



Cervical Disc Replacement (CDR / Cervical Arthroplasty)

Preoperative Patient Education Guide

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Purpose of This Document

This document explains your upcoming **cervical disc replacement (CDR)**, also called cervical disc arthroplasty or total disc replacement. Please read it carefully, bring it to your preoperative visit, and have it with you on the day of surgery.

Anatomy of the Cervical Spine

The cervical spine consists of seven vertebrae (C1–C7) separated by **intervertebral discs** that cushion the spine and allow motion. Behind each disc lies the **spinal cord**; **nerve roots** branch off the cord and exit through openings called neural foramina, traveling to the shoulders, arms, and hands. A healthy cervical spine is highly mobile — it permits flexion, extension, rotation, and side-bending.

When a disc herniates, bulges, or develops bone spurs, it can compress the spinal cord or nerve roots, causing neck pain, arm pain, numbness, or weakness. Traditional fusion surgery (ACDF) treats this problem but eliminates motion at that level. **Cervical disc replacement removes the damaged disc and replaces it with an artificial disc that preserves motion.**

How CDR Differs from ACDF

The surgical approach (anterior, through the front of the neck) is identical to ACDF. The discectomy and decompression are identical. The key difference is what is placed in the disc space:

- **ACDF:** A spacer with bone graft, plus a plate and screws — designed to **fuse** two vertebrae into one.
- **CDR:** An artificial disc with two metal endplates and a moving core (polymer or metal-on-metal) — designed to **preserve motion** at that segment.

Why Choose Disc Replacement?

Multiple randomized clinical trials have demonstrated that, for properly selected patients, CDR provides equivalent or better outcomes compared to ACDF at 5–10 years, with:

- **Preserved motion** at the operated level
- **Lower rates of adjacent segment disease** (degeneration of levels above or below)
- **Lower rates of revision surgery** in long-term studies
- **Faster return to activity** (no fusion to protect)
- **No bracing requirement** in most cases

Who Is a Good Candidate?

CDR is ideal for patients with:

- **Cervical radiculopathy or myelopathy** from soft disc herniation or limited bone spurring
- **One- or two-level disease** (FDA-approved up to two contiguous levels)
- **Preserved disc height and good bone quality**
- **Intact facet joints** (no significant facet arthritis)
- **No significant cervical instability or deformity**
- **Age generally between 21 and 65** (though older patients can be candidates with good bone quality)

Who Is NOT a Good Candidate?

- Severe cervical spondylosis with extensive bone spurs
- Significant facet arthritis at the affected level
- Osteoporosis or poor bone quality
- Cervical instability, kyphosis, or deformity
- Prior cervical fusion at the same level
- Active infection or known metal allergy

The Procedure: Cervical Disc Replacement

CDR is performed under general anesthesia and typically takes 1.5–3 hours. Steps include:

1. **Positioning** — You lie on your back with your neck in neutral position.
2. **Incision** — A 1–2 inch incision is made in a natural skin crease on the front of the neck.
3. **Exposure** — The trachea and esophagus are retracted to one side and the carotid sheath to the other to expose the front of the spine.
4. **Discectomy and decompression** — The damaged disc and any bone spurs compressing the spinal cord or nerve roots are removed.
5. **Endplate preparation** — The vertebral endplates are prepared with precise instruments to fit the artificial disc.
6. **Disc implantation** — The artificial disc is inserted into the disc space under live X-ray guidance to ensure perfect positioning. The disc has fixation features (keels, teeth, or screws depending on the device) that anchor it into the bone.
7. **Closure** — The neck muscles fall back into place. The skin is closed with absorbable sutures or skin glue.

Enhanced Recovery After Surgery (ERAS)

Our ERAS pathway for CDR emphasizes:

- **Multimodal pain control**
- **Dysphagia management** — soft diet initially, swallowing precautions
- **Early mobilization** — most patients walk the same day
- **Same-day discharge** for the majority of single-level cases
- **Early NSAID use** — to prevent heterotopic ossification (unwanted bone formation around the artificial disc)
- **Early range-of-motion** — gentle neck motion encouraged within days of surgery

Preoperative Medication Instructions

CRITICAL — REVIEW WITH YOUR SURGEON

Some medications and supplements can cause **dangerous bleeding** during or after surgery. Review every medication, vitamin, and supplement (including over-the-counter items) with our office at least **2 weeks before surgery**. If you take blood thinners, you must have specific clearance instructions.

Medications to STOP Before Surgery

Medication Class	When to Stop
Aspirin (81 mg or 325 mg)	7 days before surgery
Clopidogrel (Plavix), ticagrelor (Brilinta), prasugrel (Effient)	5-7 days before surgery
Warfarin (Coumadin)	5 days before surgery — bridging may be required
Apixaban (Eliquis), rivaroxaban (Xarelto), dabigatran (Pradaxa), edoxaban (Savaysa)	72 hours before surgery (per cardiology)
NSAIDs (ibuprofen, naproxen, meloxicam, celecoxib, diclofenac)	7 days before surgery
SGLT2 Inhibitors (Jardiance, Farxiga, Invokana)	Hold 3-4 days prior to surgery (check with the anesthesia team)
Fish oil, vitamin E, ginkgo, garlic, ginseng, turmeric, CBD	7 days before surgery
GLP-1 agonists (Ozempic, Wegovy, Mounjaro, Zepbound)	1 week before surgery (anesthesia aspiration risk)
Hormone replacement, oral contraceptives	Discuss with surgeon — increases DVT risk
Recreational marijuana, nicotine products	Stop completely; nicotine impairs bone and wound healing

Medications to CONTINUE

Medication Class	Instructions
Blood pressure medications	Take with a sip of water the morning of surgery
Antiseizure medications	Continue without interruption
Thyroid medications	Continue without interruption
Reflux medications	Continue — important for postoperative swallowing comfort
Psychiatric medications	Continue (notify us about MAOIs or lithium)
Inhalers	Bring with you and use as normal

Special Considerations

- **Diabetes medications:** Hold metformin the morning of surgery. Take half your usual dose of long-acting insulin. Hold SGLT2 inhibitors 3 days before surgery.
- **Opioid pain medications:** If chronic, continue and inform anesthesia.
- **Steroids:** Inform us — stress-dose coverage may be needed.
- **Immunosuppressants:** Coordinate timing with your prescribing physician.

Preoperative Optimization Pathway

Getting Ready for Surgery — Simple Steps for Less Pain & a Faster Recovery

Patients who follow these steps tend to have **less pain, need less medication, heal faster, and return home sooner**. Please start as early as you can — ideally **4 weeks before** your surgery date.

1. Eat Well & Hit Your Protein Target

- **Eat more protein.** Include eggs, fish, chicken, dairy, beans, or a protein shake at every meal. Protein is what your body uses to heal wounds, knit bone, and keep muscle strong.

Daily protein goal: about 1.5 grams per kilogram of body weight.

Quick guide: a **150 lb person** should aim for roughly **100 g of protein per day**, spread across meals (about **25–35 g each**). Your care team can tailor this for you.

Note: patients with significant kidney disease (advanced CKD) should discuss protein targets with their nephrologist before increasing intake.

- **Choose healing foods.** Vegetables, fruit, and whole grains lower inflammation. Cut back on sugar, processed food, and alcohol.

- **Drink plenty of water** in the days before surgery. Clear liquids are usually allowed up to 2 hours before you arrive.
- **Carbohydrate drink.** Unless you are diabetic, a clear carbohydrate drink (such as ClearFast or unconcentrated Gatorade) **2-3 hours before** surgery reduces stress and nausea. Your team will advise on the specifics.

2. Plan for Comfort & Pain Control

- **We use several mild medicines together** so we can keep you comfortable while using as little opioid medication as possible.
- **Bring a full list of your medicines.** Some blood thinners, anti-inflammatories, supplements, and diabetes/weight medicines (including GLP-1 agonists such as Ozempic, Wegovy, and Mounjaro) may need to be paused.
- **Tell us if you take pain medication regularly.** A simple plan helps us keep you comfortable afterward and prevents withdrawal symptoms.

3. Helpful Supplements (but Not Necessary)

- **Protein shake or powder** — the easiest way to reach your protein goal if appetite is low. Whey or plant blend with ~20-30 g per serving.
- **Vitamin D3** — low vitamin D is linked to slower bone healing and more pain after spine surgery. We may check your level and suggest a dose (often **1,000-2,000 IU daily**).
- **Iron** — only if you are anemic or low on iron. Correcting it before surgery lowers transfusion risk. We will test first.
- **Vitamin C and zinc** — support wound healing. A daily multivitamin usually covers both.

STOP these supplements about 1 week before surgery

Fish oil, vitamin E, high-dose garlic, ginkgo, turmeric (high-dose), and CBD — these can increase bleeding. Review every supplement with your surgeon before starting or stopping anything.

4. Keep Moving & Prepare Your Home

- **Walk every day.** A 20-30 minute walk builds strength and stamina. More active patients recover noticeably faster.
- **Practice the basics.** Rehearse getting in and out of bed, using a walker if needed, and slow deep breathing exercises with an incentive spirometer.
- **Set up your home.** Clear walkways, keep items within easy reach, and arrange a ride and a helper for the first day or two.

5. Other Important Steps

- **Stop smoking and nicotine.** This is the single most powerful change you can make. Quitting even 4 weeks before surgery greatly improves healing and lowers complications.

- **Control blood sugar.** If you have diabetes, work with your doctor to keep it well managed before surgery. Target HbA1c < 7.5% for elective cases.
- **Rest and relax.** Aim for 7-8 hours of sleep nightly. Worry can make pain feel worse — gentle breathing exercises (4-7-8 breathing), guided imagery, and mindfulness apps (Calm, Headspace, Insight Timer) help.
- **Prevent infection.** You will be asked to wash with chlorhexidine (Hibiclens) antiseptic soap the night before and morning of surgery. **Please do not shave the surgical area** — this can cause micro-abrasions that increase infection risk.

6. What to Bring on Surgery Day

- **Photo ID and insurance card.** Plus a list of all your medicines and doses.
- **Loose, comfortable clothing** and flat, non-slip shoes that are easy to put on.
- **Your CPAP machine** if you use one for sleep apnea, and any braces or walking aids.
- **A responsible adult** to drive you home and stay with you for the first 24 hours.
- **Leave valuables and jewelry at home.** Remove nail polish and contact lenses before arrival.
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Preoperative Physical Therapy ("Prehab")

We strongly recommend a **preoperative physical therapy evaluation and prehabilitation course** before surgery. Multiple randomized studies demonstrate that prehab improves postoperative pain scores, accelerates functional recovery, and reduces length of stay.

Goals of preoperative physical therapy include:

- **Cervical postural retraining** — chin tucks, scapular retractions, deep neck flexor activation
- **Shoulder girdle conditioning** — to support the cervicothoracic junction during recovery
- **Diaphragmatic breathing and thoracic mobility** — improves pulmonary reserve and reduces atelectasis risk
- **Body mechanics education** — how to move, sit, and sleep safely in the postoperative period
- **Walking endurance baseline** — establishes a functional benchmark for postoperative comparison

Our office will coordinate this referral. If you have a preferred physical therapist, please let us know.

Sessions completed before surgery do not count against postoperative PT benefits under most insurance plans, but we will verify this for your specific coverage.

Day Before & Day of Surgery

Day Before Surgery

- **Nothing to eat after midnight.** Clear liquids (water, black coffee, apple juice) are allowed up to **2 hours before** arrival unless told otherwise.
- **Chlorhexidine (Hibiclens) shower** the night before — focus on the planned surgical area.
- Sleep in clean sheets and clean clothing.

- Pack your bag: ID, insurance card, complete medication list, CPAP if applicable, loose-fitting clothing for going home, slip-on shoes.
- **Do not shave** the planned surgical site at home.

Day of Surgery

- Arrive at the time given (usually 2 hours before surgery).
- **Repeat the chlorhexidine shower** the morning of surgery.
- Brush teeth but do not swallow water.
- Do **not** wear makeup, lotions, perfumes, nail polish, or jewelry.
- Wear loose, comfortable clothing.
- Bring this packet and your medication list.
- Have a responsible adult drive you home and stay with you for the first 24 hours.

Your Countdown to Surgery

Keep this page handy — it shows what to do as your surgery date gets closer.

4-2 Weeks Before — BUILD STRENGTH	1 Week Before — GET READY	1-2 Days Before — FINAL STEPS
✓ Stop smoking & nicotine	✓ Confirm medicines to pause	✓ Antiseptic (chlorhexidine) soap wash
✓ Eat more protein (~1.5 g/kg/day)	✓ Arrange ride & helper	✓ Clear carbohydrate drink (non-diabetics)
✓ Walk 20-30 min daily	✓ Practice breathing exercises	✓ Clear liquids up to 2 hours prior
✓ Manage blood sugar & BP	✓ Keep eating protein	✓ Take pre-op medicines as instructed
✓ Correct any anemia	✓ Avoid alcohol	✓ Rest & arrive on time

Questions?

Call your care team at **301.718.9611**. Always follow the specific instructions from your surgeon and anesthesiologist — those instructions come first. This guide is for patient education and does not replace advice from your doctor.

Risks of Surgery

CDR is generally a very well-tolerated procedure with high patient satisfaction. However, all surgery carries risk.

General Surgical Risks

- **Bleeding** — Usually minimal. Neck hematoma is rare.
- **Infection** — Less than 1%.
- **Anesthesia complications**
- **Blood clots (DVT/PE)** — Low risk with early ambulation.

Procedure-Specific Risks (Shared with ACDF)

- **Dysphagia (swallowing difficulty)** — Common in the first week; usually resolves within 2–6 weeks.
- **Hoarseness or voice changes** — Usually resolves within 6–12 weeks.
- **Esophageal injury** — Rare (<0.5%).
- **Vertebral artery injury** — Very rare (<0.1%).
- **Horner syndrome** — Rare.
- **Dural tear / CSF leak** — Rare (<1%).
- **Spinal cord or nerve root injury** — Very rare (<0.5%).

Risks Specific to Disc Replacement

- **Heterotopic ossification (HO)** — Unwanted bone formation around the artificial disc that can limit motion. NSAIDs after surgery reduce this risk. Most HO is mild and does not affect outcomes.
- **Device migration or subsidence** — The artificial disc can shift or sink into the bone. Rare (<2%).
- **Polyethylene wear** — Over many years, the bearing surface can wear. Long-term studies suggest very low rates at 10+ years.
- **Implant loosening or failure** — Rare; would require revision (usually conversion to a fusion).
- **Conversion to fusion** — A small percentage of CDR patients (~5% at 10 years) ultimately require conversion to a fusion.
- **Metal allergy reaction** — Very rare. We screen for known metal allergies preoperatively.
- **Persistent or recurrent pain** — Not all symptoms may resolve completely.

Risks Higher If You Smoke

Smoking impairs healing and increases infection and wound complications. Although bone fusion is not the goal in CDR, **smoking still negatively affects outcomes**. We strongly recommend cessation.

Reason for Surgery

CDR is recommended for properly selected patients with persistent symptoms after at least 6 weeks of conservative care, or with concerning neurologic findings such as myelopathy.

Indications

- **Cervical radiculopathy** — Pinched nerve causing arm pain, numbness, or weakness not responsive to 6+ weeks of conservative care
- **Cervical myelopathy** — Spinal cord compression with hand clumsiness, gait imbalance, or hyperreflexia (typically early/mild)
- **Soft disc herniation** with neurologic symptoms
- **Patient preference for motion preservation** when anatomy is suitable
- **Younger active patients** for whom adjacent segment disease over decades is a concern

Conservative Care First

For radiculopathy without myelopathy, we typically recommend 6–12 weeks of:

- Physical therapy with traction, postural training, and strengthening
- NSAIDs and short courses of oral steroids
- Cervical epidural steroid injections (when appropriate)
- Activity modification and ergonomic improvements

Surgery becomes appropriate when symptoms persist or progress, when there is significant weakness, or when imaging shows severe compression with myelopathic findings.

Hospital Stay and Discharge Planning

Most CDR patients go home the **same day**. A small minority stay one night for observation. Before discharge:

- Tolerate liquids and soft food
 - Have stable breathing, voice, and no concerning swelling
 - Walk safely with assistance
 - Have pain controlled with oral medications
 - Urinate independently
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Contact Information

Provider: Lekhaj Daggubati, MD

Practice: Washington Brain & Spine Institute

Main Phone (All Locations): 301.718.9611 — business hours

After-Hours / Urgent Concerns: 301.718.9611 — answering service will contact the on-call provider

Clinical Office Locations

Rockville: 3202 Tower Oaks Boulevard, Suite 100, Rockville, MD 20852

Tysons: 8605 Westwood Center Drive, Suite 201, Vienna, VA

Frederick: 198 Thomas Johnson Drive, Suite 17, Frederick, MD 21704

White Oak: 11886 Healing Way, Suite 401, Silver Spring, MD 20904

Emergency: Call **911** or proceed to the nearest emergency department for life-threatening symptoms — severe difficulty breathing, sudden weakness or paralysis, loss of consciousness, seizure, severe sudden headache, chest pain, or stroke-like symptoms.