

Complete Hip Training & Conditioning



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What We'll cover

- ⌘ Anatomy of the hip and related structures
- ⌘ Assessing the hip joint & SI Joint motion, role of core in hip motion
- ⌘ Corrective strategies, mobility vs. stability
- ⌘ Specific skills: hip hinge, squat, frontal plane movements, rotations

Anatomical Differences

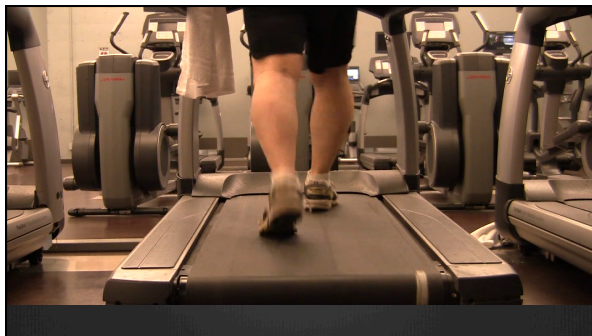


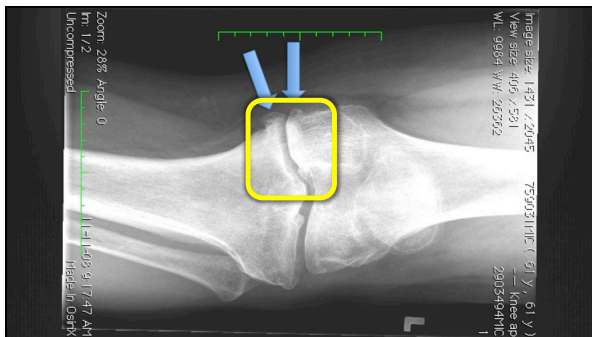














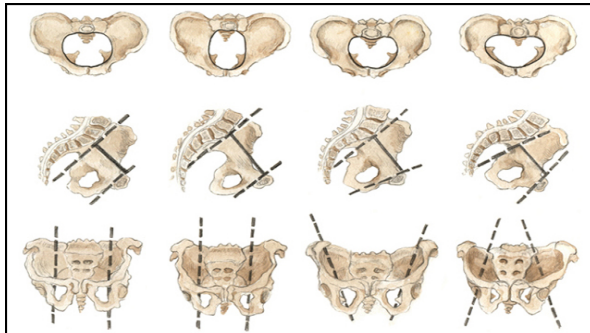


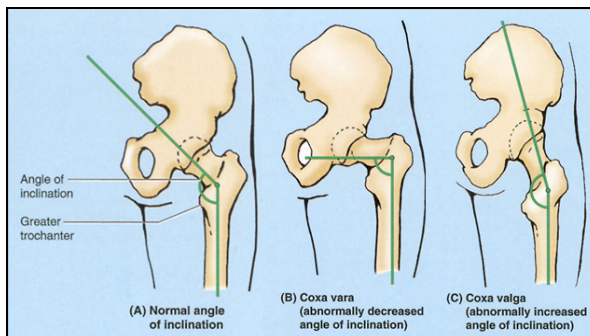


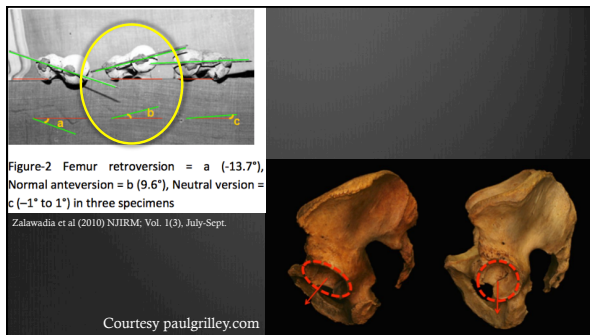




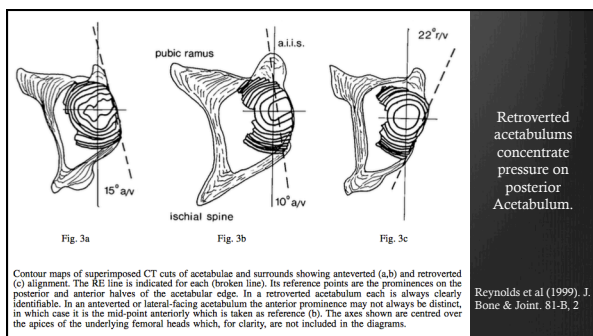


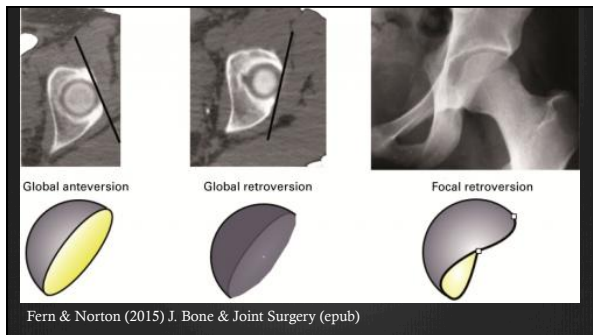






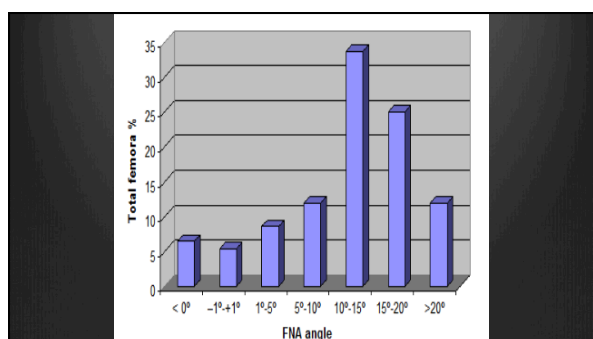






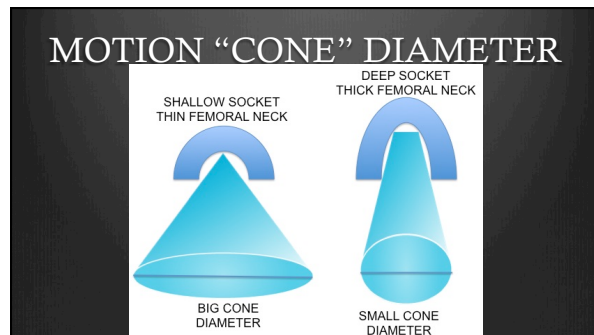
Angle of Anteversion (In degree)	Female				Male				Total %
	Left		Right		Left		Right		
	No.	%	No.	%	No.	%	No.	%	
< 0	1	3.7	1	4.3	1	4.5	3	15	6.5
-1 to +1	1	3.7	1	4.3	2	9	1	5	5.4
+1 to +5	4	14.8	2	8.6	0	0	2	10	8.6
+5 to +10	3	11.1	3	13	3	13.6	2	10	11.9
+10 to +15	3	11.1	14	60.8	3	13.6	11	55	33.6
+15 to +20	11	40.7	2	8.6	9	40.9	1	5	25
>20	7	25.9	0	0	4	18.1	0	0	11.9

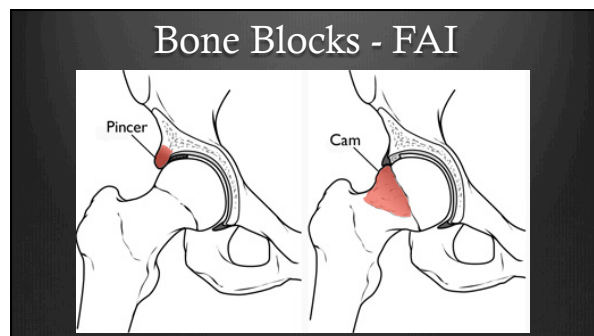
Zalawadia et al
(2010) NJIRM;
Vol. 1(3), July-
Sept.



What's the Point?

- ⊗ Femoroacetabular anteversion ++ flexion, -- extension
 - ⊗ <45 degrees Acetabular abduction (lateral placement) ++ flexion, >45 degrees decreased rotation & adduction. 45-55 degrees gave best overall mobility
 - ⊗ Thicker femoral necks decreased ROM
- ⊗ D'Lima et al J Bone Joint Surg Am. 2000 Mar;82(3):315-21.

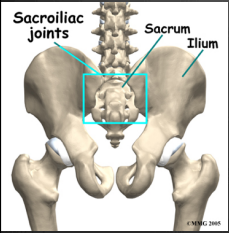




Prevalence of FAI

- ⌘ Asymptomatic cam deformities: 37% → 54.8 in athletes & 23.1% general population
- ⌘ Asymptomatic pincher deformities: 67% → 76 in athletes & 61 in GP
 - * Frank et al (2015) Arthroscopy Jan 28 (epub ahead of print)
- ⌘ Post-op, retroversion has clinically significant reductions in outcome measures vs. anteversion
 - * Fabricant et al (2015) J Bone Joint Surg Am. 2015 Apr 1;97(7):537-43

The Hip and SI Joint



⊗ Radiographs of hips in patients with SI joint pain:

⊗ 33% had cam impingements, 47% had deep hip sockets or medial protrusion into pelvis

* Morgan et al (2013) *Hip Int.* 2013 Mar-Apr;23(2):212-7

What the Hell Was The Point of That??

⊗ Everyone is different

⊗ Not everyone should or ever will squat ATG

⊗ Forcing a range of motion on someone who can't achieve it results in bad things.

⊗ Varying foot position, width, depth, front/back alignment is necessary to find individual optimal

Stratifying Hips

ANTEVERTED	V. LIMITED FLEX, NO ++ w/ ABD, GOOD EXTEN. GLOBALLY LIMITED	RESTRICTED FLEX, GREAT EXTEN. FEW LIMITS	RETROVERTED
	RESTRICTED FLEX, BEST w/ ABD, GOOD EXTEN. GLOBALLY LIMITED	NOT FULL FLEX, BEST w/ ABD, GOOD EXTEN. FEW LIMITS	
	NOT FULL FLEX, NO ++ w/ ABD, LIMITED EXTEN. FEW LIMITS	≤ FULL FLEX, GREAT EXTEN. NO MOB LIMITS	
	BEST FLEX w/ ABD, GOOD EXTEN. FEW RESTRICTIONS	FULL FLEX, ER, GOOD EXTEN. HIGH MOBILITY	
THICK NECK, DEEP SOCKET		THIN NECK, SHALLOW SOCKET	

How to Tell

Passive table assessment

- ⊗ Hip Scour
- ⊗ Look for hip movement limits, painful spots, mapping their mobility → DON'T DIAGNOSE!!
- ⊗ Supine abduction/ER– FABER test
- ⊗ Prone extension – femoral nerve test
- ⊗ Prone rotations – Craigs test

How to Tell

⊗Active Assessment

- ⊗ Rockbacks – alter knee position to observe hip flexion
- ⊗ Hip bridging, 3-point hip extension
- ⊗ Supported squat depth before butt wink
- ⊗ Unsupported squat depth before butt wink

How to Tell

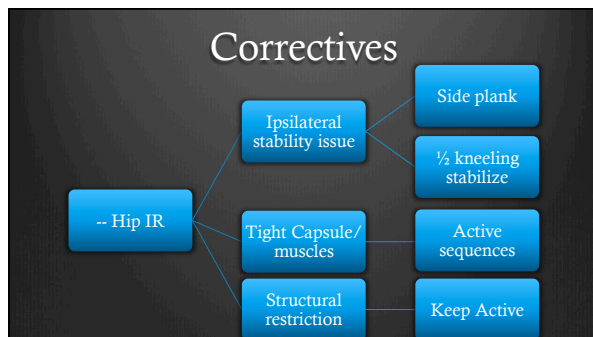
⊗Stuff that gets in the way:

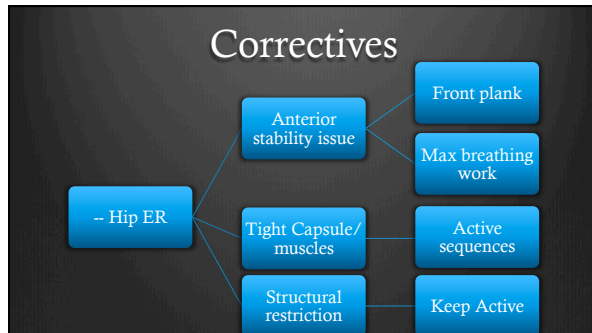
- ⊗ Soft tissue restriction, degenerative changes, injuries, fear/guarding
- ⊗ Test, corrective exercise, re-test to see change
- ⊗ If change occurred, you just found your warm up.
- ⊗ If no change, move on

Check for	Test	What it means
Structure	Passive Mobility	Theoretical limitation to active range available
CNS, motor patterns	Stability series, Novel movement	If (+) with stabilization then (-) when removed, work more with ++ stability. If movement gets easier with reps, could be novelty
Strength & Conditioning	Reps and More Reps	Train hard, and stop when fatigue disrupts movement quality

Corrective Options

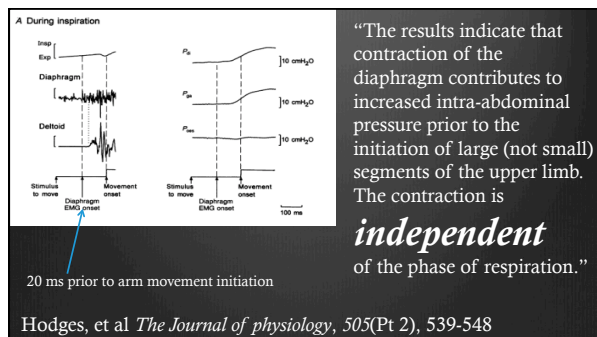
- ⊗ Mobility vs. Stability?
- ⊗ If basic core exercises ++ ROM in any test, they need stability as their warm up
- ⊗ If stability work doesn't ++ ROM, they'd benefit from active mobility & pattern grooving
- ⊗ If ROM doesn't ++ with corrections, train hard w/ limited ROM & assume structural limitations.

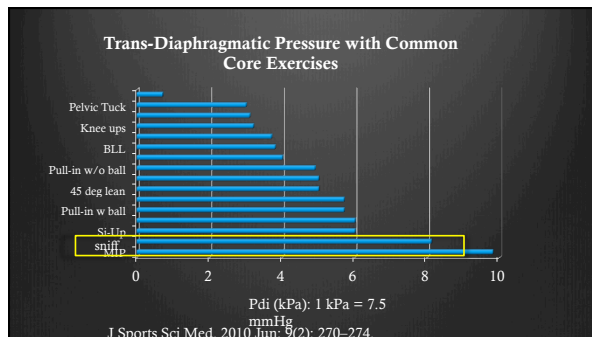




Breathing

- ⊗ Diaphragm - roof & main anchor point for most core muscles.
- ⊗ Inhalation: diaphragm distally, ++ pressure in abdominal cavity → distention – “pressure belly
- ⊗ Diaphragm & abs drive into abdomen, create pressure gradient around spine to increase stability.
- ⊗ -- stability → -- hip mobility.





Breathing

- ⊗ Mobility requires more parasympathetic stimulation than sympathetic, but needs to build off sympathetic stabilization
- ⊗ Long, slow breathing with more of a “release” of breath versus expulsion
- ⊗ Yoga, tai chi, qui gong, pilates, etc.



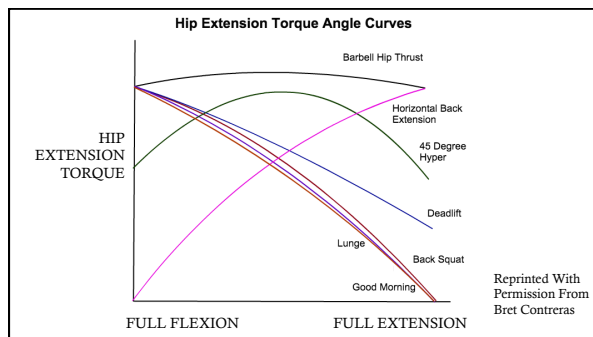
Active Mobility - Isolated

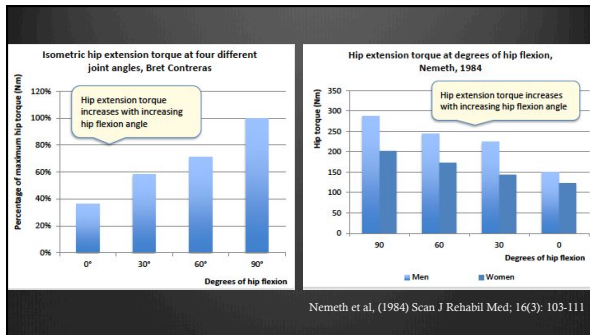
- ✧ Clamshells
- ✧ Hip bridges, pelvic tilting
- ✧ Pigeon, seated rotations
- ✧ Ankle grab baby breathing, goalie stretch
- ✧ ½ kneeling glute pulse, hip rotations

Table
Instantaneous hip extension torque at selected ranges in 3 different straight-leg hip extension exercises

Exercise	Instantaneous hip extension torque, Nm		
	90°	135°	180°
Good morning	478	338	0
45° Back extension	338	478	338
Horizontal back extension	0	338	478

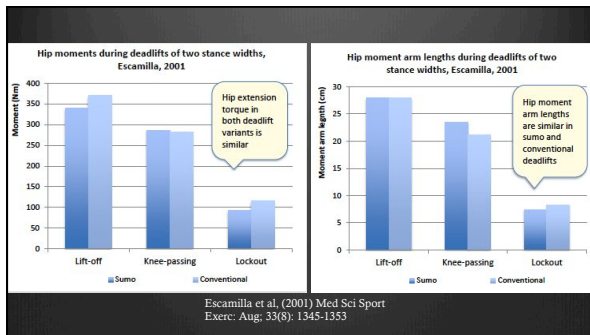
Contreras et al (2013) JSCR, 35(2), April 2013





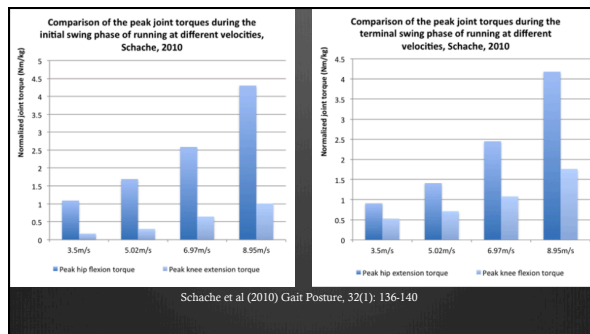
Active Mobility - Integrated

- ⊗ Flow mobility – seated, pigeon, ½ kneeling swings
- ⊗ Hip Hinge progressions
- ⊗ Squat progressions
- ⊗ TGU
- ⊗ crawling



Strength & Conditioning

- ⊗ Squat – back & front, single leg, skater
- ⊗ Hip Hinge – pull through, single leg, DL conventional & Sumo, swing, hip thrust
- ⊗ Lunge matrix
- ⊗ Loaded carries



Speed & Power

- ⊗ Jumps
- ⊗ Throws
- ⊗ Olympic lifting
- ⊗ Sprints
- ⊗ COD - agility

Big Rocks

- ⊗ Assess their range of potential, work within it.
- ⊗ Correctives should correct, otherwise they're fillers
- ⊗ Use multiple approaches to strengthening & mobility
- ⊗ Sagittal plane strength transfers to other planes, but more specific movements offer much better transfer.
- ⊗ Skill movements require rehearsal and practice, not more weight until ready.



THANK YOU
ALL!!

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