I. **Announcements**  Q last time? *Treasure Hunt II in Anatomy Lab this Thursday!* Meet directly outside B63B Klamath next session @ 10. Q?

II. **Review of Anatomy Lab I Treasure Hunt**

III. **Optimal Breathing Techniques + Valsalva’s**

IV. **Benefits & Myths of Weight Training**
Group + class discussion

V. **Anatomy of Gastrocnemius-Soleus Complex**

VI. **Knee & Leg Muscle Stress?**
A. Calf raise – straight knee
B. Calf raise – bent knee

VII. **Q? Open Discussion?**

Heck Yeah! Fun again!
Anatomy Lab Treasure Hunt I. Question 1!

Identify posterior thigh muscles/hamstrings worked by the squat and front squat and in more isolation by the leg curl exercise.

Name and identify four subdivisions of the posterior thigh.

What is a tendon? What do tendons do?

A section of the tendon of which of these four hamstrings subdivisions might be used in the reconstruction of the anterior cruciate ligament/ACL? Why might it be selected?
Vastus lateralis
Adductor magnus
Biceps femoris
Gluteus maximus
Hamstrings
L thigh posterior
Muscles: Cross Joints by Way of Tendons

Tendons: Staple Muscles to Bones!
L thigh posterior

Hamstring Group

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

Section can be used for ACL repair!
Anatomy Lab Treasure Hunt I. Question 2

Identify *anterior thigh muscles* worked by the *leg extension exercise*.

Name these *four anterior thigh muscles* specifically in the space below.

Which of these four (sub-) muscles is worked specifically by the last $10-15^\circ$ of the leg extension?
Leg Extension

Front of thigh = quadriceps
Schematic of Anterior L Thigh

- Rectus femoris
- Vastus intermedius
- Vastus lateralis
- Vastus medialis
- Patella
- Quadriceps
- Tendons
L thigh anterior

Quadriceps

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

NB: worked last 10-15° of knee extension
Find and identify muscles that are worked by the chest fly.

Why is this exercise described like “hugging an oak tree”?

Which joint/joints should be stabilized during the chest fly?

What muscle groups are activated by the bench press, but not by the chest fly?
What about a chest fly?
1. Chest Fly

Pectoral group
Anterior deltoid
R chest anterior

clavicular

sternocostal

Pectoralis major
Correct Fly Technique: Hug the Oak Tree!!

Pretty good technique, but keep those wrists straight!
Chest Fly or Press?


Comments on the technique?
Find and identify three major muscle groups worked by the military press.

Classify this exercise as squat or push or pull.

Which muscle groups activated by the military press are not exercised extensively by the bench press?

Which muscle groups worked by the bench press are not exercised extensively by the military press?
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
Bench Press

- Chest
- Shoulder front
- Arm back

Pectoral group
Anterior deltoid
Triceps brachii
Identify and list below at least **three major muscle groups** worked by the **lat pull**.

Classify this exercise as **squat** or **push** or **pull**.

Can you find **subsections or unique parts** of any of these major muscle groups? If so, **identify them**?

Can the **subsections** you’ve chosen be **isolated** based on the specific **exercise or grip performed**?
Lat Pull/Pull-up Muscle Activation

NB: + forearm muscles: brachioradialis + ...

Back – upper
Chest
Shoulder – back
Arm – front
Forearm – back
Common grips used in weight training

- Pronated / Overhand
- Supinated / Underhand
- Alternate / Spotting
Latissimus Dorsi Most Heavily Activated in *Hammering Plane!*
What are upper & lower extremity climbing muscles?
Shoulder-width grip $\rightarrow$ more Latissimus dorsi

**Wider grip** $\rightarrow$ more Rhomboids, middle Trapezius
Rhomboid muscles include Major & minor
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.
Breathe Continuously!
Weight Training Enhances 4 of 5 Components of Health-Related Fitness!!

NB: %Fat not pictured.
…but Improvements in CV Fitness are Minimal!

AEROBIC ACTIVITY

HEART RATE

RHR

85%

70% MHR

TIME

5 Min

ANAEROBIC ACTIVITY

HEART RATE

RHR

85%

70% MHR

TIME

5 Min
...even with Circuit Weight Training!
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

Muscle contracts ≠ Fat stores survival fuel!

Muscle & fat are not magically interchangeable!
Myth 6: Spot Reduction
Right Leg Muscles - Lateral

- Biceps femoris long head
- Biceps femoris short head
- Iliotibial tract
- Gastrocnemius
- Head of fibula
- Gastrocnemius
- Soleus
- Fibula
- Flexor hallucis longus
- Peroneus longus
- Peroneus brevis
- Calcaneal tendon
- Tibialis anterior
- Extensor digitorum longus
- Extensor hallucis longus
- Peroneus tertius

Thigh
Knee
Leg
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
Technique Analyses of Internet Pictures

Knees straight $\rightarrow$ 1° gastrocnemius
Technique Analyses (continued)

Knees bent $\rightarrow$ $1^0$ soleus
Discussion

+ Q?