THE SPINE HOSPITAL

ColumbiaDoctors NewYork-Presbyterian The Allen Hospital

POSTERIOR CERVICAL SPINE FUSION SURGERY

Further reading on our websites:
New York Presbyterian Spine Hospital: www.nyp.org/spinehospital/index.html

Columbia Orthopaedics: www.columbiaortho.org

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SECTION 1: SOME INFORMATION ABOUT THE CERVICAL SPINE

The bones in the cervical spine are called vertebrae. There are 7 vertebrae in the cervical spine. Between each of the cervical vertebrae (except for the top two vertebrae, which do not have discs) there are intervertebral disks, often referred to simply as 'discs'. Discs act as shock absorbers and facilitate motion in the spine. Discs are made of a tough outer part called the annulus and a soft inner part that is called the nucleus. Think of it as being similar to a jelly donut with the outer part representing the annulus and the soft jelly representing the nucleus. When discs wear out, the annulus develops cracks and the nucleus can herniate out these cracks, like the jelly squeezing out through a hole in the donut. Your body sees the nucleus as a foreign body and attacks it by sending cells to gobble it up. These cells release inflammatory chemicals that cause inflammation around the nerves, which can cause arm pain, numbness and/or weakness. In addition, the inflamed nerves make the muscles go into spasm. That is what causes the neck pain. It is a common mistake to think that the size of the disc has to correlate with the severity of symptoms. One can have a tiny disc herniation with severe symptoms like yours or have a massive disc herniation with minimal to no symptoms. That is because it is the inflammatory chemicals that cause pain, not just the pressure from a large disc herniation. If you got an MRI on a day with severe pain and another one when you are feeling little pain, you would see that the MRI looks exactly the same. Since the size of the disc didn't change, we know it has little to do with the size of the disc. Instead, on a bad day, you have a lot of inflammatory chemicals floating around and on a good day, you may very little. Over time, everyone experiences some amount of disc degeneration, but there are factors that make certain people more prone to disc degeneration than others. Some of these factors are genetic (it's just the way we're born). Sometimes, trauma or injuries can lead to degeneration. Lastly, smoking is also a large risk factor for disc degeneration -- it reduces blood flow to the discs, causing them to degenerate faster. When discs begin to bulge or herniate, they may place pressure on nearby spinal nerves causing what is called 'radiculopathy'. Radiculopathy involving the cervical spine can cause pain, numbness or weakness that extends from the neck into one or both arms. Sometimes the discs are so big that they put pressure on the spinal cord and you can have a condition called "myelopathy." This simply means that something is wrong with the spinal cord. The symptoms may be loss of hand dexterity (buttoning buttons or picking up small objects may be difficult) or loss of balance or tripping. In severe cases, there may be loss of bowel and bladder control or even quadriplegia.

Other symptoms of disc degeneration may include headaches in the back of the head, pain in the neck, shoulder, upper back, arm, and/or fingers. Numbness, tingling and weakness are other symptoms that you may be experiencing occasionally or regularly. Other more serious symptoms include loss of balance and/or problems with coordination and movement of your hands.

Some definitions to help you understand your condition:

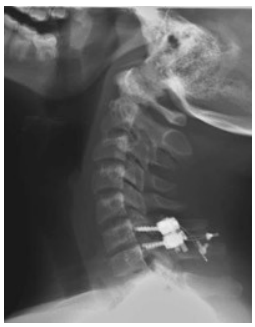
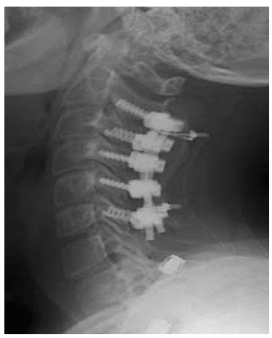
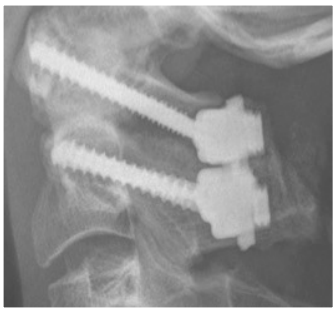
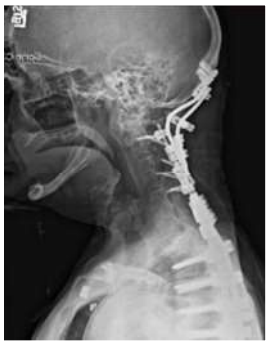
1. **Degenerative Disc Disease**: Degenerative Disc Disease is a breakdown of the disc. This may cause the disc to crack, flatten, or turn to bone. As the disc flattens the vertebrae rub together and may cause bone spurs. The bone spurs may cause irritation to the nerves.
2. **Herniated disc**: Discs are made up of mostly water. The hard outer ring of the disc, known as the annulus, may develop a tear, which allows the soft material inside the disc to bulge through the tear. The bulging portion of the disc can press on the nerve root or the spinal cord. There are many reasons that

may cause the annulus to tear which include a trauma of some sort to the spine and/or degenerative disc disease. Also may be referred to as "ruptured" or "prolapsed" or "bulging" disc.
3. **Spinal Stenosis**: Spinal Stenosis is a narrowing of the spinal canal. Bone spurs narrow the space through which the nerve roots exists in the spinal canal. Some people are born with a narrow canal and others get them because of bulging discs or bone spurs.
4. **Spondylosis**: Degenerative arthritis of the spine, which may cause pressure on the nerve roots.
5. **Radiculopathy:** What happens when the nerve root is pinched or irritated? The symptoms may be arm pain, weakness, numbness, and/or wasting away of the muscles (atrophy).
6. **Myelopathy**: A disease process meaning that something is wrong with the spinal cord. Most commonly, it is due to pressure or compression on the spinal cord. The symptoms may be loss of hand dexterity (buttoning buttons or picking up small objects may be difficult) or loss of balance or tripping. In severe cases, there may be loss of bowel and bladder control or even quadriplegia.
7. **Fusion:** When the disc is removed and replaced with a piece of bone, that bone has to heal to the vertebra above and below and they "fuse" together to become one solid sheet of bone.
8. **Pseudoarthrosis:** This refers to a condition where the bone did not fuse. If this happens, 50% remain asymptomatic but the rest have severe enough symptoms that they need another operation.
9**. Foramen:** The channel where the nerve comes out of the spinal canal

SECTION 2: TYPES OF POSTERIOR CERVICAL SPINE FUSION OPERATIONS

The cervical surgery that you have been scheduled for is to correct the problems that you have having in your cervical spine. The fusion can be done at one or multiple levels in your neck. It may also be done in combination with a decompression procedure (to take the pressure off of your nerves). The decompression operations include: Foraminotomy, laminectomy and/or laminoplasty.

Posterior Cervical Foraminotomy- The foramen is the channel where the spinal nerve comes out of the spinal canal. If this is narrowed by bone spurs or a disc, we can enlarge it by removing some of the bone in the back side of the foramen.
Posterior Cervical Laminectomy- this involves removal of the lamina (the back roof of the spine) to take the pressure off of the spinal cord.

Posterior Cervical Laminaplasty- this involves cutting the lamina completely on one side and partially on the other so that we can open up the lamina using the partially cut side as a hinge. This preserves the roof of the spine so it can protect the spinal cord while still taking the pressure off of the spinal cord.

The Incision: The incision will be made up and down in the back of your neck for this surgery. The size of the incision depends on how many levels of the cervical spine will be addressed with the surgery. Posterior (back of your neck) incisions may take longer to heal and often leave a noticeable scar.

SECTION 3: RISK AND COMPLICATIONS:

Please note that the list below includes the most common or feared complications but is not a comprehensive list as just about anything can happen anytime one does anything invasive.

* Problems with anesthesia including a rare possibility of biting your tongue while asleep due to spinal cord monitoring-a bite block will be used to help prevent this from occurring
* Infection
* Spinal cord or nerve damage
* Bleeding or possible need for transfusion
* Failure of the instrumentation
* Bone graft shifting or displacement or not healing properly, necessitating another operation
* Failure of the metal rods and screws
* Chronic pelvic pain if your own bone is taken from your pelvis
* Injury to the vertebral artery resulting in a stroke
* A blood clot can form in your arms or legs
* Heart problems and even death
* Blindness has been reported to occur in 1/1,000 cases. Mostly, this is reported to occur in elderly patients who have long operations with lots of blood loss. These are not long operations and I don't lose much blood and I have never had this complication in several thousand cases.

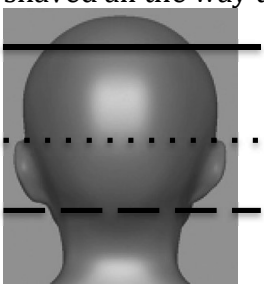
SECTION 4: PREPARING FOR SURGERY

1. Before your surgery, it is necessary to have blood work done and a urine test. **If it has been some time since you have seen your primary physician and you have a lot of medical problems, you should see your medical doctor ASAP before your surgery date.**

2. You have no physical limitations after this surgery, but please note that you have just had major surgery. Slowly increase your activity levels so that your body can adjust to all the changes that it has just overcome. Let pain be a guide to what you do and don't do.
3. To prepare your home for your recovery after surgery, please put necessary items within reach so that you may avoid a lot of movement of your neck. During the six weeks of your recovery you will not be able to lift more than 30-50 pounds, or as directed by Dr. Lombardi. Please make arrangements before surgery to have any heavy items purchased before surgery such as dog food, etc.

4. It is important to shave your hair 1-2 days before surgery. This prevents hair flying around in the operating room, if we have to do it. Also, any little nicks and cuts will seal up by surgery time. Dr. Lombardi will let you know how much to shave but in general, for procedures below C5, hair below a line connecting the bottom of the ears (dashed line in picture below) needs to be shaved. If you have long

hair, just lift up the hair and shave from bottom up so that, after the operation, the long hair will cover the area that was shaved. For those having surgery up to C1 – 4, all the hair below a line connecting the top of one ear to the other ear has to go (dotted line). For those having a fusion up to the skull, the hair has to be shaved all the way up to the top solid line. If you have questions about where to shave, just ask us.



MEDICATIONS TO AVOID BEFORE AND AFTER SURGERY

Medications that increase the chances that you will bleed excessively after surgery:

a. Aspirin. Ideally stop 2 weeks before but if your cardiologist says that you need this, Dr. Lombardi can operate even if you are taking it.
b. Coumadin- **Discuss with the prescriber as to the best time to stop this medication before surgery. Usually at least 4 days before and 2 days after surgery**
c. Ibuprofen (Advil, Motrin). Stop 2 days before
c. Naproxen (Aleve): stop 3 days before
d. Plavix-**Discuss with the prescriber as to the best time to stop this medication before surgery. Usually 5 days before and 3 days after surgery.**

II. Herbs that patients may take over-the-counter that can also affect bleeding so please stop 10 days before and don't resume until 1 week after surgery.
Chondroitin, Danshen, Feverfew, Fish oil, Garlic tablets, Ginger tablets, Gingko, Ginseng, Quilinggao, Vitamin E, Co Q10

After surgery, you should **avoid all anti-inflammatory medications** because they interfere with the bone fusing. These medications include Aspirin, Ibuprofen (Advil, Motrin), and Naproxen (Aleve), as well as all other prescription anti-inflammatories. You can take Tylenol but be careful not to take too much Tylenol (acetaminophen). Take no more than a total of 3000mg in 24 hours. Percocet and Vicodin have 325 of acetaminophen in each pill. So two pills have 650mg. If you take more than 3000 mg of acetaminophen a day, it can result in permanent liver damage and death.

SECTION 5: SURGERY:

On the day of your surgery, you will be asked to arrive approximately 2 hours before the time of your surgery. You will check in at the Surgery Registration and Waiting area. Approximately 30 minutes later, you will be called into the Holding Area where you will meet the anesthesiologist. The anesthesia staff will put catheters in your arms for the intravenous fluids and begin to medicate you. The scheduled time of your surgery is really just an approximation. Much depends on the when the surgery before you finishes.

Once you arrive in the operating room, you will not see Dr. Lombardi. Dr. Lombardi is often in a different room, finishing up with that surgery before your case. You will be sleeping when Dr. Lombardi comes into your surgery room to start your surgery. It usually takes 60-90 minutes from the time you are in the room until he makes the incision. Anesthesia puts you to sleep, spinal cord monitoring people place electrode needles and then you have to be positioned and washed and draped.

At the end of your surgery, it usually takes 20-30 minutes to wake you up and put you on the hospital bed before you are taken to the Recovery Room. At the end of the surgery, Dr. Lombardi will instruct one of the nurses in the operating room to call down to the Family Waiting Area. Your family will be notified that your surgery is finished. He will also try to call them himself. Dr. Lombardi will meet you and your family in your hospital room later on that evening. Dr. Lombardi usually makes evening rounds sometime between 5:00pm and 9:00pm in the evening, depending on when he finishes his last surgery case. If you are not yet up in your room at the time that he is making rounds, he will come and see you in the Recovery Room.

BLOOD LOSS

There is normally very little blood loss with any surgery that Dr. Lombardi does. He very rarely has to transfuse a patient. The anesthesia department has asked that you review and sign a consent that allows you to receive blood in a life threatening emergency, if you would want it. Otherwise, blood loss is usually about ½ -1 cup during these types of surgical procedure. It is very rare for Dr. Lombardi to have to transfuse a patient as he uses meticulous surgical techniques that minimize blood loss.

SPINAL CORD MONITORING:

Spinal cord monitoring is a part of the surgery where a nurse places small needles attached to wires in the scalp and other parts of the body to make sure that the spinal cord is not being damaged during surgery. You may or may not notice some irritation to your scalp after the surgery. This irritation should resolve within a few days after the surgery.

INTRAOPERATIVE TRACTION

In order to suspend you head and neck during surgery, we put pins into your skull after you are asleep. We will remove this before you wake up. You will have some tenderness just above your ears as a result of these pins.

THE EVENING AFTER SURGERY:

This is an extremely painful operation. Every movement that you make will be transmitted into the muscles in your neck. Fortunately, this pain will eventually subside. The excruciating pain typically lasts for 1-4 weeks. Thereafter, the pain gradually begins to decrease, but will still persist for at least 3-6 months. How fast the pain stops is dependent upon how fast the bone takes to heal. Once the solid fusion has occurred, the levels that Dr. Lombardi operated on should no longer cause any pain. A solid fusion takes anywhere from 3 months to 24 months to occur. It can be delayed by medications such as anti-inflammatories (aspirin, Ibuprofen, Aleve), anti-osteoporosis medications (Fosamax), diabetes, or nicotine abuse (smoking, chewing tobacco, Nicorette gum, nicotine patches).

Will all pain subside once a solid fusion has occurred? Unless Dr. Lombardi has fused your entire neck from the skull down to somewhere in the middle of the thoracic spine, it is unlikely to stop. It is true that every level that Dr. Lombardi has solidly fused will no longer cause pain. However, there are 8 motion segments in the neck, and combined with motion from the top 3-4 segments in your thoracic spine, there

are many areas in your neck that can cause pain. Even if he fuses 3 or 4 of the worst of these levels, the other levels can, and eventually will, break down. The reason that Dr. Lombardi does not fuse all of the levels in your neck is that you would then have a very stiff neck. Patients who have their entire neck fused will no longer have neck pain, but may be unhappy because of the markedly limited range-of-motion of their neck. For this reason Dr. Lombardi will choose to fuse as few levels as possible. He will choose to fuse only levels that are a danger to your nerves, or that are so severely broken down that they cause intolerable pain.

After surgery you will go to the Och Spine Hospital floor where almost always, you will have a private room. The vast majority of the patients have told us that they have never experienced such outstanding care and responsiveness in any hospital before. Unlike many hospitals, it is very rare for someone at The Spine Hospital to have to wait longer than 5 minutes after pushing a call button to get a response. If you do not get outstanding care from anyone or are displeased with anything at the Och Spine Hospital, please let the charge nurse know right away and let Dr. Lombardi know when he makes rounds. This will help to make it right for you, as well as future patients.

1. ***Activity***: You may need assistance when first getting out of bed.

2. ***Diet***: You will start on a clear liquid diet that will increase to a regular diet as you tolerate it.

3. ***Sleep*****:** If you need a sleeping pill, you may ask for it. Most people do not get much sleep the first night after surgery. During surgery, you are taking a several hour nap, which may disturb you wake/sleep cycle. Also, in the hospital, the nurses have to check up on you all night, to get your vital signs. If you are able to get 2-3 hours of sleep the night of the surgery, consider yourself lucky.

4. ***Pain Control***: If you are admitted to the hospital, you will have an I.V.-intravenous fluids running into a catheter in your arm. You may have a button to push that is connected to a machine that gives you the pain medicine when you feel that you need it or pain pills. You may be switched to pain pills the evening of your surgery or the next morning, depending on how your pain is controlled. If you have a lot of spasm between your shoulder blades the night of the operation, rather than taking a massive amount of morphine, you can take a muscle relaxant such as Valium. This will be written for you, so that you can ask the nurse for this medication.

5. ***Medications*****:** After the operation you will have all kinds of medications that are available for you, including pain medications, anti-nausea medications, anti-itch medications, sleeping pills, and muscle relaxants. However, it is up to you to ask for these medications. In addition, if there is something that you require that we have not written for, please ask one of the floor nurses. There is always a Physician Assistant (PA) and Dr. Lombardi is available 24 hours a day. Do not suffer in silence, as that is completely unnecessary. If there is anything we can do to make your hospital stay more comfortable, please do not hesitate to ask at any time of the day or night.

6. ***Drain*****:** You may have a **drain** coming from the incision in your neck. The drain removes the extra fluid from the layers of tissue under your skin. This helps to reduce the swelling in your neck. In rare cases, your **drain** may be left in for you remove at home. If so, Dr. Lombardi will let you know. The drain is hidden inside the dressing. The drain should come out when you remove the dressing on the morning after surgery. If not, just gently pull on it and it will come out. There may be some leakage from the site so just put a dressing on it for 5-10 minutes to keep your clothes clean. You do not need a dressing after that.

7. ***X-Ray*:** You will be sent down for cervical spine x-rays sometime before you leave the hospital. Feel free to ask the technician to show you the x-ray, so that you can see what Dr. Lombardi has done.

The morning after surgery:

1. ***Activity****:* you may be up as you desire and tolerate.

2. ***Diet****:* You may slowly return back to a soft-regular diet

3. ***Pain****:* The I.V. pain medication will typically be discontinued and you will be switched to oral pain pills. Please let them know of any drug allergies. **Percocet** (oxycodone with acetaminophen) is usually prescribed for severe pain and **Vicodin** (hydrocodone with acetaminophen) is prescribed for moderate pain. Use the Percocet first and when your pain has decreased enough, you can switch to Vicodin. You can take from ½ a pill up to 2 pills every 4 hours as needed.

4. **Occupational therapy** and **physical therapy** may evaluate you after surgery. Please discuss with them how to get up out of bed so that you do not pull on your neck. If you had surgery because of severe weakness of muscles in your arms or legs, you may be recommended to have physical therapy to strengthen those muscles.

Length Of Stay In The Hospital

Most patients with cervical spine surgery will be discharged on the day following surgery. Once your medical condition is stable, and your pain is under control with pain pills, the safest place for you to be is outside of the hospital environment. The hospital is the safest place to be if you are sick, but the when your health improves, the hospital is a more dangerous place for you to be. This is because there are "super bugs" in the hospital that do not exist in the community. An infection with one of these "super bugs" can be life threatening. Dr. Lombardi will recommend your discharge from the hospital as soon as we feel that your safety is better served at home than in the hospital.

SECTION 6: AFTER DISCHARGE TO HOME

1. Bed rest is not good for you. The sooner you get up, move around, walk and resume normal activities, the lower your chance is of developing a blood clot in your legs. **The symptoms of a blood clot are swelling, redness and pain in your calves (the lower part of your leg). If you develop these symptoms, please let us know right away.**

2. Brace: You will need to wear a neck brace/collar for 6-8 weeks after the surgery. There are 2 different collars/braces. A hard collar made of plastic or a soft foam collar. You can take the collar off to shower and also leave it off for a few hours each day. The brace is there to keep the neck still so that the bone will heal faster. The instrumentation inside your neck holds the neck together, but even with all the screws and rods, you will still be able to move your neck. With too much movement, you can even pull out your screws, although this is very rare. We have found that the brace speeds up the fusion process and prevents screw failure. If you experience skin irritation from the brace rubbing your skin, you may apply talc powder on your skin. DO NOT apply the talc powder to any open areas of skin. You may apply a scarf,

handkerchief, or tube sock cut on the closed end around the collar to prevent irritation. This will allow you to wash the item around the collar when you feel it is necessary, so you do not have to wash the collar. You may wash the soft cervical collar in cold water in the machine- DO NOT dry the soft collar in the dryer. This applies to ONLY the soft collar-the other collar can be washed in a sink with soap and water. If you are having trouble with you collar not fitting properly, contact Samara.

3. Wound Care:

- Keep your incision open to air – wash with soap and water-pat area dry. Keep incision clean and dry. Dressings are not needed once you are discharged from the hospital.
- Let the prineo dressing fall off by itself. This process usually takes 3-4 weeks. Do not peel the prineo off on its own as this can irritate the wound.
- You do not need to put any ointments or antimicrobial solutions over the incision or prineo dressing.
- **If you notice drainage or spreading redness more than 1 inch away from the incision (redness around the incision itself is completely normal –please call the office. We will ask you to take a picture and text or email it to us.**

4. Showering:

- You may take a shower as soon as you go home.
- There is no need to cover the incision.
- You may use soap and water to clean the incision, then gently dry off the incision, then leave it open to air.
- DO NOT take a bath or get into a pool for at least 7 days after surgery. Even after 7 days, if there is drainage, do not go under water.

5. Pain Medications: Percocet (oxycodone with acetaminophen) is usually prescribed for severe pain and **Vicodin** (hydrocodone with acetaminophen) is prescribed for moderate pain. Use the Percocet first and when your pain has decreased enough, you can switch to Vicodin. You can take from ½ a pill up to 2 pills every 4 hours as needed. After surgery, you may take Tylenol (acetaminophen) and Tylenol products, but take no more than a total of 3000mg in 24 hours. Percocet and Vicodin have 325 of acetaminophen in each pill. So two pills have 650mg. If you take more than 3000 mg of acetaminophen a day, it can result in permanent liver damage and death. You can also take Ibuprofen (Advil, Motrin), Naproxen (Aleve) or aspirin.

6. Hot or Cold Packs: Some people find that putting a bag of ice or frozen vegetables helps with the pain. There are also commercially available cold packs that you can put in the refrigerator and then put on the back of the neck. Others prefer a heating pad. Neither helps nor hurt so try both and see which one works better for you.

7. Driving:

Operating a motor vehicle may be limited due to pain. Wait until your pain is under reasonable control without taking any narcotics before driving. No one should operate a motor vehicle while under the influence of narcotics.

8. Activities:

- Gradually resume all normal activities and let pain be a guide to what you do or don't do. If it doesn't hurt while you are doing it and it doesn't hurt more the next day, you can do it.

- You may walk as much as you can tolerate over the next six weeks while you are recovering. Dr. Lombardi strongly recommends aerobic walking post-operatively.
- You may raise your arms to brush or wash your hair.
- You may ride in a car as much as you are comfortable.
- Please limit driving a car until after you are off narcotics.
- You may sleep in any position you want

9. Restrictions*:*

- No athletic activities until you have discussed your limitations with Dr. Lombardi. Unless he told you otherwise, patients who only had a 1-level artificial disc can resume all normal activities short of contact sports.
- No lifting more than a total of 50 pounds until after discussing with Dr. Lombardi at your six weeks checkup.
- Overhead activities often cause pain so let pain be your guide - stop if you have pain.
- Limit pulling or pushing with your arms, let pain be your guide-stop if you have pain.

10. What To Expect At Six Weeks After Surgery: Even though you are six weeks out from surgery you are still not fully healed. It is normal to have some achiness in the neck. We recommend doing 30-40 minutes of aerobic exercise, 3-4 times per week, which helps the wound heal and feeds the muscles with oxygenated blood. The bone takes 4 to 24 months to fully incorporate and heal. Until that time you may still have some aches and pains in your neck and between your shoulder blades. All of this is normal during the healing process. Around 4 to 12 months after the fusion, you may notice a sudden decrease in your pain. That is the day that the bones all fused together and became rock solid. Patients have often described it as a light switch going off. You can hasten this healing period by doing several things:

1) 30-40 minutes of aerobic exercise, 3-4 times per week, which feeds the growing bone with oxygenated blood
2) avoiding extremes of motion in your neck, since the less you stress it, the faster it heals
3) don't take Ibuprofen, Aleve, Aspirin or other anti-inflammatories, as they all slow down bone healing. You may take Tylenol
4) don't use any tobacco products

If you had weakness in your arms before the surgery, it may take up to 6 months or more for it to come back. If you had numbness for more than 3 weeks prior to surgery, it is possible that you still have not noticed an improvement. It often takes weeks to months for numbness to get better, especially if you had constant numbness for a long time before surgery. The longer you had the numbness before surgery, the longer it will take for it to recover. Until the 1-year mark, we won't be able to tell if the numbness is permanent.

11. As far as Dr. Lombardi is concerned there is no need for preventative antibiotic therapy before dental work after your neck surgery. If your dentist prefers you to have an antibiotic that is his or her decision.

12. THE IMPORTANCE OF AEROBIC EXERCISE:

You should start aerobic exercise as soon as you are able to. Ideally, at least 20 minutes a day 3-4 days per week. Start slowly and advance gradually as tolerated. Aerobic exercise is one of the best things that you can do for your entire body. The interesting thing is that it has been shown to markedly decrease chronic pain, including pain from your neck. People who are aerobically fit have much less neck pain than

people who are not. Aerobic exercise is any kind of continuous activity that lasts for more than 20 minutes, that increases the blood supply and oxygen delivery to all of your tissues. One way to determine if you are doing this properly is to check your heart rate.

Targeted Heart Rate Formula:

If you are a formula type person, subtract your age from 220 to get your maximum heart rate. Then multiply this number by .7. This is a reasonable goal for most people. For example, if you are 50 years old: 220-50=170; 170 x .7 = 119. Therefore, the average 50 year old should exercise until their heart rate reaches about 119 beats per minute, and maintain it there for at least 20 minutes.

If you are not a formula type person, we recommend that you exercise until you are slightly short of breath and working up a sweat. Maintain this slightly short of breath state for at least 20 minutes.

If you have medical problems, you should check with your medical doctor to make sure that you are able to tolerate such aerobic exercise. Start slowly, and keep at it, as you will find significant benefits, not only to your pain but also to the rest of your body. Exercise has been shown to improve mental function, decrease the risk of Alzheimer's, increase stamina and bone density, elevate mood, and add years to your life.

How Does Aerobic Exercise Improve Pain?

When you exercise, your body puts out chemicals called endorphins. These are naturally occurring morphine-like substances that the body produces in response to pain. This is the substance that probably gives marathon runners a runner's "high". This natural pain killing substance is produced in large amounts in people who exercise on a regular basis. In addition, regular aerobic exercise improves your cardiovascular function. Your heart works more efficiently as a pump, and your body begins building new blood vessels to feed the muscles and bones and joints. One of the reasons why you get pain when you have arthritis is that there is not enough oxygen that is delivered to the bones and joints and cartilage in-between the bones. If you exercise on a regular basis, then oxygen delivery to these arthritic joints is improved, and therefore, the pain is diminished.

We have seen many patients who have even avoided surgery on their neck as a result of taking up vigorous aerobic exercise as a means of combating their pain. If you exercise on a regular basis, you will find that you will need less sleep, have more energy, have less pain, and have a better mood.

When you stand under a hot shower or get a massage, you also increase the blood supply to your neck. This is why it feels good. However, these are passive ways to increase the blood flow. As soon as the shower or massage stops, the pain quickly returns. The difference with aerobic exercise is that it is an active means of increasing the blood supply, and the effect lasts for hours after you have finished exercising.

We recommend elliptical trainers, stationary bicycles, treadmills, and swimming. If you cannot swim, then we recommend that you wear a life vest and run in place in the deep end of the pool. This is excellent exercise, especially for those with arthritis of their hips or knees.

13. If you are a smoker, WHY YOU SHOULD NOT SMOKE:

It is known that people who smoke are much more likely to need spine surgery than people who don't smoke. Why does this happen? Nicotine decreases the formation of new blood vessels. In addition, it causes a spasm in the small blood vessels that supply parts of your body, such as bones and discs.

Because of poor nutrition to the discs and bones, they deteriorate faster; and this results in a higher likelihood of developing ruptured discs, degenerated discs, and arthritis of the spine.

More importantly, after a fusion, for the bone to heal, new blood vessels must grow into the dead bone that Dr. Lombardi has placed inside of your neck. Nicotine prevents the formation of new blood vessels, and therefore, the dead bone stays dead. It is similar to planting a tree in the garden and then pouring poison next to the roots. New roots will not be able to sprout, the tree will not be able to obtain nutrition, and therefore, it will die. If the dead bone that Dr. Lombardi places in your neck does not get fed by new blood vessels, it will stay dead and a fusion will not occur. In most cases this will mean that you will continue to have pain in your neck. Imagine if you broke a bone in your arm and it never healed - every time that you used your arm, it would hurt. Similarly, if the fusion doesn't occur in your neck, it is as though you have a broken bone in your neck that will hurt every time that you move your neck. The pain may become so severe that you will require a second operation to get the bone to heal. If you want to avoid the second operation, you should quit smoking as soon as possible before your surgery. Please avoid smoking until your bone has solidly fused. As stated above, one of the reasons why you might need surgery on your neck is because you are a cigarette smoker. If you take up smoking again after your surgery, you are much more likely to need yet more surgery on your neck as the other levels in your neck break down. Therefore, we strongly recommend that you quit smoking immediately, and avoid all Nicotine products.

SECTION 7: FREQUENTLY ASKED QUESTIONS

1. How long will the pain last?
Every patient is different. Some have it for a few weeks and some for a few months. 10% are off of it after 1-2 weeks, another 20% after 2-3 weeks. Most people are off of narcotics by 4 weeks. People who have been on narcotics before surgery typically need it the longest after surgery

2. How long should I avoid driving?
You should not drive while taking narcotics. You should avoid driving during the busy traffic times and remember to carefully position your mirrors before starting to drive.

3. When can I resume sexual relations?
Sexual relations can be resumed whenever the patient feels he/she is comfortable to do so.

4. When can I lift weights?
As soon as you can tolerate it without pain. Typically, this is not before 1-2 weeks. Start slowly and let pain be a guide to what you do. Avoid overhead lifting, as this usually causes the greatest pain.

8. My pre-operative pain has come back. What happened? Around 10% of patients whose pain went away with surgery will get the pain again in the first few weeks to months after surgery. This is due to inflammation around the nerves as the healing occurs. This pain will resolve over the next several weeks in the vast majority of cases.

9. I hear a lot of clicks and pops. This is perfectly normal, even in people who haven't had surgery. Unless there was trauma, this is rarely due to any problem.

SECTION 8: HOW TO CONTACT US

To make an appointment, please call (212) 932-5100, option 3. For any post-operative questions, please contact Dr. Lombardi's office at 212-932-5171 during business hours (Monday through Friday 9:00AM - 5:00 PM (except for holidays). Please note that the clinical team is seeing patients on Tuesdays through Thursdays and will not be able to return your calls right away.

During weekends and outside of normal business hours you will be connected with the answering service that will connect you with the on-call Physician for assistance.

IMPORTANT: Refills of medications need to be done during business hours-NO pain medication refills will be given over the phone after hours.

Follow-up appointment: The first mandatory visit is at 6 weeks post-op, but any time before then, feel free to call or come in.

Please call with any questions or concerns. We will be glad to assist you in any way during your recovery period.

SECTION 9: EMERGENCIES:

SIGNS OF AN EMERGENT SITUATION INCLUDE- Weakness of the arms and legs, loss of bowel or bladder control. While this is rare, it may be due to compression of the spinal cord. If at all possible, it is best that you return to The Spine Hospital for your emergent care. Please call our main line for further assistance at (212) 932-5100 any time of the day or night when the office is closed so that the emergent care can be initiated for you. If you have an emergency that cannot wait, please call 911.

Mailing Address:

Och Spine Hospital/NYP/Allen
5141 Broadway
3rd Floor- 3FW- Room 021
New York, NY 10034