

Keeping you on the road and out of the doctor's office: Part 2

Presented by
T.J. Stites, PT, MSHA



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Introductions

T.J. Stites, PT, MSHA

- Clinic Manager for Select Physical Therapy in Christiansburg
- Master of Physical Therapy, Old Dominion University, 1999.
- Master of Health Administration, MCV/VCU, 2006.
- Competitive age group triathlete

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Goals

- Educate active individuals regarding home treatment options for common running injuries
- Maximize workout sessions and sporting longevity
- Minimize time away from training and competition due to injury

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Goals: continued

- This seminar will not provide a comprehensive review of lower extremity biomechanics or medical management of the injuries we discuss.

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Today's topic

Managing common running injuries associated with the back, hip, and knee



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The Kinetic Chain

- The interdependent cascade of neuromuscular activity necessary to create movement
- The complexity of the kinetic chain makes separating knee, hip, and back problems into simple packages almost impossible.



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Rehab principles



- In order to manage these dynamic injuries at home you have to understand some basic biomechanical and physiologic principles

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Rehab principle #1: Hot spots



- Pain that starts while running suggests that something along the kinetic chain is moving too much or too little resulting in a hot spot or pain

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Implications for rehab

- If you can identify what area is moving improperly you can restore the motion
- Comparing one side to the other can help identify the problem
- For example, you could have differences in your hamstring tightness that could lead to low back pain



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Rehab principle #2: Post workout pain



- Pain that persists for greater than one hour or doesn't show up for hours after running suggests changes in the body's natural chemistry
- Delayed muscle soreness, inflammation, and swelling are examples of changes body chemistry

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Implications for rehab

- The body has a natural pump in the muscles for moving fluids through the injured tissues
- An exercise with high reps, low weight, no pain, and repeated performance throughout the day maximizes the body's natural muscle pump



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Rehab principle #3: Eccentrics



- The power of the eccentric muscle contraction can create a longer, stronger, and healthier muscle
- Eccentric muscle contraction occurs when the muscle is lengthening while it is contracting.

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Injury principle #3 continued

- The eccentric contraction places maximal tension on the muscle, causes the muscle tissues to align properly, and increases strength of the muscle through the full range of motion creating a longer, stronger, and healthier muscle.
- For example, an eccentric muscle contraction happens in your hamstrings and in the muscles of your low back as you reach down to touch your toes.

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Implications for rehab

- For injuries that require increasing a range of motion an eccentric exercise will maximize mechanical properties for accomplishing this goal
- Eccentric exercises for increasing tissue length should:
 - Not have pain at any point during the exercise
 - Move only through the available range of motion
 - Easily perform 30 repetitions
 - Light resistance

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CAUTION

**ECCENTRIC CONTRACTIONS
PLACE MAXIMAL TENSION ON
THE MUSCLE AND CAN CAUSE
INCREASED PAIN IF YOU DO NOT
FOLLOW THE SUGGESTED
GUIDELINES**

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Rehab principle #4: Stability

- Proximal stability equals distal mobility
 - In order to create movement the object in motion must have something to push against
 - Creating motion at your knee requires that you create stability at your hip



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Rehab principle #4: Continued



- If inadequate stability is created then an abnormal movement pattern results
- The abnormal movement pattern creates muscle tension imbalances, changes in force demands, and abnormal joint pressures

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Implications for recovery

- If you have a particular motion that is painful it is essential that you develop adequate stabilization strength further up and down the kinetic chain
- Has anyone ever told you that your mechanics are breaking down?



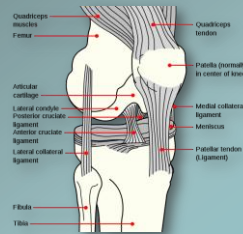
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The common running injuries

- Meniscus injury
- Patellar tendonitis
- Iliotibial band (ITB) syndrome
- Greater trochanteric bursitis
- Sacroiliac (SI) pain
- Lumbar spine pain

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Anatomy of the knee

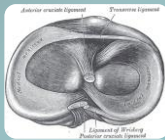


- Primary bones- femur, tibia, and patella
- Primary muscles- quadriceps, hamstrings, and calf/gastroc
- Ligaments- Anterior cruciate (ACL), medial collateral (MCL), lateral collateral (LCL), posterior cruciate (PCL)
- Meniscus

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Meniscus Injuries

- Function- Deepen the knee joint, assist in shock absorption, facilitate joint mobility
- Self diagnosis- catching, locking, or a painful clicking inside the knee



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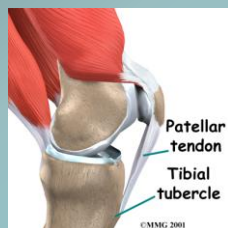
Meniscus: continued

- Self treatment- There is no magic exercise. The body can reabsorb parts of a torn meniscus over a period of years or the orthopedic surgeon can “clean out” your knee.

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Patellar tendonitis

- Pain across the front of the knee associated with chronic irritation and inflammation of patellar tendon
- Self diagnosis- pain across the front of your knee over the patellar tendon and increased pain as your foot hits the ground



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Patellar tendonitis

- Function of the patellar tendon
 - transfers the force of the quad muscle across the knee to the tibia to straighten your leg
 - The quadriceps helps with propulsion by extending the knee as you push off and with shock absorption by eccentrically controlling how knee bends as your foot hits the ground.



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Patellar tendonitis: Self treatment

- Maximize shock absorbing capabilities
 - Proper shoes for your foot type
 - Replace shoes that are worn out
 - Watch your weight



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Patellar tendonitis: Self treatment continued

- Eccentric quad exercise
 - No pain at any point during the exercise
 - Move only through the available range of motion
 - 30 repetition and 3 sets without a change in form and a 30 second break between sets
 - Light resistance



1. Raise the bar up with both legs
 2. Lower the weight down with the injured leg only
- * If your pain is bad enough you can perform this with no weight and raise one leg up with the other one

Patellar tendonitis: Self treatment continued

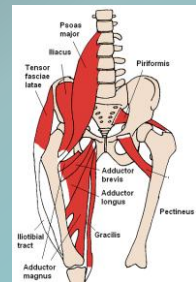
- Patellar taping has demonstrated good outcomes for managing patellar pain
- Go to <http://www.youtube.com/watch?v=sMJBHBiZjCs> for a demonstration of the technique



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ITB syndrome

- Anatomy- ITB is a tendonous band extending from the Tensor Fasciae Lata and glut medius down the outside of the thigh and knee to attach to the tibia, fibula, and patella.
- Essential function- eccentrically controlling hip adduction at initial contact of the running gait cycle (shock absorption).



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ITB syndrome: Self diagnosis



- Self diagnosis
 - Pain to the touch on the outside of your knee
 - Pain on the outside of your knee as your foot hits the ground while running
 - Pain is typically greatest with the knee slightly bent to 20-30 degrees.

Photo credit: Chen Jianli/Xinhua

ITB Syndrome: Self treatment

- Hip abduction and external rotation strengthening to improve eccentric strength
- Core strengthening to improve pelvis stability for appropriate ITB function
- Avoid over strides and down hill running
- Proper shoes for your foot type because both extremes of foot types can cause bio-mechanical changes that can lead to ITBS
- Ice

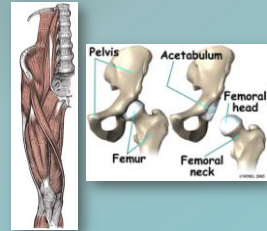
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ITB Syndrome: Self treatment



Greater trochanteric bursitis

- Defined- Chronic pain and inflammation of the bursa found under the muscle on the outside of the hip and over the top of the femur
- Relevant anatomy- The greater trochanter of the femur, trochanteric bursa, and the TFL/ITB



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Greater trochanteric bursitis

- Self diagnosis- focal pain over the large bone on the outside of your hip
- Self treatment- core strengthening, hip rotation strengthening, hip abduction strengthening, quadriceps strengthening on both sides
 - GTB typically occurs in conjunction with low back pain and knee pain

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Low back and Sacroiliac pain

The complexity of this region is such that even the experts find these waters murky



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Sacroiliac overview

- The joint is created by the ilium and the sacrum
- Functions similar to a key stone for transferring kinetic energy between the upper and lower body
- Moves in a locking and unlocking fashion



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Lumbar spine overview

- Each vertebrae has three mobile attachments to the vertebrae above it (one disc and two facet joints)
- Functions to create tri-planer motion, support the upper body, and protect the spinal cord



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Dynamic Stability

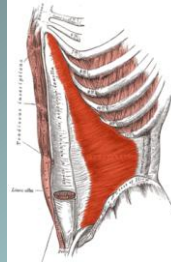
- The human torso is a dynamic stability platform that allows us to perform exceptional physical feats
- Because of its complex nature an evaluation from a knowledgeable physical therapist is necessary to design a specific home exercise program for low back or SI pain



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General low back pain treatment exercises

- Improve your core stability and strength
 - Include the transverse abdominis (TA) in your core exercises by pulling your belly button in
 - The TA is the base layer of the abdominal muscles and joins fibrous connective tissues that wrap all the way around your back



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General low back pain treatment exercises

- Improve your lower extremity flexibility
 - The low back and SI are particularly sensitive to flexibility restriction along the kinetic chain
 - Make sure to stretch after you warm up and at the end of your run



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Final notes

- It is UNREASONABLE to expect your body to properly recover without proper rest, recovery time, and diet
- Consider your terrain with any chronic irritation or pain
 - Do you run the same loop in the same direction all the time?
 - Do you need a break from the asphalt?

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On closer review



- If you need someone to take a closer look at your condition please give me a call at 381-4166 or send me an email at tstites@selectmedicalcorp.com
- If we need to bring you into the clinic all we need is a prescription from a doctor, nurse practitioner, or physician's assistant and we can help you through that process

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Acknowledgements

- Select Physical Therapy



- Runabout Sports



- The Stites family



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Questions?

T.J. Stites, PT, MSHA

p. 540-381-4166

tsites@selectmedicalcorp.com

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