

# RESISTANCE TRAINING for BONES and MUSCLES

**Introduction:** The purpose of this information is to provide guidelines for safe **weight, machine, and resistance band training** and to demonstrate proper technique while using resistance equipment. Exercises that are performed correctly promote **injury-free results**, and do so in a more time-efficient manner than incorrectly performed exercises.

**Intensity:** Bone and muscle are safely and effectively strengthened performing **1 set of 6-10 repetitions at 60-80% of your maximal 1-time resistance – it should feel "moderately hard" after the set and that your muscles “want to stop”**. IF YOU EITHER MOVE TOO FAST OR WITH SO MUCH RESISTANCE THAT YOU CAN'T DO 6 REPETITIONS SLOWLY you may be risking injuries such as tendonitis or muscle sprains. If the resistance is too light and you can do repeated sets of 10, it will likely have no effect on your bones.

**Technique:** **Breathe OUT while pushing or pulling** and never hold your breath. **Always move SLOWLY**, counting **1-2-3-4**, briefly hold, then release **5-6-7-8**.

**Alternating heavy and light work-out days every other day** is the best schedule for increasing bone and muscle strength without tissue damage or pain. **1-3 times per week** of intensive resistance training has been proven sufficient to increase bone mass and muscle strength in people of all ages. **Add either weight or numbers of repetitions no more often than every 3 days** of working out. **Always wait at least 48 hours between exercising a particular muscle.** The “light days” in between are good days to spend more time performing aerobic activities (long brisk walks, stair or hill climbing). **Never lift beyond limits that your doctor or therapist has given you!**

**Proper body mechanics:** Establishing a stable and correct position is critical, whether an exercise requires lifting free weights or pushing while positioned in or on a machine.

**When standing or walking, keep:**

- \* Toes straight ahead
- \* Knee and buttocks muscles with **KNEE OVER SECOND TOE OR SHOE POINT**
- \* Lead "with chest" keeping back and stomach muscles tight
- \* Chin “in”, head high (no forward head position)
- \* Do not lock knee (keep it slightly bent)
- \* Land with heel “soft” and smooth heel-toe roll toward “push-off” behind
- \* Alternate arm swing while walking

**When bending or lifting be sure to:**

- \* Flatten back and stomach muscles at the same time to protect back and stomach
- \* Start and end with “hip hinge” – knees bent, bottom “out” and chest “forward” keeping object as close to body as possible.
- \* Keep shoulders “square” with shoulder blades pinched back

**Importance of proper warm-up and cool-down:** Warm-up activities should precede each training session. 5-10 minutes of **activities involving multiple muscle groups** such as treadmill walking, elliptical trainer, stair climbing, or stationary cycling can serve as a warm-up for the single joint muscle strengthening activities. If this is not possible, then performing the actual exercise with light resistance for a few repetitions prior to the training level resistance will help to warm up the area. **Slow stretching (30 seconds duration) of the frequently tight muscles is important for injury prevention especially after working out.** Some of the most important muscles that need regular stretching are: **ham strings** (back of thigh), **quadriceps** (front of thigh), **gastroc/soleus** (calf), **ilio-tibial band** (side of thigh) **latissimus dorsi and pectoralis** (upper back and chest) and **biceps/triceps** (upper arm).