



...**Quiz Bowl Day is here!** Tonight Anatomy Lab 7 pm.
Next Tuesday, Olympic Lifting technique!!

BI 199 APWT Discussion 12

I. Announcements Poster outlines?

Anatomy Lab tonight! Hooray!

II. Quiz Bowl Group Competition

III. Quiz Bowl Review & Scoring!

IV. Proper Weight Loss + Connections



**Don't worry Tigger,
we're taking the
Quiz in groups!
We'll be fine!**

**Tigger's a lil' nervous
'bout da Quiz Bowl –
rather be doing
plyos?**



APWT Quiz Bowl, Group Competition

1. Which of the following is the *study or science of structure*, that primarily identifies macroscopic structures and asks questions about *what and where*?
 - a. Physiology
 - b. Anatomy
 - c. Histology
 - d. Biology
2. *Abduction* is an action that
 - a. decreases a joint angle.
 - b. increases a joint angle.
 - c. moves a limb away from the midline of the body.
 - d. moves a limb toward the midline of the body.
3. Weight training is *least likely to induce substantial improvements* in which of the following components of *health-related fitness*?
 - a. Cardiorespiratory endurance
 - b. Flexibility
 - c. Muscular strength & local muscular endurance
 - d. % Body fat
 - e. Neuromuscular relaxation
4. Which exercise pair best demonstrates *superior-inferior balance*?
 - a. Leg ext-Leg curl
 - b. Bench press-Squat
 - c. Biceps curl-triceps ext
 - d. a.,b.& c.

APWT Quiz Bowl, Group Competition

5. Which muscle groups are *worked extensively by the squat, but not by the leg press*?
 - a. Gluteal group
 - b. Quadriceps
 - c. Adductors
 - d. Erector spinae
6. Why use *soft knees or bend the knees* for all standing exercises?
 - a. To decrease tautness of the iliopsoas group.
 - b. To prevent tugging on the lumbar spine.
 - c. To decrease stress on vertebral column ligaments.
 - d. To protect the lower back.
 - e. All of the above are correct.
7. Which of the following *single-joint action exercises* is best for working the *pectoral group and eliminates the triceps brachii*?
 - a. Lat pull
 - b. Chest fly
 - c. Military press
 - d. Bench press
8. The *Bodybuilder's Syndrome* is a disproportionate focus on the development of which muscle regions?
 - a. Posterior-Inferior
 - b. Anterior-Superior
 - c. Anterior-Posterior
 - d. Superior-Inferior
9. Which exercise best isolates the *soleus*?
 - a. Russian dead lift
 - b. Straight-knee calf raise
 - c. Bent-knee calf raise
 - d. Lunge
10. Which *grip* is best for isolating the *latissimus dorsi muscles*?
 - a. Supinated wide
 - b. Pronated shoulder-width
 - c. Alternate wide
 - d. Pronated wide

1. Which of the following is the study or science of structure...?
a. Physiology **b. Anatomy** c. Histology d. Biology

ANATOMY
STRUCTURE
WHAT?
WHERE?

VS **PHYSIOLOGY**
VS **FUNCTION**
VS **HOW?**
VS **WHY?**



VS



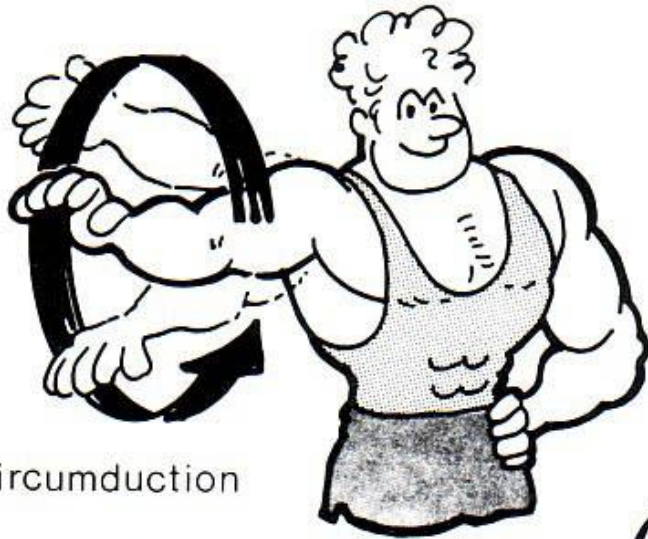
2. Abduction is an action that

a. decreases a joint angle.

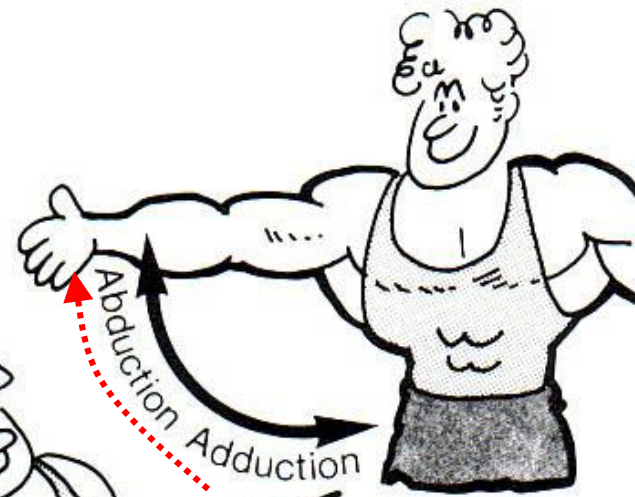
b. increases a joint angle.

c. moves a limb away from the midline of the body.

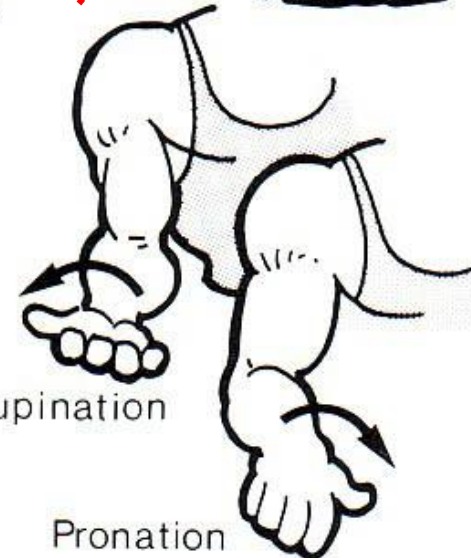
d. moves a limb toward the midline of the body.



Circumduction



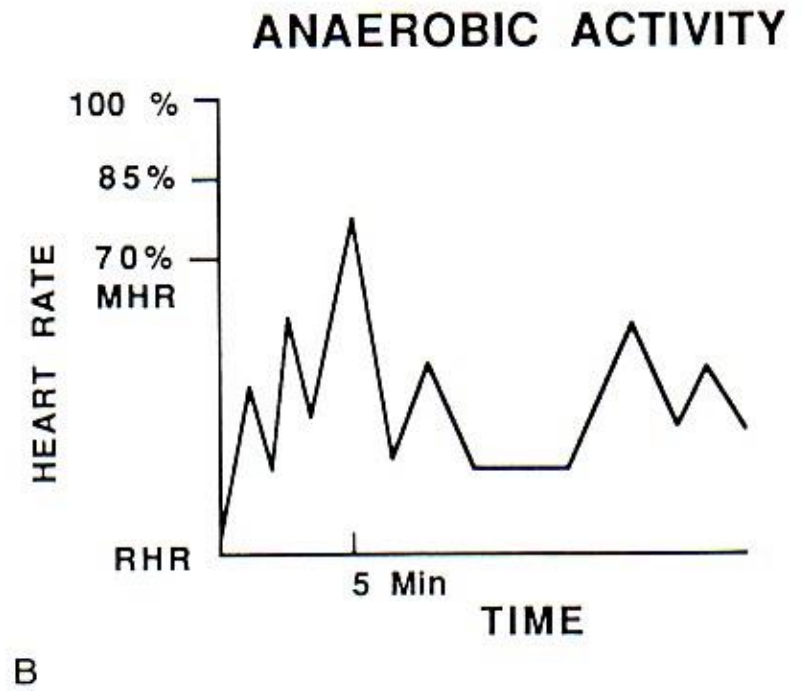
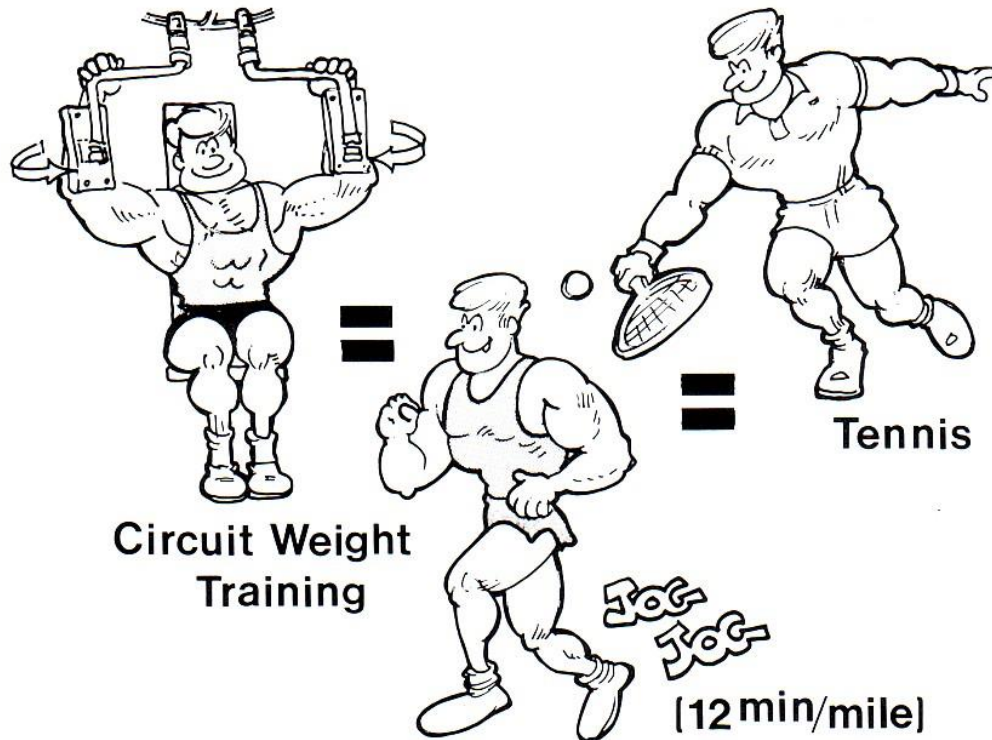
Rotation
(about long axis)



Pronation

3. Weight training is *least likely to induce substantial improvements* in which of the following components of *health-related fitness*?

- a. **Cardiorespiratory endurance**
- b. Flexibility
- c. Muscular strength & local muscular endurance
- d. % Body fat
- e. Neuromuscular relaxation



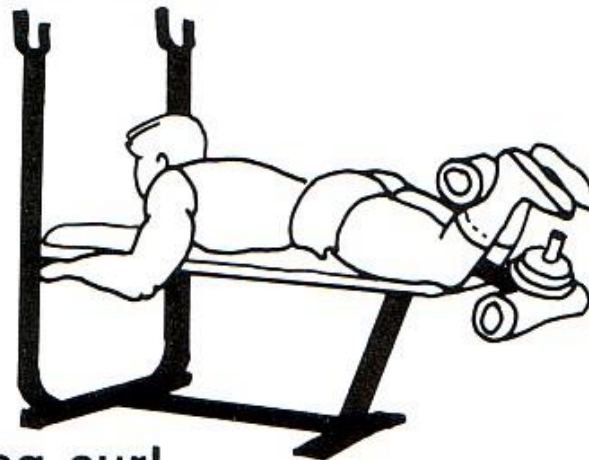
4. Which exercise pair best demonstrates *Superior-Inferior* balance?

- a. Leg ext-Leg curl b. Bench press-Squat c. Biceps curl-triceps ext d. a., b. & c.

Anterior - Posterior Balance

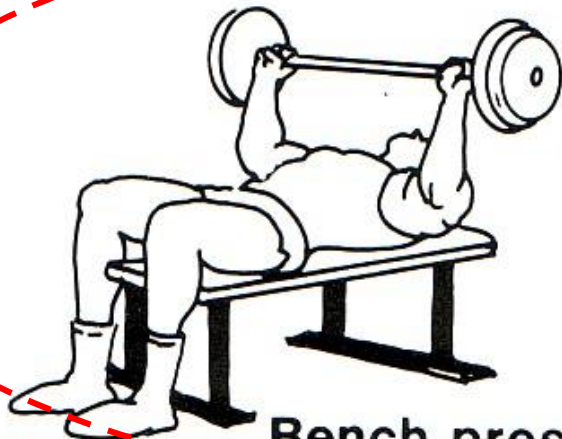


Leg extension



Leg curl

Superior - Inferior Balance



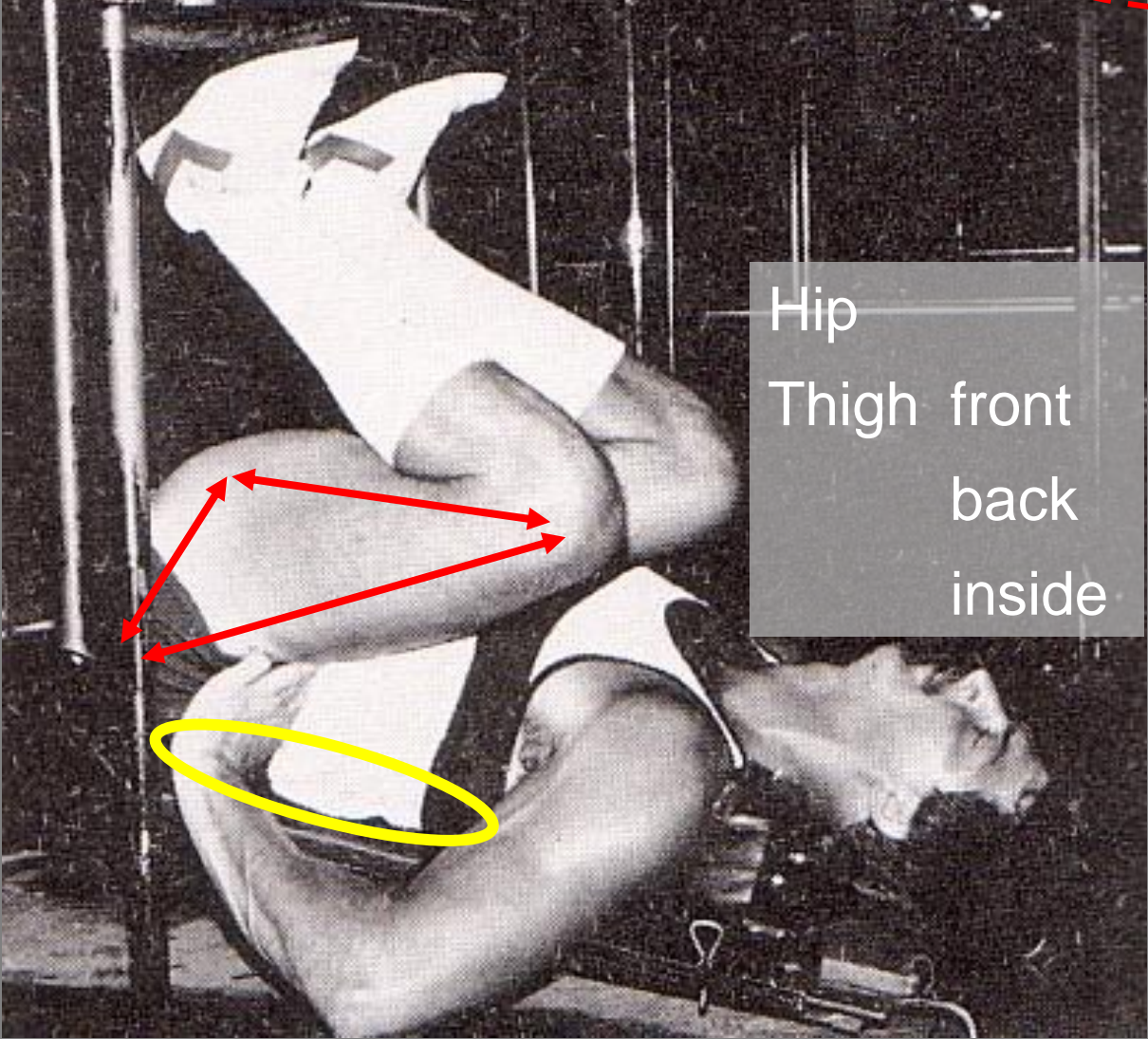
Bench press



Squat

5. Which muscle groups are worked extensively by the squat, but not by the leg press?

- a. Gluteal group
- b. Quadriceps
- c. Adductors
- d. Erector spinae



Hip
 Thigh front
 back
 inside

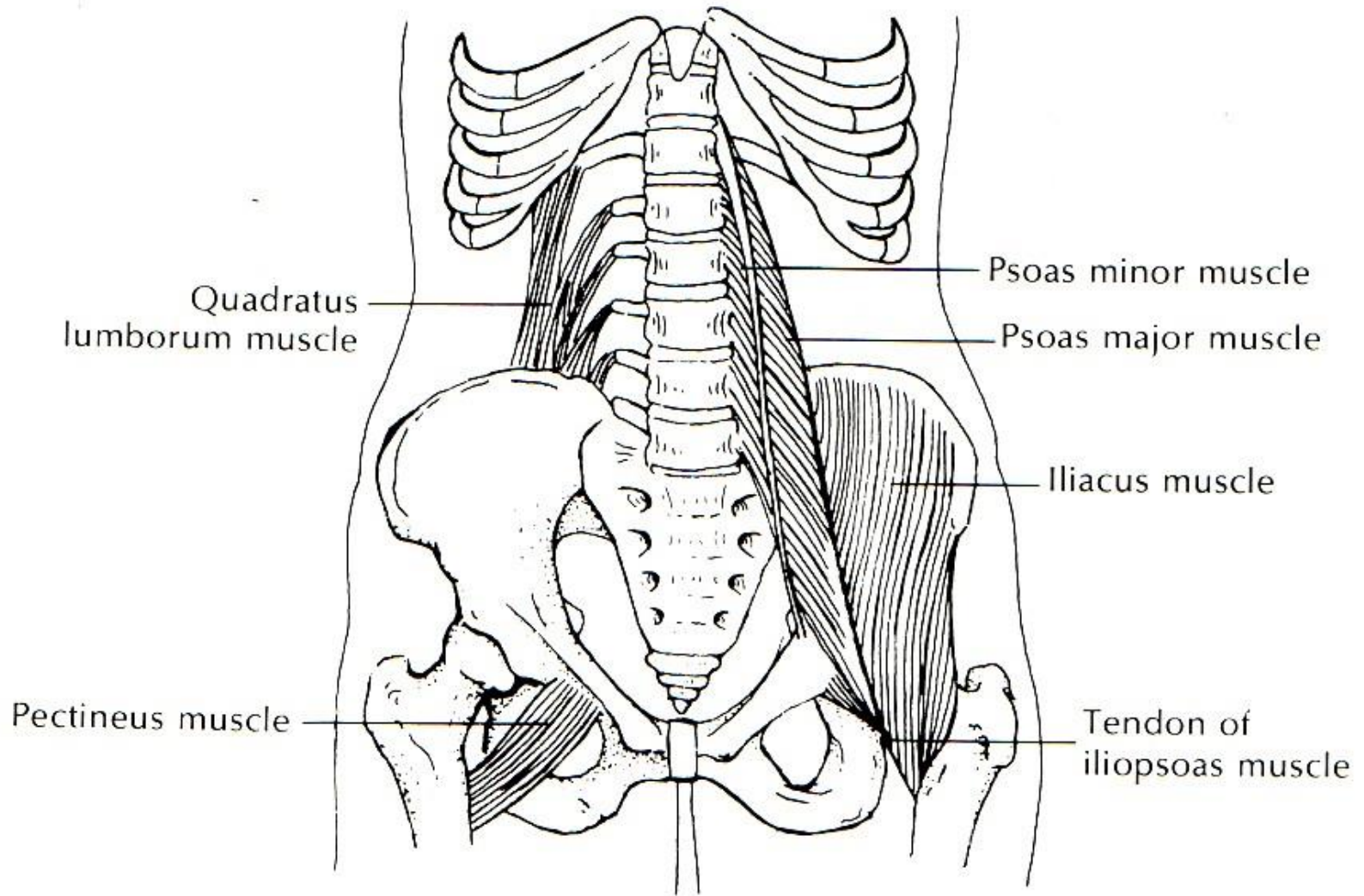
Leg Press

- Gluteal group
- Quadriceps
- Hamstrings
- Adductors

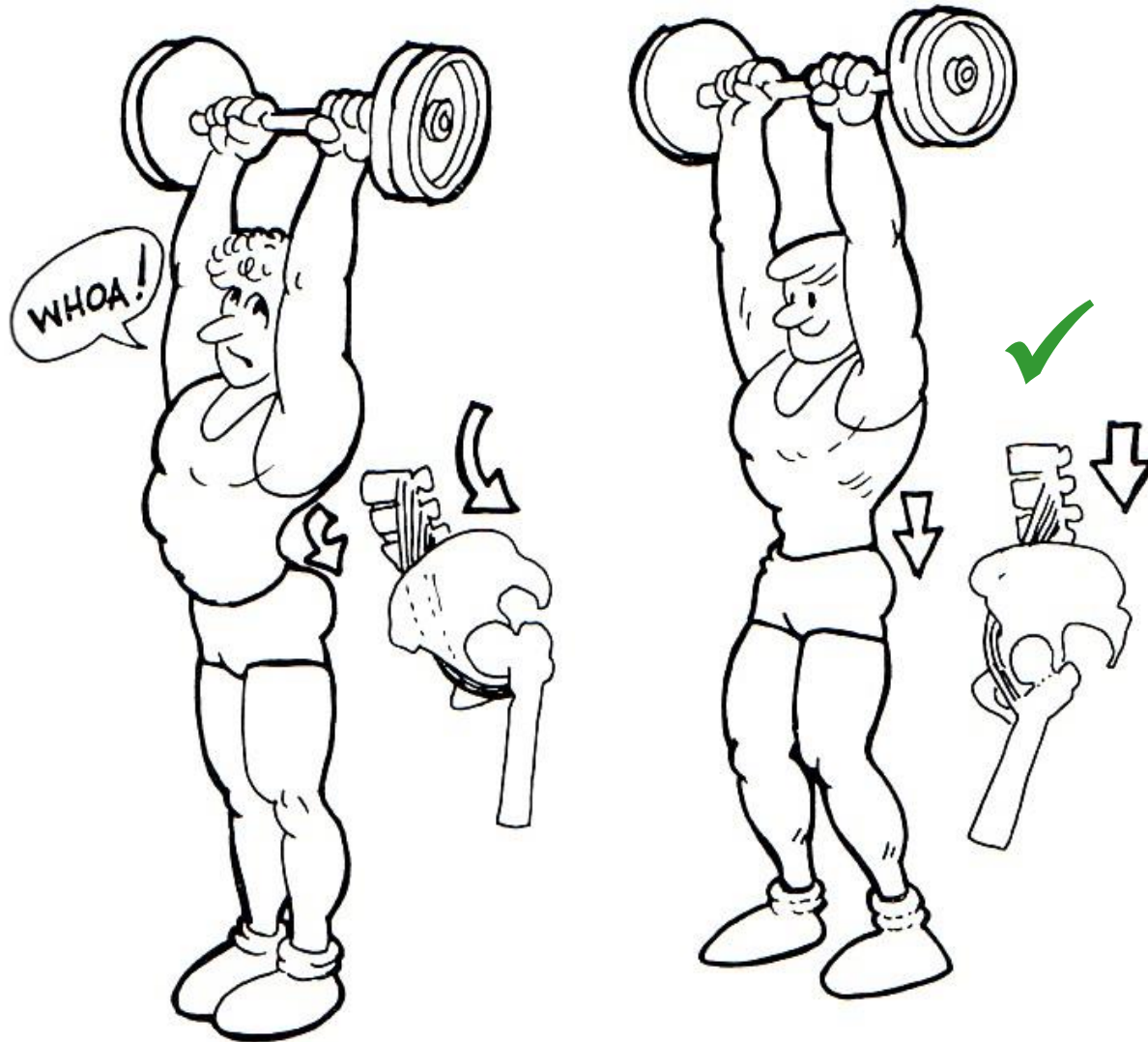
- Lower back

6. Why use *soft knees* or *bend the knees* for all standing exercises?
- a. To decrease tautness of the iliopsoas group.
 - b. To prevent tugging on the lumbar spine.
 - c. To decrease stress on vertebral column ligaments.
 - d. To protect the lower back.
 - e. All of the above are correct.

↓ Lower back stress by flexing hips & bending knees

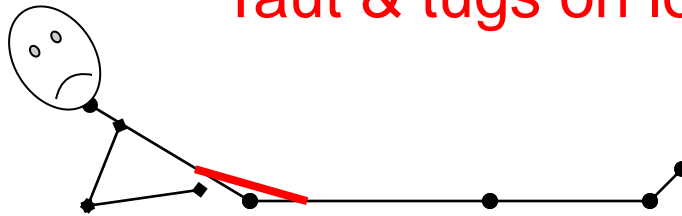


**Contract abdominals, bend knees,
widen stance to reduce back stress!**



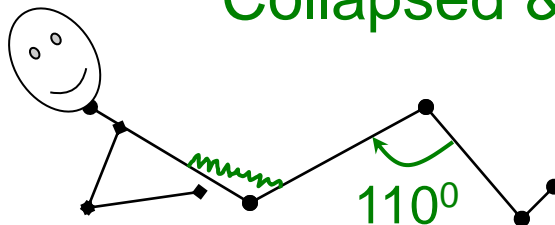
Iliopsoas with *Knees Straight* vs. *Bent*?

Taut & tugs on lower back!



Knees Straight

Collapsed & relieves stress!

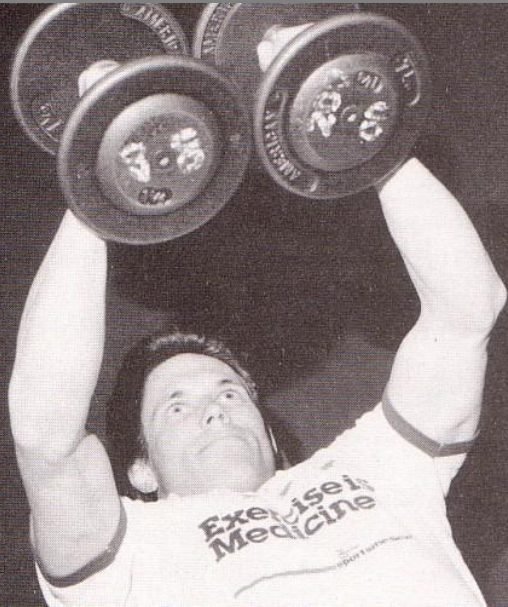


Knees Bent

Hip Flexors? *Iliopsoas, rectus femoris, sartorius*
Feet Anchored vs. *Unanchored*? *Unanchored*

7. Which of the following *single-joint action* exercises is best for working the *pectoral group* and *eliminates the triceps brachii*?
- a. Lat pull
 - b. Chest fly**
 - c. Military press
 - d. Bench press

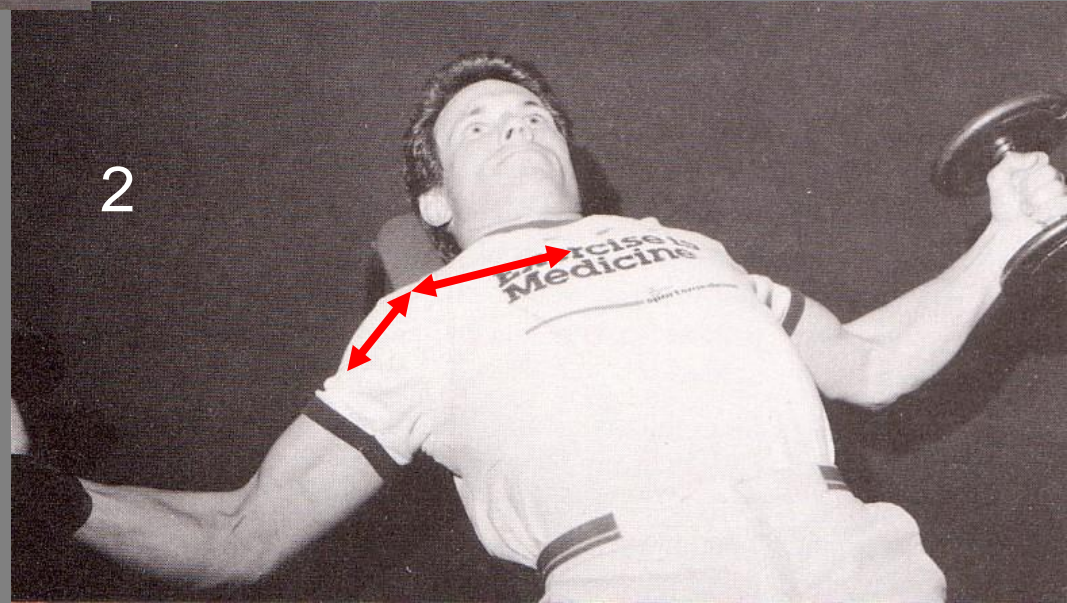
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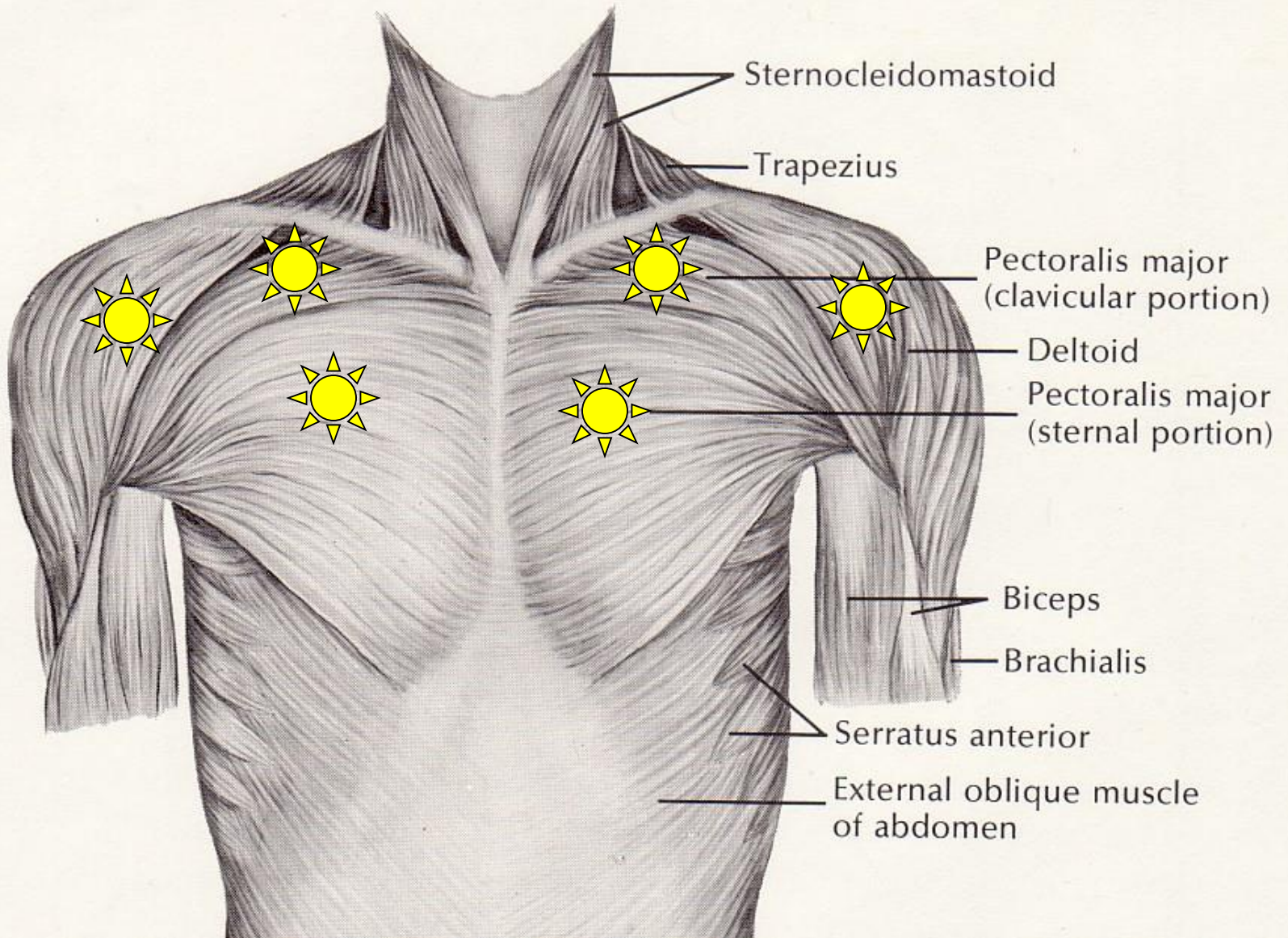


Chest Fly

Pectoral group
Anterior deltoid

2





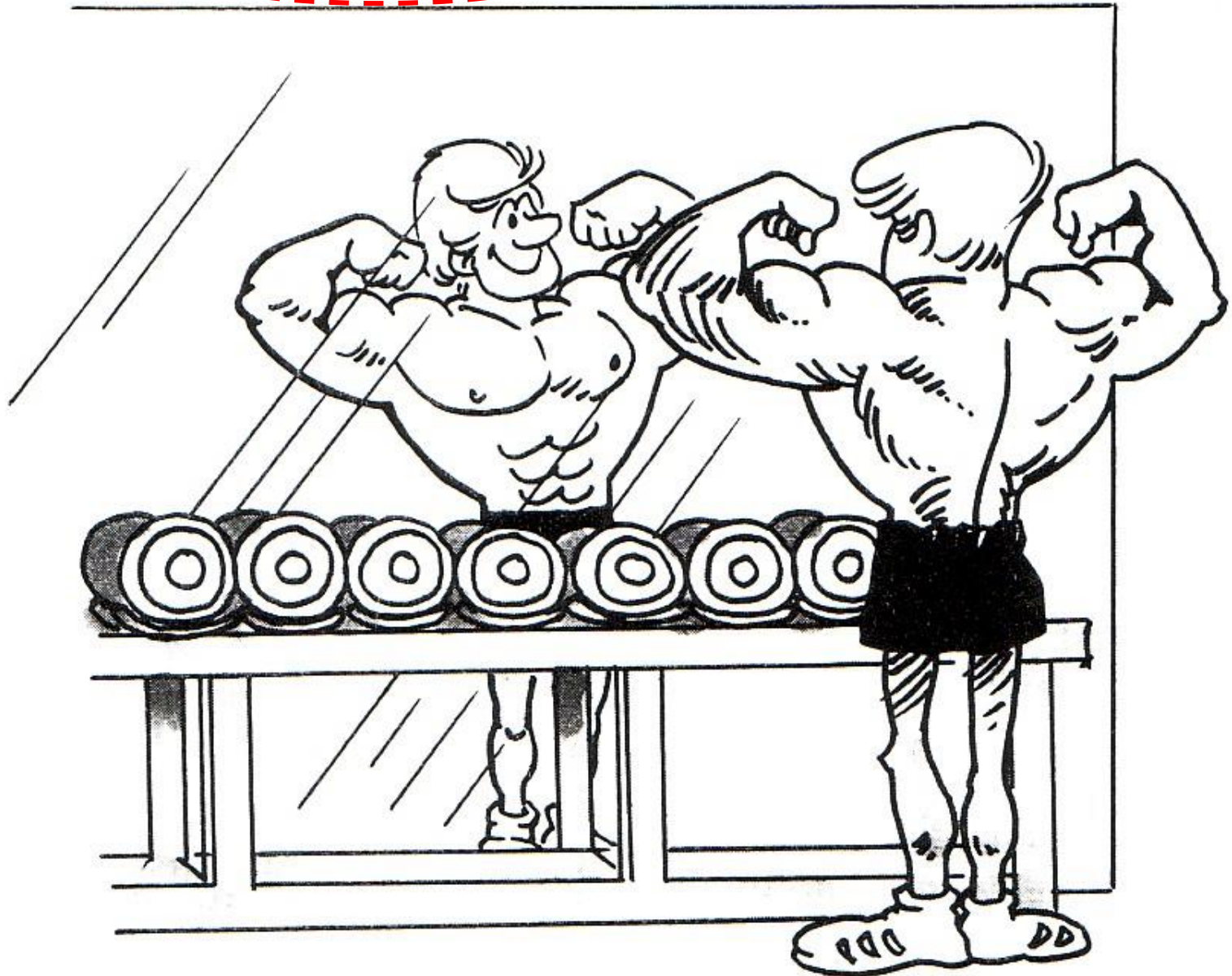
Correct Fly Technique: Hug the Oak Tree!!



Pretty good technique, but keep those wrists straight!

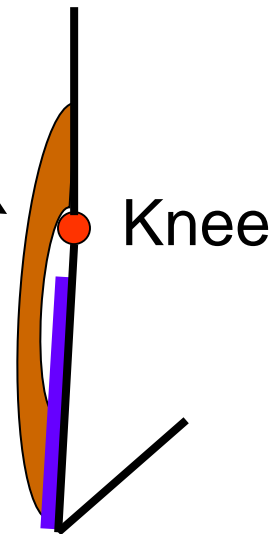
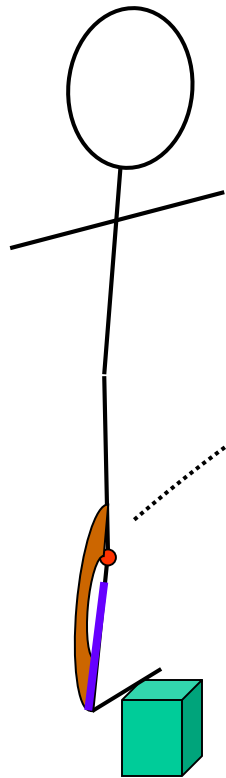
8. The *Bodybuilder's Syndrome* is a disproportionate focus on the development of which muscle regions?

- a. Posterior-Inferior **b. Anterior-Superior** c. Anterior-Posterior d. Superior-Inferior

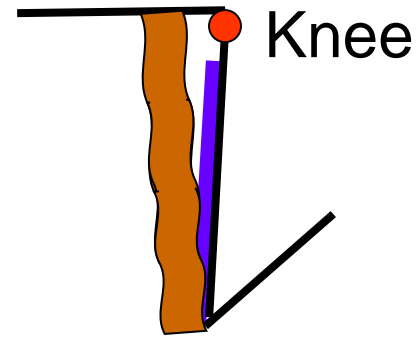


9. Which exercise best isolates the *soleus*?

- a. Russian dead lift b. Straight-knee calf raise **c. Bent-knee calf raise** d. Lunge



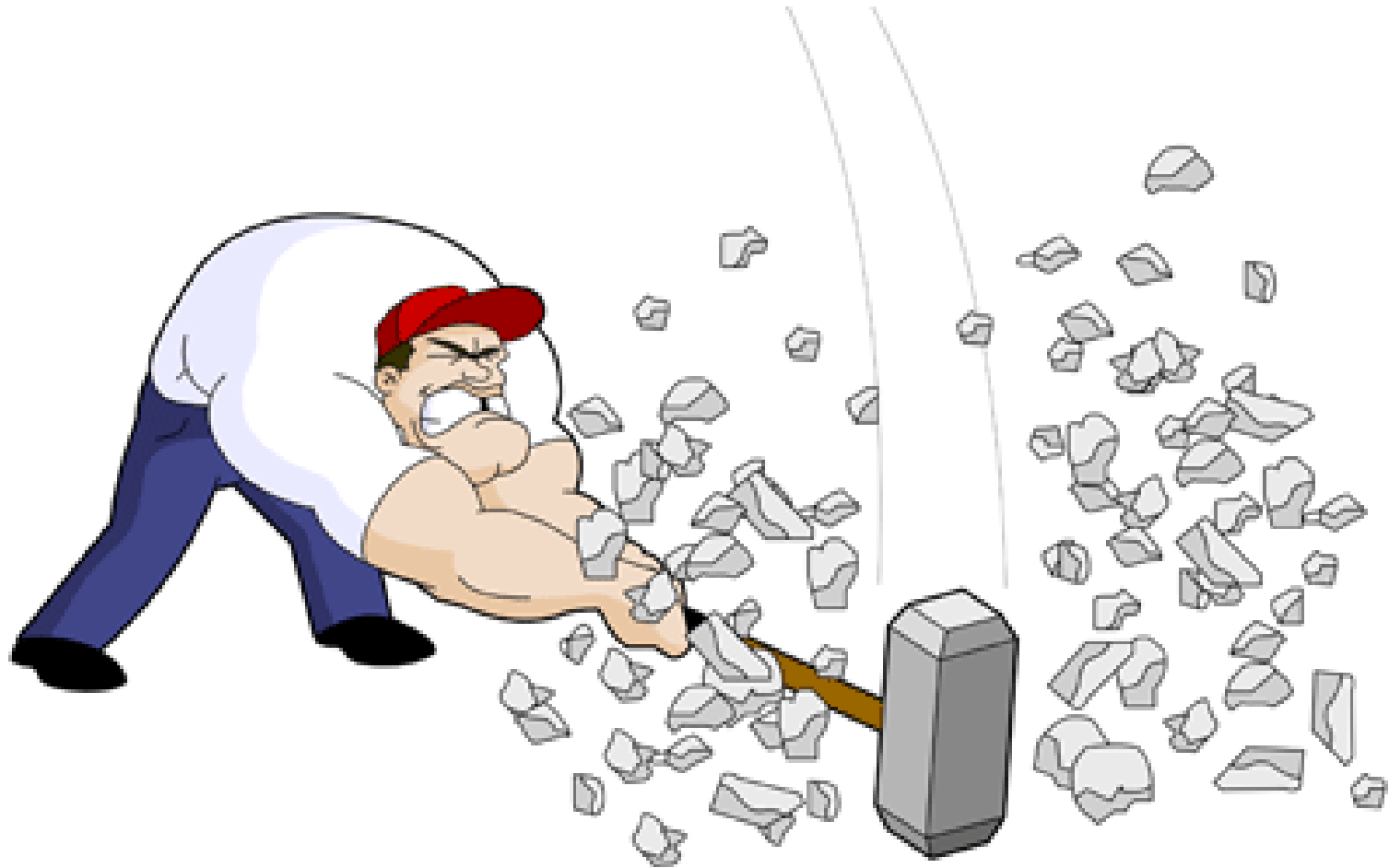
A. Knee straight
Gastrocnemius
stretched &
engaged!



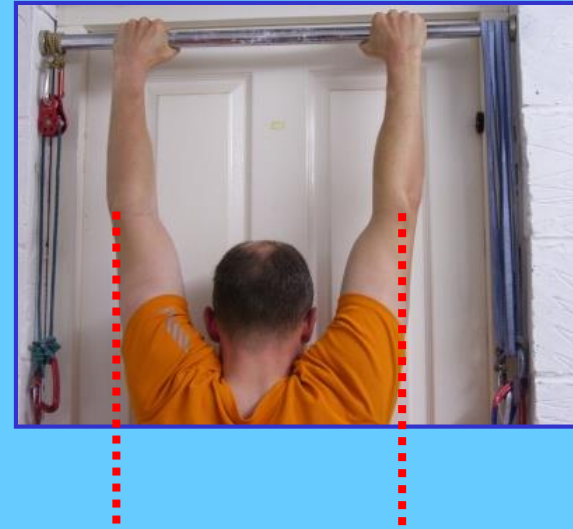
B. Knee bent
Gastrocnemius
slack, **soleus**
engaged

10. Which *grip* is best for isolating the *latissimus dorsi* muscles?

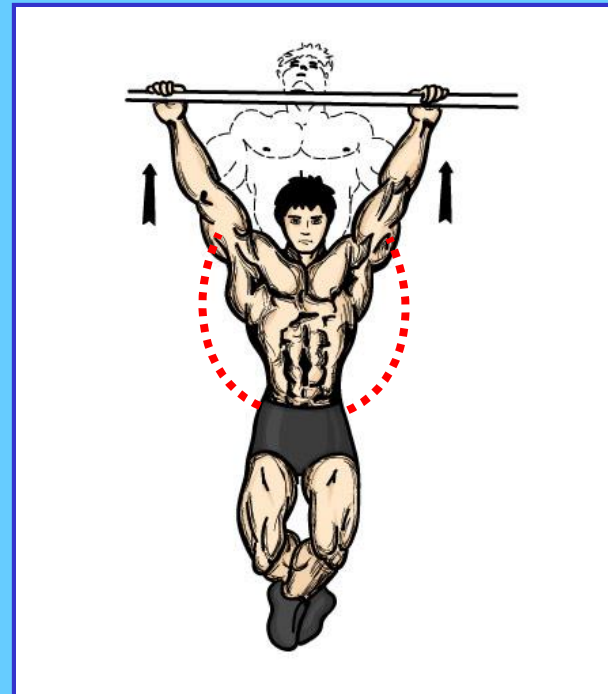
- a. Supinated wide b. Pronated shoulder-width c. Alternate wide d. Pronated wide



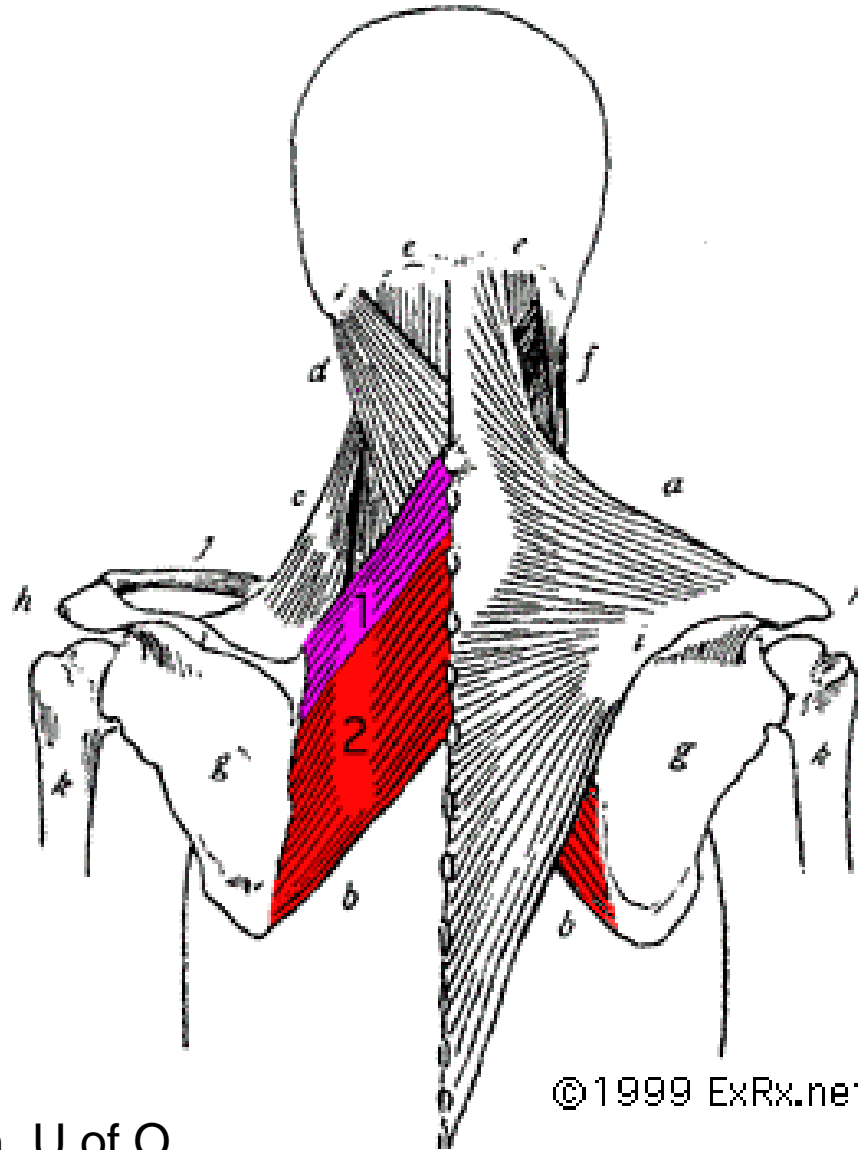
**Shoulder-width grip →
more Latissiumus dorsi**



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



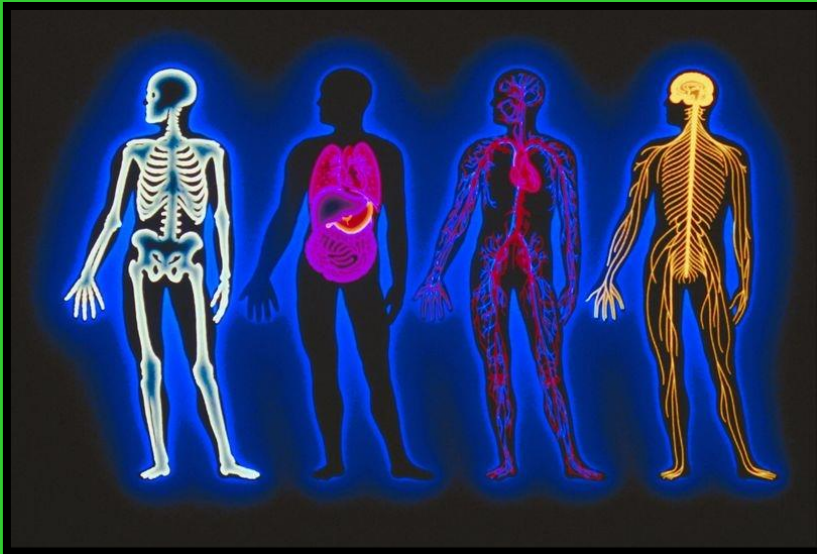
***Rhomboid muscles include
Major & minor***



©1999 ExRx.net

Courtesy S. Dawson, U of O

Physiology & Nutrition in the News!



Lose 30 lb in 30 days, Magic?



What about science?



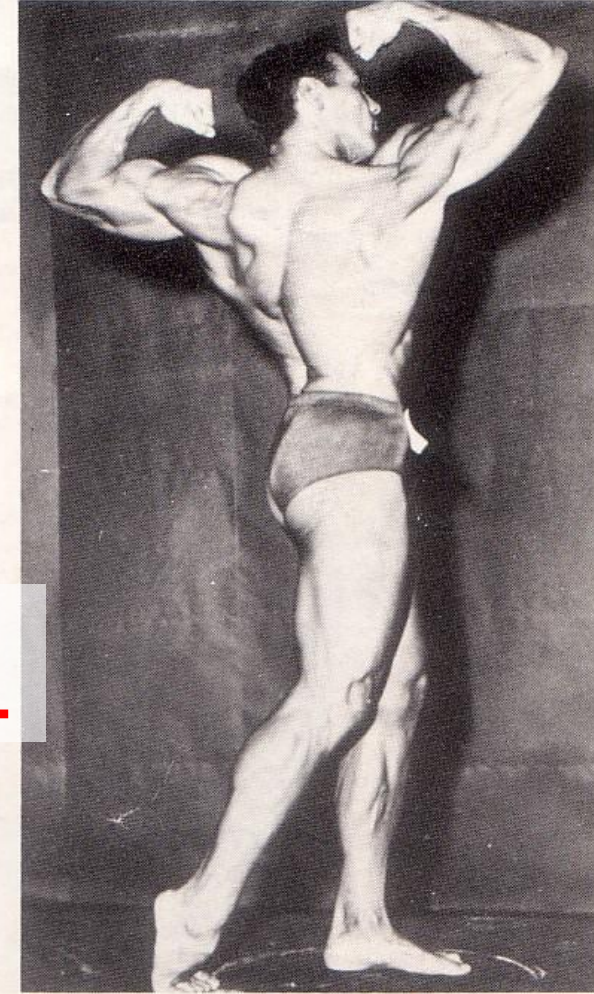
**32-wk Transformation?!! 401 lb to 222 lb!
179 lb in 224 d \equiv 0.8 lb/d \equiv 5.6 lb/wk \equiv 22.4 lb/mo**

Good morning = forward bend

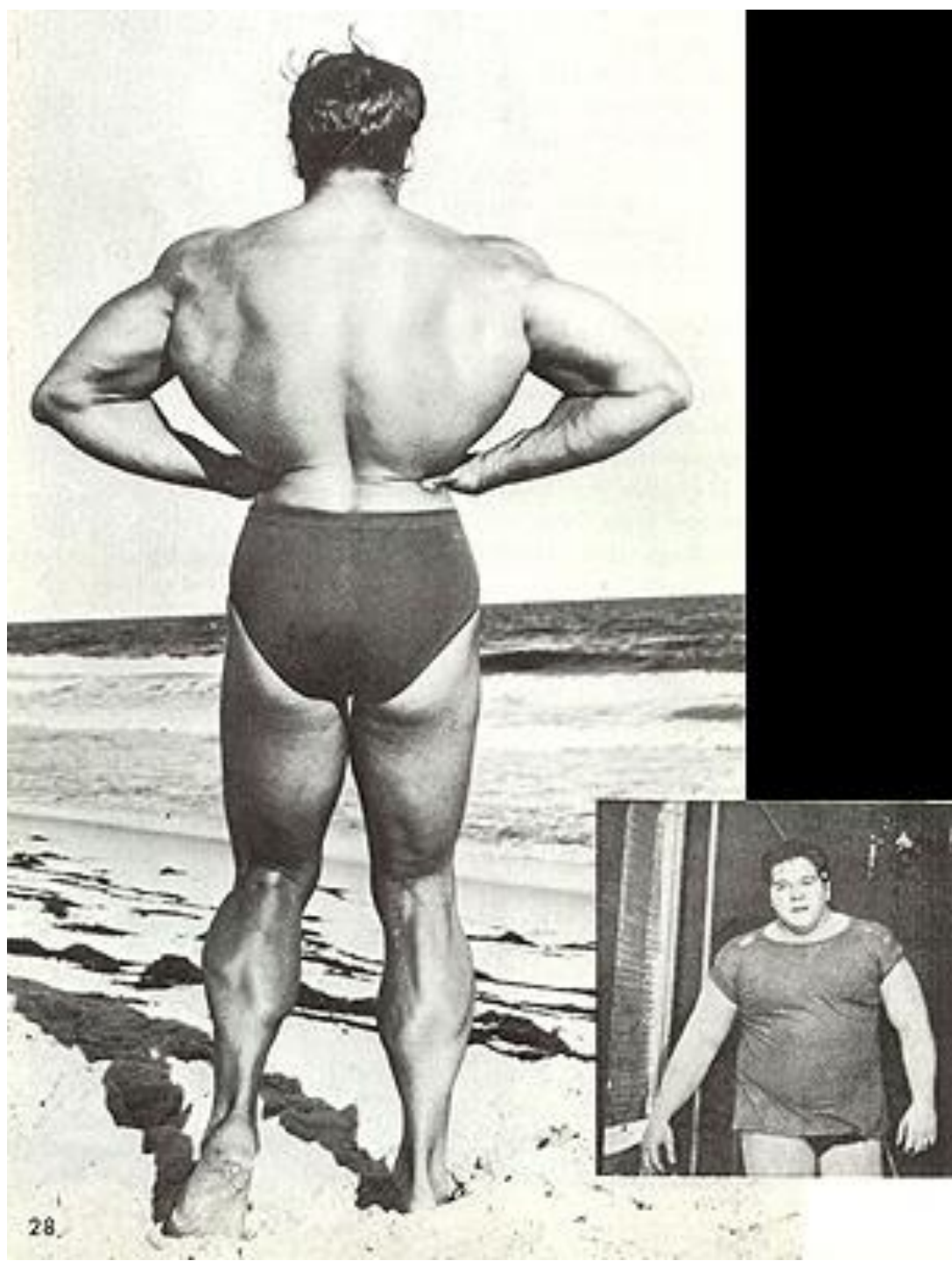


**NB: Low back?
Knees bent...**

Bruce Randall as he appeared when he weighed over 401 lb~~z~~. performing a Forward Bend exercise with 685 lb~~z~~.



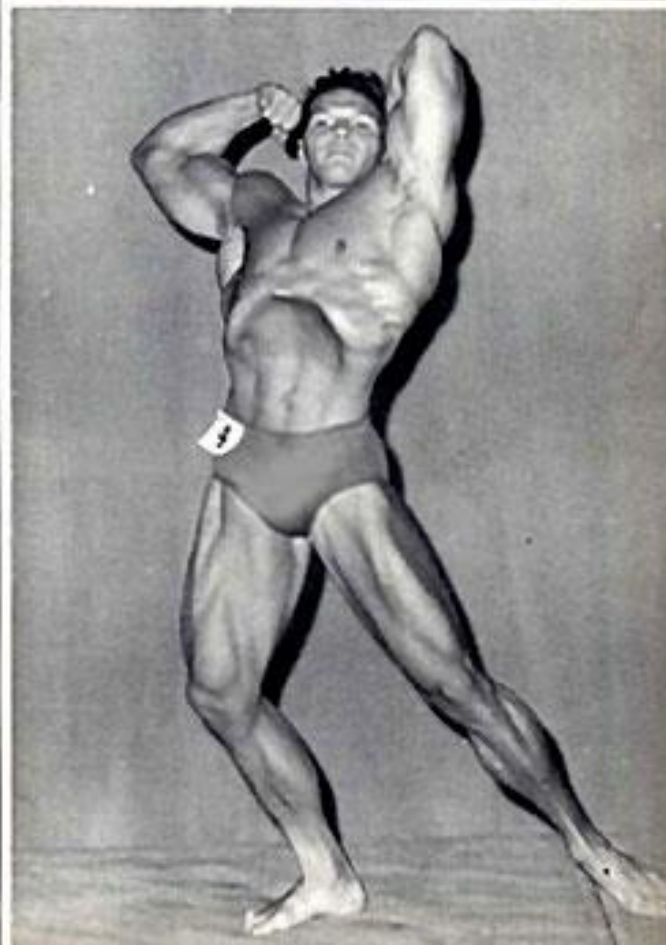
and Bruce Randall as he looked when he won the Mr. Universe Contest at a bodyweight of 222 lb~~z~~.



Bruce Randall 1959 NABBA Mr. Universe


HEALTH & STRENGTH NOV. 5 1959
1/6 Fortnightly
NATIONAL PHYSICAL FITNESS JOURNAL

Health Culture
•
Body Building
•
Weight Lifting
•
Wrestling & Judo
•
League & NABBA News



HARPER Gainer
the path to physical excellence

*bastion of
no-nonsense
drug-free
training*



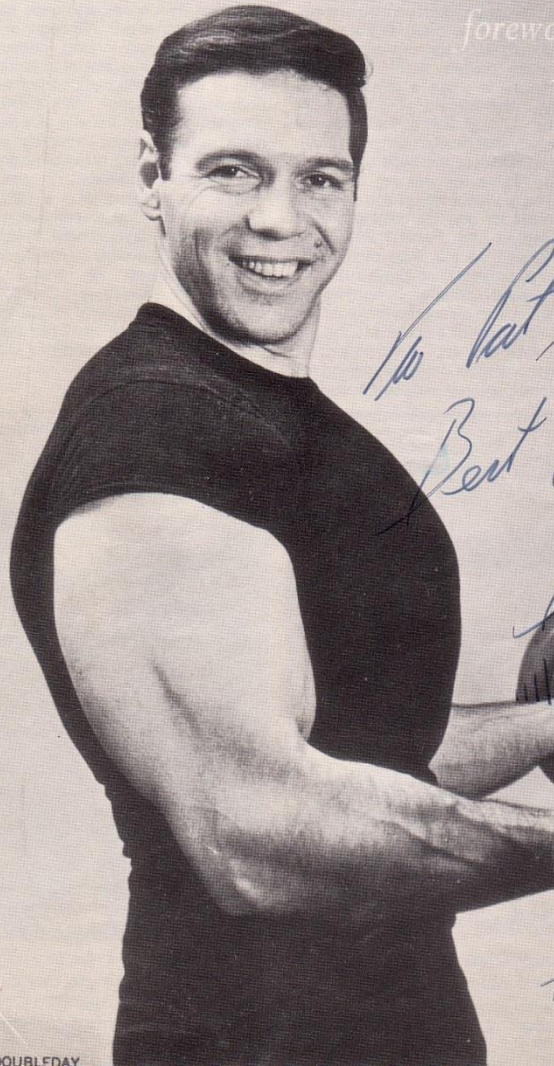
issue #75

THE BARBELL WAY TO PHYSICAL FITNESS

Bruce Randall (Mr. Universe)

foreword by **Stan Musial**

A simple effective program
for weight control and a sound
muscular body through the use
of barbells and proper diet.
With over 190 photographs



*To Pat,
Best Wishes to a Great Day!
Bruce Randall
Stan Musial
Washington Redskins
Dean Jay Walker
I. H. Superstars Weightlifting
Coach*

***I'm not sure I believe you!
Why can't I just starve to
lose weight?***



**TOTAL FAST =
No Energy Nutrients
(No Carbohydrates, Fats
or Proteins)**

ONLY

- 1. Water**
- 2. Vitamins**
- 3. Minerals**

60-day Fast???

Lost 60 lb!! Wow!!

Yet

76.7% {
26 lb Water
20 lb Lean Body Mass
14 lb Fat

Fat < 1/4 total wt loss!

***You can lose weight by
starving – but it's mostly
water & muscle! Also, there
can be complications!***



Potential Complications of Total Fasting

**Nausea, diarrhea, persistent vomiting,
postural hypotension, nutritional
deficiencies, menstrual irregularities,
and...sudden death.**

Positive Aspect??

**General loss of appetite within
first 2 days, maintained
throughout fasting period.**

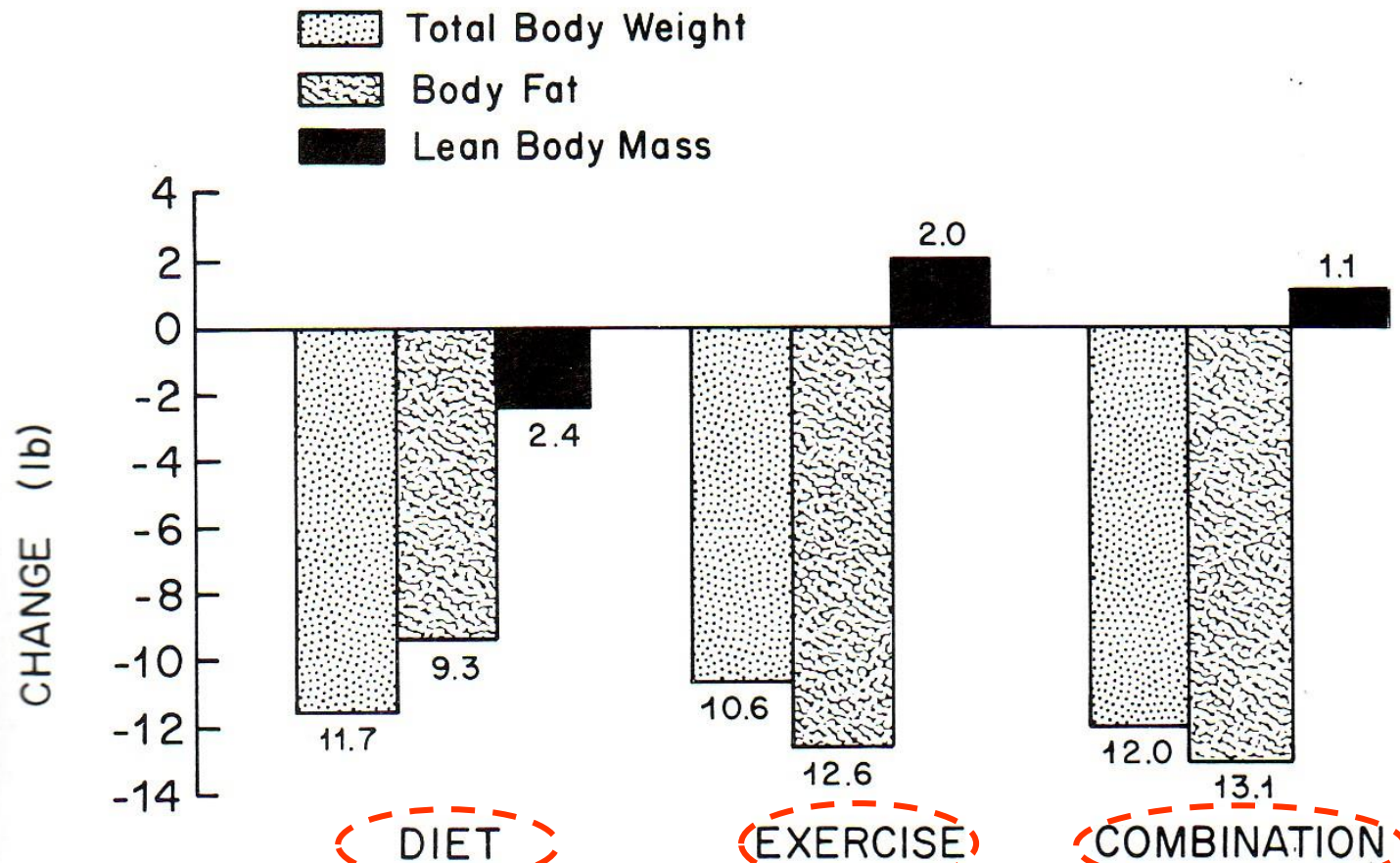


Figure 4-9. Changes in body weight, body fat, and lean body weight for diet, exercise, and combination groups. (From Zuti W. B., and Golding, L. A.: Comparing diet and exercise as weight reduction tools. *Phys. Sportsmed.* 4:49-53, 1976.)

NB: Each group 500 kcal deficit/day, 16 weeks



**Compared to dieting,
exercise is superior in
inducing % body fat
reduction & preserving
lean body mass!**

Lose no more than 2.2 lb or 1 kg/wk!



**AMERICAN COLLEGE
of SPORTS MEDICINE**
LEADING THE WAY



ACSM
CERTIFIED
PERSONAL TRAINERSM



Table H.1 Sample Exercises for Major-Minor, Agonistic-Antagonistic, and Superior-Inferior Programs

| Program Type | Muscular Regions | Sample Exercises |
|---|-----------------------------------|--|
| Major-Minor (M-M) ^a | Chest and lower extremity | Bench press and accessory chest; squat and accessory thigh and leg exercises. |
| | Back, shoulder, and arm | Lat pull, military press, biceps curl, triceps extension, and accessory SJA exercises ^d |
| Agonistic-Antagonistic (A-A) ^b | Chest, shoulder, and triceps | Bench press and accessory chest; military press, triceps extension, and accessory SJA exercises |
| | Lower extremity, back, and biceps | Squat and accessory thigh and leg exercises; lat pull and accessory back exercises |
| Superior-Inferior (S-I) ^c | Chest, shoulder, back, and arm | Bench press and accessory chest; military press, lat pull, biceps curl, triceps extension, and accessory SJA exercises |
| | Lower extremity | Squat and accessory thigh and leg exercises |

Agonistic-Antagonistic (A-A)^b

NB: Some bodybuilding routines push-pull over separate days.

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



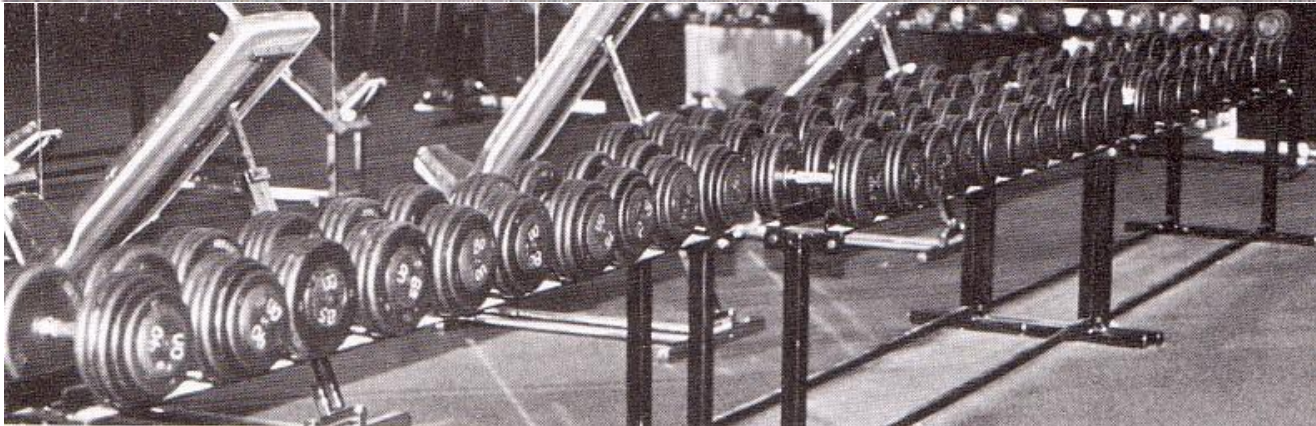
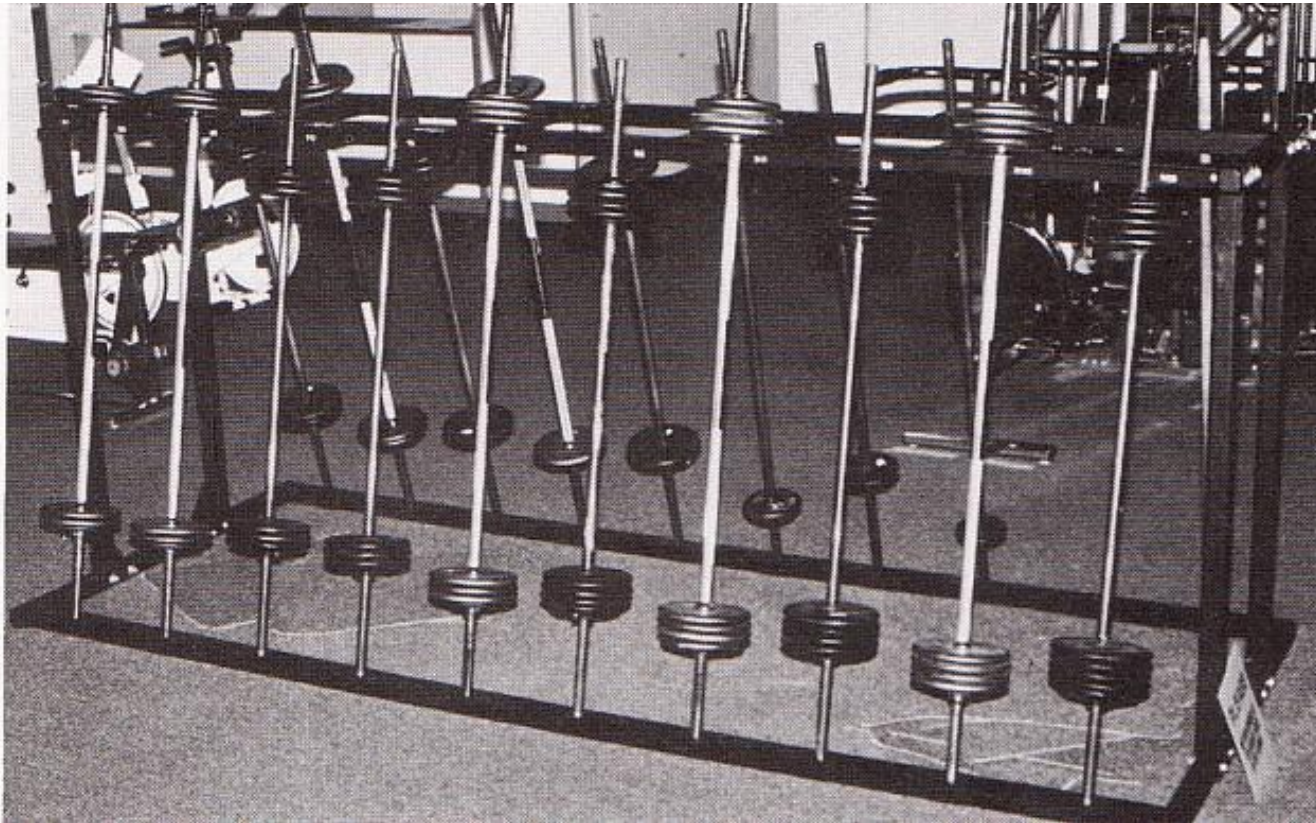
NB: $\approx 5-10^\circ$
around set \leftarrow ,
 \rightarrow limited
functionality!



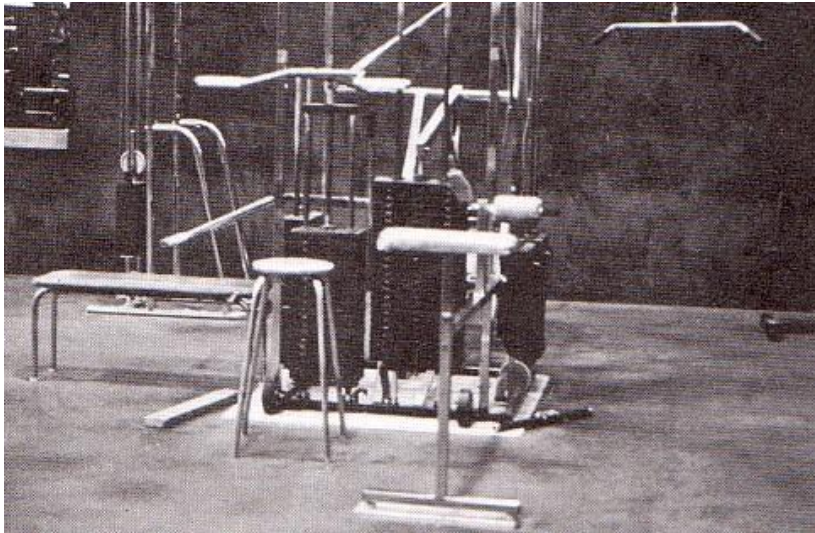
Functional isometrics at an early age!



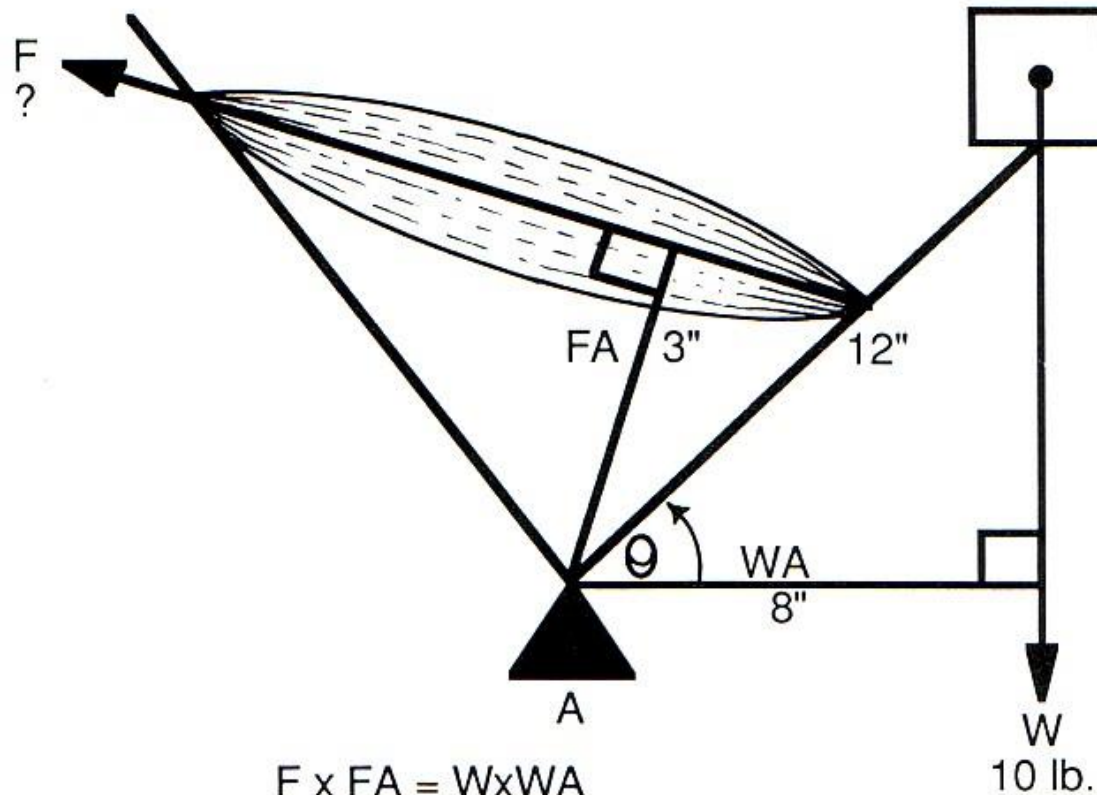
Isotonic Barbells & Dumbbells



Most CWT Machines & WT Equipment Isotonic



Force x Force Arm = Weight x Weight Arm



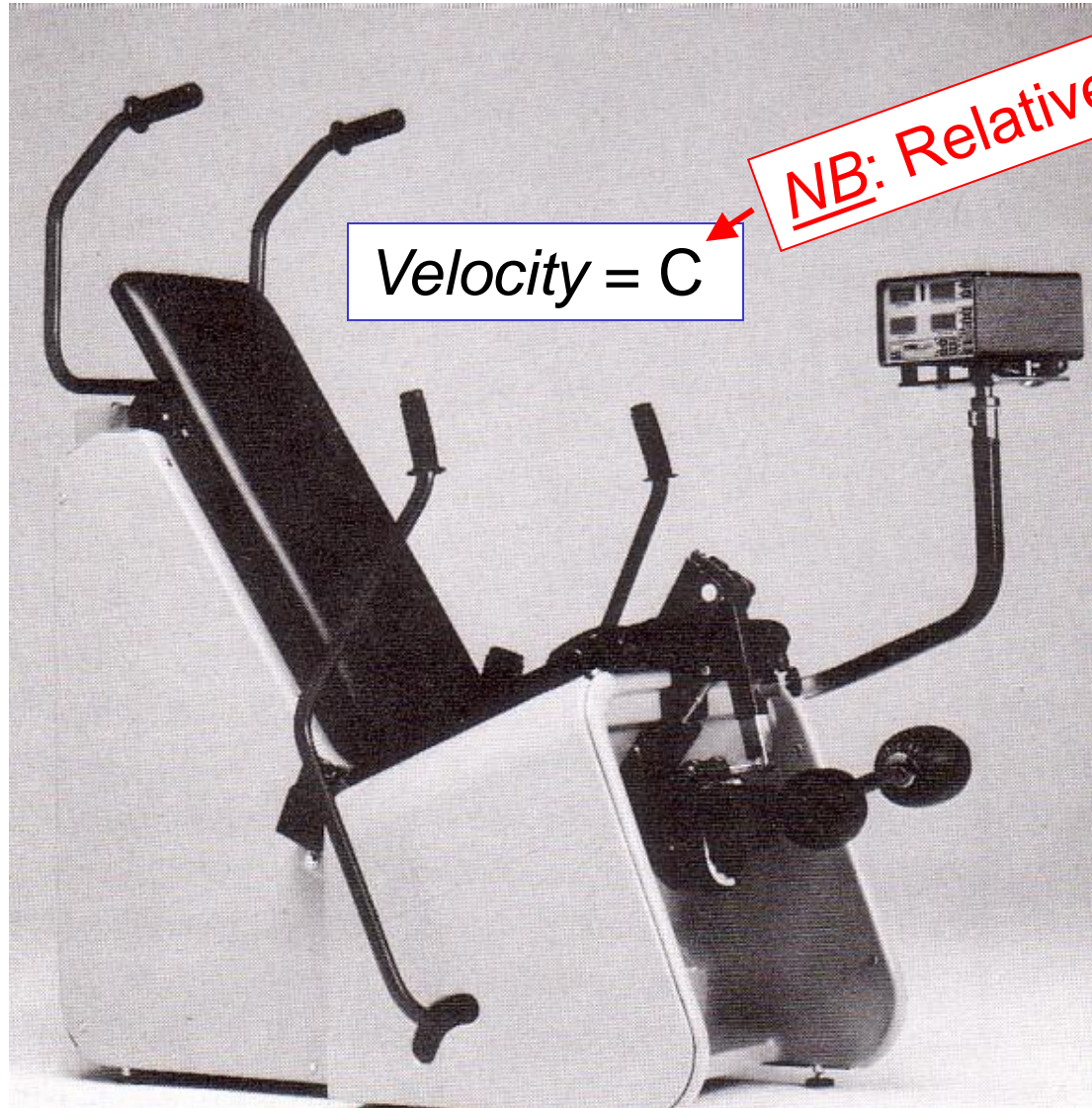
$$F \times FA = W \times WA$$

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

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

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

Isokinetic Omni-tron: Concentric-Concentric



$Velocity = C$

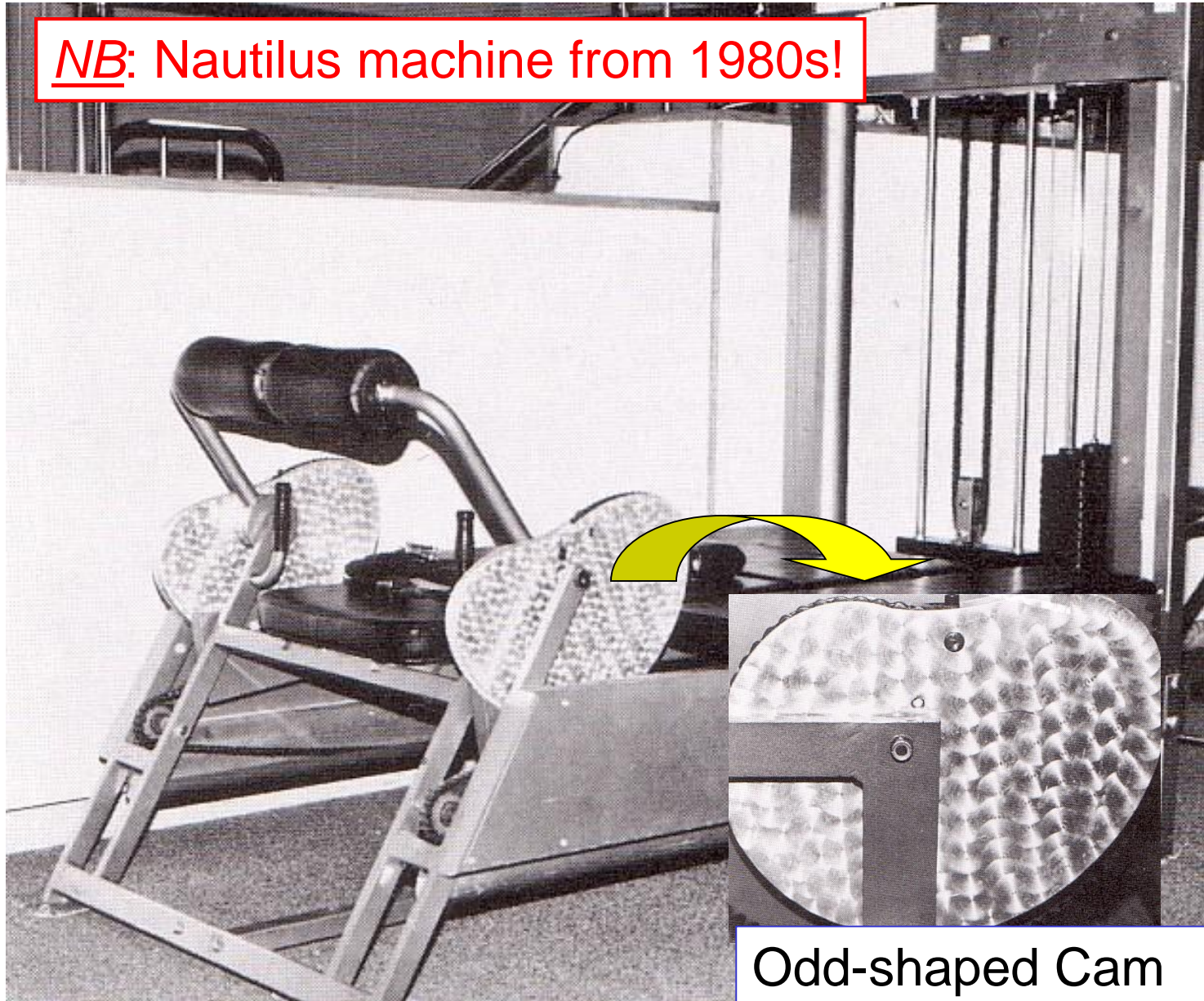
NB: Relatively constant!

**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)

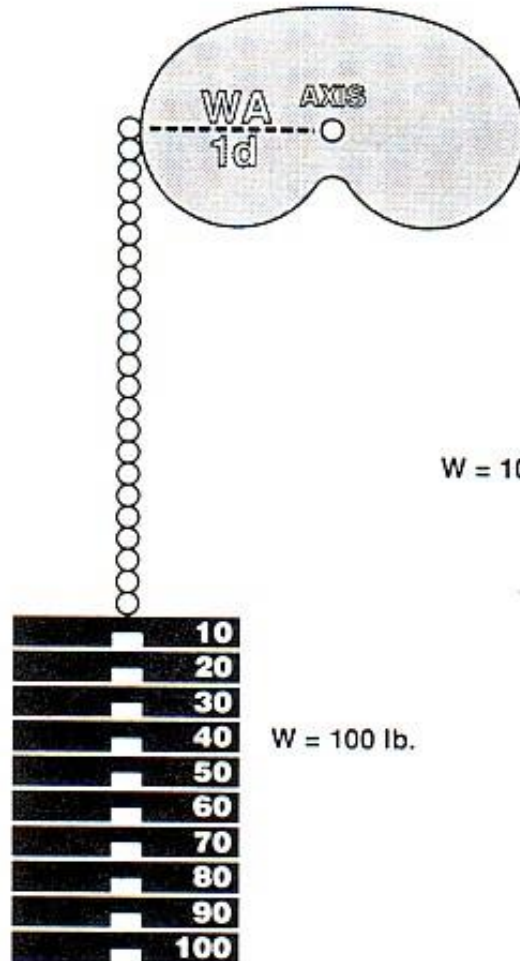
NB: Nautilus machine from 1980s!



Odd-shaped Cam

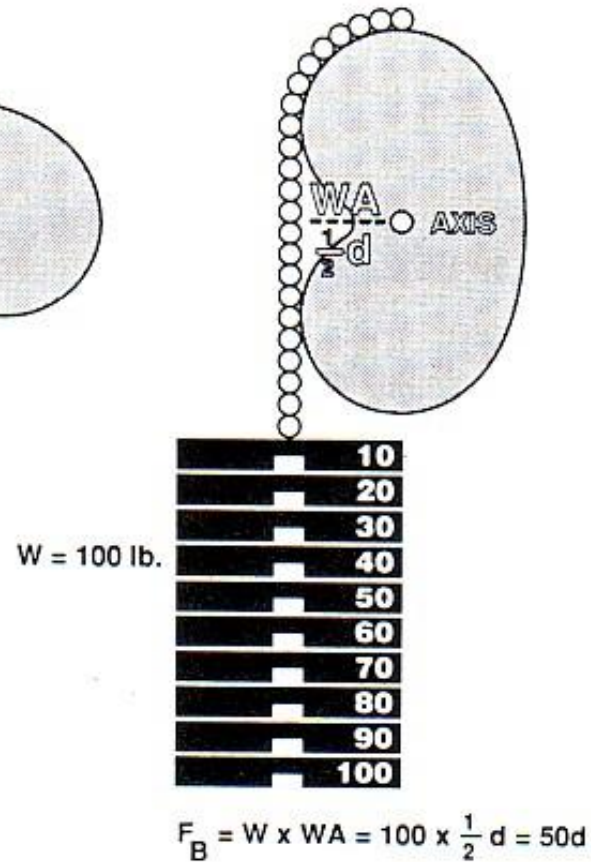
Simplified Cam System

A. Start



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

B. Finish



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