

The Fusion Confusion_ clearing the air on best therapy practices for lumbar fusion.
by Kara Thompson, PT

As technology progresses, so does the number of orthopedic surgical procedures seen by therapists. There was a 137% increase in the number of spinal fusions alone performed in the United States between the years 1998 and 2008. There are various types of procedures performed for a spinal fusion and while the approach for rehabilitation is similar for each, it is important for the therapist to have an understanding of the structure they are working with. The following are some techniques seen on a therapy order as a diagnosis for spinal fusion:

Posterolateral Gutter Fusion: With a posterior approach, bone graft is taken from the pelvis and placed on the posterolateral portion of the spine using pedicle screws and back muscles to hold the graft in place until fusion occurs (setup time of approximately 3 months and continuously building in strength for one to two years).

Posterior Lumbar Interbody Fusion (PLIF): Posterior approach in which the lamina is removed to access the nerve roots, followed by removal of the affected disc and tissues. A bone graft, allograft, or BMP with a cage is inserted into the disc space to promote fusion of the vertebrae.

Transforaminal Lumbar Interbody Fusion (TLIF): While similar to the PLIF, an entire facet joint is removed so that the nerve manipulation used to access the vertebrae is reduced. Disc material is then removed and replaced with bone graft along with cages, rods, or screws in the disc space.

Anterior Lumbar Interbody Fusion (ALIF): While the fusion process is similar to that of PLIF, an anterior approach is used in which the incision is typically 3-5 inches long in the lower abdominal area, often involving cutting of the lower abdominal muscles. Some surgeons may use a mini open ALIF approach which involves a very small incision and the abdominals are maintained. The results of this approach are not as good for stability of multilevel fusions.

Anterior/Posterior Lumbar Fusion: An incision is made through the abdomen and the disc is removed and replaced with a bone graft. A separate incision is made in the back to place a pedicle fixation and bone graft. This approach may involve a large amount of trauma to the muscles, but provides the greatest amount of stability.

Despite the increase in spinal fusion surgeries, there still remains a 20% chance that low back pain is not completely resolved. Many studies have found that people who smoke have an increased likelihood in pseudoarthrosis (nonunion). It is important to educate patients on the risks of smoking following any major surgery.

Many protocols vary regarding what precautions should be taken following a surgical lumbar fusion. While some follow the rule that there is to be no bending what-so-ever, others state that motion without pain is acceptable. Protocols also vary on lifting restrictions following a fusion, although most support a restriction at or below 5-10 lbs. As a therapist, the best option is to contact the physician directly and inquire what protocol to follow for each particular individual. However, there are some similarities that spread amongst all protocols with aims towards stabilization of the trunk, increasing neural mobility, and improving cardiovascular endurance.

Currently, PTS does not have a formal protocol for rehabilitation following a lumbar fusion. Midwest Orthopaedic Center has prepared a set of guidelines for their surgeons which have also been provided to each of our Outpatient Clinics for reference. For a copy of these guidelines, please contact the PTS Regional Office.

Rehabilitation Guidelines – Lumbar Fusion

General Precautions

Avoid flexion ROM

Avoid flexion based exercises (eg. Knee to chest, abdominal crunches)

Avoid rotation exercises for the first 6 months

Avoid extension exercises beyond neutral

Weeks 1-4

TLSO-per surgeon

Ambulation progression as tolerated

Use assistive device as needed (FWW, Cane)

Bed mobility / Positioning

Log rolling, instruct in proper transfers (OOB to chair, car)

Place pillow between knees when sidelying

Place pillow under knees when supine

Start light lumbar stabilization exercises, e.g. pelvic tilts, floor exercises

Start light exercises for lower extremity weakness. Avoid neural tension positions such as long sitting, hip flexion with the knee extended

Posture education – correct standing and sitting postures

Maintain neutral posture

Weeks 4-12

Start light weight training, focusing on lumbar stabilization

Strengthen extensors, multifidus, thoracodorsal and scapulothoracic musculature

Can start light abdominal exercises, but keep a neutral spine. No sit-ups, crunches, or flexion based abdominal exercise.

Increase intensity of lower extremity exercises to include closed chain tasks e.g. ball squats, mini lunges, step ups, etc

Can progress aerobic exercise e.g. treadmill, elliptical

Aquatic therapy can be performed for very low functioning/deconditioned patients, or those with balance problems

Weeks 12-34 (3-6 months)

Progress exercises appropriately, avoiding flexion and twisting

Increase work and intensity of all aerobic tasks

Start light functional re-training/lifting, re-training and work simulation if necessary at 4-6 months

24 weeks (6 months)

Progression to more aggressive functional strengthening and work re-training if appropriate

Work conditioning and simulation

Still avoid flexion based exercises in weightbearing, but can perform flexion exercises on floor e.g. knee to chest, hip rotator stretching

Can start rotational exercises and functional movement patterns e.g. PNF