



REHAB / RECOVERY / PHYSIOTHERAPY

Functional Hip Impingement (Part 1)

EVALUATION, HIP SPARING AND MOBILIZATION

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Every time I sit down to write an article, I realize how much more there is to know about musculoskeletal pain. I also learn something new every time. (I want to give special thanks to Lucy Whyte Ferguson for assisting with this article.) As always in our field, the evidence tends to be a bit sparse. Why am I once again revisiting the hip? Because I want to share what I've learned in the past seven years.

A Few Perspectives

Here is what I do know, based on 35 years of paying attention to clinical experience and attempting to keep up with the literature. Hip function is critical. Hip dysfunction is a significant component of the joint-by-joint approach. Treat the hip to create more mobility and stability, which helps stabilize the hypermobile lower back.

Your lower back pain patients, whether you think the problem is their facets, discs, SI joints and/or fascia, need their hips to work optimally to take the load off the lower back. When the hip isn't working right, it throws gait off and puts an extra load on the knees. Think about the extra load on the medial knee ligaments when the patient is walking around with their hips stuck in an externally rotated position. Hip dysfunction is often missed, as it does not necessarily cause hip pain.

What do I mean by hip dysfunction or functional impingement of the hip? I would define it as an anterior positioning of the femoral head, creating impingement of normal femoral motion. I like the term *subluxation* here; it implies a joint that is slightly out of position, but not dislocated.



I think some fixations have a more significant quality of malpositioning; this is one such fixation. The femoral head is jammed forward and unable to move freely, especially into flexion internal and/or external rotation. This is accompanied by tenderness and stiffness over the femoral head; and you will usually note inhibition and weakness of the hip flexors.

Here are a few additional views of impingement issues of the hip. [Shirley Sahrman](#) is a pioneer in looking at functional problems with the hip. Sahrman's concept is similar to mine; her term is *anterior femoral glide*.¹ Sahrman describes this as "inadequate posterior glide of the femur head during hip flexion."

Craig Liebenson has a [great post](#) on this topic, using the term *femoral acetabular impingement* (FAI). He explains the diagnosis and basic principles of rehab for the functional versions of FAI.² It can be, or can progress to, a true pathology that needs surgical care.

Marc Phillipon is a surgeon who has written and treated the pathological version of FAI.³ Quoting Phillipon, "Physical examination criteria included a positive impingement test ... or flexion-abduction-external rotation (FABER) test. A positive impingement test was defined as groin pain with 90 degrees of hip flexion and maximal internal rotation."

The hips we successfully treat are a functional version of the same or a similar condition.

Patients in Pain

Who are these patients? Let's make a list of the different categories:

- One category is patients who have a lower back or knee problem; they have no idea their hip is part of the issue. They can be any age, any gender.
- Another group, which tends to be older, has some degenerative changes in the hip joint. Our goal is a little different with some of the members of this group. If they are 50-70 years old, we may just be keeping them functioning longer, and putting off the eventual hip replacement.
- A third group is athletes who tend to train excessively in their sport, often creating overuse muscle imbalances. Skating, hockey and dance come to mind; activities with external rotation of the hip.
- A fourth group is yoga students. Yoga wants the practitioner to open the hip, and the person may be forcing themselves into external rotation, pushing the femoral head into the anterior ligaments. For many of our patients, there is an obvious critical piece: Stop doing the stupid stuff that re-creates your problem. Quit forcing the thigh into end-range external rotation.

Pain Patterns

Where do hip patients hurt? One classic indicator that the problem is in the hip joint itself is anterior pain, groin pain. When the pain is more lateral, it can still be from the hip, but there are other obvious contributors. Consider fixation of the upper lumbar and lower thoracic facets, which can irritate the superior cluneal nerves or ilio-hypogastric nerves, which supply sensation to the lateral and posterior gluteal area ([Maigne syndrome](#)).

If the pain is in the posterior hip, start by looking at the SI joints and the greater trochanter's muscular attachments. I consider *trochanteric bursitis* an overused diagnostic term, used for any lateral pain. If you do a proper assessment of both gluteal function and hip function, do the right adjustments, and the patient is willing to rehab, most "bursitis" resolves without directly treating the bursa.

Assessing Normal and Abnormal Hip Function

The hip has to be able to sit deeply in its socket and rotate freely. Let's look at the eccentric and isometric components of normal hip function. We'll use the left hip as our example, and think about right-handed activities.

As you swing a golf club, as you hit with a bat, as you twist the trunk to the left, the left hip provides counterbalance. The left hip is internally rotating and eccentrically resisting both external rotation and lateral (frontal-plane) motion. Your adductors, your core and your left gluteus medius need to activate to stabilize the left hip. (My next article will go into depth describing muscular assessment and exercise rehab.)

My previous articles on the hip have touched on assessment, but I want to update this with a clear step-by-step sequence. I use three types of testing:

1. Test hip range of motion.
2. Palpate and motion palpate; confirm tenderness and a lack of motion at the femoral head.
3. Test the strength of the hip flexors.

This triad, or at least two positive tests out of the three, indicates the need to address hip dysfunction. If the person just has lack of motion, this may be anatomy; a normal variant based their genetic

limitations. If they lack motion and have tenderness, fixation and/or weakness, you are usually looking at more significant dysfunction.

First, *test the hip's range of motion*, looking for a loss of flexion, internal rotation and/or external rotation. I tend to use these three motions as my guides. For a more complete view, assess adduction, abduction and extension. Always compare to the opposite side. Pay attention to the end feel, to the smoothness of the motion, and to whether you elicit pain in the hip or lower back.

My default position for testing flexion, internal and external rotation is the 90-90 position with the patient supine. If the patient cannot flex with ease to 90 degrees, take the hip to 60-70 degrees of flexion and then test rotation. Prone testing of internal and external rotation has advantages, as the hip is in a more neutral position and range of motion may be increased.⁴ (Read Janice Morside's article; it is a great report of her recent hip ROM research and implications of same.)

Normal hip range of motion varies widely. Males, in general, have less; females have more. There are genetic variations in the shape of the acetabulum and femur neck, which affect the total capacity for motion of the hip.

Second, you are going to *palpate*; both for tenderness (pain on palpation) and lack of joint-play motion. Testing for tenderness helps fits [Triano's criteria](#).⁵ The evidence is best for manipulation where you can elicit tenderness or pain. Unhappy ligaments are tender. In this case, you are over the anterior hip, the iliofemoral ligaments.

Here's how to palpate the head of the femur: The patient is supine; your landmarks are the ASIS and the most lateral border of the pubic tubercle. These are the origin and insertion of the inguinal ligament. Find the midpoint of the inguinal ligament, and then move your fingers or thumb about 1 cm inferior. Press directly anterior to posterior; you are directly over the bony head of the femur. Anatomy is variable; you may need to move slightly to find the spot.

You are over a location that has increased density, as you are as close as you can get to the femoral head in its socket. If the hip is irritated and the femoral head is not sitting deeply enough in its socket, the anterior hip ligaments will be tender and rigid.

Another element is classic *motion palpation*. There should be a sense of "give"; of reduced joint play under your fingers, rather than rigidity. I've been using additional motion testing, thanks to Dr. Whyte Ferguson:

"Use the flat of your palm, placed just distal to the AIIS, against the upper few inches of the femur and then perform an anterior to posterior spring type test. It is easiest to make the assessment if we compare a potentially subluxed femur on one side with a normal joint on the other. In addition, often there is also reduced lateral to medial joint play. The contact for this assessment is a broad (four fingers, palmar contact) over the greater trochanter or the area just caudad to the trochanter. The motion test is lateral to medial."⁶

Third, use manual muscle testing to test the *strength of hip flexion*. Hip-flexion strength seems to be consistently inhibited by functional hip impingement. I don't know that there is solid evidence of this, but clinically, this rule holds up well.

Start the muscle test with the straight or bent leg raised 30-40 degrees. (Use a bent leg when there are any sciatic nerve tension issues.) I tend to think of this as a functional neurology finding, connected to proprioceptive changes that occur due to the altered mechanics. When the hip flexors are weak, the patient will often complain of trouble going up stairs. If you ask, they will tell you they cannot lift the leading leg, rather than having trouble pushing with the stance leg. There are other muscular imbalances that affect the hip, including short hip flexors, and inhibited gluteus maximus and medius. (More on this in my next article.)

This triad, or at least two positive tests out of the three, indicates the need to address hip dysfunction. After a successful mobilization, and/or after a successfully performed exercise, the tenderness and rigidity will immediately change, strength will usually return, and a fuller motion will be restored.

Hip Sparing: Stop Re-Injuring the Hip by Doing Stupid Stuff

Inspired by Dr. Stuart McGill, I coach my patients to stop doing the stupid stuff that continually re-irritates or re-subluxes their hip. Stop the end-range external rotation and the cross-legged sitting. Combining flexion and external rotation is dangerous for these patients. Dr. Whyte Ferguson points out that in this positioning, the shortened psoas mechanically pulls the femur out of its centric position.⁷

If the hip is already stuck forward, when you open the hip into external rotation, you are pushing the femoral head farther anterior into the ligaments. This both irritates the joint, and overstretches the anterior hip ligaments.

Dangerous exercises would include the classic supine figure-four piriformis stretch. Yoga and dance often seems to emphasize "opening the hip."

The other exercise that can irritate the anterior hip is a "psoas stretch," done in a lunge position. The lunge position does have function, but watch the leg positioning. In relation to the back leg, don't force the femoral head into the joint capsule. Yes, you can teach the patient to stretch the hip flexors - they do get tight; but the patient needs to avoid an end range that presses the femur head into the anterior capsule.

According to Dr. Whyte Ferguson, "One of the things that patients do without thinking, is assume an improper sleep position: sidelying on the unaffected hip, bending the other knee, and rolling part way onto the stomach, so that the affected femur is in the flexed and externally rotated position and the impingement recurs."⁸

I cannot overemphasize these "addition by subtraction" points enough. Your yoga students will come to you complaining they cannot fully open or externally rotate their hips. If you don't advise them otherwise, they will continue to try to sit cross-legged to stretch into external hip rotation. These patients will not respond unless they change their habits and quit irritating their hips. They need to give it a break. At best, they need to take a few months and get the hip working better, and let the anterior capsule recover.

Mobilizing the Hip

Manipulation has a valued place in addressing hip dysfunction. An article I wrote in 2007 accurately

describes the manipulation I am still using today. This adjustment is from the work of Dr. Whyte Ferguson.⁹ The wishbone maneuver is a hip mobilization done while the patient is eccentrically firing the adductors. This adjustment seems to reset the hip deeper into its socket, and consistently frees up internal rotation of the hip. If you don't know this mobilization, read my article on this¹⁰ (and/or Dr. Whyte Ferguson's original descriptions)⁹ and start mobilizing it in this manner.

Part two of this series will address rehab, a critical part of normalizing hip function. With Dr. Whyte Ferguson's help, I will share how to test for imbalances and the exercises that help correct them. We are both excited about some newer exercises that seem to make a huge difference in helping the patient normalize their hips.

Pay attention to the patient's responses. Exercises and manipulation usually begin to restore increased hip flexion and internal rotation immediately. If there is no change in the hip motion, it can mean you are not doing the technique right or the patient is not doing the exercise correctly. Recurrent problems are often caused by some inappropriate activity the patient is doing.

On the other hand, a lack of progress may mean the hip is just too worn out, or the patient has a true pathological impingement. If the patient has persistent anterior or lateral hip pain, they can't walk normally and they are not responding to your care, get a specialist consult.

We can't fix all of these folks, but we certainly can help a large percentage of them. I have noted that many of my patients do not get back to full hip motion; but the improvement they get is enough to make them pain free or nearly pain free. I find it useful to accept the limitations of the aging body, and have realistic expectations.

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