

## **When to Initiate Postoperative Physical Therapy in Multilevel Posterior Cervical-Thoracic Fusions?**

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**INTRODUCTION:** The role of Physical Therapy (PT) in postoperative degenerative cervical myelopathy is understudied and not well understood. Current literature reports varied effects on outcomes, and thus postoperative standards of care neither address nor include PT in postoperative posterior cervico-thoracic fusions. The aim of this study was to analyze when neck strengthening exercise should be initiated after multilevel posterior cervical-thoracic fusions.

**METHODS:** Retrospective chart reviews were conducted between 2016-2020 on patients who underwent a  $\geq 3$  level posterior cervico-thoracic fusion with caudal levels as C7 and T1/T2. Prescription and completion of PT were study inclusion criteria. Demographic, clinical, and radiographic data were collected at structured intervals from preoperative to two years postoperative. Percentage improvement for cervical lordosis, T1 slope, and C2-C7 sagittal plumbline were compared at 2 weeks and 2 years postop. Visual Analog Scale (VAS) for pain and Oswestry Disability Index (ODI) scores were similarly analyzed.

**RESULTS:** A total of 105 patients were included in the study and were divided into two cohorts: those that initiated PT  $\leq 6$  weeks postop and those who initiated PT  $> 6$  weeks postop. Fifty-eight patients were included in the Early PT cohort, and 47 were included in the Late PT cohort. Demographically, the Early PT and Late PT cohorts were similar in age (62.8 vs. 61.1 years, respectively) and predominantly female (64.5% vs. 67.6%, respectively). No significant difference was reported between the groups in body mass index, with a mean of 30.7 for Early PT and 31.2 for Late PT. While both cohorts showed improvement in radiographic parameters and patient-reported outcomes at 2 years postop, there were significant differences in level of improvement between the two groups. The Early PT group had a comparatively better % improvement in cervical lordosis (25.2% vs. 14.2%); mean T1 slope (-5.6% vs. -2.6%); and mean C2-C7 sagittal plumbline (-15.2% vs. -11.7%). Patients who started PT  $\leq 6$  weeks postop also reported greater VAS % improvement 61.9% vs. 41% and Oswestry Disability Index % improvement 46.3% vs. 29.6% at 2 years postop.

**DISCUSSION AND CONCLUSION:** Patients who underwent a three or more-level posterior cervico-thoracic fusion and started PT at or before 6 weeks postop benefited greater in terms of radiographic and patient-reported outcomes than those that started PT more than 6 weeks postop. The results of this study support the early initiation of neck strengthening PT in most uncomplicated post-cervical fusion adult patients.