

clinical conduit

by Ed Mulligan, PT, DPT, OCS, SCS, ATC

During the past year my colleagues and I have focused on the evaluation and management of lateral hip pain. This has culminated in presentations at the Combined Sections and TPTA annual meetings. Over the next 4 issues we will reprint our findings on Greater Trochanter Pain Syndrome as to be published in *Physical Therapy in Sport* in 2015.

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2015 CALENDAR



Upcoming Courses for 2015

Advanced Manual Therapy Series
Clinical Orthopedic Rehab Education

2015 tentative dates

- Part 1: Cervicothoracic/TMD - Apr 11-12
- Part 2: The Upper Quarter - May 30-31
- Part 3: Lumbopelvic Spine - Jul 11-12
- Part 4: Hip/Knee - Aug 15-16
- Part 5: The Lower Quarter - Oct 3-4 (Leg, Ankle, and Foot)

A detailed description of the course content and learning objectives is available at our web site — www.continuing-ed.cc

Single course attendance is allowed on a space-available basis

Greater Trochanteric Pain Syndrome (GTPS): Part 2 History and Differential Diagnosis



Differential diagnosis is difficult given the geographic proximity of many potential tissues that could be involved in the symptomatic complaint of GTPS. A thorough patient interview and detailed physical exam can help tease out the specific source of the patient's chief complaint. Generally, anterior hip and groin pain comes from intra-articular disorders while lateral hip pain is more likely from extra-articular disorders that are more insidious in their onset (Grumet et al., 2010). For GTPS, solicitation regarding the primary complaint typically yields a concern of intermittent, yet persistent lateral hip pain that is often exacerbated by lying on the affected side, sitting with the legs crossed, prolonged weight-bearing in unilateral stance, and a reduced tolerance for physical exercise (Kimpel, Garner, Magone, ...

May, & Lawless, 2014). Symptoms may also extend laterally down the thigh or posteriorly into the gluteal region in a non-dermatomal pattern, particularly in the more acute phase of the injury.

Again analogous to the onset of shoulder pain in the adult, the mechanisms of injury is attributed to a variety of sources. Traumatic impact to the soft tissues or acute tendon tears are possible but insidious onset secondary to intolerance to eccentric tensile strain and cumulative microtrauma is more common. Tendon degeneration, poor postural habits, or faulty mechanics from lower extremity malalignment may all contribute to this more gradual commencement of the problem.

Because of the propensity for referred pain and frequent concurrent presence of intervertebral disc pathology, facet joint degeneration, or sacroiliac joint dysfunction the examiner should perform a neurological and screening examination for the lumbosacral spine. Less likely causes of referred lateral hip pain from non-musculoskeletal origin could

include endometriosis, prostate disease, inflammatory bowel disease, ovarian cysts, or inguinal hernias. Meralgia paresthetica is a nerve entrapment that results in pain, paresthesias, and sensory loss within the distribution of the lateral femoral cutaneous nerve (anterolateral hip/thigh). Reproduction of symptoms with pelvic compression, neurodynamic assessment of adverse tension, or a positive Tinel sign may rule in this neuropathy as the source of lateral hip pain (Cheatham, Kolber, & Salamh, 2013).

Intra-articular hip pain may be ruled out by symptom reproduction with gentle passive hip rotation (log rolling) or comparable signs or symptoms during end-range sagittal plane motions of the hip. The log roll moves only the femoral head in relation to the acetabulum and the surrounding capsule and has been described as the most specific test to rule in intra-articular lesions of the hip as no significant excursion or stress occurs on the myotendinous or nerve structures (Byrd, 2007).

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New Diagnostic Criteria for Chronic Exertional Compartment Syndrome



Chronic Exertional Compartment Syndrome (CECS) is a form of exercise-induced leg pain that can be a challenge for our patients that enjoy walking and/or running. The patient complains of lower leg pain and tightness that occurs at a constant interval after the initiation of physical activity. The symptoms of CECS usually subside quickly following the cessation of the offending activity. Usually there is bilateral involvement with mild edema, tenderness, and occasional paraesthesias generated from the nerves in the affected compartment. While there is some promising evidence regarding alterations in gait mechanics as a possible solution this condition is still searching for a consistently effective conservative intervention. Consequently, surgical fascial release remains a viable option. In order to confirm the presence of CECS we've traditionally used the "Pedowitz" protocol to determine abnormal elevations in resting vs. post-

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GTPS continued ...



The references provided in this article are available as full citations in a bibliography available on-line at our web site - www.continuing-ed.cc

I also would like to acknowledge my colleagues and co-authors for their contributions to the manuscript. Thank you to:

Dr. Emily Middleton, PT, DPT, OCS, CSC
Dr. Meredith Brunette, PT, DPT, OCS

Lateral hip pain seems to be more sensitive to frontal and transverse plane motion assessment. These active and passive joint motions, particularly when combined in multiple cardinal planes may help exclude intra-articular disorders as a source of lateral hip pain (i.e. flexion, adduction, and internal rotation stress indicating femoroacetabular impingement or simultaneous compression and circumduction reproducing osteoarthritic symptoms).

The consistent hallmark of the GTP syndrome is increased tenderness to palpation. Knowledge of the anatomical structures in the area may assist in identifying the precise location of the offending tissue generating the symptoms. The gluteus medius tendon inserts via two sites on the lateral facet of the greater trochanter. The posterior fibers of the medius insert on the more superoposterior portion of the facet while the central and anterior portion terminate more inferiorly on the lateral facet of the trochanter. The tendon of the gluteus minimus inserts into the hip capsule and the more anteroinferior facet of the greater trochanter deep to the gluteus medius (Robertson, Gardner, Barker, Boraiah, Lorch, & Kelly, 2008). Several bursae in the immediate area serve to cushion the lateral hip muscles and reduce frictional irritation. They lie deep to the tendons and are inconsistent in location and unpredictable in their pain referral patterns. The most frequently cited bursae that may be involved are the subgluteus maximus and subgluteus medius bursa. The subgluteus maximus (trochanteric) bursa is the largest and is centered over the greater trochanter between the gluteus maximus and medius tendons. The subgluteus medius bursa resides at the superoposterior tip of the greater trochanter and prevents friction between the gluteus medius and trochanter as well as the interface of the gluteus medius and minimus (Woodley, Mercer & Nicholson, 2008). Unfortunately, the intertester error in palpating the greater trochanter bony landmark is greater than 15 mm which is significantly larger than the dimensions of the normal bursae or footprint of the tendon insertions (Moriguchi, Carnaz, Silva, Salazar, Carregaro, Sato Tde O, & Coury, 2009; Woodley et al., 2008). This finding would indicate that diagnostic specificity based on palpatory tenderness is unlikely in the differential clinical examination. However, the agreement to the presence of tenderness to palpation (without reference to the specific tissue of involvement) has been reported to be good with Kappa values of 0.66 (CI95 0.48-0.84) (Martin & Sekiya, 2008).

One of the more common manifestations of GTPS in the younger, active patient is coxa saltans. The awareness of the snapping symptom is magnified by the repetitious nature of hip sagittal plane motions inherent to ambulatory exercise. The hallmark of this diagnosis is an audible and sometimes painful snapping of the hip when the anterior fibers of the gluteus maximus and ITB band migrate from posterior to anterior over the greater trochanter as the hip moves from an extended to a flexed position. Patients can often reproduce this symptom or the examiner can place them in a side lying position with the ITB on stretch and evaluating if the snapping complaint is present as the patient actively flexes and extends the hip. To confirm the suspicion the examiner can manually compress the band just proximal to the trochanter or externally rotate the hip to see if that alleviates the "snap" (Allen & Cope, 1995; Larsen & Johansen, 1986; Strauss et al, 2010).

In the next issue, we will continue the discussion of physical examination focusing on a cluster of sign/symptoms of GTPS along with special tests and an algorithm to differentiate orthopedic hip conditions.

Where do you stand on the debate of early motion vs. late motion following rotator cuff tears?



This was a hot topic at the recent CSM meeting with two well-known therapists, Kevin Wilk and George Davies, participating in a Socratic Debate on early passive mobility vs. delayed immobilization. The pendulum continues to undulate back and forth on this issue. I think I've written before that while I use to be quite aggressive with motion acquisition and an early motion advocate my paradigm has slowly shifted to a more customized approach based

on the unique circumstance inherent to each patient we treat. Things like size of the tear, tissue quality, method of fixation, medical co-morbidities, etc. We constantly have to balance the need for regaining motion with avoiding unnecessary stress on the healing tissue. I was part of team that published a systematic review that could not identify pain or functional differences between healed and unhealed rotator cuff repairs at one year follow-up but common sense would suggest that the goal of the surgical intervention is to maximize the chance for healing.

My take away from the literature is the following. It is a fallacy to think that early range of motion is necessary to avoid post-op stiffness or that early intervention enhances outcomes. My current recommendation (subject to change) is to individualize care but error on the side of longer immobilization. At the very least, you need to be acutely aware of the EMG activity levels of each intervention you prescribe.

Questions you would like addressed in a future issue can be sent to mulliganpt@tx.rr.com

Compartment Pressures continued -



exercise compartmental pressures. The diagnostic criteria for a positive test are based on a non-uniformed exercise protocol with the detection of elevated pre and post-exercise pressures that do not resolve within a given amount of time. These criteria are outlined in the graphic below but have come under scrutiny for their validity.

Diagnostic Criteria for the Presence of Exertional Compartment Syndrome (One of the Following Three Criteria Must Be Present)

1. Preexercise pressure >15mm Hg
2. Postexercise pressure >30mm Hg at 1 minute following cessation of activity
3. Postexercise pressure >20mm Hg at 5 minutes following cessation of activity

A recent study was published that proposes an alternative method for detection. This protocol relies on a dynamic methodology matching intercompartmental changes with symptom presentation during a standardized challenge on a treadmill.

This protocol is based on indwelling catheters to measure real-time intramuscular compartment pressure. Only the anterior compartment changes were monitored in this study and this may be considered a limitation to the methodology as many patients have lateral compartment complaints (and periodically deep or superficial posterior compartment issues). The standardized protocol was a resting assessment of pressure followed by reassessment after standing for 30 seconds. The exercise protocol commenced with treadmill walking and the subject wearing a 7 lb. backpack and walking at 4 mph for 5 minutes. The next 5 minutes the same walking speed was maintained while elevating the treadmill to 5°. If tolerated, the protocol was continued another 5 minutes without the backpack but with the speed increased to 6 mph (jogging). Subjects could stop at any time if their pain level reached 10/10.

The results were quite interesting. Both control (non-symptomatic) and CECS subjects had similar resting baseline levels (around 15 mmHg). After 30 seconds of standing the two groups began to differ with the CECS group pressure now up to 35 as compared to 24 in the control group ($p = 0.006$). The pressure was significantly higher in all three phases of the exercise protocol for the CECS group with the second phase being the most diagnostically accurate in distinguishing the two groups. Based on a receiver operating curve analysis the authors found that pressures over 105 mmHg in the second stage were 95% specific and 63% sensitive rendering a positive likelihood ratio of 12.5 and a negative likelihood ratio of 0.39. The authors contend this protocol renders superior validity to the established criteria we use however; they acknowledge that further study with a larger cohort to narrow the confidence intervals is indicated.

GROC – Global Rating of Change: Different from Functional Outcome Measures

Patient reported outcomes have become a critical element of patient care. One of the more versatile tools used extensively in the past decade for research projects is the Global Rating of Change form (GROC). It has an excellent track record for its reliability and face validity. For those not familiar with the tool it is a 15-point scale that asks the patient to rate their perception of change. The scale continuum ranges for a -7 indicating “a very great deal worse” to “0” indicating “about the same” to +7 which represents “a very great deal better”. This Likert-like transition scale can be used to “quantify” the change from one period of time to another without having to necessarily know the status of the variable in question at baseline. We use this tool quite often in our practice to assess the patient’s “satisfaction” with the change they perceive in their condition and as an indicator of their overall satisfaction with the care that has been rendered.

Global Rating of Change Scale	
Please rate your overall satisfaction with your current status from the time that you began treatment until now (check only one):	
<input type="checkbox"/> A very great deal worse	<input type="checkbox"/> A very great deal better
<input type="checkbox"/> A great deal worse	<input type="checkbox"/> A great deal better
<input type="checkbox"/> Quite a bit worse	<input type="checkbox"/> Quite a bit better
<input type="checkbox"/> Moderately worse	<input type="checkbox"/> Moderately better
<input type="checkbox"/> Somewhat worse	<input type="checkbox"/> Somewhat better
<input type="checkbox"/> A little bit worse	<input type="checkbox"/> A little bit better
<input type="checkbox"/> A tiny bit worse (almost the same)	<input type="checkbox"/> A tiny bit better (almost the same)

A new study just published in *J Orthop Sports Phys Ther* evaluated how self-report changes in function relate to or influence global ratings of change. The authors hypothesized that the relationship between the two would diminish as time passes. In other words, do these two tools only correlate over shorter periods of time (like 30 days)?

The study looked at over 7000 episodes of lower extremity care and compared the patient’s functional (FOTO value) and GROC scores. The study showed very modest correlation and coefficients of determination. This became particularly true as the recall period lengthened. In fact, the GROC score was biased toward the discharge (but not initial) FOTO functional score.

The authors concluded that the GROC does not adequately or consistently correlate with changes in functional status and should not be used in lieu of a validated outcome measurement tool. It is important to emphasize that this tool is not discouraged but should be used as an adjunctive or complimentary measure of patient’s progress.

References

Roscoe D, Roberts AJ, Hulse D. Intramuscular compartment pressure measurement in chronic exertional compartment syndrome: new and improved diagnostic criteria. *Am J Sports Med.* 2015 43(2):392-8.

Pedowitz RA, et al. Modified criteria for the objective diagnosis of chronic compartment syndrome of the leg. *Am J Sports Med.* 1990 Jan-Feb;18(1):35-40.



TPTA Legislative Day

As many of you know, the TPTA sponsored a legislative day on February 17th to demonstrate to our state representatives our commitment to achieving unfettered direct access to physical therapy for all Texas citizens. I know there is opposition to this agenda but there is simply no evidence that this would do anything but benefit both our profession and the patients we serve.

It is completely legitimate to question the efficacy and safety of this type of legislative change. If we cannot show that this type of patient access does not negatively affect outcomes or increase costs the conversation should stop right there. To address these concerns a systematic review was published in the *PT Journal* last year that found evidence to support:

- Same (or better) outcomes
- No adverse incidents
- Fewer PT visits
- Less adjunctive services (imaging and medications)
- Less overall cost to the health system

... and all of this was shown in studies evaluating the care of non-specialist or non-doctorally trained PTs. I think we’ve shown that this type of policy shift would decrease waiting time, enhance rural access, improve convenience, and reduce cost without altering outcomes.

IMO, PTs should be a part of the healthcare solution in reducing the economic burden of musculoskeletal care. Granted this was a systematic review based on level III/IV evidence resulting in Grade B and C recommendations but the opposition’s perspective is nothing more than personal opinion with absolutely no evidence in the literature to support their position. I hope you’ll join me in fighting for this change.

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Clinical Orthopedic Residency Education Series: An Advanced Manual Therapy Education Track



These courses are designed to provide a comprehensive overview of orthopedic physical therapy (from head to toe) based on the APTA's definition of advanced specialty practice. We've had a number of clinicians from the community take the series over the past 5 years and received excellent feedback on the content and format. In fact, we've had over 30 clinicians from our first four classes pass the orthopedic specialty (OCS) exam. We anticipate another 10-12 from the 2014 class to be sitting for the exam in March. If you'd like a mechanism by which to prepare for the exam or would simply benefit from advanced coursework with expert colleagues, we hope you'll consider joining us this year. These courses are taught by the orthopedic faculty at UT Southwestern. The 2015 series will begin again in April. The course content includes examination and intervention strategies for the cervicothoracic spine, upper quadrant (shoulder, elbow, hand), lumbopelvic spine, and lower quarter (hip, knee, ankle/foot). All of the material is based on current evidence with over 50% of the on-site course work devoted to lab demonstration and practice. For more information on the 2015 advanced clinical orthopedic education series please visit our web site at www.continuing-ed.cc/residencycourse.htm. Let us know if you'd like us to send you a brochure. The courses are designed as a series but attendance at singular courses is allowed on a space available basis.



Scapular Stabilization During Stretching

A basic principle of stretching is to separate the origin from its insertion. To facilitate this tenet we often teach our patients to stabilize one segment while moving the other in a controlled manner to the endpoint at which a comfortable tension is perceived in the appropriate anatomical location. This principle was put to the test in a recent study in the *Archives of Physical Medicine and Rehabilitation Journal*. In this study, the authors compared the gains in both horizontal adduction and internal rotation range of motion following a cross body stretching maneuver with either the scapular free to move or manually stabilized by the therapist. I'm not exactly sure why the authors chose internal rotation mobility as a dependent variable other than it also generally



considered to be limited in the presence of posterior shoulder tightness. Probably the more appropriate direct assessment of the value of scapular stabilization during cross-body stretching was made by reporting the results of the difference in mobility as measured in the side lying position with the help of inclinometer.

To no one's surprise, the range of motion improvement was significantly better in the group that had scapular stabilization applied during the stretch. With scapular stabilization applied the subjects had an immediate improvement of about 20° as compared to the non-stabilized group which had a minimal change ($p < 0.001$). For internal rotation there was about a 10° immediate improvement in internal rotation for the stabilized group as compared to 4° for the "non-stabilized" group.

Although not assessed as a part of this study I've also found that the scapular stabilization commonly reduces the discomfort of the stretch in the subacromial area. In fact, if you think about it, the stretch position mimics some of the provocative positions we use for symptom reproduction for patient with rotator cuff overuse syndromes.

We have a number of home studies that are relevant to the management of the common shoulder conditions. These are all TPTA approved and can be accessed free of charge. A post-test for CEU credit is available at <http://www.continuing-ed.cc/homestudy.htm> for a reasonable fee.

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