“Getting Your Cabin in Ship Shape”
MATW Fall Conference

Clark MacAlpine, Corporate Loss Control Consultant
Agenda

• Office Ergonomics
• Wellness & Aging in the Workforce
• Municipality Worker Safety
• Safety Resources
Ergonomic Risk Factors

- Awkward Postures
- Static Postures
- Contact Pressures
- Task Repetition
- Task Duration
- Visual

Level of Risk depends on INTENSITY, FREQUENCY, DURATION
Common Office Ergo Complaints:

- Discomfort/Pain
  - Neck & Back Pain
  - Upper Extremities: Shoulders, Arms, Elbows
  - Hands, Wrists, Fingers

- Repetitive Motion
  - Wrists/Hands
  - Fingers

- Vision
  - Blurry
  - Dry Eye
Anatomy & Ergonomic Injuries of Upper Extremities
Examples of Cumulative Trauma Disorders

• Tenosynovitis/Tendonitis
• Trigger Finger/Thumb
• Carpal Tunnel Syndrome
• DeQuervain’s Syndrome
• Intersection Syndrome
• Back Strains & Sprains
Wrist/Hand Injuries

- Tendonitis – Inflammation of the tendon in the wrist
- Tenosynovitis – Inflammation of the lining around the tendon in the wrist
- Carpal Tunnel Syndrome
  - Compression of the median nerve in the carpal tunnel
  - Characterized weakness and pain in hand/fingers.
Anatomy of the Human Wrist/Hand
Finger/Thumb Injuries

• Tendonitis – Inflammation of the tendon in the finger

• Trigger Finger or Thumb
  – Finger tendon thickening and/or nodules
  – Causes the tendon to become stuck when finger is moving.
Wrist/Hand Injuries

• DeQuervain’s Syndrome
  – Swelling of the tendons on the thumb side of hand
  – Characterized by catching or snapping feeling when moving the thumb.
Elbow Injuries

- Strains/Sprains
- Tendonitis
- Compression of Ulnar Nerve
Workstation Design
We are all different!

95th Percentile Male:
- Stature: 74"
- Shoulder: 61"
- Elbow: 47"
- Knee: 21"

5th Percentile Female:
- Stature: 60"
- Shoulder: 48"
- Elbow: 37"
- Knee: 17"
### How These Measurements are Used

#### Female

<table>
<thead>
<tr>
<th>Measurement</th>
<th>5th Percentile</th>
<th>50th Percentile</th>
<th>95th Percentile</th>
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<td>A. Eye Height</td>
<td>26.6”</td>
<td>28.9”</td>
<td>30.9”</td>
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<tr>
<td>B. Elbow Height</td>
<td>7.1”</td>
<td>9.2”</td>
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<tr>
<td>C. Popliteal Height</td>
<td>14.0”</td>
<td>15.7”</td>
<td>17.4”</td>
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<td>D. Popliteal Length</td>
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Setting Up a Computer Workstation
What a Mess... Where Do I Start?
Workstation Elements to Consider

- Chair Setup
- Positioning Armrests
- Keyboard
- Mouse Position
- Monitor Positioning
- Work Surface Height
- Telephone
- Manuals, etc.
Start with the Chair!!

- Adjust chair until arm/hand posture is correct
- Arms should be positioned between 90-120°
- Wrists should be in a neutral position
- Add a foot rest if the feet are not flat on the floor
Adjusting Your Chair

Upright Posture:
• Height
• Seat pan
• Backrest
• Arm rests
• Neutral positions
If Keyboard Height is Adjustable

Again, Start with the Chair!!

Adjust the chair until the feet are flat on the floor

• Then adjust the keyboard height
• Achieve neutral hand/arm posture
• If work surface height is adjustable; place it 1” below elbow height
Keyboard Position

- Neutral wrist posture is best
- Keep keyboard flat and use a wrist rest
- Add palm support pad
Keyboard Positioning

Keyboard too far away

Keyboard too close

What may be the bigger issue here???????
Mouse Positioning

- Next to keyboard
- Same level as keyboard
- In easy reaching distance
- Make sure the cord is not restricting movement.
- Keep wrist neutral and use a wrist rest if needed.
Keyboard Innovations

- Split keyboard design
- Microsoft.com
Keyboard Innovations

- No external mouse
- Reduces reaching
- Neutral wrist posture
- CountourDesign.com
Keyboard Innovations

- Vertical Design
- SafeType.com
Monitor Positioning

- Position top of monitor in line with eyes.
  - Natural line of sight is 10-20° below our eyes’ horizontal
- Monitor should be directly in front of you
- Bifocals?
  - Monitor should be placed lower than average and angled slightly upward
Monitor Position

- Should be 20-40” from eyes (about an arm’s length)
- Font should be large enough to read easily.
- Position to reduce glare from windows and lights.
Dual Monitors

One is Primary
- Primary monitor goes in front of user
- 2nd goes off to the side

Used Equally
- Move close together
- Center both of them
Laptops

On the Go
• Periodic use okay
• Neck & arm pain
• Vision issues

In Office
• Constant use
• Plug into full-size monitor & keyboard
• Improves postures
Visual Discomfort

Blurry Vision
• Focusing on monitor for a long period of time
  – Take short micro breaks every ½ hour to 1 hour, or
  – 20/20/20 rule – Every 20 min, look at something 20’ away for 20 seconds.

Annual eye exam
Computer glasses!!
Visual Discomfort

Eye Strain – Eyes feel tired or uncomfortable
  • Dry Eye – Blink response decreased from 5 seconds to 15
    – Use eye lubes
    – Fish oil supplement
  • Improper Lighting/Glare
    – Indoor Light Glare – Use baffle or diffusers
    – Outdoor Light – Close or tilt blinds
  • Constant Refocus of Eyes – Reading hard copy docs
    – Keep monitor and document holder at same visual distance
Other Item Location

- Move items used often into the **Primary** work zone.
- Items used less frequently but used almost daily should be placed in the **secondary** work zone.
- Material used occasionally such as reference material should be put in the **seldom** access zone.
Sit/Stand Option

- Becoming more common
- Use same ergo guidelines
- Measure floor to elbow
- Work surface 2” below elbow height
- Keyboard 1” below elbow height

- May have health benefits ??
Where Are the Office Ergo Problems You See?
Answer:
Where Are the Problems?
Where Are the Problems?
Answer:
Where Are the Problems?
Answer:
Where Are the Problems?
Where Are the Problems?
Answer:
What is the problem?
Where Are the Problems?
Answer:
Office Ergo Evaluation Form Example

VDT Workstation Checklist

* responses indicate potential problem areas which should receive further investigation.

Does the workstation ensure proper worker posture, such as:

a. horizontal thighs? □ Yes □ No
b. vertical lower legs? □ Yes □ No
c. feet flat on floor or footrest? □ Yes □ No
d. neutral wrists? □ Yes □ No

Does the chair:

a. adjust easily? □ Yes □ No
b. have a padded seat with a rounded front? □ Yes □ No
c. have an adjustable backrest? □ Yes □ No
d. provide lumbar support? □ Yes □ No
e. have casters? □ Yes □ No

Are the height and tilt of the work surface on which the keyboard is located adjustable? □ Yes □ No

Do keying actions require minimal force? □ Yes □ No

Is there an adjustable document holder? □ Yes □ No

Are arm rests provided where needed? □ Yes □ No

Are glare and reflections avoided? □ Yes □ No

Does the monitor have brightness and contrast controls? □ Yes □ No

Do the operators judge the distance between eyes and work to be satisfactory for their viewing needs? □ Yes □ No

Is there sufficient space for knees and feet? □ Yes □ No

Can the workstation be used for either right- or left-handed activity? □ Yes □ No

Are adequate rest breaks provided for task demands? □ Yes □ No

Are high stroke rates avoided by:

a. job rotation? □ Yes □ No
b. self-paced? □ Yes □ No
c. adjusting the job to the skill of the worker? □ Yes □ No

Are employees trained in:

a. proper postures? □ Yes □ No
b. proper work methods? □ Yes □ No
c. when and how to adjust their workstations? □ Yes □ No
d. how to seek assistance for their concerns? □ Yes □ No
The Sitting Disease
Sitting Disease & Sedentary Duties

Jobs that involve prolonged periods of sitting or sedentary duties.
- 50-70% spend 6 or more hours sitting
- 20-35% spend 4 or more hours viewing TV
Increased Risk of Adverse Health Affects including:

- Cardiovascular disease
- High blood pressure
- Obesity
- Type 2 diabetes
- Breast & colon cancer
- High cholesterol
- Worse mental health
The Sitting Disease & Sedentary Duties

Causes are not fully understood

- Lack of blood flow
- Don’t burn fat
The Sitting Disease Solution?

Treadmill Workstation
• TheHumanSolution.com

Isometric Ball Chair
• Amazon.com
Practical Tips To Being More Active

• Stand once an hour; do something else
• Take the long way to the water cooler
• Vary tasks to break up the day
• Get a pedometer – track # of steps & activity (FitBit.com)
• Sit/Stand workstation
Wellness Programs

Aging Workforce, Comorbidities, Obesity
Aging Workforce Risk Factors

- Loss of visual acuity
- Balance & coordination
- Reduction in joint mobility and manual dexterity
- Decrease in muscular strength
- Slowing of reaction and movement time
- Greater susceptibility to occupational health hazards
- Loss of hearing
Frequency & Severity by Age Group
2009 to Present – Policy Years

- 15 - 19: $106,287, 97 claims
- 20 - 29: $2,138,925, 626 claims
- 30 - 39: $4,088,141, 375 claims
- 40 - 49: $9,960,145, 1,218 claims
- 50 - 59: $10,323,347, 1,103 claims
- 60 or Older: $2,432,592, 274 claims
- Invalid Date: $6,538, 19 claims

Legend:
- Sum of Total Incurred
- Count of UH Accident Source Description

United Heartland
Impact of Obesity & Comorbidities on WC Costs

California WC Institute Study on Obesity
- Claim costs 81% higher
- 83% of claims were indemnity, 3x higher
- Litigated 4.5x higher
- Opioids prescribed 4x higher
- Much higher rate of comorbidities

NCCI Study on Comorbidities
- # claims increased to 6.6% in 2009
- Twice the medical costs
- 7x the # of visits
Setting Up a Wellness Program

Work with Medical Provider
- Health Risk Appraisals
- Maintain Individual Privacy
- ID Health Risk Potential
- Develop Plan for Employee

Form a Wellness Committee
- Liaison with Medical Provider
- Promote Wellness Participation
- Develop Wellness Campaigns
- Monitor Program Activities
Engineering Controls

Reducing the Risk Factors of the Job
Eliminate or Reduce High Force Job Tasks
Eliminate or Reduce High Force Job Tasks

- Rebuilding catch basins
- Replaced hand digging tasks
- Setting frames & covers
- Compact excavator
- [www.takeuchi-us.com](http://www.takeuchi-us.com)
Eliminate or Reduce High Force Job Tasks

- Post pounders attachments
- Typically done manually
- Reduce shoulder/back strains
- www.postdriver.com
Eliminate or Reduce High Force Job Tasks

- Powered cots & stair chairs

Stryker.com
- Reduces lifting
- 700 lb capacity
Job Site Visits – “Boots on the Ground”

Prevent CAT Claims - Perform Job Site Inspections
Prevent Catastrophic Claims

- Buried in trench exposure
- Excavation & trench safety
Prevent Catastrophic Claims

- Struck by vehicle exposure
- Traffic control procedures
Prevent Catastrophic Claims

- Lack of oxygen or asphyxiated by gas
- Confined space entry program
Safety Resources – How We Can Help
Updated LWMMI Safety Manual

- Sample safety programs
- Modified duty program & job task list
- Dept. of SPS links
- 296 pages
Questions

- ClarkMacAlpine@UnitedHeartland.com
Safety Resources/References:

- Accident Investigation Guide/Forms
- Sample Safety/OSHA Programs
- Injury Management/Light Duty Job Banks
- WWW.UnitedHeartland.com
- Clark.MacAlpine@UnitedHeartland.com
- Manual update planned for summer 2014

Lezage Training Resources – Online Videos – Free
CLMI – DVD/Workbook training kits $99
- WWW.UnitedHeartland.com
- Clark.MacAlpine@UnitedHeartland.com
Safety Resources/References:

Police – John Krahn’s Story
•  www.nleomf.org/officers/month/otm-archive/december-2009-officer-of-the.html

Police Training
•  http://www.redmangear.com/
•  https://wilenet.org/html/career/

Fire/EMS – Safe Patient Handling Equipment
•  http://ems.stryker.com/products

FEMA Grants
•  www.fema.gov/firegrants
Safety Resources/References:

DPW – Compact Excavators
- www.takeuchi-us.com
- www.postdriver.com

DPW – Machine Guarding:
- www.osha.gov/Publications/osha3170.pdf

Water Department Pipe Saw
- www.StanHouston.com
Safety Resources/References:

DOT – Wisconsin Manual on Uniform Traffic Control Devices
• Peter Amakobe, State Work Zone Engineer, DOT
• MUTCD - http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/pdf_index.htm
• Part 6D.03 PPE Requirements

University of Wisconsin – Work Zone Safety & Flagger Training Workshops
• 800-462-0876
• Website: www.Epdweb.engr.wisc.edu
Safety Resources/References:

Wellness
• [www.welco.org](http://www.welco.org)

Wisconsin Dept. of Safety & Professional Services
• [http://dspw.wi.gov](http://dspw.wi.gov)