

BACK SAFETY & ERGONOMICS TRAINING

Mike Palmer, PT, CEAS, MHA








@healthworks4me



Central Virginia's **Only** **Occupational Health** and **Wellness Provider!**

 434.200.6933

 www.hw4me.com

 125 Nationwide Drive 2nd Floor,
Lynchburg, VA 24502



My Background

- ▶ Master's degree in both Physical Therapy and Healthcare Administration
- ▶ Practiced physical therapy for 34 years with 25 years' experience in orthopedic rehabilitation
- ▶ Over the last 10 years I have primarily focused on Industrial Rehabilitation providing physical therapy for work injuries
- ▶ Certified Ergonomic Assessment Specialist (CEAS)
- ▶ Worked with companies in central and southwest Virginia in prevention of work injuries through ergonomic assessment and training and development of employee wellness programs



HealthWorks

Occupational Health & Safety



Copyright © 2012, ReadyToManage

Work Injury Statistics in 2022

(according to National Safety Council and Bureau of Labor Statistics)

- ▶ 2.8 Million recordable injuries (total number of non-fatal work-related injuries)
- ▶ \$120 Billion in estimated work comp costs (total direct and indirect costs of work-related injuries)
- ▶ \$42,000 Average Cost per work injury (including wage/productivity losses, medical expenses, administrative expenses, uninsured costs)

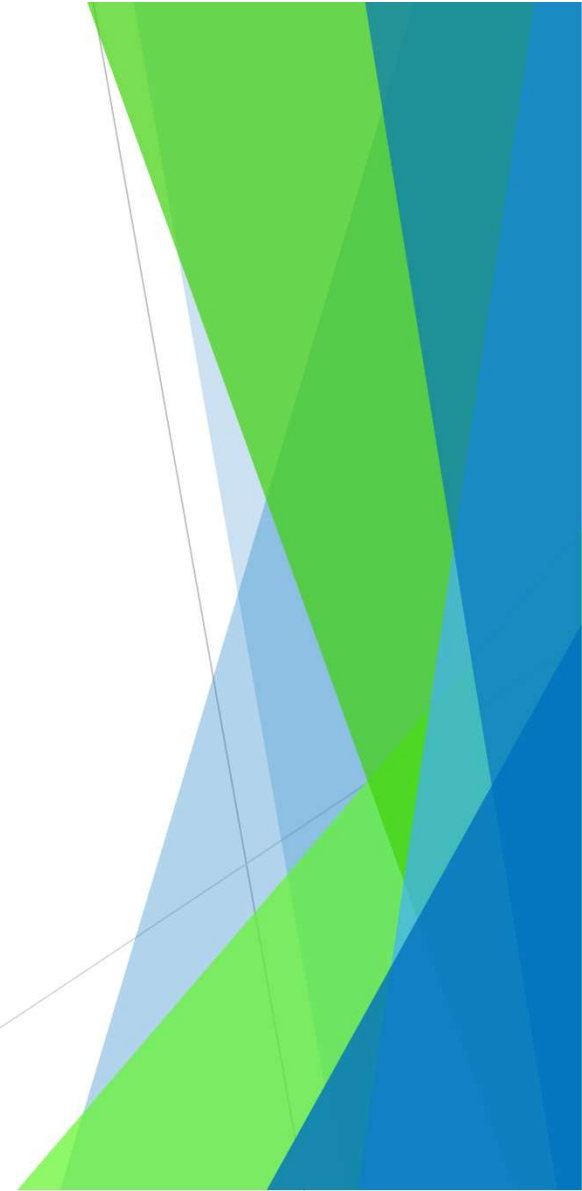


Increased Musculoskeletal Work Injuries

- ▶ Older Workforce
- ▶ Static Work & Home Postures
- ▶ Poor Physical Fitness Levels
- ▶ Obesity
- ▶ Increased Workload
- ▶ More Physical Fatigue
- ▶ More Mental Fatigue



HealthWorks

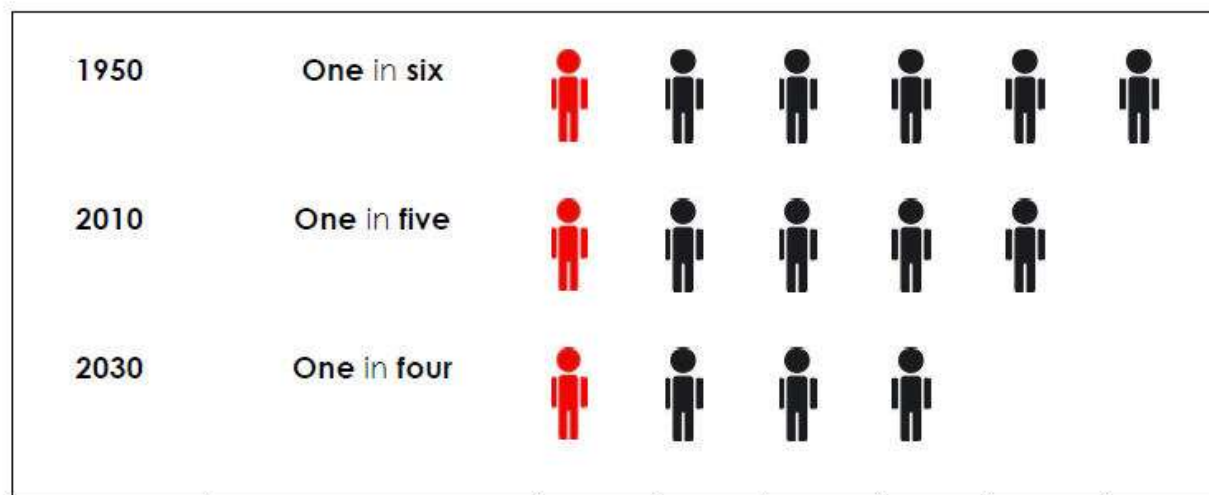


Our Aging Workforce

- ▶ In 1972 the median age of a US worker was 28
- ▶ In 2019 the median age of a US worker was 41.9
- ▶ 2020 – 37.3% of workforce over 50 years old
- ▶ The number of Americans over age 55 in the labor force is projected to increase to 42.1 million in 2026 from 35.7 million in 2016

Workers are Aging

Over age 55 in the Labor Force as a Proportion of all workers, projected 1950 to 2030



Presentation is the property of HealthWorks and cannot be reproduced without permission.

How do you feel at the end of the workday?

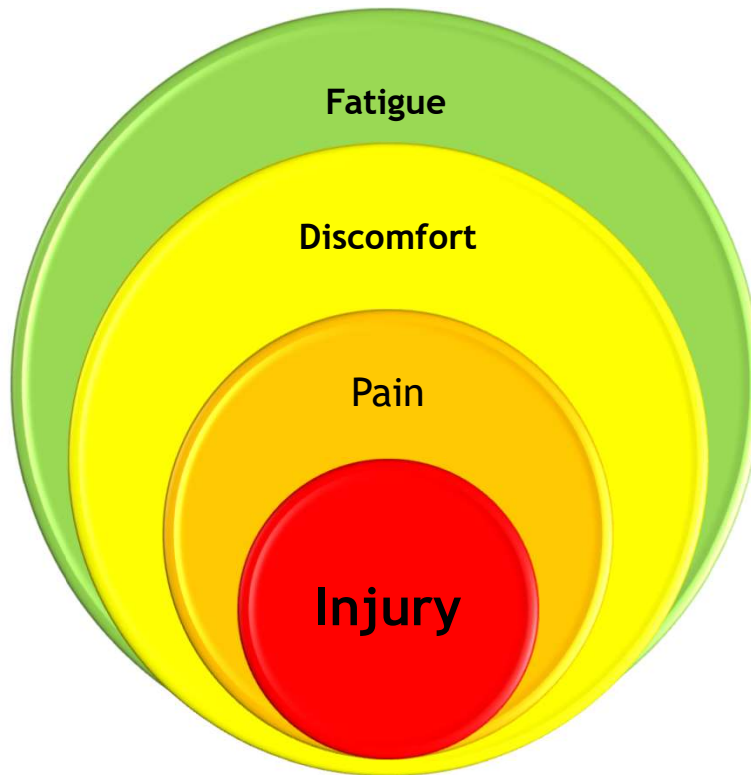


HealthWorks

Look familiar?



The Phases of Musculoskeletal Injury



Oh, My Aching Back!



HealthWorks

Prevalence Back Injuries

- ▶ Low back pain is the most common work-related medical problem in the United States and the second most common reason for doctor visits among U.S. citizens, according to the National Center for Health Statistics.
- ▶ It affects more than 20 million Americans and is the leading cause of disability among people ages 19 - 45.
- ▶ Low back is the No. 1 leading cause of missed work-days, costing Americans \$60 billion per year in treatments and American businesses about \$15 billion annually.
- ▶ It's estimated that at least 80 percent of all Americans will experience some form of low back pain at some point in their lives.



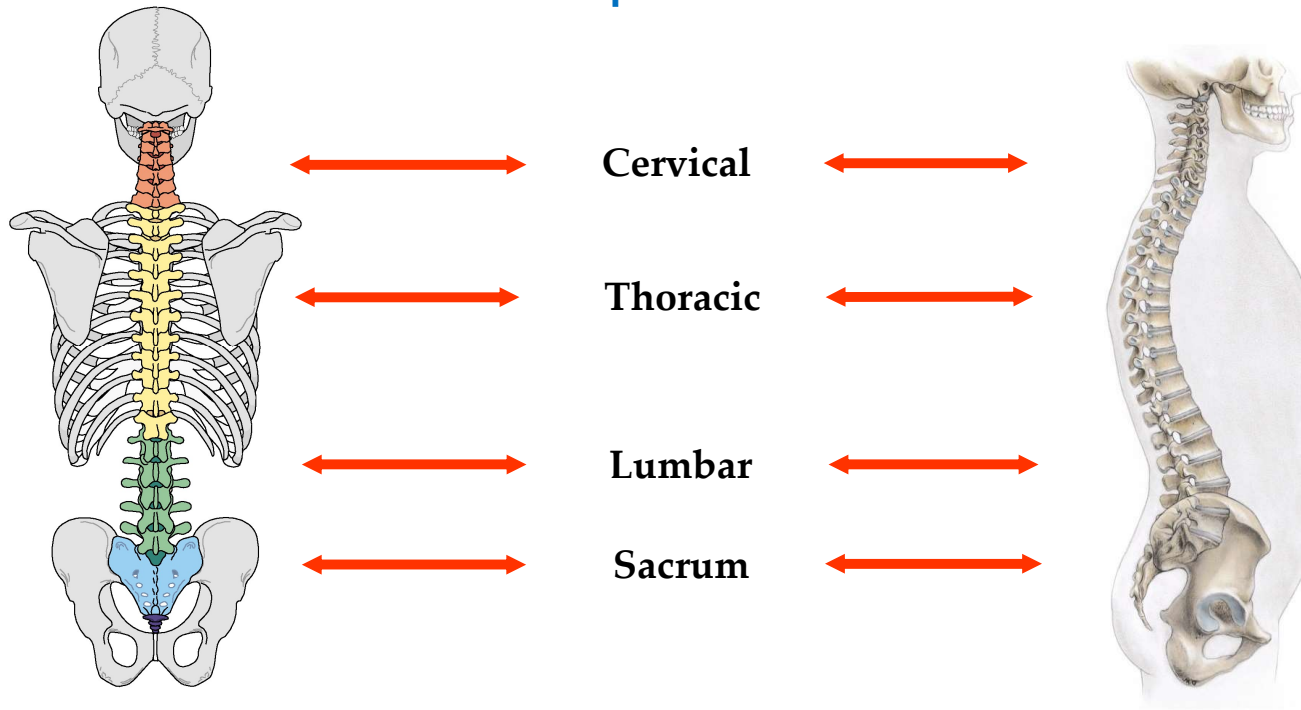
Common Causes of Back Pain

- ▶ Mechanical Low Back Pain
- ▶ Postural Stress
- ▶ External force
- ▶ Osteoporosis
- ▶ Arthritis
- ▶ Pregnancy



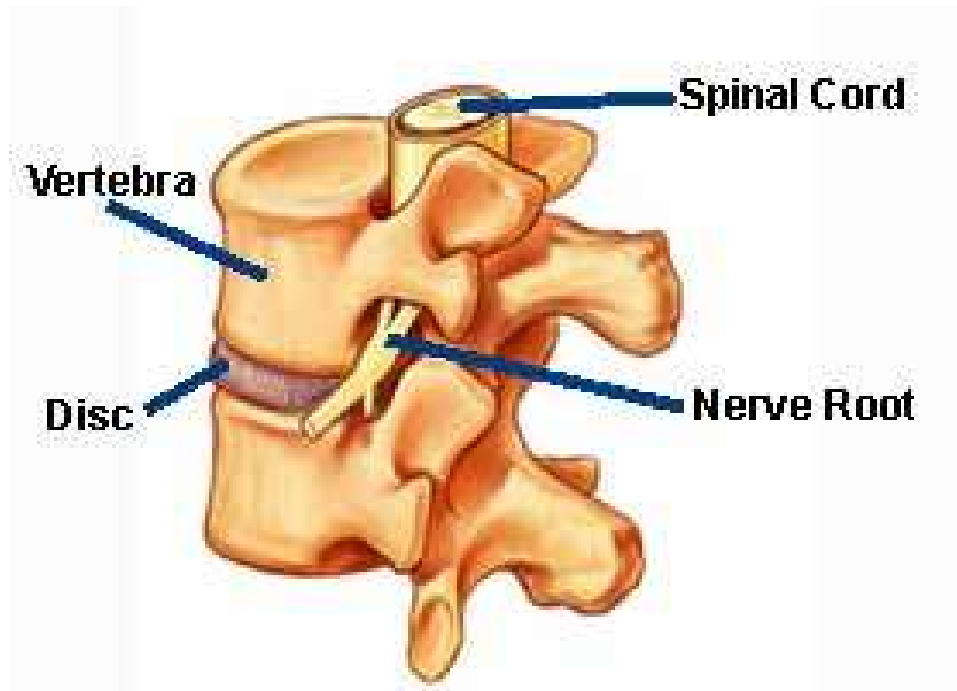
HealthWorks

Spine



*Several Important Features (review spine model)

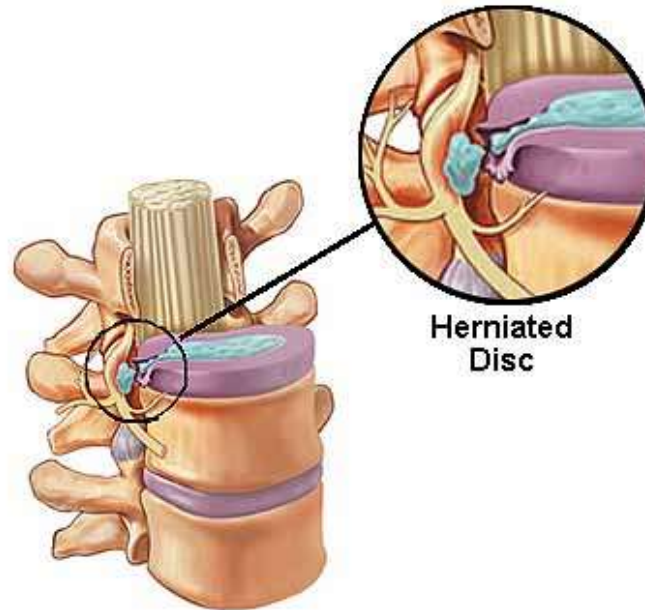
Lumbar Spinal Segment



HealthWorks

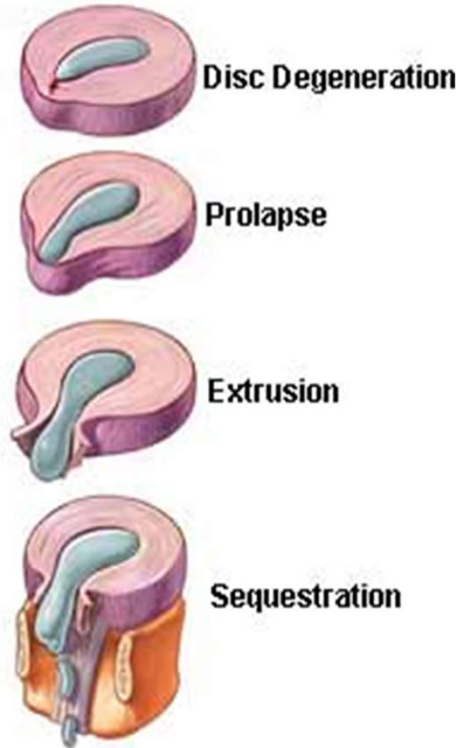
Disc Problems

- ▶ In between each of the five lumbar vertebrae (bones) is a disc, a tough fibrous shock-absorbing pad. Endplates line the ends of each vertebra and help hold individual discs in place.
- ▶ Excess spinal pressure can cause these discs to be compressed until they rupture.
- ▶ Disc herniation occurs when the annulus breaks open or cracks, allowing the nucleus to escape. This is called a Herniated Disc

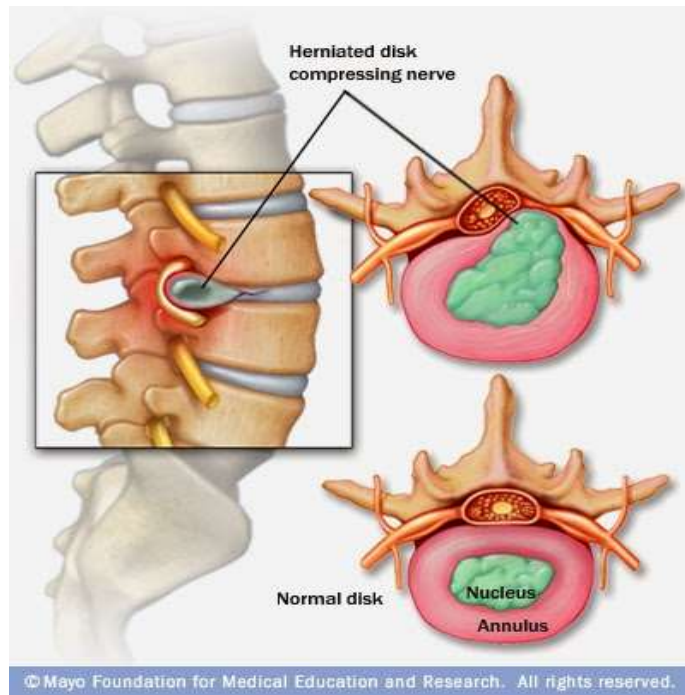


Disc Degeneration

- ▶ Disc Degeneration: chemical changes associated with aging causes discs to weaken, but without a herniation.
- ▶ Prolapse: the form or position of the disc changes with some slight impingement into the spinal canal. Also called a bulge or protrusion.
- ▶ Extrusion: the gel-like nucleus pulposus breaks through the tire-like wall (annulus fibrosus) but remains within the disc.
- ▶ Sequestration or Sequestered Disc: the nucleus pulposus breaks through the annulus fibrosus and lies outside the disc in the spinal canal (HNP).



Pinched Nerve



HealthWorks

Preventing Back Injuries

- ▶ Maintain Proper Posture
- ▶ Practice Proper Ergonomics
- ▶ Take Sufficient Rest Breaks
- ▶ Change Positions Often (we are designed to move)
- ▶ Engage in Regular Exercise and Stretching
- ▶ Wear Comfortable Shoes with good Arch Support.

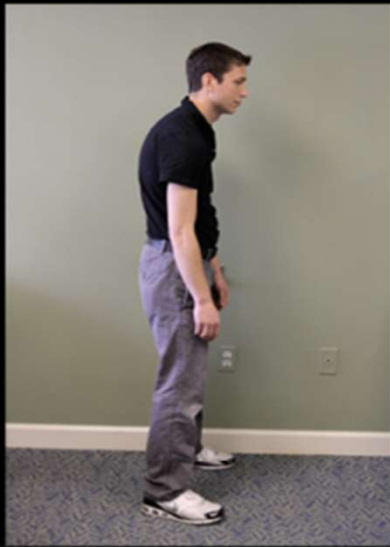
Tips for Good Posture

- ▶ Maintain Your Spine in Neutral (normal) Position
- ▶ Keep Your Ears, Shoulders, and Hips in Line.
- ▶ Pull in Your Stomach and chin to help support your back.
- ▶ Support Low Back in Sitting (sit tall)



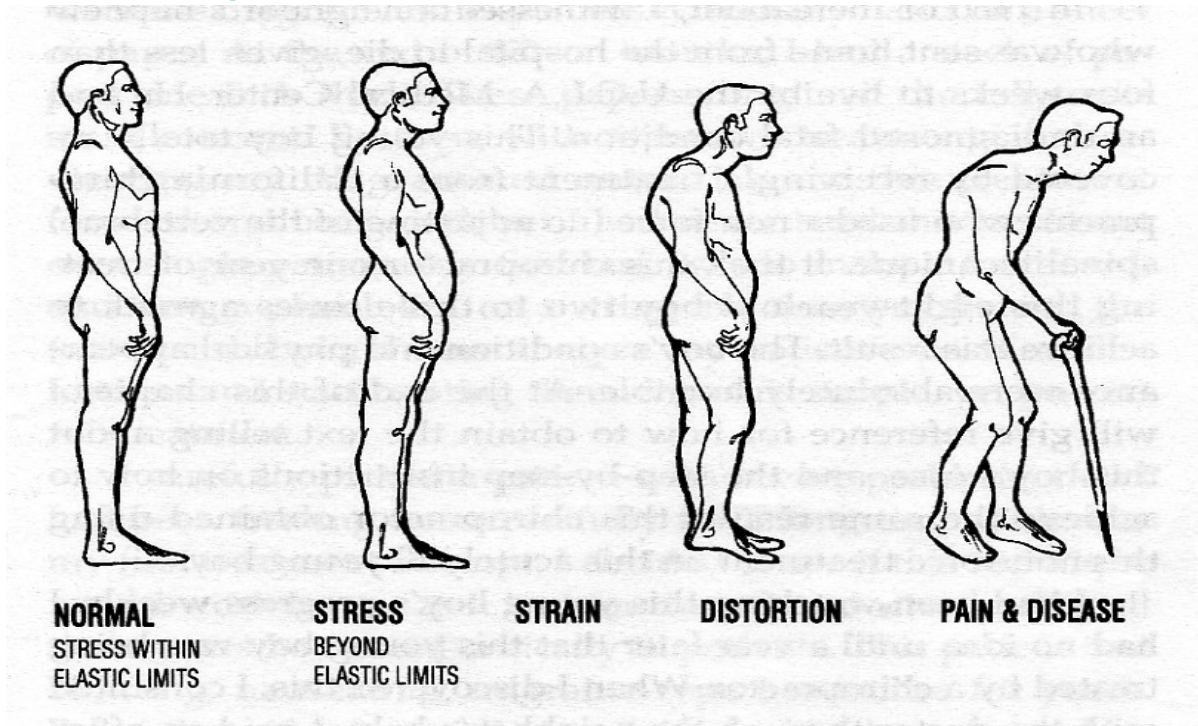
HealthWorks

Which Posture is Best?



HealthWorks

Consequences of Poor Posture



HealthWorks

Relieve Pressure on Back in Standing

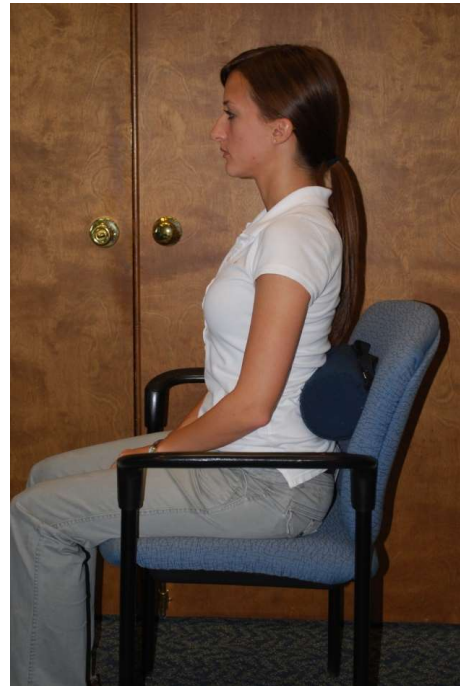
- ▶ Stand Tall
- ▶ Place one foot on a stool for prolonged standing
- ▶ Switch legs to off load stress



Relieve Pressure on Back in Sitting



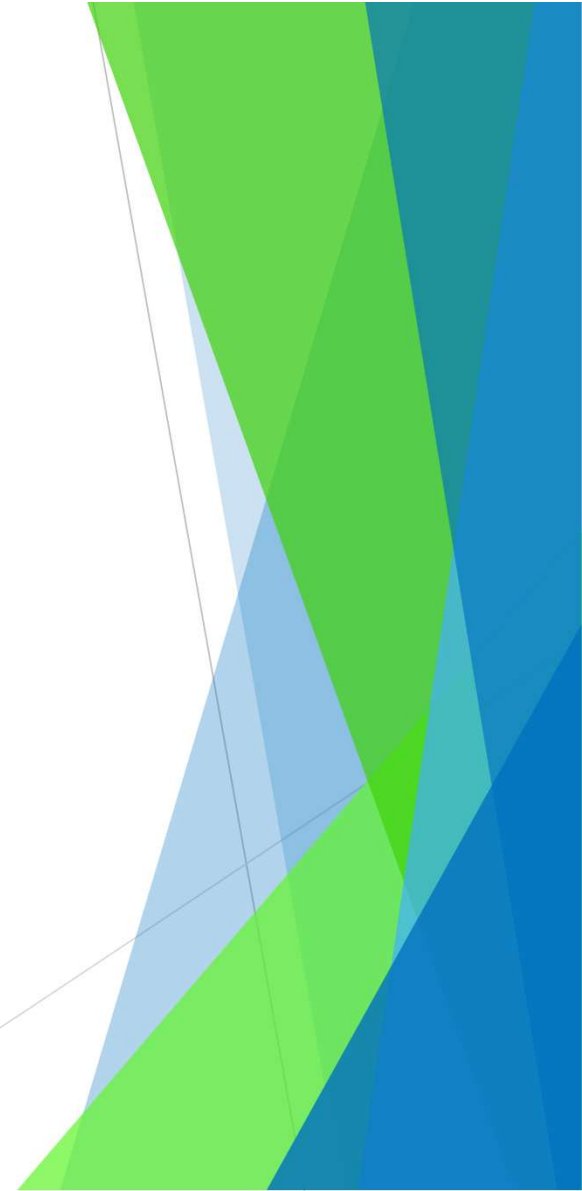
Avoid Slouching



Sit Tall



HealthWorks



ERGONOMICS

- ▶ Ergonomics considers the match between the person, the equipment they use, the work processes and the work environment.
- ▶ Ergonomics principles are used to improve the “fit” between the worker and the workplace.
- ▶ A person’s capabilities, physical attributes and work habits must be recognized to improve ergonomics factors in the workplace.



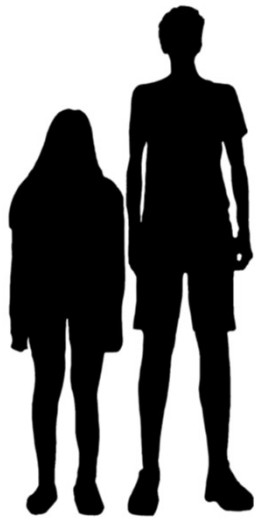
HealthWorks

Average Size and Shape



HealthWorks

Differences in Size and Shape



HealthWorks

Ergonomics Principles

- ▶ Fitting the workplace to the worker for safety
- ▶ Planning ahead on how tasks are performed
- ▶ Working in a way that minimizes physical stress
- ▶ Protecting the Spine



HealthWorks

Primary Risk Factors for Ergonomic Injuries

- ▶ Posture- awkward, static positions (> 2 hrs)
- ▶ High Force- Lift, carry, push, pull, grip, pinch, (> 2 hrs)
- ▶ High Repetition- frequency & speed (2-4 hrs)
- ▶ Contact Stress- focused sustained or suddenly applied with compressive force (> 2 hrs)
- ▶ Vibration- segmental or whole body over time, frequency and amplitude (30 min continuous, > 2hrs)



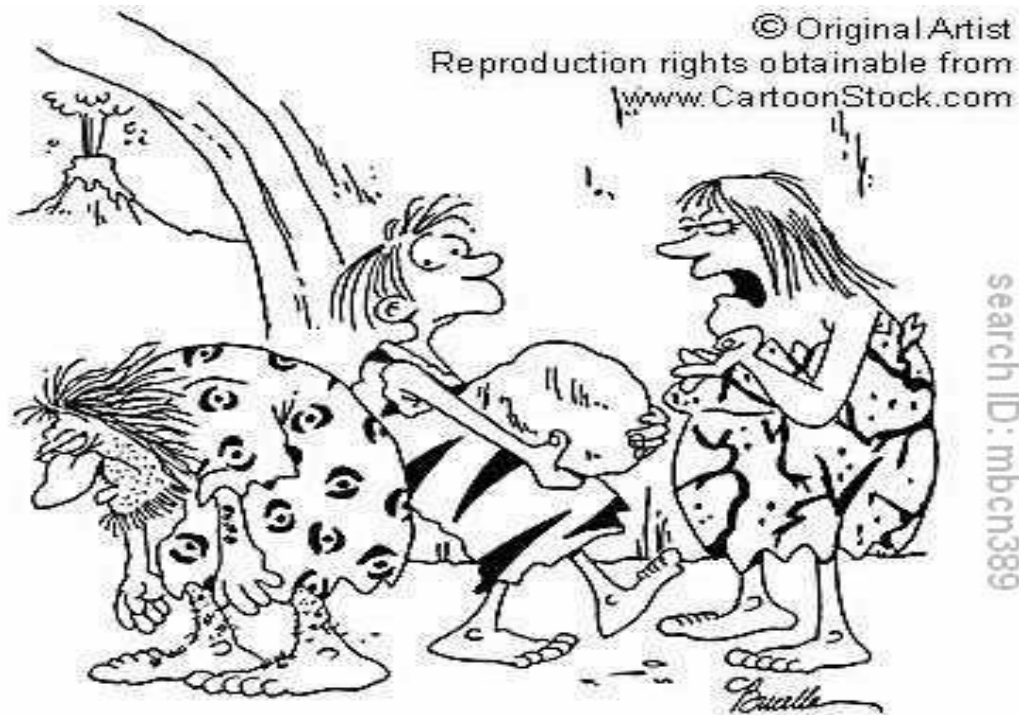
HealthWorks

Personal Protective Equipment (PPE) to Mitigate Work Injury

- ▶ Vibration-reduction gloves (will increase required grip force)
www.radargloves.com
- ▶ Carpet layer's knee pads



Awkward Postures

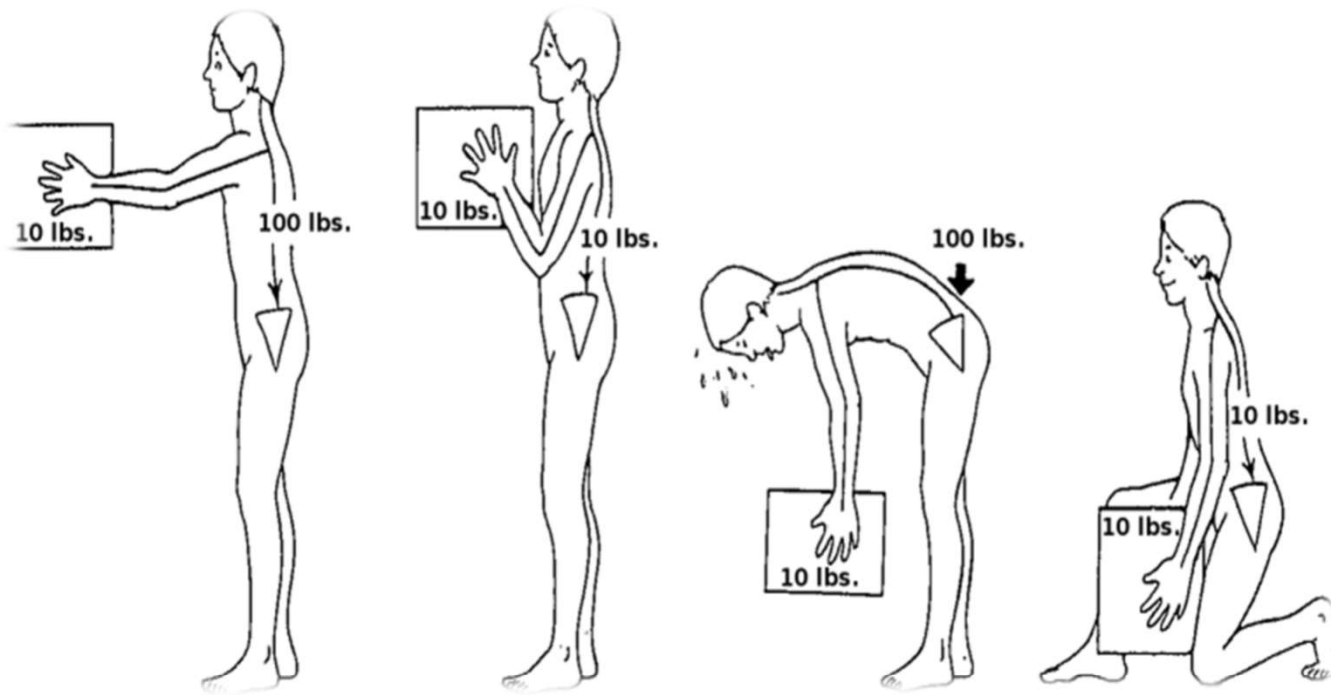


"Look at your father. See what happens when you lift with your back instead of your legs?"



HealthWorks

Mechanical Stress to Low Back



HealthWorks

Proper Lifting



HealthWorks

Proper Lifting



The wrong way!



The right way!



HealthWorks

Proper Position Prior to Lift

- ▶ Get Close to Object
- ▶ Use Wide Stance
- ▶ Straddle Object



Proper Lift From Floor

- ▶ Maintain Back in Neutral (slightly arched)
- ▶ Squat down using legs to change height
- ▶ Tuck in Chin
- ▶ Keep eyes forward when standing up



Proper Lifting – Squatting Method



HealthWorks

Proper Lifting – Single Knee Method



HealthWorks

Lifting Awkward or Bulky Items



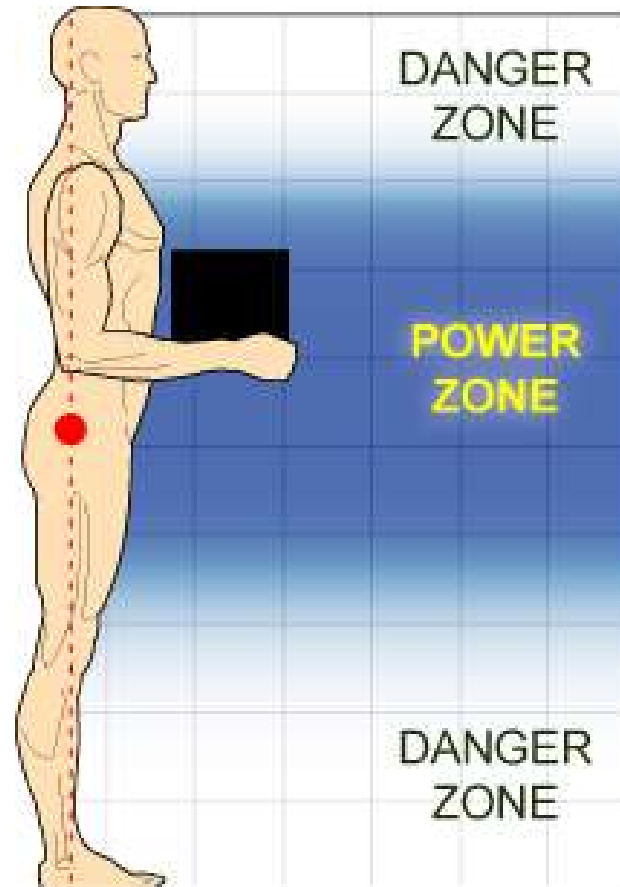
HealthWorks

Golfer's Lift for Lighter Objects



Work in Power Zone

- ▶ Power Zone is area where you are strongest
- ▶ From your chest to your hips
- ▶ Position work directly in front of you
- ▶ Work with arms close to your body



THE POWER ZONE

Taking Care of You!

- Bend your elbow at a 90 degree angle (an L shaped position of the arm) and you are in your primary **POWER ZONE**
- The area up to the shoulders and down to the knees (often called the **Strike Zone** in baseball) is acceptable.
- The more time you can work in your **POWER ZONE** the less stress and fatigue on your body.



THE POWER ZONE

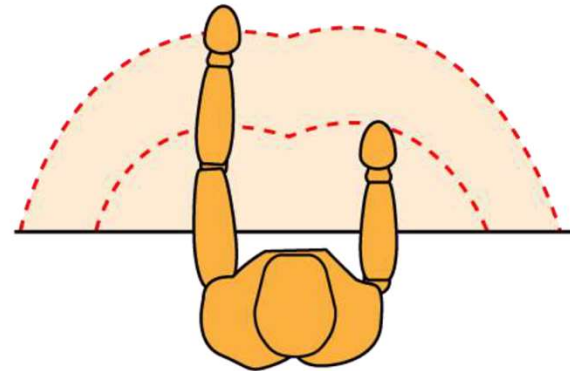
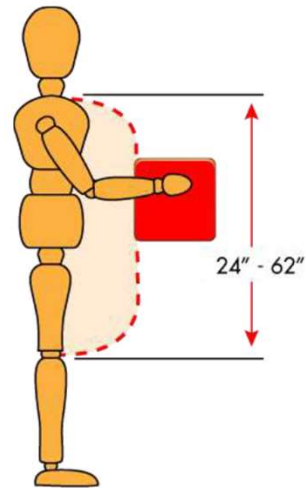
Taking Care of You!

- Bend your elbow at a 90 degree angle (an L shaped position of the arm) and you are in your primary **POWER ZONE**
- The more time you can work in your **POWER ZONE** the less stress and fatigue on your body.



HealthWorks

THE POWER ZONE



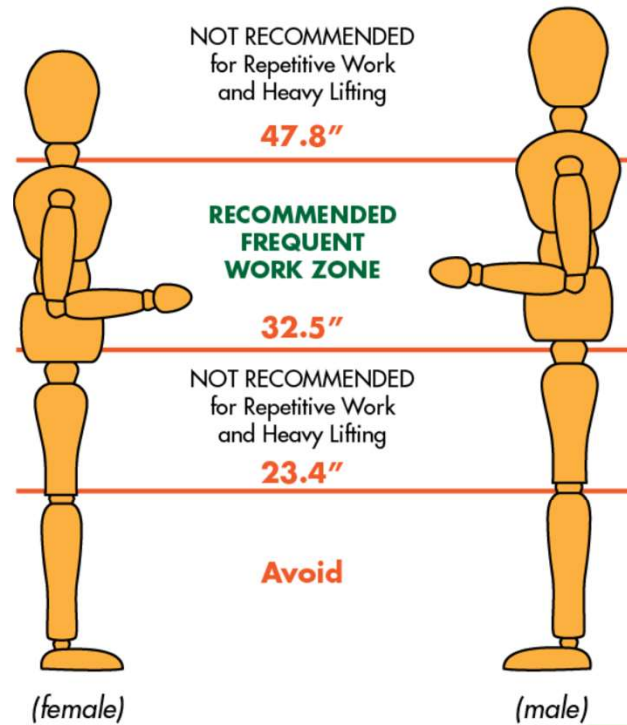
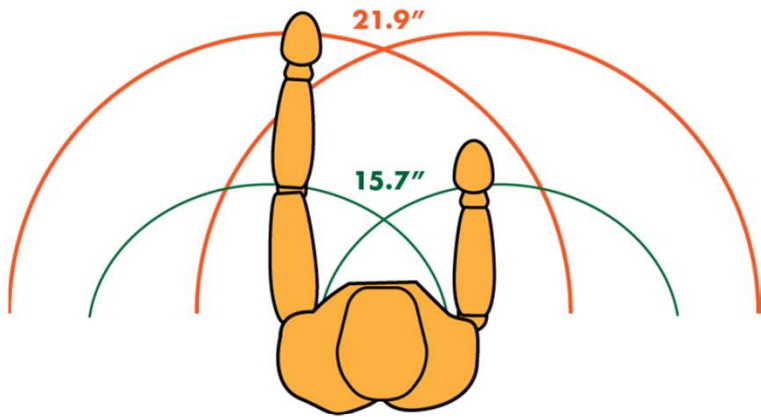
Primary reach is 0"-12" from the body
Secondary reach is 12"-24" from the body
Tertiary reach is > 24" from the body

THE POWER

ZONE

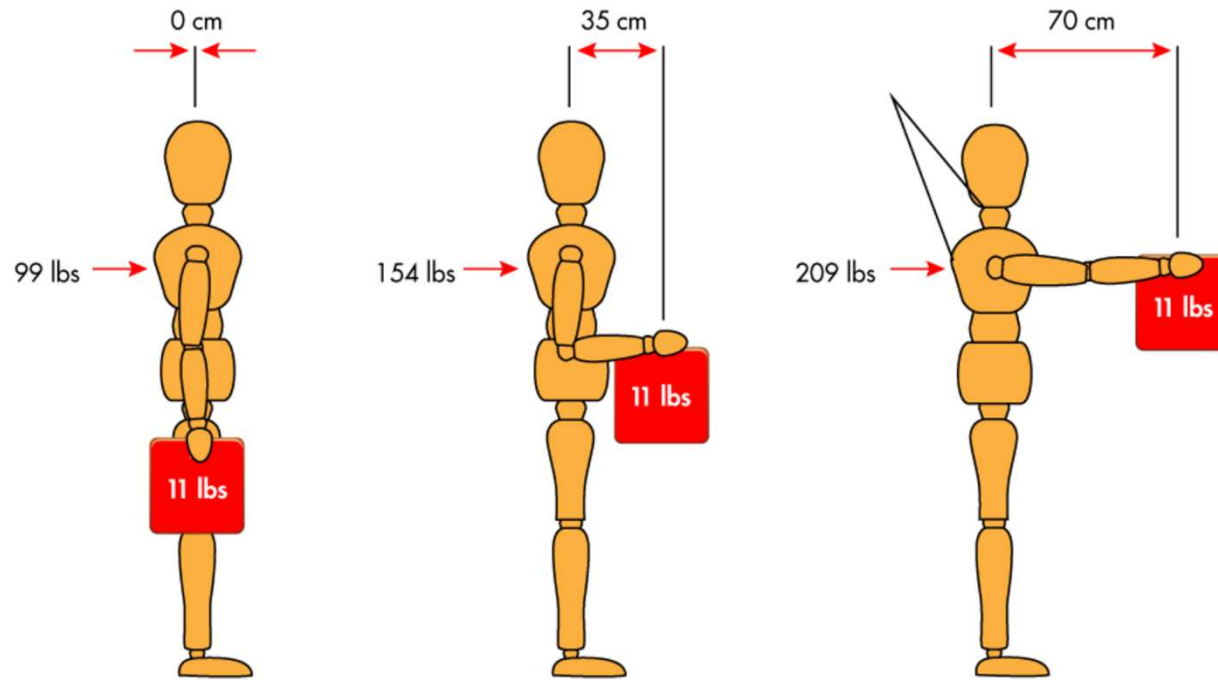
Vertical Reaches

Horizontal Reaches



HealthWorks

Leverage is Everything



Increasing the distance between the hands and the body increases the stress on, among others, the lower back.



HealthWorks

Safe Carrying

- ▶ Stand tall
- ▶ Hold at comfortable height in Power Zone
- ▶ Keep load close
- ▶ If box is large get assistance even if not heavy



Pushing & Pulling



HealthWorks



Tips for Safe Pushing and Pulling

- ▶ Keep head and eyes forward
- ▶ Don't extend too far from Power Zone
- ▶ Check wheels or casters
- ▶ Keep rolling surfaces clear of debris
- ▶ Avoid rough or uneven surfaces
- ▶ Ensure that a loaded cart or equipment is stable.
- ▶ Wear appropriate footwear to minimize slipping
- ▶ Minimize the distance that loads need to be pulled or pushed
- ▶ Reduce the weight or size of loads



HealthWorks

Warehouse/Material Handling

*Awkward Postures
such as lifting and
twisting with high
repetition
significantly
increases injury risk*



Avoid Lifting and Twisting



Don't Pivot



Move Your Feet



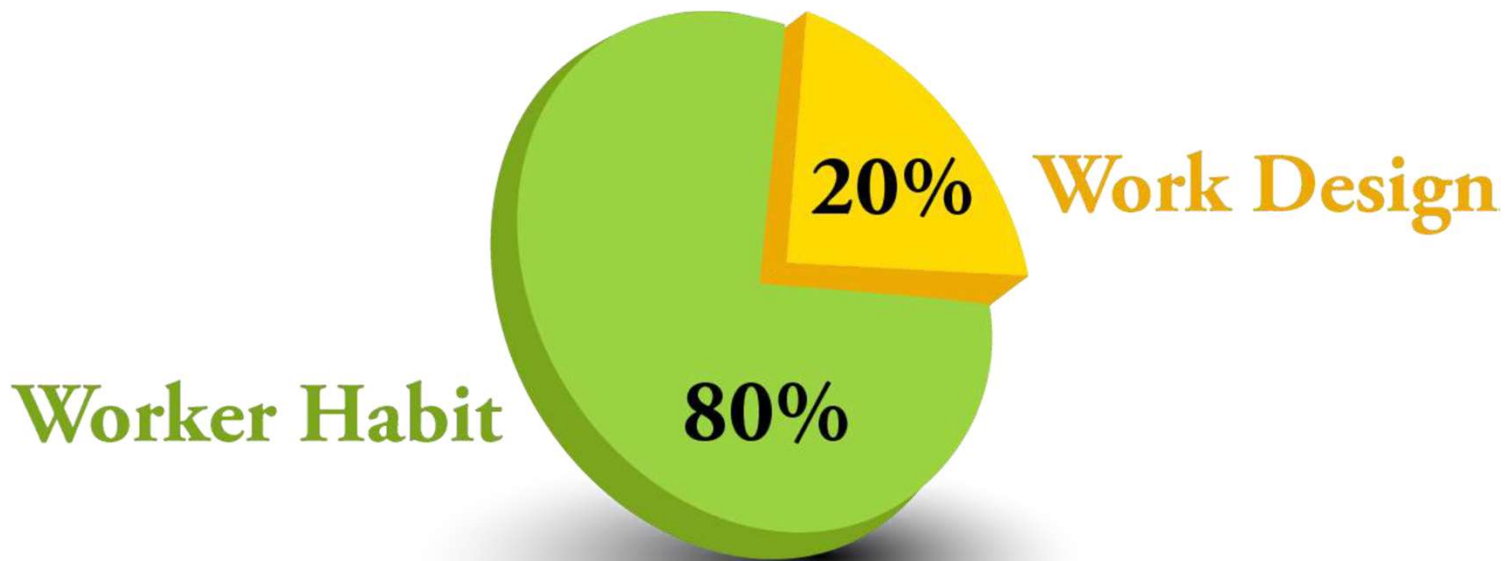
HealthWorks

Shoveling

- ▶ Use legs
- ▶ Bend at hips not back
- ▶ Keep load close
- ▶ Don't twist
- ▶ Move Feet
- ▶ Pace yourself



Injury Risk

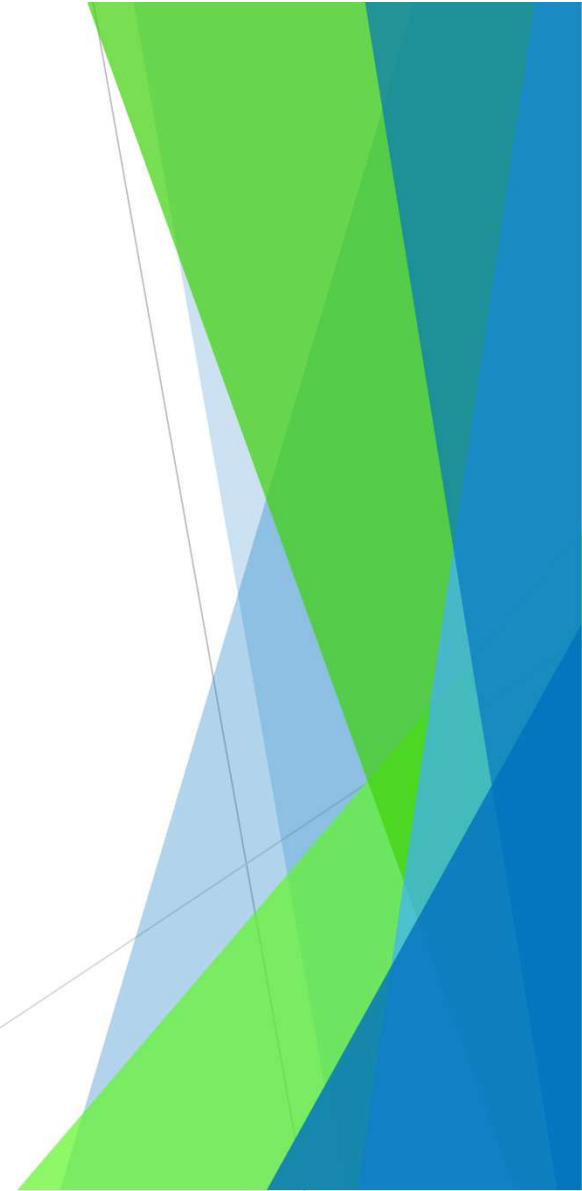


Don't Mindlessly Perform Work



HealthWorks

Plan the Way You Perform Your Work

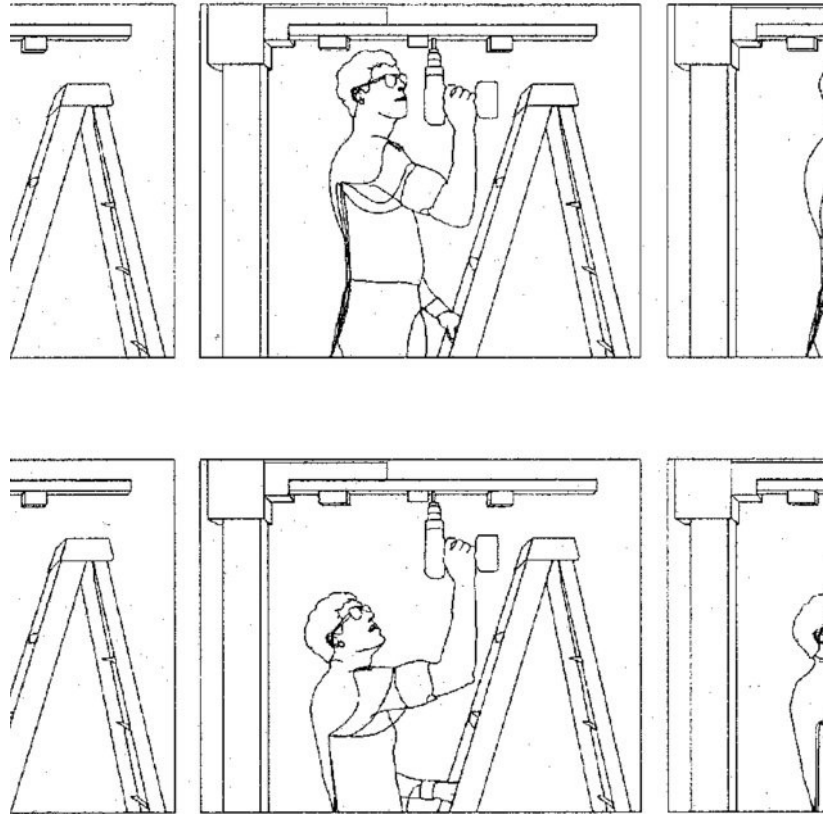


Are you in the best position to do the job?



HealthWorks

Small Adjustments Matter



HealthWorks

Ergonomics Checklist

- ✓ Plan your lift
- ✓ Keep the load close
- ✓ Keep your back straight; Bend your knees and hips
- ✓ Lift with your legs
- ✓ Don't rush
- ✓ Don't lift and twist
- ✓ Get help if needed



HealthWorks

Ergo Stretch Breaks

Performing stretching prior to shift and during breaks is helpful in preventing work injuries



HealthWorks

Micro Breaks

- ▶ 30/30 Rule
- ▶ 30 second breaks
- ▶ Every 30 minutes
- ▶ Change positions
- ▶ Re-adjust your posture
- ▶ Perform stretching (like when getting out of car on long trip)



Benefits of Stretching

- ▶ Increase Blood Flow to Muscles and Tendons
- ▶ Reduce Muscle Fatigue with Increased Oxygen Supply
- ▶ Decrease Muscle Tightness with Increased Soft Tissue Flexibility
- ▶ Alleviate Pain with Increased Circulation
- ▶ Diminish Chance of Injury with Increased Muscle Recovery after Activity
 - ▶ Lack of Flexibility is a Risk Factor for Injury
 - ▶ Flexibility Decreases with Age but can be maintained through stretching



HealthWorks

Basics of Stretching

- ▶ Move Slowly and Breathe Normally
- ▶ Stop at Point of Gentle Stretch or Tightness
- ▶ Hold Static Stretch (do not bounce)
- ▶ Should Not Experience Progressive Pain (any discomfort should improve while performing)



HealthWorks

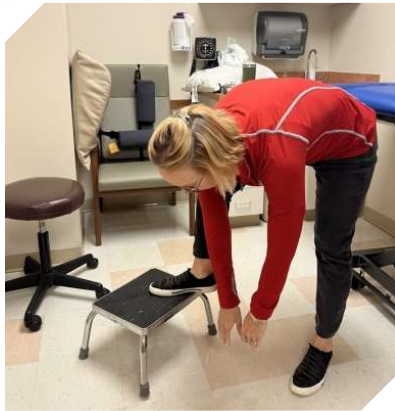
Back Stretches at Work

- ▶ Lumbar Flexion Stretch
- ▶ Lumbar Extension Stretch
- ▶ Lumbar Rotation Stretch



HealthWorks

LUMBAR FLEXION STRETCH



- ▶ Can be done in sitting or standing
- ▶ Can be done with low step under foot to reduce hamstring tightness
- ▶ Should be performed slowly
- ▶ Should stop at point of gentle stretch (don't need to reach floor)
- ▶ Hold for slow count of 10
- ▶ Repeat 2-3 times
- ▶ This stretch is helpful after long periods of standing

LUMBAR EXTENSION STRETCH



- ▶ Place your hands behind your back and lean backward while pushing hips forward until you feel gentle pressure in lower back.
- ▶ Hold for a slow count of 10 and repeat 2-3 times.
- ▶ This stretch is helpful to reduce stiffness after performing repetitive bending or after sitting for an extended period
- ▶ Can be performed throughout the day



HealthWorks

LUMBAR ROTATION STRETCH



- ▶ Cross arms over chest and rotate until gentle stretch in back and hold for slow count of 10 and then perform to other side
- ▶ Can also perform with arms at sides and rotate to each side
- ▶ Perform 2-3 times each side
- ▶ Back rotation is good for performing stretching, but avoid any lifting and twisting



HealthWorks

Neck Stretches at Work

- ▶ Cervical Rotation Stretch
- ▶ Cervical Flexion & Extension Stretch
- ▶ Upper Trap Stretch
- ▶ Middle Trap Stretch



HealthWorks

Cervical Rotation Stretch



- ▶ Turn your head until tightness is felt and hold for a slow count of 10.
- ▶ Return to looking straight ahead.
- ▶ Turn your head to the other side and hold for slow count of 10.
- ▶ Repeat 2 times each way



HealthWorks

Cervical Flexion & Extension Stretch



- ▶ Sitting or standing tall and lifting your chest as you tilt your head upward towards the ceiling and hold for count of 10.
- ▶ Keeping your chest tall tilt your head downwards until feeling a stretch hold for count of 10.
- ▶ Repeat 2 times each way



HealthWorks

Cervical Flexion & Extension Stretch



- ▶ Place one hand behind your back and gently pull your head towards the opposite side with the help of your other arm.
- ▶ Hold for count of 10 and then repeat to other side.
- ▶ Can also do this with arm at side instead of behind back and hold for count of 10 and perform on each side.
- ▶ Repeat 2 times each way



HealthWorks

Middle Trap Stretch



- ▶ Interlace your fingers and then draw your hands forward until a stretch is felt along your upper back.
- ▶ Hold for a count of 10.
- ▶ Repeat 2-3 times.



HealthWorks

Practice Work Habits for Back Health & Safety

- ▶ Remember Proper Posture
- ▶ Focus on Ergonomics
- ▶ Take Proper Rest Breaks
- ▶ Regular Exercise and Stretching

*This will keep you healthier not only at work, but in life



HealthWorks

Presentation is the property of HealthWorks and cannot be reproduced without permission.

Ergonomics and Prevention: IS GOOD BUSINESS INVESTMENT

- ▶ Every \$1 invested in Safety/Ergo has a \$3 to \$6 return on investment- Liberty Mutual Insurance Co.
www.libertymutual.com
- ▶ Goldman Sachs study determined that corporate investment in safety showed increased value (\$\$\$) in stock prices –
www.goldmansachs.com



How to tell if it is successful?

- ▶ Improved work processes
- ▶ Improved quality of work & product
- ▶ Improved employee morale
- ▶ Decreased employee turnover
- ▶ Decreased total injury rate, lost days or cost per case




HealthWorks

QUESTIONS?

THANK YOU

Michael Palmer, PT, CEAS, MHA

 434-200-6937

 mike.palmer@hw4me.com



HealthWorks