



Intro to Strength Training



Total Fitness Series

What we are going to cover



- ⌘ Basic Definitions
- ⌘ Benefits of strength training
- ⌘ Exercise Prescription
- ⌘ Principals
- ⌘ Introduction on Machines

Basic Definitions



- ⌘ Muscle - A contractile organ consisting of a special bundle of muscle tissue, which moves a particular bone, part, or substance of the body
- ⌘ Resting Metabolism - the amount of energy (in calories) needed on a daily basis when your body is at rest. Accounts for 75% of your total caloric needs

Benefits....

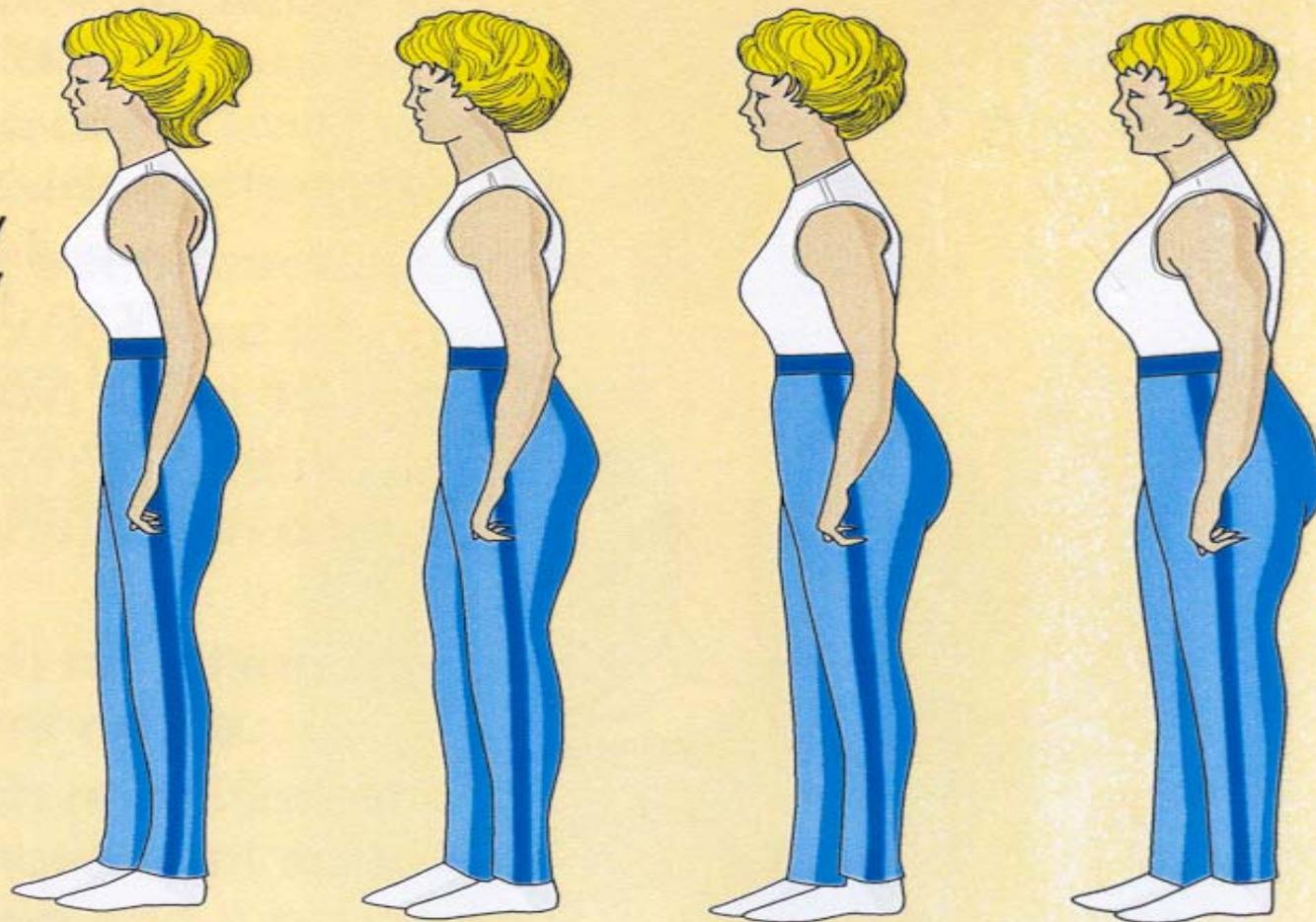
Why Strength Train?



Maintain / Gain Muscle Mass

- ⌘ The average American loses about 5-7 pounds of muscle every 10 years

Figure 1. Body weight and body composition changes during adult life.

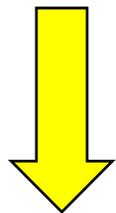


| Age: | 20 | 30 | 40 | 50 |
|-------------------|-----------|-----------|-----------|-----------|
| Bodyweight (lbs.) | 126 | 136 | 146 | 156 |
| Muscle (lbs.) | 45 | 40 | 35 | 30 |
| Fat (lbs.) | 29 | 44 | 59 | 74 |
| Percent Fat (%) | 23 | 32 | 40 | 47 |

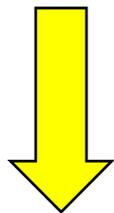
Adding to the Problem...

Diet and Muscle Loss

- ⌘ A low caloric diet will place your body in a state of calorie deprivation and cause weight loss (Yea!!!)
- ⌘ Unfortunately 25% of the weight lost comes from reduced muscle



Muscle =



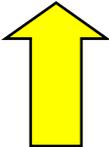
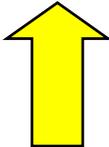
Resting Metabolism

Note: Muscle mass can only be replaced by performing strength training

Benefits...

Increase Resting Metabolism

⌘ Muscle requires 35 calories per pound per day to maintain present levels.

 Muscle =  Resting Metabolism

Note: The average adult increases resting metabolic rate 7% by adding 3 pounds of muscle.

Relationship Between Muscle and Metabolism

| | Body Weight* | Percent Fat | Fat Weight* | Lean Weight* | Estimated Muscle Weight* | Resting Metabolism % |
|-------------------|---------------------|--------------------|--------------------|---------------------|---------------------------------|-----------------------------|
| Tracy | 100 | 30 | 30 | 70 | 35 | 850 |
| Tiffany | 100 | 20 | 20 | 80 | 40 | 1075 |
| Difference | ---- | 10 | 10 | 10 | 5 | 225 |

Data from BioAnalitics Diagnostic Medical Health Systems, Beaverton, Oregon

*In Pounds

% In Calories

Benefits...



Reduce Body Fat

⌘ As muscle mass increases resting metabolic rate increases. This will cause a reduction in body fat if no change occurs in your diet.

Note: The average adult loses 4 pounds of fat after 3 months of strength exercise.

Changes in body composition following eight weeks of strength and endurance exercise

| Training Group | Lean Weight ** | Fat Weight** | Body Composition Improvement |
|-----------------------|-----------------|-----------------|------------------------------|
| Younger Adults | +3.0 Lbs | -8.5 Lbs | 11.5 Lbs |
| Seniors | +2.5 Lbs | -4.0 Lbs | 6.5 Lbs |

*Significant Change ($p < 0.05$)

**Change in Pounds

Other Benefits of Strength Training



- ⌘ Increase Bone Mineral Density
- ⌘ Improve Cholesterol levels in the blood
- ⌘ Increase Gastrointestinal Transit Speed
- ⌘ Reduce Resting Blood Pressure
- ⌘ Reduce Low Back Pain
- ⌘ Reduce Arthritic Pain
- ⌘ Increase Physical and Mental Well-Being
- ⌘ Improve Glucose Metabolism

Strength Training Program Guideline

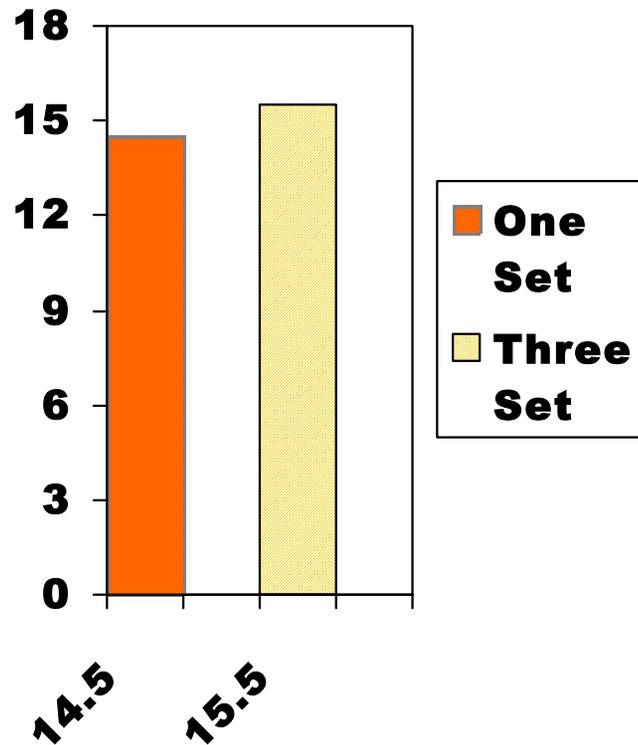


- ⌘ Days - 2 to 3 days per week
- ⌘ Time - 15 to 20 Minutes per workout
- ⌘ Machines - 10 selectorized machines
- ⌘ Sets- 1 set to muscle failure
- ⌘ Reps- 8 to 12 repetitions

Note: By performing one set of 8-12 repetitions per exercise for each muscle group you will see similar benefits as multiple set routines

Strength Percentage Gain

One Set VS Three Sets



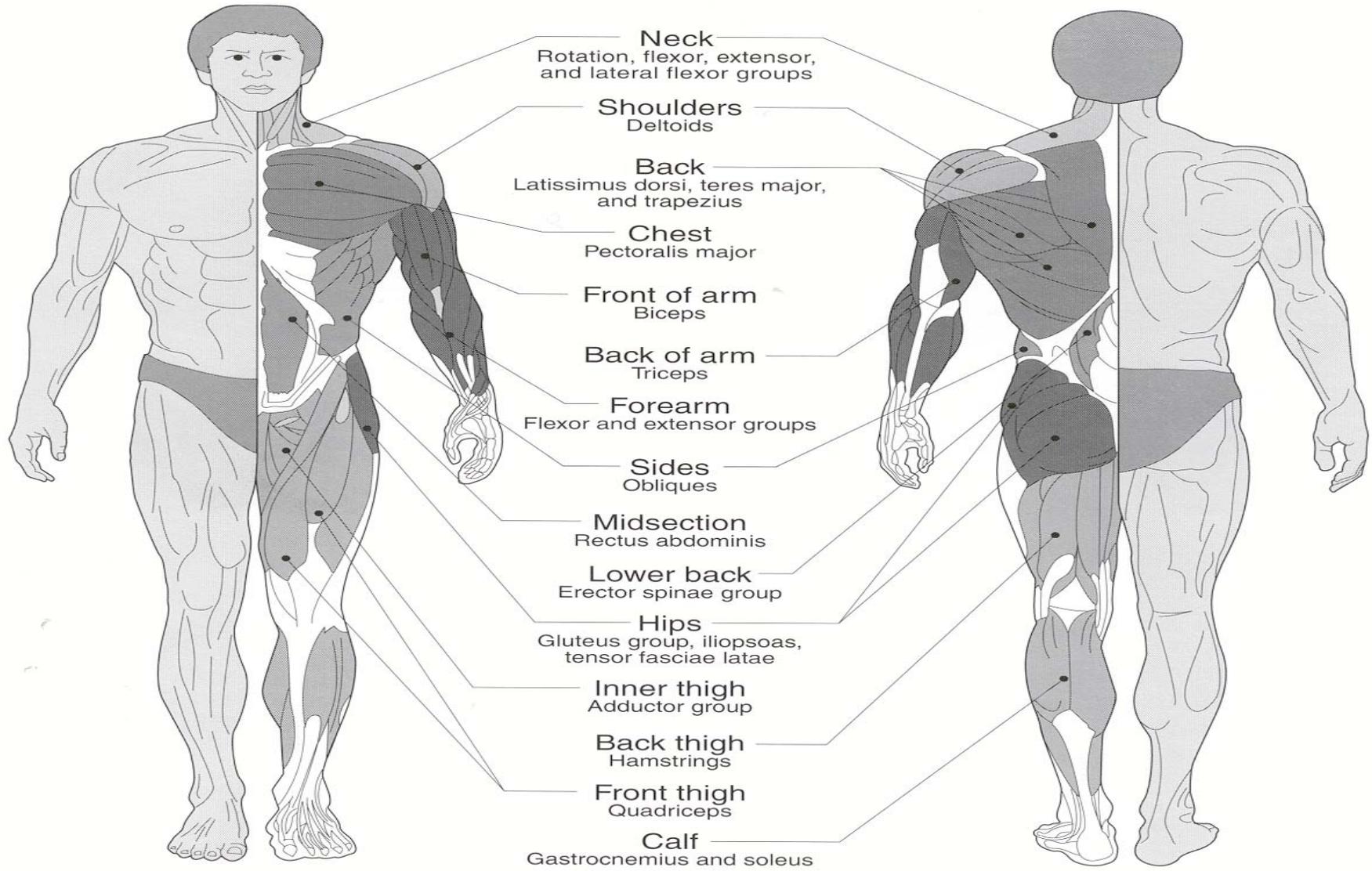
- ⌘ One properly performed set of 8-12 repetitions (75% of your 1 repetition maximum) is as effective for increasing muscle strength as three sets
- ⌘ Single-Set training is more time-efficient than multiple set training

Note: Performing extra sets does burn more calories.

Exercise Prescription

| <i>Machine</i> | <i>Muscle Group</i> | <i># Of Sets/ Reps</i> | <i>Speed of Movement</i> | <i>Rest / Stretch</i> |
|---------------------------|--------------------------------------|----------------------------|------------------------------|---------------------------|
| <i>Leg Press</i> | Quadriceps, Hamstrings, Glutes | 1/8-12 | 2 sec. 4 sec. | 15 sec. |
| <i>Leg Extension</i> | Quadriceps | 1/8-12 | 2 sec. 4 sec. | 15 sec. |
| <i>Leg Curl</i> | Hamstrings | 1/8-12 | 2 sec. 4 sec. | 15 sec. |
| <i>Chest Press</i> | Pectoralis Major | 1/8-12 | 2 sec. 4 sec. | 15 sec. |
| <i>Lat Pulldown / Row</i> | Lats | 1/8-12 | 2 sec. 4 sec. | 15 sec. |
| <i>Shoulder Press</i> | Deltoids | 1/8-12 | 2 sec. 4 sec. | 15 sec. |
| <i>Tricep Extension</i> | Triceps | 1/8-12 | 2 sec. 4 sec. | 15 sec. |
| <i>Bicep Curl</i> | Biceps | 1/8-12 | 2 sec. 4 sec. | 15 sec. |
| <i>Low Back Extension</i> | Erector Spinae | 1/8-12 | 2 sec. 4 sec. | 15 sec. |
| <i>Abdominal Flexion</i> | Abdominals | 1/8-12 | 2 sec. 4 sec. | 15 sec. |

Exercises and Muscles Involved



1. Leg Press 2. Leg Extension 3. Leg Curl 4. Chest Press 5. Lat Pulldown / Row 6. Shoulder Press
7. Tricep Extension 8. Bicep Curl 9. Abdominal Crunch 10. Low Back Extension

What kind of results can I expect?

Everyone can expect to see gains in strength and mass. Results will vary based on individual genetic make-up.

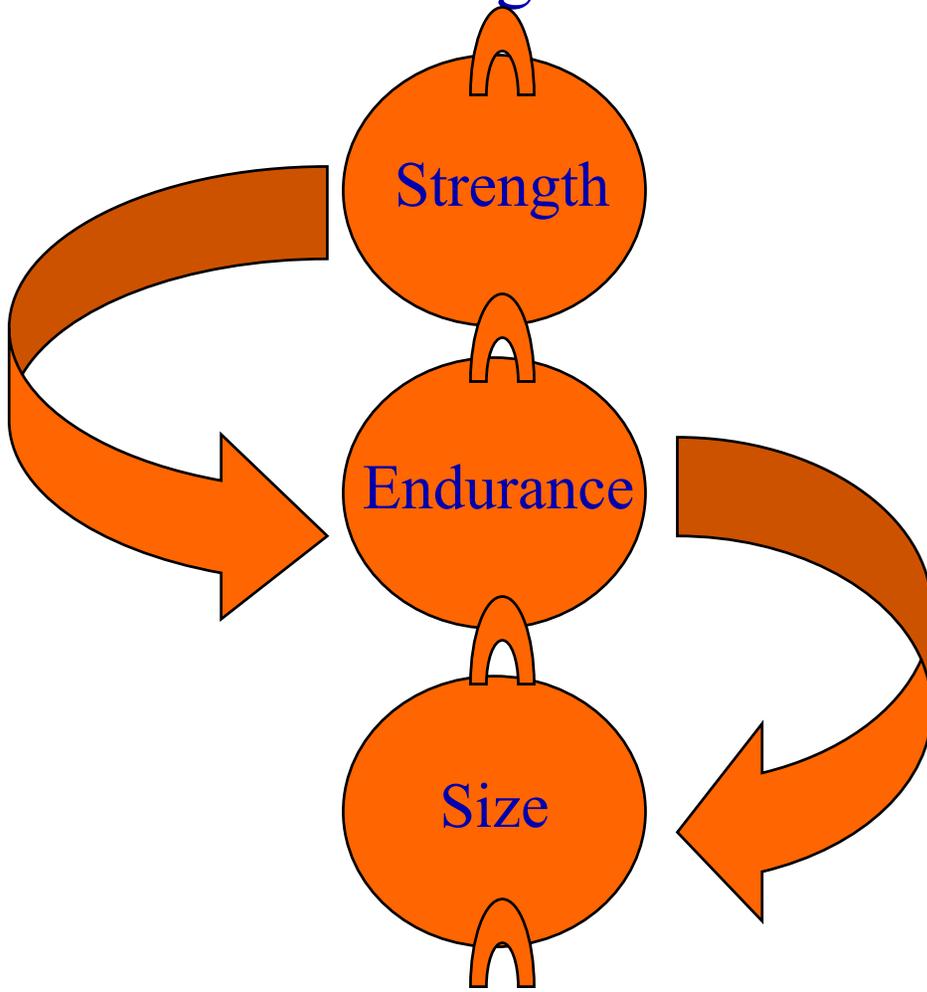
- ⌘ Body Type (Ectomorph, Endomorph, Mesomorph)
- ⌘ Muscle Fiber type (Fast or Slow Twitch)

Note: As a beginner you should see an initial 3-5% strength gain per week. The average adult can expect to add 3 pounds of muscle after 2 months of strength exercise.



Interaction of Muscular Strength, Endurance, and Size

Muscular Strength = Muscular Endurance = Muscular Size



Expect similar gains in each area regardless of program design.

Strength Training Principals

- ✗ **Maintain a Fitness Log**
- ✗ **Warm Up**
- ✗ **Overload Principle**
- ✗ **Workout Sets**
- ✗ **Rest**
- ✗ **Muscle Balance**
- ✗ **Exercise Range of Motion**
- ✗ **Exercise Speed**
- ✗ **Breathing**
- ✗ **Supplementation**



Maintain A Fitness Log



Strength Training Log

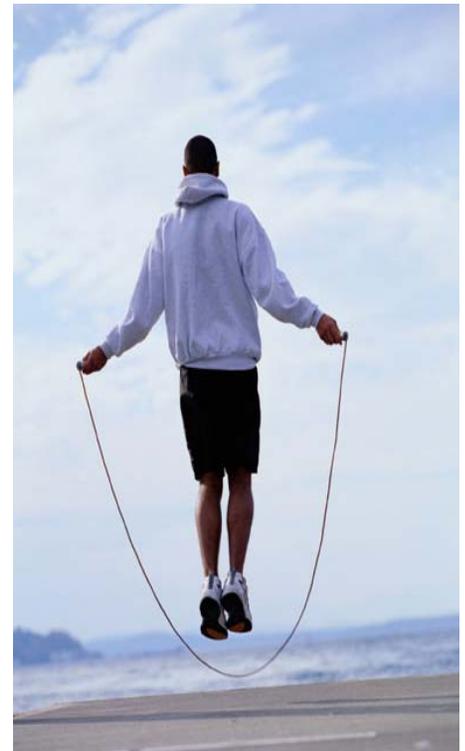
Name: John Doe

| Exercise | Machine Settings | | DATE | | | | | | | | |
|---------------------|------------------|--------|--------|--------|--------|--------|--|--|--|--|--|
| | | | 14-Sep | 16-Sep | 18-Sep | 21-Sep | | | | | |
| Leg Extension | 2 | WEIGHT | 150 | 155 | 155 | 160 | | | | | |
| | | REPS | 12 | 10 | 12 | 10 | | | | | |
| Leg Curl | 5 | WEIGHT | 135 | 135 | 140 | 140 | | | | | |
| | | REPS | 10 | 12 | 10 | 11 | | | | | |
| Leg Press | 4 | WEIGHT | 400 | 420 | 430 | 440 | | | | | |
| | | REPS | 12 | 12 | 12 | 10 | | | | | |
| Chest Press | 6 | WEIGHT | 210 | 215 | 215 | 220 | | | | | |
| | | REPS | 12 | 10 | 12 | 10 | | | | | |
| Lat Pulldown | 7 | WEIGHT | 180 | 180 | 185 | 190 | | | | | |
| | | REPS | 8 | 12 | 12 | 8 | | | | | |
| Shoulder Press | 5 | WEIGHT | 160 | 165 | 170 | 170 | | | | | |
| | | REPS | 12 | 12 | 8 | 10 | | | | | |
| Tricep Extension | 6 | WEIGHT | 130 | 130 | 130 | 135 | | | | | |
| | | REPS | 8 | 10 | 12 | 10 | | | | | |
| Bicep Curl | 4 | WEIGHT | 120 | 120 | 125 | 125 | | | | | |
| | | REPS | 10 | 12 | 8 | 10 | | | | | |
| Low Back Extensions | 2 | WEIGHT | 180 | 180 | 190 | 190 | | | | | |
| | | REPS | 9 | 12 | 8 | 11 | | | | | |
| Abdominal Flexion | 3 | WEIGHT | 130 | 135 | 140 | 140 | | | | | |
| | | REPS | 12 | 12 | 8 | 10 | | | | | |
| | | WEIGHT | | | | | | | | | |
| | | REPS | | | | | | | | | |
| | | WEIGHT | | | | | | | | | |
| | | REPS | | | | | | | | | |
| | | WEIGHT | | | | | | | | | |
| | | REPS | | | | | | | | | |
| | | WEIGHT | | | | | | | | | |
| | | REPS | | | | | | | | | |

Repetitions: Reach muscle failure while performing 8-12 repetitions
Speed: 2 seconds on the positive and 4 seconds on the negative
Breathing: Exhale on the positive and exhale on the negative

Warm Up

- ⌘ A general warm up consisting of light to moderate movement should be performed for a minimum of 3-5 minutes. This will start the flow of blood to your muscles.(Jogging, Biking, Cross Trainers)
- ⌘ Light Stretching should performed for tight muscle groups.
- ⌘ Stretching between sets also aids in keeping the muscle loose during a workout and can enhance your benefits from strength training.



Workout Sets



- ⌘ 1 to 3 Sets is generally recommended per muscle group
- ⌘ When performing multiple sets, do all sets on one machine before moving to the next machine.

Overload Principal

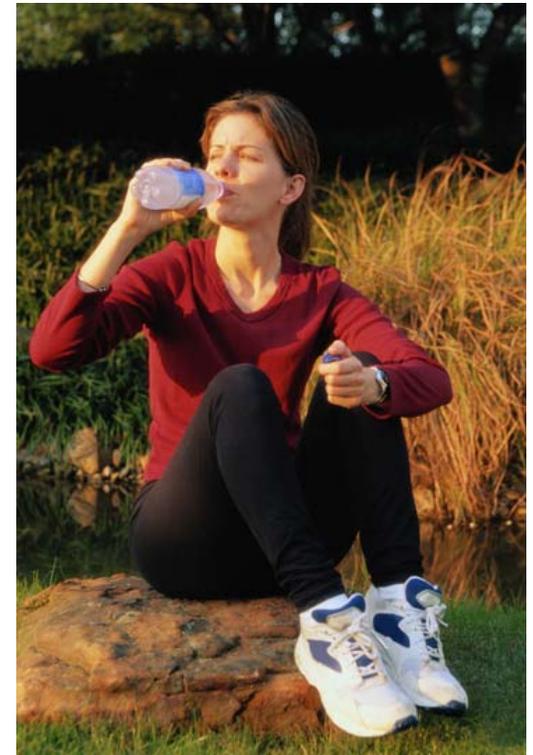
⌘ In order for adaptation to occur, the muscle must be challenged into performing more work than it is used to performing



Rest

⌘ During a beginning program you should have at least 48 hours rest between workout sessions.

Note: Eight hours of sleep per night is optimal for muscle to recover between workouts.



Muscle Balance

⌘ Work opposing muscle groups equally through out the week to prevent injury and increase results.

Chest ↔ Back Quads ↔ Hamstrings
Low Back ↔ Abs Biceps ↔ Triceps

⌘ It is important to work all major muscles equally to achieve overall body balance.

Exercise Range of Motion

- ⌘ Full Range of Motion is the complete movement that a joint can make (Associated with machines with cams)
- ⌘ Optimal Range of Motion is when an exercise is performed to the point where the muscle group being worked is no longer efficient in the movement at that weight. (Most associated with free weights)

Exercise Speed

- ⌘ All exercise should be performed with a consistent speed
- ⌘ 2 seconds on the concentric phase
- ⌘ 4 seconds on the eccentric phase



Note: Sets should last between 50-70 seconds

Breathing

- ⌘ Exhale during the concentric (lifting phase)
- ⌘ Inhale during the eccentric phase (lowering phase)



Supplementation

- ⌘ A normal diet where 15% of your calories is consumed from protein sources is plenty for muscular strength and size gains.
- ⌘ Excess protein is costly and not needed for gains in muscular strength and size. Can be harmful to the body if taken in excess.



Should I weight train before or after cardiovascular training?

⌘ You may begin your workout with either exercise because you can achieve similar strength gains regardless of the activity order



?



Have a great workout!!



NAVY 
Fitness

