Back Safety
Incorporating Safe Body Mechanics

Amy Brown, M.S., CPE
Senior Ergonomist
VSI Risk Management & Ergonomics Inc.
Today we will cover:

- Intro to Ergonomics
- Why is Back Safety Important
- Anatomy of the Spine
- Neutral Postures
- Lifting and Carrying
- Reaching
- Tools
- Tips and Tricks
What is Ergonomics?

DADDY... WHAT'S ERGONOMY?

IT'S MAKING CHILDREN TALL ENOUGH NOT TO HAVE DADS BEND SO MUCH!
What is Ergonomics?

Definition:

Ergonomics looks at the design of tasks, tools, equipment & overall workplace layout in order to fit the task and workstation to the person.
What is Body Mechanics?

- The purposeful and coordinated use of body parts and positions during activity.

- What does that really mean to me?
  - Using correct muscles to complete a task **safely and efficiently**
When to Consider Back Safety

- How many times a day do you:
  - Sit
  - Stand
  - Lift something
  - Bend over
  - Reach above your head
  - Twist
  - Push
  - Pull

- Are you doing these tasks safely?
Common Causes of Back Injuries
Common Causes of Back Injuries

- Slipping, tripping, or falling
- Lifting heavy or odd shaped items
- Jerky motions while lifting
- Twisting and/or reaching while lifting
- Working in awkward positions; poor posture
- Sitting or standing too long in one position
Anatomy of the Spine

Vertebral Column:
- **Cervical** (neck) - C1 – C7
- **Thoracic** (ribs) - T1 – T12
- **Lumbar** - L1 – L5
- **Sacrum** (5 fused)
- **Coccyx** (tailbone)

Diagram showing the Spinal Cord, Disc, and Vertebrae.
What is the most injured area of the Back?
What is the most injured area of the Back?

- Lower = more compression
- More movement
- Less protection (ribs)
Low Back Injuries

- **Low back** injuries are most common and most **costly** musculoskeletal disorder (MSD)

- **Over one million** American workers suffer from back injuries each year!

- Account for **1/5** of the workplace injuries.

- Peak age of low back pain is **30 to 50**

- More common in **males**
  - Muscle Mass
  - Center of Gravity
Keep the Curves

Without the natural curves your spine is weakened making your back more vulnerable to injury.
Postures

How’s *Your* Posture?
Why Back Safety?

- Back-friendly posture helps to prevent back pain while performing activities

Neutral Posture Matters!
- May feel fewer aches and pains
- Protect your joints
- Breathe easier
- Feel more energized
- Engage your “core”
- Improved self-perception and confidence
- Look good!
Neutral Posture: Ears over shoulders over hips, shoulders relaxed, elbows at sides.
Lumbar Support

A slightly angled backrest with lumbar support minimizes compressive force on the lumbar discs.
Correct Chair Fit / Tool Placement

To encourage neutral spine positions in your office, check your:

- Chair Adjustments
- Monitor Distance
- Keyboard Placement
- Mouse Placement
- Document placement
- Footrest

Before

After
What About the Neck?

http://www.teamgiles.com/2011/05/why-is-good-posture-important/

Disc / Joint Compression with Neck Extended

www.xraydigitizing.com
Forward Head Posture

Dangers of Forward Head Posture

The Domino Effect

1. The head moves forward shifting the Center of Gravity.
2. To compensate, the upper body drifts backward.
3. To compensate for the upper body shift, the hips tilt forward.

So, the forward head position can be the cause of not only head/neck problems, but also mid-back and low back problems.

For every inch of Forward Head Posture, it can increase the weight of the head on the spine by an additional 10 pounds.

-Kapandji, Physiology of Joints, Vol. 3

http://www.posturepro.com/
Laptop Posture

- Laptop Risers / Stand
- External Keyboard or Monitor
Standing Posture

- Center of Gravity should pass through the center of base of support.
- High heeled shoes throw the body off balance and increase stress on your lower back.
- Align Ears – Shoulder – Knees

Line is Center of Gravity
Lifting, Carrying and Moving
Lifting and Carrying

Stay Balanced with Stable Base

Neutral Spine

Keep Object Close
Balanced Stance

Staggered Stance

www.balazsboxing.com

www.movingdiysolutions.com
Neutral Spine

- When lifting from the floor, bend at the hips and knees – keeping the back neutral
- Engage your abdominal muscles
- When lifting is not done correctly, you are forcing the lower back to lift the upper body weight plus the load

Movement Facts

- Keep the work as close as possible to your body (Leverage).

- Keep the work at a comfortable height to avoid reaching or excessive bending at the waist.

- Use the arm and leg muscles as much as possible, not the back.

- Movements should be smooth and controlled, not jerky.
Leverage Zones

- Force on your muscles depends on the **mass** (weight of object) and **distance** (from the pivot point).

- Keep the work **as close as possible** to your body. It puts less of a strain on your back.

- In the **Red Zone**, it can be a 10:1 ratio of force around the pivot point (lower back).
Red– Danger Zone

- When lifting in the Red Zone, it is commonly a **10:1** ratio of force around the pivot point (lower back).

- Lifting 10 lb bag of groceries would be 100lbs pressure on your low back!
Tips for Safe Lifting

- Ensure you have **enough room** and clear access to the object that you are lifting
- Check the **weight** of the object before trying to lift
  - *Mark Items as “Heavy”*
- Get a good **grip**
- Keep the object **close** to you

- Keep your feet shoulder distance apart and staggered
- Keep your back neutral
- Bend your knees and hips
- Always turn your feet, never twist your back

- Make **smaller loads**
- Get help for heavy loads
Lifting Exercises
Staggered Stance Lift

- Legs become more involved in the lift which takes pressure off your back
- Keep the load close to your body
- Engage your abdominal muscles
Unsafe Lifting

When not done correctly, you are forcing the lower back to lift the upper body plus the load.

Keep the curves
Build a Bridge

- Support your upper body weight by placing your hand on your thigh or a table

- Decreases stress on the lower back
Golfer’s Lift Technique

www.totaltherapy.ca/blog/the-start-of-long-term-back-health/

www.safety.duke.edu/ergonomics/ProtectYourBack.htm
Reaching

- With excessive reaching you lose your stable center of gravity
  - Fall
  - Increase pressure on your back and shoulders
  - Strain smaller muscles
  - Drop the object
  - Repetitive shoulder elevation
Primary Work Zone

Frequently used items should be in primary work zone to reduce reaching and leaning
Storage Height Recommendations

- Don’t store heavy or frequently used items above shoulder height
- Do not overload shelves
- Use containers if items are likely to fall

www.osha.gov
Tips for Safe Reaching

- Maintain good balance and a firm base of support
  - Stagger your legs
- Stand directly in front of and close to the object, avoid twisting
- Use a stool or ladder for high objects
  - Use appropriate stool for task
- Before attempting to move the object, be sure that it is not too large or heavy
Tools

Tools can improve body mechanics and postures

- Reduce the need for awkward postures
- Mechanically assist with a task
- Perform duties safer and more efficiently
When Carrying an item further than 10 feet, use a cart or dolly.

- Consider the Handle
  - Height
  - Distance from your body (reaching out)

Stool

- When reaching is unavoidable (due to space), use the necessary tools to avoid awkward postures.
Forearm Forklift

- Lifting straps assist with grip and improve postures
Use a Tool

- Awkward postures

Select a tool based on your task
Where else can I apply this?
Around the House

Sore lower back after vacuuming

- Bending, Twisting

Housework - Vacuuming

Hold the vacuum with arm held at side. Step back and forth to move it, keeping head up. Avoid twisting.

Copyright VHI 1995
Avoid twisting (especially with bending) when moving an object

Laundry Basket
Squat down and hold basket close to stand. Use leg muscles to do the work.

Laundry - Loading Wash
Place laundry basket so that bending and twisting can be avoided.

Great use for the Golfer’s Technique!
Around the House

Lift with your legs keeping your back straight, standing as close as possible to the object to be lifted

Build a Bridge!
Lying on your stomach on the floor or bed, is the best position in which to do extension exercises. **Upward Dog**

If you have no place to lie down (if you are at work), then do the exercise standing.
Reminders

- Be **Aware** of your Postures
- **Neutral** Spine
- Get a Plan Before Moving an Object
- Keep it Close (Leverage)
- Work/ Store things at a **comfortable height** to avoid reaching or excessive bending at the waist
- Movements should be **smooth** and controlled, not jerky
Thank You for Your Time!

Amy Brown M.S. HFE, CPE
Senior Ergonomist
VSI Risk Management & Ergonomics
amy@vsi-consulting.com
www.vsi-consulting.com