



Personal Trainer  
Manual

1<sup>st</sup> edition

## Table of Contents

Introduction.....	3
Hip Extension.....	4
Hip – Other Joint Actions.....	<b>Error! Bookmark not defined.</b>
Knee and Ankle Joint Actions .....	<b>Error! Bookmark not defined.</b>
Shoulder Joint Actions Part 1.....	<b>Error! Bookmark not defined.</b>
Shoulder Joint Actions Part 2.....	<b>Error! Bookmark not defined.</b>
Shoulder Girdle Actions .....	<b>Error! Bookmark not defined.</b>
Elbow and Wrist Actions.....	<b>Error! Bookmark not defined.</b>
Trunks Actions .....	<b>Error! Bookmark not defined.</b>
Special equipment.....	<b>Error! Bookmark not defined.</b>
Resistance Training Basics .....	<b>Error! Bookmark not defined.</b>
Resistance Training Advanced .....	<b>Error! Bookmark not defined.</b>
Cardiovascular Training .....	<b>Error! Bookmark not defined.</b>
Body Composition – Muscle and Fat .....	<b>Error! Bookmark not defined.</b>
Skeletal system .....	<b>Error! Bookmark not defined.</b>
Connective Tissue .....	<b>Error! Bookmark not defined.</b>
Nervous System .....	<b>Error! Bookmark not defined.</b>
Endocrine system .....	<b>Error! Bookmark not defined.</b>
Physical Activity and Disease .....	<b>Error! Bookmark not defined.</b>
Pre-exercise Screening .....	<b>Error! Bookmark not defined.</b>
Fitness assessment .....	<b>Error! Bookmark not defined.</b>
Weight loss goals .....	<b>Error! Bookmark not defined.</b>
Successful Trainers .....	<b>Error! Bookmark not defined.</b>
APPENDIX .....	<b>Error! Bookmark not defined.</b>

## Introduction

This personal trainer manual is designed to help you pass the PFTA Personal Trainer exam. But even if you have no intention of taking the PFTA Personal Trainer exam, this manual will still provide you with substantial knowledge on muscles, exercises, nutrition, and weight loss. We hope you enjoy it!

This manual is written in outline form. It is meant to be easier to understand and easier to study than a traditional personal trainer book. This manual is divided into smaller, more manageable sections. At the end of each section is a quiz review to help you pass the section quiz if you decide to enroll in the personal trainer class.

The manual starts with joint actions. In order to get a balanced body, we recommend working out all joint actions at least once a week.

If you have questions or comments on the PFTA Personal Trainer manual, please email [director@pftaschools.com](mailto:director@pftaschools.com)

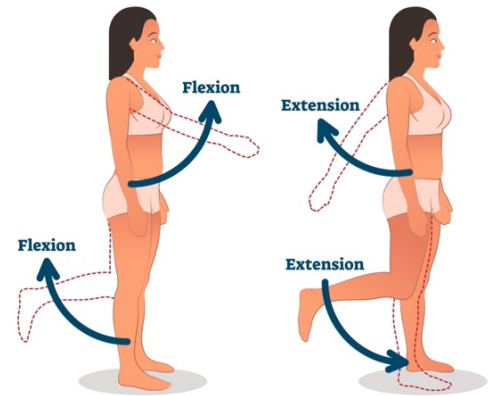
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## Hip Extension

1. Definitions for this quiz
  - a. Single joint exercises – movement around 1 joint
    - i. Barbell curls move around the elbow joint
    - ii. Leg curls move around the knee joint
  - b. Multi-joint exercises – movement around 2 or more joints
    - i. Barbell squats move around the hip, knee, and ankle joints
    - ii. Bench press moves around the shoulder and elbow joints
  - c. Flexion
    - i. Angle between two bones normally getting smaller
      1. Dumbbell front raise = shoulder flexion
      2. Leg curls = knee flexion
  - d. Extension
    - i. Angle between two bones normally getting larger
      1. Straight arm pulldown = shoulder extension
      2. Leg extensions = knee extension
  - e. Agonist – the primary mover or the primary muscle
    - i. Pectoralis major is the primary mover for bench press
    - ii. Gluteus maximus is the primary mover for squats
  - f. Antagonist – the opposing muscle
    - i. Triceps is the antagonist for dumbbell curls
    - ii. Hamstrings are the antagonist for leg extensions
  - g. Secondary mover – assistor of the primary mover
  - h. Exercise spine or neutral spine
    - i. Keeping your back straight when performing squats, deadlifts, rows, etc.
    - ii. Almost all exercises should be performed with a neutral spine except abdominal crunches
  - i. Tibial translation
    - i. Excessive stress on the knee ligaments
    - ii. Occurs when the knee extends past the toes during a lunge or step-up
      1. Push from the heel to the balls of your feet
      2. Do NOT push from your toes

### FLEXION AND EXTENSION



Exercise Spine

2. Primary movers for hip extension

- a. Gluteus maximus
- b. Hamstring (3 muscles)
  - i. Biceps femoris (long head only)
  - ii. Semitendinosus
  - iii. Semimembranosus

3. Common exercises for hip extension

c. Barbell Squats

- i. Bar on your traps or shoulders (not on your neck)
- ii. Do not curve your spine – keep a neutral spine
- iii. More than 90 degrees knee bend is not necessary but more flexible athletes may benefit from deeper squats (more glute recruitment)
- iv. Knees should follow the toes and try to prevent:
  - 1. Caved-in knees
  - 2. Bowed-out knees
- v. Narrow stance, toes point forward
- vi. Wider stance, toes point outward
- vii. Wider stance squats will recruit more adductor muscles
  - 1. Wider stance squats may also result in more power

d. Russian deadlift

- i. Knees will bend on Russian deadlifts
- ii. Focus on keeping back straight – neutral spine
- iii. Use a weightlifting belt if near max
- iv. Since knees are bending, this exercise includes quadriceps with glutes and hamstring

e. Romanian deadlift

- i. AKA RDLs or straight leg deadlifts (knees fairly straight throughout so less quads)
- ii. Focus on keeping back straight – neutral spine
- iii. Performance may be compromised by tight hamstrings

f. Leg press

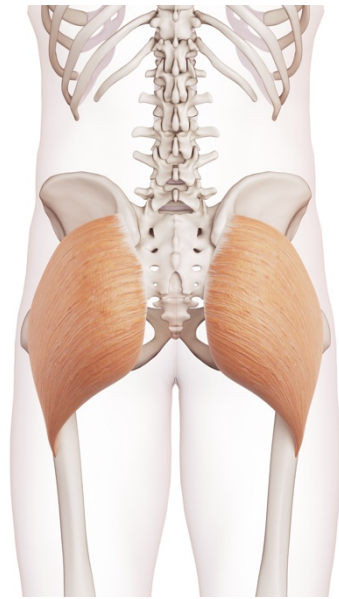
- i. Control the movement so low back stays pressed against the pad
- ii. Feet high on the plate emphasizes glutes and hams
- iii. Feet low on the plate emphasizes quads
- iv. Feet wide on the plate emphasizes adductors

g. Lunges

- i. Excessive dorsi flexion may cause tibial translation
  - 1. Knees past your toes on the downward movement may be stressful on your knee ligaments
  - 2. Keep your weight centered between your heel and ball of your foot to prevent tibial translation
- ii. To improve balance and increase proprioception requirement, try lunging backward

h. Box step-ups

- i. To avoid tibial translation, your client should step toward the middle of the box and press through the heel



Gluteus Maximus

## Quiz Review

1. What is the definition of prime mover?
2. What is the definition of agonist and antagonist?
3. What is a single joint exercise? What is a multi-joint exercise?
4. Know all the prime movers and common exercises for hip extension.
5. Know all the muscles of the hamstring.
6. How can you perform a squat exercise that will also include the adductor muscles?
7. How does set up affect muscle recruitment in the leg press?
8. What is tibial translation? In what exercise is it most common?
9. Where do you place your foot on the box step-up?