THE SPINE HOSPITAL

ColumbiaDoctors NewYork-Presbyterian The Allen Hospital

EXPLANATION OF ANTERIOR CERVICAL SPINE 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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PROCEDURES

Anterior Cervical Discectomy & Fusion
Artificial Disc Replacement
Anterior Cervical Foraminotomy without Fusion
Anterior Cervical Corpectomy & Corpectomy/Discectomy

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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:

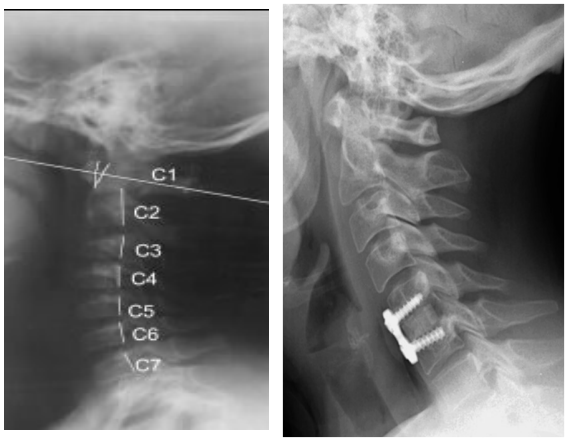
1. **Degenerative Disc Disease**: Degenerative Disc Disease is a breakdown of the disc. This may cause the disc to crack, flatten, or turn to bone. As the disc flattens the vertebrae rub together and may cause bone spurs. The bone spurs may cause irritation to the nerves.
2. **Herniated disc**: Discs 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.

SECTION 2: TYPES OF ANTERIOR CERVICAL SPINE OPERATIONS

The cervical surgery that you have been scheduled for is to correct the problems that you have having in your cervical spine. There are several types of surgeries that Dr. Lombardi can perform to help correct the problems you are having. Occasionally, he will use a combination of some or all of the following:

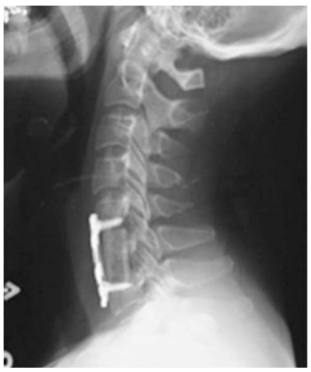
1. **Anterior Cervical Discectomy and Fusion -** This involves removing the disc and replacing the disc with bone to allow the bone graft to fuse the vertebrae together as one.



2. Anterior Artificial Disc Replacement - There are several different kinds available in the USA. While Dr. Lombardi has used extensive experience with all of these, his current favorite is the Prestige LP. This is because: 1) the earliest version of his disc was first implanted in 1991 so has the longest track record and 2) it is made of a titanium-ceramic composite that the company claims has demonstrated slower wear while minimally degrading the ability of MRI scans to assess the spine after surgery. The best candidate is someone who has minimal to no arthritis, usually younger than 45, has little to no disc height loss, no arthritis of the facet joint, no bone forming diseases, no inflammatory arthritis (e.g., rheumatoid, lupus, etc.), no infection and has a stable spine.

3. Anterior Cervical Foraminotomy &/or Partial Discectomy without a Fusion - This involves the removal of a small bone spur impinging on your nerve or drilling a tiny hole in the vertebra to just pluck out a small herniated disc fragment. The ideal candidate is older, with lots of arthritis with a collapsed disc and bone spurs with minimal motion and no neck pain.

4. Anterior Cervical Corpectomy and Fusion - This involves removing the discs and the front part of the vertebrae. This is necessary when there is compression of the spinal cord, not just behind the disc, but also behind the vertebral body.



5. Removal of Anterior Spurs in Patients with Large Bone Spurs - Some patients has a condition called "Diffuse Idiopathic Skeletal Hyperostosis" or DISH. This disease cause's very large bone spurs to form in front the spine, making swallowing difficult. If extensive workup shows that this is responsible for swallowing difficulties, Dr. Lombardi can remove the spurs.

The Incision: The incision will be made in a sideways in the front of your neck. We try to put it in a natural wrinkle so that the incision is disguised. Most people get a very cosmetically pleasing incision. If you develop keloids, let Dr. Lombardi know and he can help prevent that. The length of the incision depends on how many levels of the cervical spine will be corrected. Anterior (front of the neck) incisions usually will gradually fade over the next year, so that the incision is hardly noticeable.

If you have had surgery in the past on your cervical spine with a front approach, you may need to meet with an ENT (a doctor who cares for the ear, nose and throat) to evaluate the laryngeal nerves, (the nerves that control your vocal cords). This evaluation allows Dr. Lombardi to be informed as to how your vocal cords are functioning, thus allowing Dr. Lombardi to determine which side of your neck to place the incision.

SECTION 3: RISK AND COMPLICATIONS

Fortunately, complications are very rare in Dr. Lombardi's practice. He has never had some of the most feared complications of surgery, including paralysis, intraoperative death, blindness, injury to the trachea (breathing tube), esophagus (swallowing tube), carotid artery, thyroid gland.

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.

* Side effects from anesthesia - 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
* Damage to nearby structures Esophagus, Trachea (windpipe), Thyroid gland, Vocal cords and Arteries
* Spinal cord or nerve damage
* Bleeding or possible need for transfusion
* Persistent hoarseness and/or swallowing problems
* Stretch or injury to the superior or laryngeal nerve (vocal cord) that would cause the inability to scream and sing high notes and/ or the recurrent laryngeal nerve (vocal cord)that would cause the inability to speak louder than a whisper. These complications are rare and if they would occur, they usually resolve, but on a very unusual occurrence you may need surgery with an ENT doctor to repair the nerve.
* Injury to the vertebral artery resulting in a stroke (~1/1,000)
* Bone graft shifting or displacement
* Failure of the metal plates and screws
* The bone graft not healing properly, necessitating another surgery
* The artificial disc can wear out
* The bone could fuse to the artificial disc
* A blood clot can form in your arms or legs
* Heart problems, stroke and even death
* Injury to sympathetic chain causing the eyelid to droop and eye dryness
* Eventually, the next level will break down. Since all your discs are the same age, if one is broken down, it makes sense that the others can also go bad

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. To prepare your home for your recovery after surgery, please place necessary items within your reach so that you can avoid moving your neck a whole lot. During the six weeks of your recovery you should try

not to lift more than **50 pounds,** unless instructed by Dr. Lombardi. Please make arrangements before surgery to have any heavy items purchased before surgery such as dog food, etc.

3. 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 till 1 week after surgery.

a. Chondroitin
b. Danshen
c. Feverfew
d. Fish oil
e. Garlic tablets
f. Ginger tablets
g. Gingko
h. Ginseng
i. Quilinggao
j. Vitamin E
k. Co Q10

For anyone getting a fusion procedure **- AVOID Aleve, Advil, Motrin, aspirin, Ibuprofen, Celebrex and Naproxen medications until Dr. Lombardi says that it is okay to start taking them. All of these medications delay bone healing.**

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.

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. Dr. Lombardi will also see you in the pre-op holding area and will sign your neck to indicate the location of the operation. The

scheduled time of your surgery is really just an approximation. Much depends on when the surgery before you finishes.

Once you arrive in the operating room, you may not see Dr. Lombardi. Dr. Lombardi is often in a different room, finishing up with the surgery before your case. You will be sleeping when Dr. Lombardi comes into your surgery room to start your surgery.

Your family/friend will be updated throughout the procedure as to how it is going. 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 call or 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. On Tuesdays, he is down at the 51st street office so one of his associates will make rounds. He is notified of your condition by the PA (physician assistant), as well as by his associate and is happy to talk to you by phone if you have any questions or concerns. Just ask the PA to get a hold of him. If you are still in the hospital on Wednesday, he will be back to see you then.

BLOOD LOSS:
There is normally very little blood loss with this surgery. 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.

THE EVENING AFTER SURGERY:
After surgery you will go to The 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 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.

Occasionally, patients may prefer to stay overnight in the hospital. Otherwise, if you are feeling well after surgery, you may be discharged from the recovery room to home, instead of being admitted to the hospital. You will be given prescriptions to have filled on your way home from the hospital. If early enough, some can be filled in the hospital.

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 stay overnight in the hospital, and 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 will 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. Your **drain** may be left in for you remove at home, especially if you are discharged on the day of surgery. 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****:* If you stayed overnight in the hospital, the I.V. pain medication will be discontinues and you will be switched to 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. 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.

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 either on the day of the operation or the following day. 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. For the anterior (front of your neck) cervical surgery patients. Your windpipe (which is known as the trachea) and the esophagus (which is the tube that connects the mouth to the stomach) both lie in front of the cervical spine. During the surgery, the trachea and esophagus are gently held to one side while Dr. Lombardi does the surgery. This may be necessary for up to 2 to 3 hours. The movement of the trachea and esophagus may cause swelling after surgery. Many people complain after surgery of throat tenderness and pain, a choking type of sensation, and/or a feeling of fullness in their neck. These symptoms will gradually decrease over the next few weeks or months. Your difficulty with swallowing may persist for months after your surgery. Use caution when eating dry foods, large portions of meat or when swallowing large pills. Remember to chew carefully and to take small bites of food. This will usually subside gradually over the next week to two weeks. Sleeping with the head of the bed up at 30 degrees (with 3-4 pillows) will help to reduce the swelling. Some prefer sleeping in a reclining chair, with the head of the chair in a raised position. You may sleep on either side. Sleeping in this elevated position helps to reduce the swelling in your neck in the first 5-7days after your surgery. You may sleep in a flat position whenever you are comfortable. If the swelling becomes very uncomfortable, you can take the **Medrol Dose Pak steroid** medication that was prescribed for you. If you did not get it, it can be called into your pharmacy. The steroid medication will help to reduce the swelling. Steroid medications can increase blood sugar and increase fluid retention. Please inform us if you are a diabetic or have high blood pressure, so that these conditions may be monitored closely.
IMPORTANT - If you find in the first 5-7 days after your surgery that you cannot swallow or if water/food comes up your nose, you need to take the steroid medication. This is a very uncommon

occurrence. If you find that in addition to significant swallowing difficulties that the swelling makes it DIFFICULT TO BREATHE - you will need to seek emergent care. Please call the hospital at 212-932-5100 to speak to our after- hour answering service while the office is closed so that the emergent care can be initiated for you. If you cannot contact them, call 911. For routine clinical questions, please call my clinical team at (212) 932-5171].

3. BRACE: (VERY IMPORTANT, if you had a fusion). If you had an artificial disc and no fusion, you do not need to wear a collar.
This is the most important thing you can do to heal well and fast. If you had a fusion, you will need to wear a neck brace/collar for at least 6 weeks after the surgery. There are 2 different collars/braces. A hard collar made of plastic or a soft foam collar. Dr. Lombardi uses a hard collar for 2 or more level fusions and a soft collar for a 1-level fusion. You can take the collar off to shower and also leave it off for a few hours each day, as long as you keep your neck very still while it is off. Most people can hold their neck still while working on a computer, watching TV, working out on a treadmill, elliptical, stationary bike, etc. If you live in a town that doesn't allow you to drive with a collar on, you can leave it off until you get to your destination, since most people can hold their neck still while driving. Obviously, properly adjusted mirrors, blind spot monitoring, back-up cameras can all help to decrease how much you have to move your neck.

The brace is there to keep the neck still so that the bone will heal faster. The plate inside your neck prevents the bone from popping out, but even with the plate, you will still be able to move your neck. Studies show that if you fuse the neck and keep the bones very still for 6 weeks, the bones will heal together in 2-3 months. If there is motion, however, the body puts scar tissue in between the bone graft and the spine and it can take 6, 12, 24 or many more months for the bones to heal. Sometimes, it never heals and you need another operation to get it to heal. This is why Dr. Lombardi wants you to wear the collar, because neither he nor you want a 2nd operation for the same problem. He much prefers that you dislike him while wearing the collar and then like him when you heal fast. Many surgeons do not require a collar for 6 weeks because they want you to be happy during that time. But it's your long-term happiness and well-being that Dr. Lombardi cares about. At your 6 week post-operative visit, it is quite obvious who has worn the collar religiously and who as not. The ones who have worn it and have kept their neck still will be almost healed, whereas the ones who have not will be delayed in their healing process. Only about 25% of our patients are actually highly compliant with wearing the collar and keeping their neck very still for 6 weeks, but those are the ones that are almost fully healed at 6 weeks. You want to be in that top 25%.

If you experience skin irritation from the brace rubbing your skin, you may apply talc powder on your skin. Please do not put the powder on the incision. DO NOT apply the talc powder to 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.

If you have only the artificial disc placed, the collar is not needed, but you can wear one occasionally for comfort, if you prefer.

4. 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 steri-strips fall off by themselves. If after 7-10 days they have not fallen off- you may remove the steri-strips.
- You do not need to put any ointments or antimicrobial solutions over the incision or steri-strips.
- **If you notice drainage, redness more than 1 inch away from the incision, progressive swelling or increased pain at the incision site - please call the office. We will ask you to take a picture and text or email it to us.**

5. 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.

6. 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.

7. MEDICATIONS TO AVOID AFTER SURGERY:
If you had a fusion, **AVOID Aleve, Advil, Motrin, Aspirin, Ibuprofen, Celebrex and Naproxen medications** until Dr. Lombardi says that it is okay to start taking them. **All of these medications delay bone healing.**
After surgery, you may take Tylenol and Tylenol products, but take no more than 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.

8. Driving: **Operating a motor vehicle may be limited due to your inability to adequately turn your head from side to side. No one should operate a motor vehicle while under the influence of narcotics.**

9. Swallowing and increased phlegm production:
It is normal to have swallowing difficulties and increased phlegm production after surgery. You may use **Chloroseptic spray** to help with the sore throat or **Mucinex** can be used for increased phlegm production.

10. Activities:
- 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. Please realize that you will have limited motion of your neck while driving, so your peripheral vision is very limited.
- You may sleep lying flat 3-4 days post-operatively.

11. 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.

12. What To Expect at Six Weeks after Fusion Surgery: Even though you are six weeks out from surgery you are still not fully healed. If you had surgery on the front of your neck, you will still notice some swallowing difficulties and hardness on the side of your throat. This takes about 3 to 4 months for the soft tissues to get soft again. The swallowing may take up to 6-12 months to fully return to normal.
If you had a **fusion** operation, either from the front or the back, the bone can take 4 to 12 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 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. Until the 1-year mark, we won't be able to tell if the numbness is permanent.

13. What To Expect At Six Weeks After Artificial Disc Surgery: Even though you are six weeks out from surgery you are still not fully healed.
If you had surgery on the front of your neck, you will still notice some swallowing difficulties and hardness on the side of your throat. This takes about 3 to 4 months for the soft tissues to get soft again. The swallowing may take up to 6-12 months to fully return to normal.

You may have some pain in your shoulders and this should ease up over time.

Please include these things in your normally daily routines:

1.) 30-40 minutes of aerobic exercise, 3-4 times per week, which feeds the tissue with oxygenated blood
2.) don't use any tobacco products

If you had weakness in your arms before the surgery, it may take up to 6 months 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. Until the 1-year mark, we won't be able to tell if the numbness is permanent.

14. 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.

15. 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. This will help the bone to heal after a fusion and help you get over the pain of surgery. 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.

16. 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.
If you have a fusion operation on your neck, you should avoid all nicotine products. 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 swelling last in my neck last?
Every patient is different. The swelling can last for weeks, even a few months. The swelling should only slightly improve each week, but it is important that you call if it is not slowly improving.

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. Some states do not allow collars when driving. If you have had the fusion, you should wear you collar when driving, so if your states does not allow you to drive with a collar, then do not drive for the first 6 weeks post-op.

3. Why do I have pain in between my shoulders/muscle spasms?

When the disc degenerates, it collapses. For the fusion patient's the bone graft is placed, it stretches the disc height back to its normal place, which is a change and irritating to the muscles. Once the bone heals, the pain should dissipate.

4. When can I resume sexual relations?
Sexual relations can be resumed whenever the patient feels he/she is comfortable to do so. The safest position for the patient is lying flat in bed.

5. When should I take the Medrol dose pack?
If your swallowing becomes more and more difficult, please start the Medrol dose pack. When starting the Medrol dose pack on the first day, it is best to take all 6 pills at one time, and then follow the directions on the package thereafter.

6. When should I be concerned about my swallowing?
Swallowing problems are not unusual, but swallowing and breathing are not options. If swallowing becomes more and more difficult, then please start the Medrol dose pack.

7. When can I lift weights?
Please avoid all overhead lifting. You can lift light weights close to your body. Please keep the neck in a neutral position.

8. My pre-operative pain has come back. What happened? Around 20% 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 micro motion of the bone which can irritate the nerves. This pain will resolve when the bone has fused.

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 contact our main line at: (212) 932-5100. For any post-operative questions, please contact my office at 212-932-5171 during business hours (Monday through Friday 9:00AM-5:00PM (except for holidays). Please note my team is in clinic Tuesday -Thursday 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-If you find in the first 5-7 days after your surgery that you cannot swallow even sips of water, you will possibly need to be re-admitted to the hospital for I.V. hydration. This is a very rare occurrence. If you find that in addition to significant swallowing difficulties that the swelling makes it difficult to breathe-you will need to seek emergent care. 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, call 911.

Mailing Address:

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Columbia University Irving Medical Center
5141 Broadway
3rd Floor, 3FW-021
New York, NY 10034