicines at a Glance

These are my standard medicines after this surgery

Your plan may be different because of your allergies, your health history, or a different plan for pain or blood thinners (anticoagulation). If we discussed a different plan with you, follow that plan and your prescription labels.

Type	Medicine	Its job	How to take it
PAIN	Acetaminophen (Tylenol)	Your main everyday pain medicine. Because you are not taking an anti-inflammatory, taking it on schedule matters more.	Every 8 hours for 2 weeks, then as needed
CLOTS	Aspirin 81 mg baby aspirin	Thins the blood slightly to prevent blood clots after surgery while you are less active.	Twice a day, unless you were given a different blood thinner plan
PAIN	Narcotic pain medicine usually oxycodone (or hydrocodone or Dilaudid)	Takes the edge off strong pain so you can rest, sleep, and do your exercises.	As needed
HELPER	Anti-nausea medicine ondansetron (Zofran) If prescribed	Settles nausea from anesthesia or the narcotic.	As needed
HELPER	Miralax and Senna	Treat constipation from the narcotic, if it happens.	Only if constipated
HELPER	Omeprazole 20 mg Prilosec	Protects your stomach if the aspirin upsets it.	Only if stomach upset

A Typical Day

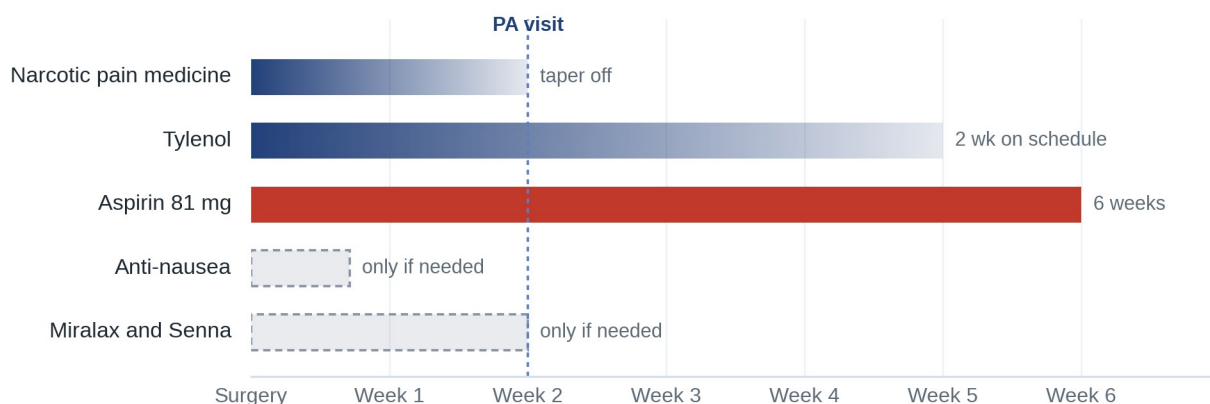
Scheduled medicines, spread through the day. Take the morning and bedtime doses with food or a snack.

Medicine	Morning with breakfast	Afternoon around 3 pm	Bedtime with a snack
Acetaminophen (Tylenol)	●	●	●
Aspirin 81 mg	●		●

Only when needed: Narcotic pain medicine; Anti-nausea medicine; Miralax and Senna; Omeprazole 20 mg.
Follow the label for how often.

How Long to Take Each One

Solid bars: take every day for the full time. Fading bars: taper off as you feel better. Dashed: only if needed.



Stop them in this order

- 1. Narcotic first.** Most people are off it within 1 to 2 weeks.
- 2. Tylenol on schedule for 2 weeks,** then only as needed until your pain is manageable without it.
- 3. Aspirin at 6 weeks. Always finish the full course.** It protects against clots while your weight bearing is limited or your bone is healing.
- 4. No anti-inflammatory until we say so** at your 6-week visit.

Each Medicine in Detail

Acetaminophen (Tylenol)

Its job: Your main everyday pain medicine. Because you are not taking an anti-inflammatory, taking it on schedule matters more.

How to take it: Take **1,000 mg (two 500 mg tablets) every 8 hours, on a schedule, for the first 2 weeks**. After that, take it as needed until your pain is manageable without it.

- **WARNING: Never take more than 3,000 mg of acetaminophen in a day from all sources combined.** Too much can seriously damage your liver.
- Some narcotic pills (such as Norco or Percocet) and many cold and flu medicines also contain acetaminophen. If yours does, it counts toward the 3,000 mg. We usually prescribe plain oxycodone for this reason. If you are not sure, ask your pharmacist or call us.

Aspirin 81 mg baby aspirin

Its job: Thins the blood slightly to prevent blood clots after surgery while you are less active.

How to take it: Unless we have discussed a different blood thinner plan with you, take **1 tablet twice a day** (morning and evening) for **6 weeks**. Finish the whole course, even if you feel great.

- **Some patients get a different blood thinner instead of aspirin**, for example if you already take one (such as Eliquis, Xarelto, or warfarin) or need a stronger one after surgery. If we have discussed a different plan with you, follow that plan instead of these aspirin instructions, and do not take aspirin on top of it unless we tell you to.
- If it upsets your stomach, take omeprazole (below).

Narcotic pain medicine usually oxycodone (or hydrocodone or Dilaudid)

Its job: Takes the edge off strong pain so you can rest, sleep, and do your exercises.

How to take it: Take as directed on the bottle, **only as needed** for pain. Use the lowest dose that keeps your pain around 6 out of 10.

- **Do not drive**, drink alcohol, or take sleeping pills or anxiety medicine (like Ambien or Xanax) while taking it.
- It causes constipation. See Miralax and Senna below.
- Without an anti-inflammatory, some people need it a little longer. **Call us during business hours before you run out** if you still need it.
- Store it out of reach, and take any leftovers to a pharmacy drop box when you are done.

Anti-nausea medicine ondansetron (Zofran)

If prescribed

Its job: Settles nausea from anesthesia or the narcotic.

How to take it: Take as directed, **only as needed** for nausea. The dissolving tablet goes on your tongue if you can't keep pills down.

Miralax and Senna (over the counter)

Its job: Treat constipation from the narcotic, if it happens.

How to take it: **Only if you become constipated**. Start with Senna, and add Miralax if you still need it. Follow the package directions, and see the constipation steps in your post-op packet. Stop when you stop the narcotic.

Omeprazole 20 mg (over the counter) Prilosec

Its job: Protects your stomach if the aspirin upsets it.

How to take it: **Only if you get an upset stomach or heartburn:** take 1 capsule once a day, 30 minutes before breakfast.

- If you already take a stomach medicine (Prilosec, Nexium, Protonix, Pepcid), keep taking yours instead.

Questions about your medicines?

Call our office at **(425) 656-5060**, day or night.

Refills: call during business hours, a day or two before you run out.

Call 911 for trouble breathing, or swelling of the face, lips, or throat after taking a medicine.