Rehabilitation Guidelines for Conservative Management of Spinal Stenosis of the Lumbar spine

These guidelines are intended to guide clinicians and patients through the conservative course for spinal stenosis of the lumbar spine. These guidelines are time based (dependent on tissue healing) as well as criterion based. Specific intervention should be based on the needs of the individual and should consider exam findings and clinical decision making. The timeframes for expected outcomes contained within this guideline may vary based on physician preference, additional procedures performed, and/or complications. If a clinician requires assistance in the progression of a patient, they should consult with the referring provider.

The interventions included within these guidelines are not intended to be an inclusive list of exercises. Therapeutic interventions should be included and modified based on the progress of the patient and under the discretion of the clinician.

Considerations for Lumbar spinal stenosis
Many different factors influence spinal stenosis rehabilitation outcomes including the presence of leg pain with or without neurogenic claudication, comorbidities, and psychosocial factors. It is recommended that clinicians collaborate closely with the referring physician regarding progression through the phases of the program.

PHASE I: ACUTE (0-6WEEKS), 6-8 PT visits

Rehabilitation Goals	• Control pain/inflammation • Centralize LE radicular symptoms, if present • Participate safely in activities of daily living • Address mobility/flexibility limitations of the hip and lumbar spine • Promote hip and core muscle strength and stability • Maintain cardiovascular conditioning
Bracing/ Precautions	• Precautions: avoid prolonged sitting, bending, lifting, forced lumbar extension • Special considerations: balance, safety and pacing strategies

Intervention	*Education*
	• Patient education: posture, positioning, body mechanics, activity modification
	• Advise in home walking program, if pain free
	• Utilize Oswestry Questionnaire to guide functional outcomes
	• If chronic, education should include pain neurophysiology, consider FABQ, STarT back tool
	
	Pain Management
	• Modalities: heat/ice
	• Positional: lumbar spine unloading in 90-90 position, frequent postural changes
	• Consider lumbar support
	• Consider assistive device for spinal unloading: unilateral/bilateral canes, trekking poles, rolling walker, rollator
	
	Mobility/Flexibility
	• Manual Therapy
	  ○ Soft tissue mobilization: paraspinals, quadratus lumborum, piriformis, gluteals
	  ○ Manual stretching: iliopsoas, rectus femoris, iliotibial band
	  ○ Hip/lumbar spine/thoracic spine joint mobilization

	○ Lumbar traction in hook-lying or supported 90/90 • Hip and LE flexibility ○ Supine hip flexor stretching ○ Supine piriformis stretching ○ Supine hamstring stretching, if no radicular symptoms present. ○ Supine gluteal stretching ○ Standing hip flexor stretching ○ Standing gastrocnemius stretching ○ Standing hamstring stretching, if no radicular symptoms present ○ Quadruped rock • Thoracic and Lumbar spine ○ Supine single knee to chest ○ Supine pelvic tilt/pelvic clock ○ Supine lower trunk rotation (if low reactivity) ○ Standing hip flexion on step: (lumbar flexion opening/oscillation) ○ Quadruped/modified plantigrade cat and camel: flexion/extension thoracic spine ○ Seated lumbar forward bend: straight plane/with rotation ○ Standing lumbar forward bend with one foot on step or chair *Stability/strength* • Local core muscle control (Transverse Abdominis (TA)/Multifidus (MF) in low load, spine-supported positions ○ Hook-lying isometric TA contraction ○ Hook-lying isometric TA contraction with march ○ Hook-lying isometric TA contraction with heel slides ○ Hook-lying isometric TA contraction with alternate UE elevation ○ Hook-lying isometric TA contraction with isometric clam with theraband ○ • Hip strengthening ○ Hook-lying gluteal set ○ Sit to stand with neutral lumbar spine ○ Modified plantigrade hip abduction ○ Modified plantigrade hip extension *Cardio/low impact exercise* • Aquatics with modified stroke to reduce extension • NuStep • Stationary/Recumbent bike • Body weight supported treadmill walking • Treadmill walking with slight incline • Home walking program with/without assisted device
Criteria to Progress	• Improved pain tolerance to weight bearing positions • Improved activity tolerance • Improved quality of gait

PHASE II: SUBACUTE STRENGTHENING (6-12 WEEKS), 6 PT visits

Rehabilitation Goals	• Monitor pain and activity • Continue to address mobility/flexibility limitations • Improve hip and core muscle strength and stability • Progress cardiovascular conditioning • Consistent use of proper body mechanics
Bracing/ Precautions	• Reduce/discontinue use of lumbar support • Determine ongoing need of assistive device for ambulation

	• Reinforce body mechanics for bending, lifting and reaching

Additional Intervention **Continue with Phase I interventions, as indicated*	*Stability/strength*
	• Neutral trunk stabilization
	  ○ Hook-lying march with isometric shoulder flexion at 90°
	  ○ Plantigrade opposite arm and hip extension
	• Hip strengthening
	  ○ Side-lying clamshell
	  ○ Modified plantigrade hip extension
	• Close chain strengthening
	  ○ Squat with/without support
	  ○ Lunge with/without support
	  ○ Standing low rows with posterior pelvic tilt
	  ○ Standing latissimus pulldown with posterior pelvic tilt
	  ○ Sidestepping
	  ○ Step up with/without support
	
	Stretching/Mobility
	• Thoracic/Lumbar
	  ○ Progress quadruped prayer stretch/thread the needle
	  ○ Open book with hip flexion
	• Hip
	  ○ Standing hip flexor stretching
	
	Proprioception/Balance
	• Balance progression depending on weight bearing irritability
	
	Cardio/low impact aerobics
	• Progress treadmill walking: time/incline
	• Progress stationary bicycle: time/resistance
	• Progress NuStep: time/resistance
	• Progress elliptical machine: time/resistance/incline
	• Aquatics with modified stroke to reduce extension

Criteria to Progress	• Self-management of symptoms • Pain free ADLs • Consistent use of proper body mechanics

PHASE III: ADVANCED STRENGTHENING (12-16WEEKS), 2-4 PT visits

Rehabilitation Goals	• Maintain mobility/flexibility • Progress core and lower quarter strength and endurance, as appropriate/tolerated • Demonstrate lumbopelvic control with closed chain movement patterns • Progress cardiovascular endurance
Bracing/ Precautions	• Avoid lumbar extension with strength training
Additional Intervention **Continue with Phase I-II Interventions*	*Stability/Strength* • Standing squat progression • Side stepping with/without resistance • Plantigrade plank *Neuromuscular re-education* • Proprioceptive training on static and dynamic surfaces *Cardio/low impact aerobics* • Progress treadmill walking: time/incline • Progress stationary bicycle: time/resistance • Progress elliptical machine: time/ resistance/incline

Criteria to Progress	• Successful return to gym-based exercise program • Self-management of symptoms

PHASE IV: OPTIONAL RETURN TO SPORT/RECREATIONAL EXERCISE (16 WEEKS +)

Rehabilitation Goals	• Introduce, progress and maximize sport/recreational specific strength and endurance • Demonstrate lumbopelvic control with dynamic sports/ recreational specific activities • Establish appropriate training routine with independent management plan
Additional Interventions **Continue with Phase I-III interventions*	*Education* • Monitor graded return to sport specific and/or recreational exercise i.e., swimming with modified strokes to decrease extension
Criteria to Discharge	• No increase in pain during/after sport specific exercise training • Proper mechanics during sports specific movement

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Contact	Please email MGHSportsPhysicalTherapy@partners.org with questions specific to this protocol

References:

1. Ammendolia C, Hofkirchner C, Plener J, et al. Non-operative treatment for lumbar spinal stenosis with neurogenic claudication: an updated systematic review. *BMJ Open* 2022;12:e057724. Doi:10.11136/bmjopen-2021-057724

2. Comer C, Williamson E, Mcllroy S, et al. Exercise treatments for lumbar spinal stenosis: A systematic review and intervention component analysis of randomised controlled trials. *Clinical Rehabilitation* 2024;38(3):361-374. doi:10.1177/02692155231201048

3. Temporiti F, Ferrari S, Kieser M, et al. Efficacy and characteristics of physiotherapy interventions in patients with lumbar spinal stenosis: a systematic review. *European Spine Journal* 2022;31:1370-1390. doi:/10.1007/s00586-022-07222-x