

Pectus Excavatum

Post Op Minimally Invasive Repair (Nuss Procedure) Guidelines

What to expect & restrictions:

Manage your **pain**: You will still have some pain after surgery, which must be treated with medications. Pain might be on the sides or center of the chest (not just around the incisions); sometimes even the back may hurt. Manage pain with Narcotics and Non-Narcotic medications (as prescribed). It is important to note that the use of intra-operative Cryoablation will significantly decrease the pain and will also minimize the need for pain medications. Cryoablation will cause numbness in the chest which can last up to 3 months.

No driving for 4-6 weeks (depending on your mobility and the need for pain medications). Teenagers and young adults with a Driver's License are allowed to start driving after 4 weeks. No driving is allowed if taking any narcotic pain medication.

No lifting anything greater than 5 lbs for approximately 1-2 months

You may **NOT** carry backpacks or satchels on your shoulders for 3 months. The weight of a backpack or satchel will pull on your chest and cause unwanted strain and stress.

You should **sleep** on your **BACK** for about 2 weeks. Patients often say that sleeping in a recliner is more comfortable - if available. Slowly transition to sleeping on your side as tolerated.

The only activities you are permitted to do for the first 4 weeks following surgery are the ones provided by your physical therapist and should include **DEEP BREATHING WITH BREATH HOLDING AND WALKING** (see detailed instructions at the end of this document).

No PE for school-aged children.

No working out at a gym until you receive clearance from your physician and/or surgeon. This includes aerobics/pilates/yoga classes, biking, running, swimming, elliptical machine, sit-ups, or weight lifting.

As it relates to working out with weights: Most patients will be able to start exercising with small weights after about 4-6 weeks (see instructions below).

Many patients will be followed by physical therapy.

No twisting at the waist for 4 weeks. Flexing is acceptable but it must be done slowly and very carefully for the first 4 weeks.

No slouching or slumping—**GOOD POSTURE is important**

Postoperative Goals (after discharge):

Ø WEEKS 1-3:

- You may return to school when you are not taking narcotic pain medicine or a muscle relaxant. Do not carry a book bag.
- You should be able to take normal showers.
- Your steri-strips or derma bond may still be on; it is ok to gently peel them off.
- It is important to have long daily walks and to try to move as much as possible. Every movement should be done slowly, like in slow motion. Avoid abrupt turns or any fast movement. No running.
- It is also important not to become inactive and spend too much time in bed or sitting. Immobility will interfere with normal recovery.
- You will still have to manage pain with some medications. Pain might be on the sides or center of the chest. Start transition from Narcotic to Non-Narcotic medications (like Tylenol and Motrin). For patients that received intra-operative Cryoablation, the **use of Narcotics should be very limited** (usually only needed during the first week after surgery)
- It is completely normal to feel or see the bar now under the skin and soft tissues, particularly on the sides. The swelling is subsiding and thus the bar might be more noticeable.
- You may also notice a small stitch come out through the skin (also referred to as stitches being “spit out”) from one of your incisions. This is completely normal as the sutures are absorbable material and it should be of no major concern. It may look like a small piece of fishing wire. Cover it with a band-aid and a little antibiotic ointment; you may also snip the stitch at the level of your skin. It will be reabsorbed spontaneously.

- Office visit with your surgeon as scheduled at the time of discharge from the hospital (typically between 2-4 weeks post-op).

Ø **WEEK 4:**

- You may sleep on your side if pain is not a limiting factor; may also try to sleep on your stomach.
- You may raise your arms above your head (may do wall climbing with fingers exercise to increase range of motion). May reach for objects high up. May brush hair without limitations.
- It is important to remember that your overall energy level may still feel low and you may get tired easily – that is normal. It will get much better with time.
- May consider driving if recovering well from surgery, asymptomatic, and not taking pain medications.

Ø **WEEK 6:**

- You may drive (Note: cannot drive if taking any Narcotic medications)
- You may twist at the waist (slowly and with controlled movements)
- Continue to increase your level of physical activity

Ø **WEEK 8:**

- We highly recommend that you begin upper-body weight training (no more than 5 lbs. and above). May exercise in a gym setting with weights and machines. Consider the help of a trainer. Many patients are referred to physical therapy (as previously discussed)
- We highly recommend that you begin cardiovascular conditioning such as running, swimming, biking (only if you are skilled), Pilates, Yoga etc. in addition to weight training
- Remember: exercise is the key to a strong and healthy recovery from surgery

Ø **3-4 MONTHS:**

- You may carry a backpack without limitations
- You may participate in PE (unless instructed otherwise by your surgeon)
- Continue to work out with weights at increasing levels and participate in aerobic exercises/activities

- You may return to non-contact sports such as tennis, swimming, running, baseball, golfing, biking, volleyball, etc.
- You can ride a rollercoaster
- You can run, ride a bike, or skateboard (be careful and avoid any falls)

Ø 6 MONTHS:

You are **restriction-free** except for the following activities:

1. Football and other contact sports such as soccer.
2. sparing with martial arts
3. wrestling

It is important to note that participating in any contact sport while the bar is in place may increase the possibility of the bar shifting. Check with your surgeon if you wish to participate in any such sports.

Other information that you may need:

- v We **suggest** that you buy a medic alert bracelet. The inscription should state the following: **steel bar in chest, CPR more force, cardioversion ant/post placement.**
- v CPR can be performed; however, more force may be needed.
- v No MRIs are allowed unless cleared by a physician. CT scans are acceptable (the bar may cause artifact on the images)
- v If you notice any redness, swelling, blisters, or drainage please contact us immediately.
- v If you develop any significant acute pain that does not improve with the use of over-the-counter medications or the medications prescribed, please contact us immediately. A Chest X-Ray may be necessary to evaluate bar position.
- v You do **NOT** need to take antibiotics prior to routine dental work unless you have a diagnosis of mitral valve prolapse or any other major cardiac anatomical problems. However, during the first 3 months after surgery, if you are having major dental work such as extractions or braces applied, you may need to be pretreated with an antibiotic that is to be ordered by your dentist.
- v You should be able to join the military, if desired. Your surgeon can provide a letter to support military enrollment.

MEDICATIONS:

Ø You may be sent home with the following medications (this will vary a little based on the patient's overall condition at the time of discharge):

1. **Narcotic Medication** - prescription

§ We expect that you will need to take this for just a few days post-discharge (in decreasing frequency). Follow recommendations provided by your surgeon and care team. It is important to note that the use of intra-operative Cryoablation will significantly decrease the need for any type of narcotic medications after surgery.

§ This medication is to be taken only for severe pain and **only as needed**.

§ As your pain begins to lessen (probably around 4-7 days post-surgery) we highly encourage you to wean yourself off the narcotic medication. For example, if you have been taking your narcotic every 6 hours we suggest that the next day you try and extend it to every 8 hours and then every 12 hours and so on and so forth until you no longer need it.

§ This medication also causes constipation so you must take your Senna (or equivalent) while you are taking narcotics.

2. **Robaxin** (Methocarbamol) - prescription

§ We recommend that you take this in the morning when you wake up and at night before you go to bed. This schedule will help with muscle stiffness.

§ This may also be taken for backaches and sudden spasms that feel like a "charlie horse".

3. **Naproxen** (Naprosyn) **or Ibuprofen** – over the counter

§ We recommend that you take this around the clock during the first several weeks for the post-surgical inflammation. (dose will depend on your age and size)

§ You may need to take this for up to 3-4 weeks as needed.

§ It is **necessary** that you take this medication with food to prevent stomach upset.

4. **Valium** (Diazepam) - Prescription

§ You may need to take this for 1-2 weeks as a muscle relaxant and to help you sleep. It is an effective medication to relax muscles and decrease tension.

(Dose will be dependent on your age and size).

5. **Senna** (laxative) - over the counter

§ Must be taken while taking narcotic to prevent constipation.

§ Discontinue if stool becomes loose but continue Colace as directed

6. **Colace** (stool softener) - over the counter
 - § Must be taken while taking narcotic to prevent constipation.
7. **Zofran** (Ondansetron) - prescription
 - § Used as needed for nausea and vomiting
8. **Zantac** (Ranitidine) - over the counter
 - § *Continue taking while on any type of non-steroidal anti-inflammatory medication like Motrin and Naproxen.*
9. **Gabapentin (Neurontin)** - Prescription
 - § Used after surgery and duration may range from 7 to 21 days post-surgery.
 - § Used to reduce chronic nerve pain

10. Occasionally the following medications can be considered after surgery in selected cases:

A. Lidocaine Patch 4% - Over the counter

- § Used for incisional pain
- § Leave on for 12 hours then off for 12 hours
- § Discontinue when no longer needed
- § Use only one patch per day. Cut the one patch. Place above and below incisions. Do not place directly on incision. Use gloves when handling the patches. Use care when disposing of the old patches to prevent any pets or children from handling/ingesting.

B. Scopolamine Patch - Prescription

- § Used for nausea
- § Place behind the ear
- § Leave on for 3 days then remove.

Please note that you will probably **not** need all the medications that have been prescribed nor is it necessary that you finish all the medications.

We also strongly advise that you do **NOT** set an alarm during the night to wake up and take any medication. It is very important to get a good night's sleep. Have the medication ready and available if you wake up having pain.

FOLLOW-UP APPOINTMENTS:

1. One of our post-op nurses will call you a few days after discharge to check on your recovery.
2. A post-surgery appointment is to be scheduled approximately **2-3 weeks** after you are discharged from the hospital. You will likely have the appointment made before you leave the hospital.
3. Other follow-up appointments will be made based on your individual progress after clinical evaluation at your first post-surgery visit. Many patients will also have follow-up with physical therapy.
4. **Long term follow-up: every 6-12 months** post-surgery appointment is recommended
5. **Yearly** appointments are required until the bar is removed (in approximately 3 years). In the event of any unusual problems or symptoms, patients should be seen in clinic.
6. **AFTER bar removal** - once the bar is removed, you will be followed in the outpatient clinic until you receive a final clearance for unrestricted activities from your surgeon.

PLEASE REMEMBER to do your breathing exercises 10 times twice a day AND your posture exercises daily until the bar is removed. This will help with recovery from surgery.

Most patients will also be followed by Physical Therapy after surgery.

Here are some basic Pectus Excavatum Post Nuss Exercises which are commonly prescribed:

Exercise #1: Chest Expansion – Deep Breathing with Breath Holding. Do this exercise in the morning and at night - **Begin after surgery.**

1. Stand up straight (or sitting straight in chair) with the shoulders pulled back. Breathe in as deeply as possible and hold your breath for 10 seconds.
2. Repeat 10 times.

Exercise #2: Back Straightening Exercise. Do this exercise 10 times each morning and evening. The goal of this exercise is to straighten the back and pull the shoulders back.

Begin 1 month after surgery.

1. Hands are placed behind the head and fingers interlocked.
2. The elbows are pulled back as much as possible and the head and neck remain straight. This posture causes the chest to fill out in front.
3. Bend from the hips, forward and down, to a horizontal position. This position is held for 2-3 seconds. It is very important that the elbows, head, and neck remain straight during the exercise.

Exercise #3: Strengthening the Chest and Back Muscles. **Begin 2-3 months after surgery.**

1. Do 25 push-ups each day.
2. Another exercise to strengthen the chest muscles:
 - Lie with your back on the floor and with arms stretched out on each side. Place small, light weights in each hand.
 - Keeping arms straight, bring them together over the chest.
 - Do 25 each day.

Remember:

- Total exercise time should be about 10 minutes.
- Your child should do these exercises immediately upon getting out of bed in the morning and sometime in the evening.
- During the day your child should be active and do aerobic activities.
- Motivation and monitoring are very important. It is vital to monitor and encourage your child during exercise on a regular basis; otherwise he/she could lose interest.
- This exercise program is also recommended before surgery – it will not cure pectus excavatum; however, it will help correct poor posture, prevent progression of a mild pectus excavatum, make surgical correction easier and help prevent recurrence after bar removal.
- Please ask any team member if you have any questions regarding this exercise program. Referral to physical therapy is recommended and your team will provide the referral as necessary.