

GymCon USA

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Arch Healthy- Spine and the Relationship to Hips and Shoulders
Injuries, Prevention and Biomechanics

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Spine , Shoulder and Hips- How are they connected?

1. Back, what it does
2. Shoulders- how do they contribute to flexibility?
3. Hips- what do they need to do for arching?
4. When do you use together?
5. Hinge Theory



Basic Pearls

- 1. Louder and repetitive does not mean learning- they will not arch more!
- 2. AR= Available Range
- 3. AF = Opposite (antagonist) flexibility
- 4. FS = Functional Strength
- * $AR = AF + FS$
- KEY TO FLEXIBILITY!!!!!!!!!!!!!!

1) Spine- What it Does

- Natural curve
- 6 motions
 - Front back
 - Side to side
 - Rotation each way
- Stability
- Mobility
- EXAMPLE-Demo



Demo

- Stand and bend forward- hunch
- Stand and arch-
 - First from low back only- OUCH!
 - Then through entire spine
- Side bend, walk fingers down
- Rotate- airplane

Curve of Spine

- Lordosis (Arch)
 - Natural, ab strength counters this
 - Hyperextended knees usually go with this
- Kyphosis (Rounding)
 - Poor posture
 - Stress of the student- the plague...
- Excessive
- Reversals and demand
 - Reversal of kyphosis for choreography, rolling, double back tuck holding
 - Reversal of lordosis in the low back- for straight handstand in neutral, pike, wolf, bar work

Mobility focus.

- The Arch
 - Lordosis of spine
 - Movement of sacrum
- Split position and leap
 - Ilium rotation one way forward/backward
 - Arching/extension on the side of back leg
 - Rotation toward back leg
 - Flexibility of the hip flexor of back leg, hamstring of front

Arch example:



- Good example of overall arch- hips extended, back not stressed, shoulders open, head in neutral

Two Examples- where is there stress?



2) Shoulders- What they do

- 6 motions
 - Flex and extend
 - Out and in
 - Rotate external/ internal
- Stability
 - Shoulder
 - Joints above and below



Actions in Sport

- Vaulting
 - Stability, Serratus Anterior, Upper trap
- Shoulder Extensors
 - Bar Release
 - Free Hip/Back Extension roll, Rings
- Shoulder Flexors
 - The Kip!
- Shoulder ADDuctors
 - Important in Rings and P Bars

3a) Together....

- Spine and shoulder stability
 - Blocking
 - Tumbling
 - Handstand isometrics
- Spine and shoulder mobility
 - Arching tumbling
 - Leaping and back leg

3b) Opposites...

- Shoulder mobility with spine stability
 - Kips
 - Cast handstands
 - leaps
- Shoulder stability with spine mobility
 - Back tumbling

Spinal RelationshipsHIP!

- Hips
 - Flexors stretch with extension
- Hip flexor flexibility and its relation to spine arching and shoulder motion
 - Want to arch more? Turn out hip... OR do it the right way and stretch the flexors
- Skills
- LETS SHARE...

Skills- Hip extension and shoulder motion and arch

- Ring leap
- Switch leap
- Sheep jump
- Layout on beam
- Double lay on floor
 - Front layout
 - Onodi
 - Pak salto
 - Tkatchev
 - Roll down on beam
- Whip (depending on arm position)
- Yerchenko entry to vault skills
 - All ring swing work
- Pbar swing between bars
 - Choreography!
 - More?



Arch in back, breast bone and public bone
far apart from one another



Reserved.

Hip turn out due to lack of coordinated strength of 1) obliques, and 2) hip internal rotation of standing leg



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4) Hinge Theory

- The concept of the arch
- Total Functional Motion (TFM ©)
- Slinky Mechanics
- Injuries that result
- Cont...



A) Concept of the Arch

- Each individual piece of spine moves, like wings of the airplane stacked
 - Hips extend
 - Shoulder flex
 - Rib cage tilts
 - Ribs expand
 - Abs stretch
-
- LETS DO IT!

Demo- the Total Arch

- 1- Upper only
- Lay on stomach, lift arms only, leave legs down
- Elbows must be locked out
- 2- Lower only
- Demo of strength
- 3- Both at the same time
- 4- Back bend (no need to try this one!)

B) Total Functional Motion (TFM)

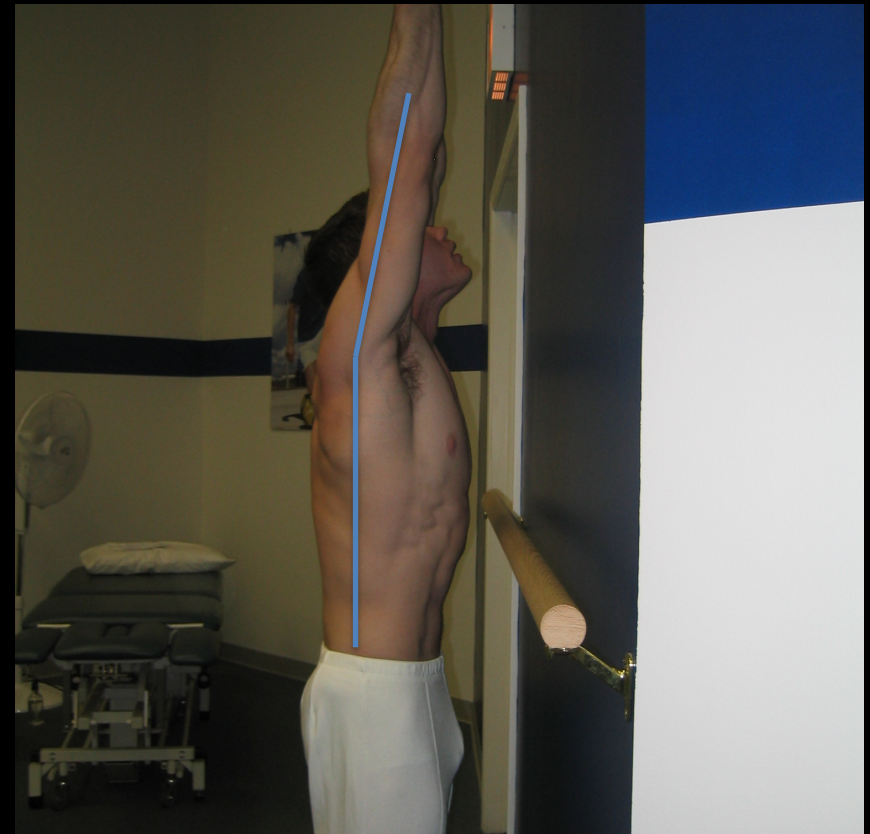
- Available Range at each joint
 - Passively
 - Shoulders: supine overhead (EX)
 - Hips: true extension testing
 - Spine – goniometer measure
 - Actively
 - Shoulders: Prone Flexion test or wall overhead (EX)
 - Hip: Leg swing, standing arabesque, etc.

Standing Evaluation

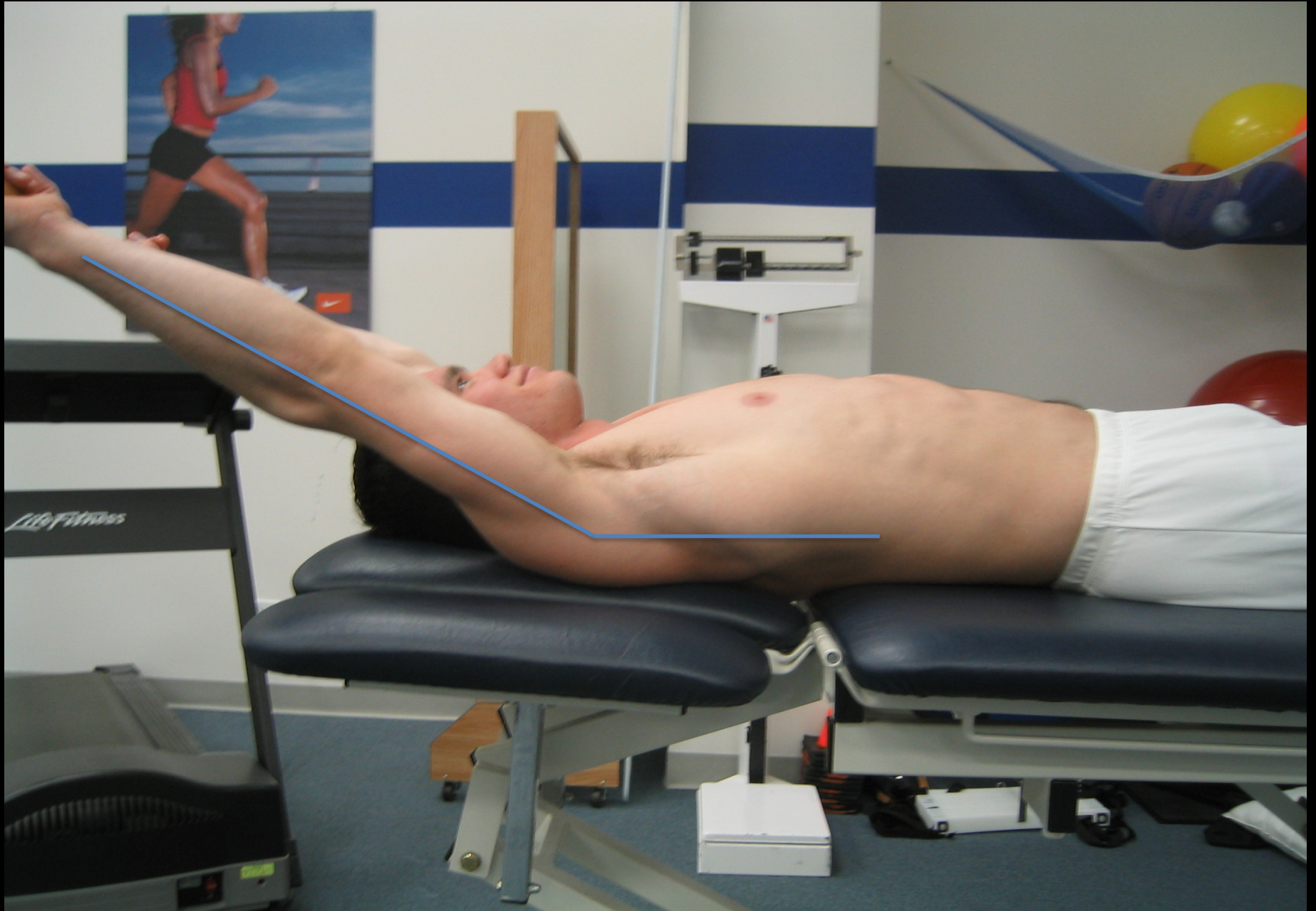
**Shoulder angle, lordosis lower,
hips relatively flexed**



Better- still shoulder flexed



Supine Evaluation





Reserved.

Supine Evaluation



Proper and Improper Evaluation and Strength Technique



Top pic angle and bottom are same!



Finally... The Handstand



Product Help...

- Open Shoulder Trainer
- Allows an increase in shoulder flexion, IF AVAILABLE **, to focus on where ribs are
- Could be bad thing, pointing out how open the rib cage is



C) Slinky Mechanics

- Each level
- Sharing
- Takeover to help/overuse
- Level above and below

D) Injury Mechanics

- Bend too much at the spine without shoulder motion
- Force shoulders back without a combination of 3 motions (flexion, rotation, and abduction)
- Repetitive stress

E) Skills

- Basic
 - Back Bend and walkovers
- Bars
 - Free Hip Hechts, reverse hecht
 - Shushanovas
 - Front giants
 - Jaegers
- Floor/Vault
 - Pre-flight to Yerchenko
 - Tumbling back handsprings
 - Back Whips and Front Layouts
- Beam
 - Similar to floor, add roll downs and BH Lay series
- Pbars
 - Under bar work
- Rings
 - Tap swing

Awareness/Diagnosis

- Back pain in combination with...
 - Pin point bone pain
 - Repetitive with backwards bend
 - Sometimes with run/jump
 - Low hip and shoulder flexibility
 - Lots of turn out on skills
 - Rule Out Spondy category
 - MD may just xray, not sensitive enough
 - Rest for 2 weeks and NSAID no help

(Cont)

- Shoulder pain with-
 - Overhead motion hurts
 - Sharp pain at end
 - Cannot have arm overhead at end range
 - Back also not flexible
- Tells me
 - Stress on capsule, likelihood labral tear higher
 - Impingement injury
 - Need to change mechanics not just fix symptoms

FIX IT!

1. Shoulder strength
 1. Flexion on wall, prone, shrugs, press
2. Rib position in handstand
3. True Hollow Hold (EX)
4. Spine motion and flexibility
5. Properly performed Splits!
6. Pay for coach to watch and monitor conditioning and flexibility/warm up with hands on
7. Skill readiness based on the above!
 1. i.e. don't do cast handstands if shoulders are not strong enough and back arches, just encouraging bad MM!





Cues



- Conditioning to positioning
- Positioning to practical application

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- Presentations
 - Hinge Theory
 - Lat
 - Core
 - Hip Flexors- Flexibility and Importance
- Writings:
 - Hinge Theory
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