

BI 199 APWT Discussion 9



...Personal topic + outline
due next session!

- I. *Announcements* Thursday topic + thematic poster outline due. Send .doc/.docx file attachment to: lombardi@uoregon.edu. Presentation schedule soon!
Anatomy Lab rotations this Thursday!**
- II. *Sports Medicine News* Weights for pitchers?**
- III. *Fundamental Training Principles Overview*
Homeostasis, Overload, Reversibility, Specificity**
- IV. *Exercise Anatomy, Technique & Options*
 - A. Calf raise
 - B. Chest fly
 - C. Military press
 - D. Triceps extension
 - E. Biceps curl**
- V. *Weight Training Exercises & Systems***
- VI. *Group Overview of Presentations***

Weightlifting OK for pitcher

Dear Dr. Donohue: I am a 16-year-old baseball pitcher. I'd like to increase my throwing speed, so I have taken up weightlifting. I've gotten two different opinions on this. One tells me that I will get muscle-bound and tight, and that I won't be able to throw like I can now. The other encourages me to train with weights. Which is right?

I also think I am at a disadvantage because of my height. I am 5 feet 9 inches. Wouldn't being taller give me more throwing power?

— R.K.

Dear R.K.: When people use that word, they're indicating someone with large, bulky muscles. The thought is that such muscles hinder fluid movement; that's not the case. Bodybuilders with huge muscles move with swiftness, grace and power.

Go ahead and lift weights. Don't focus exclusively on your arm and shoulder. Much of the power

imparted to a thrown baseball comes from leg, hip and trunk muscles.

Plyometric exercises are recommended for increasing throwing speed. Plyometrics indicate an exercise in which a rapid muscle stretch is followed by muscle shortening. Overhead throwing of a 6-pound medicine ball is an example.

If you're actively in season, practice and play now, but go easy on exercises. Save this program until the season is over.

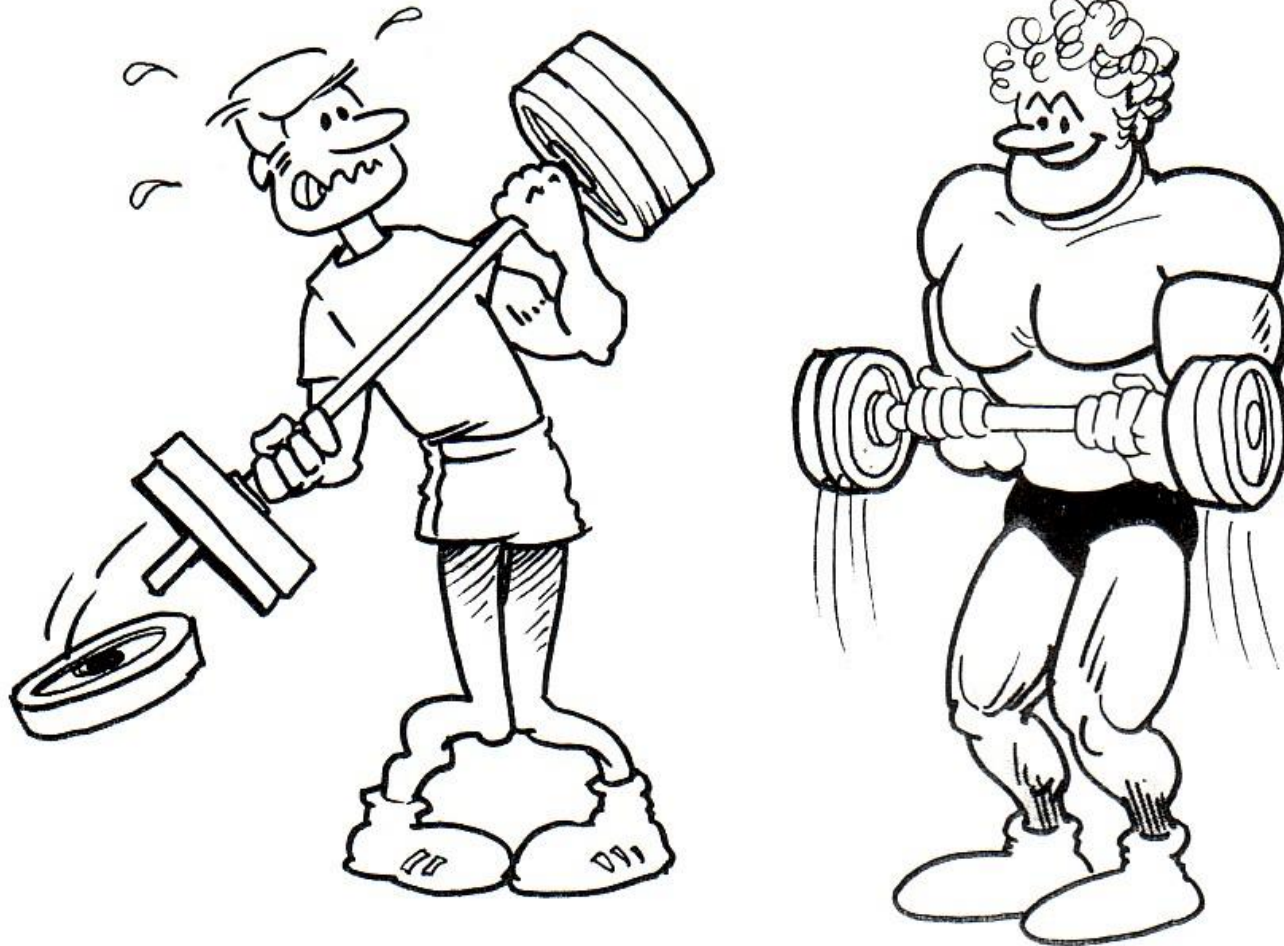
Your height isn't a disadvantage. Major-league pitchers Randy Johnson and Tim Lincecum both throw over 90 miles per hour. Johnson is 6 feet 10 inches; Lincecum is 5 feet 11 inches. They derive their power from the rotation they make in their deliveries.

Dr. Donohue is unable to answer individual letters. Write to him at P.O. Box 536475, Orlando, FL 32853-6475.

© 2010 North America Syndicate Inc.

Source: Eugene Register Guard, Saturday, May 1, 2010, D2.

Overload, Not Over Overload! Stress the Form, Not the Weight!!



Source: VP Lombardi & Diann Laing. *Beginning Weight Training: The Safe & Effective Way*, 1989.



Atrophy

*Decrease in size
& strength*



Hypertrophy

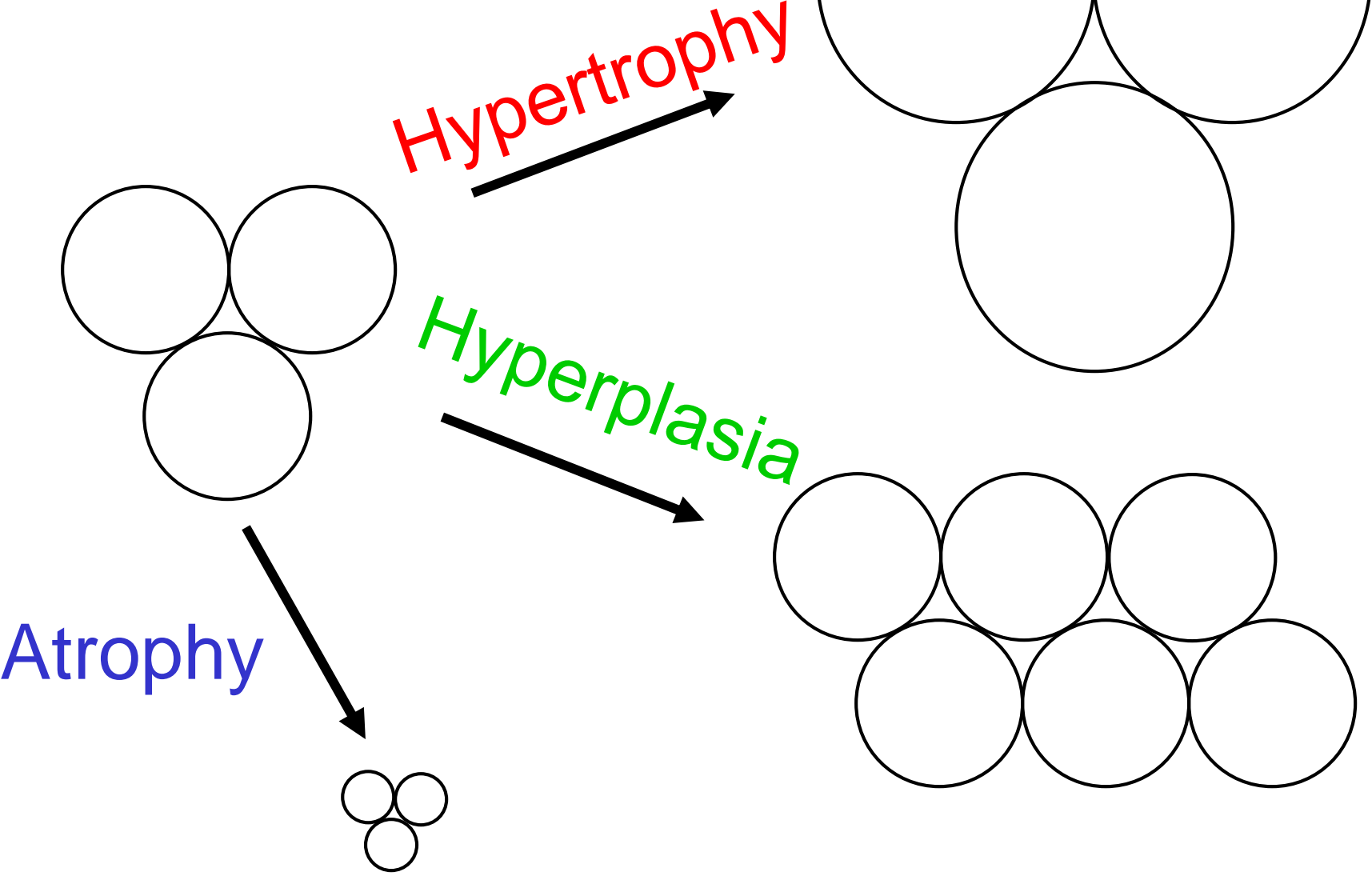
*Increase in size
& strength*



Reversibility!

Use it or lose it!

Skeletal Muscle





Want to improve your time in the Butte-to-Butte?



Your best bet!
Beep! Beep!!

Long-distance training!

Interval training!

Run the Butte-to-Butte!



Contradict Principle of Specificity?



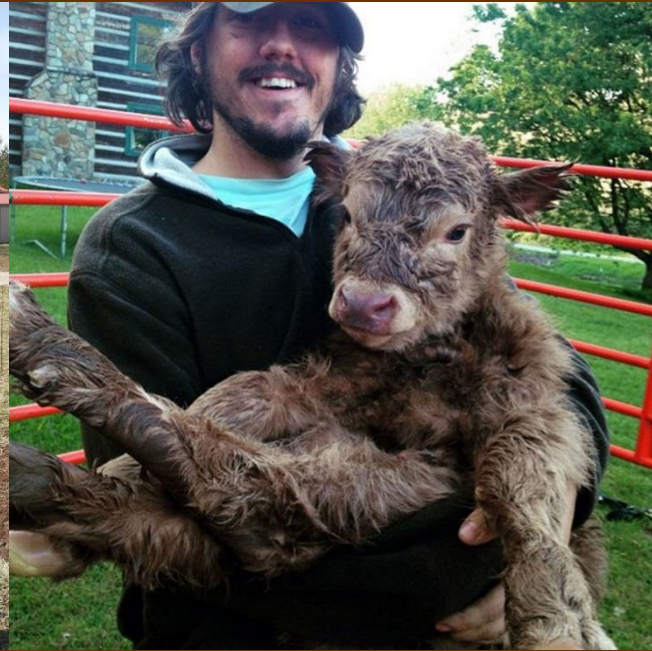
**WEIGHTED
VEST FOR
VERTICAL
JUMP**



Can ankle weights increase your vertical leap?



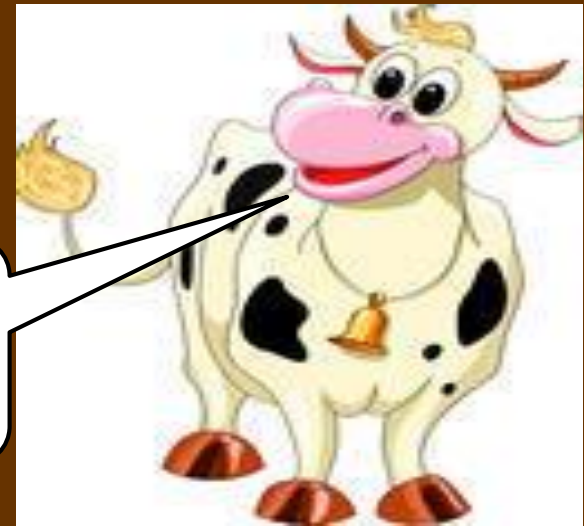
What about calf raises?



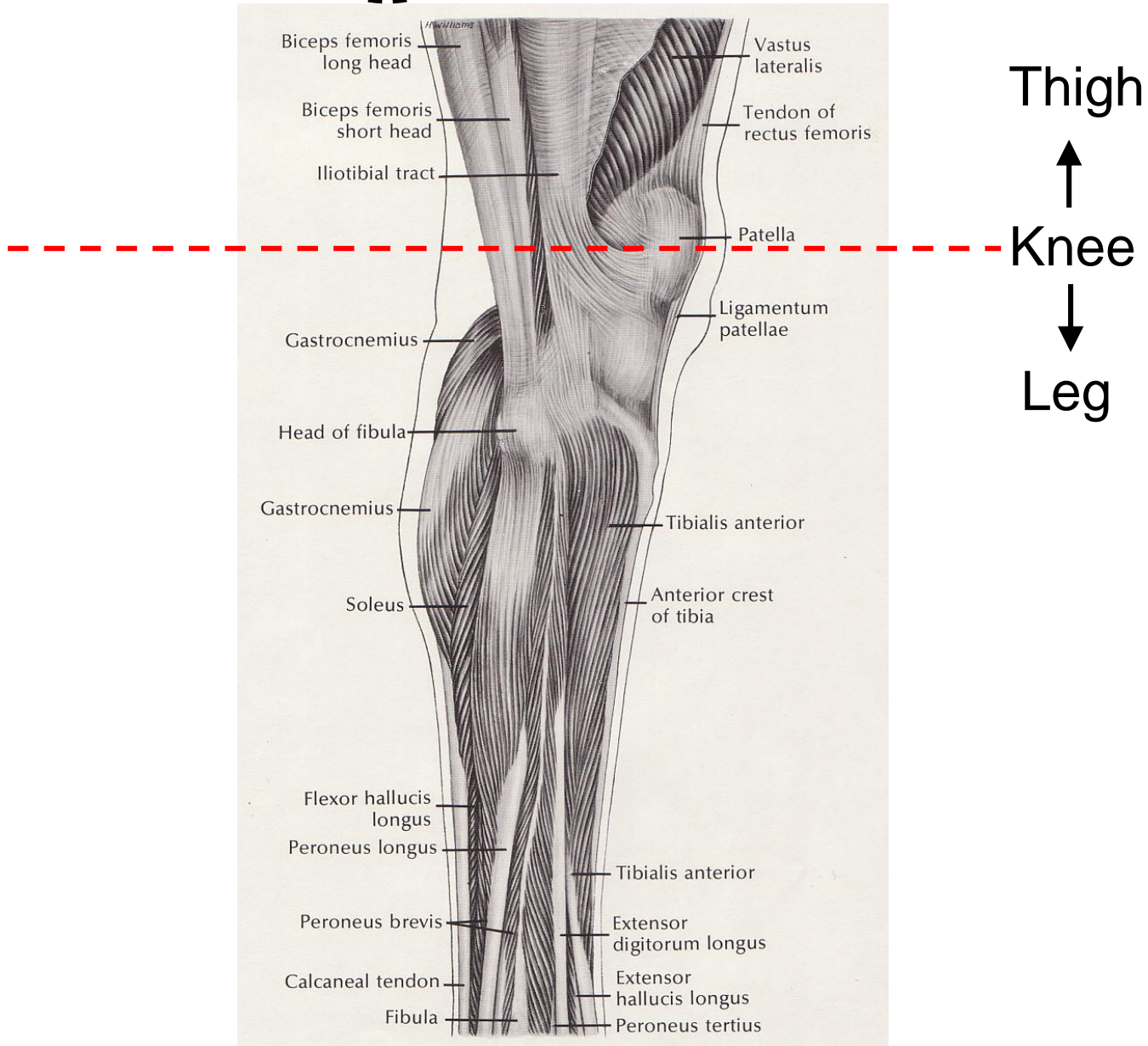
Momma, these humans are crazy!!



I know dear, but we just have to deal with 'em!



Right Leg Muscles - Lateral

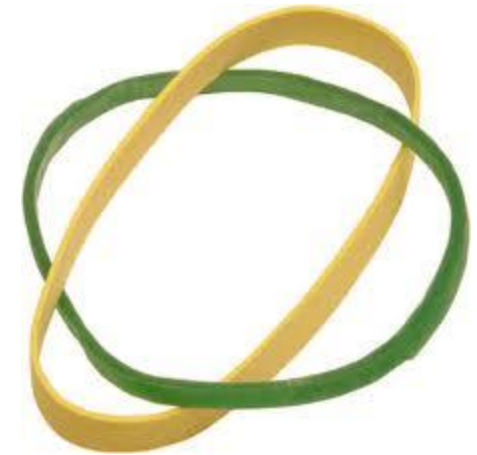


Left Leg Muscles - Lateral

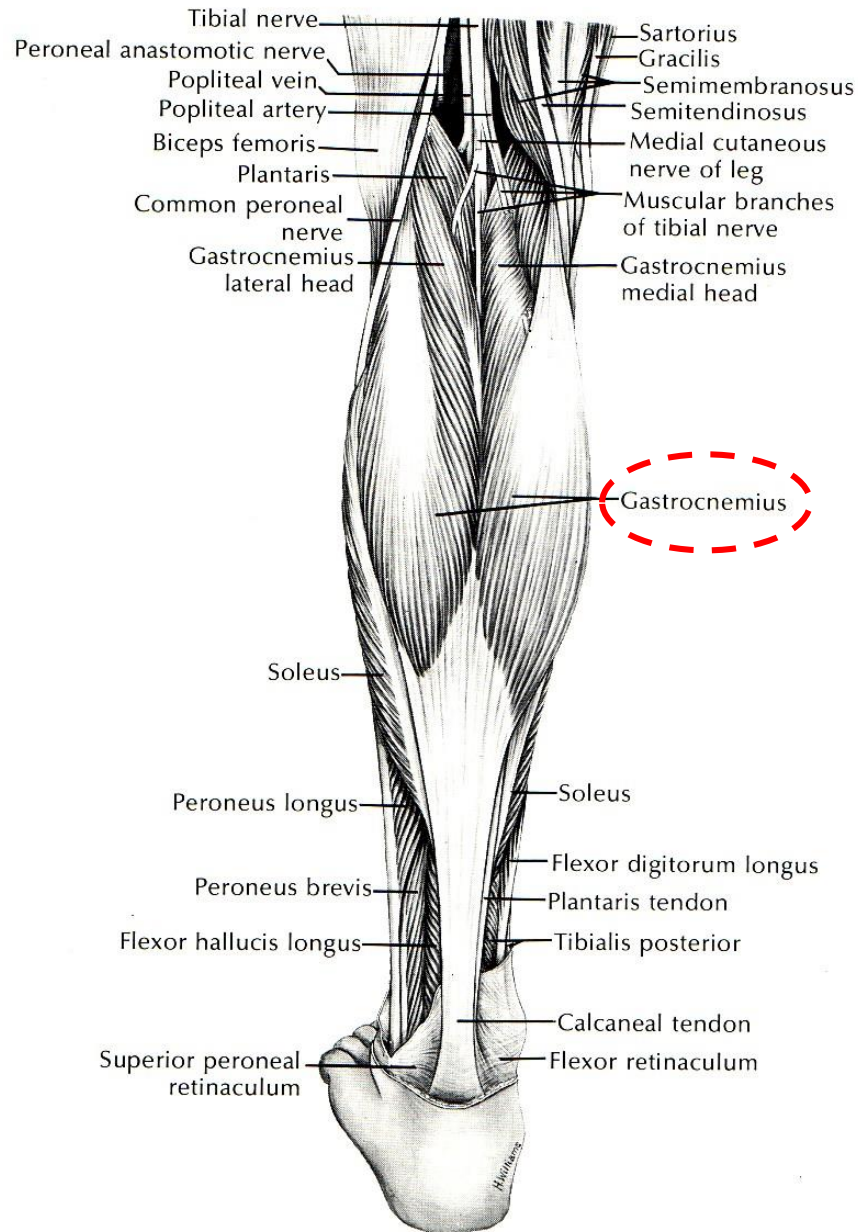


Retinaculum?
L. v. retinere
to retain or to halt

~Rubber bands!



Left Leg Superficial Muscles - Posterior

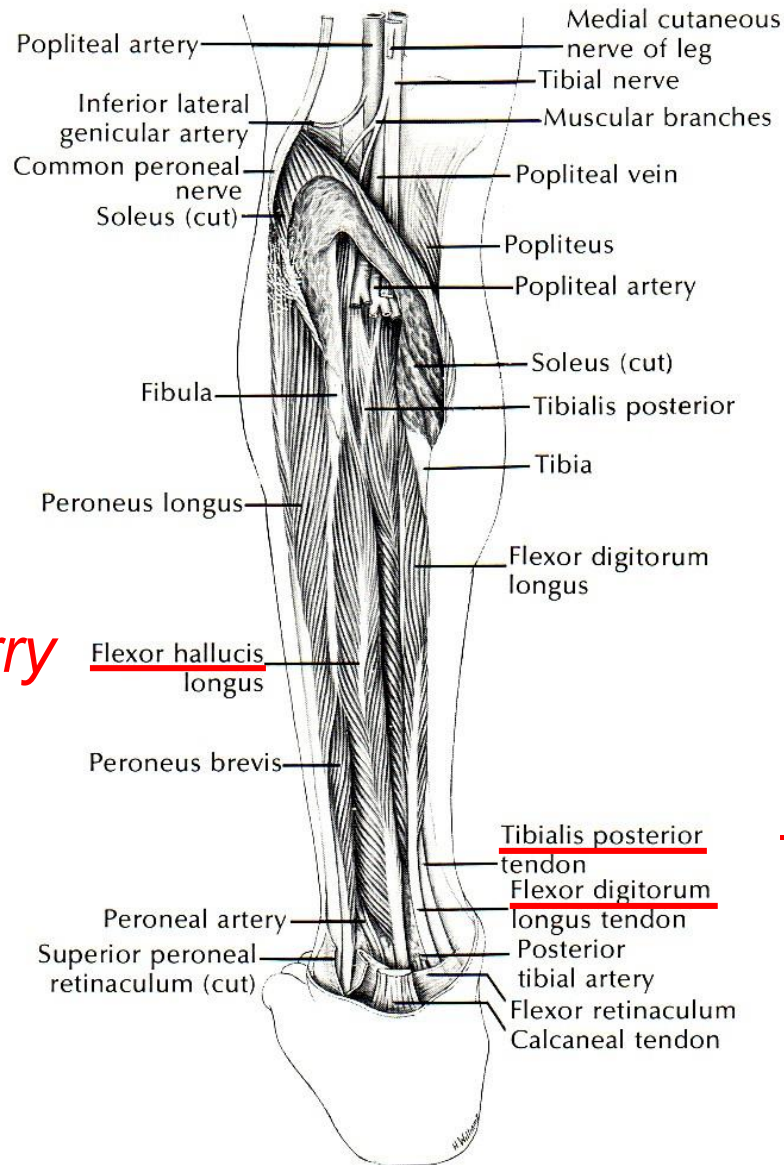


Gastrocnemius



"stomach-shaped of the leg"

Left Leg Deep Muscles - Posterior

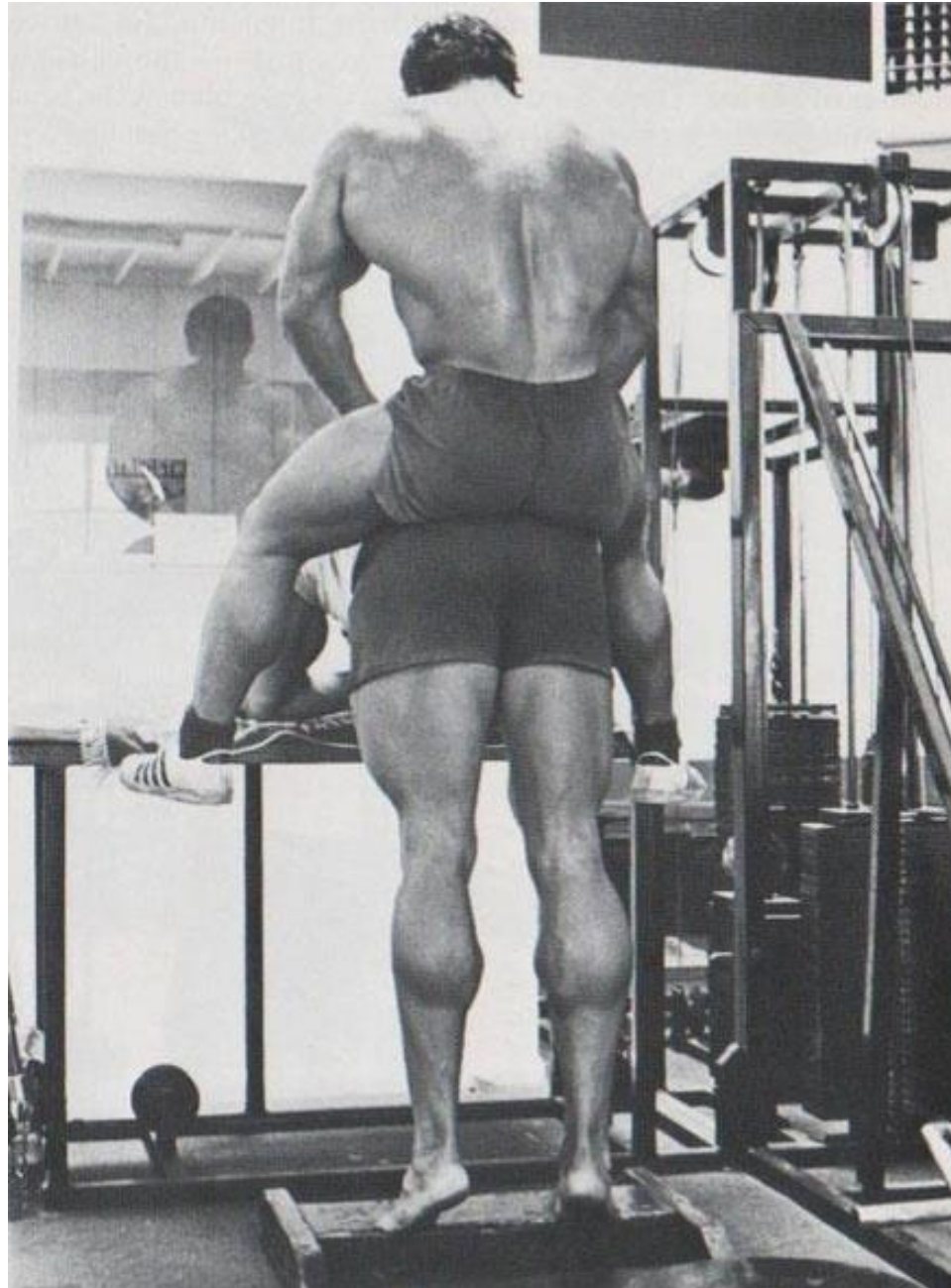


Hallicus = Harry

Tom = Tibialis

Dick = Digitorum

Donkey Calf Raise – Straight Knee → Gastrocnemius



Franco Columbo

*Former Governor
of California!
Arnold
Schwarzenegger*

FROM

*@ Top full
contraction*



*@ Bottom full
stretch*

Technique Analyses of Internet Pictures



Not
much
loading
cf: 2x
body
weight

Knees straight \rightarrow 1^o gastrocnemius

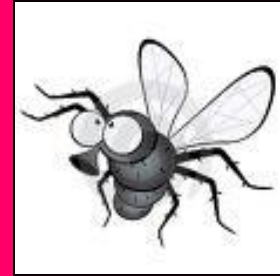
Technique Analyses (continued)

*More of
thigh less of
knee directly
under pad.*

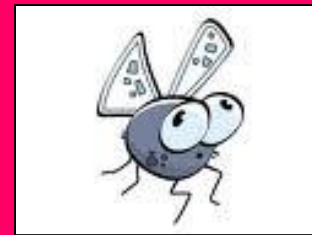


Knees bent \rightarrow 1⁰ soleus

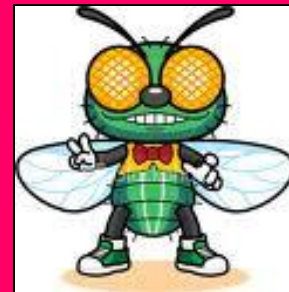
What about the chest fly?



?

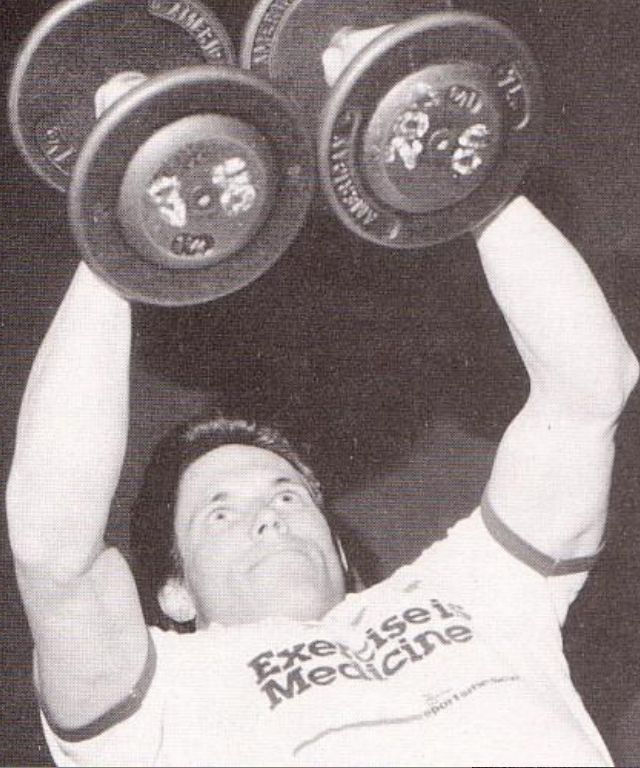


?



?

1



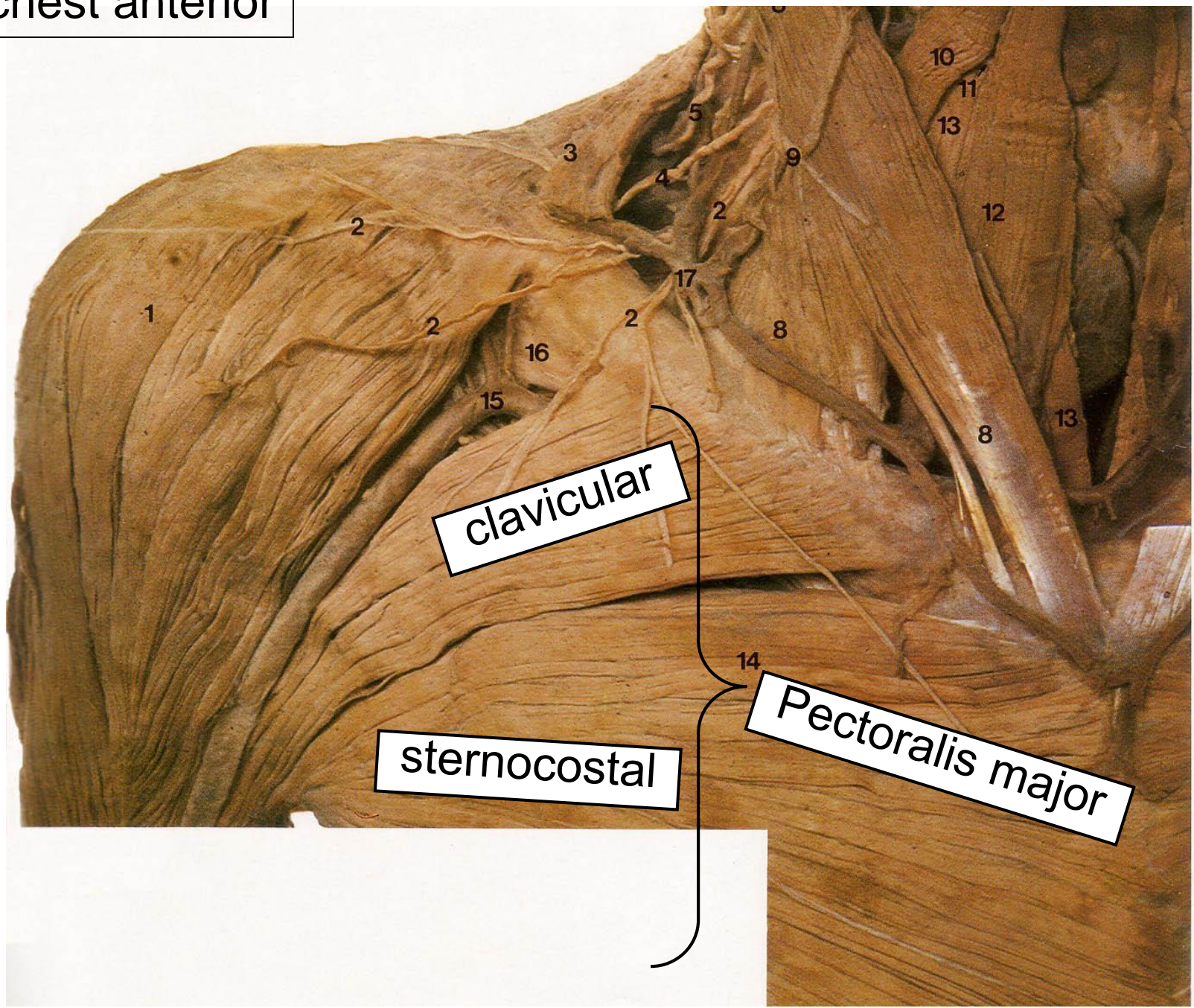
Chest Fly

Pectoral group
Anterior deltoid

2

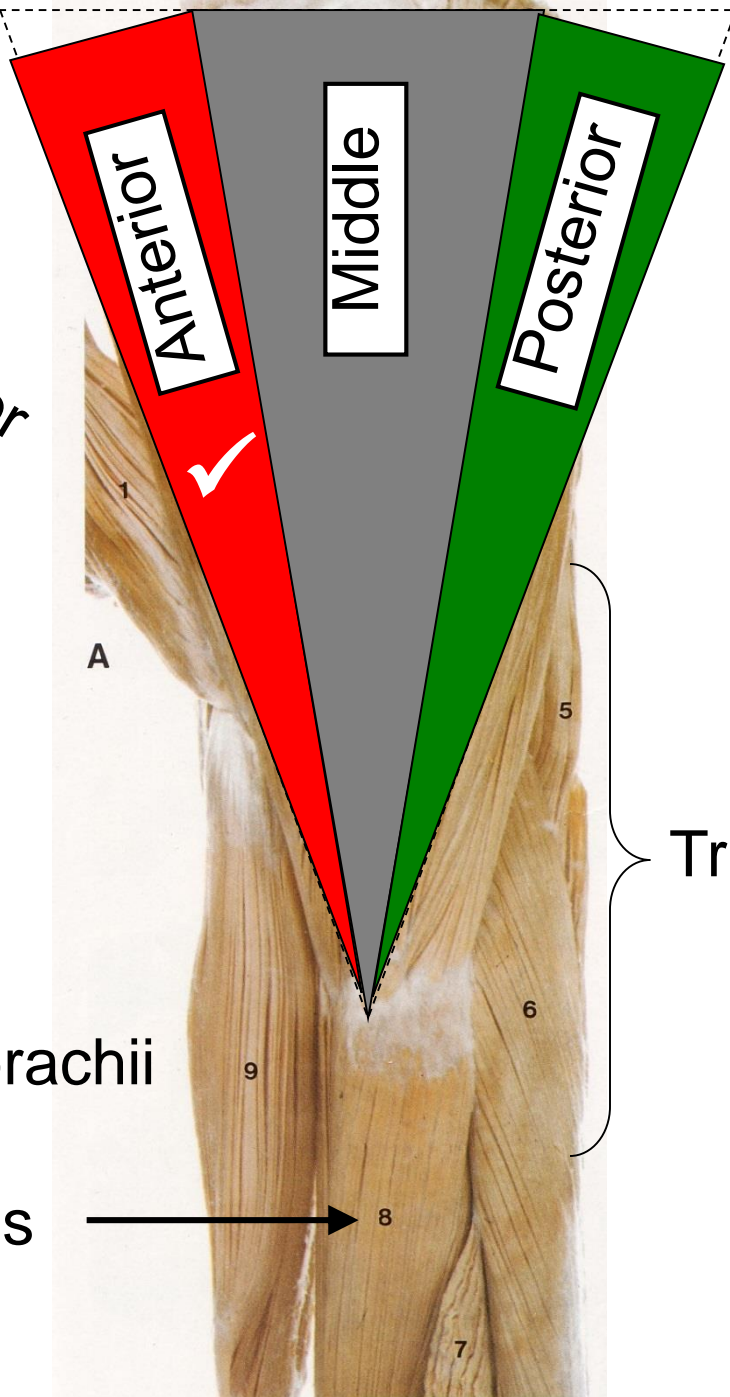


R chest anterior



L arm lateral

Pectoralis major



Deltoid

Triceps brachii

Biceps brachii

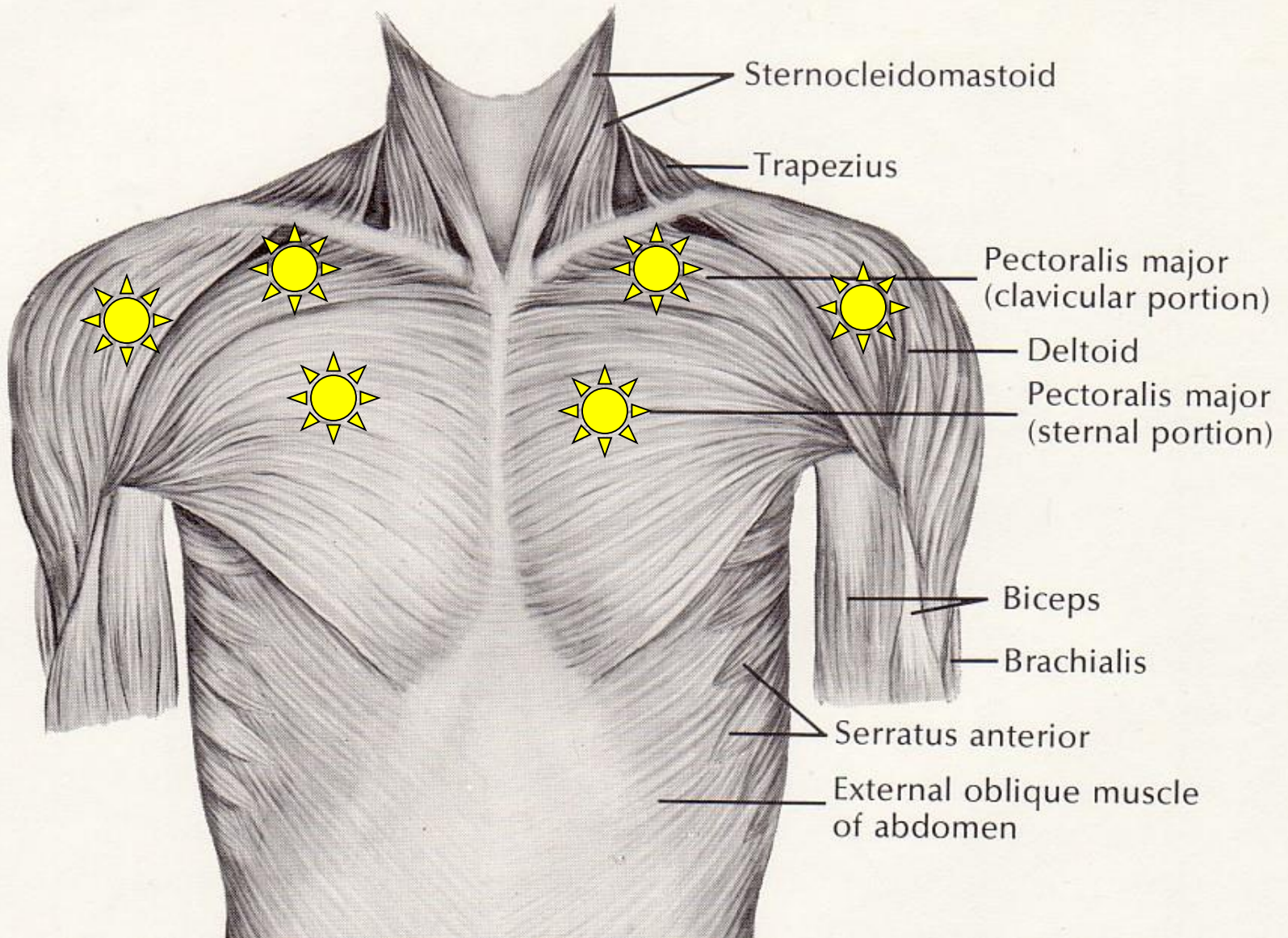
Brachialis



Correct Fly Technique: Hug the Oak Tree!!



Pretty good technique, but keep those wrists straight!



Chest Fly or Press?



<http://asp.elitefts.com/qa/default.asp?qid=37598&tid=104>

Comments on the technique?



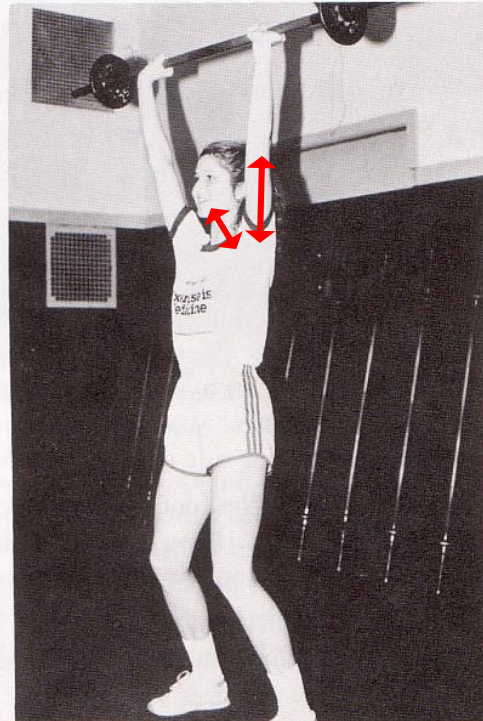
A

Military Press

(Shoulder) – front & middle
Arm – back
Neck



B

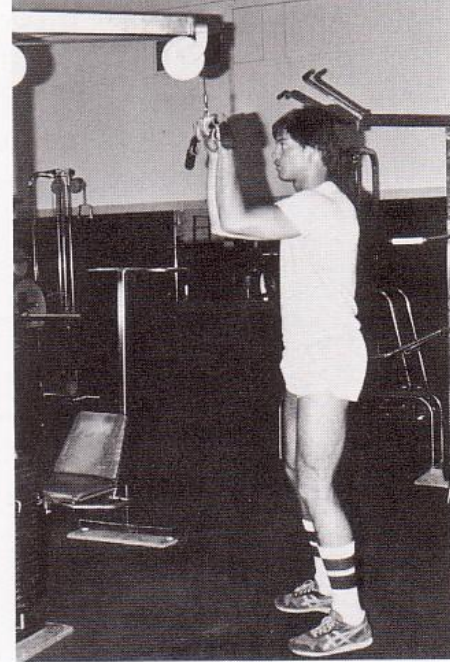


C

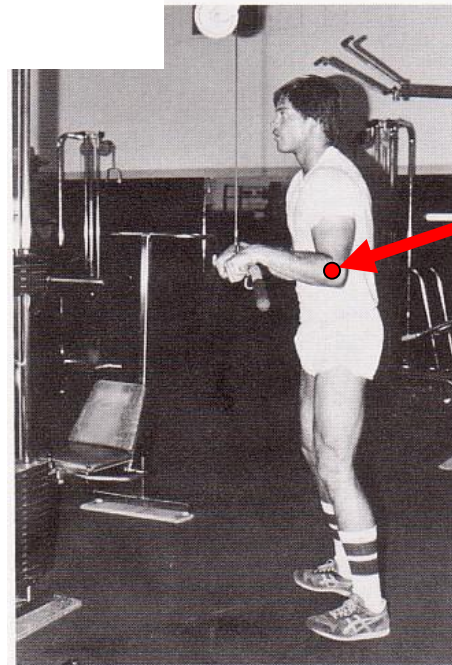
Anterior & Middle Deltoid
Supraspinatus
Triceps Brachii
Anterior neck muscles
 Sternocleidomastoid
Posterior neck muscles
 Upper trapezius
 Levator scapula

Triceps Extension

1. Isolate axis of rotation.
2. Pin elbows to anterior abdominal side.
3. Fully extend elbows.
4. Flex elbows just beyond 90°.
5. Pause & extend.

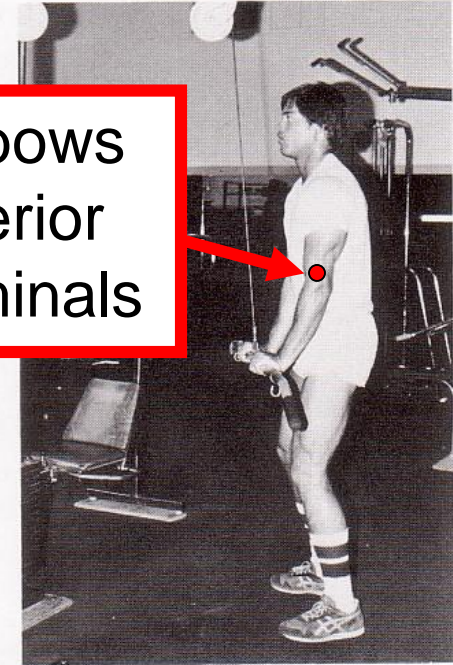


A



B

Pin elbows
to anterior
abdominals



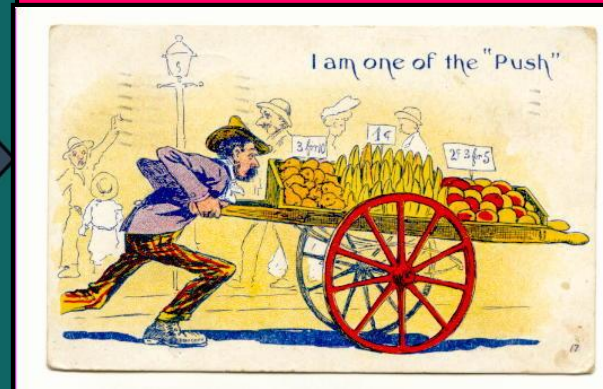
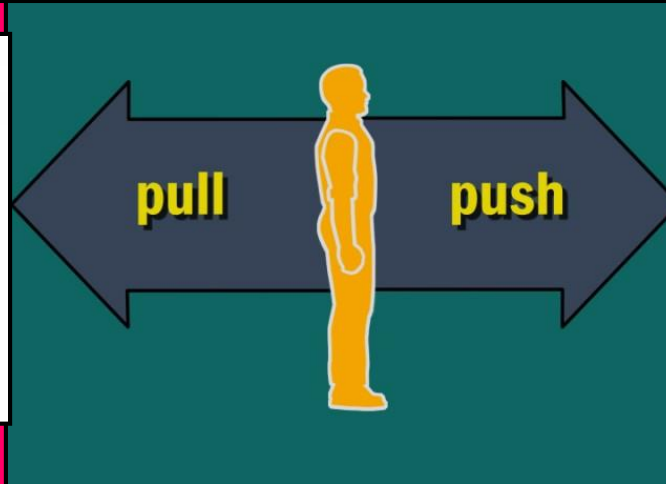
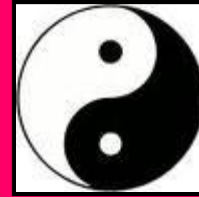
C

NB: Bend knees, contract abdominals! Adjust hands & wrists to maximize range of motion (ROM).

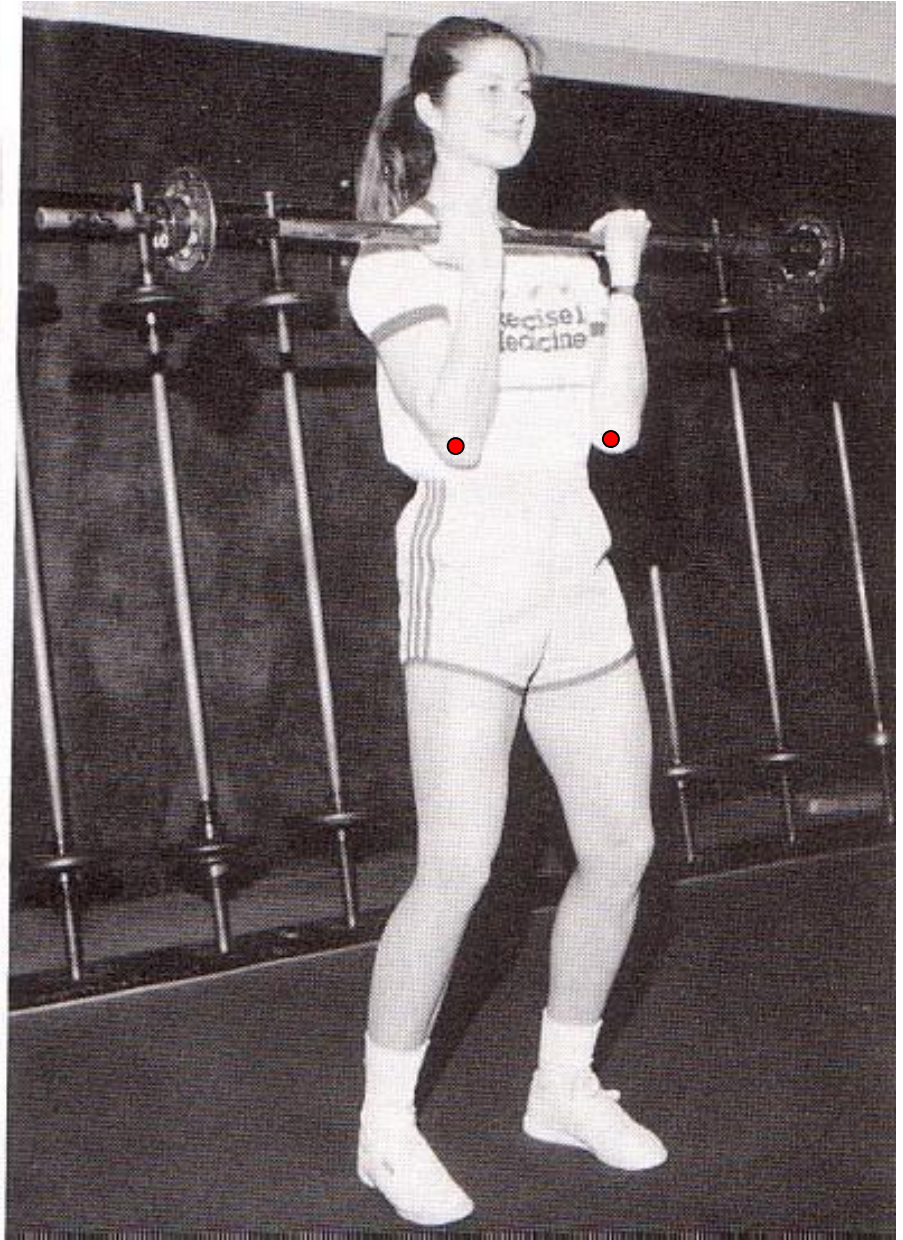
NB: Always complement



**Push with Pull to
ensure balance!!!**



Biceps Curl



NB: Knees bent & abdominals contracted!

Table 3.1 Characteristics of Weight Training Exercises and Systems

| Characteristic | Exercise or System | | |
|--|---------------------------|---|-----------------------|
| | Isometric | Isotonic | Isokinetic |
| Type of Contraction/ Synonym | Static | Dynamic | Dynamic ^a |
| Relative Expense | None or low | Low ^b to high ^c | High |
| Maintenance | None or low | Low ^b to moderate ^c | Moderate to high |
| Portability | Not required | Easy ^b to difficult ^c | Moderate to difficult |
| Concentric loading | Yes | Yes | Yes |
| Eccentric loading | No | Yes | No ^d |
| Accommodation | No | No ^b /Yes ^c | Yes |
| Intramuscular tension | Low to high? | Moderate ^b to high ^c | Moderate to high |
| Potential for delayed muscle soreness | Low | High | Low |
| Potential for rehabilitation | Limited | Moderate to high | High |

^aSince the velocity on isokinetic devices may be set to zero, static contractions are also possible.

^bFor free-weight barbells, dumbbells, and most other constant load devices.

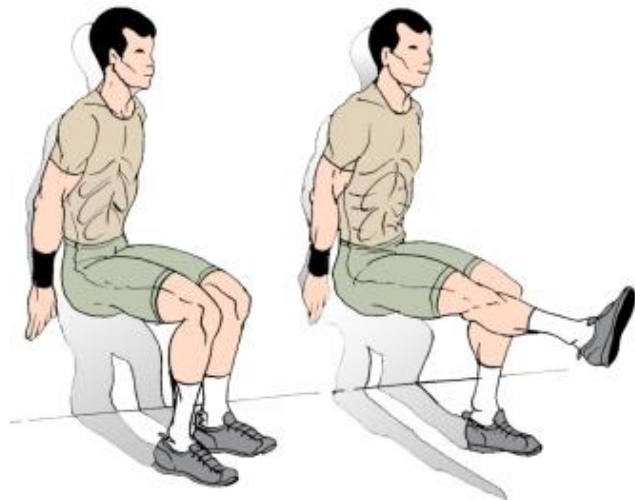
^cFor isotonic dynamic accommodating resistance (DAR) devices.

^dNew isokinetic devices by Chattecx (Kincom) and Loredan (Lido) have built-in options for constant velocity eccentric loading. These are exceptions to typical isokinetic machines.

Isometric Squat Works Very Limited Range, But Can Help with Sticking Points



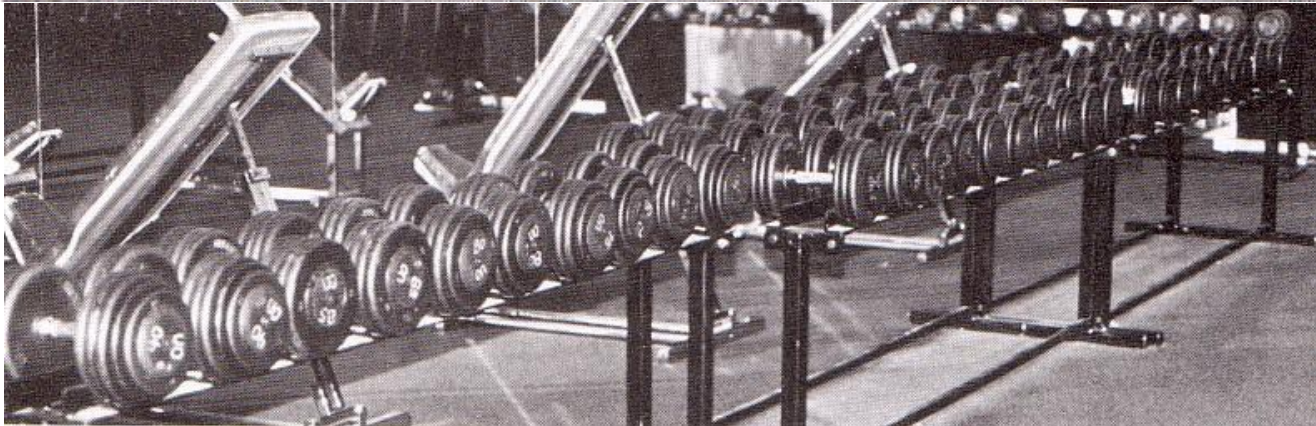
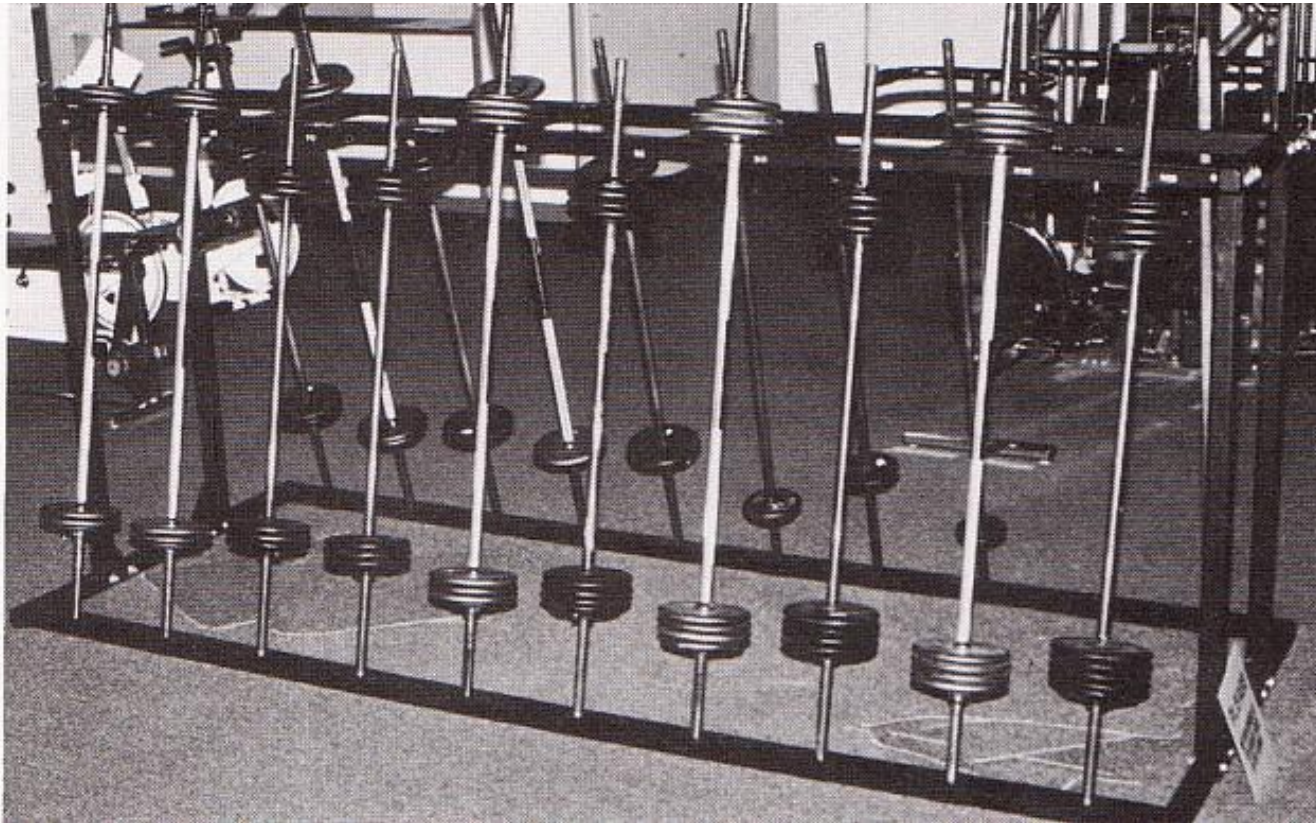
NB: $\approx 5-10^\circ$
around set \leftarrow ,
 \rightarrow limited
functionality!



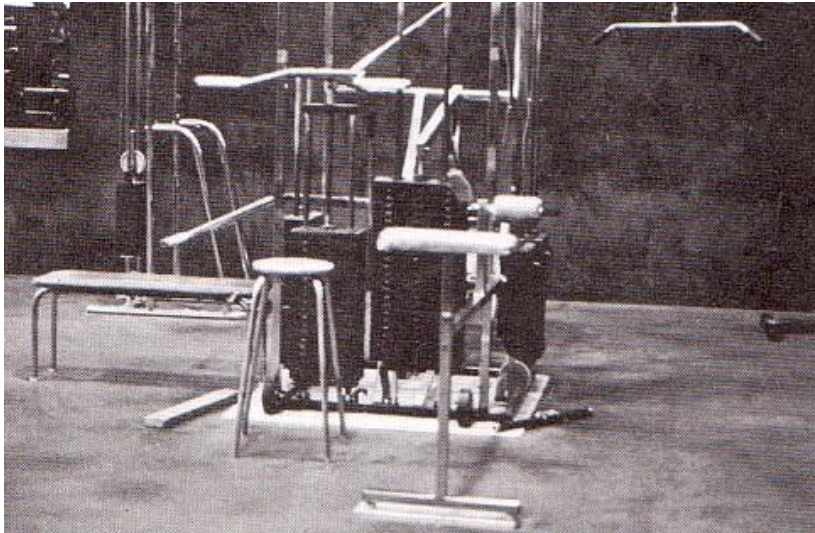
Functional isometrics at an early age!



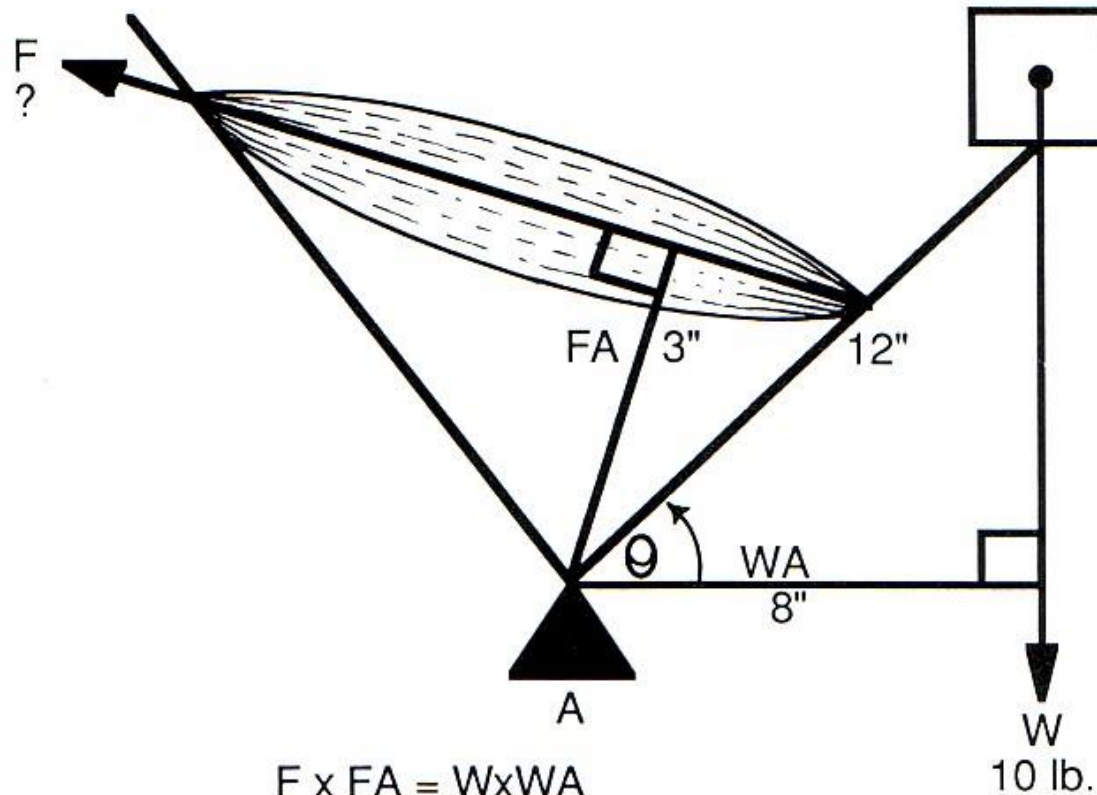
Isotonic Barbells & Dumbbells



Most CWT Machines & WT Equipment Isotonic



Force x Force Arm = Weight x Weight Arm



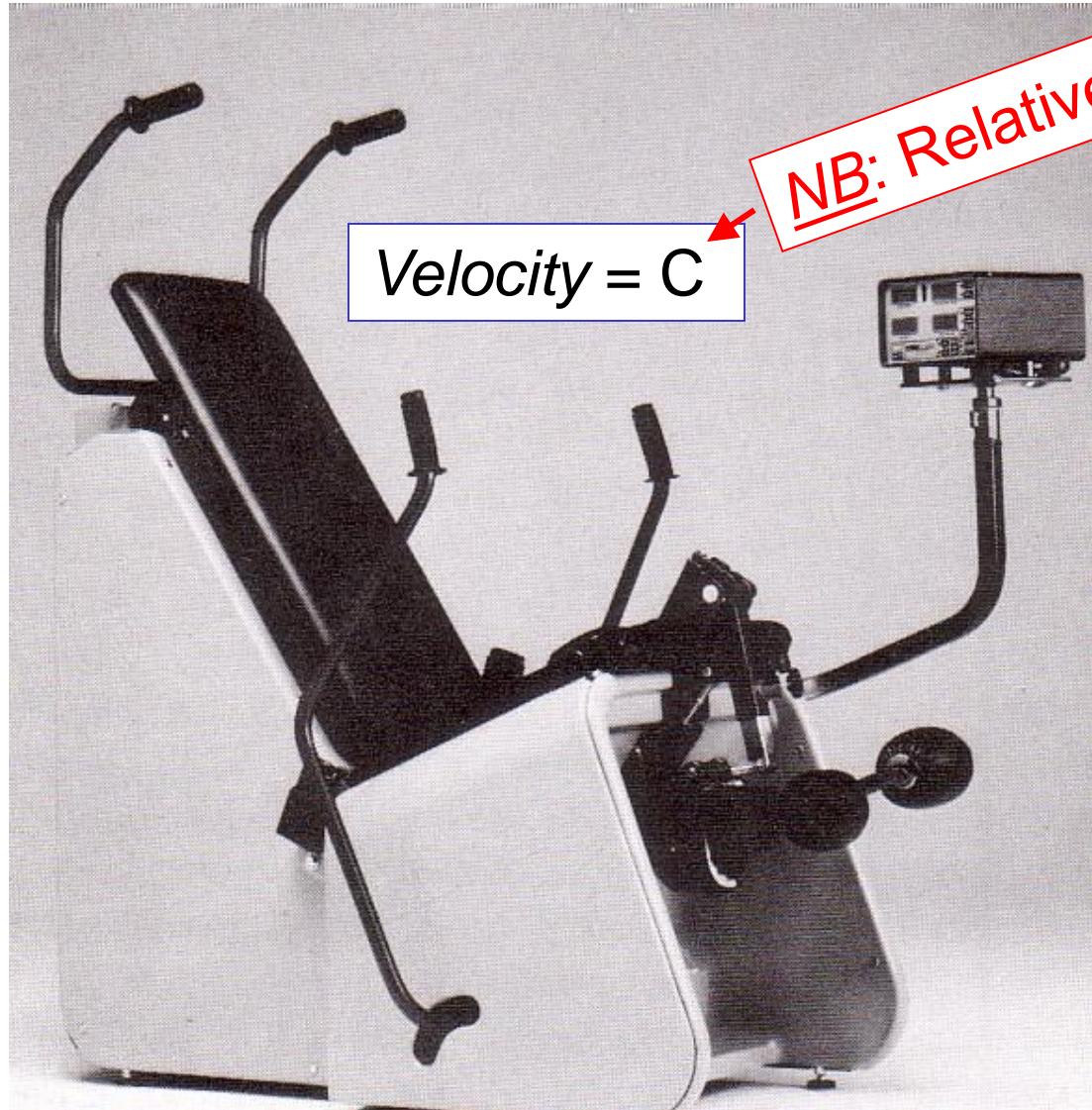
$$F \times FA = W \times WA$$

$$F = \frac{W \times WA}{FA}$$

$$F = \frac{10 \text{ lb.} \times 8''}{3''}$$

$$F = 26.67 \text{ lb.}$$

Isokinetic Omni-tron: Concentric-Concentric

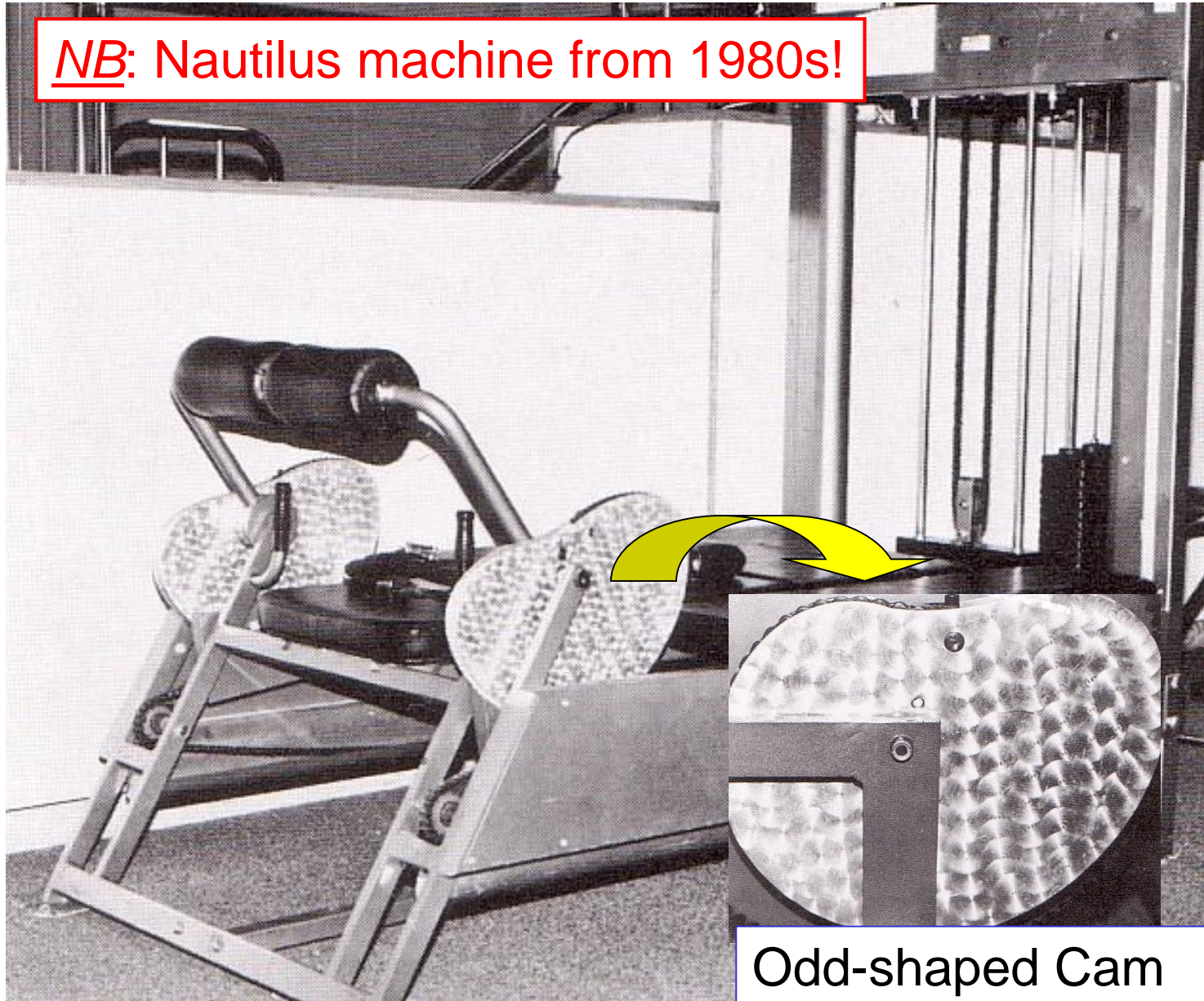


**Can these also evolve
into Isometric?**

**Yes, if you handle more
weight than you can
overcome or set $\vec{v} = 0!$**

Dynamic Accommodating Resistance (DAR)

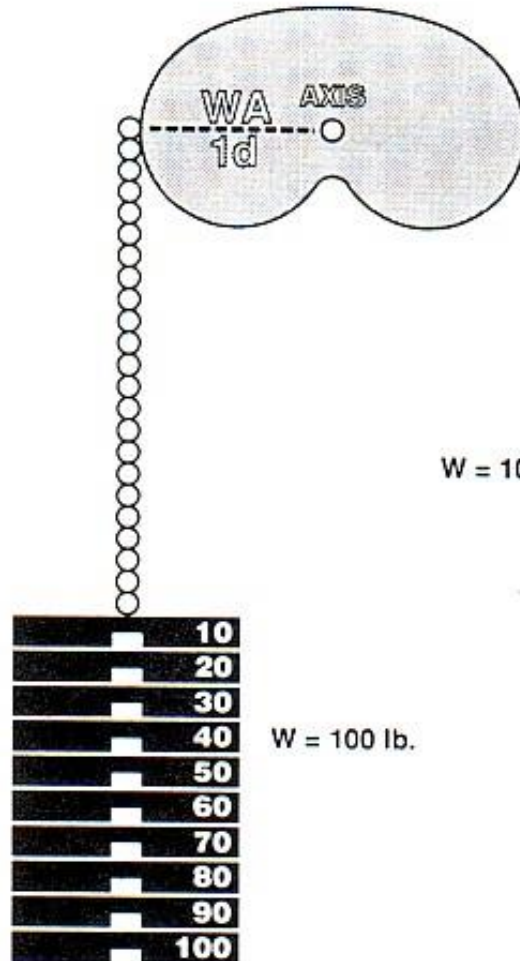
NB: Nautilus machine from 1980s!



Odd-shaped Cam

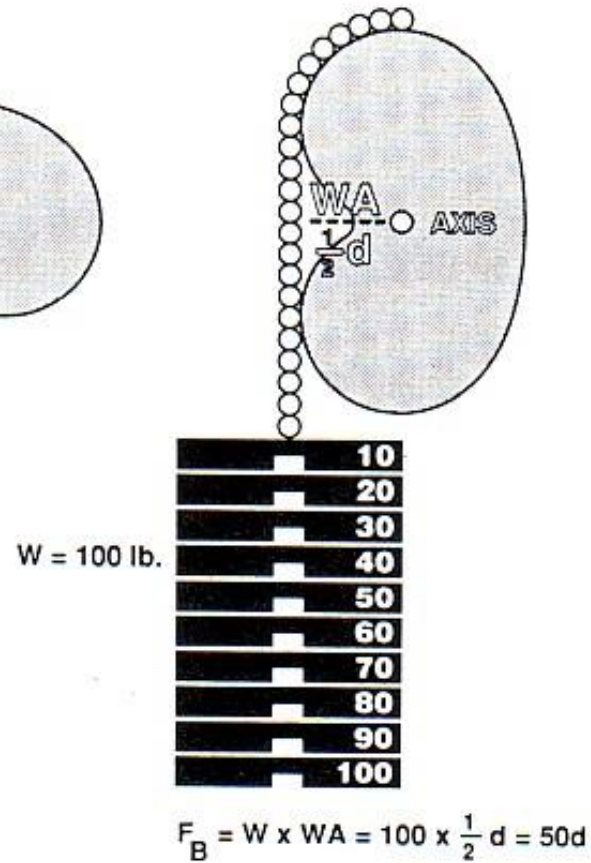
Simplified Cam System

A. Start



$$F_A = W \times WA = 100 \times 1d = 100d$$

B. Finish



$$F_B = W \times WA = 100 \times \frac{1}{2}d = 50d$$

Group Overview of Presentations

