

Ergonomics

Computer Workstations
&
Back Safety

Ergonomics

Definition: The study of fitting the task to the human.

Goal: Prevent musculoskeletal disorders by surveying the workplace, take preventive steps, relying on employee input and addressing problems early.

Topics:

- ★ Musculoskeletal Disorders (MSDs)
- ★ Recognizing signs and symptoms of MSDs and how to report.
- ★ Common Causes of MSDs
- ★ Computer Ergonomics
- ★ Safe Lifting Principles

Introduction

- ★ MSD Injuries in general
- ★ VDT/Computer Workstations
- ★ Back Safety

Musculoskeletal Disorders

Caused by overuse or repetition involving:

- ★ Muscles
- ★ Nerves
- ★ Tendons
- ★ Ligaments
- ★ Joints
- ★ Spinal Disks
- ★ Cartilage

MSD Symptoms & Signs

Symptoms should be reported to your supervisor early:

- ★ Muscle Fatigue
- ★ Aching
- ★ Burning
- ★ Numbness
- ★ Stiffness
- ★ Tingling

Adjusting the way you work removes stress. If injured you could develop a MSD.

★ **Signs** should be reported immediately:

- ★ Decreased range of motion
- ★ Decreased grip strength
- ★ Loss of function
- ★ Loss of balance
- ★ Deformity
- ★ Swelling
- ★ Cramping
- ★ Redness
- ★ Color loss

Common Causes Of MSDs

- ★ **Lifting**- continuously lifting and moving
- ★ **Repetitive motion** (factors: angle, alignment, force, length of time without break)-
keying and using the mouse
- ★ **Contact stress**- hammering
- ★ **Extreme force**- tightening objects
- ★ **Vibration**- drilling
- ★ **Awkward postures**- pulling carts

Why Worry ?

- ★ Musculoskeletal Ergonomic Injuries are the fastest-growing category (accounting for 1.8 million annual Work Related Musculoskeletal Disorders Up 600% over last 11 years (MSDs).
- ★ \$9 billion total injury cost / year & \$29 K / case compensation claim cost
- ★ More lost workdays for MSDs (ave. = 30 days for a Carpal Tunnel injury)

MSD Injury Data

- ★ 600,000 MSDs require time off from work.
- ★ Women suffer more ergonomic injuries due:
 - to having jobs requiring more heavy lifting, repetitive tasks and awkward postures
 - 70% of Carpal Tunnel
 - 62% of Tendonitis

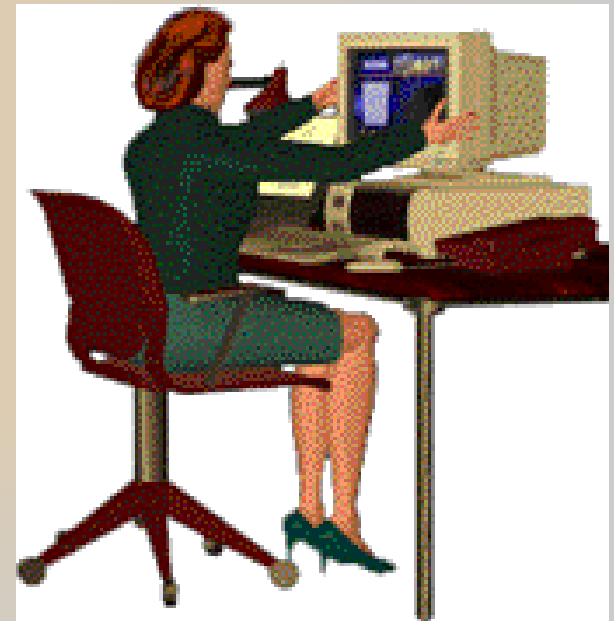
CTD Injury Factors

- ★ Lesions to tendons of the neck, back, shoulders, arms, wrists or hands
- ★ Primary causes:
 - Repetitive movements over long periods of time
 - Awkward postures
 - Use of excessive forces

MSD Risk Control: Posture

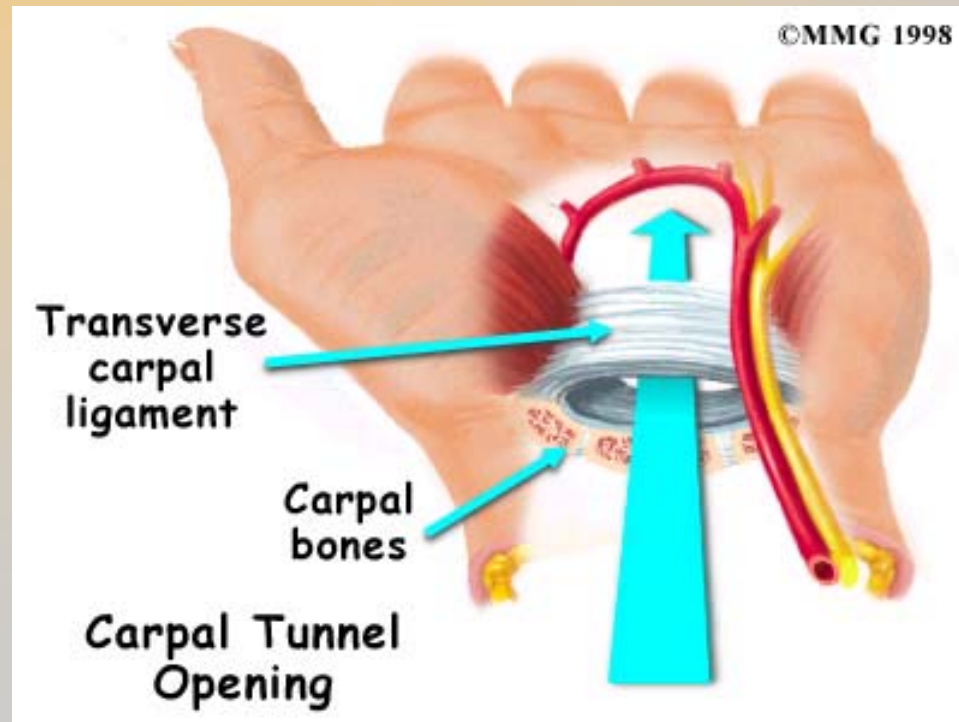
★ NEUTRAL & COMFORTABLE:

- Wrists straight
- Shoulders relaxed with elbows close to body
- head / shoulders & back in vertical alignment
- Frequent breaks when bent postures can't be avoided



Carpal Tunnel Syndrome

- ★ Occurs with repetitive motion of hands & wrists--especially with high force levels, compression of nerves and tendons



MSD Risk Control: Repetition

- ★ Eliminate unnecessary tasks / movements by redesigning procedures and workstations
- ★ Take short, frequent breaks
- ★ Alternate tasks and processes to use different muscle groups

Computer Workstation Facts

- ★ Routine PC user is defined as spending 20 hours or more per week working at a computer.
- ★ Studies of PC users have not shown a risk of *eye damage...although fatigue is very possible.*
- ★ *NIOSH* studies have not indicated a radiation hazard nor pregnancy risk from PC usage.
- ★ Workers using bi/tri-focal glasses before beginning PC use may need special purpose glasses for computer work.

Articulating Keyboard Support

- ★ Height Adjustable
- ★ Positive/Negative Slope
- ★ Mouse Attachment/Slide Support
- ★ Palm Rest



Palm Rests

- ★ No medical evidence that they reduce RSI injuries...As they work for some, but not for others
- ★ Usage Guidelines:
 - Buy rest that is even with top of keyboard
 - Material should be "medium-soft" (foam--gel mix) so foam doesn't break down. **AVOID** hard plastic types
 - **DON'T** leave wrists on rest...which compresses carpal tunnel. *Palm rest instead.*
 - Changing typing habits more critical than wrist support
 - **MOST APPROPRIATELY USED TO REST HANDS DURING PAUSE IN TYPING**
- ★ **LEARN TO TYPE CORRECTLY WITH "FLOATING WRISTS" FIRST!!!**

Ergonomic chairs



- ★ Adjustable back height and angle
- ★ Adjustable arm rests
- ★ Adjustable height
- ★ Five star base

Alternative Pointing Devices

- ★ Track-balls
- ★ "Scrolling" Mouse
- ★ "Touch pad mouse"
- ★ Cordless mouse



Unsatisfactory Workstation "Design"

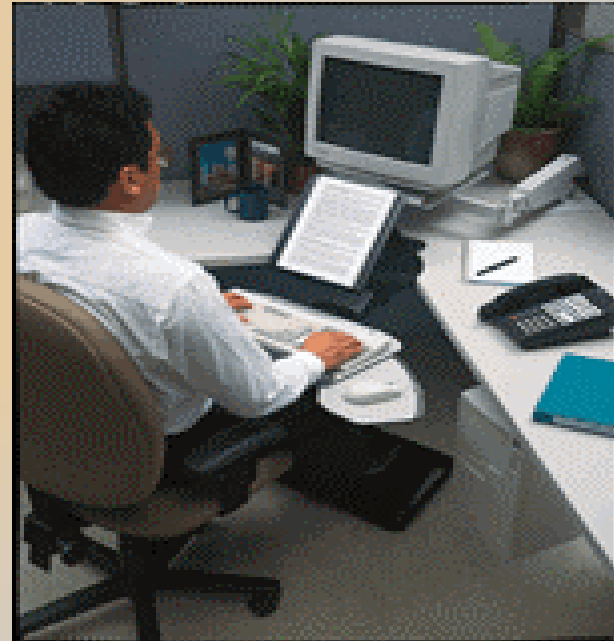


- ★ Reaching for mouse
- ★ Monitor too low
- ★ Keyboard too high, wrists bent
- ★ Chair too high, feet should be flat on the floor or on a foot rest
- ★ Document holder too far back
- ★ No arms on the chair
- ★ Bad posture, leaning forward

Satisfactory Workstation "Design"



- Use head sets for frequent phone use.
- Monitor at eye level.
- Keep wrists straight, arms close to body, and at a right angle.



- Mouse on support next to keyboard.
- Document holder near monitor.
- Foot rest used if feet do not touch the floor.
- Fully adjustable computer task chair.

VDT Ergonomics Summary

- ★ Good ergonomic design of processes and furniture DOES improve personnel comfort, health, morale, and productivity.
- ★ It's critical to seek prompt medical aid for symptoms of ergonomic stress / CTDs

Back Injury Facts

- ★ Back injuries account for nearly 20% of all injuries in the workplace
- ★ 8 out of 10 Americans will suffer a back injury at sometime in their life
- ★ Back injuries account for 93 million lost work days each year-2nd only to the common cold
- ★ Worker's compensation costs of up to \$20 billion each year
- ★ Back injuries increase with age, fitness level and weight

Common Causes



← Trying to lift too much weight



← Twisting and bending while lifting

Reaching and lifting →



Common Causes Continued...

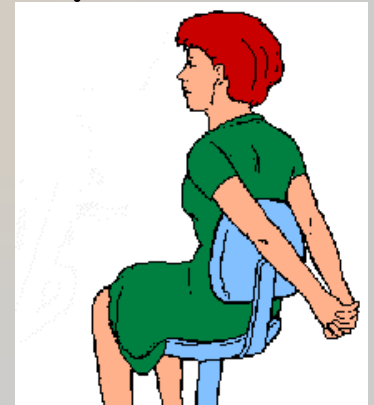


← Carrying awkward objects

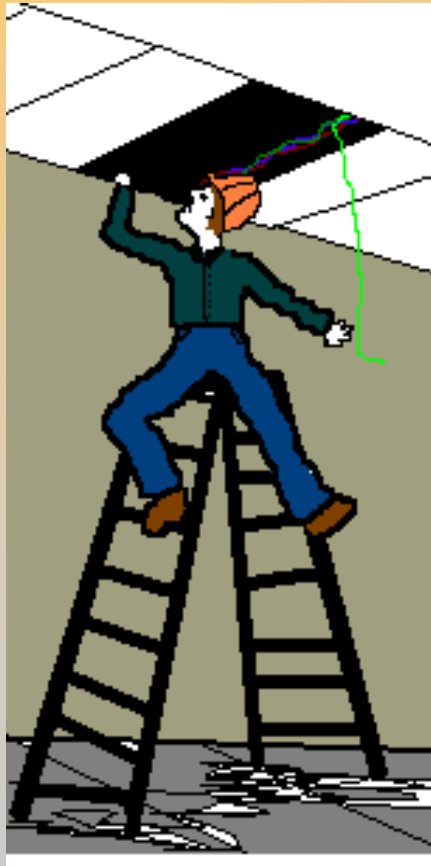


← Working in awkward positions

Sitting or standing too long →



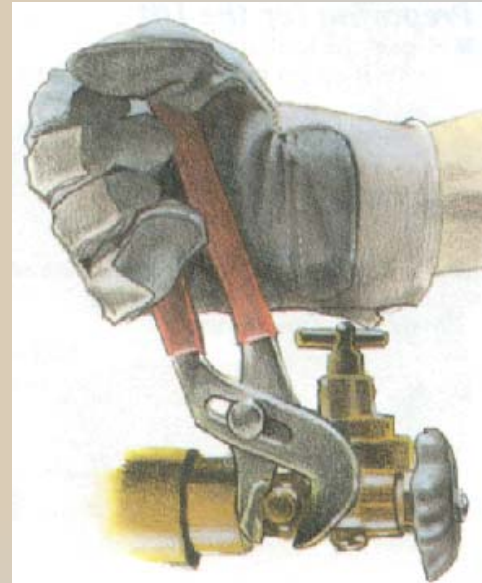
Working On Ladders



- ★ Balancing
- ★ Overhead work
- ★ Materials movement

Use Of Tools

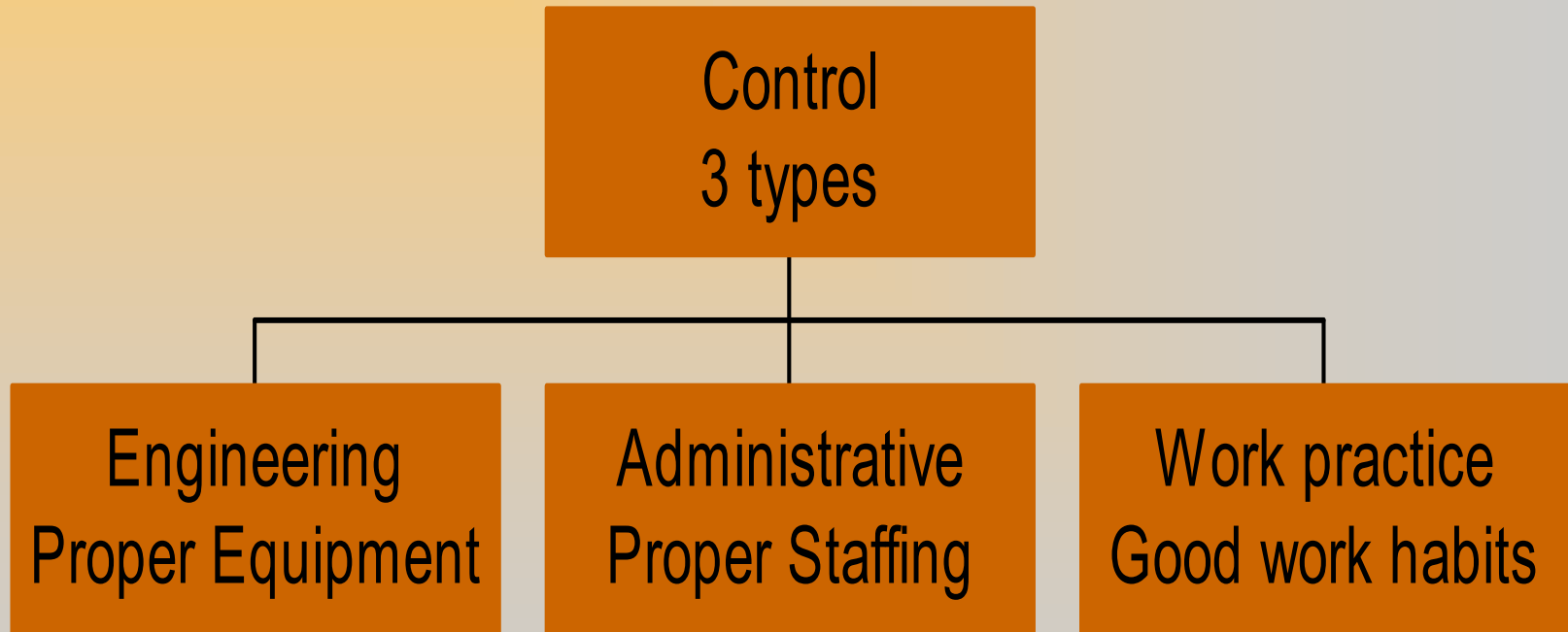
Pinch grip →



End-on-end grip

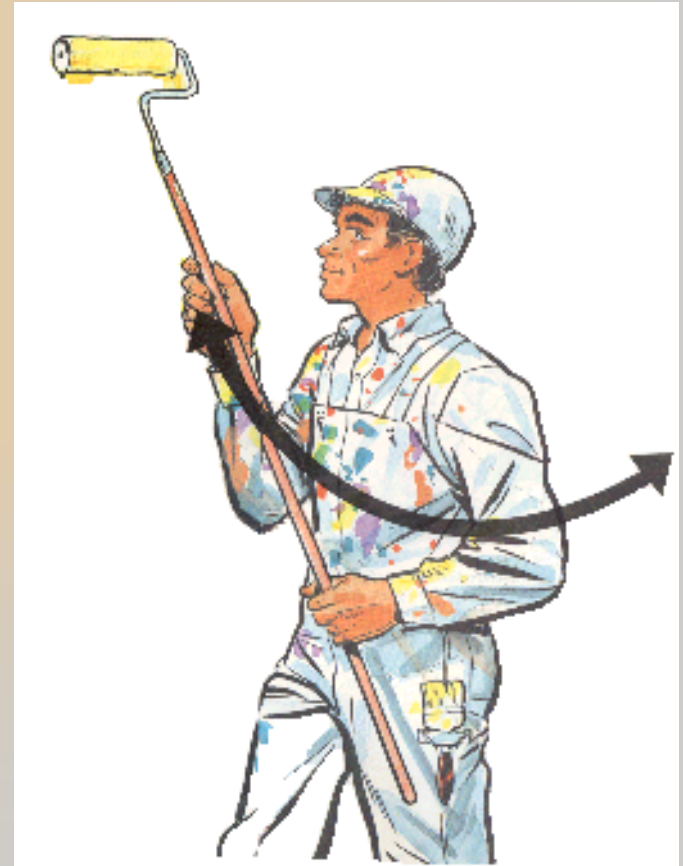


Lowering The Risk Of Injury



Engineering Controls

- ★ Supply proper equipment i.e. ergonomically designed tools
- ★ Maintain equipment i.e. lubricate and repair



Administrative Controls

- ★ Assure adequate staffing
- ★ Purchase proper equipment
- ★ Rotate "heavy" or repetitive jobs



Work Practice Controls

- ★ Proper lifting techniques
- ★ Good postures
- ★ Alternate repetitive tasks
- ★ Use breaks to divide up "heavy" work
- ★ Stretching/exercise

Proper Lifting Techniques



Step One

Test the load to get an indication as to how heavy the object is.

Proper Lifting Techniques



Step Two

Stand close to the load with your feet spread apart about shoulder width, with one foot slightly in front of the other for balance.

Proper Lifting Techniques

Step Three

Squat down bending at the knees (not your waist). Keep your back straight.



Proper Lifting Techniques



Step Four

Get a firm grasp of the object before beginning the lift.

Proper Lifting Techniques



Step Five

Begin slowly lifting with your legs by straightening them. NEVER twist your body during this step.

Proper Lifting Techniques

Step Six



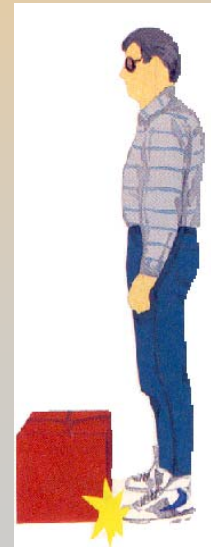
Once the lift is complete, keep the load close to your body to prevent straining the lower back.

If you must turn while carrying the load, turn using your feet-not your torso.

Proper Lifting Techniques

Step Seven

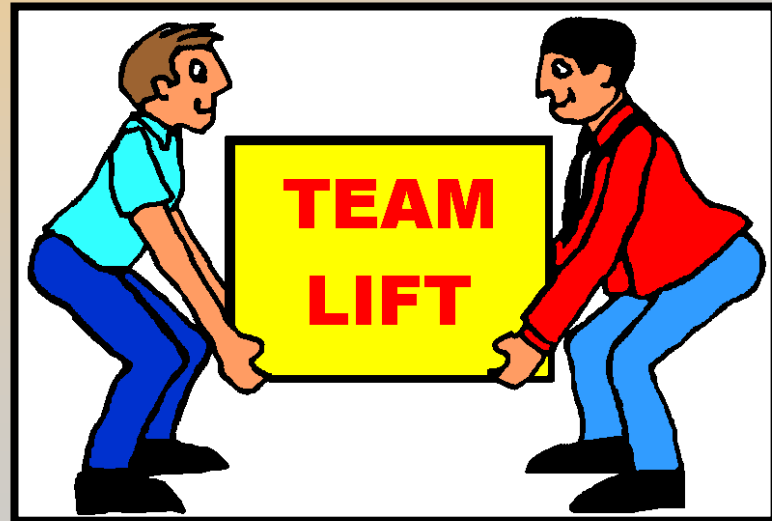
To place the object below the level of your waist, follow the same procedures in reverse order.



Alternatives To Lifting

For difficult lifting tasks, keep these options in mind:

Ask a co-worker for help.



Alternatives To Lifting:

Use a cart but keep this in mind;
Pushing a load is easier on the back
than pulling.

When pushing a cart:

- ★ Stay close to the load
- ★ Don't lean forward
- ★ Use both arms



Alternatives To Lifting

If you must pull the cart:

- ★ Face the object squarely, with one foot at least 12 inches in front of the other
- ★ Keep your back straight
- ★ Bend your knees slightly and pull in a smooth motion.



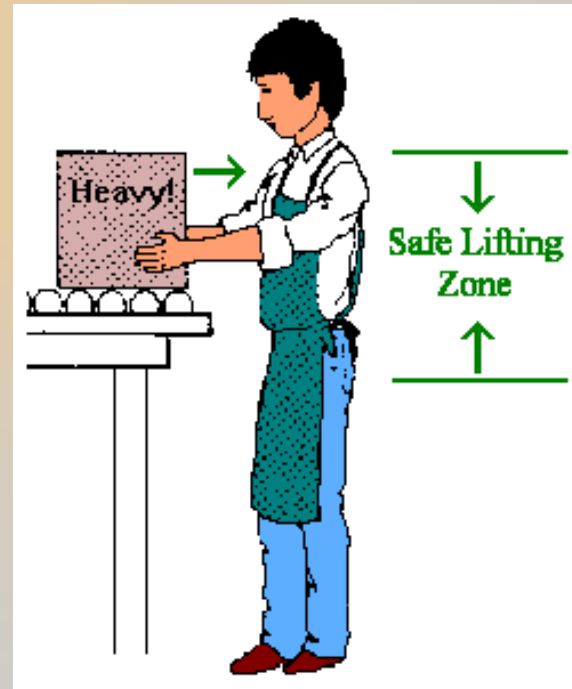
Safety Tips For Lifting

- ★ Don't lift objects over your head
- ★ Don't twist your body when lifting or setting an object down
- ★ Don't reach over an obstacle to lift a load. Move whatever is in the way or go around it.
- ★ Pace yourself to avoid fatigue when doing heavy work for a long period of time.

Back Safety Summary

Avoid Lifting and Bending Whenever You Can

- ★ Use carts, dollies and other lifting devices
- ★ Ask for assistance
- ★ Place objects off of the floor and store in the body's "neutral" zone



- ★ Practice Safe Lifting Techniques!!

What you can do...

Look at the risk factors you encounter at home and at work - think ergonomics. Ask yourself:

- ★ "What awkward postures do I encounter?"
- ★ "Can I readjust sitting/standing positions to maintain neutral postures?"
- ★ "Do I use excess force on my job? If so, how can I reduce or eliminate that force?"
- ★ "When lifting is required, am I following the right steps to lift correctly?"
- ★ "Do I have any other ideas to make my work space or tasks more ergonomically comfortable?"

Remember...

- ★ Always report any signs/symptoms of Musculoskeletal Disorders, and any other ergonomic concerns to your supervisor immediately.
- ★ You may contact EH&S 275-3241 for more information, or access our website www.safety.rochester.edu