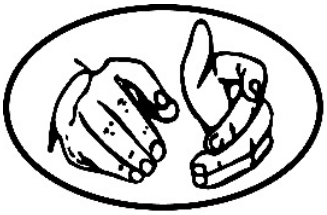

Orthopaedic Division
Groupe d'orthopédie

Canadian Physiotherapy Association

Case History Exam
Objective Booklet

Questions to be completed following the ***Objective*** Examination

Candidate Number:_____

Candidate Name:_____

Exam Date:_____

1. Provide your main hypothesis for this patient's clinical picture. Outline in detail your rationale and justification for this hypothesis with consideration of the evidence from both the subjective and objective examination. (10 marks)

P1 is an Achilles tendinopathy (degenerative, chronic) due to an eccentric load (sprinting in flat shoes) - supported by pain reproduced with eccentric loading/heel drop (objective) and running (subjective); TOP Achilles tendon; thickened middle third of tendon. He was predisposed because his gastroc/soleus have increased protective tone due to altered neurodynamics (see below)(+ve SLR/slump). The long term increased gastroc/soleus protective tone may have caused subtalar inversion/supination and capsular tightness causing reduced subtalar eversion/pronation, supported by PROM and decreased accessory movement. This restriction causes the Achilles tendon to be bowed (convex left = lengthened on the lateral side) and breakdown on this lateral side. Non-responsive to previous local Achilles treatment suggests not a local dysfunction.

P3 is an L5/S1 motion segment injury. Subjective evidence – initially (10 years ago) MOI prolonged flexion (3 hours at sailing); pain while coughing. Currently L5/S1 symptoms include tightness with prolonged sitting; increased morning stiffness after Frisbee practice; better with walking. Objective evidence - predisposed to a motion segment flexion injury as flexes forward primarily from the lumbar spine instead of the hips (poor movement pattern). Restricted into EROM extension (findings on AROM + PPIVMs and PAIVMs)

The L5/S1 motion segment injury lead to the development of altered neurodynamics of the L5 or S1 nerve root (+ve SLR and slump test)

Left L5/S1 irritability with end range stretch (soreness with R flexion quadrant PPIVM and PAIVM)

Increased L hamstring and gastroc/soleus tone to protect the neural tissues on the L

P2 –may be neuropathic, mechanical nociceptive from the hamstring, or a combination of both.

Subjective evidence - Frequent hamstring strains, pain with running across the street, responds well to frequent stretching

Objective evidence – SLR, Slump, hamstring length test

Overall – old Lspine injury→L5/S1motion segment injury → altered neurodynamics→ increased protective muscle tone hamstrings/gastrocs/soleus→muscular dysfunctions/breakdown

2. State your predictive outcome, <u>including timelines</u>, for this patient and <u>provide your supporting evidence</u>. (3 marks)

(your supporting evidence includes the positive and negative prognostic indicators)

P1 may completely resolve in 12 weeks once the altered neurodynamics is addressed and the appropriate tendinopathy exercise protocol is completed.

P2 will resolve (6-8 weeks) but may recur if exercises to maintain neural health and hamstring length are not maintained long term.

P3 will improve 75% in 6 weeks but given the chronicity of the injured tissue, it will always be a weak link unless the muscles are trained to keep the L5/S1 in neutral and avoid hyperflexion forces.

-ve prognostic indicators include on feet all day, associated long term lumbar and neurodynamic component; requires high load tolerance when returns to Ultimate Frisbee.

+ve prognostic indicators – age, educated, motivated, general health

3. At this point, with respect to this particular patient, are there any medical diagnostic tests that would be indicated (either now or later) or the need to refer to another health care professional? Give your rationale. (2 marks)

pedorthist for orthotics if subtalar mechanics can not be restored

massage therapist for chronic increased muscle tone in hamstrings, gastrocs, erector spinae

If it doesn't resolve, US or x-ray for diagnostics; for treatment shock wave, PRP

4. Complete the following chart. For this patient, give 2 of the most relevant physical impairments. Relate an activity limitation and participation restriction to each of the impairments. Then indicate what outcome measurement you would choose to monitor change and provide your rationale. (4 marks)

	Physical impairment	**Activity limitation**	**Participation restriction**	**Outcome measure (OM)**	**Rationale for OM**
1.	Pain in Achilles tendon with eccentric loading	Running	Frisbee	VISA-A # of heel drops LEFS	Reliable, validated by research, easy to administer VISA-A Very specific to Achilles LEFS – see guidelines
2.	+ve SLR decreased hamstring length	Running	Frisbee	SLR	Specific to the problem, easy to measure hip flexion with a goniometer

Many other examples available

5. Indicate your PRIMARY FUNCTIONAL GOAL as it relates to the Activity Limitations and Participation Restrictions. Select 4 of the most relevant problems related to the primary functional goal you have identified. For each problem listed, include your treatment goal and the testing criteria you would use to monitor change. (6 marks)

PRIMARY FUNCTIONAL GOAL: Return to running and playing Frisbee without pain in 10-12 weeks

(the 4 problems all need to be high priority problems but order not relevant i.e. #1 does not need to be a higher priority than #4 etc.)

PROBLEM #1 altered neurodynamics (+ve SLR)

Treatment goal: 75° *hip flexion with 0° knee extension and 0° talocrural dorsiflexion in 4 weeks*

Testing Criteria: SLR looking at ROM and decreased P2

PROBLEM #2 Achilles tendon pain

Treatment Goal: 3 x 20 heel drops in 6-8 weeks with minimal discomfort

Testing Criteria: # of painfree heel drops, score on VISA – A, LEFS

PROBLEM #3 L5/S1 motion segment dysfunction

Treatment goal: full ROM into Left extension quadrant in 3 – 4 weeks

Testing Criteria: combined movement testing, PPIVMs, PAIVMs

PROBLEM #4 decreased eversion/pronation ROM of Left subtalar joint

Treatment Goal: full ROM (equal to the right) in 2-4 weeks

Testing Criteria: squat test, standing body torque test, PROM, PAM

6. Outline in detail the management strategies you would use over the first two treatments under the following headings: manual therapy, exercise, education and other. Include your rationale. (10 marks)

Treatment Intervention	Rationale
Manual Therapy	
1. Slider mobilization of the L sciatic nerve in the side lying position (hip flexion + knee extension + plantar flexion f/b knee flexion + dorsiflexion 10 reps	The adverse neural tension may be the cause of the increased hamstring and gastroc tone.
2. Friction the middle third of the left Achilles tendon in a lengthened position (knee extension/ankle dorsiflexion) for 5 minutes.	The palpable thickening suggests excessive scar tissue has formed.
3. Left L5/S1 extension PPIVMs grade 4+; for 1 minute in right sidelying. grade 4+ inferoposterior glides of L5/S1 for 1 minute	This movement is lacking and is required to attain lumbar lordosis for comfortable sitting.
4. Grade 4+ medial glides of the posterior joint of the left subtalar joint in right sidelying, 2 minutes	To restore the eversion/pronation of the left subtalar joint and reduce the bowing and stress on the Achilles tendon.
Exercise	
1. Slump slider exercise – 10 reps , twice a day to start.	To maintain the mobility gained with the passive mobilization but not risk a flare up.
2. concentric heel raises 3 x 20 reps, once a day.	To make sure this level of exercise is tolerated before starting the eccentric protocol. Any appropriate tendinopathy exercise protocol with rationale is acceptable.
3. Inner unit activation exercises especially for multifidus but also Tr Ab and pelvic floor – prone lying co-contracting TrAB with pelvic floor while pulling PSISs up and in and holding for 10 secs, 10 reps.	To stop the hyperflexion forces on his lower lumbar spine when sitting
4. Standing calf stretch with the left leg laterally rotated to encourage pronation/eversion of the hindfoot. 3 reps held 20 secs each.	To maintain the eversion/pronation gained with the manual therapy

Education 1. How to get into neutral spine in sitting and standing. Do this position as often as possible throughout the day. 2. to flex more at the hips as opposed to the spine when bending forward. 3. to wear footwear with a slight heel	To reduce the flexion forces on the L5/S1 To reduce the flexion forces on the L5/S1 until the altered neurodynamics and eccentric load is better tolerated
Other 1. Acupuncture or dry needling to trigger points in the hamstrings or gastroc 2. EMS to the left multifidus muscle 3. 8mm heel lift initially.	To improve the resting muscle tone to regain its tone faster and/or overcome the body's arthrogenic inhibition to reduce the load on the Achilles tendon. Wear bilaterally to not cause a leg length discrepancy

Obviously many other options

7. Outline in detail your progression of subsequent treatments to discharge addressing all the identified problems and provide your rationale. Use the following headings: manual therapy, exercise, education and other.
(10 marks)

Treatment Intervention	Rationale
Manual Therapy 1. Passive sciatic nerve mobilizations can be progressed to include tensioners. As before but knee extension combined with ankle dorsiflexion – 10 reps 2. Grade 5 extension left L5/S1. Gap is another option 3. Myofascial release techniques for the hamstrings and gastrocs 4. Passive stretching of the hamstrings with the hip flexed to 90° and knee extension. Hold 20 seconds and repeat 3 times. 5. Grade 5 osteokinematic eversion flick of the calcaneus or grade 5 medial thrust on the posterior part of calcaneus	To restore full nerve mobility and reduce need for muscle guarding if full ROM not regained with mobilizations. Chronicity of increased muscle tone may warrant more aggressive myofascial techniques To restore length of hamstrings after chronic guarding which may lead to shortening to restore EROM eversion/pronation
Exercise 1. Progress Achilles exercise protocol e.g., from concentric to eccentric exercises. For example, Alfredson suggests 3 x 15 reps of heel lowering with the knee straight followed by 3 x 15 reps with the knee bent. Twice a day. The eccentric portion is unilateral (Left leg only) but the concentric loading uses both legs. To continue to progress the load and make the exercise more functional, the speed of the drop (acceleration phase) and stop (deceleration phase) should be increased. Progression is also achieved by dropping the heel lower into the	To restore the strength of the gastroc and Achilles tendon to the point where the tendon can transfer the forces required for running at Ultimate

dorsiflexion range. 2. Glut max strengthening exercises – strength grade 4+ to start so shouldn't start with just activation. McGill's airplanes would be good once the neurodynamics are normalized. 3. Waiter's bow 4. Hamstring and gastroc active stretching 5. Continue standing pronation/eversion exercise as in 4 in Q6 6. Once optimal nerve health, muscle length (ham and gastroc) and strength (glut max), and Achilles eccentric load are achieved, jogging can be started and progressed to sprinting and jumping/landing	To restore the strength and function of this muscle for running at Ultimate incorporates movement patterns (hip flexion > lumbar flexion and mobilizes the sciatic nerve) maintain hamstring and gastroc length to increase and maintain mobility gained with passive manipulation preparation for return to sport must involve gradual increases in load that are specific to Frisbee (running/jumping/landing)
Education Advice re running technique. For example, if he is a rearfoot striker encourage forefoot as opposed to hindfoot landing Get up from sitting as often as possible and walk around for 15 secs When sitting, try to maintain a neutral spine position and using a lumbar support might help. Decrease and eventually remove the heel lift as heel drop exercises become easier.	to reduce the injurious forces. Reduce the flexion F on L-spine and encourage frequent extension Reduce the flexion F on L-spine and encourage frequent extension Return to normal mechanics and use the gained length of gastroc / Achilles complex

Other **Laser**	**Clinical Practice Guidelines suggest it is effective. May encourage increased blood supply to the damaged area of the tendon that is known to have very poor blood supply**

8. **(Advanced exam and level courses 4 and 5) What 3 key terms would you enter into one search on PubMed to inquire about the evidence related to your assessment or management of this patient? Provide your rationale. (2 marks**)

   Achilles tendon – this is the tissue that is the most problematic and restricting return to activity

   Tendinopathy – this is the pathology afflicting the Achilles tendon

   Treatment – to determine which treatments are supported by research

8. (Level courses 2 and 3) State 1 of your treatment interventions and briefly describe the evidence to support its use.
(2 marks)

Treatment	Description of evidence
Eccentric exercise protocol	K. Khan BJSM 2009 Alfredson; Am J Sports Med, 1998 Heavy-Load Eccentric Calf Muscle Training For the Treatment of Chronic Achilles Tendinosis Achilles Tendinopathy Tool kit JOSPT issue on tendinopathy Nov 2015