



Musculoskeletal System

So Much To Do, and So Little Energy

The most common age-related changes in the muscular system are: reduced muscle strength, decreased muscle mass, increased muscle weakness, and reduced muscle size (1). The loss of muscle mass and contractile force often experienced by older adults is called sarcopenia, resulting in muscles becoming weak and easily tired. These age-related changes in the musculoskeletal system can greatly impact an older adult's functioning and lead to difficulties when performing activities of daily living. This simulation has two activities that will help you understand the challenges of sarcopenia, in particular muscle weakness and restricted motion in the leg and arm muscles. You will place various forms of resistance on your body to simulate joint stiffness and muscle weakness. This will increase your awareness of what it feels like to experience fatigue and difficulty moving, which older adults face daily. Your new understanding will build your sense of empathy toward the aging population.

Materials

- Backpack
- 2 grocery bags
- Heavy objects (i.e., books, cans, water bottles) to make about 10 percent
- your body weight (e.g., 110-pound person should take 11 pounds of weight, 155-pound person should take 15 pounds of weight)
- Various grocery items from pantry (about 8 items)
- Resistance band. If you do not have a resistance band, use stretchy yoga pants.
- 1 chair
- Stairs or a stepping stool
- Elevated surface such as a cupboard or a shelf

Procedure

1. Complete the precursor simulations if you have not already done so.
2. Gather all the materials at the bottom of the stairs or near a stepping stool.
3. **Sit on a chair and tie** a resistance band around your thighs, just above the knee.
4. Place heavy objects into the backpack and put it on.
5. Do **10-15** deep squats to fatigue leg muscles.
6. Then, walk up the stairs slowly OR do 10 step-ups on each leg using the stepping stool to mimic walking up stairs.
7. Sit on the chair. Keep resistance band and backpack on.
8. Get up, walk to the entrance door (as when an older person answers the door), turn around and sit back on the chair. Get up, walk to the washroom and back, sit down. Get up again and walk to the kitchen to get a glass of water, return and sit down. This is the end of the first activity.
9. **Take off resistance band from above knees. Keep the heavy backpack on.**
10. Divide the grocery items evenly into the 2 grocery bags (4 items per bag).



11. Hold one bag in each hand. Lift your arms 10 times straight out in front of you while holding the grocery bags. Place the grocery bags on the floor.
12. Tie the resistance band/yoga pants in a loop, step in and hold it between your inner thigh and elbow on the right side of your body.
13. Pick up the grocery bags again.
14. Walk to the elevated surface above shoulder height (i.e., cupboard or a bookshelf).
15. Pick the groceries out of the bags one by one and place them onto the elevated surface.

Reflection Questions

1. With all the various types of restriction on the joints and fatigue of the muscles, how did this simulation impact your ability to perform daily activities? How did this make you feel?
2. In what way did this simulation experience change your opinions about the older adults' ability to move or carry things we use in everyday life?
3. What are some preventative measures you may consider implementing into your life to prevent sarcopenia as you grow older?