PROCEDURE GUIDE

Anterior Lumbar Fusion

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Contemporary Spine Surgery

Table of Contents

ABOUT THE PROCEDURE

Anterior Lumbar Fusion

The primary goal of anterior lumbar fusion surgery is to relieve pressure on either the nerve roots or spinal cord and/or treat an unhealthy disc in the lumbar spine through a surgical approach through the front of the body.

The anterior lumbar fusion is performed with a general or vascular surgeon to help with exposure. A 2–3-inch transverse incision is made on the lower abdomen. The anterior organs and blood vessels require some retraction to gain access to the spine.

Dr. Paul then uses an instrument to remove the disc and restore normal alignment to the spine. A cage filled with material engineered to grow bone. This may be cadaver bone and/or other materials like bone morphogenic protein.

The cage is specifically sized to restore as much normal alignment as possible. Dr. Paul typically plans for potential sizes and realignment before surgery. He also uses live intraoperative technology to monitor realignment during surgery as well.

Dr. Paul will sometimes apply screws and/or a plate to help fix the cage in place. Depending on your situation, he may have to perform surgery from the back as well. Your implants are MRI compatible and are not known to set off metal detectors.

ABOUT THE PROCEDURE

Anterior Lumbar Fusion

The primary goal of anterior lumbar fusion surgery is to relieve pressure on either the nerve roots or spinal cord and/or treat an unhealthy disc in the lumbar spine through a surgical approach through the front of the body.

HOW LONG DOES IT TAKE DR. PAUL TO PERFORM THE ANTERIOR LUMBAR FUSION?

Approximate surgical times would be 60-90 minutes for one level, 75-100 minutes for two levels. We must emphasize, these are approximate times. These times are much higher if you have had prior surgery on your spine.

Please an additional 1½ to 2 hours if there is additional surgery required from the back.

Remember, there is substantially more time involved in putting you to sleep, prepping and draping prior to surgery, and more time required to wake you up. As a result, many additional hours are required. Time required to go to sleep, wake and recover can vary from two to three hours. Most of the variability is in the post-anesthesia recovery unit.

Dr. Paul typically calls the waiting room to update a family member or friend about you briefly. Kevin or Adam will typically check on you in the recovery room and speak to the nurse and Dr. Paul about your recovery. Nursing will let your family know when they can see you.

PREPARING FOR SURGERY

Making arrangements before surgery helps ensure all necessary steps are taken and allows you to focus on recovery.

DAY OF SURGERY

Information to help you arrive on time for your procedure and to better help you understand the process on procedure day.

AFTER SURGERY

After surgery, you can expect to have some pain. Your surgeon and the staff will use every reasonable measure possible to help.

RECOVERING AT HOME

Exercise is extremely important; activity stimulates circulation and deep breathing which speeds recovery.

Common Surgical Risks

We have attempted to define the more common risks of surgery under each of the procedures outlined. It is impossible to outline all potential poor outcomes, but we have attempted to do so in good faith. It has not been formed as legal protection for us – only to better inform you. Please read them thoroughly.

Infections: are a known complication of lumbar surgery. Infection rates are more associated with smoking, poorly controlled diabetes, obesity as well as other health factors. Less invasive and shorter procedures also have lower complication rates. Infections requiring additional surgery are extremely rare in Dr. Paul's practice.

Bleeding: can be a serious complication since blood accumulation can compress the spinal cord or nerve roots. For that reason we require discontinuing blood thinners, some anti-inflammatories and all herbal medications.

Spinal Leaks: are a known complication in spine surgery but typically can be managed. They occur approximately 3 to 5% of the time They can be the result of adherent bone, disc, ligament or scar tissue to the dura and the membrane surrounding your nerves or spinal cord. They are far more associated with revision surgery, severe nerve compression and advanced age. If this occurs, we typically repair the leak during your operation. You may be required to lay flat for a short period of time afterwards. Late presenting or persisting spinal leaks can require additional surgery. Spinal leaks typically do not affect long term outcomes.

Neuropraxia & Nerve Injury : nerves under pressure can react with pain or increased weakness after being decompressed. These issues are expected and usually resolve with treatment or time. The goal of fusion is to realign and improve the position of the spine which can cause some nerves to be stretched and also induce typically temporary changes. Rarely, these changes are permanent As a precaution, Dr. Paul utilizes a state of the art nerve and spinal cord monitoring system to avoid neurologic problems.

Non-Union: not all fusions heal. Some heal as early as three months but many take longer. Some fusions require a year to heal. Dr. Paul's team gets x-rays regularly during the first year and meets with you to make sure the fusion is successful. Some fusions will require revision surgery to fix the problem.

Medical complications: related to the heart, lung and kidneys and other organs are also a possibility. Although shorter less invasive procedures are associated with lower complication rates, they can still occur. We work closely with your primary care doctor and other specialists to make sure your medical conditions are optimized prior to surgery.

This is not a complete list of every possible surgical complication but does recognize the more pertinent problems that occur with spine surgery.

How Do People Function After Anterior Lumbar Fusion Surgery?

With proper post-operative activity, therapy and positive mindset, people lose minimal function with a short lumbar fusion. The goal is for improved overall function with surgery. The degree to which people notice a loss of motion is very subjective and individual. From a mechanical perspective, you lose some motion with any fusion. The question becomes how your remaining levels and joints compensate to retain your function and everyday lifestyle.

Dr. Paul's team rarely relies on braces and extensive immobilization. The instrumentation and current spinal techniques generally create enough stability to allow the bones to fuse. As a result, we allow people to move sooner after surgery. If necessary, we typically order physical therapy after your two-week visit with Adam or Kevin. Exceptions would include fusions involving four or more levels and people with osteopenia.

It's especially essential to maintain or improve motion through your hips, knees, and upper back after a lumbar fusion. Flexibility, core strengthening, and an emphasis on function during the postoperative course helps to optimize your motion.

Will the fusion affect the health of the rest of my spine?

Your surgery was done for a degenerative condition that may affect other parts of your spine in the future. If you have had surgery at one level in your spine, it would be reasonable to assume you could have problems at the same or other levels. Since the spine has 36 levels, this is not unusual.

Most people handle degenerative difficulties with self-care and non-operative care. Dr. Paul and his team go to great lengths to minimize the chances of needing additional care for your spine. That includes careful surgical planning, intraoperative decision making, and post-operative care.

Preparing For Surgery

Things to do Leading up to Surgery

Optimization For Spinal Surgery

Before undergoing surgery, Dr. Paul and his team will work with your primary care provider and other specialists to optimize your health to minimize the risk of complications.

CARDIOVASCULAR HEALTH

People who have had cardiac interventions such as stents, ablations and surgery or a history of significant cardiac diagnoses will need to see their cardiologist prior to surgery. Your cardiologist may require additional testing or interventions prior to surgery.

SMOKING

We require all patients undergoing spine surgery to quit smoking two weeks prior to surgery. Nicotine is a significant risk factor for many complications, including infections, recurrent nerve problems, fusions failure, and others. Click here for more information and support.

OBESITY

A BMI over 35 is associated with major complications from spine surgery. Your pain and recovery are also adversely impacted by excess weight. If your BMI is over 35, we postpone surgery because the weight must be improved. We are happy to offer additional help from our weight loss clinic. For more information, see our Duly Weight Loss Clinic Page by clicking here.

Supplements to Begin Before Surgery

We recommend all our patients start the following regimen of supplements two weeks prior to surgery. There is some evidence that they improve wound healing and bone healing (if fusion is required).

CALCIUM

Calcium is essential for normal bodily functioning. If not received in great enough quantities, the body will look to mobilize other sources, namely the bones. Naturally, this leads to weakening of the skeletal system, and increases the risk of injury. Adults should aim to consume approximately 1000 mg of calcium per day.

VITAMIN C

Necessary for the formation of collagen, Vitamin C is another essential supplement if normal daily intake is inadequate. Collagen is used in bone building and supports the skeletal system in connective tissues. A recommended daily dosage is at least 1000 mg.

VITAMIN D

Another crucial vitamin for healthy bones, vitamin D aids in calcium absorption. Inadequate levels can lead to thin or brittle bones prone to damage. Optimal daily intake for adults is approximately 1000 IU.

Pre-Operative Timeline

2-4 Weeks Before Surgery

- Attend PCP appointment
- Choose Your Coach - Click here for a guide to choosing your coach
- If recommended by your surgeon, see your current specialists for medical clearance
- If you are a smoker, you should stop using tobacco products. Please read information about quitting smoking before surgery
- Stop all herbals and supplements, vitamins, and appetite suppressants 14 days before surgery
- Stop non-steroidal anti-inflammatory medications (NSAIDs) such as Motrin, ibuprofen, Advil, Aleve, Naproxen, and others 10 days before surgery
- Stop taking herbals, Vitamin E, Fish Oil, 14 days before surgery
- Stop taking appetite suppressants 14 days before surgery

1 Week Before Surgery

- Prepare your home
- Start using the Hibiclens 4% solution 5-days prior to surgery
- Fill post operative pain prescriptions from Dr. Paul' office*
- Confirm your ride home from the Westmont Surgery Center or Edward Hospital

Day Before Surgery

- Use your Hibiclens 4% solution (4oz or 8oz) as instructed the night before surgery
- Stop eating solid foods at 10pm
- Pack your bag along with walker/cane, Any brace IF ORDERED, loose fitting clothing for the ride home and insurance information
- Set your alarm and wake up 3½ hours prior to your scheduled arrival time

Morning of Surgery

Approximately 12 hours prior to scheduled surgery:

- Drink 12 oz of regular Gatorade (not red) – finish in less than 30 minutes. *If you oversleep or miss the alarm, do not drink Gatorade*

Approximately 4 hours prior:

- Drink another 12-ounce bottle of Gatorade and take the two Tylenol (500mg each) with a small sip of water

The Days After Surgery

Post-Operative Information

The First Few Days After Surgery

Incisional Care

Be sure to keep the wound dry by changing the dressings at least once a day, more if needed. Your incision may drain for the first week or so after surgery. This is common and expected and should lessen as you get further out from surgery.

Regular dressing changes will prevent problems. A wet dressing will breakdown the healing skin and may lead to delayed healing and possibly infection. You may shower 72 hours after surgery, but you must keep the wound dry. If you cannot keep the wound dry, please take a sponge bath until your first postoperative visit to discuss. Concerning signs include foul smelling drainage and a “tomato red” wound.

How to Handle Post-Operative Pain

Naturally, once anesthetics have worn off, pain will become increasingly evident in the areas involved in a surgical procedure. You may not have much incisional pain after surgery because there is local anesthesia injected at the time of surgery. This will wear off in the evening. We recommend you use the pain medicine prescribed or muscle relaxant to avoid the potential for getting behind your pain.

Dr. Paul will prescribe pain-killers, also known as analgesics, to reduce the discomfort of this post-surgical recovery period. Medications prescribed can range from over-the-counter NSAIDs (after the first five days) to potent prescription opioids depending on the projected severity of pain.If you are or have undergone a fusion procedure, you should avoid NSAIDs for the first 6 weeks.

Patients should take care to manage their dosing relative to the pain experienced. Opioids can usually be tapered off within the first two weeks of surgery. NSAIDs may be taken with protective measures for the gastrointestinal system such as proton-pump inhibitors (PPIs) such as omeprazole, antacids such as TUMS, and bismuth salts such as Pepto Bismol to reduce the risk of ulcer formation.

Night time and transitions:

It is very common to have increased pain at night and when you first get up out of bed. Any time you remain in one position for an extended period of time the muscles may tighten and swell and you can experience pain. As a result, transitioning can bring on pain.

Transitioning includes lying to sitting, sitting to standing. Anticipate this and use medication appropriately and or take time to do these activities. Do not try to move quickly. You won’t do anything to harm your surgery but you may have an increase in pain. This will improve with time.

Stairs & Toilets

You may have some mild to moderate discomfort going up and down stairs immediately after surgery. However, you are allowed to do so since you will not hurt your surgery. Similarly, getting on and off the toilet may give you some discomfort but you will not do any damage to your surgery. If you have a lower toilet, a raised toilet seat may be helpful.

When to Call Our Office After Surgery

Reasons to Call After Hours:

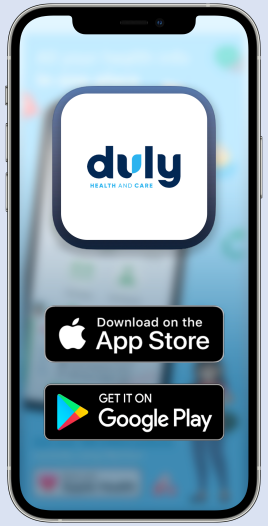
- Increasing drainage from a surgical wound or fevers greater than 101 degrees
- Significant throat swelling (after neck surgery)
- Loss of control of bowel or bladder
- Potential need to postpone scheduled surgery for the next business day

Reasons to Call During Business Hours:

- To make an appointment
- Discuss or obtain test results
- Medication refills
- Inquiries regarding insurance, billing, or disability paperwork

(630) 967-2225

We strongly recommend implementing the use of MyDulyHealth to contact the office.



Communicate with your doctor.
Get answers to your medical questions from the comfort of your own home

Access your test results.
No more waiting for a phone call or mail. View results and your doctor's comments within days

Request prescription refills.
Manage and send a refill request for any of your refillable medications from inside the app

Manage your appointments.
Schedule your next appointment, or view details of your past and upcoming appointments

Common Post-Operative Concerns: Q&A

You may still experience some of your pre-operative symptoms.
This is because the nerves can take a long time to heal and may still be sensitive immediately after surgery. As healing progresses and the initial inflammatory phase as surgery resolves, the nerve irritations will resolve. This may take weeks to months in certain circumstances. Therefore, we follow our patients up to a year after surgery.

The use of pain medicines can, and most likely will, cause constipation.
If you are prone to constipation, make sure your bowels are soft and moving regularly prior to surgery for several days. Some patients will start a clear liquid diet the day before. It is especially important that you have a bowel movement within 48 hours after surgery. Opioid medications are associated with constipation, and patients should think about taking a stool softener such as docusate, and a fiber laxative such as psyllium to facilitate normal bowel movements.

Nausea and Vomiting.
If you are prone to nausea and vomiting, please let the anesthesiologist know the day of surgery. Current anesthetic practices have drastically improved these issues, but additional precautions may help. Also, Dr. Paul's team will avoid medications that may cause nausea and vomiting for you.

Infection.
Although uncommon, wounds can become infected following any operation. Redness and warmth accompanying unusually painful incisions are suggestive of infection, as well as oozing of the incision site. Risk of deep infection within the first 2 weeks after surgery is rare. If you develop a sustained fever over 101 or if you experience malodorous drainage or the incision turns deep red and sensitive to touch, please contact our office. Notify your physician immediately if any of these symptoms occur, please call or message us using the MyDulyHealth app.

Urinary Retention.
If you have had trouble urinating after other surgeries, please let Dr. Paul's team know. We can sometimes become concerned with urinary retention after surgery since this can be a sign of spinal cord compression which can lead to permanent effects if not quickly addressed. If you have a history of an enlarged prostate or prior history or postoperative urinary retention, please let us know.

It is very common to have elevated temperatures post-operatively.
You may notice your body temperature fluctuating between 99-101 degrees. This is commonly due to the body's reaction to the trauma of surgery, as well as pain medicine causing slight changes in breathing by not allowing our air sacs in the lungs to expand (atelectasis). Use the breathing machine (if received during your hospital stay) or be sure to take a deep breath 10 times per hour while awake to aid in keeping the lungs healthy and the body temperature down. It is very rare to develop a postoperative infection within the first 2 weeks after surgery. If you have sustained temperature greater than or equal to 101 or have concerns, call our office to discuss.

Sore Throat.
Surgeries performed under general anesthesia will involve placing a tube down the windpipe to facilitate breathing during the operation. Irritation can persist for a few days but will usually resolve on its own.

The Blues.
It is not uncommon to feel mildly depressed or anxious for the first 4-6 weeks after any surgery, but those feelings should go away as your daily activities and exercise resume. This is more common with larger or multilevel surgeries. If depression continues, please consult with your primary care doctor.

The Weeks After Surgery

What to Plan For & Expect

2-6 Weeks After Surgery

We often talk to patients about the first two weeks being the most difficult after a lumbar fusion. The first 2 days are the hardest in that 2-weeks. Although anterior fusions may have less back pain than traditional fusions, they can have some abdominal discomfort. The more generally active you are the more the muscle soreness improves. Please do not just lay in bed.

In the early weeks, gradually increase activities. Remain on your feet for more extended periods and improve your walking distances. You may return to a sedentary job in as little as 2-3 weeks but with no bending, twisting, or lifting more than 10 pounds. Sit only in chairs with good lumbar support.

You may start a regular aerobic activity such as vigorous walking, stair master, or low impact aerobic exercise classes if allowed after the first follow up appointment. This is typically within 2-3 weeks. Once you are off of any narcotic pain killers, you are free to drive from our standpoint.

From a mechanical perspective, you lose some motion with any fusion. The question becomes how your remaining levels and hip joints compensate to retain your function and everyday lifestyle. Dr. Paul's team rarely relies on braces and extensive immobilization. The instrumentation and current spinal techniques generally create enough stability to allow the bones to fuse. As a result, we allow people to move sooner after surgery. This also helps to maintain strength and flexibility in the remaining portions of your core and spine. If necessary, we typically order physical therapy after your two-week visit with Adam or Kevin. Exceptions would include fusions involving four or more levels and people with osteopenia.

6-12 Weeks After Surgery

After the first six weeks, we typically decrease restrictions. If you were given a brace, it is typically no longer required, and we allow for more bending or twisting as required for normal everyday activities.

We will often raise the lifting restriction to 20 to 30 pounds. You may return to light duty or physical labor if pain-free and allowed by your surgeon—with minimal bending or twisting. We do not recommend returning to work if you commute more than one hour each way. You may swim after six weeks. Continue your physical therapy exercise program. You may be shown specific therapeutic exercises at your six-week visit.

The most dramatic changes will take place in the first 8-weeks post-op. Even if you experience some of your pre-op pain during this time you should not be too concerned. We follow our patients for a year post-op knowing the nerves may take a long time to heal. Most feel significantly better after the first week or two.

TRAVEL & TRANSPORTATION

You may travel by car for more than 3 hours in 2-3 weeks, but with frequent breaks. You may travel by plane in 4-weeks for trips less than 4 hours. After 6-weeks, you can resume all travel. You may drive as soon as you are off narcotic pain killers.

Bracing

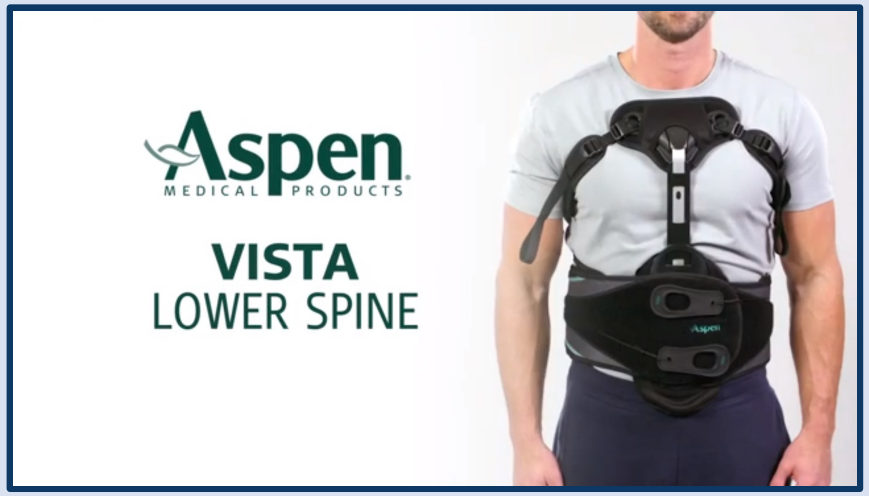
The use of a lumbar brace is often used with an instrumented fusion (use of spacer implant, screws and rods). This bracing is typically for 6-weeks only, which usually aligns with the second post-op visit. The brace is to be worn anytime you are standing, sitting or walking greater than a few minutes. If you need to get up to briefly use the washroom, you may do so without the brace on. You do not need to use the brace while bathing or sleeping.

We look at the brace as serving <u>three</u> purposes:

1. **Pain Control:** Your body is going to respond to the surgery by muscles potentially going into spasm. The brace can help with this pain.

2. **Excessive Motion:** Much like putting a cast on a broken wrist, stabilizing the bones allows the new bone growth to bridge and fuse together. Think of the phrase “A rolling stone gathers no moss”. In the fusion we don’t want motion and want the moss. The use of the brace limits excessive motion to allow for bone growth and a successful fusion.

3. **Reminder:** This is probably the most important reason for using a brace. Because we have been doing our fusions in a less invasive manner, we have been finding people have been getting back to normal activities quicker than in the past. We ask that you respect the surgery. Even if you have minimal to no pain does not mean the fusion is complete. The use of the brace is a reminder for you to not overdo activity which may lead to increased pain.



Care & Recovery Information

The most dramatic changes will take place in the first eight weeks after surgery. Even if you experience some of your pre-op pain during this time, you should not be too concerned. We follow our patients for a year post-op knowing the nerves may take a long time to heal. Most feel significantly better after the first week or two.

It is not uncommon to experience your post-operative pain. The nerves are still sensitive once pressure is taken off them and it may take time for them to heal.

You may not have much incisional pain after surgery because there is local anesthesia injected at the surgery time. This will wear off in the evening. We recommend using the pain medicine prescribed or muscle relaxant to avoid the potential for getting behind your pain.

It is important you keep your bowels moving after surgery. Should you have increasing abdominal pain, nausea, vomiting or are not passing any gas you should call the office.

It is not uncommon for patients to come out of surgery with significant improvement in their post-operative pain. This does not always occur, however. The nerves can take time to heal and while they are still swollen and sensitive you may still experience pain, numbness and or weakness.

Strength can sometimes return immediately after surgery and other times it can be a full year before we know what ultimate strength recovery will be. The most dramatic gains occur in the first 2 months then the healing is slow from there.

Be careful with attempting overhead activities and keep lifting to 15lbs. close to the body.

Life After ALIF Surgery

Physical Therapy & Rehabilitation

Physical Therapy

Some of our patients may benefit from physical therapy after surgery. Kevin and Adam will likely order this for you in 2 or 6 weeks if necessary. We prefer to send you to physical therapists with specific emphasis on spine and in your immediate area.

Our “partner” physical therapists understand Dr. Paul’s protocols and surgeries. If you live outside our area, or out of state, we will work with your local therapists on a case-by-case basis.

Learn More About Our Physical Therapy Partners →

Explore Other Surgical Treatments

Anterior Cervical Disc Replacement

Anterior Cervical Fusion

Anterior Lumbar Fusion

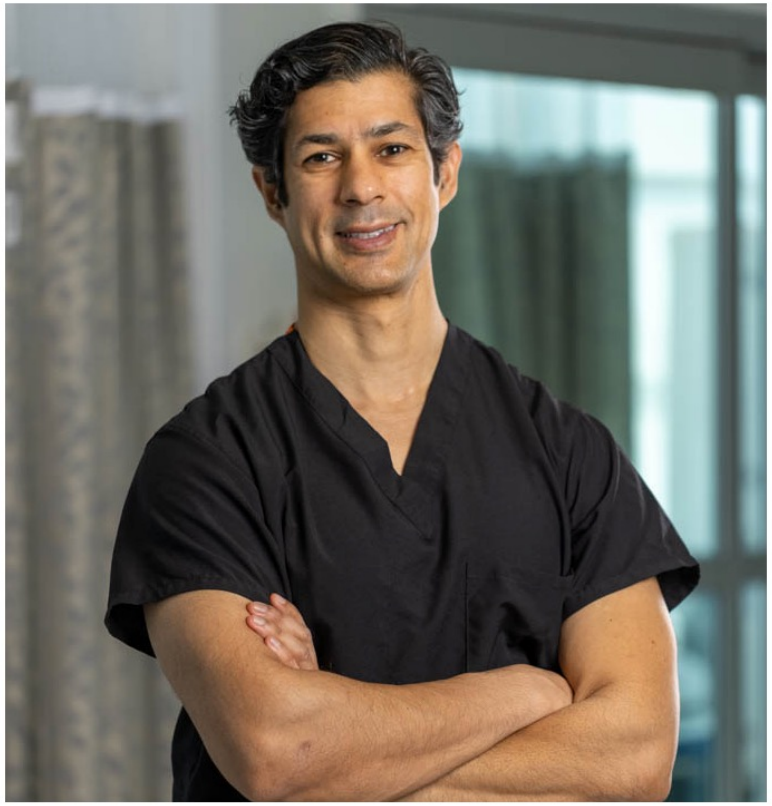
Lateral Interbody Fusion

Lumbar Decompression

Lumbar Microdiscectomy

Posterior Lumbar Fusion

RONJON PAUL MD



Meet Dr. Ronjon Paul

Founding Member, **The Spine Center**
DuPage Medical Group (2005)

CASTLE CONNOLLY TOP DOCTORS

TOP ORTHOPEDIC DOCTORS CHICAGO MAGAZINE

Dr. Paul has a rapidly growing reputation as an expert for performance and research in complex cervical and lumbar spine reconstruction with an emphasis on optimal long-term outcomes and sustainability.

He is actively involved in instructional activities teaching minimally invasive techniques to neurosurgeons and spinal surgeons from around the country as well as Asia, Africa and Europe.

Armed with his passion for excellence, decades of research, countless accolades and recognition, Dr. Paul helps pave the way for the future of multidisciplinary spine care. Along with his experienced team of Physician Assistants and Nurses, Dr. Paul presents patients with a truly unique and contemporary approach to minimally-invasive spine treatment and surgery.

Learn More About Dr. Paul →

THE UNIVERSITY OF CHICAGO PRITZKER SCHOOL OF MEDICINE

IMSA Illinois Mathematics and Science Academy

AAOS American Academy of Orthopaedic Surgeons

RateMDs BEST RATED ORTHOPEDIC SURGEON

vitals COMPASSIONATE DOCTOR AWARD

NASS ADVANCING GLOBAL SPINE CARE