

Study Guide

Strength and Conditioning

SAFETY ASPECTS: The chances of injury can be greatly reduced or completely removed by:

- Using correct Lifting techniques
- Spotting correctly
- Breathing properly
- Proper warm up
- Proper volume of weight
- Maintaining equipment in good working condition
- Wearing proper clothing

PROPER FORM --WHY?

- **To gain desired results**-changing the proper form will allow other muscle groups to perform the movements, this decreases the training stimulus on the muscles normally associated with the particular exercise .
- **To prevent injury-** (especially in exercises such as squats, dead lifts, and power cleans) Improper technique in these types of exercises places undo stress on the lower back region. * *Improper form often occurs when the lifter performs an exercise with resistance that exceeds his or her present strength capabilities.*

WHAT IS PROPER FORM?

- Balanced athletic position
- Intended muscles move---other muscles stabilize
- Use full range of motion
- Controlled movement through with complete concentric and eccentric contraction
- Proper breathing through positive and negative phase of lift

PURPOSE OF SPOTTING:

- To ensure safety of all participants
- To assist the lifter with the exercise
- To motivate, encourage, and coach technique through the set.
- To call for help if an accident occurs

ORDER OF EXERCISING MUSCLES: Researchers agree that working the large muscle groups first provides the best possible training stimulus to all the muscles involved in a lift. For example, doing a squat is better than doing a bicep curl first. Knowing this, should affect how you warm up.

MUSCLE GROUPS: All muscle groups and exercises for those groups should be known (see diagram). All students should know proper technique for each of the following lifts: SQUAT BENCH PRESS BENCH FLIES INCLINE PRESS LAT PULL DOWN HAMMER CURL DIPS LEG CURL LEG PRESS LEG EXTENSION STANDING BICEP CURL

FITNESS TERMINOLOGY

Antagonist muscle- A muscle that causes movement at a joint in a direction opposite to that of the joint's agonist (prime mover).

Agonist muscle- A muscle that is very effective in causing a certain joint movement. Also called the prime mover. On a biceps curl, the biceps is the agonist muscle that flexes the elbow joint

Eccentric contraction- A lengthening of the muscle during its contraction; controls speed of movement caused by another force.

Concentric muscle action- Force produced while the muscle is shortening in length

Body composition- Amount of fat vs. lean muscle tissue in the human body

Aerobic exercise- Any rhythmic activity that increases the body's need for oxygen by using large muscle groups continuously for at least 10 minutes. The term aerobic means "with oxygen."

Flexibility- The measure of the range of motion, or the amount of movement possible, at a particular joint.

Muscular endurance- The ability of the muscle to perform repetitive contractions over a prolonged period of time. *RECOMMENDED SETS AND REPS 3 X 12-16, 60%-70% OF 1 REP MAX...REST 30-60 SECONDS B/W SETS*

Muscular strength- The ability of the muscle to generate the maximum amount of force.
RECOMMENDED SETS AND REPS 3 X 4-8, 80-85% OF 1 REP MAX...REST 1:30-2 MINUTES B/W SETS

One-Rep Max (1 RM)- The amount of weight/resistance that can be lifted or moved once, but not twice; a common measure of strength.

Positive Phase_-this is the exertion phase of your lift, whether you are pulling or pushing against resistance.

Negative Phase – this is the relaxation part of your lift. (gravity is pulling against resistance)

Overload Principle- This principle says that in order to train muscles, they must work harder than they are accustomed to. This "overload" will result in increased strength as the body adapts to the stress placed upon it.

Progressive Overload: Gradually adding more resistance during strength training exercises as your strength increase. A reasonable guideline for increasing weight is 2.5% to 5% at any one time. Make sure your form is maintained throughout the whole set.

Rate of perceived exertion (RPE)- Scale of 1-10 that rates how you are feeling (both physically and mentally) as it relates to exercise fatigue.

Repetition- The number of times an exercise is repeated within a single exercise "set."

Hypertrophy- An increase in cell size (girth), usually in reference to fat or muscle cells

Forced repetitions- Forced repetitions are assistance with repetitions to perform additional reps of an exercise when muscles can no longer complete the movement on their own.

Set- A basic unit of a workout containing the number of times (repetitions) a specific exercise is done (e.g. do 3 sets of 5 repetitions with 100 pounds).

Exhaustion Set- an **exhaustion set** would be to perform a **set** until momentary concentric contraction failure. Which means the resistance can't be lifted or lowered under control.

Super setting- The s best way to superset is by pairing exercises of opposing muscle groups such as Back and Chest, Thighs and Hamstrings, Biceps and Triceps; or different muscle movements such as Shoulders and Calves, Upper Abs and Lower Abs. When pairing antagonistic exercises, there is no drop of strength whatsoever once your cardiovascular system is well conditioned and this is a great way to save time!

Specificity of Training Principle- This principle says that only the muscle or muscle group you exercise will respond to the demands placed upon it. By regularly doing curls, for example, the muscles involved (biceps) will become larger and stronger, but curls will have no effect on the muscles that are not being trained. Therefore, when strength training, it is important to strengthen all of the major muscles.

Opposing muscles- Muscles that work in opposition to the ones you are training. For example, the bicep is the opposing muscle to the triceps; the hamstring is the opposing muscle to the quadriceps

Target heart rate (THR)- The recommended range is 60-85% of your maximum heart rate. It represents a pace that ensures you are training aerobically and can reasonably be maintained.

Maximum Heart Rate (MHR) -the age-related number of beats per minute of the heart when working at its maximum that is usually estimated as 220 minus one's age

Resting Heart Rate (RHR) - Your heart rate at total rest. Best when taken right before you get up out of bed.

F.I.T. Principle of Exercising- Frequency (how often you exercise) Intensity (how hard you exercise) Time (the duration of time of your exercise

ANTERIOR DELTOID

Barbell-[Front Raise](#)-[Incline](#)-[Military Press](#)-[Seated](#) **Cable**-[Military Press](#)-[Front Raise](#)

Dumbbell-[Front Raise](#)

LATERAL DELTOID

Barbell-[Upright Row](#) **Cable**-[Lateral Raise](#)-[Upright Row](#) **Dumbbell**- [Incline Lateral Raise](#)-[Raise](#)-[Upright Row](#)

PECTORALS

BARBELL-[Bench Press](#)- [Incline Bench Press](#)
Cable - [Lying Fly](#)-[Standing Fly](#)-[Seated Fly](#)-[Bench Press](#)-[Standing](#)-[Chest Dip](#) -[Standing Incline Chest Press](#)

Dumbbell- [Bench Press](#)-[Fly](#)-[Pullover](#)-[Incline Bench Press](#)

BICEP

Barbell-[Curl](#)-[Preacher Curl](#)-

Cable-[Cable Bar](#)-[Seated](#)-[One Arm Curl](#)-[Concentration Curl](#)

Dumbbell-[Curl](#)-[Incline Curl](#)-[Concentration Curl](#)

Forearms

Barbell- [Reverse Curl](#)- [Reverse Preacher Curl](#)-

Cable- [Reverse Curl](#)-

Dumbbell- [Hammer Curl](#)

QUADRICEPS

Barbell-[Squat](#)-[Front Squat](#)-[Trap Bar Squat](#)-[Step-up](#)-[Lunge](#)-[Walking Lunge](#)-[Split Squat](#)-[Single Leg Split Squat](#)-

Cable- [Squat](#)-[Cable Bar Squat](#)-[Standing Leg Extension](#)-

Dumbbell-[Lunge](#)-[Single Leg Split Squat](#)-[Split Squat](#)-[Single Leg Squat](#)-[Squat](#)-

Leg Press Machine-[45° Leg Press](#)

ABDOMINALS

Barbell- [Push Crunch](#)-

Cable-[Lying Crunch on ball](#)-[Kneeling Crunch](#)-[Seated Crunch](#)-[Standing Crunch](#)

Dumbbell- [Push Crunch](#)

OBLIQUES

Cable- [Kneeling Twisting Crunch](#)-[Russian Twist \(on ball\)](#)- [Side Bend](#)- [Cross Arm](#)- [Twist](#)- [Down Up](#)

Dumbbell- [Russian Twist \(on ball\)](#)- [Side Bend](#)

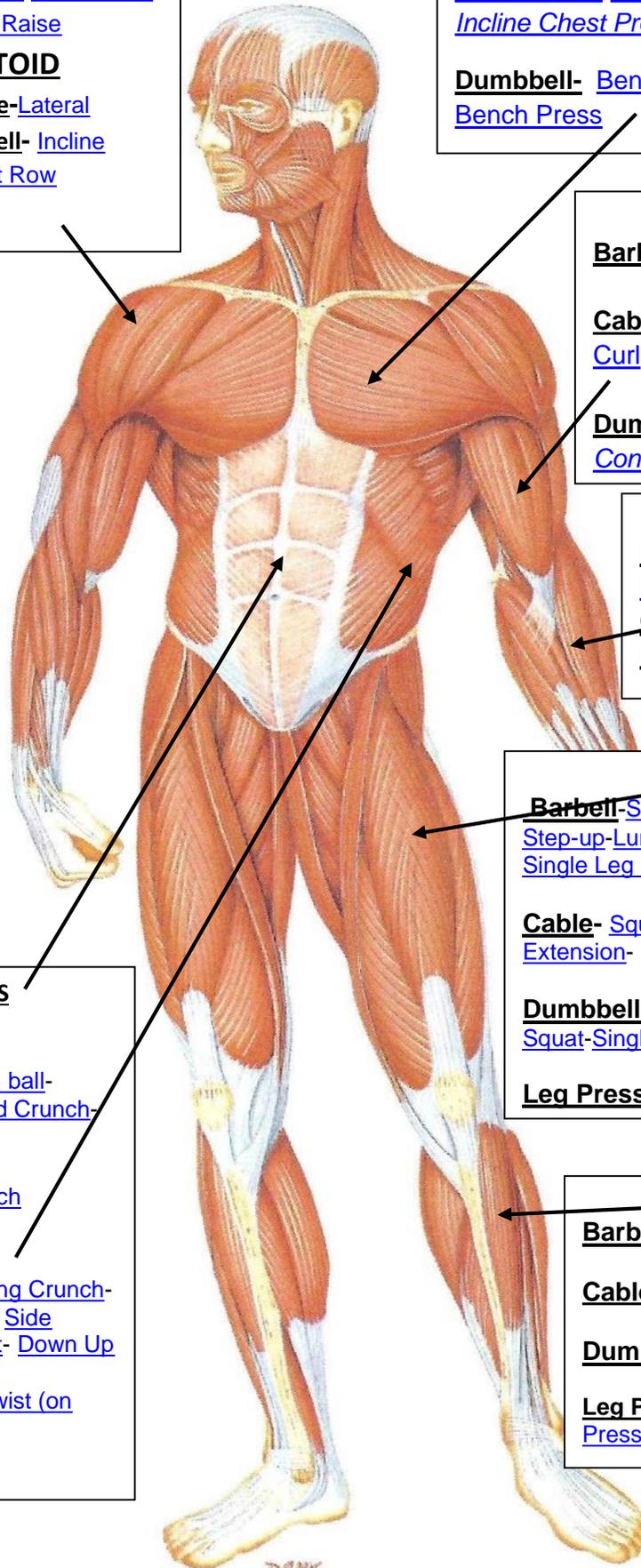
TIBIALIS ANTERIOR

Barbell-[Reverse Calf Raise](#)-

Cable- [Reverse Calf Raise](#)

Dumbbell-[Reverse Calf Raise](#)

Leg Press Machine-[45° Reverse Calf Press](#)



TRICEPS
Barbell
[Close Grip Bench Press](#)
[Lying Triceps Extension](#)
[Skull Crusher](#)
[Triceps Extension](#)
Cable
[Bent-over Triceps Extension](#)
[Pushdown](#)
[Triceps Extension](#)
Dumbbell
[Kickback](#)
[Lying Triceps Extension](#)
[Triceps Extension](#)
[One Arm Triceps Extension](#)
[Triceps Dip](#)

POSTERIOR DELTOID
CABLE- [Reverse Fly](#)- [Rear Delt Row](#)-[Standing Cross Row](#)
BARBELL-[Rear Delt Raise](#)-[Rear Delt Row](#)
DUMBBELL- [Lying Rear Lateral Raise](#)-[Lying Rear Delt Raise](#)-[Rear Lateral Raise](#)-[Rear Delt Row](#)-[Seated Rear Lateral Raise](#)

TRAPEZIUS
BARBELL-[Upright Row](#)-[Shrug](#)-[Trap Bar Shrug](#)
CABLE- [Upright Row](#)-[Shrug](#)-[Dual Pulley](#)
DUMBBELL-[Upright Row](#)-[Shrug](#)

EXTENSORS
[Reverse Wrist Curl](#)
[Curl](#)
[Seated Pronation](#)

LATISSIMUS DORSI/ GENERAL BACK
MACHINE- [Parallel Close Grip Pull-up](#)
BARBELL- [Pullover](#)- [Bent-over Row](#)
CABLE- [Pulldown](#)-[Pullover](#)- [One Arm Bent-over Row](#)- [Straight Back](#)
DUMBBELL-[Bent-over Row](#)

GLUTEUS MAXIMUS
BARBELL-[Bent Knee Good-morning](#)-[Sumo Deadlift](#)-[Single Leg Lunge](#)-[Single Leg Split Squat](#)-[Split Squat](#)
CABLE- [Single Leg Split Squat](#)-[Cable Bar Squat](#)-[Belt Squat](#)-[Standing Hip Extension](#)
DUMBBELL-[Lunge](#)-[Single Leg Stiff Leg Deadlift](#)-[Step-up](#)
LEG PRESS MACHINE-[45° Leg Press](#)

HAMSTRINGS
BARBELL-[Hyperextension \(45-degree\)](#)- [Straight-leg Deadlift](#)-[Trap Bar Straight-leg Deadlift](#)
CABLE-[Bent-over Leg Curl](#)-[Lying Leg Curl](#)-[Standing Leg Curl](#)-
DUMBBELL-[Straight-leg Deadlift](#)-
MACHINE-[Seated Leg Curl](#)

GASTROCNEMIUS/SOLEUS
BARBELL-[Standing Calf Raise](#)-
CABLE-[Standing Calf Raise](#)
DUMBBELL-[Standing Calf Raise](#)
LEG PRESS SLED MACHINE-[45° Calf Press](#)

