

PHYE 281 - Applied Kinesiology

Lecture 8

Muscular Analysis of Upper Extremity Exercises

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Objectives

Understand the appropriate anatomic considerations when conducting a kinesiological analysis

Conduct movement analyses for a variety of upper extremity exercises.

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Kinesiological Concepts

Kinesiological analysis of exercises is critical to appropriate exercise prescription

When analyzing an activity the following must be considered:

Which joints are moving?

Which actions are the moving joints performing?

Which joints are static and which position are they in?

Which muscles are involved for each joint?

Which type of contraction is occurring?

concentric, eccentric, isometric

This must be done for the up-phase (against gravity) and the down-phase

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Kinesiological Analysis Chart

Joint	Action when lifting	Muscles in lifting	Contraction type in lifting	Action when lowering	Contraction type when lowering

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Kinesiological Analysis For an Arm Curl

Joint	Action when lifting	Muscles in lifting	Contraction type in lifting	Muscles in lowering	Action when lowering	Contraction type when lowering
Wrist and Hand	Flexion - static	Wrist and hand flexors -Flex. carpi rad. -Palm. long -Flex. carpi uln.	Isometric	Wrist and hand flexors -Flex. carpi rad. -Palm. long -Flex. carpi uln.	Flexion - static	Isometric
Elbow Joint	Flexion - dynamic	Elbow Joint Flexors -Biceps brachii -Brachialis -Brachioradialis	Concentric	Elbow Joint Flexors -Biceps brachii -Brachialis -Brachioradialis	Extension - dynamic	Eccentric

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Military Press Analysis

Joint	Action when lifting	Muscles in lifting	Contraction type in lifting	Muscles in lowering	Action when lowering	Contraction type when lowering
Wrist and Hand	Flexion - static	Wrist/hand flexors -Flexor carpi radialis -Palmaris longus -Flexor carpi ulnaris	Isometric	Wrist/hand flexors -Flex. carpi rad. -Palmaris longus -Flex. carpi uln.	Flexion - static	Isometric
Elbow Joint	Extension - dynamic	Elbow Extensors -Triceps brachii -Anconeus	Concent.	Elbow Extensors -Triceps brachii -Anconeus	Flexion - static	Eccentric
Shoulder Joint	Abduction - dynamic	-Deltoid - all 3 heads -Supraspinatus -Pect. maj - clav. fib. -Coracobrachialis	Concent.	-Deltoid all heads -Supraspinatus -Pect. maj - clav. fib. -Coracobrachialis	Add. - dynamic	Eccentric
Shoulder Girdle	Upward rotation - dynamic	-Trapezius - upper fiber. -Serratus anterior	Concent.	-Trapezius - upper fibers -Serratus anterior	Down. rotation - dynamic	Eccentric

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Exercises in Analysis

Complete kinesiological analysis for the following exercises:

Chest Press

Over-head Tri. Ext.

Lat Pull

Bent Over Row



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Joint	Action when lifting	Muscles in lifting	Contraction type in lifting	Action when lowering	Contraction type when lowering

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Joint	Action when lifting	Muscles in lifting	Contraction type in lifting	Action when lowering	Contraction type when lowering

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Joint	Action when lifting	Muscles in lifting	Contraction type in lifting	Action when lowering	Contraction type when lowering

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