

Weight Training Study Guide

I. Muscular Development:

Muscular Strength – the ability of a muscle group to apply maximal force against a resistance one time. Accomplished by lifting heavy weight/low reps (80-90% of max)

Muscular Endurance – the ability to repeat muscle movement over a period of time. Accomplished by lifting light weight/high reps (50-70% of max)

- **Plyometrics** – exercise program used to develop explosive strength & quickness (ex: box jumps, clapping push ups, squat jumps, step ups).
- **Pilates** – exercise program used to develop core muscles in the abdomen, back, & buttocks.
- **Relative Strength** – using one's own body weight as resistance (ex: pull ups, dips)
- **Absolute Strength** – using external devices as resistance (ex: free weights)
- **Hypertrophy** – increase in the size of a muscle.
- **Atrophy** – decrease in the size of a muscle due to lack of use.
- Repetitions refer to the number of times a lift is executed in a set.
- When lifting, inhale during the relaxation phase & exhale during the exertion phase (never hold your breath).
- Utilize the 3 principles of training: Frequency (how often # times per week), Intensity (how hard – amount of weight), & Time (how long – # of sets/reps).

I. Muscle Groups & Lifts or Exercises that will improve muscular fitness:

- Chest** (Pectoralis major & minor) – bench press, dumbbell fly & press, incline bench press, push ups
- Shoulders** (Deltoids) – shoulder/military press, upright & posture rows.
- Back** (Trapezius & Latissimus Dorsi) – upright rows, shoulder shrugs, lat pull downs, posture/seated rows, pull ups
- Arms** (Biceps, Triceps, & Forearm) – arm curls, reverse curls, triceps pushdowns & extension, wrist curls, dips
- Legs** (Quadriceps, Hamstrings, & Calves-gastrocnemius & soleus) – squats, leg press, leg extensions, leg curls, calf press & extensions
- Stomach** (Rectus Abdominus & External Obliques) – sit ups, crunches, lower abdominal leg lifts, V-ups, bicycle crunches
- Buttocks** (Gluteus Maximus) – lunges, squats

III. Types of Resistance Training:

- Isometric** – Involves no change in the muscle's length (aka...flexing)
- Isotonic** – Lifting through a full range of motion (free weights)
- Isokinetic** – Maximum resistance through a full range of motion (involves expensive machines)

IV. Types of Muscular Contractions:

- Concentric** – muscle is flexed (made shorter)
- Eccentric** – muscle is extended (made longer)
- Static** – no change in muscle (tighten & hold)

V. Types of Muscle Fibers:

A. **Slow Twitch** – contributes to muscular endurance (long distance running)

B. **Fast Twitch** – contributes to muscular strength (sprints)

C. **Intermediate Twitch** – used in activities of high intensity and moderate duration (middle distance running)

VI. Flexibility: the ability to move body parts through a full range of motion

A. Types of soft tissues:

- 1) **ligament** – attaches bone to bone
- 2) **tendon** – anchors muscle to bone
- 3) **muscle** – meaty tissue surrounding bones

B. Importance of flexibility: A reasonable amount of flexibility is required to live a healthy and functional life both at work and play. In many cases weight training actually decreases flexibility due to not lifting through a full range of motion. Stretching also will help reduce the risk of injury, prevent lower back pain, and relieve emotional tension.

C. Types of stretching:

- 1) **static** – slowly moving the muscle to its stretching point (mild tension) and holding for 10-30 seconds.
- 2) **dynamic** – involves continuous movement done in a slow and controlled manner.

VII. General Information:

- Spotting is necessary for providing safety to the lifter.
- Advantage of free weights is they develop better balance along with strength; thus better for overall muscle control.
- Circuit Training is when you have a predetermined course (6-20 stations) and time (30-90 seconds per station) to follow during a workout.
- Steroids (laboratory produced testosterone) can cause harm to the body's hormonal system, as well as other organs.
- Females will not gain large muscle mass due to their lack of the growth hormone, testosterone.
- One can maintain strength if you lift once a week with high intensity.
- The bench press is the best indicator of upper body strength.
- Power Cleans will develop overall strength, balance, & explosiveness.
- Average percentage of body fat for females is 25%; males are 15%.
- Do not overload the same muscle group every day or injury could occur. Rest is just as important as the exercise itself. You must allow for the muscle tissue to recover from the intense workout placed upon it. 48 hours is recommended between workouts of the same muscle group.