



Runner's Questionnaire

1. How long have you been running?

2. Running Interest: (circle all that apply)

- *Fitness and fun
- *Recreational/social
- *Racing for improved performance
- *Racing for awards

3. Race experience: (circle one) None Novice Intermediate
Experienced

4. What is your normal weekly training schedule? (Distance/time. Include all training ie: gym)

Mon:

Tues:

Wed:

Thurs:

Fri:

Sat:

Sun:

5. Have you made any recent changes to your training schedule?

6. Are you training for a race/event?

7. What are your goals?



8. Do you have any current injuries? Please list below.

9. Do you have any history of injuries? Please list below.

10. What is your usual running shoe?

11. Have you recently changed your running shoes? Yes No

12. What surface do you run on?

13. Have you recently made changes to the surface you run on? Yes No

14. Is your pain present during your run, if so when does it start?

15. Rate your pain during your run out of 10. At best: At worst:

16. Does it get worse, better, or stay the same while running?

17. Does it continue to hurt after the run? If so, for how long?

18. Do you have pain on non-running days?

Further comments or details:



Running Assessment

General Principles

There is an art to knowing when to modify someone's running technique. Remember we do not 'correct' but 'modify'. Load does not disappear but gets redistributed elsewhere with modifications. Solutions for a problem may cause others.

Eg:

- Increasing running speed = reduced knee joint load but increased calf/ Achilles load (Schache et al. 2011, Peterson et al. 2014)
- Rearfoot strike = reduced calf/Achilles load but increased PFJ load
- Higher cadence = reduced PFJ load but increased muscle work.

Managing Load

- Distance, speed, surface, frequency all contribute to overall load.
- Be aware of UNDERloading. This can make someone less tolerant of load on their return. What CAN they do? (Blanch & Gabbett 2015)

Importance of Strength and Conditioning

- Helps prevent injury. (Lauersen et al. 2014)
- Stronger athletes better able to tolerate larger increases in weekly load, & higher absolute load. (Malone et al. 2018)
- Improves performance such as running times (Paavolainen et al. 1999)
- Improves running economy (Moore 2016).

Managing the Injured Runner

1)UNLOAD: Reduce load below tissue tolerance level.

2)REHAB: Improve ability of body to cope with load:

-Improve deficiencies

-Reduce sources of excess load (not remove, can you strike a balance?)

3)RELOAD: Gradually increase load to desired levels.

With running technique, there is no single normal. Each individual has a range of what their body can tolerate.

If you see something- is it relevant?

Running injury is multi-factorial- so too should be the management.



Common injuries and associated biomechanical abnormalities

Increased internal rotation/adduction in stance is associated with:

- Patellofemoral Pain (Dierks et al. 2008, Noehren et al. 2011, Noehren et al. 2012, Willy et al. 2012)
- Medial shin pain (Louden & Reiman 2012)
- Gluteal tendinopathy (Grimaldi et al. 2015, Mulligan et al. 2015)
- Is common in runners with poor proximal strength, and female runners (Barton et al. 2015, Dierks et al. 2008)

Injury	Common biomechanical abnormalities
Sesamoiditis	Pronated foot Abducted gait Limited 1 st Ray ROM Forefoot valgus/plantarflexed 1 st ray
Plantar fasciitis	Pronated foot/high arched foot Abducted gait Ankle equinus
Achilles tendinopathy	Pronated foot Ankle equinus
Peroneal tendinopathy	Pronated foot at toe off Excessive supination
Medial shin pain	Pronated foot Ankle equinus Varus alignment Abducted gait
Illiotalband friction syndrome	Lateral pelvic tilting Varus alignment

Patellar tendinopathy	Pronated foot Tight quadriceps, hamstrings, calves Anterior pelvic tilt Varus alignment
Patellofemoral pain	Pronated foot Anterior pelvic tilt Varus alignment Abducted gait
Hamstring strain	Anterior pelvic tilt Ankle equinus
Metatarsal stress fractures	Pronated foot Supinated foot
Navicular stress fractures	Pronated foot Varus alignment Ankle equinus
Fibular stress fractures	Supinated foot Pronated foot Varus alignment

Bruckner & Khan 2007



Cadence as possible variable

Increases of 10% = significant biomechanical changes including:

- Reduced vertical displacement of centre of mass.
- Less hip adduction and internal rotation (inward drop) during stance.
- Less knee and PFJ load.
- Reduced impact forces.
- More flexed knee at impact, more stable at stance.
- Reduced stride length, less overstride.
- Less dorsiflexion of ankle at impact, reduced braking forces.
- Greater glute activity in preparation for impact.

(Schubert et al. 2014, Willson et al. 2014, Heiderscheit et al. 2011, Wellenkotter et al. 2014, Hobarra et al. 2012)



Postural Assessment

Iliac crest height	Normal	Right High	Left High
PSIS height	Normal	Right High	Left High
Leg length difference	Normal	Right (cm)	Left (cm)
Head and neck posture	Normal	Poked	Retracted
Scoliosis	Yes	No	Comment
Scapula Position			
Right:	High	Low	Normal
Left:	High	Low	Normal
Thoracic kyphosis	Normal	Hyper	Hypo
Lumbar lordosis	Normal	Hyper	Hypo
Pelvic tilt	Anterior	Posterior	Neutral
Foot posture:			
Left:	Normal	Pronation	Supination
Right:	Normal	Pronation	Supination
Arches: (high, normal, flat)	Left	Right	Comment
First ray ROM (deg) (dorsiflexion/windlass)	Left	Right	Comment



Assess running on treadmill

Lumbar position (hyper lordosis?)	Comment:
Pelvis position (anterior/posterior/neutral)	Comment:
Lateral pelvic tilting (excessive?)	Comment:
Hip rotation? (excessive internal/external rotation?)	Comment:
Hip angle (excessive abduction/adduction)	Comment:
Knee position (valgus/varus? How much flexion during stance?)	Comment:
Pronation/supination (normal or abnormal amounts?)	Comment:
Footstrike (heel, mid-foot, toe?)	Comment:
Toe off (appropriate windlass?)	Comment:



Functional Movement Screen (FMS)

Deep Squat

3	2 (Performed with heels on 2x6 board)	1 (Performed with heels on 2x6 board)
<ul style="list-style-type: none"> -Upper torso is parallel with tibia or toward vertical. -Femur below horizontal. -Knees are aligned over feet. -Dowel does not extend past feet 	<ul style="list-style-type: none"> -Upper torso is parallel with tibia or toward vertical. -Femur is below horizontal. -Knees are aligned over feet. Dowel does not extend past feet. 	<ul style="list-style-type: none"> -Tibia and upper torso are not parallel (remain upright). -Femur is not below horizontal. -Knees are not aligned over feet. -Lumbar flexion is noted.
Score:		
Comments:		

Hurdle Step

3	2	1
<ul style="list-style-type: none"> -Hips, knees and ankles remain aligned in the sagittal plane. -Minimal to no movement is noted in the lumbar spine. -Dowel and Hurdle remain parallel. -Foot remains dorsiflexed. 	<ul style="list-style-type: none"> -Alignment is lost between hips, knees and ankles. -Movement is noted in lumbar spine. -Dowel and hurdle do not remain parallel. 	<ul style="list-style-type: none"> -Contact between foot and hurdle. -Loss of balance is noted.
Score:		
Comments:		



In-Line Lunge

3	2	1
-Dowel contacts remain with lumbar spine extension (dowel touches head, thoracic spine and sacrum). -No torso movement is noted. -Dowel and feet remain in sagittal plane. -Knee touches board behind heel of front foot.	-Dowel contacts do not remain with lumbar spine extension. -Movement is noted in torso. -Dowel and feet do not remain in sagittal plane. -Knee does not touch behind heel of front foot.	-Loss of balance is noted -Inability to place hands in proper position.
Score:		
Comments:		

Shoulder Mobility

3	2	1
-Fists are within one hand length.	-Fists are within one and a half hand lengths.	-Fists are not within one and a half hand lengths.
Clearing exam – Hand on opposite shoulder with 90deg shoulder flexion. Pain in shoulder? <div style="display: flex; justify-content: space-around; width: 100%;"> Yes No </div> (If answer is yes, score instant 0).		
Score:		
Comments:		



Active Straight Leg Raise

3	2	1
<p>-Ankle/dowel resides between mid-thigh and ASIS.</p> <p>-Opposite hip remains neutral (does not externally rotate), toes remain pointing up.</p> <p>-Knees remain in contact with board.</p>	<p>-Ankle/dowel resides between mid-thigh and mid-patella.</p>	<p>-Ankle/dowel resides below mid patella.</p>
Score:		
Comments:		

Push up

3	2	1
<p>-Males perform one rep. with thumbs aligned with forehead.</p> <p>-Females perform one rep. with thumbs aligned with chin.</p> <p>-Body is lifted as one unit (no lag in lumbar spine).</p> <p>-Feet remain dorsiflexed.</p>	<p>-Males perform one rep. with thumbs aligned with chin.</p> <p>-Females perform one rep. with thumbs aligned with clavicle.</p> <p>-Body is lifted as one unit.</p> <p>-Feet remain dorsiflexed.</p>	<p>-Males are unable to perform one rep. with hands aligned with chin.</p> <p>-Females are unable to perform one rep. with thumb aligned with clavicle.</p>
<p>Clearing exam- Cobra. Pain in lower back?</p> <p style="text-align: center;">Yes No</p> <p>(If answer is yes, score instant 0).</p>		
Score:		
Comments:		



Rotary Stability

3	2	1
-Performs one correct unilateral repetition while keeping spine parallel to board. -Knee and elbow touch in line over the board.	-Performs one correct diagonal repetition while keeping spine parallel to board. -Knee and elbow touch in line over the board. -Minimal trunk flexion.	-Inability to perform diagonal repetition.
Clearing exam- Child's pose. Pain in hips or lower back? <div style="display: flex; justify-content: space-around;"> Yes No </div> (If answer is yes, score instant 0).		
Score:		
Comments:		

Knee to wall

3	2	1
-Toes more than 10cm from the wall. Good ankle mobility.	-Toes 5-10cm from the wall. Acceptable ankle mobility.	-Toes less than 5cm from wall. Poor ankle mobility.
Score:		
Comments:		



Sit and Reach

3	2	1
-Females: +11cm past toes or more. -Males +6cm past toes or more.	-Females 0cm (toes) to +10cm past toes. -Males 0cm (toes) to +5cm past toes.	-Females: -7cm (can't reach toes) to 0cm (toes). -Males: -8cm (can't reach toes) to 0cm (toes).
Score: (If females -8cm or more and males -9cm or more score 0)		
Comments:		

Y- Balance

3	2	1
-Anterior: 71-80cm -Posteromedial: 81-90cm -Posterolateral: 86-95cm	-Anterior: 61-70cm -Posteromedial: 71-80cm -Posterolateral: 76-85cm	-Anterior: 50-60cm -Posteromedial: 60-70cm -Posterolateral: 65-75cm
Score: (If scores sit across multiple levels, average the score. Can use .5 measures.) (Anterior reach asymmetry of >4cm predicts individuals for higher risk of injury.)		
Comments:		



Calf Raise test- metronome (x30 at 60 BPM)

3	2	1
-Able to maintain full height of single leg calf raise at 60BPM for 30 reps.	-Able to maintain full height of single leg calf raise at 60BPM for 20 reps.	-Loses full height of calf raise and/or 60BPM tempo before 20 reps.
Score:		
Comments:		

Total score:

Scores of less than or = to 26 on the FMS put a runner at greater risk of sustaining an injury. Perfect score is 33.

Findings and recommendations: (Pathways plan sessions 1-3)



[Functional Movement Screen | FMS | System. - YouTube](#)

[Functional Movement Screen - Bing video](#)