

Lane Community College Physical Therapist Assistant Program

PTA 133 Lab Movement Analysis Group Project

Groups

Groups are comprised of 4-5 students with no more than 2 of the same students from previous 132 lab group.

The Movement

Choose a human movement to analyze.

The movement must be pre-approved by instructors by week 5.

Each group must have an original movement – no repeats.

Must have at least 2 distinct phases of movement.

Must be total body movement (involve minimum of 6 joints)

Can be athletic movement or activity of daily living.

The Video

A clear video of your movement must be provided and published in the PTA133L You Tube account.

The video can be a previously published video or created by your group. (The latter is preferred.)

Groups may keep the video on a private during editing but need to be shared on the group wiki for instructor viewing by during Week 6.

Videos must be annotated or labeled similar to the example video provided. (This was done on You Tube very easily by uploading from a Flip Video camera.)

Zooming in to show each specific joint is highly recommended.

The Analysis Chart

Create a table outlining the characteristics of the joints and muscles involved similar to the one below.

This will be turned in with your report.

The Report

The movement analysis must be written up in narrative report describing the motion, when the motion may occur, and description of the joint according to the table. Also include one paragraph with some references to injuries that may occur as a result of this motion or through faulty mechanics of this motion.

Specifications: 2 page minimum length (not including cover page, reference page, or analysis chart), double spaced with 1 inch margins **MAXIMUM**, include a cover page with all group member names and a photo of your movement, reference cited in APA Style.

The Presentation

Use your imagination!

We need to see the video, stopping at major points for explanation of joint characteristics.

Time requirement: 10-15 minutes

Here is the twist...there will be ONE presenter from the group, chosen **RANDOMLY** the day of the presentation, so each member must be prepared to do the speaking.

Timelines

Week 3: Assignment announced on Friday

Week 4: Groups member names sent to Beth by Friday

Week 5: Movement submitted for approval by Friday

Week 6: No lab – Work evidence including video link and designation of duties on wiki, and contributions from each member required by following Monday

Week 9: Report Due via Moodle, including analysis chart; special requests

Week 10: Friday Presentations for ALL GROUPS

Helpful Kinesiology Reminders:

1. Recall and apply the types of muscle contraction.
 - a. Concentric – a muscle contracts and shortens, causing joint movement
 - b. Eccentric – a muscle contracts and lengthens, causing joint movement
 - c. Isometric – a muscle contracts and develops tension, but does not appreciably change length; no joint movement occurs. Isometric contractions are used to stabilize a segment (usually proximal) so that motion can occur elsewhere.
2. Knowledge of muscles and their actions to analyze movement.
 - a. Muscle actions learned in lecture are generally the concentric actions, or the motion the muscle causes when it actively shortens.
 - b. Antagonist muscle actions are the eccentric actions, the motion a muscle causes when it actively lengthens.

If your group finds this difficult to conceptualize, try the preparatory exercise. Make a table listing the prime movers muscles involved in your selected movement. List the muscles in the left hand column, the concentric action in the middle column, and the eccentric action in the right column. The concentric and eccentric actions should be opposite. See the example table below.

| MUSCLE | CONCENTRIC | ECCENTRIC |
|----------------|-----------------|-----------------|
| Biceps | Flexes elbow | Extends elbow |
| Middle deltoid | Abducts humerus | Adducts humerus |
| | | |

3. Ability to accurately discern the resistance to a movement and the direction of that resistance.
 - a. When movement occurs in the opposite direction to the direction of resistance, a concentric contraction occurs. (Gravity is always directed toward the center of the earth.)

- b. When the movement is in the same direction as that of the resistance, an eccentric contraction is occurring. (Resistance to gravity can be redirected using equipment such as cables.)
4. Comprehension of the difference between closed and open kinetic chain and the effect the difference will have on movement.
 - a. Closed – distal end of the extremity is fixed; movement is predictable and interdependent.
 - b. Open – distal end of the extremity is free; movement is unpredictable and independent
 5. Recognition that muscle contraction can occur even when no joint movement occurs.
 - a. When movement occurs distal to an unmoving body part, the stabilization of the part may be due to isometric contraction.
 - b. When movement occurs proximal to an unmoving part, the stabilization may be due to the fact that the distal end is fixed in a closed kinetic chain.

Sample Movement Analysis Chart:

| PHASE I | Joint | Movement/ Position | Muscles | Resistance Same or Opp | Type of Contraction |
|---------|----------|-----------------------|---------------------------|---------------------------|------------------------|
| | Shoulder | Flexion | Deltoid | Opposite | Concentric |
| | Elbow | Flexion | Biceps Brachioradialis | Opposite | Concentric |
| | Wrist | Flexion | Flexor Carpi... | Neutral | Isometric |

| PHASE II | Joint | Movement/ Position | Muscles | Resistance Same or Opp | Type of Contraction |
|----------|----------|-----------------------|------------------|---------------------------|------------------------|
| | Shoulder | Extension | Latissimus Dorsi | Opposite | Concentric |
| | Elbow | Extension | Triceps | Opposite | Concentric |
| | Wrist | Flexion | Flexor Carpi... | Neutral | Isometric |

