

# BI 199 APWT Discussion 3



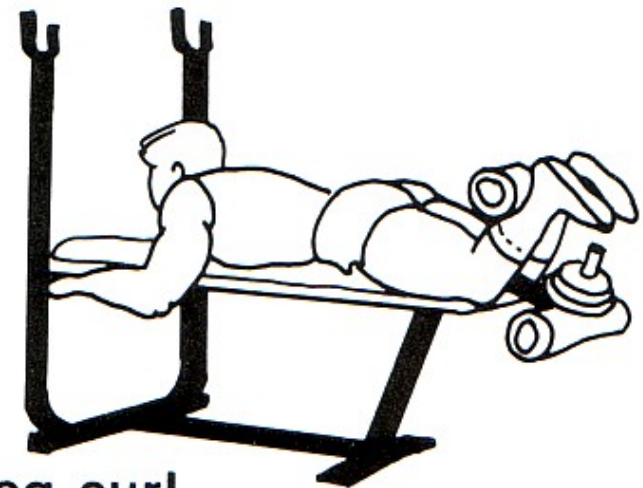
...Patience is a virtue!

- I. Announcements Update on Anatomy Lab. New cadavers just in, so our 1<sup>st</sup> visit next Thurs during class. Other t? 2-4 Mon + Thurs, > 4 Fri?
- II. Article Group Discussion Squat depth+...NSCA
- III. Anterior-Posterior Superior-Inferior Balances!  
Body builder's syndrome?
- IV. Continuous Breathing  
Valsalva's maneuver?
- V. Benefits & Myths of Weight Training *Superset Combinations!!*  
Group + class discussion
- VI. Anatomy of Squat-Push-Pull Exercises
  - A. Squat, lunge, leg/knee extension & curl
  - B. Bench press, military press
  - C. Lat pull, bent-over row, rowing variations

## Anterior - Posterior Balance

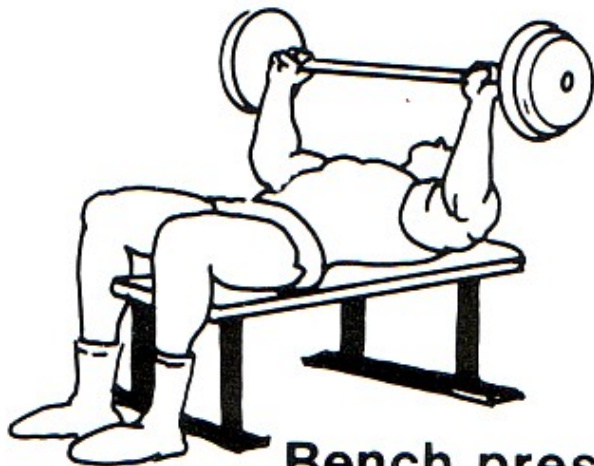


Leg extension



Leg curl

## Superior - Inferior Balance

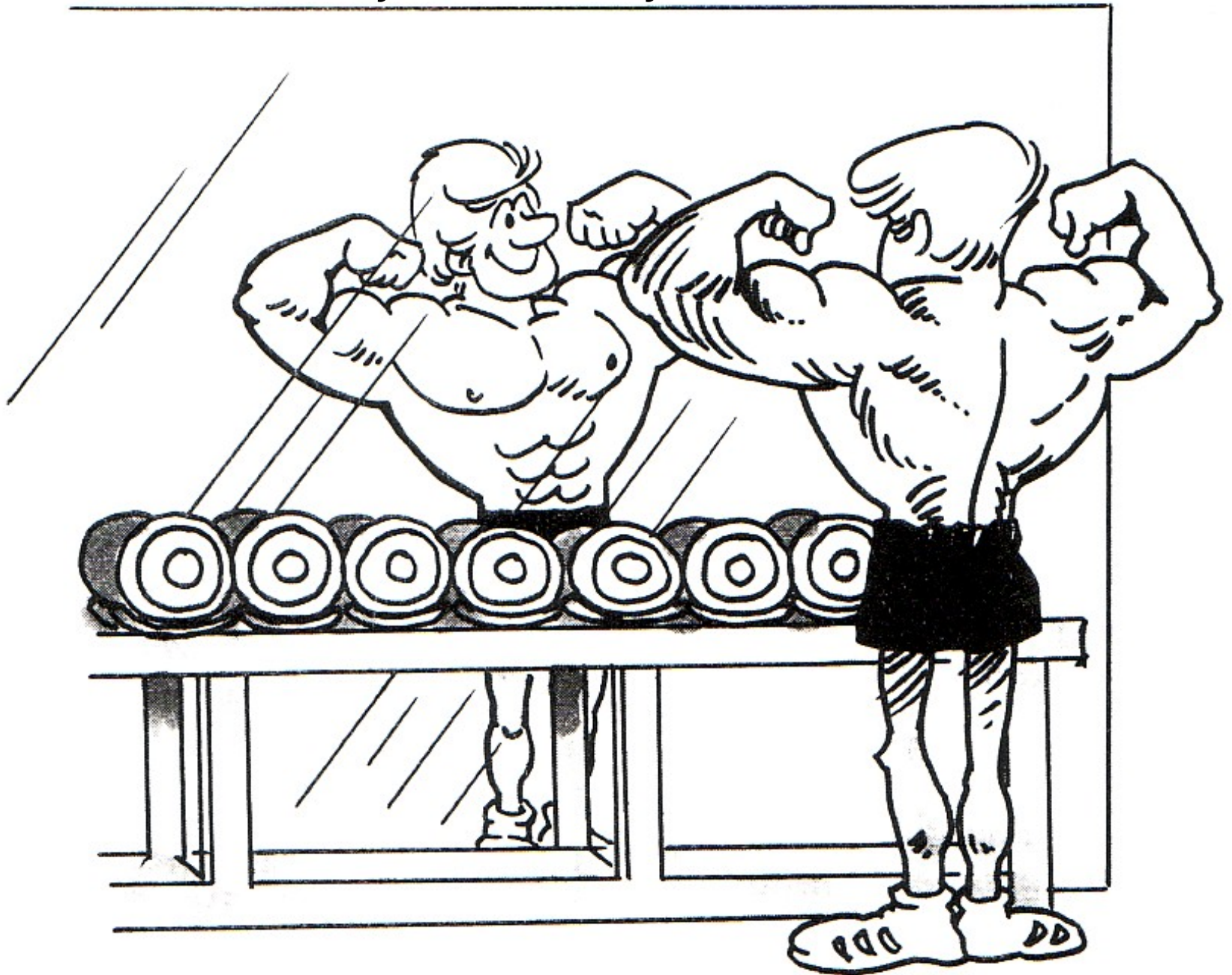


Bench press



Squat

# *Body Builder's Syndrome!*



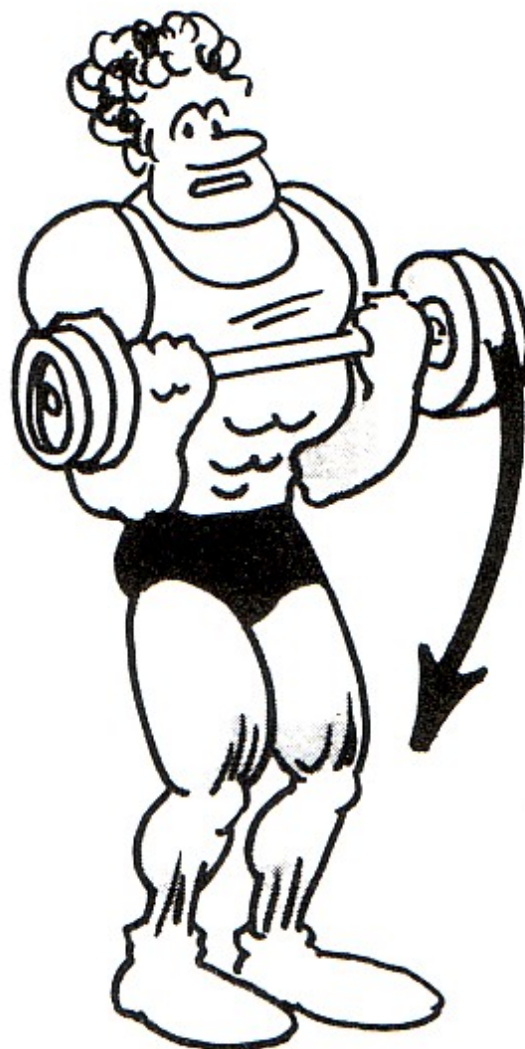
***Breathe Continuously!***



BREATHE CONTINUOUSLY

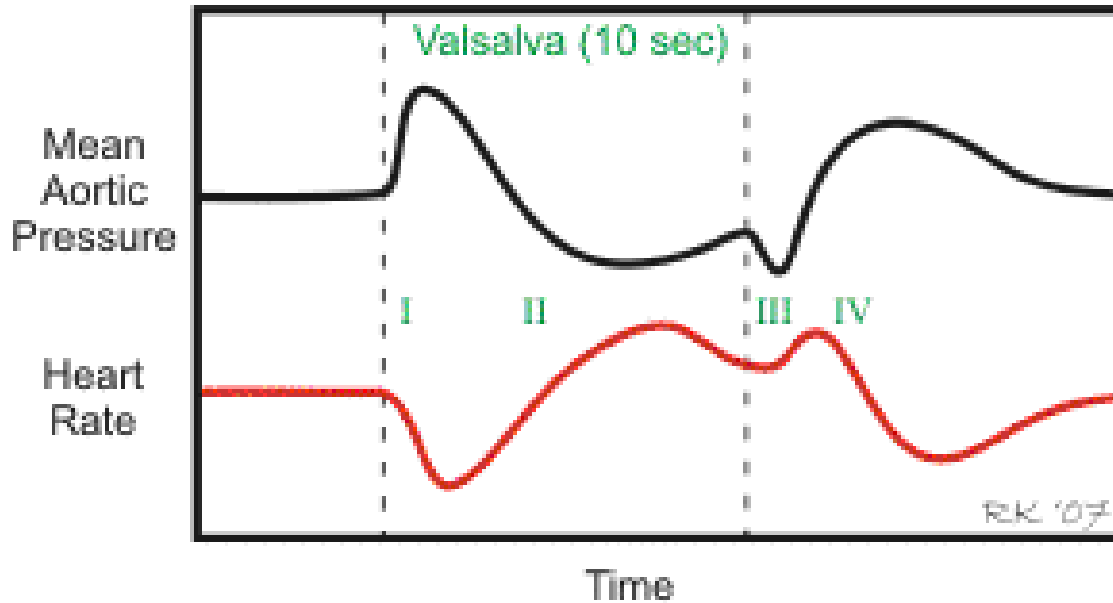


EXHALE  
CONCENTRIC PHASE



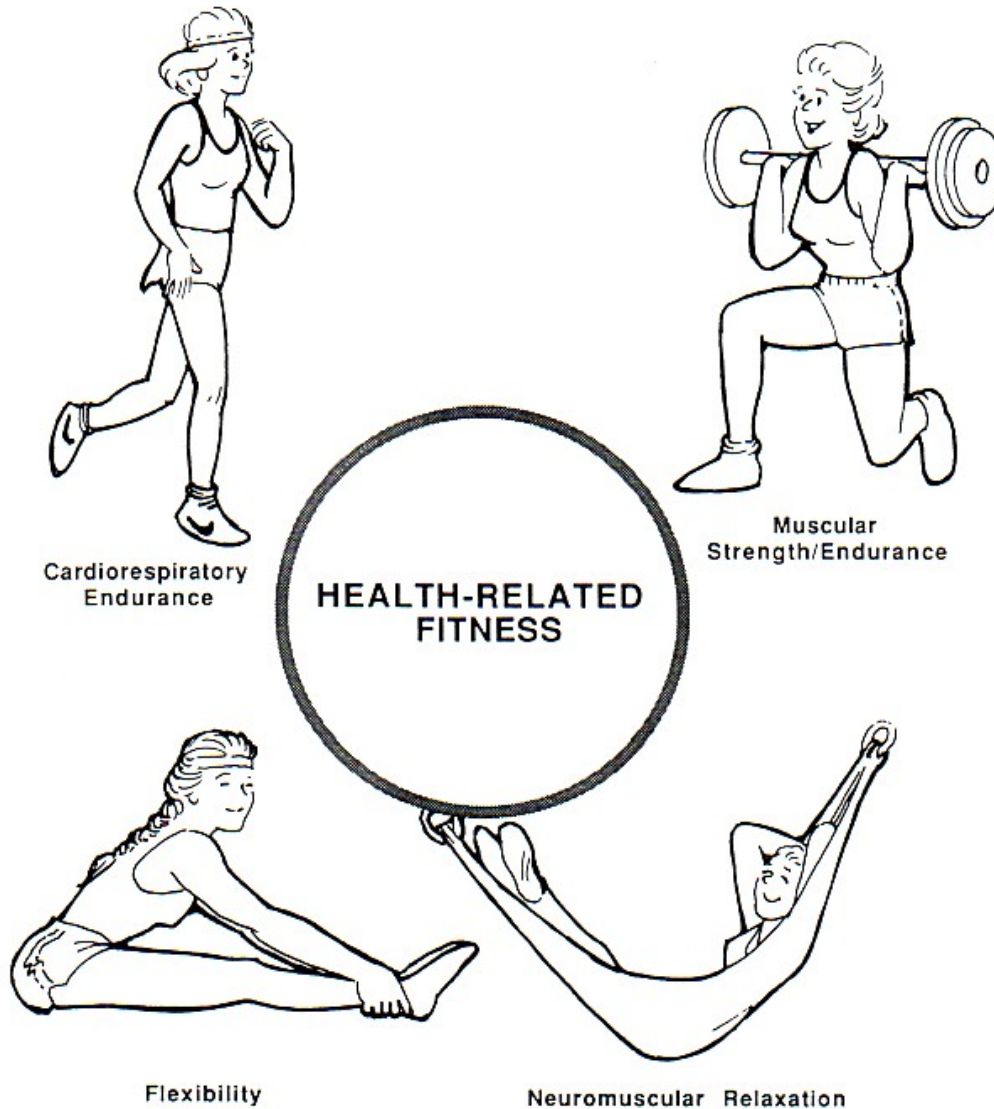
INHALE  
ECCENTRIC PHASE

# *Antonio Maria Valsalva* *Italian Anatomist, 1666 - 1723*



Forcibly exhaling against a closed glottis (vocal cords), which closes off the entrance to the trachea (windpipe) and increases pressures in the chest and abdomen.

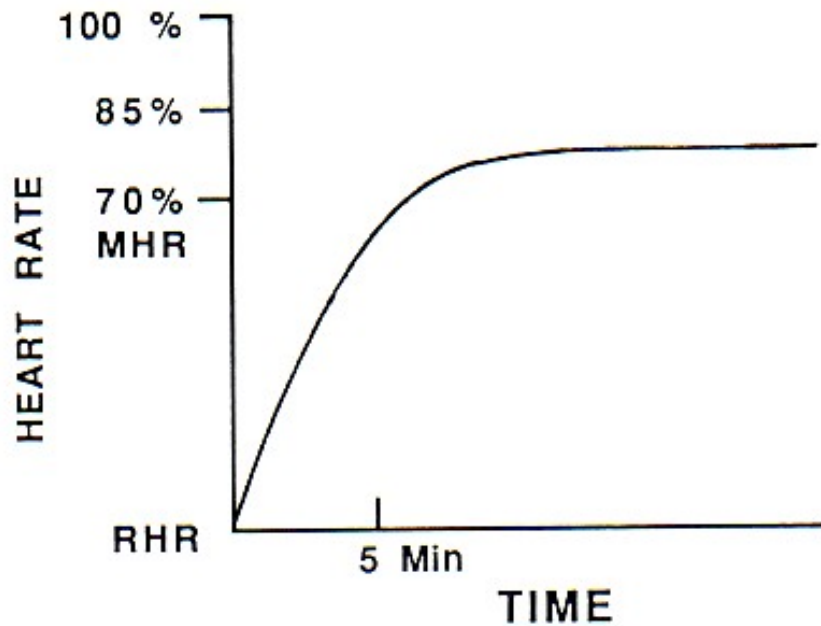
# *Weight Training Enhances 4 of 5 Components of Health-Related Fitness!!*



NB: %Fat not pictured.

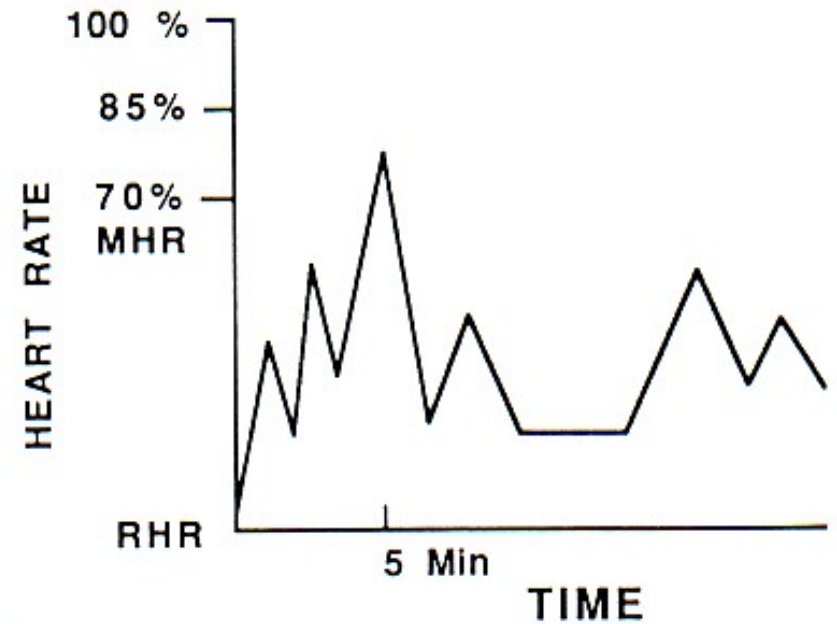
*...but Improvements in CV Fitness are Minimal!*

### AEROBIC ACTIVITY



A

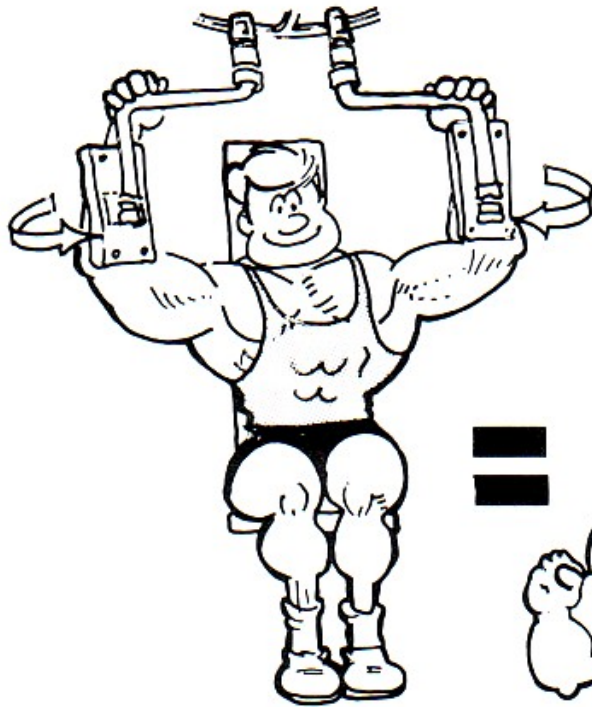
### ANAEROBIC ACTIVITY



B



*...even with Circuit Weight Training!*



=

**Circuit Weight  
Training**



**JOG  
JOG**

**(12 min/mile)**



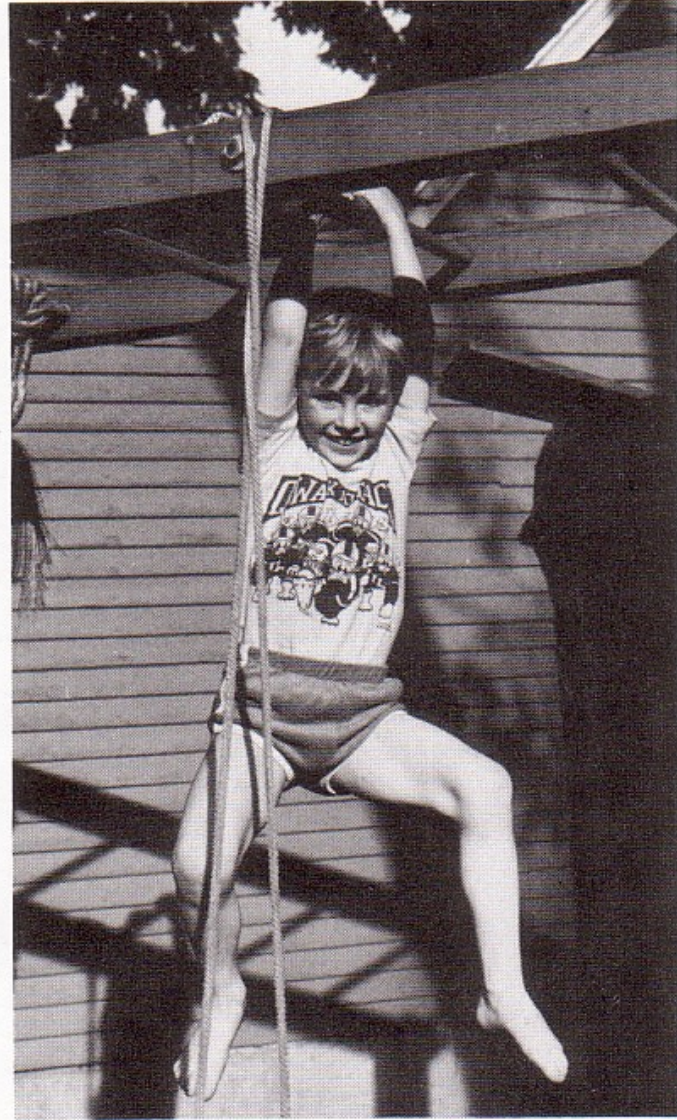
=

**Tennis**

# Myth 1: Weight Training Injures Joints



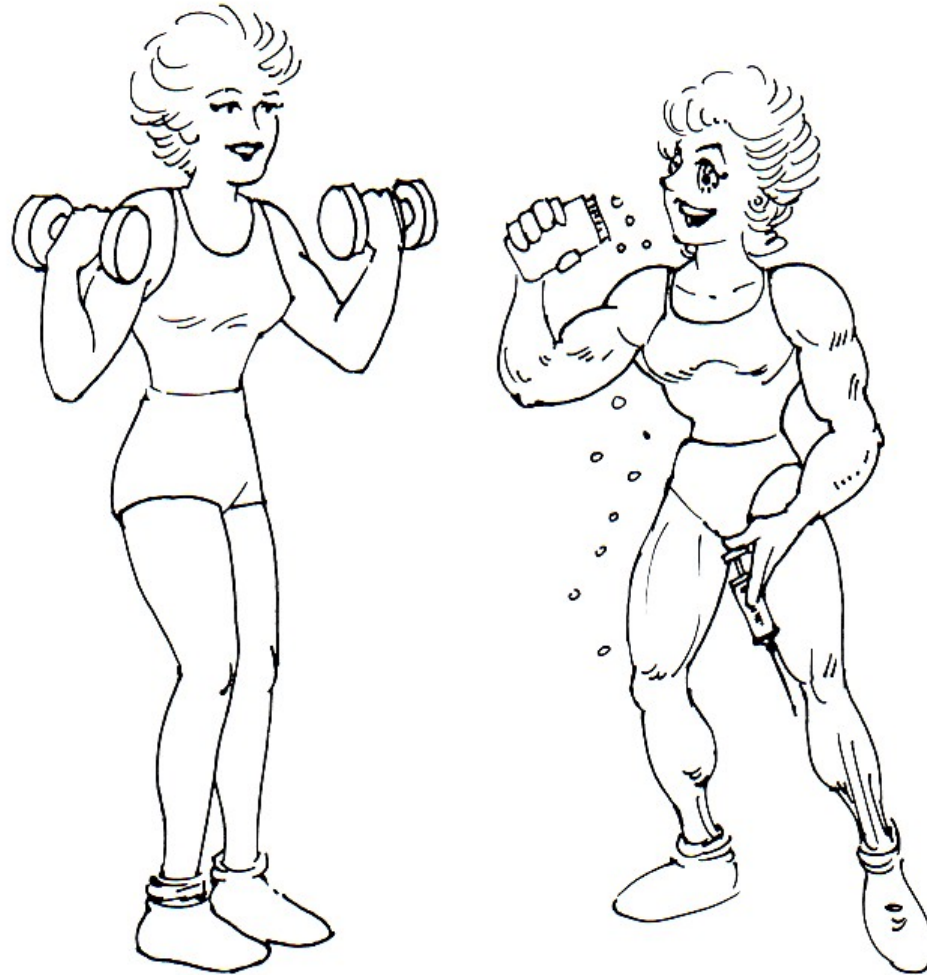
## Myth 2: Weight Training Depresses Growth & Development



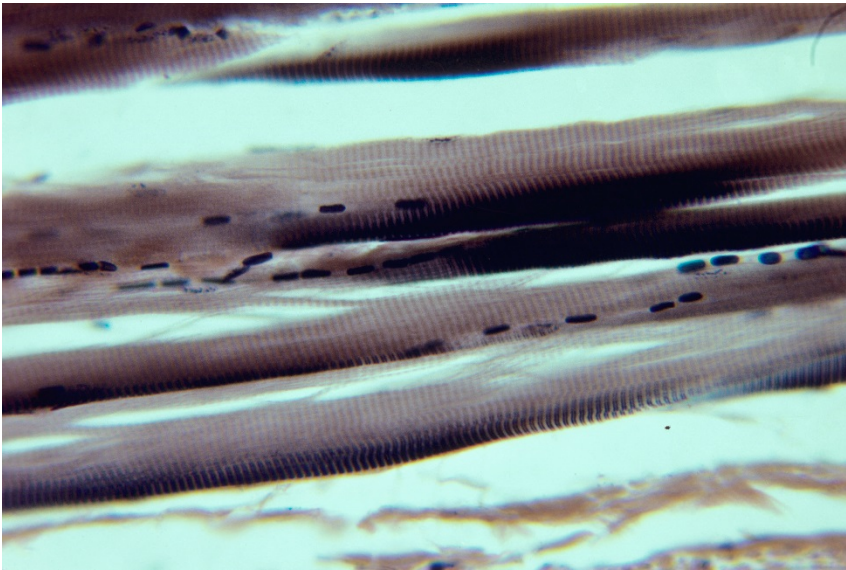
## Myth 3: Loss of Speed, Flexibility & Coordination



## Myth 4: *Women Hypertrophy as Much as Men*

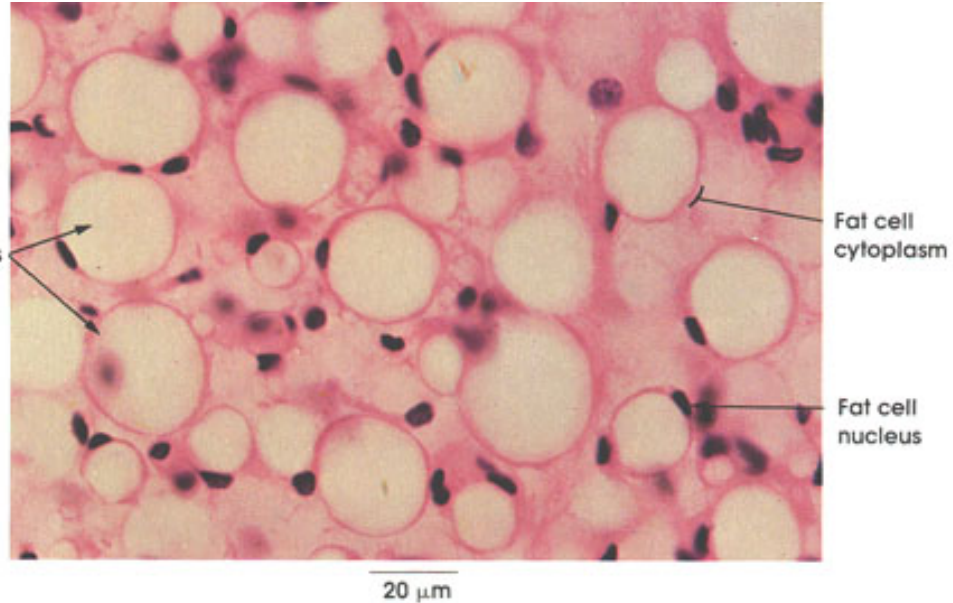


## Myth 5: Muscle Turns to Fat



Fat globules

≠



Muscle contracts

Fat stores survival fuel!

**Muscle & fat are not magically interchangeable!**



≠



## Myth 6: Spot Reduction



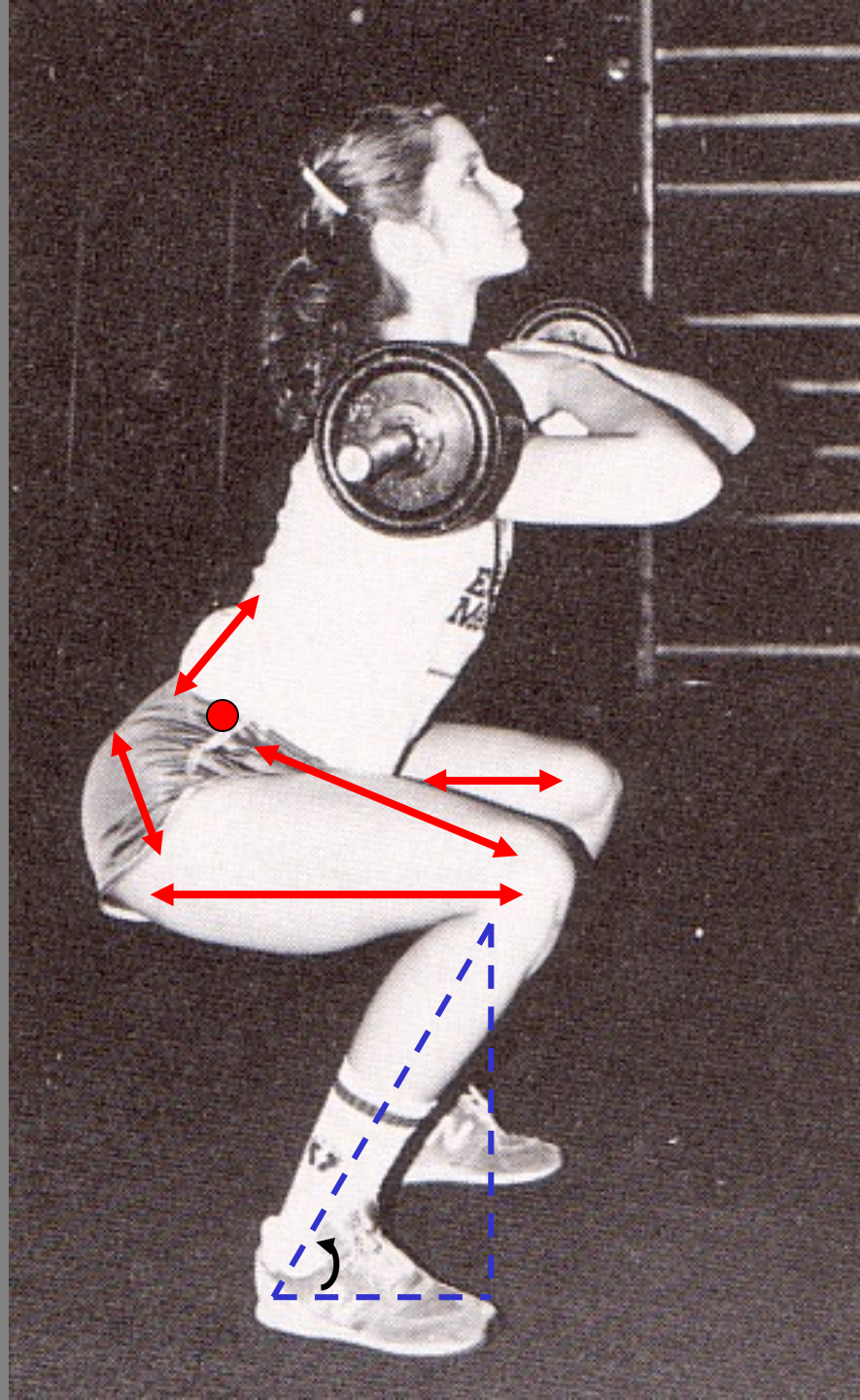
***Squat!***

***Lower Body!***

***COG to periphery!***



# Front Squat



Hip  
Thigh front  
back  
inside  
Lower back

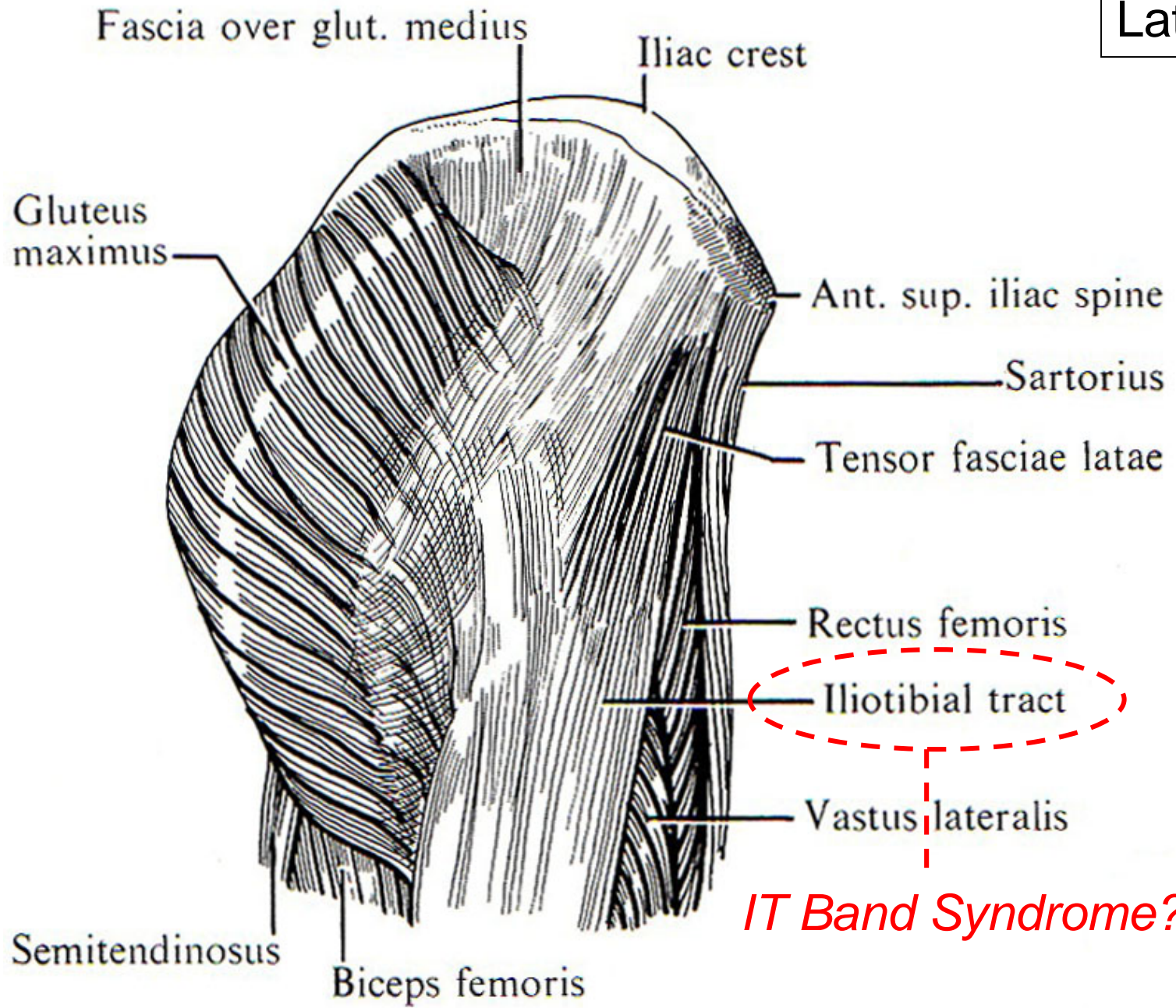
Gluteal group  
Quadriceps  
Hamstrings  
Adductors  
Erector spinae

*Sprinters  
rely upon  
explosive  
hip & thigh  
strength  
emanating  
from the  
Center of  
Gravity! ●*



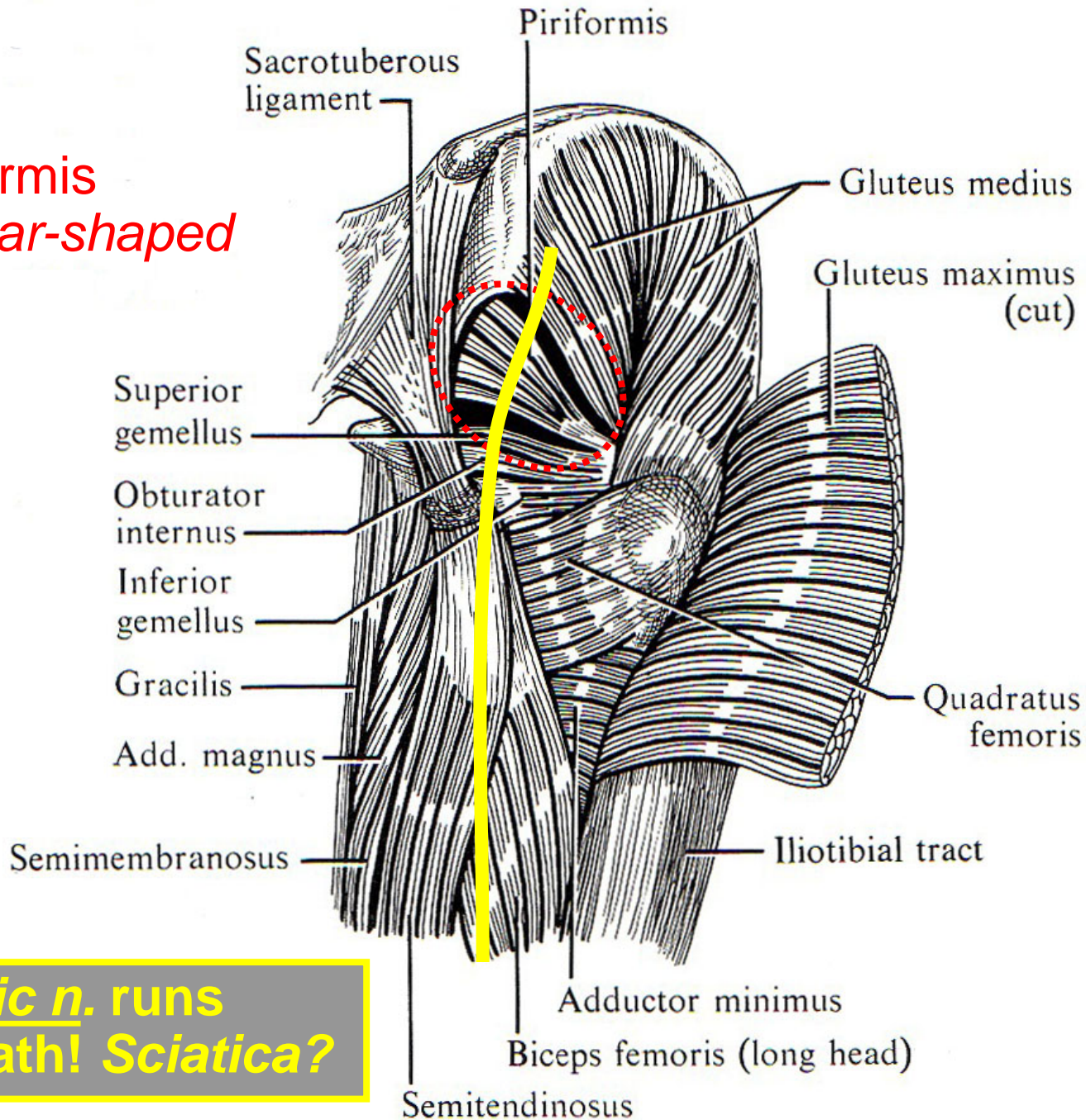
L Sherwood

R hip  
Lateral



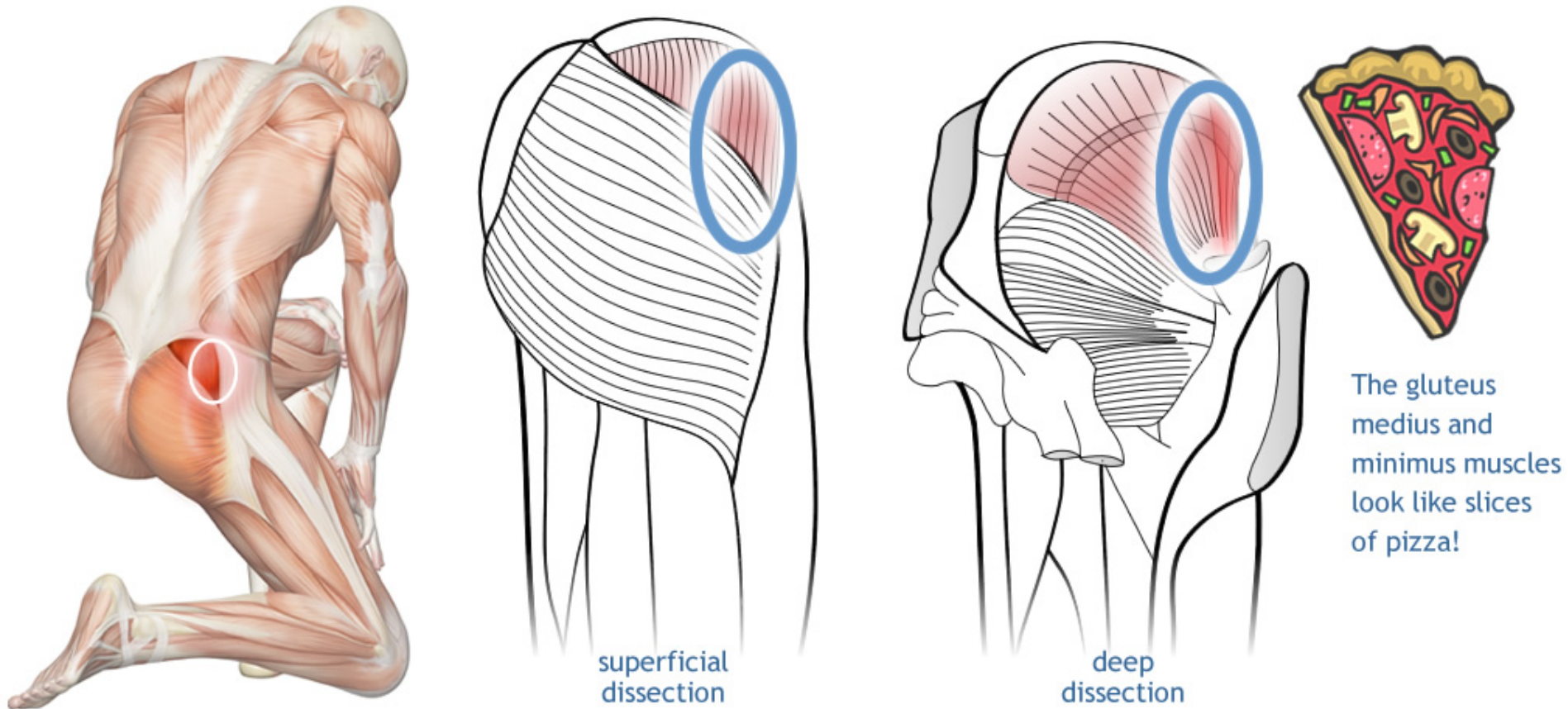
R hip  
Posterior

Piriformis  
*L. pear-shaped*



**Sciatic n. runs  
beneath! *Sciatica?***

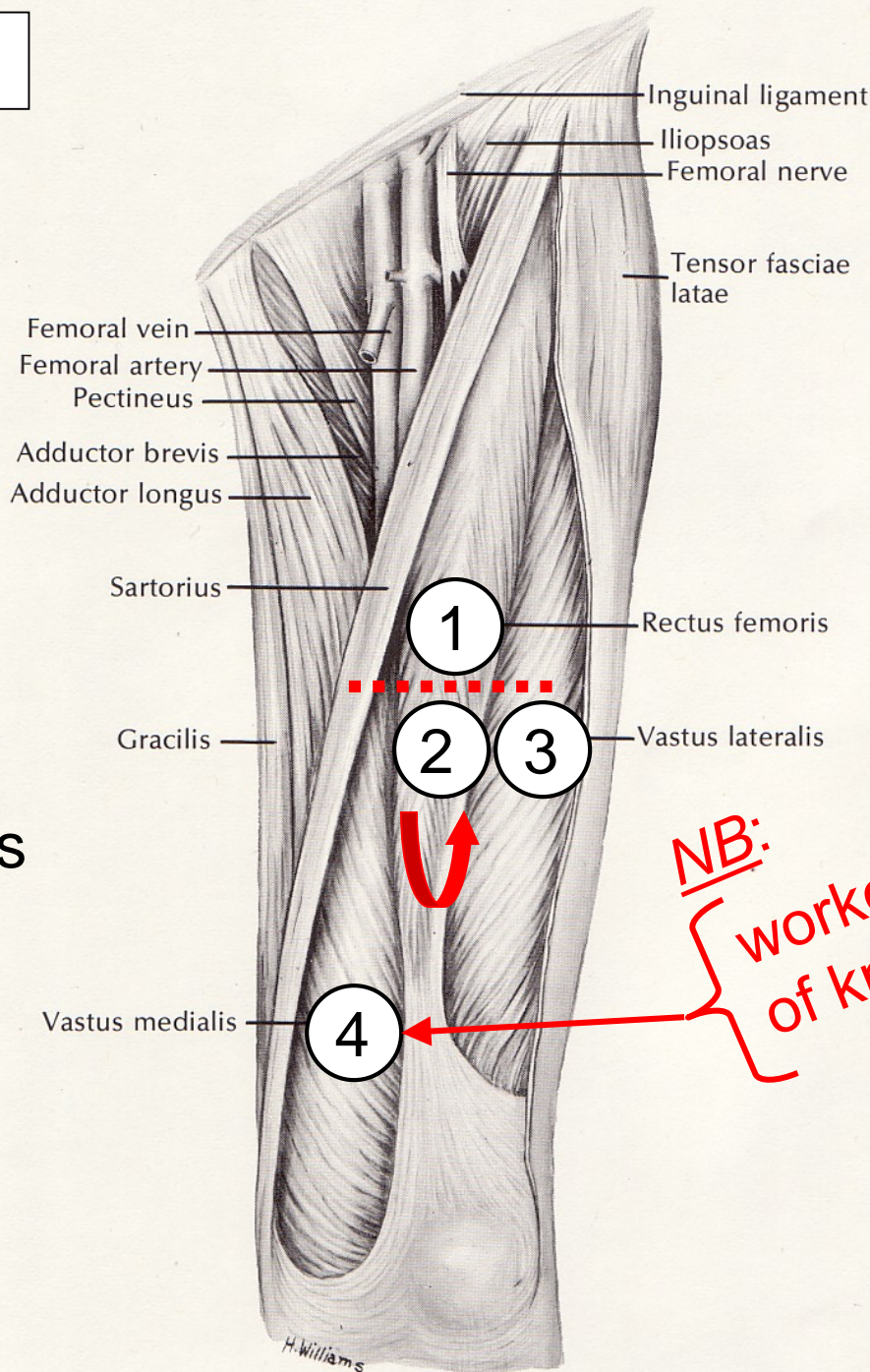
# Deeper Gluteal Muscles Look Like Pizza Slices!! Superficial to Deep: *Maximus, Medius, Minimus*!



[http://www.anatomyexpert.com/structure\\_detail/5715/](http://www.anatomyexpert.com/structure_detail/5715/)

Image Source: <http://saveyourself.ca/articles/spot-06-gluteus-medius.php>

# L thigh anterior



## Quadriceps

- 1 Rectus femoris
- 2 Vastus intermedius
- 3 Vastus lateralis
- 4 Vastus medialis

**NB:**  
worked last 10-15°  
of knee extension

L thigh anterior  
& medial

**NB: torqued laterally**

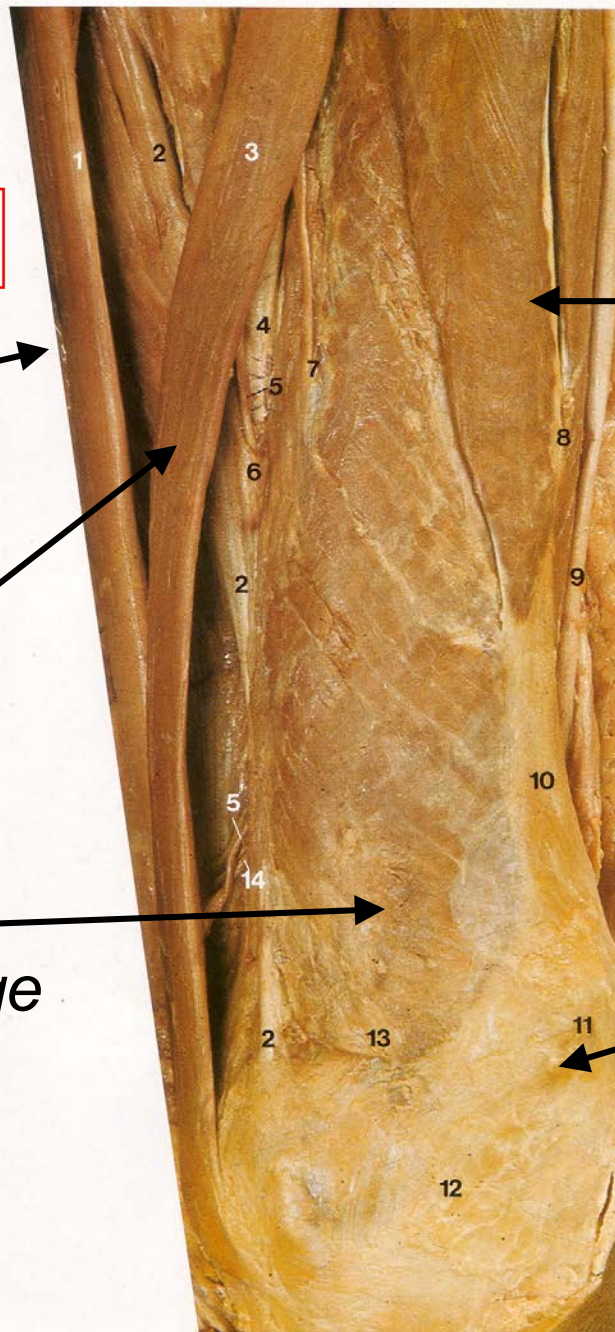
Gracilis  
*L. slender adductor*

Sartorius  
*L. tailor*

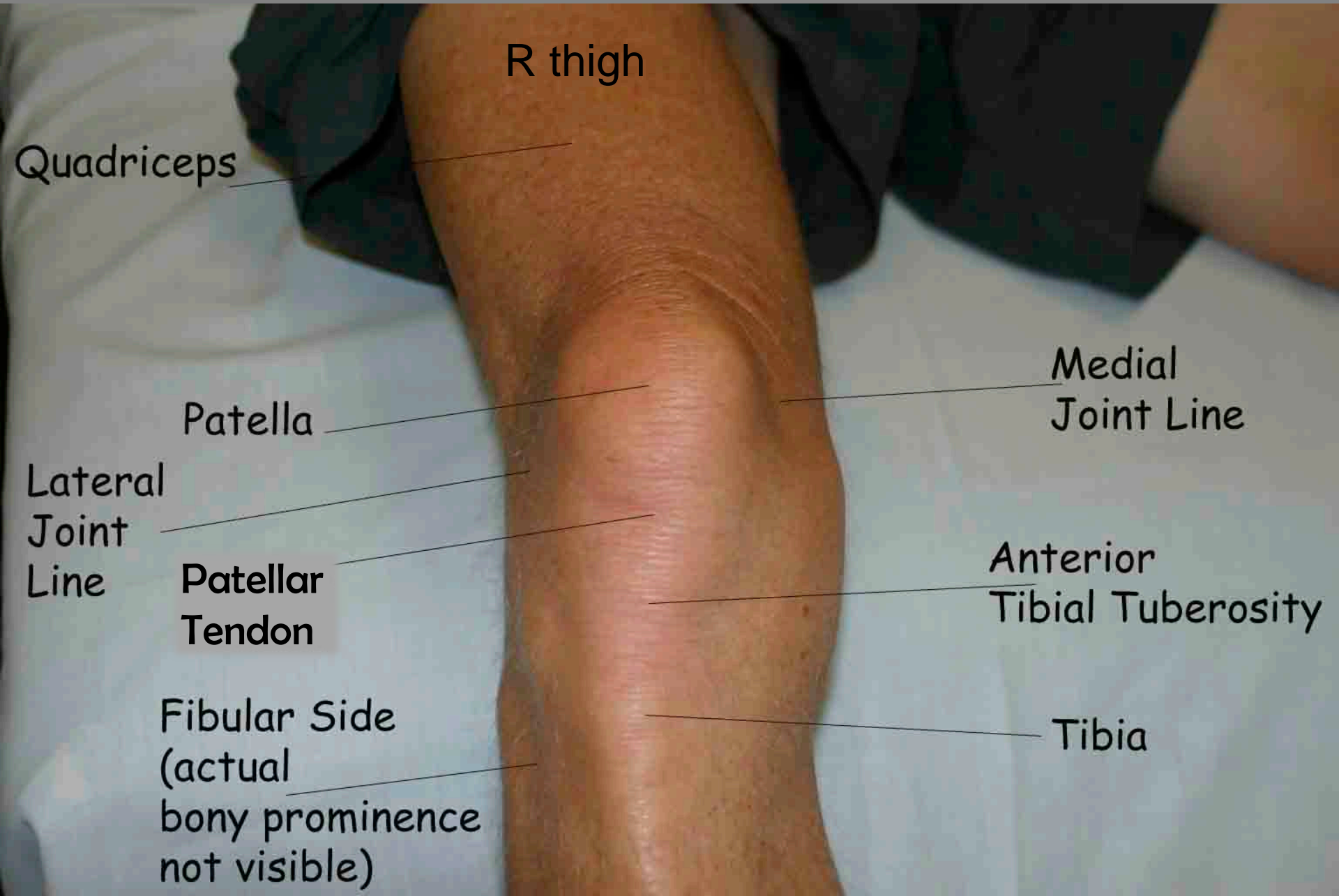
Vastus medialis  
*L. great, vast, huge medial extensor!*

Rectus femoris  
*L. straight thigh muscle, also extensor*

Patella ≡ kneecap  
*L. shallow dish/pan, sesamoid or island bone*



# *Knee Surface Anatomy – UC San Diego Clinical Medicine*



R thigh

Quadriceps

Patella

Medial  
Joint Line

Lateral  
Joint  
Line

Patellar  
Tendon

Anterior  
Tibial Tuberosity

Fibular Side  
(actual  
bony prominence  
not visible)

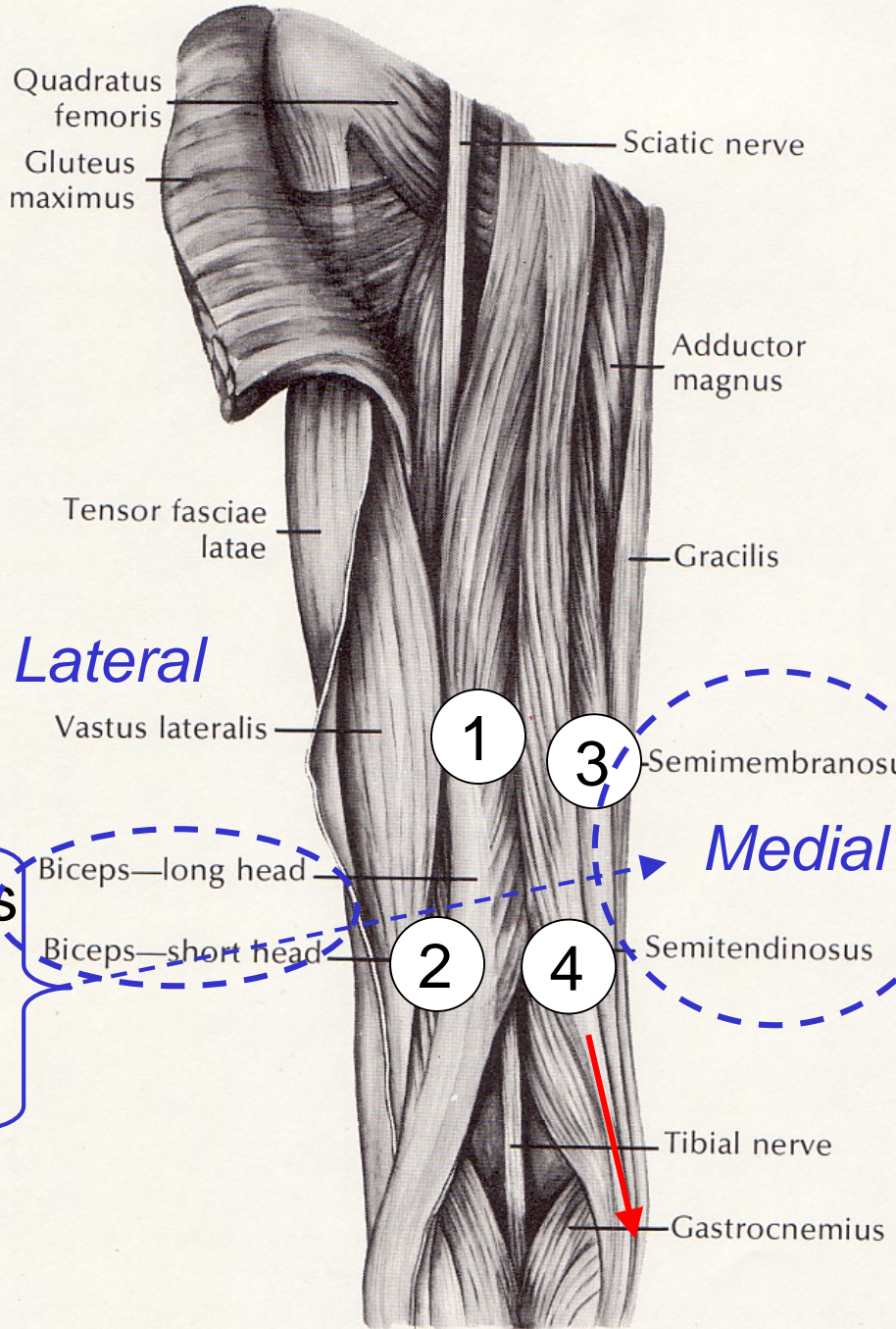
Tibia



L thigh  
posterior

### Hamstring Group

- ① Biceps femoris (long)
- ② Biceps femoris (short)
- ③ Semimembranosus
- ④ Semitendinosus



L thigh  
posterior

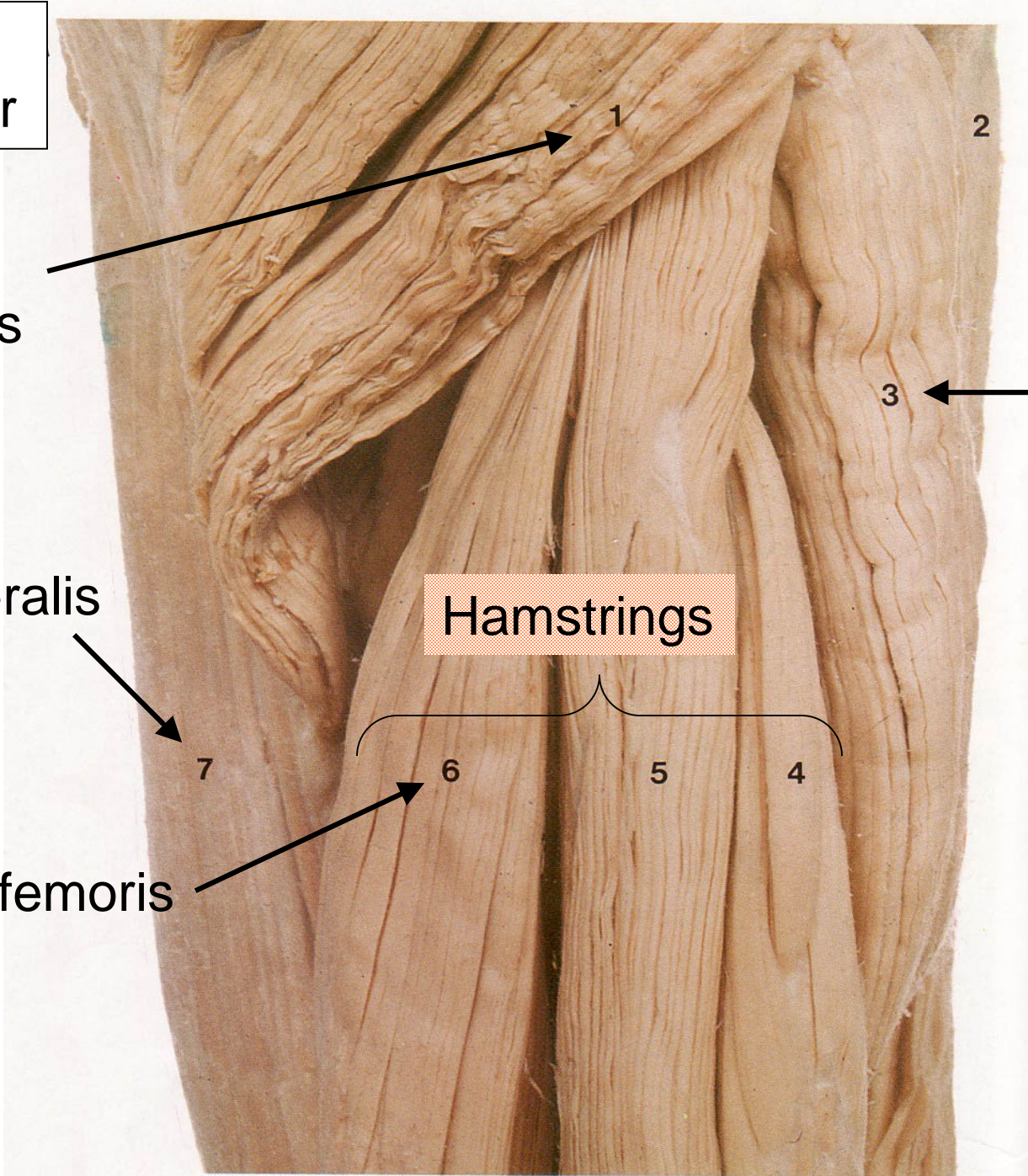
Gluteus  
maximus

Vastus lateralis

Biceps femoris

Hamstrings

Adductor  
magnus



1

2

3

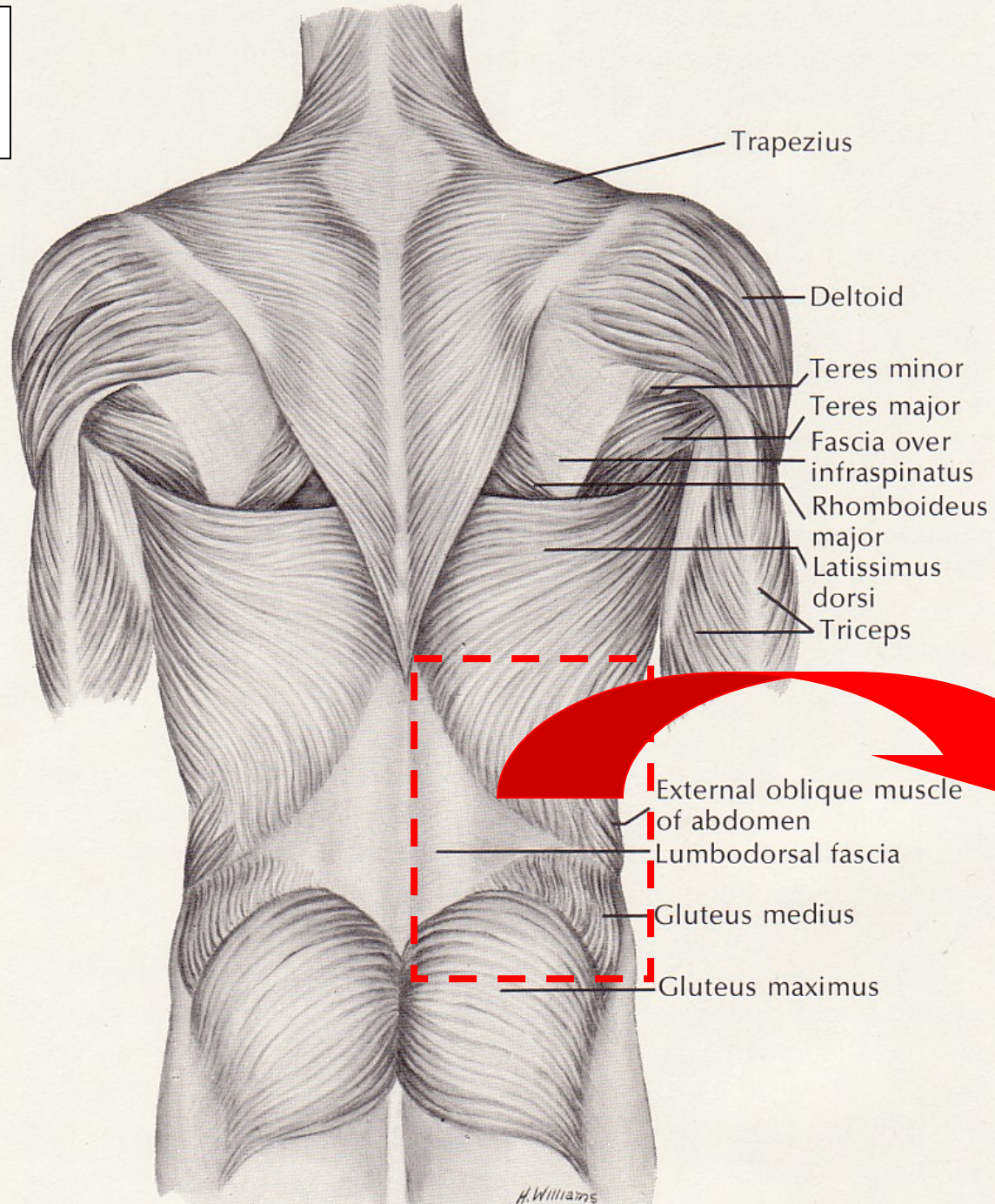
7

6

5

4

R lower back  
& hip quadrant



R lower back  
& hip quadrant



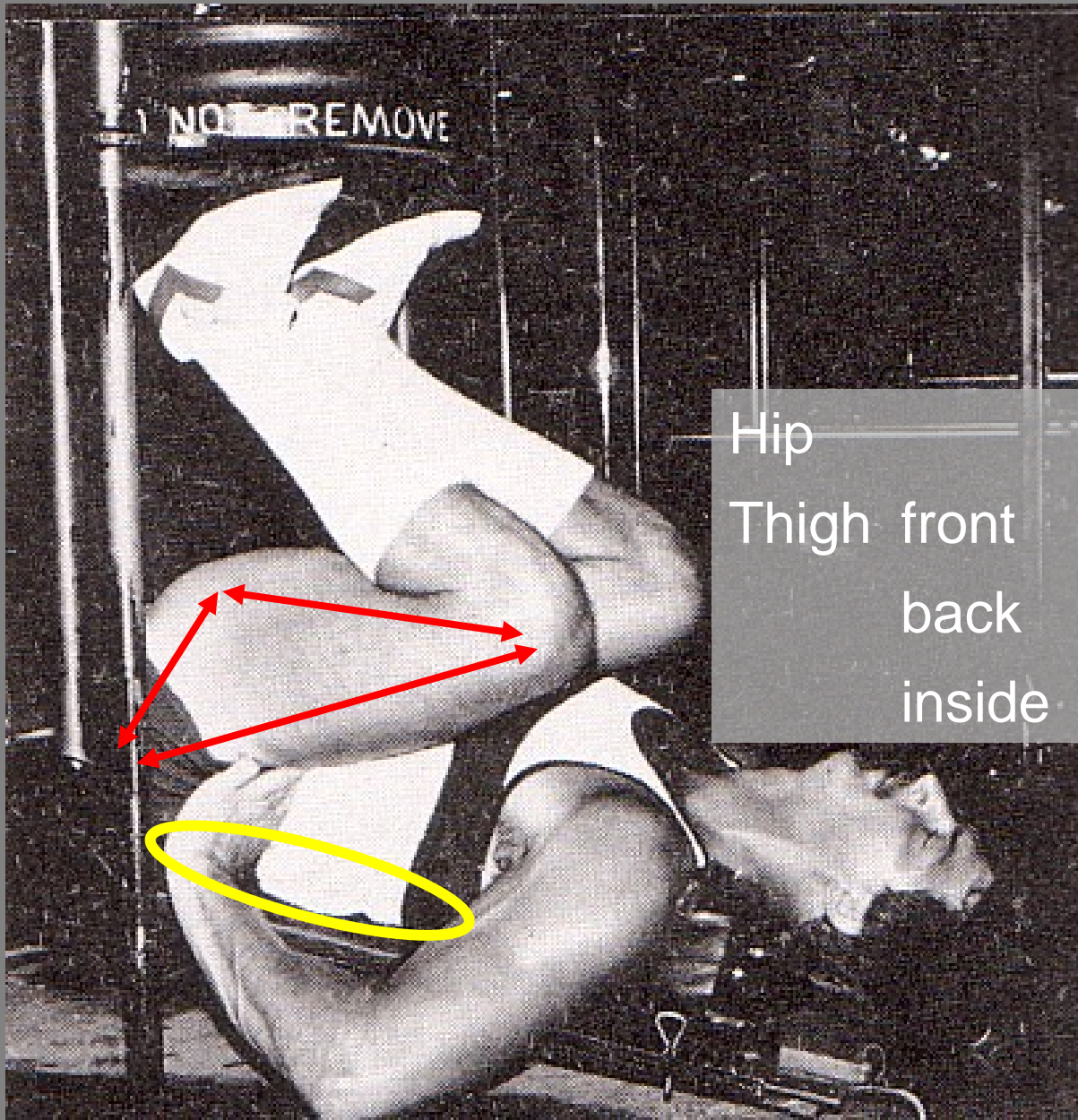
Latissimus dorsi

Erector spinae  
beneath fascia

External oblique

Gluteus maximus

# Leg Press

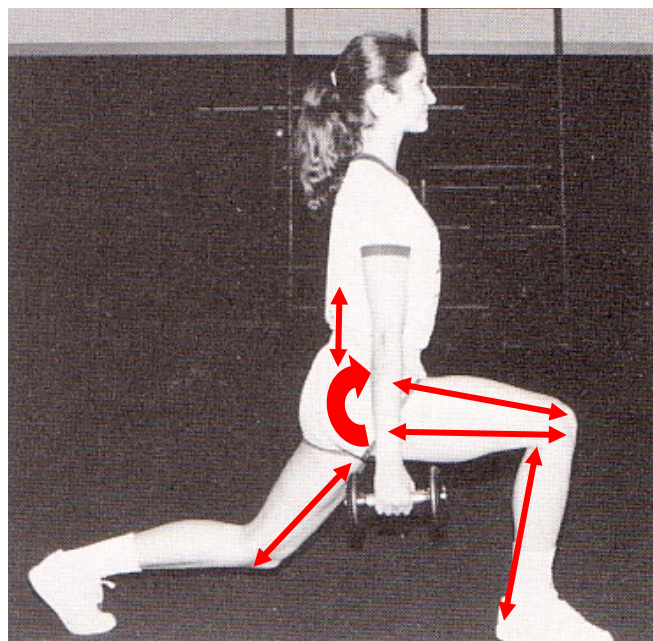
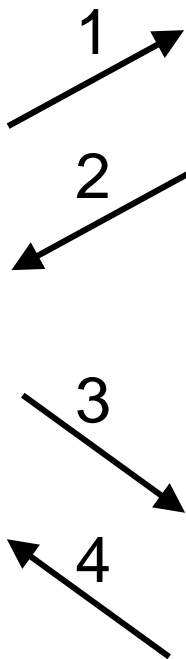


Hip  
Thigh front  
back  
inside

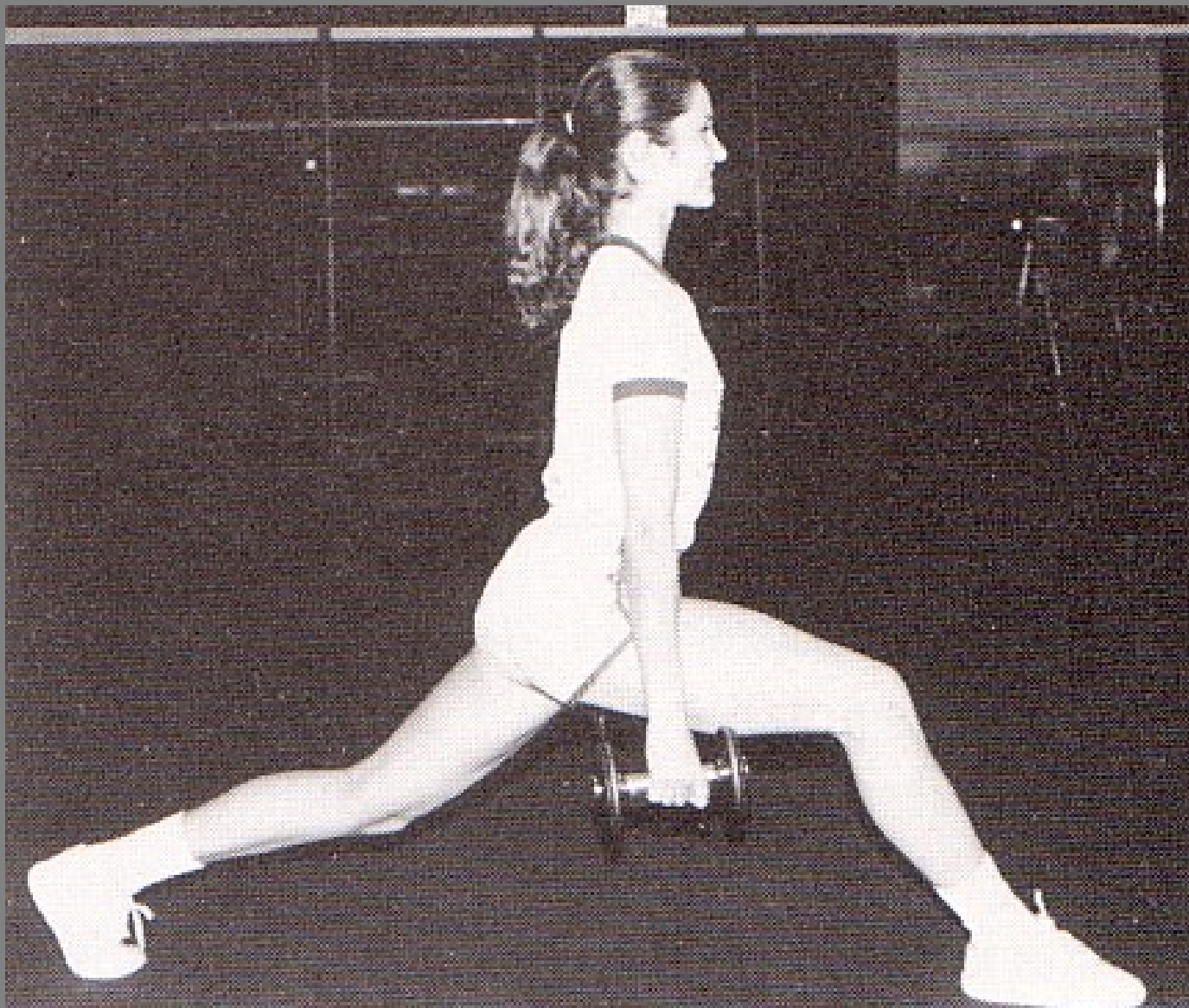
Gluteal group  
Quadriceps  
Hamstrings  
Adductors

- Lower back

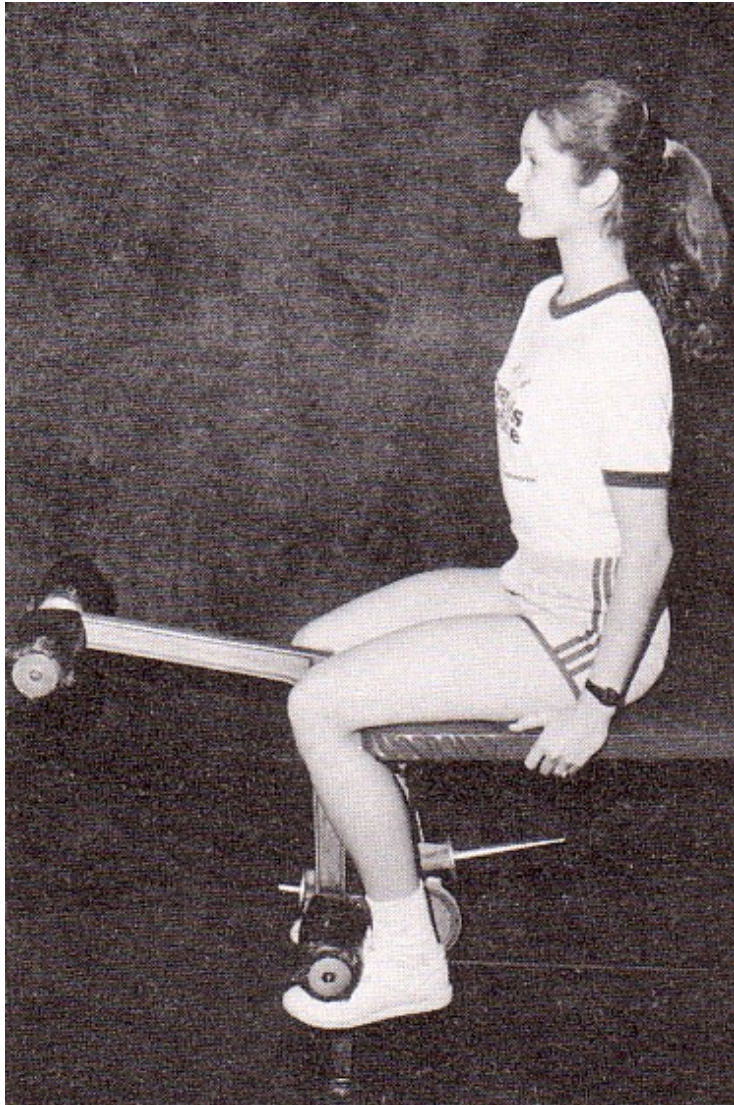
# Lunge



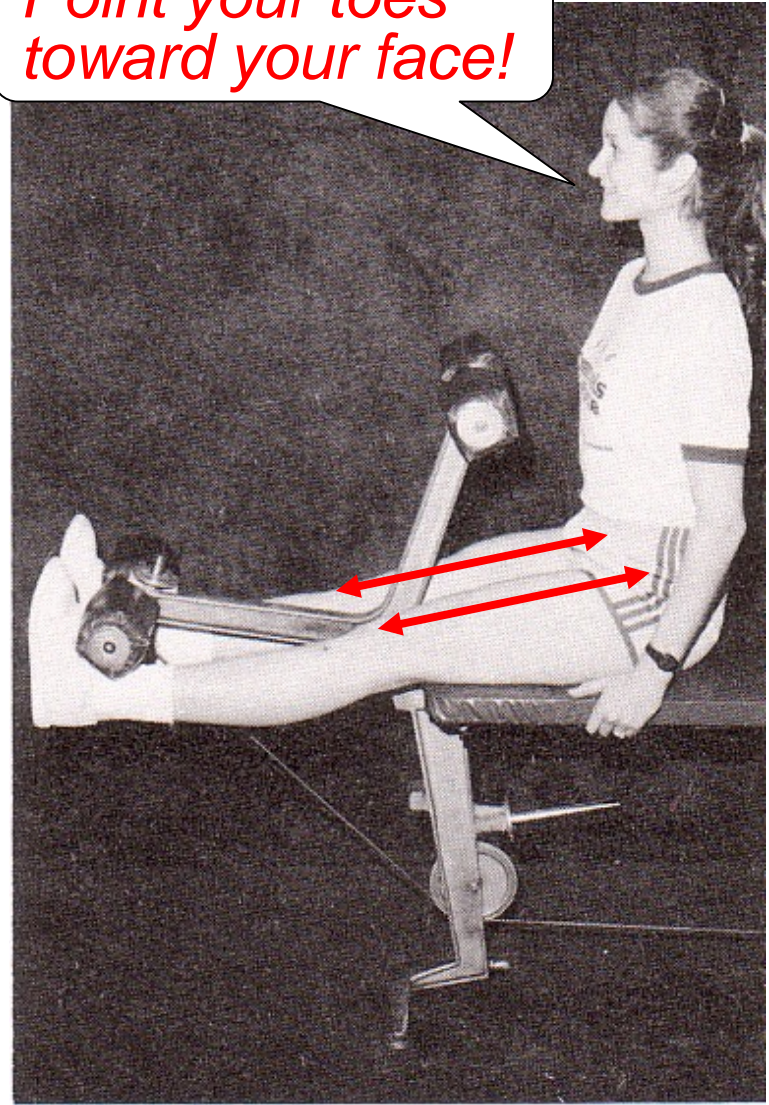
# Avoid Overstriding!



# Leg Extension



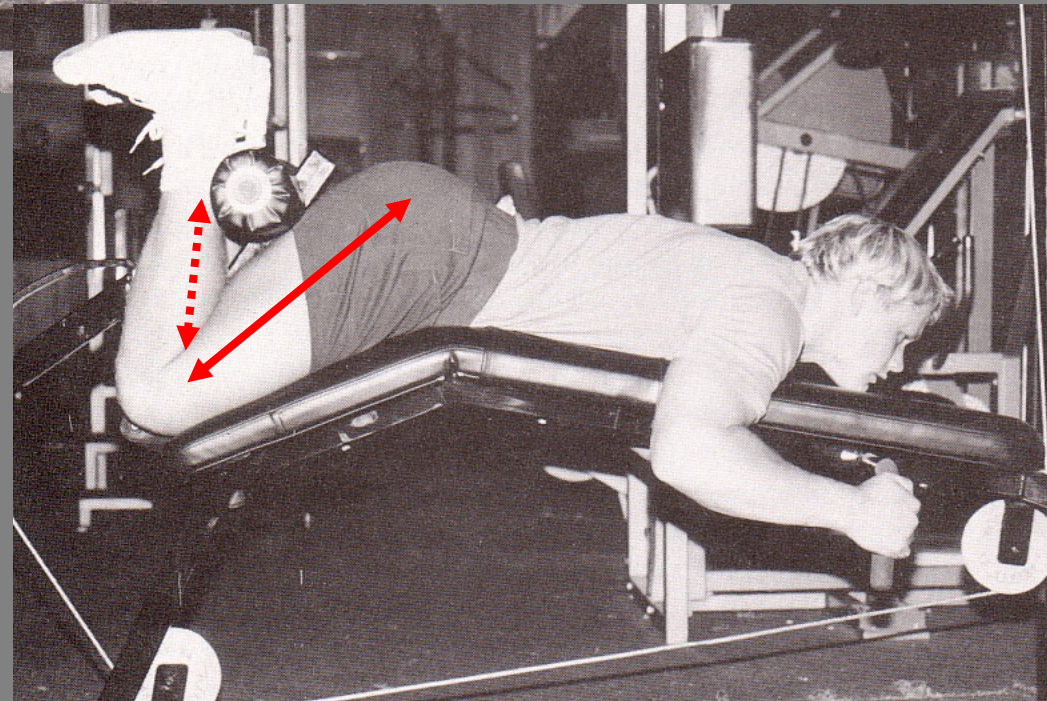
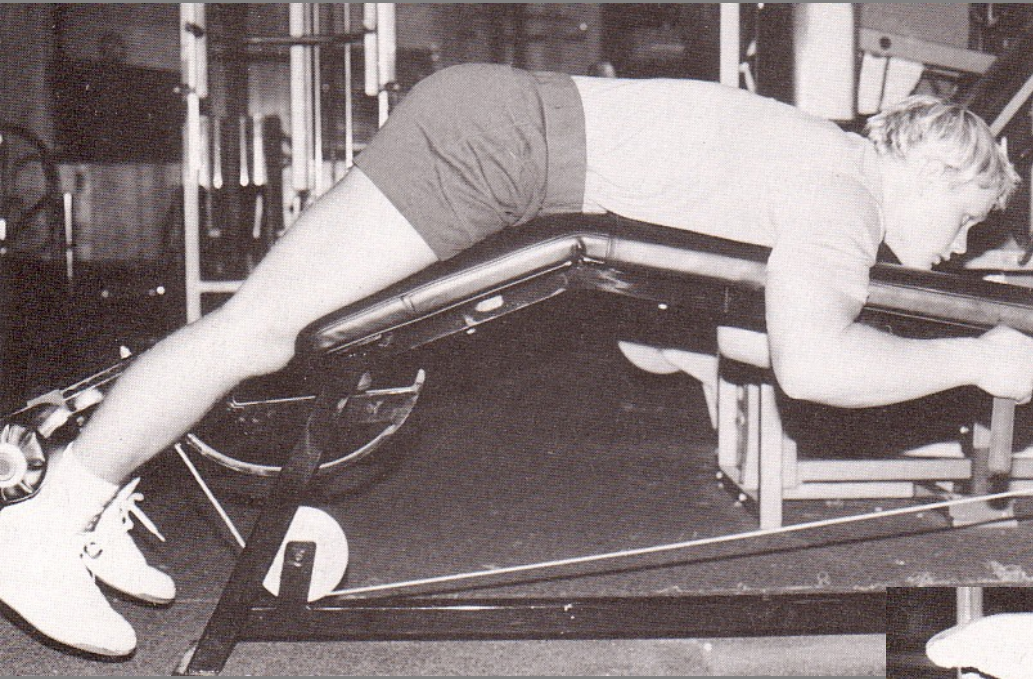
*Point your toes toward your face!*



*Front of thigh = quadriceps*



# Leg Curl



*Posterior thigh = hamstring group*

*Calf = gastrocnemius  
(minor involvement)*

***Push!***

***Upper Body!***

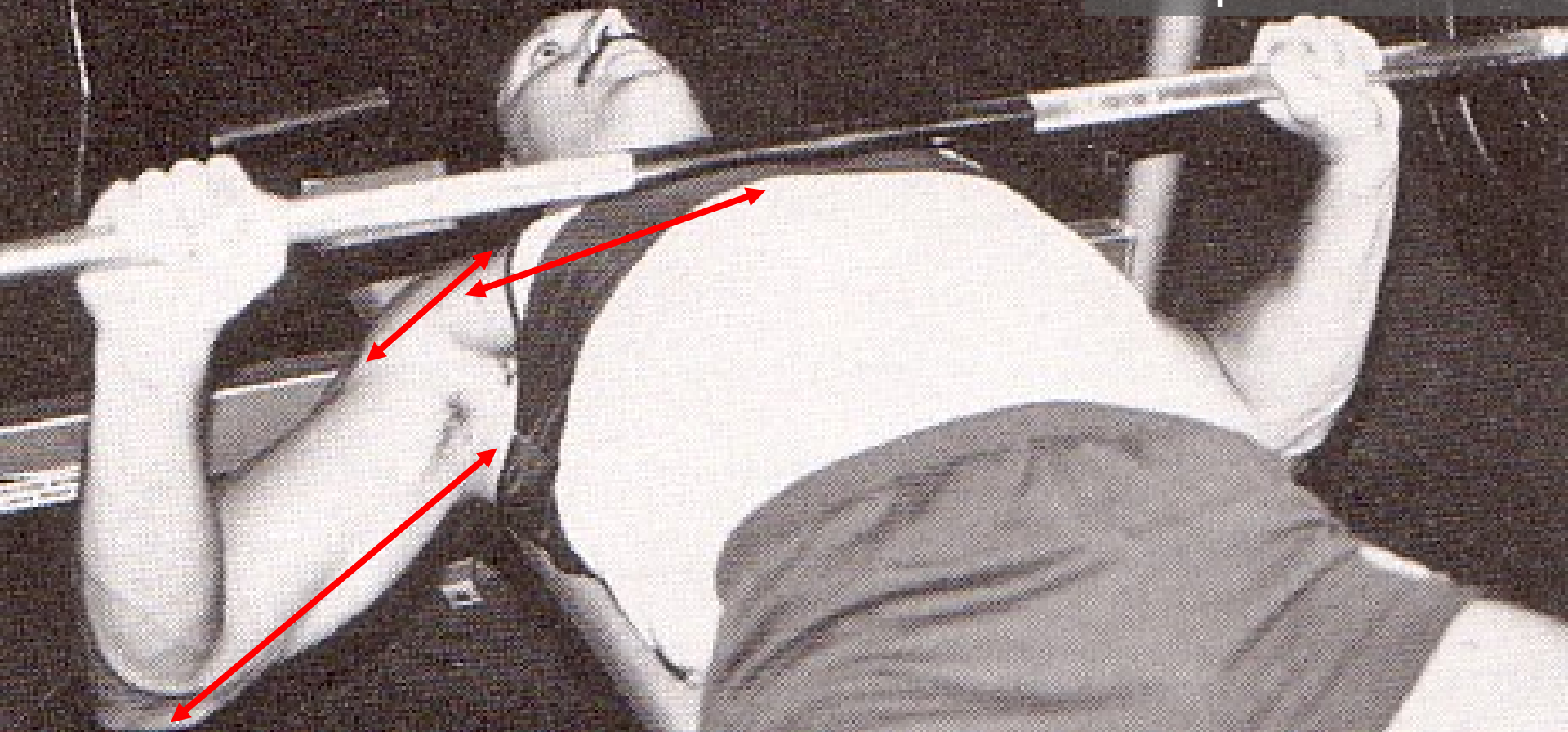
***Multi-Joint Action!***

***Agonistic!***

# Bench Press

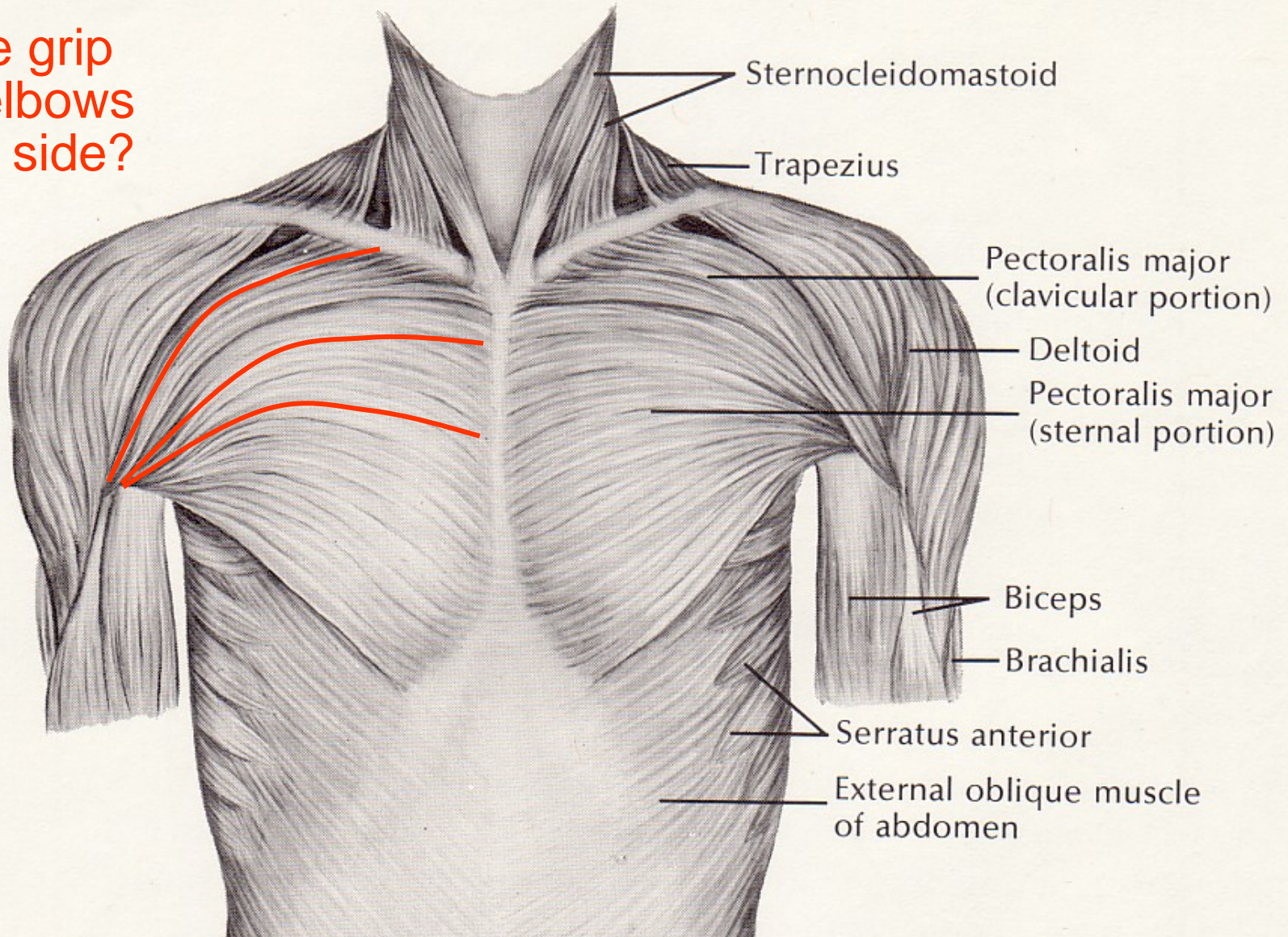
Chest  
Shoulder front  
Arm back

Pectoral group  
Anterior deltoid  
Triceps brachii



# Chest anterior

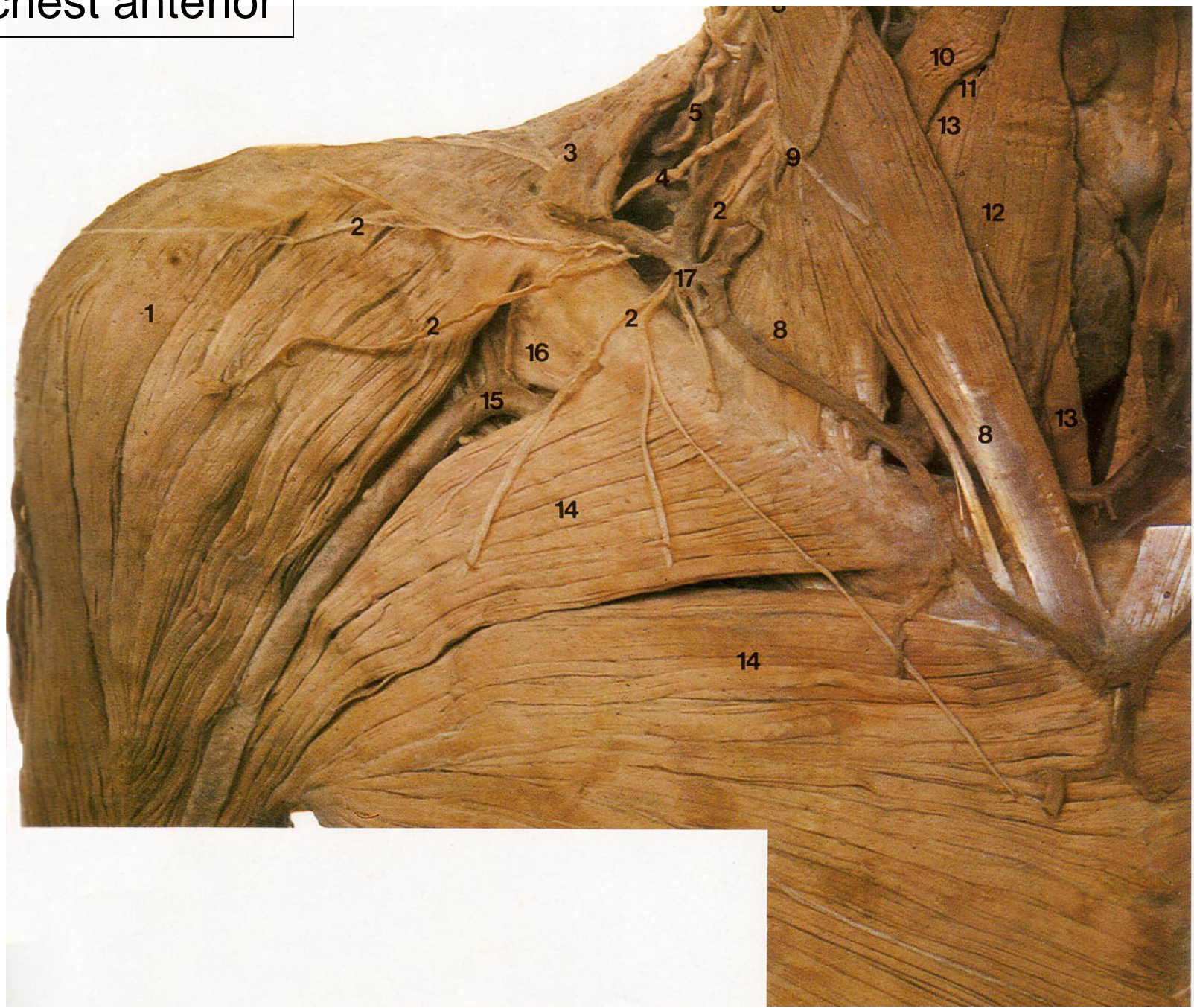
Q. Wide grip  
vs. elbows  
near side?



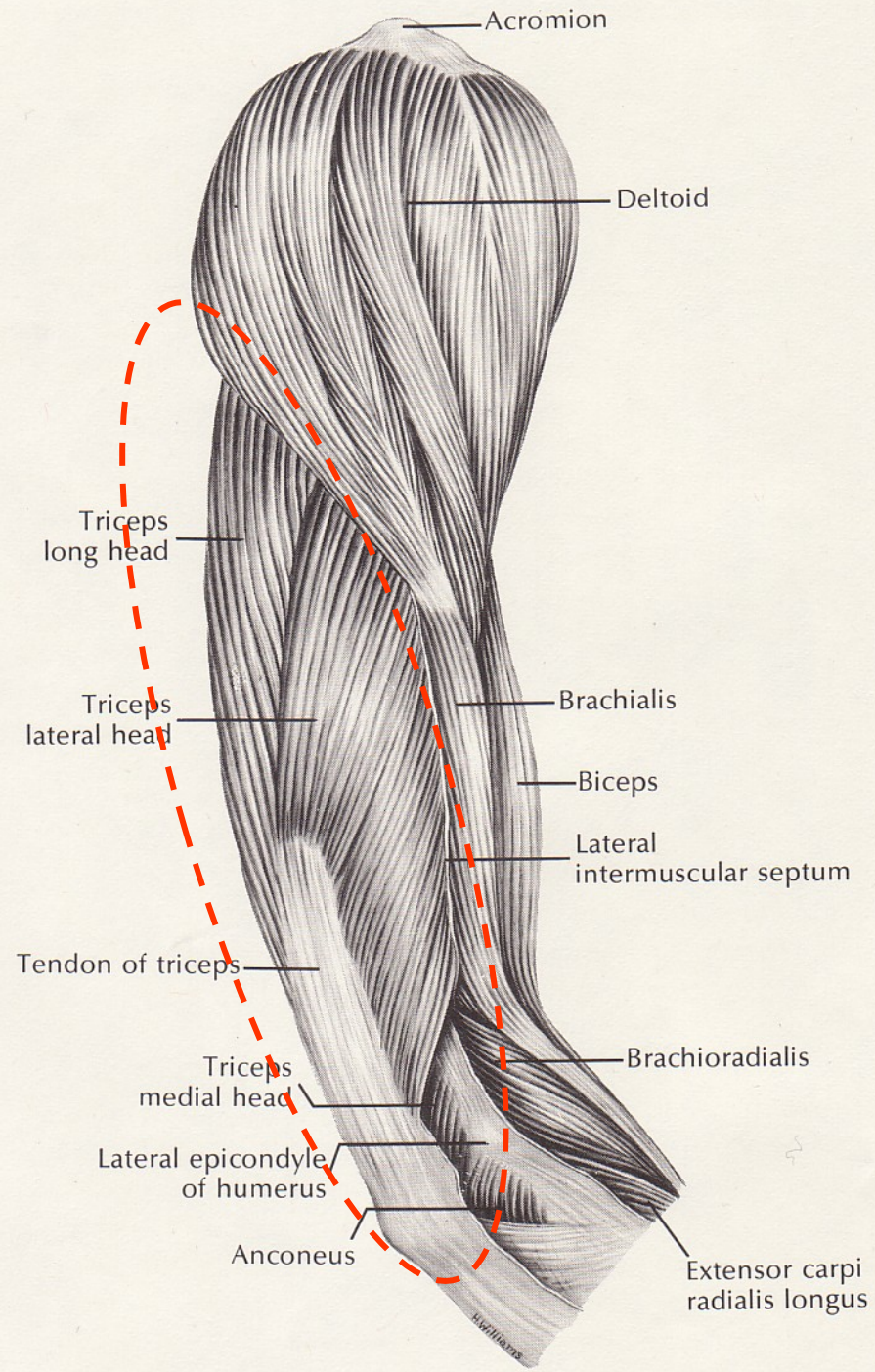
R chest anterior



R chest anterior



# R arm lateral



L arm lateral

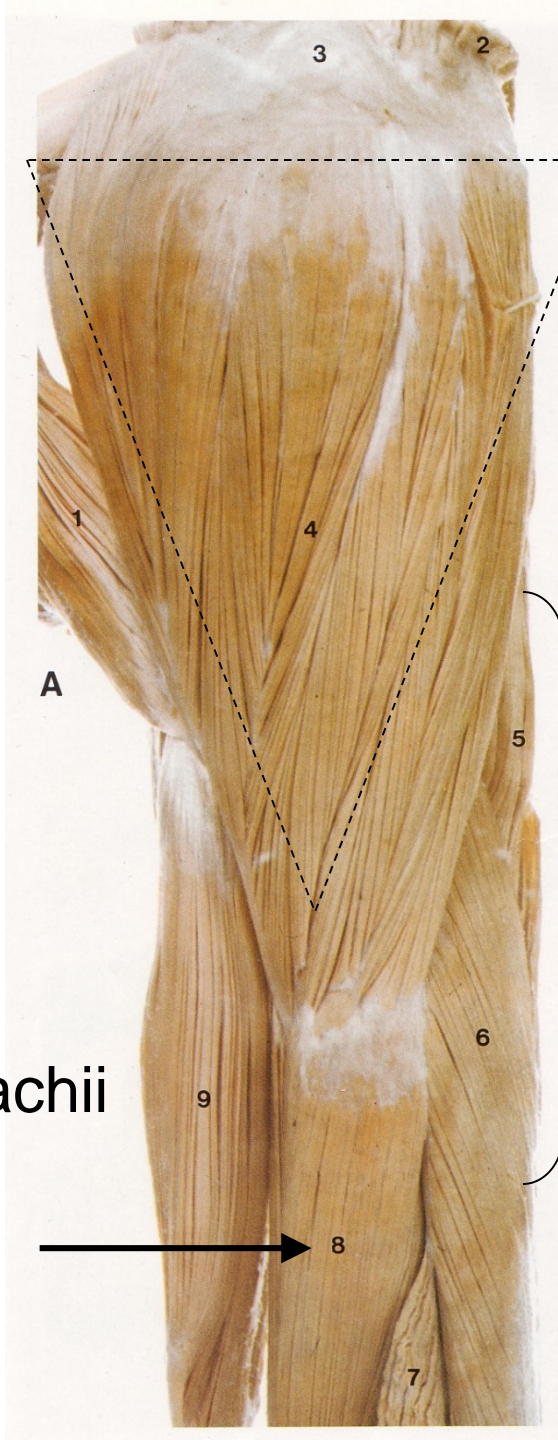
Pectoralis major

Deltoid

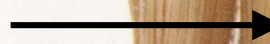
Triceps brachii

Biceps brachii

Brachialis

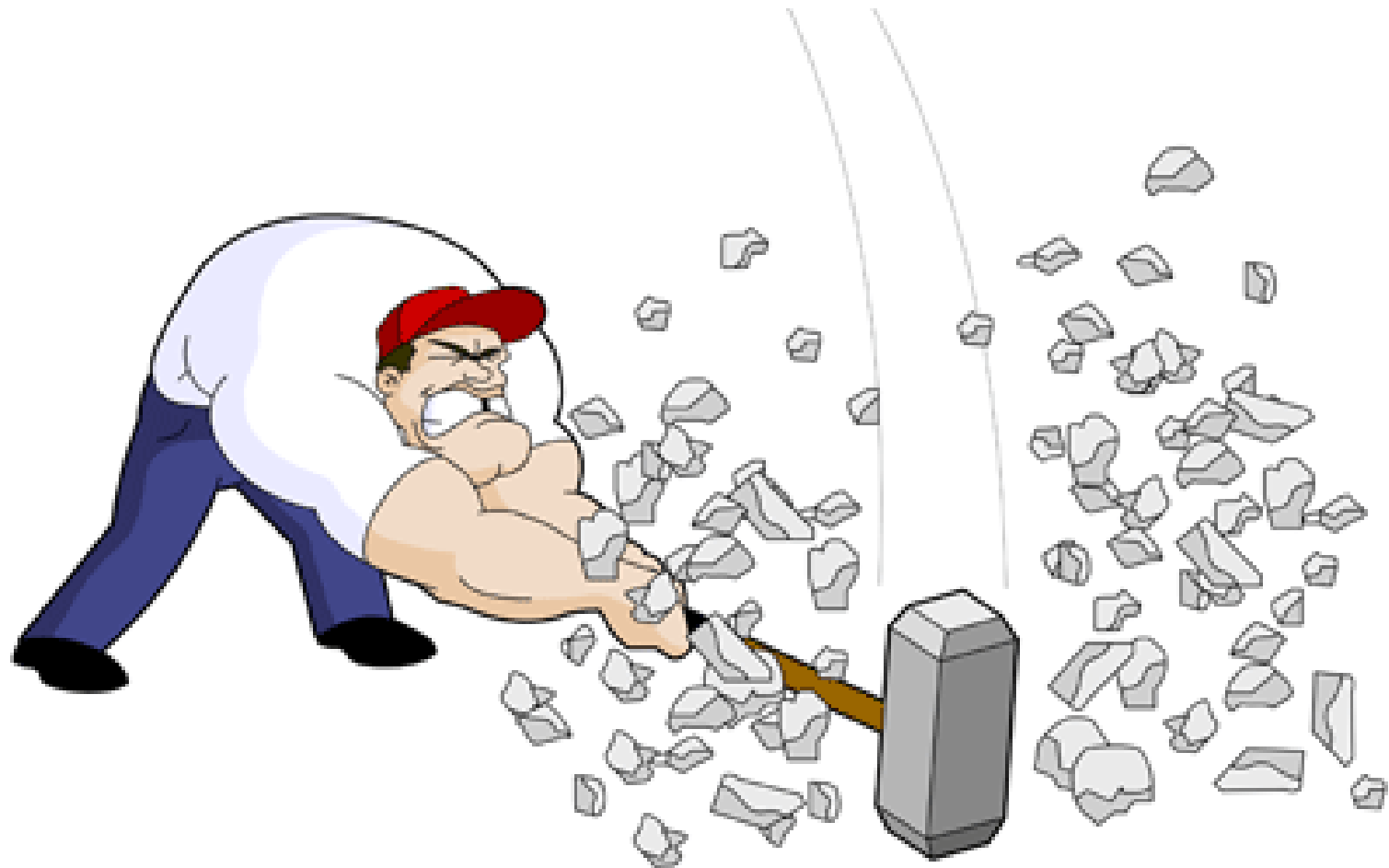


A

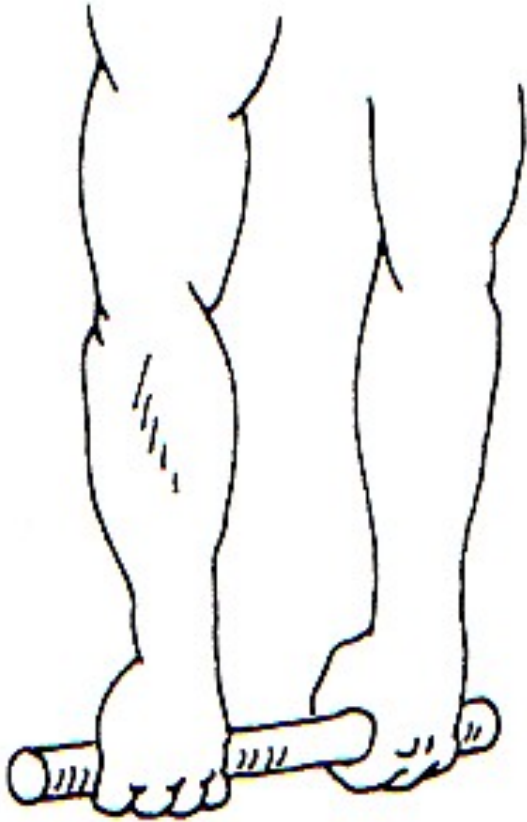




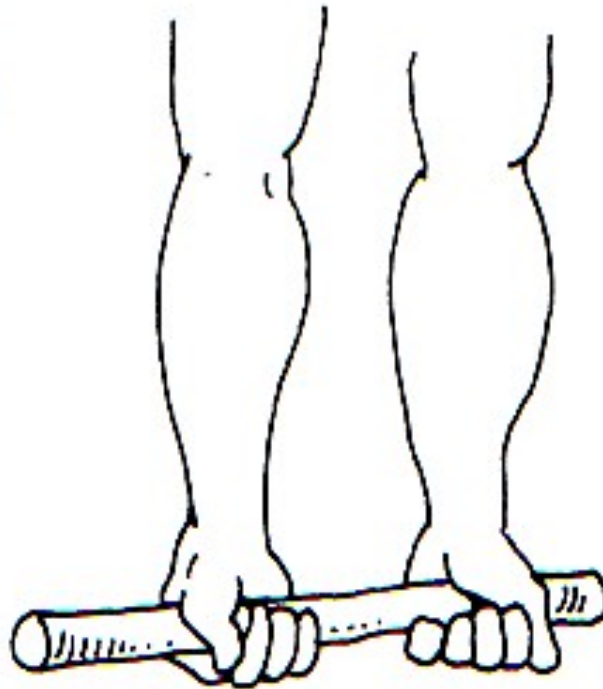
# Latissimus Dorsi Most Heavily Activated in *Hammering Plane*!



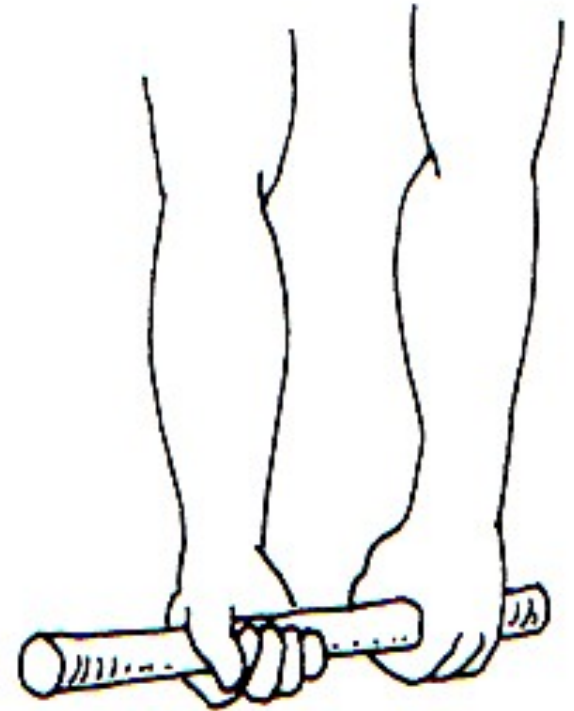
# ***Common grips used in weight training***



Pronated  
/Overhand



Supinated  
/Underhand



Alternate  
/Spotting

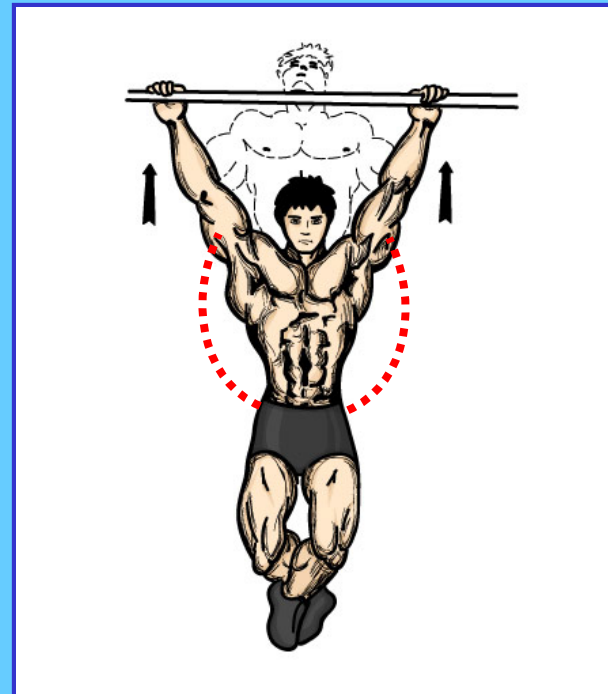
# What are upper & lower extremity climbing muscles?



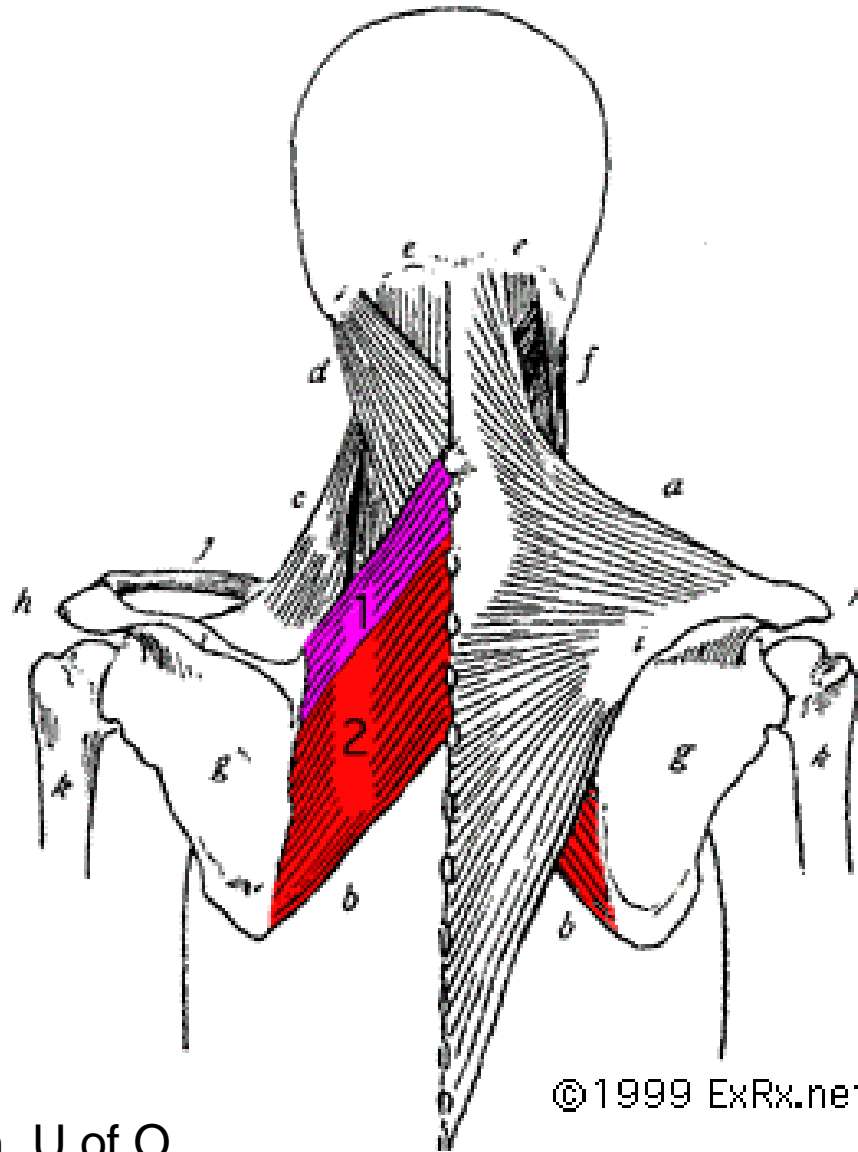
**Shoulder-width grip →  
more Latissiumus dorsi**



**Wider grip → more  
Rhomboids,  
middle Trapezius**



***Rhomboid muscles include  
Major & minor***



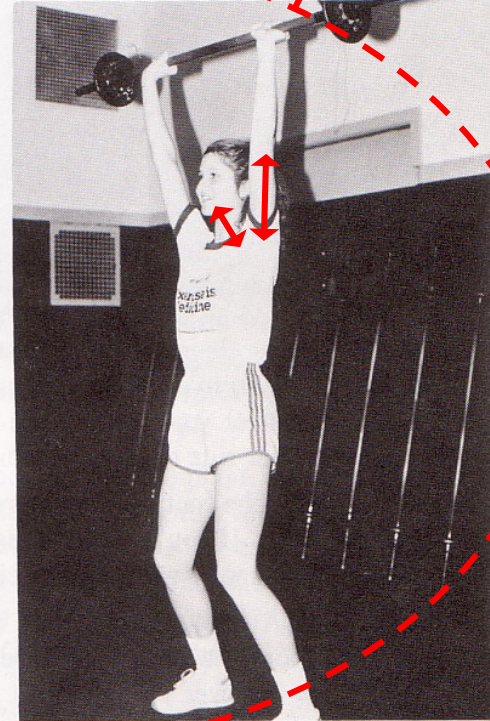
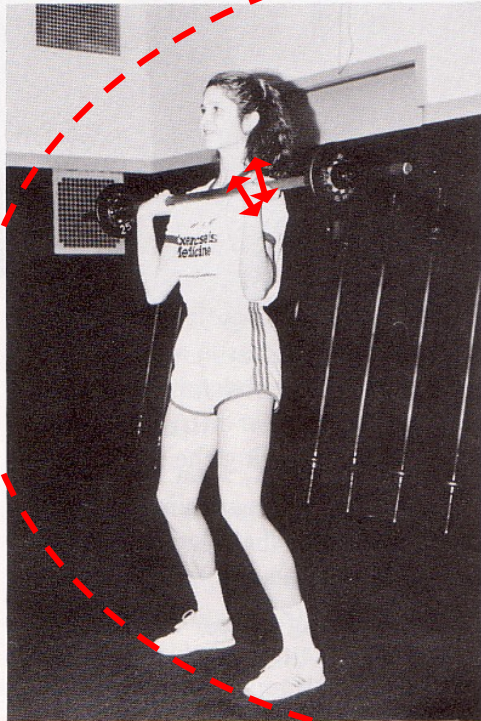
©1999 ExRx.net

Courtesy S. Dawson, U of O



## *Military Press*

Shoulder – front & middle  
Arm – back  
Neck

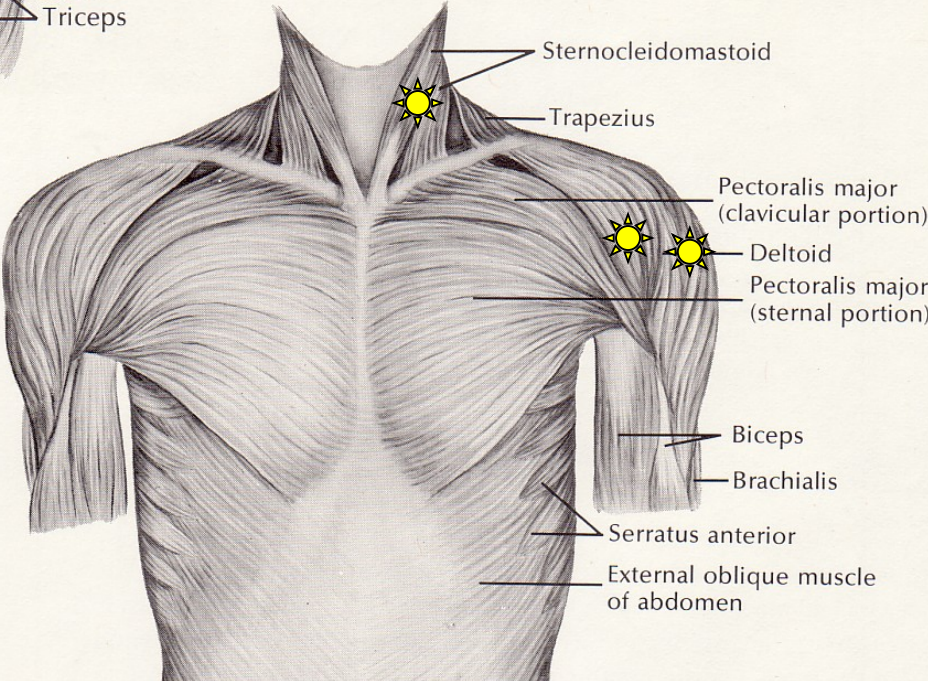
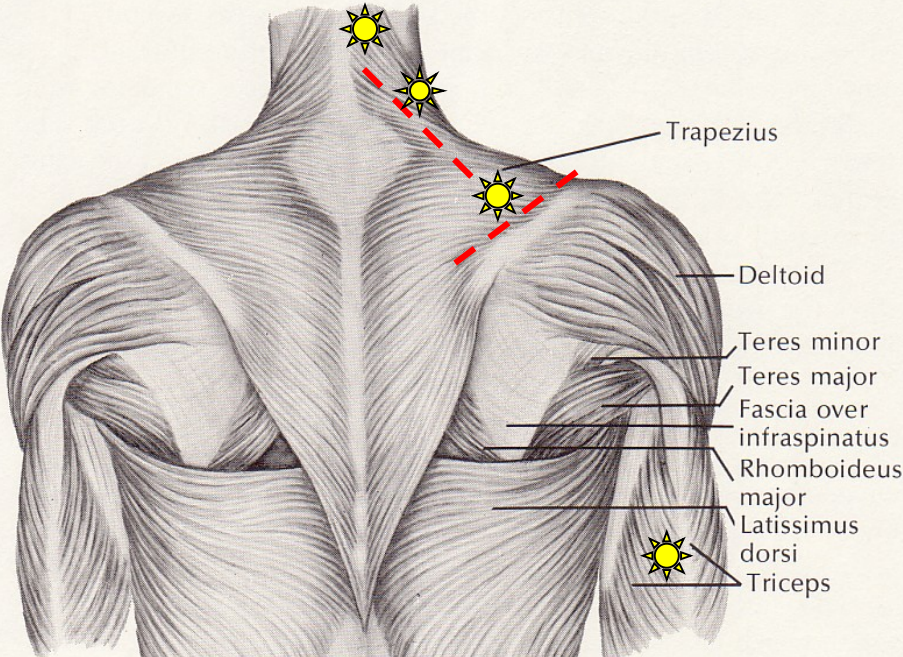


Anterior & Middle Deltoid  
Supraspinatus  
Triceps Brachii  
Anterior neck muscles  
Sternocleidomastoid  
Posterior neck muscles  
Upper trapezius  
Levator scapula

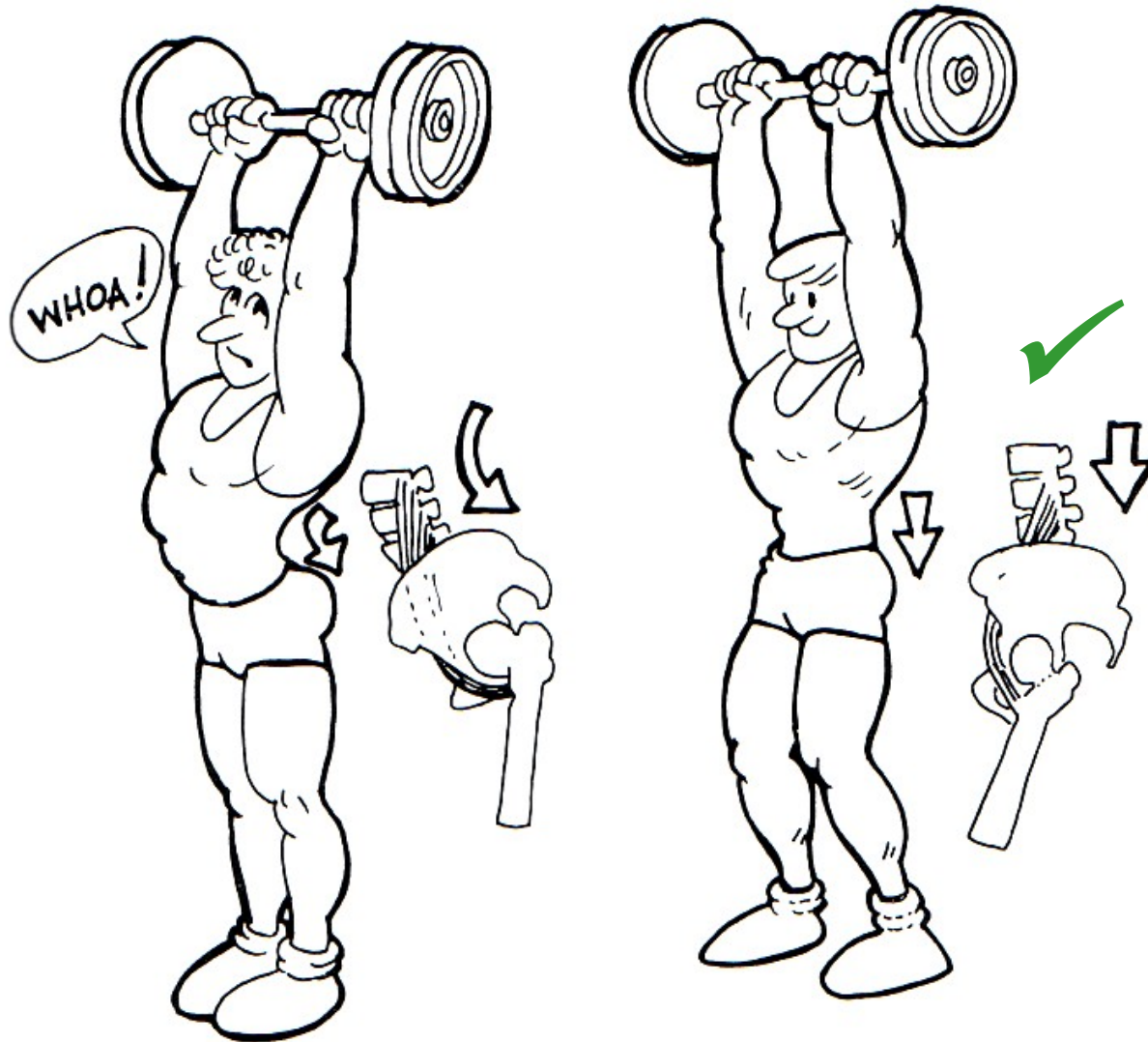
B

C

# Military Press Muscle Activation



***Contract abdominals, bend knees,  
widen stance to reduce back stress!***





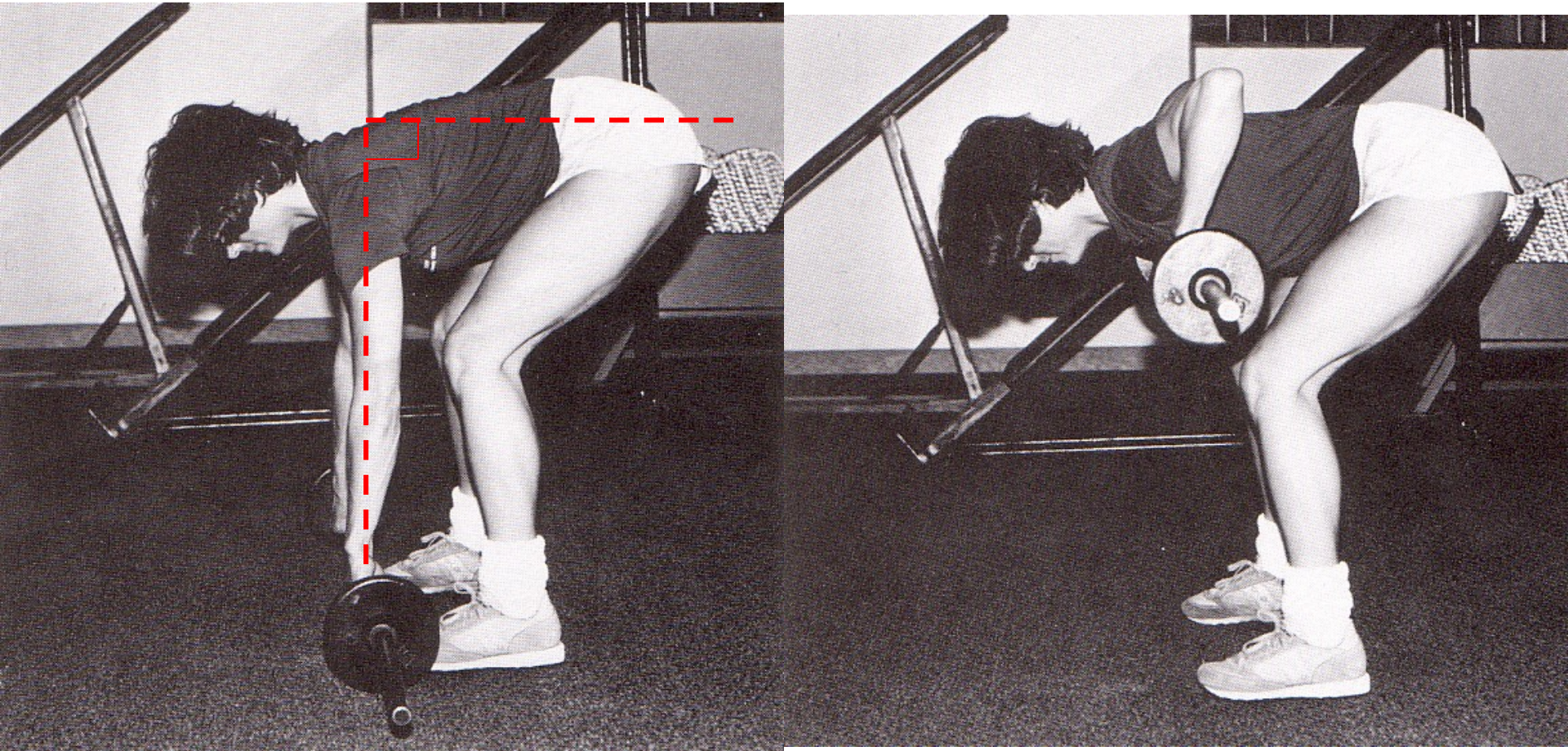
***Pull!***

***Upper Body!***

***Multi-Joint Action!***

***Antagonistic!***

# Bent-over Row



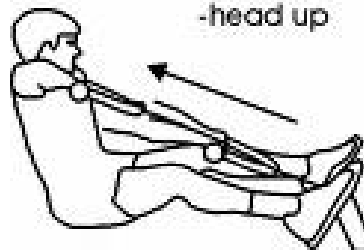
**NB:** Engages muscles exactly inverse to bench press. Upper back, back of shoulder, front of arm, back of forearm. Great for supersetting!

# Seated Row! Wow Possibilities!?

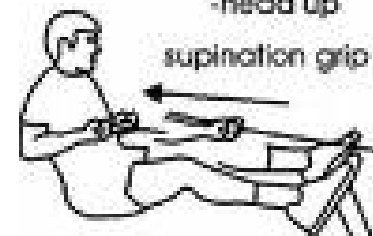


on pulley  
with cable

- keep back straight
- chest out
- head up



- keep back straight
- chest out
- head up



**NB:** Engages muscles inverse to bench press with a bit more lower back! Still good for supersetting! Variable grip and pull?

Latissimus dorsi grip vs wider rhomboid,  
mid-trapezius grip. Posterior deltoid?  
Pronated vs supinated?



SOURCE: [www.fitworkz.com](http://www.fitworkz.com)

[http://www.ehow.com/video\\_2367237\\_do-rowing-upper-body-exercises.html](http://www.ehow.com/video_2367237_do-rowing-upper-body-exercises.html)