

## Cervical Spine Non-Fusion Rehabilitation Protocol

Phase 1	Day 1 post-op to 2 weeks
Rehabilitation Goals	<ul style="list-style-type: none"> <li>• Protect the incision, encourage healing and monitor for signs of possible infection</li> <li>• Independent in ambulation and ADL's</li> <li>• Improved aerobic tolerance</li> <li>• Good postural awareness and the ability to control it</li> <li>• Demonstrate a neutral spine/pelvis, appropriate positioning of cervical spine for bed mobility and transfers</li> <li>• Patient will demonstrate phase 1 motor control correctly</li> <li>• Maintain the nerve root mobility and prevent an adherent nerve root</li> <li>• Independent in pain management and methods to decrease inflammation</li> <li>• Independent in donning and doffing cervical brace</li> </ul>
Appointments	<ul style="list-style-type: none"> <li>• Every 1 to 2 weeks to advance home exercise program or more as indicated by re-assessment</li> </ul>
Brace	<ul style="list-style-type: none"> <li>• As recommended by Spine Surgeon</li> </ul>
Precautions	<ul style="list-style-type: none"> <li>• Prevent excessive initial mobility or stress on tissue.               <ul style="list-style-type: none"> <li>○ Limit forward head positioning</li> <li>○ No cervical flexion/rotation</li> </ul> </li> <li>• Avoid holding positions for a prolonged period of time and avoid cervical flexion.               <ul style="list-style-type: none"> <li>○ No lifting over a range of 10-15 pounds.</li> <li>○ No sharp neck or radicular pain during or following exercises.</li> </ul> </li> </ul>

Treatment Strategies	<ul style="list-style-type: none"> <li>• Instruct the patient to protect the incision site and to inspect for signs of infection.</li> <li>• Gait training as needed with maintenance of proper posture             <ul style="list-style-type: none"> <li>○ Walking program 2 times per day for 10 to 15 minutes at a slow pace</li> </ul> </li> <li>• Instruct/re-instruct in proper sitting and standing posture</li> <li>• Instruct in transfers and bed mobility with maintenance of neutral spine and good motor control</li> <li>• ADL training with maintenance of neutral spine position and correct body mechanics</li> <li>• Instruct in donning/doffing of cervical brace</li> <li>• Instruct in using ice to control pain and inflammation 2 to 4 times per day for 20 minutes</li> </ul>
Therapeutic Exercises	<ul style="list-style-type: none"> <li>• Instruct Patient in Phase 1 Exercises:             <ul style="list-style-type: none"> <li>○ Gentle nerve flossing</li> <li>○ Supine deep cervical flexor sets</li> <li>○ Sitting lower trapezius sets (scapula retraction/depression)</li> </ul> </li> </ul>
Advancement Criteria	<ul style="list-style-type: none"> <li>• Pain and swelling within tolerance, including no radicular symptoms</li> <li>• Independent in phase 1 home exercises</li> <li>• Tolerance of 15 minutes of exercise and 10-15 minutes of slow-paced walking</li> <li>• Functional with ADL's (self-care, hygiene, transfer, and brace donning/doffing)</li> <li>• Achieve all phase 1 goals</li> </ul>

## Cervical Spine Non-Fusion Rehabilitation Protocol

Phase 2	2-4 Weeks Post-op
Rehabilitation Goals	<ul style="list-style-type: none"> <li>• Independence in monitoring the incision for proper healing and scar tissue mobility</li> <li>• Independence in training techniques to increase ambulatory endurance</li> <li>• Good postural awareness and control of it</li> <li>• Normalize nerve tissue mobility</li> <li>• Non-fusion &amp; disc replacement patients will be independent in mid-range cervical exercises to prevent dysfunction</li> <li>• Progress to phase 2 cervical stabilization exercises</li> <li>• Demonstrate good motor control during phase 2 exercises and ADL's</li> <li>• Independence in methods to decrease pain and inflammation</li> </ul>
Appointments	<ul style="list-style-type: none"> <li>• Every 1 to 2 weeks to advance home exercise program or more as indicated by re-assessment</li> </ul>
Brace	<ul style="list-style-type: none"> <li>• As recommended by Spine Surgeon</li> </ul>
Precautions	<ul style="list-style-type: none"> <li>• Avoid rotation/side bending and end-range movement of the cervical spine</li> <li>• No loaded ROM testing until 6 weeks post-operative for non-fusion patients only</li> <li>• No lifting over 10-15 pounds</li> <li>• No sharp neck pain or radicular pain during or following exercises</li> </ul>
Treatment Strategies	<ul style="list-style-type: none"> <li>• Monitor incision for proper healing and scar tissue mobility (instruct in self-mobs)</li> <li>• Instruct in a progressive walking program               <ul style="list-style-type: none"> <li>○ Duration (20-30 minutes)</li> <li>○ Intensity (slow to moderate comfortable pace)</li> </ul> </li> <li>• Re-instruct in maintaining good posture and body mechanics during all ADLs</li> <li>• Utilize STM through the cervical paraspinals, upper trap, and levator scapulae as needed to relieve muscle tension and alleviate pain</li> <li>• Re-assess nerve tension and advance nerve flossing as tolerated</li> <li>• Watch for mechanical signs and symptoms</li> <li>• Instruct use of ice to control pain and inflammation PRN</li> </ul>

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

## Cervical Spine Non-Fusion Rehabilitation Protocol

Phase 3	4-6 Weeks Post-op
Rehabilitation Goals	<ul style="list-style-type: none"> <li>• Normalize scar tissue mobility</li> <li>• Independence in a progressive walking program and in cardiovascular exercises</li> <li>• Normal sitting and standing posture without verbal cues</li> <li>• Normal nerve tissue mobility</li> <li>• Patient will tolerate progression from unloaded/loaded and supported cervical stabilization exercises to unsupported Phase 3 exercises</li> <li>• Patient will be independent in Phase 3 progressive low resistance, high repetition extremity strengthening and advanced stabilization exercises with a neutral spine and good motor control</li> <li>• Patient will be independent in preventing the onset of mechanical signs and symptoms</li> <li>• Patient will be able to control pain and inflammation</li> </ul>
Appointments	<ul style="list-style-type: none"> <li>• Every 1 to 2 weeks to advance home exercise program or more as indicated by re-assessment</li> </ul>
Brace	<ul style="list-style-type: none"> <li>• As recommended by Spine Surgeon</li> </ul>
Precautions	<ul style="list-style-type: none"> <li>• Avoid reproduction of cervical and radicular pain.</li> <li>• Avoid loading the cervical spine with resisted overhead activities, and avoid excessive loading of the upper trap.</li> <li>• Avoid flexion or lifting exercises in the AM secondary to diurnal variations in fluid level of the inter-vertebral disc (more hydrated in the early A.M.).</li> <li>• Focus on low load high repetitions to improve endurance, rather than high load low repetition for strength.</li> <li>• Avoid passive stretching of the cervical spine.</li> <li>• Adhere to weight lifting restrictions as indicated by surgeon.</li> </ul>

Treatment Strategies	<ul style="list-style-type: none"> <li>• On-going instruction on managing scar tissue development and mobility</li> <li>• Instruct in a progressive walking program             <ul style="list-style-type: none"> <li>○ Duration (30 minutes)</li> <li>○ Frequency (1-2x/day)</li> <li>○ Intensity (moderate to brisk rate)</li> </ul> </li> <li>• Re-instruct in postural correction and body mechanics for ADL's as indicated</li> <li>• Re-assess nerve tension and advance nerve flossing as tolerated</li> <li>• Utilize STM through the cervical paraspinals, upper traps, and levator scapulae as needed to relieve muscle tension and alleviate pain.</li> <li>• Initiate thoracic mobilizations/AROM as needed to improve mobility and decrease strain on the cervical spine.</li> <li>• Initiate UBE with light resistance progressing as tolerated</li> <li>• Cardiovascular exercises:             <ul style="list-style-type: none"> <li>○ Duration (30 minutes)</li> <li>○ Exercise mode (Nordic track, elliptical, stair climber)</li> </ul> </li> <li>• Watch for mechanical signs and symptoms above and/or below the surgical sight, treating as indicated</li> <li>• Instruct in using ice to control pain and inflammation PRN</li> </ul>
Therapeutic Exercise	<ul style="list-style-type: none"> <li>• Instruct in Phase 3 progressive exercises in unloaded/loaded and supported/unsupported positions:             <ul style="list-style-type: none"> <li>○ Cervical retraction in sitting</li> <li>○ Front planks, side planks and back planks standing at the wall and at an incline</li> <li>○ Prone arms lifts (I's, T's, &amp; Y's)</li> <li>○ Standing elastic band rowing</li> <li>○ Standing elastic band shoulder extension</li> <li>○ Standing elastic band shoulder external rotation</li> <li>○ Standing arm clocks to 90 degrees</li> <li>○ Sitting thoracic stretching (flexion, extension, rotation)</li> <li>○ Squats to 90 degrees</li> <li>○ Lunges</li> </ul> </li> </ul>
Criteria for Progression	<ul style="list-style-type: none"> <li>• No increased neck or any radicular pain with HEP</li> <li>• Independent with home exercise program for Phase 3</li> <li>• Able to maintain a neutral spine and good motor control during all ADL's and extremity strengthening exercises</li> <li>• Able to demonstrate proper breathing technique during all home strengthening exercises</li> <li>• Independent in postural correction and body mechanics for ADL's</li> <li>• Demonstrate dynamic sitting and standing tolerance of 20-30 minutes</li> <li>• Tolerate walking and cardiovascular exercise for 30 minutes</li> </ul>

## Cervical Spine Non-Fusion Rehabilitation Protocol

Phase 4	6-8 Weeks Post-op
Rehabilitation Goals	<ul style="list-style-type: none"> <li>• Independence in scar tissue mobilization</li> <li>• Demonstrate normal posture</li> <li>• Demonstrate normal nerve tissue tension</li> <li>• Tolerate assessment of cervical ROM in sitting without increasing or reproducing symptoms</li> <li>• Tolerate manual muscle testing of all major cervical and extremity musculature</li> <li>• Progress to Phase 4 progressive moderate resistance, high repetition extremity strengthening and advanced stabilization exercises with a neutral spine and good motor control</li> <li>• Progress to functional lift training and will achieve all functional goals</li> <li>• No mechanical signs or symptoms</li> <li>• No pain with HEP and ADL's</li> </ul>
Appointments	<ul style="list-style-type: none"> <li>• Every 1 to 2 weeks to advance home exercise program or more as indicated by re-assessment</li> </ul>
Precautions	<ul style="list-style-type: none"> <li>• Reproduction or increase in any symptoms with repetitive cervical motions</li> <li>• Avoid flexion or lifting exercises in the AM secondary to diurnal variations in fluid level of the inter-vertebral disc (more hydrated in the early A.M.)</li> <li>• Focus on low-load high repetitions to improve endurance, rather than high-load low repetition for strength</li> <li>• Weight lifting restrictions as indicated by surgeon</li> </ul>

Treatment Strategies	<ul style="list-style-type: none"> <li>• Instruct patient in improving scar tissue mobility as indicated</li> <li>• Re-instruct in postural correction and body mechanics for ADL's PRN</li> <li>• Assess cervical AROM and instruct in ROM exercises as indicated</li> <li>• Assess cervical and shoulder isometric strength</li> <li>• Advance patient's progressive walking program             <ul style="list-style-type: none"> <li>○ Duration (30-40 minutes)</li> <li>○ Frequency (1-2x/day)</li> <li>○ Intensity (Brisk rate)</li> </ul> </li> <li>• Instruct in neural mobilizations to normal end-range response with overpressure as needed.</li> <li>• Initiate work/activity specific training</li> <li>• Cardiovascular exercises:             <ul style="list-style-type: none"> <li>○ Duration (30-40 minutes)</li> <li>○ Exercise mode (swimming, cycling, Nordic track, elliptical, stair climber)</li> <li>○ Resume jogging/running if pain free</li> </ul> </li> <li>• Watch for mechanical signs and symptoms, treating as indicated</li> <li>• Use ice to control pain and inflammation PRN</li> </ul>
Therapeutic Exercise	<ul style="list-style-type: none"> <li>• Instruct in Phase 4 progressive exercise program in loaded and unloaded positions:             <ul style="list-style-type: none"> <li>○ Pain free cervical AROM through all planes of motion</li> <li>○ Suspended cervical isometrics in supine, side lying and prone</li> <li>○ Push-ups at the wall progressing to counter top</li> <li>○ Isotonic U/E exercises in standing and in sitting on a ball</li> <li>○ Prone on ball arm lifts (I's, T's, &amp; Y's)</li> <li>○ Prone on ball shoulder flexion/opposite hip extension</li> <li>○ Prone planks on ball</li> <li>○ Walkouts/push-ups on ball</li> <li>○ Elastic band PNF D1 &amp; D2 flexion/extension patterns</li> <li>○ Supine on ball pull overs, flies and chest press</li> </ul> </li> </ul>



## Cervical Spine Non-Fusion Rehabilitation Protocol

Phase 5	8-12 Weeks Post-op
Rehabilitation Goals	<ul style="list-style-type: none"> <li>• Independent in the final home exercise program</li> <li>• Able to maintain normal posture</li> <li>• Able to demonstrate normal cervical and bilateral shoulder ROM</li> <li>• Patient will be able to demonstrate 5/5 isometric strength for the neck and bilateral shoulders with manual muscle testing</li> <li>• Demonstrates good cardiovascular fitness</li> <li>• Participates in full mechanical evaluation without pain or increased symptoms</li> <li>• Patient's functional capacity results will be suitable for employment, sports and ADL's</li> <li>• Patient will return to full activity or fully redefined activity level</li> <li>• Patient will be responsive to mechanical signs and symptoms</li> </ul>
Appointments	<ul style="list-style-type: none"> <li>• PRN</li> </ul>
Precautions	<ul style="list-style-type: none"> <li>• Any mechanical signs or symptoms with testing</li> <li>• Any neurological signs and symptoms</li> </ul>
Treatment Strategy	<ul style="list-style-type: none"> <li>• Assess patient ability to perform their independent home exercise program for maintenance of functional status</li> <li>• Assess sitting and standing posture</li> <li>• Perform a full mechanical evaluation as indicated</li> <li>• Assess isometric cervical and bilateral shoulder strengths</li> <li>• Assess gait on multiple surfaces</li> <li>• Assess cardiovascular status</li> <li>• Set-up a Functional Capacity Evaluation (Results suitable for employment, sports and ADL's) if ordered by Physician</li> <li>• Instruct patient in how to return to activity or fully redefined activities</li> <li>• Instruct patient in prophylaxis:               <ul style="list-style-type: none"> <li>○ Maintenance of normal posture</li> <li>○ Functional ROM/flexibility</li> <li>○ Functional cervical and extremity strength</li> <li>○ Good cardiovascular fitness</li> <li>○ Responsive to mechanical signs and symptoms</li> <li>○ Proactive</li> </ul> </li> </ul>