

Cervical Spine Fusion Rehabilitation Protocol

| Phase 1 | Day 1 post-op to 6 weeks |
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| Rehabilitation Goals | <ul style="list-style-type: none"> • Protect the incision, encourage healing and monitor for signs of possible infection • Independence in ambulation and ADL's • Improved aerobic tolerance • Good postural awareness and the ability to control it • Demonstrate a neutral spine/pelvis, appropriate positioning of cervical spine for bed mobility and transfers • Demonstrate phase 1 motor control correctly • Maintain the nerve root mobility and prevent an adherent nerve root • Independence in pain management and methods to decrease inflammation • Independence in donning and doffing cervical brace |
| Appointments | <ul style="list-style-type: none"> • Patient will be seen at 2 weeks post op and at 6 weeks post op with physician visits • The patient will then be seen every 1-2 weeks to advance HEP |
| Brace | <ul style="list-style-type: none"> • As recommended by Spine Surgeon |
| Precautions | <ul style="list-style-type: none"> • Prevent excessive initial mobility or stress on tissue <ul style="list-style-type: none"> ○ Limit forward head positioning ○ No cervical flexion/rotation • Avoid holding positions for a prolonged period of time and avoid cervical flexion <ul style="list-style-type: none"> ○ No lifting over a range of 10-15 pounds ○ No sharp neck or radicular pain during or following exercises |
| Treatment Strategies | <ul style="list-style-type: none"> • Instruct the patient to protect the incision site and to inspect for signs of infection • Gait training as needed with maintenance of proper posture <ul style="list-style-type: none"> • Walking program 2 times per day for 10 to 15 minutes at a slow pace • Instruct/re-instruct in proper sitting and standing posture. • Instruct in transfers and bed mobility with maintenance of neutral spine and good motor control • ADL training with maintenance of neutral spine position and correct body mechanics <p style="text-align: center;">CONTINUED ON NEXT PAGE</p> |

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| <p>Treatment Strategies Continued</p> | <ul style="list-style-type: none"> • Instruct in donning/doffing of cervical brace • Instruct in very gentle nerve flossing (4-5 times per day) <ul style="list-style-type: none"> ○ Cervical flossing techniques • Instruct in Phase 1 home exercise program in an unloaded supported position: • Instruct in using ice to control pain and inflammation 2 to 4 times per day for 20 minutes |
| <p>Therapeutic Exercises</p> | <ul style="list-style-type: none"> • Instruct Patient in Phase 1 Exercises: <ul style="list-style-type: none"> ○ Gentle nerve flossing ○ Supine deep cervical flexor sets ○ Sitting lower trapezius sets (scapula retraction/depression) |
| <p>Advancement Criteria</p> | <ul style="list-style-type: none"> <input type="checkbox"/> Pain and swelling within tolerance, including no radicular symptoms <input type="checkbox"/> Independent with phase 1 home exercise program <input type="checkbox"/> Tolerance of 15 minutes of exercise and 10-15 minutes of slow-paced walking <input type="checkbox"/> Functional with ADL's (self-care, hygiene, transfers, and brace donning/doffing) |

Cervical Spine Fusion Rehabilitation Protocol

| Phase 2 | 6-8 Weeks Post-op |
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| Rehabilitation Goals | <ul style="list-style-type: none"> • Independence in monitoring the incision for proper healing and scar tissue mobility • Independence in training techniques to increase ambulatory endurance • Good postural awareness and control of it • Patient will be independent in normalizing nerve tissue mobility • Progress to phase 2 cervical stabilization exercises • Demonstrate good motor control during phase 2 exercises and ADL's • Independence in methods to decrease pain and inflammation |
| Appointments | <ul style="list-style-type: none"> • Every 1 to 2 weeks to advance home exercise program or more as indicated by re-assessment |
| Brace | <ul style="list-style-type: none"> • As recommended by Spine Surgeon |
| Precautions | <ul style="list-style-type: none"> • Avoid rotation/side bending and end-range movement of the cervical spine • No lifting over 20-25 pounds • No sharp neck pain or radicular pain during or following exercises |
| Treatment Strategies | <ul style="list-style-type: none"> • Monitor incision for proper healing and scar tissue mobility (instruct in self-mobs) • Instruct in a progressive walking program: <ul style="list-style-type: none"> ○ Duration (20-30 minutes) ○ Intensity (slow to moderate comfortable pace) • Re-instruct in maintaining good posture and body mechanics during all ADLs • Utilize STM through the cervical paraspinals, upper trap, and levator scapulae as needed to relieve muscle tension and alleviate pain • Re-assess nerve tension and advance nerve flossing as tolerated • Watch for mechanical signs and symptoms • Instruct patient to use ice to control pain and inflammation PRN |

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| <p>Therapeutic Exercise</p> | <ul style="list-style-type: none"> • Instruct patient in phase 2 progressive exercises in an unloaded position, progressing to a loaded position: <ul style="list-style-type: none"> ○ Bilateral shoulder isometrics ○ Two-finger cervical isometrics ○ Supine UE resisted movements ○ Seated AROM of B UEs ○ Standing balance progressions ○ Partial squats with/without support |
| <p>Advancement Criteria</p> | <ul style="list-style-type: none"> <input type="checkbox"/> No increase in cervical pain or any radicular pain with home exercise program <input type="checkbox"/> Independent with phase 2 home exercise program <input type="checkbox"/> Able to maintain a neutral spine and proper breathing technique for all transitional activity and exercises <input type="checkbox"/> Independent in postural correction in sitting, standing, and lying <input type="checkbox"/> Dynamic sitting and standing tolerance of 15 to 20 minutes <input type="checkbox"/> Able to ambulate 20-30 minutes at a moderate pace |

Cervical Spine Fusion Rehabilitation Protocol

| Phase 3 | 8-12 Weeks Post-op |
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| Rehabilitation Goals | <ul style="list-style-type: none"> • Independence in normalizing scar tissue mobility • Independence in a progressive walking program and in cardiovascular exercises • Normal sitting and standing posture without verbal cues • Demonstrate normal nerve tissue mobility • Tolerate progression from unloaded/loaded and supported cervical stabilization exercises to unsupported Phase 3 exercises • Independence in Phase 3 progressive low resistance, high repetition extremity strengthening, and advanced stabilization exercises with a neutral spine and good motor control • Independent in preventing the onset of mechanical signs and symptoms • Able to control pain and inflammation |
| Appointments | <ul style="list-style-type: none"> • Every 1 to 2 weeks to advance home exercise program or more as indicated by re-assessment |
| Brace | <ul style="list-style-type: none"> • As recommended by Spine Surgeon |
| Precautions | <ul style="list-style-type: none"> • Avoid reproduction of cervical and radicular pain • Avoid loading the cervical spine with resisted overhead activities, and avoid excessive loading of the upper trap • Avoid flexion or lifting exercises in the AM secondary to diurnal variations in fluid level of the intervertebral disc (more hydrated in the early A.M.) • Focus on low load high repetitions to improve endurance, rather than high load low repetition for strength • Avoid passive stretching of the cervical spine • Adhere to weight lifting restrictions as indicated by surgeon |
| Treatment Strategies | <ul style="list-style-type: none"> • On-going instruction on managing scar tissue development and mobility • Instruct in a progressive walking program <ul style="list-style-type: none"> ○ Duration (30 minutes) ○ Frequency (1-2x/day) ○ Intensity (moderate to brisk rate) • Re-instruct in postural correction and body mechanics for ADL's as indicated <p style="text-align: center;">CONTINUED ON NEXT PAGE</p> |

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| <p>Treatment Strategies (Continued)</p> | <ul style="list-style-type: none"> • Re-assess nerve tension and advance nerve flossing as tolerated • Utilize STM through the cervical paraspinals, upper traps, and levator scapulae as needed to relieve muscle tension and alleviate pain • Initiate thoracic mobilizations/AROM as needed to improve mobility and decrease strain on the cervical spine • Initiate UBE with light resistance progressing as tolerated • Cardiovascular exercises: <ul style="list-style-type: none"> ○ Duration (30 minutes) ○ Exercise mode (Nordic track, elliptical, stair climber) • Watch for mechanical signs and symptoms above and/or below the surgical sight, treating as indicated • Instruct in using ice to control pain and inflammation PRN |
| <p>Therapeutic Exercise</p> | <ul style="list-style-type: none"> • Instruct in Phase 3 progressive exercises in unloaded/loaded and supported/unsupported positions: <ul style="list-style-type: none"> ○ Cervical retraction in sitting ○ Front planks, side planks and back planks standing at the wall and at an incline ○ Prone arms lifts (I's, T's, & Y's) ○ Standing elastic band rowing ○ Standing elastic band shoulder extension ○ Standing elastic band shoulder external rotation ○ Standing arm clocks to 90 degrees ○ Sitting thoracic stretching (flexion, extension, rotation) ○ Squats to 90 degrees ○ Lunges |
| <p>Criteria for Progression</p> | <ul style="list-style-type: none"> <input type="checkbox"/> No increase in neck or any radicular pain with HEP <input type="checkbox"/> Independent with home exercise program for Phase 3 <input type="checkbox"/> Able to maintain a neutral spine and good motor control during all ADL's and extremity-strengthening exercises <input type="checkbox"/> Able to demonstrate proper breathing technique during all home strengthening exercises <input type="checkbox"/> Independent in postural correction and body mechanics for ADL's <input type="checkbox"/> Tolerate dynamic sitting and standing 20-30 minutes <input type="checkbox"/> Tolerate walking and cardiovascular exercise for 30 minutes |

Cervical Spine Fusion Rehabilitation Protocol

| Phase 4 | 12-24 Weeks Post-op |
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| Rehabilitation Goals | <ul style="list-style-type: none"> • Patient will be independent in scar tissue mobilization • Patient will demonstrate normal posture • Patient will demonstrate normal nerve tissue tension • Patient will tolerate assessment of cervical ROM in sitting without increasing or reproducing symptoms • Patient will tolerate manual muscle testing of all major cervical and extremity musculature • Patient will progress to Phase 4 progressive moderate resistance, high repetition extremity strengthening and advanced stabilization exercises with a neutral spine and good motor control • Patient will progress to functional lift training and will achieve all functional goals • Patient will have no mechanical signs or symptoms • Patient will report no pain with HEP and ADL's |
| Appointments | <ul style="list-style-type: none"> • Every 1 to 2 weeks to advance home exercise program or more as indicated by re-assessment |
| Precautions | <ul style="list-style-type: none"> • Reproduction or increase in any symptoms with repetitive cervical motions • Avoid flexion or lifting exercises in the AM secondary to diurnal variations in fluid level of the intervertebral disc (more hydrated in the early A.M.) • Focus on low-load high repetitions to improve endurance, rather than high-load low repetition for strength • Weight lifting restrictions as indicated by surgeon |
| Treatment Strategies | <ul style="list-style-type: none"> • Instruct patient in improving scar tissue mobility as indicated • Re-instruct in postural correction and body mechanics for ADL's PRN • Assess cervical AROM and instruct in ROM exercises as indicated • Assess cervical and shoulder isometric strength • Advance patient's progressive walking program <ul style="list-style-type: none"> ○ Duration (30-40 minutes) ○ Frequency (1-2x/day) ○ Intensity (Brisk rate) <p>Instruct in neural mobilizations to normal end-range response with overpressure as needed</p> <p style="text-align: center;">CONTINUED ON NEXT PAGE</p> |

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| <p>Treatment Strategies Continued</p> | <ul style="list-style-type: none"> • Initiate work/activity-specific training • Cardiovascular exercises: <ul style="list-style-type: none"> ○ Duration (30-40 minutes) ○ Exercise mode (swimming, cycling, Nordic track, elliptical, stair climber) ○ Resume jogging/running if pain-free • Watch for mechanical signs and symptoms, treating as indicated • Use ice to control pain and inflammation PRN |
| <p>Therapeutic Exercise</p> | <ul style="list-style-type: none"> • Instruct in Phase 4 progressive exercise program in loaded and unloaded positions: <ul style="list-style-type: none"> ○ Pain-free cervical AROM through all planes of motion ○ Suspended cervical isometrics in supine, side lying, and prone ○ Push-ups at the wall progressing to countertop ○ Isotonic U/E exercises in standing and sitting on a ball ○ Prone on ball arm lifts (I's, T's, & Y's) ○ Prone on ball shoulder flexion/opposite hip extension ○ Prone planks on ball ○ Walkouts/push-ups on ball ○ Elastic band PNF D1 & D2 flexion/extension patterns ○ Supine on ball pull overs, flies and chest press |

Cervical Spine Fusion Rehabilitation Protocol

| Phase 5 | 24 Weeks Post-op and Beyond |
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| Rehabilitation Goals | <ul style="list-style-type: none"> • Patient will be able to maintain normal posture • Demonstrate normal cervical and bilateral shoulder ROM • Demonstrate 5/5 isometric strength for the neck and bilateral shoulders with manual muscle testing • Demonstrate good cardiovascular fitness • Able to participate in a full mechanical evaluation without pain or increased symptoms • Functional capacity results will be suitable for employment, sports, and ADL's • Patient will return to full activity or fully redefined activity level • Patient will be responsive to mechanical signs and symptoms |
| Appointments | <ul style="list-style-type: none"> • PRN |
| Precautions | <ul style="list-style-type: none"> • Any mechanical signs or symptoms with testing • Any neurological signs and symptoms |
| Treatment Strategies | <ul style="list-style-type: none"> • Assess patient's ability to perform their independent home exercise program for maintenance of functional status • Assess sitting and standing posture • Perform a full mechanical evaluation indicated • Assess isometric cervical and bilateral shoulder strengths • Assess gait on multiple surfaces • Assess cardiovascular status • Set up a Functional Capacity Evaluation (Results suitable for employment, sports and ADL's) if ordered by physician • Instruct patient in how to return to activity or fully redefined activities • Instruct patient in prophylaxis: <ul style="list-style-type: none"> ○ Maintenance of normal posture ○ Functional ROM/flexibility ○ Functional cervical and extremity strength ○ Good cardiovascular fitness ○ Responsive to mechanical signs and symptoms ○ Proactive |