Osteofit Jasinskas IAFC 2012

OsteoFit: A Land-based Program for Bone-Conscious Clients

Facts about bone loss:
Osteoporosis is defined as: “a chronic, progressive skeletal disorder in which the architecture of bone deteriorates and bone mass decreases. This results in fragile, weakened bones that fracture easily, even in the absence of trauma.” (National Center for Biotechnology Information. National Library of Medicine. 18 Oct. 2008.) Common fracture sites are the forearm, wrist, vertebrae, pelvis, and hips.

Who is at risk for osteoporosis?
People with slighter skeletons and low BMI, a genetic predisposition to osteoporosis (European and Asian ancestry), early menopause or hormone loss (due to medical or other issues), immobility / lack of exercise, alcohol abuse, certain medications and disease states, are all factors increasing risk for bone loss. Advanced age is a key risk factor: “After 40 years of age, the risk for osteoporosis increases five-fold for each decade of life” (Weppner, 2009). By age 75, women have lost 25 – 40% of their bone mass (≥30% loss defines osteoporosis).

Prevention of falls is a key component of fracture avoidance.

Osteofit Exercises:

Objectives –
- Improve strength of postural and core stabilizers with postural cueing and reinforcement throughout all exercises, whether sitting or standing.
- Work to improve postural alignment (stretch tight musculature; strengthen weak musculature).
- Challenge and improve core strength with osteo-appropriate exercises.
- Learn appropriate exercise technique with elastic resistance and light hand weights for use in muscle strengthening in the class and at home.
- Challenge and increase lower extremity strength, endurance, and ability to maintain single leg support time.
- Challenge and improve ability to maintain balance and gait in spite of postural perturbations and distractions, to improve fall prevention / recovery skills.
- Educate regarding the need for regular, appropriate exercise (including postural training); fall avoidance strategies; osteoporosis information available in the community / on line.

L/E = Lower extremity  U/E = Upper Extremity  TVA = Transversus Abdominis
Tandem Stance = Stand with one foot in front of the other like on a tight rope or balance beam
Music – 118 – 128 bpm depending on participants & goals

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<th>Warm Up: Options are continually given to accommodate participants with challenges or increased need for</th>
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## Warm Up:
- Welcome and introduction to class including fit tips and posture education.
- Posture reinforcement throughout standing warm up
- Systematic movement of lower and upper extremities with good alignment and a stable core
- **Arm actions:** can mirror legs, be uni-lateral, can off-balance leg movements, or be still – not assisting balance. *This is a way of progressing difficulty.*
- **Examples:**
  - Alternate heel touch front
  - Alternate heel touch front diagonal
  - Alternate foot tap laterally (more advanced people can perform alternate leg lift, abducting in frontal plane, foot off floor)
  - Alternate posterior leg push (hip extension) with emphasis on gluteal squeeze to strengthen gluteals and hamstrings
  - Alternate hamstring curls* – progress to repeater curls to increase stance time on supporting leg.

  **Single Leg Stance Precautions:** Always keep the supporting knee well aligned and slightly flexed (unlocked). Offer support options for those who need them (chair / wall / railing). Monitor comfort of the supporting lower extremity and low back during prolonged single leg activities. To increase challenge, stand on a gardener’s kneeling pad.

## Single Leg Stance

1. **Free Leg:** performs alternate toe-heel touches
   - Stop centre and change sides after 4 or 8 repetitions.
   - **Progression:** tap front & back (leave out centre touch); move leg front and back without touching the floor.
   - Repetitions and progression will depend on strength and comfort of support leg.

2. **Free Leg:** tap front, centre, back, centre (repeatedly)
   - **Progression:** tap front & back (leave out centre touch); move leg front and back without touching the floor.
   - No supports
   - **Add postural perturbations,** ie: bounce a ball against the wall or floor, perform vigorous (unbalancing) movements with one arm.
   - Partner or trainer provides a **gentle,** unpredictable push or pull to challenge balance (safety first, always!).

## Walk the line
- Walk on an imaginary tight rope – forward, then backward.

**Progressions:** (any option below with eyes closed will be more difficult, but remember – safety first!)
- Walk with feet a little wider apart (instep touches the line)
- Walk with mid-foot directly on mid-line
- Lift knee and pause between steps forward
- Lift heel and pause between steps backward

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Standing Squats and Lunges:
- Small ROM squats (at least) should be considered for all (with support if necessary), since this is a functional movement for ADL.
- Reps & ROM dependent on strength and balance capabilities.
- Use external support if needed; reduce ROM if painful.
- Add U/E resistance equipment for high functioning participants.

Side Stepping: Step-width will depend on stability & L/E comfort
- As leg abducts to step laterally, increase activation of pelvic floor and transversus abdominis (TVA) musculature (9/10)
- As trailing leg adducts (feet together), decrease activation of pelvic floor & TVA to 3/10
- Perform several steps in one direction, then reverse directions.
- More difficult = stepping side to side repeatedly with the above muscle activation changing more quickly

Standing Partner Elastic Work:
- One length of ~5 feet of elastic band or tubing per pair
- Match pairs for size and strength if possible
- One person (#1) is standing stable, other person (#2) has elastic in hands, looped around the waist or hips of partner #1
- Both people are standing tall and strong, with the following options in order of difficulty:
  - Feet shoulder width apart – equal weight on feet
  - Feet close together – equal weight on feet
  - Standing on one foot – change feet each rotation
  - Tandem stance – change forward foot each rotation
  - Tandem stance challenge – in this stance with front toe and back heel off the floor
  - Any of the above stances with the eyes closed!

Start with partners facing.

Rotations: Perform the following exercises at 4 locations: front, side, back, other side (could do diagonals as well, for variety / increased challenge).
- #2 pulls on elastic looped around waist of #1. 8 – 10 reps performed smoothly, with good control & not too fast
- Each time #2 changes location of pull, BOTH people change standing leg or change which leg is in front on tandem stance
- Pulls can be straight arm / more vigorous when #2 is facing or behind #1
- Pulls will have to be more gentle when #2 is at the side or on a diagonal to #1 (bent arm, smaller range)
- After all rotations around #1 have been completed by #2, change positions, with #2 standing and #1 pulling.
### Hand Weights / Elastic Resistance for U/E & Core:

- Exercises can be done sitting – progress to standing options.
- Reinforce posture – especially scapular set.
- Reinforce deep, relaxed breathing throughout.
- Teach and reinforce excellent biomechanics, wrist alignment, and precise control of each movement.
- Adjust load to meet participant needs.
- Consider functional daily activities and postural imbalances when choosing these muscle conditioning exercises for your group.
  - Work biceps, triceps, shoulder girdle (scapular) stabilizers, and shoulder joint – flexors, extensors, abductors, adductors, and rotator cuff.
  - Emphasize extension over flexion, since this is usually weakest.

### Seated Ball Squeeze Progressions:

- Squeeze a soft (~8” diameter) ball between the knees for a slow breath out (~10 sec).
- Encourage relaxed, ‘normal’ breathing between sets to avoid hyperventilation.
- Add activation of each of the following muscle groups with subsequent repetitions:
  - Pelvic floor
  - Abdominal wall
  - Gluteal muscles

### Push-Ups; Front or Side Plank:

- Can be done against a wall (easier) or on the floor from the knees – progress to toes (only for very high functioning people).

### Seated Stretches for:

- Hamstring, calf, shin, groin, gluteals & piriformis (if appropriate)
- Hip flexor stretch may be done standing with or without support.
- Slow, supported torso rotation (holding at end point)
- Chest, back, and U/E stretches – may wish to stretch pectorals using a wall to increase stretch force (wall-clock stretch)
- Gentle, supported ROMS / static stretch for neck muscles unless individually contraindicated.

### Fit Tips / Reminders for ‘homework’ / joke of the day

**References:**

- Cosca, D., Aquatic exercise is a great activity at any age. U C Davis Health System, www.ucdmc.ucdavis.edu
- Melzer, I., et al, A water-based training program that include perturbation exercises to improve stepping responses in older adults: study protocol for a randomized controlled cross-over trial, BMC Geriatrics 2008, 8:19