Spine Sparing Strategies:  
*Hip Mobility & Healthy Aging*

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Outline

• **Context:**
  – Hip anatomy (quick reminders)
  – Functional requirements, daily tasks
  – Clinical importance of the hip – optimal mobility & function for all ages!

• Relationship between hip function & LBP
  – What does the literature say?

• Interventions for all ages
  – Clinical tools for improving hip mobility, strength, stability, balance
Hip – Anatomy
Hip – Anatomy

• The hip is a functionally important, complex structure with *multiple functions and possible pain generators*, including:
  – Joint surfaces – bone & articular cartilage
  – Joint capsule (composed of 3 ligaments)
  – Surrounding musculature/fascia
  – Nerves, vessels, referral, central sensitization...

• Connected anatomically (and functionally) to the thoracic spine/rib cage, lumbar spine, pelvis, knee, ankle/foot complex – basically, *everywhere!*
Hip – Functional Requirements

• Via force generation & transmission, stability & balance, the hip is *intimately tied to (all) functional movements, athletic tasks, ADLs* (Polkowski 2010)
  – Therefore, we should address it via manual techniques (when needed) and ongoing movement interventions

• With age → almost predictable changes in hip joint anatomy and muscle function:
  – Reduced ROM, stiffness/tissue changes, muscle weakness/inhibition
Hip – Functional Requirements

• **Adequate hip strength/mobility required for:**
  – Walking/hiking/jogging
  – Climbing/descending stairs
  – Sitting/rising from chair, toilet, car
  – Kneeling/squatting
  – Cycling/swimming/resistance training/exercise
  – ADLs – shoes/socks, getting dressed, cleaning, hygiene, lifting, carrying, bending, reaching…

• **Since the hip is central to all tasks, proper hip ‘function’ can (should?) spare the spine, right?**
Clinical Importance of the Hip

• In younger patients/athletes, hip muscle function has been linked to knee pain (Earl & Hoch 2011), lumbopelvic kinematic changes (Popovich & Kulig 2012) & LBP (Harris-Hayes et al. 2009)

• In older patients, LBP is a poor prognostic factor for patients with hip OA (but not knee OA) (Stupar et al. 2010)
  ─ However, concomitant LBP is a poor prognostic factor for those undergoing TKR (Clement et al. 2013)
Clinical Importance of the Hip

• Hip OA is common in chiropractic practice, yet likely underdiagnosed (Poulsen et al. 2012)

• Hip pathology can lead to pain in the groin, lateral hip, buttock, anterior & posterior lower extremity (Lesher et al. 2008)

• “Hip” pain is not always “hip joint” pain → patients often refer to their lower back, lumbopelvic region, buttocks, SIJ, groin/pubic region when they say “hip”

• Pain can be referred to and from the region
Clinical Importance of the Hip

• "Hip-Spine Syndrome": (Prather et al. 2012; Devin et al. 2012; Redmond et al. 2014)
  – In elderly patients, ‘hip-spine syndrome’ refers to coexisting degenerative changes in the hip and spine – DDx is often difficult
  – Elderly (and other) patients with LBP often have limited hip mobility and ROM → surgical hip correction can positively influence the LBP
  – Not a perfect correlation, but should be a consideration as it is ↑ing in prevalence
Clinical Importance of the Hip

• Treatment of many MSK conditions includes addressing hip function (right?!):
  – Local hip complaints
  – Mechanical low back/pelvic/SI pain*
  – Knee pathology (arthritic changes in elderly & also overuse/functional problems in younger patients)
  – Lower kinetic chain issues, sports injuries
  – General fitness & performance enhancement
Clinical Importance of the Hip

• For now, can we agree that it is logical to assess and address hip mobility & function, especially with our aging patients, to preserve & promote optimal physical capacity and functional fitness?

• How does the hip relate to lower back issues?
  – Can we assume that suboptimal hip function can influence the lumbopelvic complex (or vice versa)?
The Hip & LBP

• In theory:
  – People with hip pathology may move/load/utilize their lumbar spines differently
    • Chicken or egg, co-morbidity or coincidence?
  – Proposed Mechanism: ↓ hip motion due to injury or inactivity ± capsular stiffness/OA → altered loading profiles in the lumbopelvic region → accumulation of lumbar spine tissue stress/sensitization → LBP or tissue injury
The Hip & LBP

• This relationship is the subject of much study
  – Results have clinical, exercise & performance AND healthy aging implications

• To date, research has been conducted (summarized by Harris-Hayes et al. 2009) on the relationship between LBP and:
  – Active or passive hip range of motion (ROM)
  – The coordination/kinematics of hip and back movement during clinical tests, such as forward bending (Pirouzi et al. 2006)
  – Functional movements such as sit-to-stand (Shum et al. 2005)
The Hip & LBP

• To summarize, the literature tells us:
  – There *might* be a relationship between hip function and LBP, but the *exact nature* of the relationship *remains unclear*...

• For example – the *Prone Hip Extension test*
  – Bruno & Bagust (2006-2008) revealed that:
    • Muscle activation patterns inconsistent (normals/LBP)
    • Reliability/validity of assessment questionable
    • *Potential* for ‘alternate’ use/interpretation...more research needed on clinical populations
The Hip & LBP

• **Shortcomings of the literature:**
  – Heterogeneity of the study samples & tasks
  – Gender differences – anatomical, hormonal, tissue properties, recruitment patterns
  – LBP classification is often not addressed
    • Does hip pathology correlate with > 1 type of LBP?

• Remember, *evidence-informed practice = your clinical experience + patient preference + best available evidence + logic (I hope!)*
The Hip & LBP

• *We can move on to some practical advice, if you will indulge these assumptions?*
  – A limitation in a specific hip function may be more likely related to LBP if that person regularly requires that particular aspect of hip function – *all patients are unique!*
  – Addressing that specific hip function via manual therapy & home care *may* alleviate or prevent LBP
  – Functional capability (strength, ROM, stability) in the hips will promote ‘spine sparing’
Functional Hip Interventions

• Not much high level evidence to guide us

• After appropriate assessment & clinical work-up, our toolbox includes:
  – Manual therapy → hip/pelvic muscles, fascial ‘chains’, joint mechanics of the hip, pelvis, lumbar spine, lower extremity
  – Modalities & ancillary treatments
  – Home care: Exercise prescription – strengthen & stabilize; mobility & balance – a daily routine
Functional Hip Interventions

• **General Goals with Elderly *(all!)* Patients:**
  – Maintain or improve strength, balance, mobility in the hips in order to ‘spare the spine’
  – Preserve and/or enhance overall function, capability and confidence
  – Empower patients to be involved and take charge of their own health
Manual Techniques

- **Possibilities/Suggestions:**
  - *Soft tissue* – Gmax/med, hip rotators, joint capsule, adductors, pelvic ligaments
  - *Mobilization* – hip joint A→P (@ 90° flex), P→A ± rot, long axis distraction (LAD), lateral glide (straps), proximal tib-fib, ankle/foot
  - *Manipulation* – SIJ, lumbar spine, hip LAD
Manual Techniques

- PA mobilization/neutral
- PA mobilization/ext rot
Manual Techniques

• Hip LAD ± thrust
• Hip lateral mob + belt
Mobility & Flexibility

- **Possibilities:**
  - Glute, hip flexor/rotator, adductor stretches
    - Partner assisted? Swimming pool?
  - Supine bent-knee hip internal rotation (to affect posterior joint capsule) – use at any age!
  - Dynamic stretches/movements – squat progressions, sit-to-stand (uni/bilateral), lunge to raised surface, quadruped rocking
    - Ensure adequate balance, utilize supports etc.
Mobility & Flexibility

- Supine hip internal rot
- Hip flex/ext – stairs
Mobility & Coordination

- Quadruped rocking: ↑ abduction, multi-direction movement
- Hip abd on foam roller
Hip Mobility – 90/90

Video Clip
Movement/Flow Workouts

Video Clip
Balance

• *Possible Progression:*
  – Single leg + support – eyes open
  – Single leg – support – eyes open
  – Single leg +/- support – eyes closed
  – Single leg + weight shift or small hand weight around centre of gravity
  – Unstable surfaces (ex. pillow)
  – Perturbations, react & adapt…
Rehabilitation & Home Care

- Seated ext rot – tubing
- Standing hip abd – tubing
Rehabilitation & Home Care

• *Monster walks* (Cambridge et al. 2012 – RRS)

• Band placement affects gluteal activation (without ↑ing TFL activation...)

![Monster walks demonstration](image-url)
Conclusions & Take Home Points

• There is a functional link between the hip, pelvis and spine – not clearly defined yet
• There are numerous treatment & rehab options that we can employ or facilitate
• Patients at all ages should work on hip mobility as part of their exercise & movement routine...it is never too late to start!
• Get your patients moving!!!
Thank you for attending the webinar today...

QUESTIONS?
Contact Dr. Shawn Thistle

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