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Spondylolysis/Pars Fracture Rehabilitation Protocol

Phase 1	Day 1 after removal from sport participation for 4 weeks
Rehabilitation Goals	• Minimize pain and allow adequate time for healing to occur • Become pain free with ADLs • Initiate deep abdominal muscle training • Educate patient in ways to alleviate pain when present
Precautions	• No sports participation • Avoid end range extension ROM • Prescribed exercises should remain pain free • Brace use as directed by physician • Avoid prone lying while sleeping

Suggested Therapeutic Exercise/Treatment	• Supine/side lying/seated ADIM/multifidus activation
	• Flexion based pain free stretching for the lumbar spine and lower extremity muscles, mainly hip flexors and hamstrings
	• Unloaded and supported pain free core strengthening exercises in the neutral spine position utilizing UE and LE resistance in the supine/side lying/seated positions.
	  ○ Supine B UE flexion
	  ○ Supine UE horizontal abduction
	  ○ Supine SLR
	  ○ Side lying clamshells/hip abduction
	  ○ Seated supported T-band shoulder extension/rows
	  ○ Seated supported B UE Flexion

Cardiovascular program	• Based on symptoms during activity • If patient can ambulate pain free then initiate a daily walking program • If walking is painful, initiate a stationary biking program, upright bike preferred • Either program will start with 5-10 minutes and gradually progress to 30 minutes making sure the patient remains pain free
Criteria for Advancement to Phase 2	• Able to demonstrate and maintain transverse abdominis contraction (ADIM) and neutral spine during exercise routine • Able to demonstrate proper transfers, squatting, and lifting technique while maintaining transverse abdominis contraction and neutral spine position • Able to ambulate or bike for up to 20-30 minutes pain free

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Phase 2	4-8 Weeks
Rehabilitation Goals	• Improvement in pain free ROM • Pain free with ADLs • Increase abdominal core strength and strengthen any deficiencies in the lower extremities maintaining neutral spine position and keeping program symptom based • Progress to more loaded/unsupported core stability exercises • Progress aerobic program
Precautions	• Avoid ROM into extension of the lumbar spine • Exercise should remain pain free
Suggested Therapeutic Exercises	• Progress to loaded and unsupported core stability exercises • Continuation of OKC strengthening to address deficiencies • Initiate progressive LE strengthening program starting with DL and progressing to SL exercises as patient tolerates. o DL Bridges o Inclined planks o Seated exercise on physioball with UE and LE movements o Quadruped arm/leg lifts o Supine dead bug progressions o Body weight squats to 90 degrees, progress to goblet squat if pain free, T-band monster walks/side stepping o SL balance training
Cardiovascular Exercise	• If patient can perform 30 minutes of walking pain free progress to elliptical training starting with 5-10 minutes, progressing to 20-30 minutes as tolerates
Criteria for Advancement to Phase 3	• Noticeable increase in abdominal strength • Patient will be able to perform 20-30 minutes of elliptical training without an increase in symptoms • Patient can perform inclined planks and quadruped core routine without symptoms

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Phase 3	8-12 Weeks
Rehabilitation Goals	• Full pain free lumbar ROM into all planes • Initiating a walk/jogging program without increased symptoms • Progress to SL strengthening for lower extremities • Continue core stability exercises focusing on local and global strengthening

Suggested Therapeutic Exercise	• Double and single leg lower extremity strengthening/plyometrics if appropriate
	• Loaded and unsupported core strengthening on a physio ball
	• Initiate return to appropriate, approved lifting for upper and lower extremities emphasis on proper technique and low weight/high reps training
	  ○ Supine on physio ball UE flexion or horizontal abduction
	  ○ DL or SL bridge on physio ball
	  ○ Prone on physio ball opposite arm/leg lifts
	  ○ Prone planks, side planks, anti-rotation
	  ○ Walkouts on physio ball, push-ups with feet on physioball
	  ○ 3-way lunge matrix
	  ○ Step ups
	  ○ T-band side stepping/monster walks in squat position
	  ○ RDLs
	  ○ Prone passive lumbar extension without lingering symptoms

Cardiovascular Exercise	• Moderate intensity stationary biking or elliptical • Introduction to low-level, quick response plyometrics • Initiate walk/jog program if low-level, quick response plyos have been symptom free, progressing jog time as patient tolerated
Criteria for Advancement to Phase 4	• No increase in pain with lumbar range of motion and sport skills • Daily activities are pain free • Able to perform low level, quick response plyos without increased symptoms • Tolerates walk/jog program for up to 10 minutes without reproduction of symptoms

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Phase 4	12-16 Weeks
Rehabilitation Goals	• Return to athletic movements • Return to sport must be at least 12 weeks or more • Initiate sprinting and progress to cutting • Advance plyometric activity • Maintain flexibility in key muscle groups • Maintain strength in abdominals and hip muscles

Suggested Therapeutic Exercise	• Progressive strength program to include:
	  ○ Upper body vertical push and horizontal push
	  ○ Upper body vertical pull and horizontal pull
	  ○ Lower body push, double and single leg
	  ○ Lower body hip dominant pull and knee dominant pull
	  ○ Trunk strength and stability
	• In stance, Diagonal #1 and #2 trunk rotational patterns with medicine ball (wood chops)
	• Multi-planar training of total body movements
	• Gradual exposure to sport-specific activities and drills, making sure to concentrate on spine stability; this may include hitting, throwing, etc.

Exercise Progression	• Impact control exercises beginning 2 feet to 2 feet, progressing toward 1 foot to the other foot (bounding) then to single leg (hop) • Initiate return to running progression once patient shows good single leg control and tolerance to bounding • Manipulate intensity, amplitude, and velocity of impact forces to create a gradual progression • Moderate to high intensity intervals with stationary bike • Training of sport specific energy system through safe exercise selection
Criteria for Advancement to Phase 5	• Successful completion of comprehensive exercise program • Be able to demonstrate sport-specific skills and practice drills without pain; this depends on the sport and may include intervals of sprinting and pivoting, jumping and landing, back hyperextension and/or twisting

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Phase 5	Following Successful Completion of Phase 4
Independent Exercise Program and Re-Injury Prevention Program	• Cleared to participate in athletics • Maintenance exercises will be provided to enhance athletic performance and help prevent future injuries • Depending on the extent of the injury, recommendation may be made to avoid certain weightlifting moves such as Olympic lifts, back squats and deadlifts