

Aging Work Force

What's Ergonomics Got To Do with It?

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Agenda

- Aging – what is it and who is it?
- Functions of the structures in your body and what happens to your body with age
- High impact risk factors
- Accommodations



Aging

- “The gradual changes in the structure and function of humans and animals that occur with the passage of time that do not result from disease or other gross accidents and that eventually lead to the increased probability of death as the person or animal grows older”



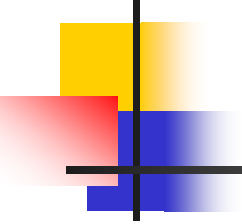
Canadian Centre for Occupational Health and Safety

- “Older worker” may be considered defined as someone starting at the age as young as 45!



Stats Canada

- As of Oct. 2006 – 32,730,200 Canadians**
- 12,721,776 in Ontario**
- In 2001: 2,699,280 people in Ontario of age to be defined as “older worker” or 24%
- 2001: more than 300,000 Canadians age 65 or older employed = one in 12
- (**based on adjusted 2001 values from Stats Canada)

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- # of Canadians aged 65 and older will double to almost 8 million by 2028 from 4 million in 2000
 - In 1999 the average age of retirement for workers was 61
 - Trend from 2000 to 2005 was gradual increase in age from 61.1 to 62 years



Bone

- Hard tissue which provides support and structure to the body
- Protects internal organs and brain, two or more bones come together to create a joint to allow flexibility and movement
- With Age:
 - Decreased bone density and strength
 - Becomes more porous and brittle
 - Shape of bones change
 - Bones break much more easily



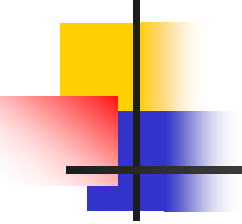
Soft tissues

- Cartilage – provides cushioning in a joint
- Ligaments – hold joints together and maintain stability of a joint
- Tendons – attach muscles to bones and assist to stabilize joints
- With age:
 - Tissues dry out
 - Hormones which help with maintaining tissue declines
 - Cartilage begins to rub together
 - “Osteoarthritis”: degeneration of synovial joints
 - Reduced elasticity reducing flexibility



Muscle

- Provide the force and strength to movement body segments
- Help to stabilize joints
- With aging:
 - Decreased lean muscle mass (approximately 1% per year after 30)
 - Muscle fibres shrink
 - Muscle tissue replaced slower

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- More fatty deposits in muscle tissue
 - Decreased tone, contractility and flexibility (complicates gait pattern)
 - Decreased Basal Metabolic Rate (BMR)
 - Increased resting energy expenditure
 - By age 65, have 70% of strength we had when we were 25 - 30



Nervous System

- Controls voluntary and involuntary movement
- Thinking processes
- Sensory and movement messages
- With aging:
 - Decreased nerve cell mass which results in decreased brain and spinal cord size
 - Decreased # of nerve cells
 - Resultant decrease in speed of messages being sent and received
 - Need for increased resting period in between messages
 - **Slight** slowing of thought, memory and reaction (may not be directly related to age but maybe lifestyle changes)



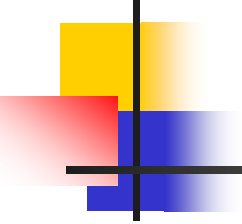
Nervous System (cont)

- With aging:
 - Decreased pain perception, temperature perception (localized), perception to change in pressure
 - Decreased reflexes
 - Decreased coordination
 - Decreased balance



Senses

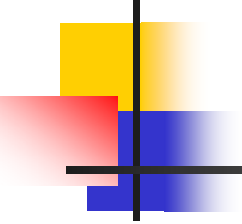
- Smell : ability to sense odours through the nose
- With age:
 - Decreased number of nerve endings in the nose
 - **But:** some evidence changes in sense of smell is a result of chronic environmental exposures to smells and smoking

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- Hearing: ability to sense sounds through our ears and contributes to balance control
 - With aging:
 - Structure of the ears deteriorate
 - Eardrum thickens
 - Ability to sense high frequency sounds (especially those who have been exposed to noise when younger) is decreased
 - Decreased acuity of hearing
 - Decreased ability of brain to process sound messages
 - Decreased balance



Vision

- Vision: ability to perceive using our eyes (vision also contributes to balance)
- With aging:
 - Lens lose flexibility as early as 40 years of age, may harden and set
 - Decreased visual acuity
 - Decreased ability to focus on near objects
 - Decreased ability to focus at varying distances
 - Decreased ability to discern between colours, especially blue-green
 - Decreased ability to perceive or judge depths

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- Vision cont:

- Decreased ability to focus in low light levels
- Decreased response to changes in light level
- Decreased ability to judge distances
- Increased sensitivity to glare
- Increased need for light



Injury Statistics

- In 2005, “older worker” accounted for only 35.7% of injuries in the work place according to WSIB
- Typical injury cause appears to be bodily movement and over exertion
- Older workers tend to have fewer accidents BUT injuries are often more severe when they have them
- May be more susceptible to soft tissue injuries and injuries to the low back and may take more time to get better
- May be more susceptible to chronic diseases



Specific Injury Relationships

- Neck and low back:
 - Heavy strength requirements (NOC = greater than 20 kgs)
 - Static work postures
 - Severe neck flexion

- Knee
 - Squatting greater than 30 min/day
 - Kneeling greater than 30 min/day
 - Climbing stairs greater than 10 flights/day
 - Heavy lifting from squatting/kneeling position or with stair climbing
 - Knee bending



- Hip:

- Lifting greater than 25 kg for 10 years prior to age 30 at least 10 times per week
- Lifting greater than 25 kg for more than 20 years at least 10 times per week
- Stair climbing form more than 20 years at least 10 times per week
- Walking greater than 2 miles/day for women age 55 year or older
- Standing greater than 2 hours/day for more than 40 years



General Risk Factors

- Bone:
 - Trip and fall hazards
 - Whole body vibration (may contribute to demineralization)
 - Impact hazards and/or sharp edges
- Soft tissue:
 - Awkward postures
 - Repetitive or sustained postures
 - High forces



- Muscle:

- Sustained positions
- Repetitive movements
- High forces
- Temperature

- Nervous System

- Repetition, including speed
- Duration of tasks
- Temperature



Myths About the Older Worker

- Frail
- Unwilling to change and resistant to learning new skills
- Chronological age forecasts a worker's physical and mental ability



Ergonomics

- Fitting the task to the person(s)“
- Training appropriately for the group and individuals for the situation
- Best ergonomic program and practices in place for everyone and prior to your workforce aging



Accommodations

- Bone:
 - Reduce trip/fall hazards including addressing floor or platform conditions
 - Address exposure to whole body and localized vibration and impact hazards by looking at condition and substance of flooring, grasping materials, edges of materials
- Soft Tissue:
 - Micro breaks –more frequent breaks approximately every 10 – 15 minutes of continuous work provide 20 – 180 second alternate work or break
 - Reduce or eliminate awkward postures



■ Muscle:

- Reduce strength requirements of jobs by providing material handling assistance
- Break up size of loads
- Micro breaks
- If possible, assign activities which require low intensity endurance activities (but can be prolonged)
- Flooring surfaces should be smooth and even to address changes in gait pattern



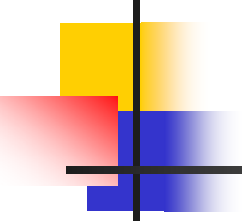
- **Nervous System:**

- Micro breaks
- Floor condition
- Reduce whole body and localized vibration which disrupts touch sensation and balance
- Hand rails and touch surfaces for balance
- Temperature controls to avoid hot/cold exposure
- Ensure first aid despite lack of reports of pain
- Access to cues for processes



- Senses:

- Odour control in the environment
- Fume detectors
- Audio smoke detectors
- Heat sensors
- Extensive colour contrast with red/yellow
- Control glare
- Increase light levels

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- Balanced lighting instead of light from a single source
 - Large print
 - Provide supplemental input from visual sources to accompany audio cues
 - Decrease ambient noise
 - Noise control system in the environment
 - Handrails in obvious and not so obvious locations
 - Appropriate matting
 - Stability of surfaces



Lifestyle

- Encourage healthy lifestyle choices outside of work
 - Smoking
 - Weight control
 - Moderate exercise
 - Mentally stimulating activities



Old versus Young

- Older workers score high on loyalty , job skills and reliability
- Compensate for age related changes by working smarter and being more safety conscious
- More accurate and make more correct decisions faster



References

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- Ontario's Senior's Secretariat, Ministry of Citizenship
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