FALLS PREVENTION AWARENESS EVENT

FALLS PREVENTION IN ACTION:

LEARNING WITH SCIENCE

ORANGE COUNTY DEPARTMENT ON AGING
Wellness

Applied Biomechanics Laboratory

Lampe Joint Department of Biomedical Engineering

UNC CHAPEL HILL

NC STATE UNIVERSITY

Our mission

To engineer solutions that help people age gracefully.

Applied Biomechanics Laboratory

Shout-out!

Dr. Vicki S. Mercer, PT, PhD, FAPTA

UNC
DIVISION OF
PHYSICAL THERAPY

Shannon Bush, DPT

Why balance and movement matter

- Falls are common, but not a normal part of aging.
- Falls can be prevented!
- Small changes = big impact

Today's agenda

Falls Education: *Prevent, Protect, Recover*

Strong & Steady: *Exercises for Better Balance*

Step Smart: *Choosing Safe Footwear*

Our goals for you

Learn skills you can use today!

Build confidence in your balance!

Stay curious, keep moving!

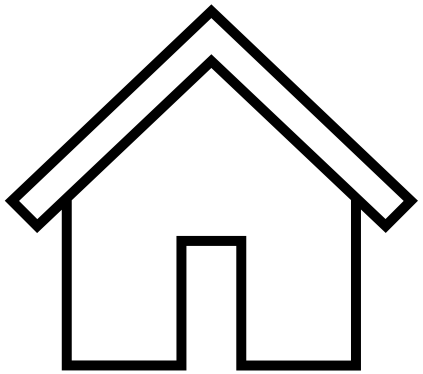
Falls Education: Prevent, Protect, & Recover

Applied Biomechanics Lab
UNC Chapel Hill & NC State University

Presented by: Emily Eichenlaub and Olivia Stepp

How can we prevent falls?

Maintain health & well-being

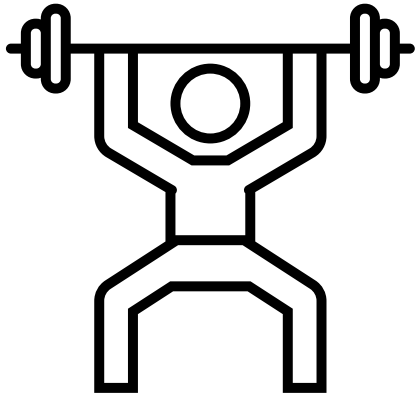


Create a Safe Environment

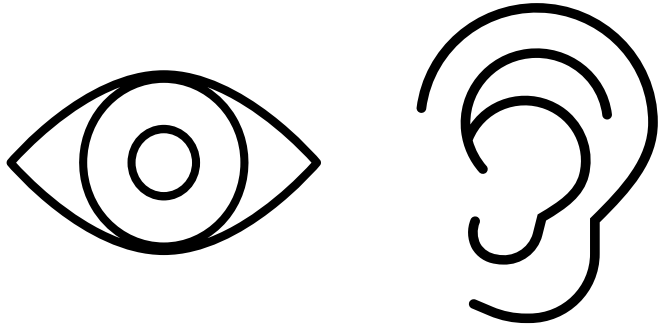
Choose Proper Footwear

Tips to Maintain Your Health and Well-being

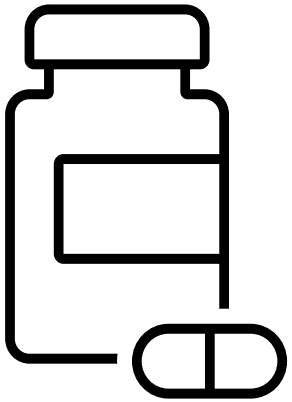
Maintaining your health & well-being



Strength & balance exercises



Regular vision & hearing checks

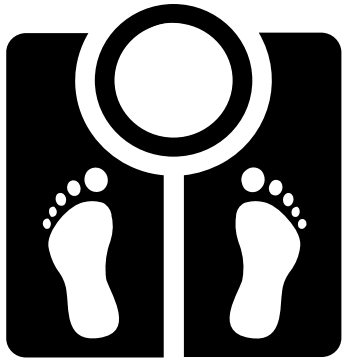


Understand medication side effects & interactions

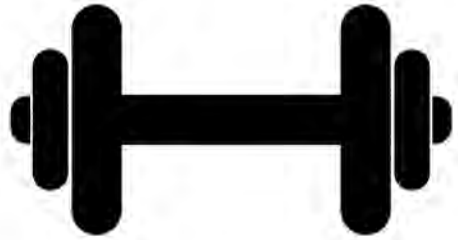
Maintaining your bone health

Get enough Calcium and Vitamin D

Quit Smoking and Limit Alcohol Use



Maintain a Healthy Weight



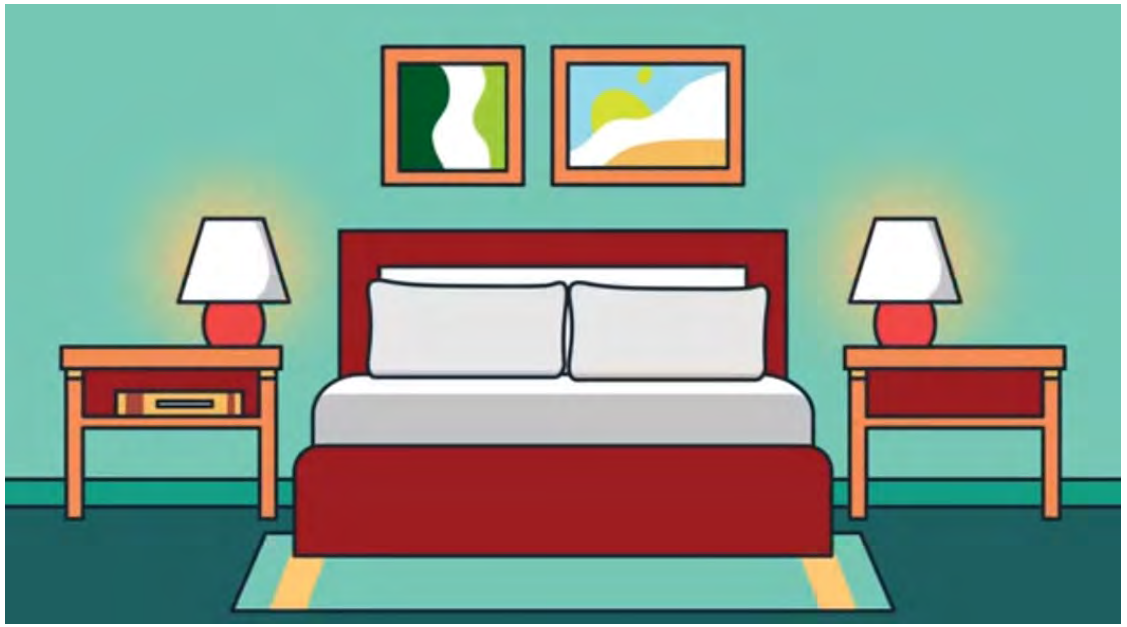
Strength Training

Tips to Make Your Home Safer

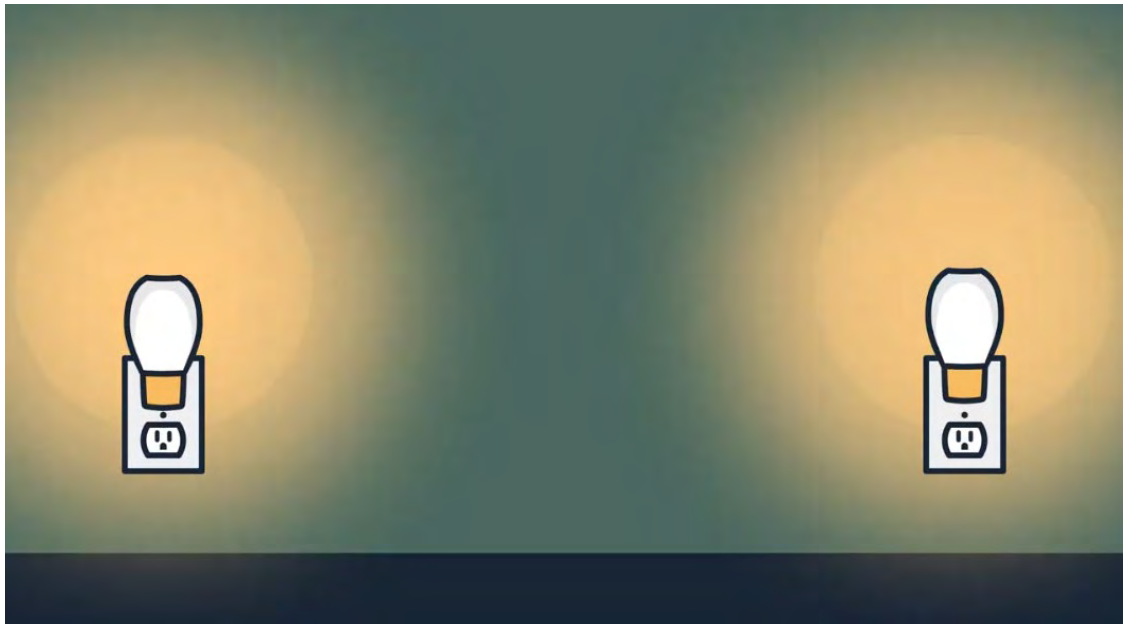
Pick up clutter

Steadi, CDC

Brighten up your space



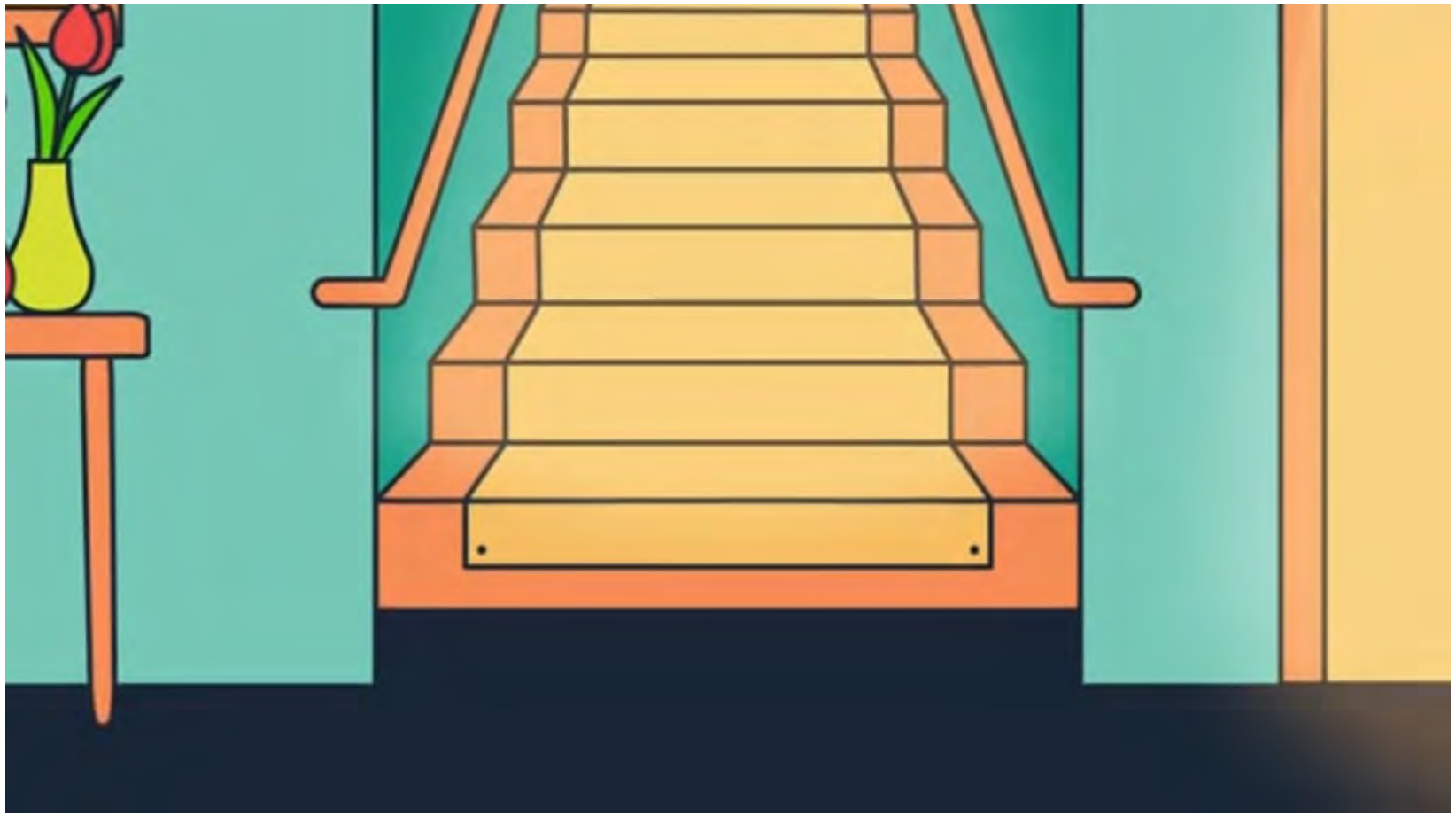
Bedside lamps



Nightlights for dim spaces

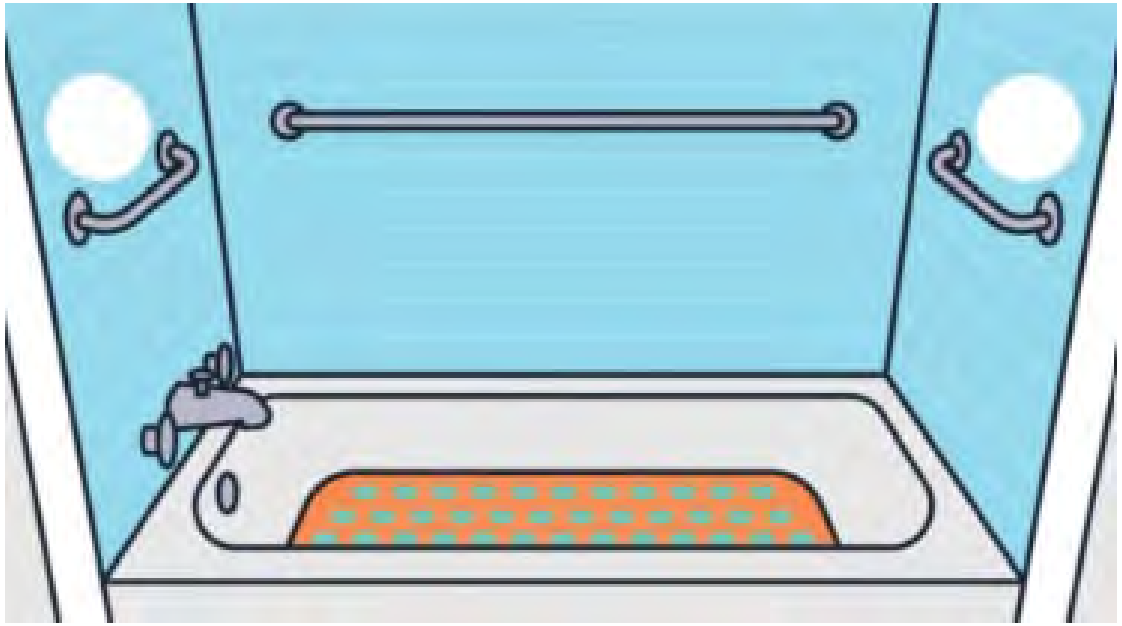
Steadi, CDC

Use railings on stairs

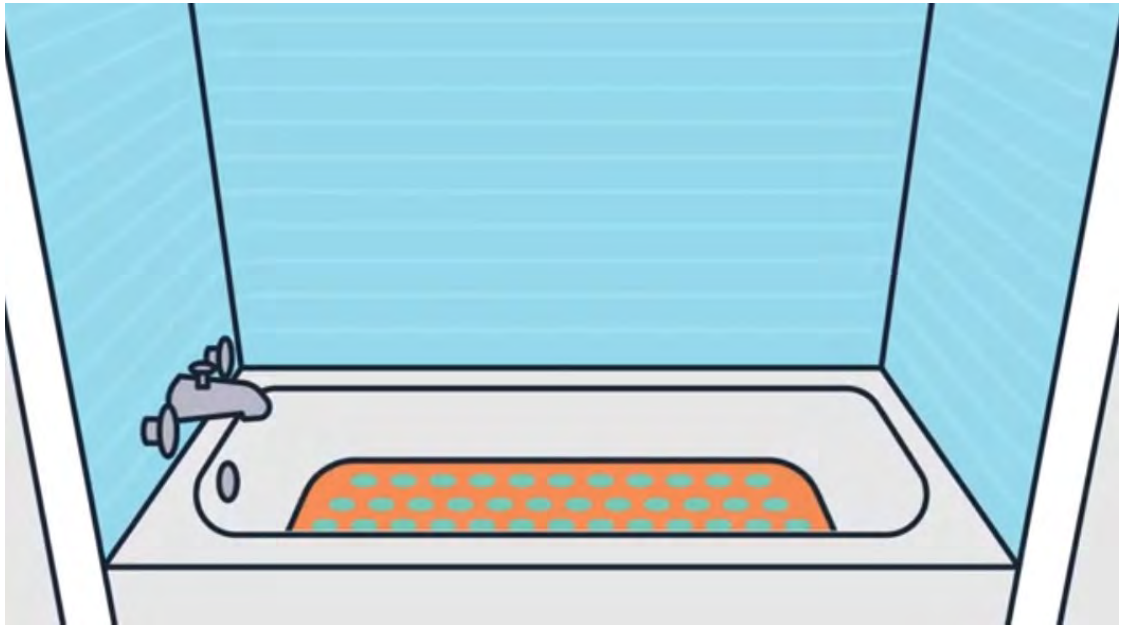


Steadi, CDC

Bathroom Safety



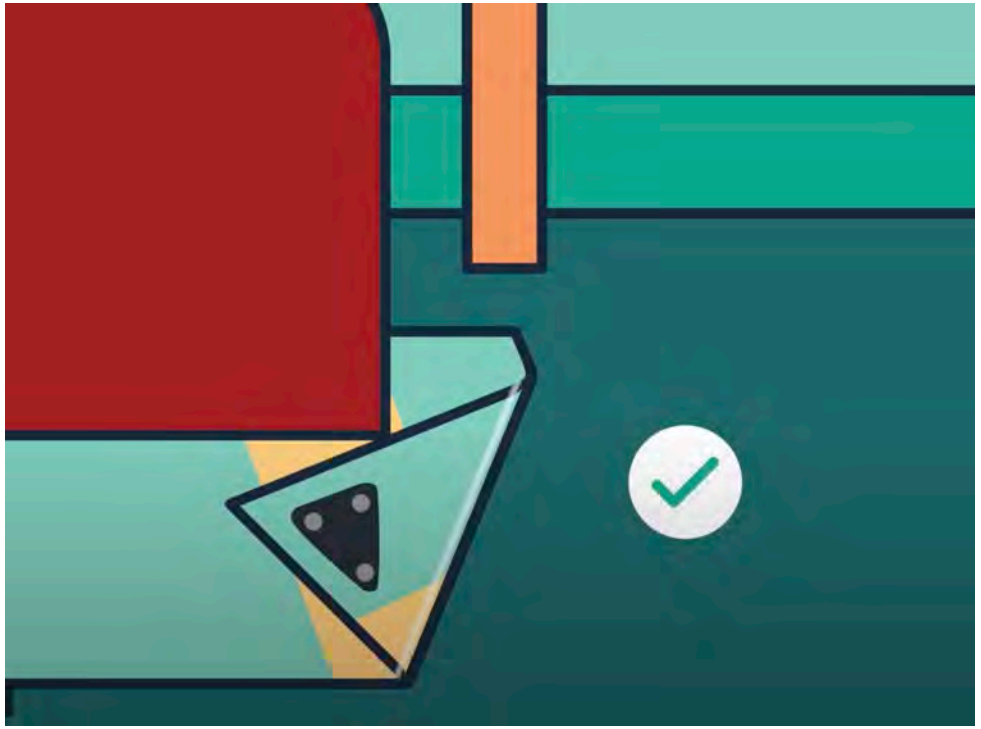
Handrails/grab bars



Nonslip mats

Steadi, CDC

Ensure safe flooring

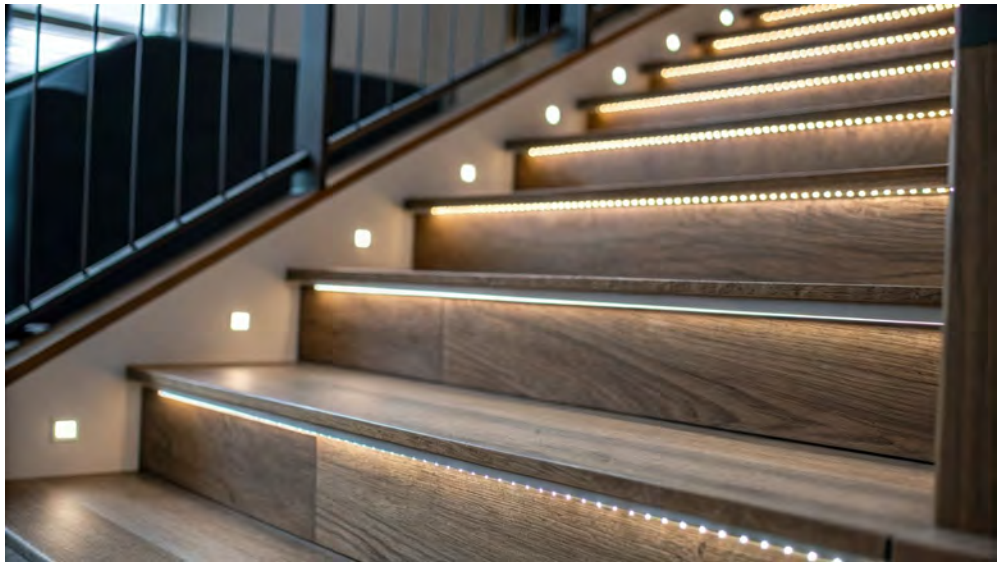


Fix carpets and rugs firmly to the floor

Add non-slip mats to any potential slippery surfaces

Steadi, CDC

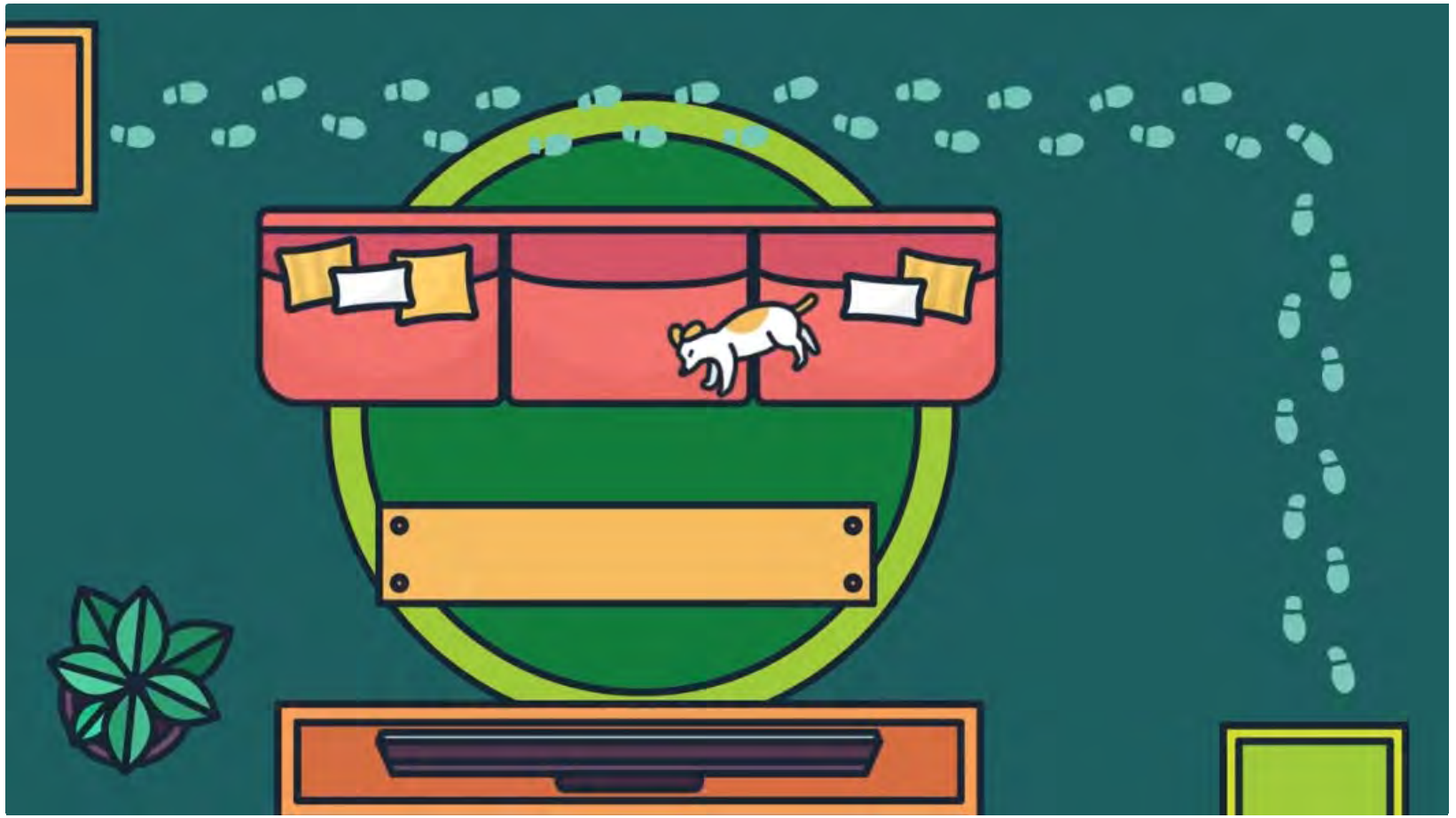
Ensure safe flooring



Add treads, lights, and/or color distinctions on stairways

Tips for Navigating Your Environment Safely

Create a clear walking path through your home

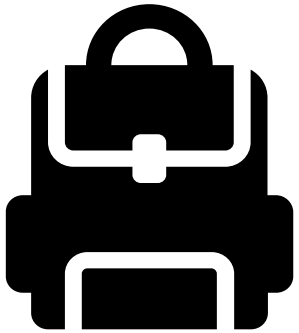


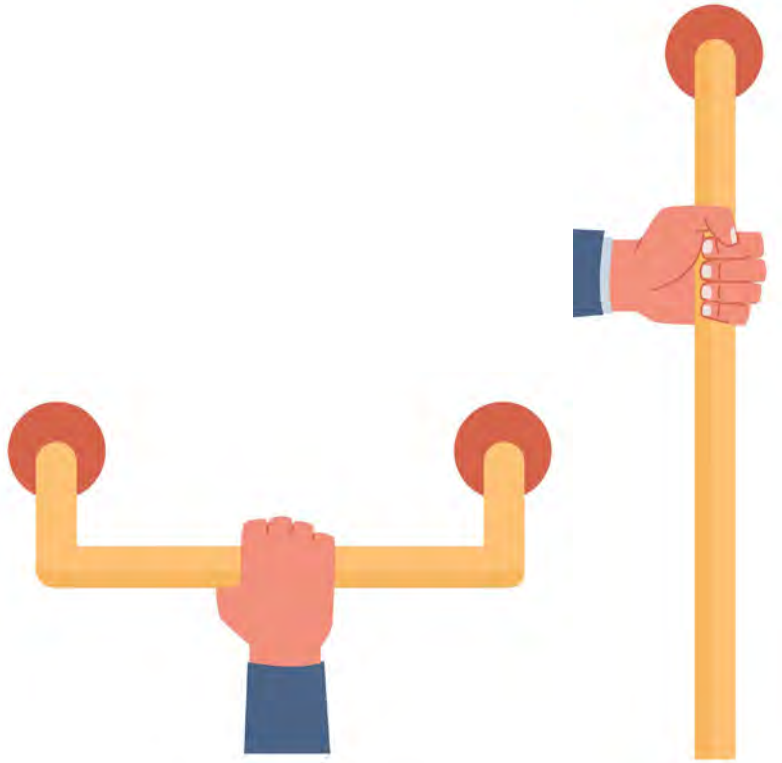
Steadi, CDC

Stand up slowly and use a cane or walker*

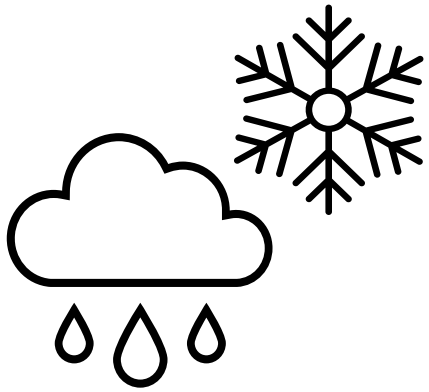
*If recommended by a health care provider

Keep your hands free and grab hold of railings

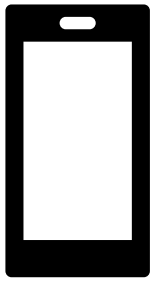




Outdoor Environments



Avoid walking in bad weather



Carry a phone with you

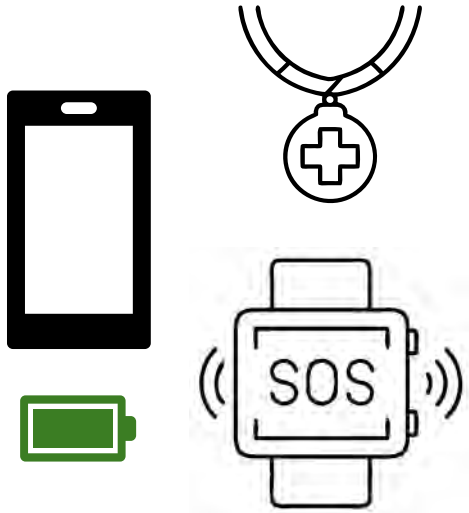
Walk with a friend

Be aware of your surroundings

Be Prepared

Arrange for daily contact with family/friends

Be able to call for help



Keep a phone or emergency response device with you at all times

Consider a smart home device that you can connect you to help

Have your emergency contacts handy

Activity:
How to Recover From a Fall

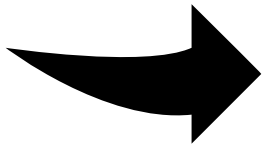
Breathe

Take a few moments and
don't try to get up too fast

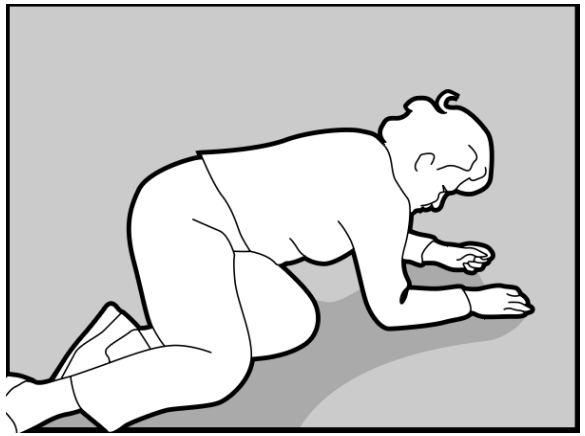
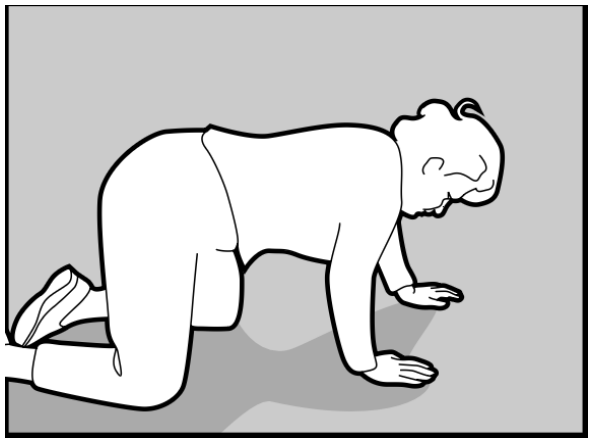
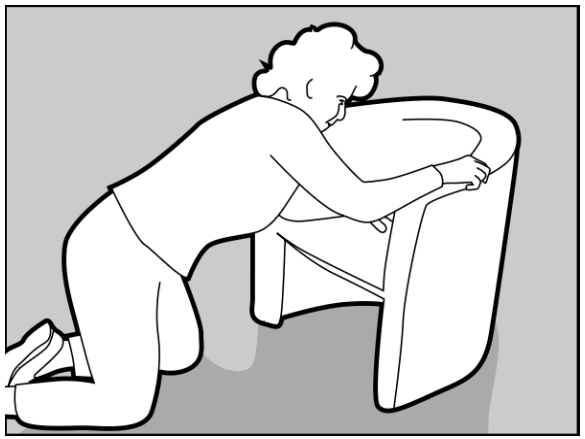
Assess for injuries

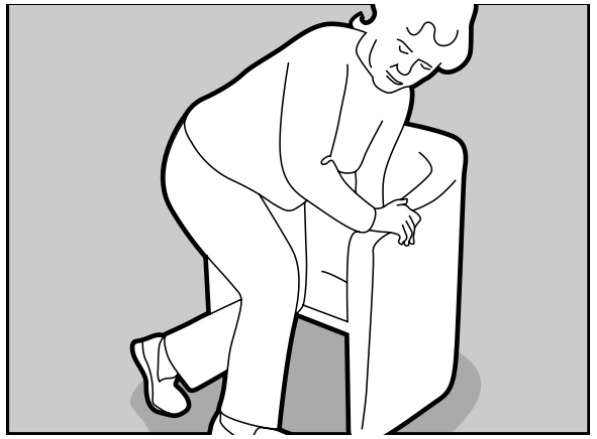
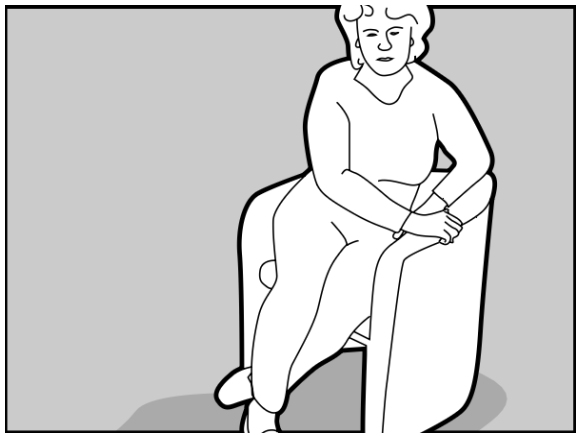
Call for help
if you're injured and/or
unable to get up
safely on your own

If you're not injured,
start making a plan
for getting up safely

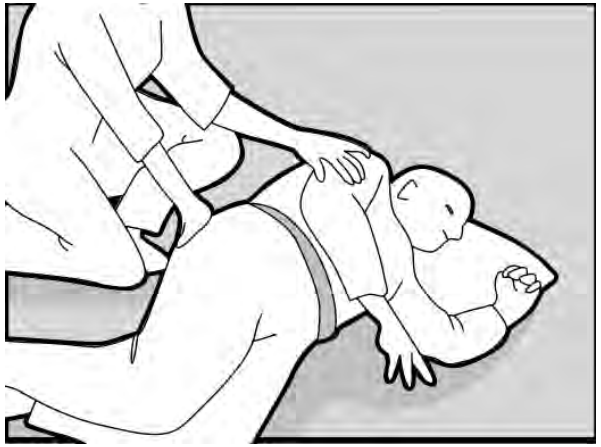


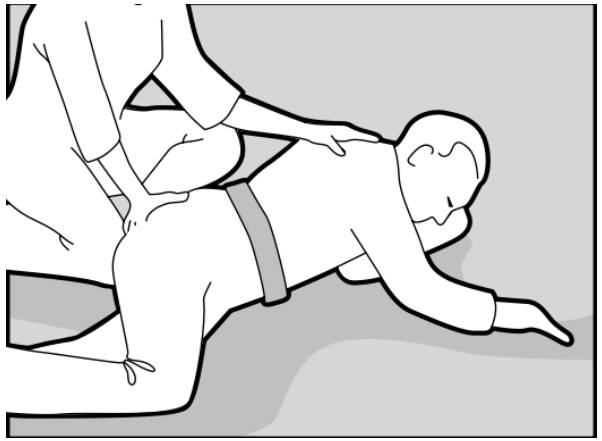
Getting up by yourself

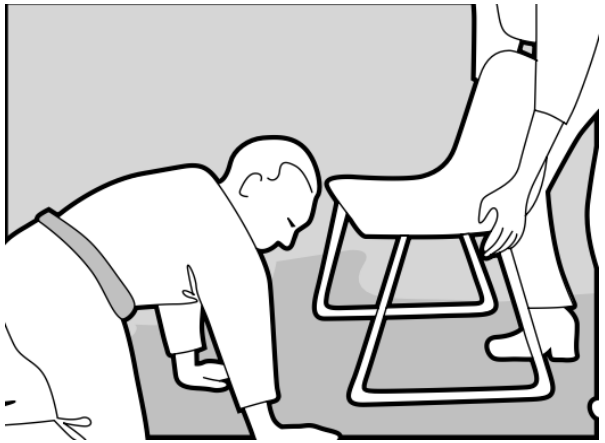





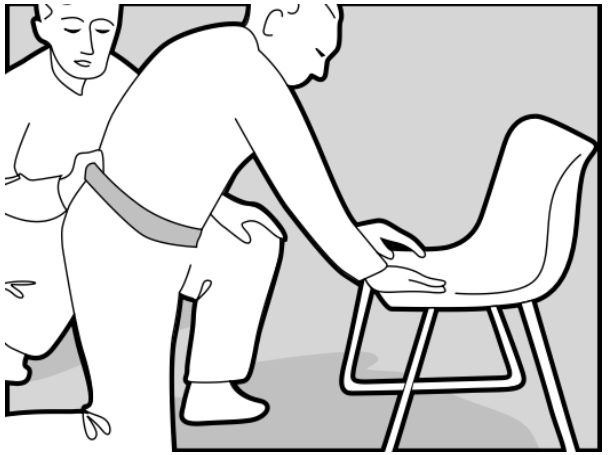



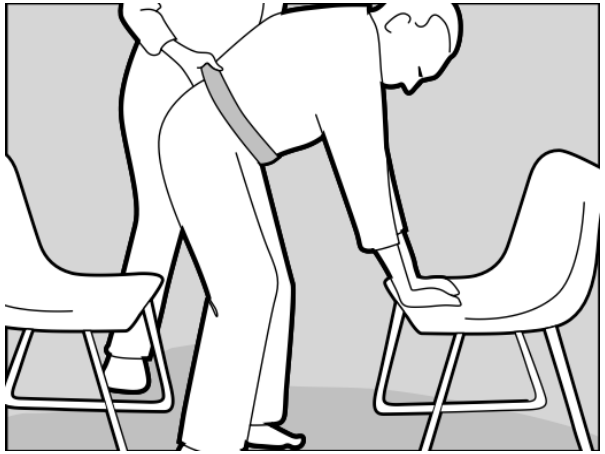
Getting up with someone's help



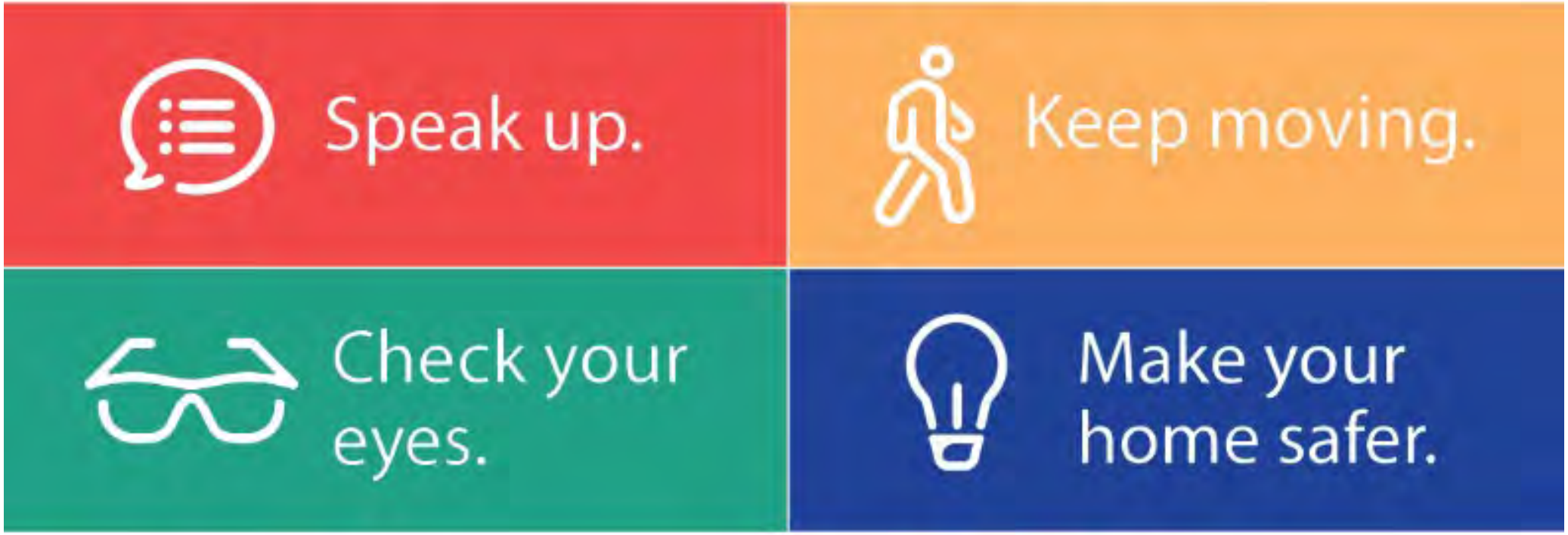








Falls are Preventable.



www.cdc.gov

STEADI Stopping Elderly Accidents, Deaths & Injuries

Resources

- https://www.lifeline.ca/en/resources/reducing-falls-risk-home/
- https://www.standingstrongnc.org/home-safety
- https://www.aarp.org/health/conditions-treatments/how-to-fall-safely/
- https://www.cdc.gov/steadi/patient-resources/index.html
- https://www.nia.nih.gov/health/falls-and-falls-prevention/preventing-falls-home-room-room
- https://www.nia.nih.gov/health/falls-and-falls-prevention/falls-and-fractures-older-adults-causes-and-prevention
- https://www.dshs.wa.gov/sites/default/files/ALTSA/hcs/documents/safelygetup.pdf

Exercises for Better Balance

SHANNON BUSH, DPT

VICKI S. MERCER, PT, PhD, FAPTA

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Division of Physical Therapy

What is the single best way to address falls and fall risk?

EXERCISE is the answer!

What kinds of exercises should I do?

- Balance exercises are most important
- May also include strengthening exercises, especially leg strengthening
- Many exercises target both balance and strength

How much exercise should I do?

- Exercise for at least 150 minutes to 3 hours per week
- Continue performing exercises for at least 6 months

How can I find an exercise program that is right for me?

- Identify your goals and preferences
- Consult with a physical therapist or other health professional
- Consider your overall health and fitness level
- Take into account program availability and cost

Community-Based Falls Prevention Programs

- Otago Exercise Program
- Stepping On (Clemson et al, 2004)
- Tai Chi

*A Matter of Balance – for individuals with low balance confidence

Otago Exercise Program

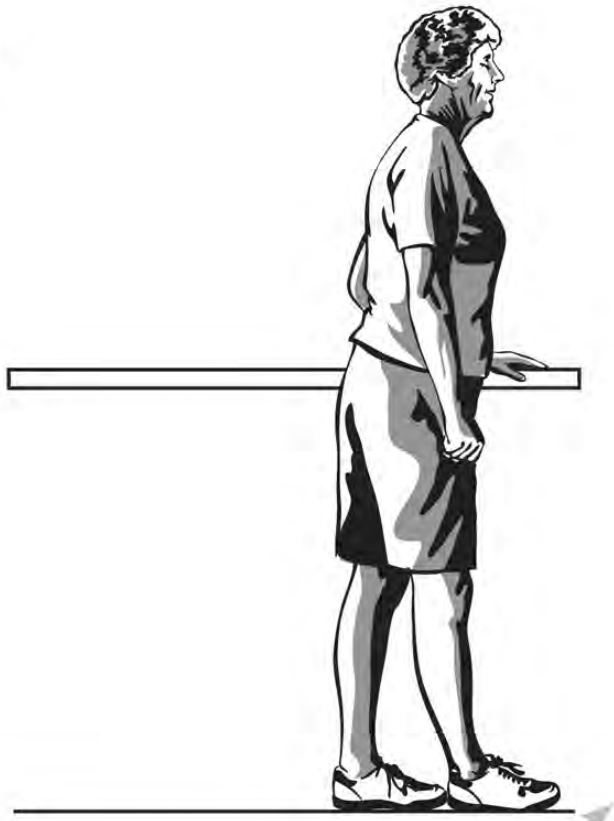
- Developed in New Zealand
- Consists of simple home exercises and a walking program
- Originally implemented by PTs, then also by trained nurses
- Has strong evidence for effectiveness in preventing falls

Otago exercises to improve balance

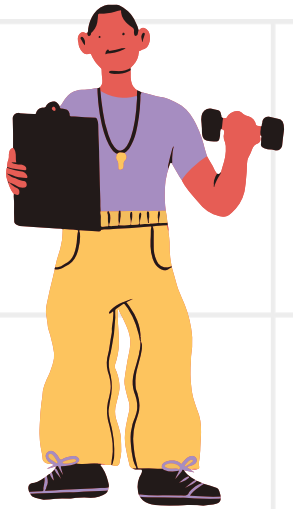
Heel Toe Walk

Heel toe walking – hold support

- Stand up tall beside the bench
- Hold on and look ahead
- Place one foot directly in front of the other so they form a straight line
- Place the foot behind directly in front
- Repeat for 10 more steps
- Turn around
- Repeat the exercise



Side Hip Strength



Side hip strengthening exercise

- Strap the weight on to your ankle
- Stand up tall beside the bench
- Hold on to the bench
- Keep the exercising leg straight and the foot straight forward
- Lift the leg out to the side and return
- Repeat ( ) times
- Strap the weight on to the other ankle
- Turn around
- Repeat this exercise ( ) times

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Calf Raises

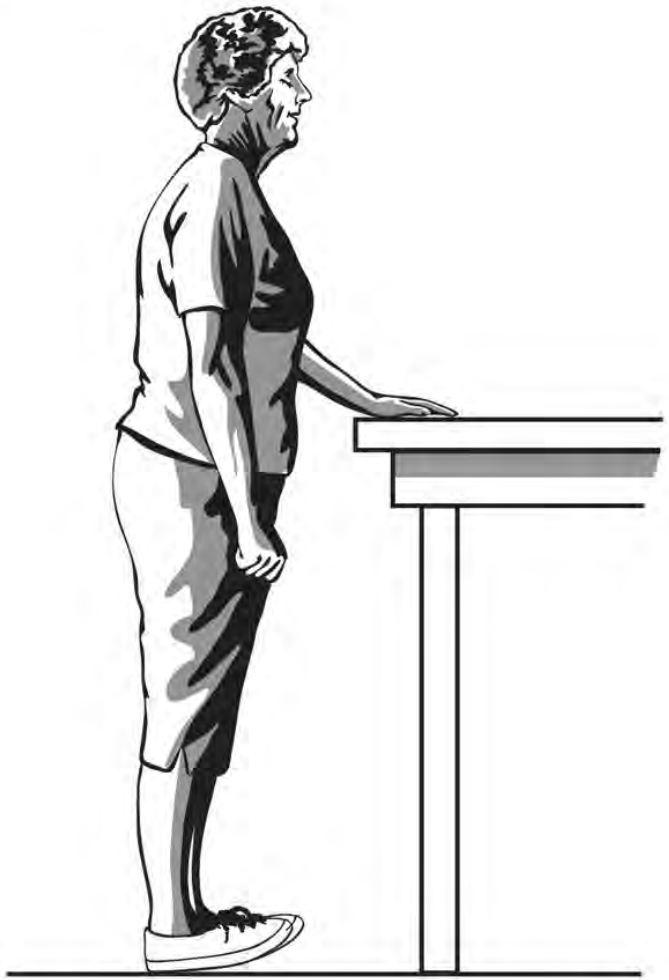
Calf raises – hold support

- Stand up tall facing the bench
- Hold on and look ahead
- The feet are shoulder-width apart
- Come up onto your toes
- Lower the heels to the ground
- Repeat this exercise 20 times

Toe Raises

Toe raises – hold support

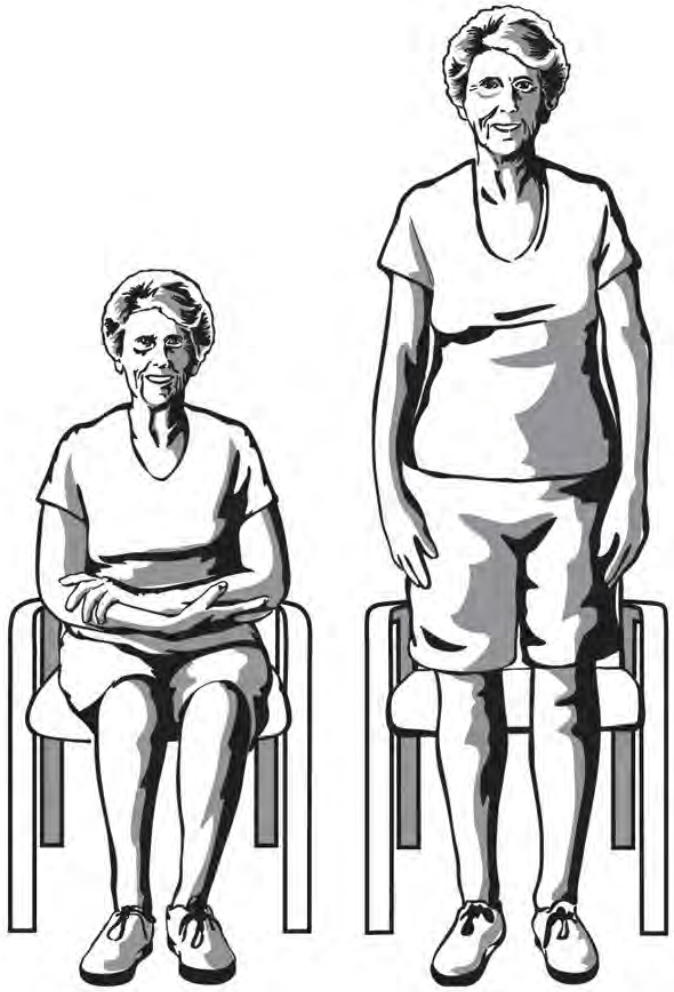
- Stand up tall beside the bench
- Hold on and look ahead
- The feet are shoulder-width apart
- Come back onto the heels, raising the front foot off the floor
- Lower the feet to the ground
- Repeat this exercise 20 times



Sit-to-Stands

Sit to stand – no hands

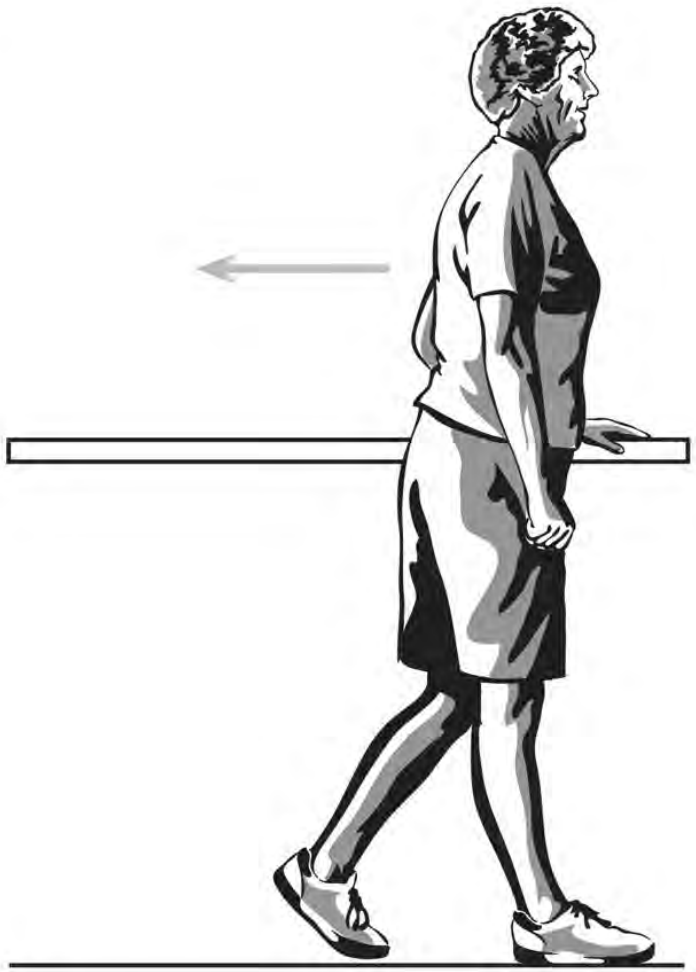
- You could do this exercise while you watch TV
- Sit on a chair which is not too low
- Place the feet behind the knees
- Lean forwards over the knees
- Stand up without using your hands
- Repeat ◯ times



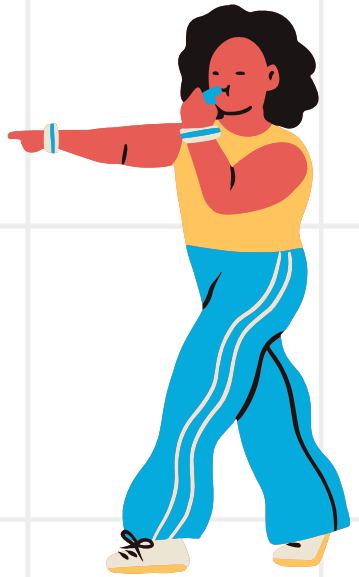
Backwards walking

Backwards walking – hold support

- Stand up tall and hold on to the bench
- Walk backwards 10 steps
- Turn around and hold on with the other hand
- Walk backwards 10 steps to the beginning
- Repeat this exercise

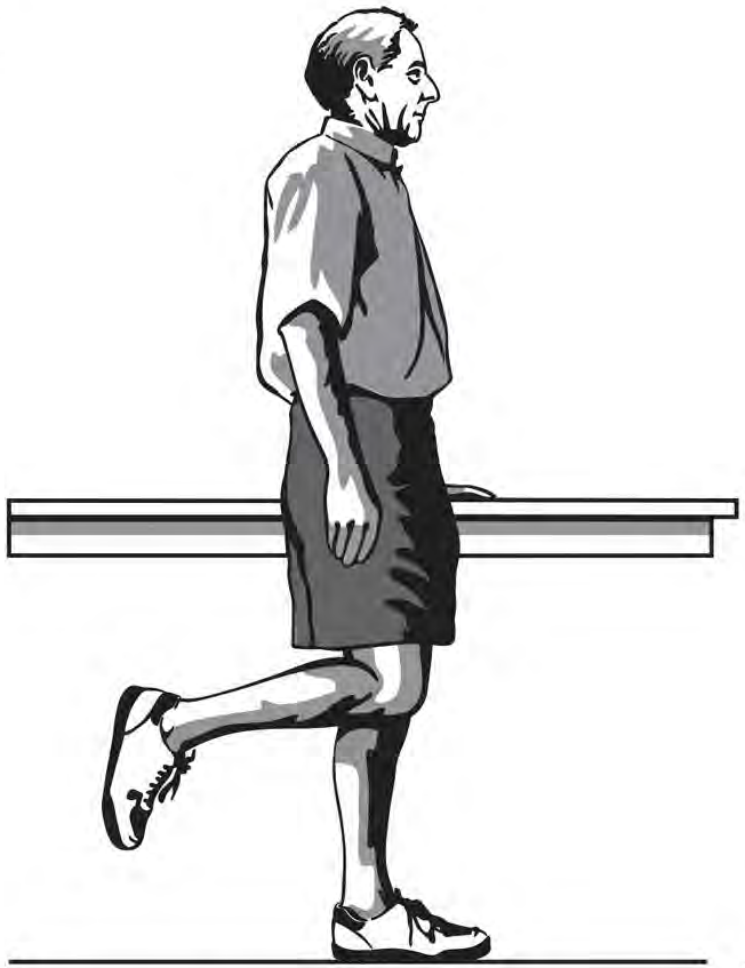


Single Leg Stance



One leg stand – hold support

- Stand up tall beside the bench
- Hold on and look ahead
- Stand on one leg
- Try to hold this position for 10 seconds
- Stand on the other leg
- Try to hold this position for 10 seconds



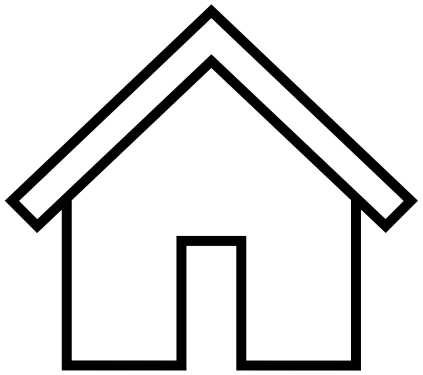
Resources

- Centers for Disease Control and Prevention www.cdc.com
  - Stopping Elderly Accidents, Deaths, and Injuries (STEADI)
    - *Tools to Implement the Otago Exercise Program: A program to Reduce Falls- Third Edition*. Published online. Accessed September 16, 2025.
- Carolina Geriatric Workforce Enhancement Program (CGWEP)
  - https://www.med.unc.edu/aging/cgwep/wp-content/uploads/sites/865/2024/04/Otago-Guide-for-PT_April-2024-update.pdf
- GiveFit – Otago exercise on YouTube
  - Introduction https://www.youtube.com/watch?v=4iugjk9AbN8


Keep Moving.
Keeping active and maintaining balance helps prevent falls.
www.cdc.gov

How can we prevent falls?

Maintain health & well-being



Create a Safe Environment

Choose Proper Footwear

Step Smart: Choosing Safe Footwear

Presented by: Ethan Simaitis and Megan Spencer

Choosing Safe Footwear

NORDSTRONG

DSW Designer Shoe Warehouse

For the most accurate information and guidance, it's always best to get tested by a professional.

Chapel Hill Foot & Ankle Specialists
Keeping you on track... For Life!
A Division of USFAS

FLEET FEET

bull city running co.
transform your sole

1. Sole

Insole: The inside layer your foot touches. Should feel <u>comfortable and cushioned</u>.

1. Sole

Midsole: Provides stability. A firm midsole prevents shoe from bending/twisting.

Outsole: The bottom layer that touches the ground. Look for non-slip tread for grip and safety.

2. Size

Snug but not tight: Secure fit without squeezing

Room for toes: About thumb's width at end

Width matter: Too narrow = blisters
Too wide = unstable

Check both feet: Fit the larger foot

Feet size change with age: Measure regularly

Shoes Size Chart

EUR	US	UK	Foot length, cm
35	5	34,5	22
35,5	5,5	35	22,5
36	6	35,5	23
37	6,5	36,5	23,5
37,5	7	37	24
38	7,5	37,5	24,5
38,5	8	38	25
39	8,5	38,5	25,5
40	9	39,5	25,7
40,5	9,5	40	26
41	10	41	26,5

3. Support

Heel Counter

- Firm cup at back of shoe
- Prevents side-to-side rolling of the foot
- Important for balance

3. Support

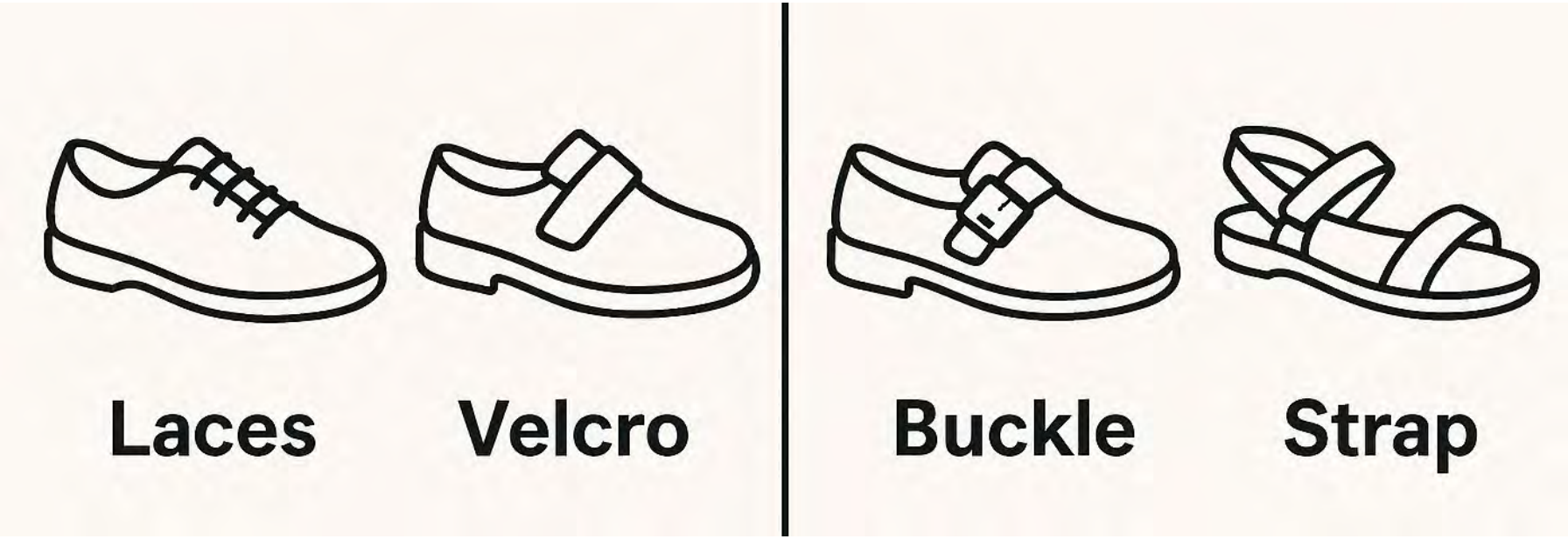
3. Support

Arch Support

- Lifts and supports arch of foot
- Reduces foot pain and helps distribute pressure more evenly

4. Secure

Shoes should fasten and stay firmly on feet.



4. Secure

- Loose/slipping shoes increase fall risk
- Suggest "at-home shoes" with support and fastening
  - NOT just socks or backless slippers

Common Shoe Mistakes

Wearing tight shoes

Choosing shoes with inadequate support

Wearing high heels

Using worn-out shoes

Neglecting foot health

Choosing fashion over comfort

Step Smart, Stay Steady.

FALLS PREVENTION AWARENESS EVENT

FALLS PREVENTION IN ACTION:

LEARNING WITH SCIENCE

ORANGE COUNTY DEPARTMENT ON AGING
Wellness

Applied Biomechanics Laboratory

Lampe Joint Department of Biomedical Engineering

UNC CHAPEL HILL

NC STATE UNIVERSITY