

## **Protocol for Cervical Fusion Surgeries**

**This should be divided into 3 phases primarily based on the post-surgical time frames. However, if patient cannot demonstrate tolerance to, or correct completion of program progression, phases may be prolonged as necessary. Please note that this protocol should not serve as a substitute for clinical judgement. Therapists should take into consideration additional factors, such as patient age, prior functional status, as well as concurrent health conditions when implementing this rehabilitation program. Initiation of outpatient physical therapy will be determined by surgeon on a case by case basis.**

### **PHASE 1**

#### **Rehabilitation Goals for 1-6 weeks:**

1. Be sure patient knows home exercise (mostly isometrics) and beginning muscle recruitment for stabilization and postural support.
2. Increase daily activity levels; work on restoration of any mobility losses, mostly with walking and calf pumping.
3. Remind patient to continue to observe precautions as instructed below.
4. Reinforce use of neck brace or cervical collar if patient has been instructed to use one. Re-evaluate effectiveness of brace.
5. Initiate home walking program, trying to increase distance to one to two miles by six week checkup with the surgeon.
6. Determine mechanical means of pain control for the patient using physical agents, positioning, support, or peripheral movements, as needed.
7. Release soft tissue restrictions/muscle spasms. Soft tissue mobilizations appropriate during this initial phase starting in the 4<sup>th</sup> week from surgery, and once incisional areas are fully healed.
8. Reinforce proper posture and body mechanics for all activities of daily living (ADLs). Prepare to wean from brace or cervical collar after 6 weeks, if neck brace has been used. Ensure that patient can correctly complete log roll with positional changes.
9. Emphasis on proper breathing mechanics.

#### **Precautions:**

*No lifting greater than 5 pounds until cleared by surgeon (usually by 4-6 weeks after procedure).*

*No active side bending, twisting, or stretching of cervical spine. Gentle active motions in pain free range may begin in week 4.*

*No resisted overhead exercise.*

*No sudden, jerky spinal motions.*

*No high impact activity.*

### Rehabilitation Program, 1-6 weeks

- Exercises appropriate for this phase include:
  - a. Scapular retractions
  - b. **Beginning in week 4 at the earliest**, isometric exercises for cervical spine into side bending, rotation, flexion, and extension. Position of training these muscles is dependent on patient tolerance, and therapist discretion.
  - c. Gentle seated thoracic extensions over chair while supporting neck in collar. Monitor for excessive cervical spine motion.
  - d. Gentle pec stretching in supine with towel roll behind mid scapular area if this is tolerable.
  - e. **Beginning in week 4 at the earliest**, cervical AROM in all directions. Gentle, and pain free.
  - f. Sitting-standing, and standing-sitting with emphasis on erect spinal posture.
  - g. Upper extremity neural glides to prevent dural scarring; exercise caution to avoid inflaming neural tissue. Arm motions only prior to the 4<sup>th</sup> week following surgery. Gentle cervical side bending can be integrated after week 4.
  - h. Deep neck flexor training. This can be commenced while using collar by pressing into collar. Once collar is removed, patient can achieve this by pressing into fist. Begin in supine with adequate support, progress to neutral position. As patient progresses, work to increase hold times, and frequency of exercise completion.
  - i. Walking (no bike).
  - j. Postural education, emphasis on upright sitting posture, use of Lumbar support roll.
  - k. Lumbar spine stability if appropriate.

Promote neutral spine with all therapeutic exercises.

**\*\*If patient cannot complete these correctly, they should not be performed independently.**

- Review of all precautions. Reinforce lifting limit.
- Continue to emphasize basic stabilization exercises, and maintaining neutral spine. Use fully supported positions until patient shows good control and has minimal symptoms during exercise.
- Encourage walking.
- Reinforce use of neck brace if required. If brace is optional, reassess patient's capability to do functional activities without pain, with and without the brace. Start to wean the patient from the brace or cervical collar as pain-free function improves.

- Have patient record walking times or distances each day, starting with 10 minutes or less, 1-2 times per day, progressing tolerance to 30 minutes. Set distance, time, or step goals for 6 weeks post-surgery.
- Review pain control strategies each visit. Incorporate with self-help care.
- Work on specific stretching and soft tissue/joint mobilization to maximize function in adjacent areas, such as thoracic spine. Gentle thoracic spine mobilizations may be performed (if no contraindications for mobilizations) while maintaining neutral cervical spine position.

## PHASE 2

### Rehabilitation goals for 6-12 weeks:

1. Continue spine stabilization exercises.
2. Progress aerobic program in intensity and/or duration in improve aerobic level and achieve at least three miles/day walking distance by twelve weeks if appropriate, based on prior level of function.
3. Continue release of soft tissue restrictions/muscle spasms using manual therapy if appropriate.
4. Include motor control considerations in the treatment program. Integrate coordination and quality of movement in the exercise. Test and train balance as part of the program.
5. Instruct in proper body mechanics and postures for patient's ADLs.
6. Continue with neural mobilization and attention to upper extremity flexibility.
7. Once 5 pound lifting restriction has been lifted during follow up visit with surgeon, gradual increments in resistance are appropriate during exercise program, and daily activity.
8. Continue work on specific stretching and soft tissue/joint mobilization to maximize function in adjacent areas from fusion site, such as thoracic spine. Gentle thoracic spine mobilizations may be performed (if no contraindications for mobilizations) while maintaining neutral lumbar spine position.

#### Precautions:

*Patients should seek clearance from surgeon for lifting greater than 10 pounds if daily function of patient requires them to do so. Resisted overhead exercises should continue to be avoided, unless surgeon specifies otherwise.*

*Avoid excessive bending, or twisting of cervical spine.*

*No neck stretching or passive neck motions past end range. Gentle motions in pain free range only.*

*No high impact activity.*

### **Rehabilitation program for 6-12 weeks**

Exercises appropriate for this phase include:

- A. Continue with previously mentioned phase 1 exercises as appropriate.
- B. Theraband exercises: lat pull downs, external rotations, rows, horizontal abduction as tolerated.
- C. Mini squats with erect spinal posture.
- D. Prone scapular stabilization if patient can tolerate this position.
- E. Gentle resisted elbow flexion and extension with light weights.
- F. Progression of cervical stabilization program. Prone on elbow, quadruped, and modified plank positions may be used during this phase to progress cervical isometrics, and deep neck flexor training.
- G. Progress spinal stabilization program in seated position. Use of unstable surfaces such as physio balls, and dyna discs are permitted to perform exercises.
- H. Stationary bike.

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### **PHASE 3**

**Rehabilitation Goals for 12-18 weeks** following surgery, or through next six weeks of therapy. Some patients may also require more than 6 weeks at the previous stage. Patients may be discharged during, or towards the conclusion of this phase once they can demonstrate independence with home exercise program, and appropriate activity modifications. While spinal motions may be further progressed at this stage, it is important to educate patients on expected long term spinal motion limitations following a cervical fusion to minimize risk of future injury.

1. Continue to maximize soft tissue function and mobility.
2. Seek continued improvement in muscle balance through the upper quarter, and minimize or eliminate radiating symptoms.
3. Restore needed lifting and strength capacity for return to work or work hardening.
4. Maximize trunk strength, as well as capability to isolate deep neck flexors.
5. Continue to reinforce body mechanics and maintaining neutral spine throughout all conditioning exercise.
6. Recreational activities that may be resumed after this phase include: horseback riding, road biking, hiking, swimming, outdoor biking, and pilates. Patients should consult with their surgeon regarding return to higher level activities for their specific case.

**Precautions:**

*Patients should minimize, or avoid high impact activity if possible. While lifting is permitted, patients should continue to avoid resisted overhead activity if possible. Sudden, jerky motions should be minimized.*

**Rehabilitation Program, 12-18 weeks**

- Continue to work on specific stretching and soft tissue/joint mobilization to maximize function in adjacent areas, such as thoracic spine, and upper extremities. Continue spine stabilization exercise, emphasis on neutral spine, upright posture and balance/coordination challenges.
- Progress lifting with a high repetition low weight increase regimen. Continue to avoid resisted overhead exercise, unless this is necessary for daily responsibilities. Our recommendation is 15-20 reps with proper form before increasing weight, in 3-5 pound increments.
- Continue progress with cardiovascular conditioning. Follow with FCE and work hardening, if needed.
- After week 12, (at the earliest), re-introduce neck stretches, and progress passive range of motion program.
- Appropriate exercises during this phase include:
  - A. Continue with previously mentioned phase 1 and 2 exercises as appropriate.
  - B. Prone I's T's, and Y's. Ensure patient can complete this with their own body weight before progression to light weights.
  - C. Side lying resisted upper extremity exercise.
  - D. Modified Planks. Progress to push up program.
  - E. Gentle neck PROM, and stretches.
  - F. Elliptical with light resistance.
  - G. Initiate plyometric program if appropriate.

Promote neutral spine with all therapeutic exercises with exception of re-introduction of spinal motions as stated above.

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Last reviewed and modified: June, 2019