Lecture 6: Noise, Manual Handling, CTD

Course: Health Safety & Environment

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BUITEMS – DEPARTMENT OF MECHANICAL ENGINEERING

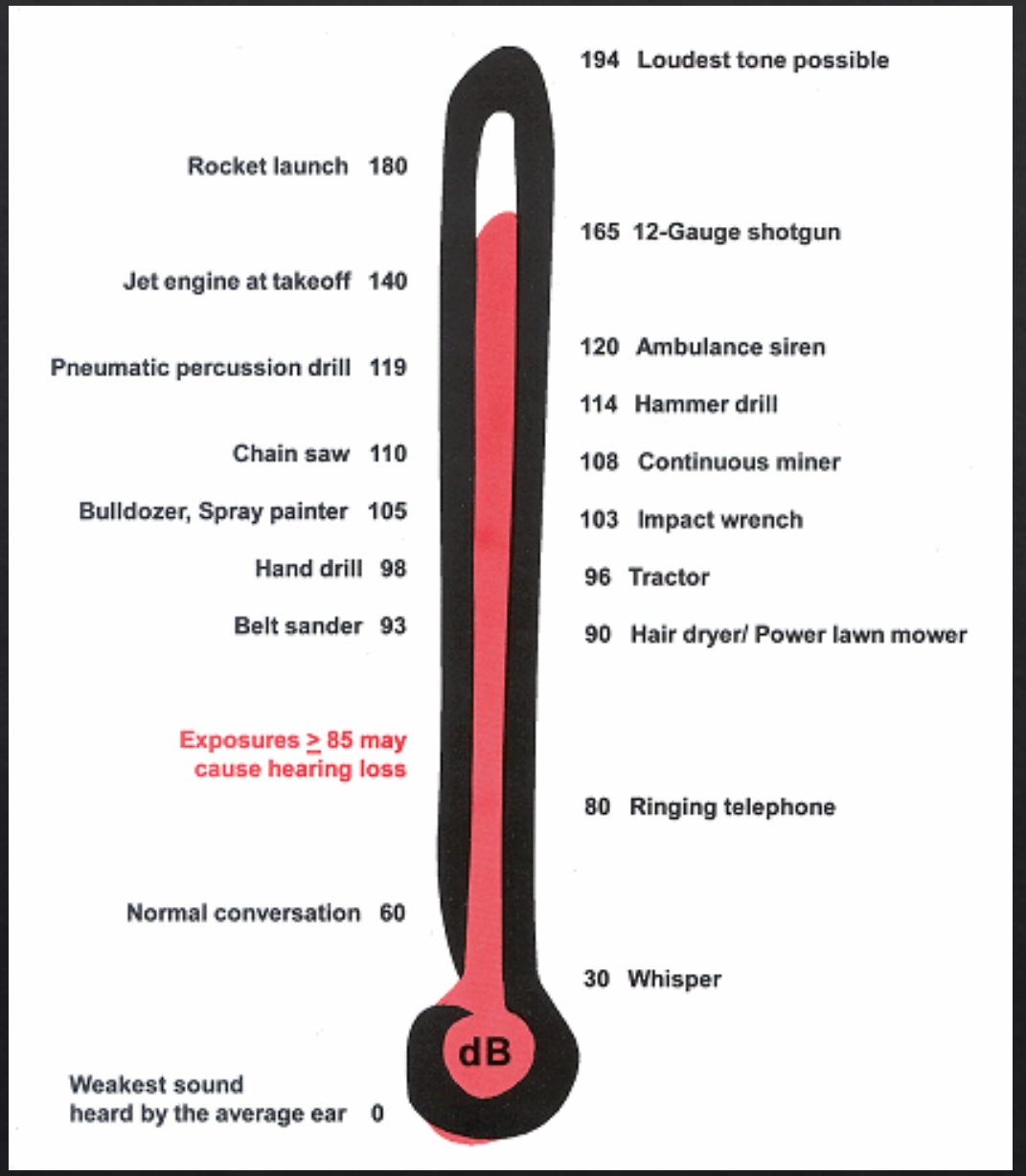
Did You Know?

- About *30 million* workers are exposed to hazardous noise on the job
- Noise-induced hearing loss is the most common occupational hazard for American workers
- Hearing loss from noise is slow and painless; you can have a disability before you notice it
- If you must raise your voice to speak with someone only 3 feet away, you are in high (hazardous) noise.
- It is ***100%*** preventable

What is Noise?

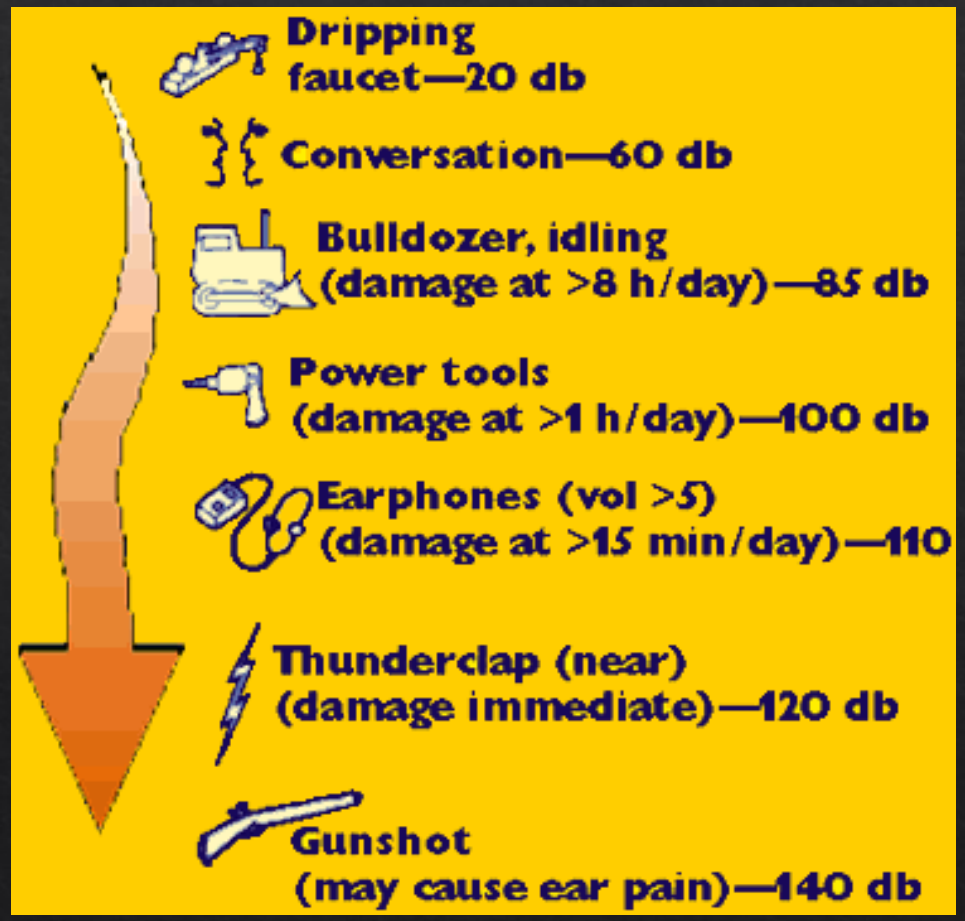
- Noise is any unwanted sound
- By-product of many industrial processes, e.g. operating machinery
- Exposure to high levels of noise may lead to hearing loss and other harmful health effects

General Estimate of Work-Related Noises



Sounds at or below 70 dBA are generally considered safe. Any sound at or above 85 dBA is more likely to damage your hearing over time.

Common Sounds may be louder than you think…



Hearing Loss

- **Temporary Hearing Loss**

  -results from short term exposure to noise

  -hearing returns when away from the noise

- **Permanent Hearing Loss**

  - results from exposure to a moderate or high level of noise over a long period of time

  -hearing loss is PERMANENT

Types of Hearing Protection Devices

- Ear muffs
- Foam insert earplugs
- Semi-aural earplugs

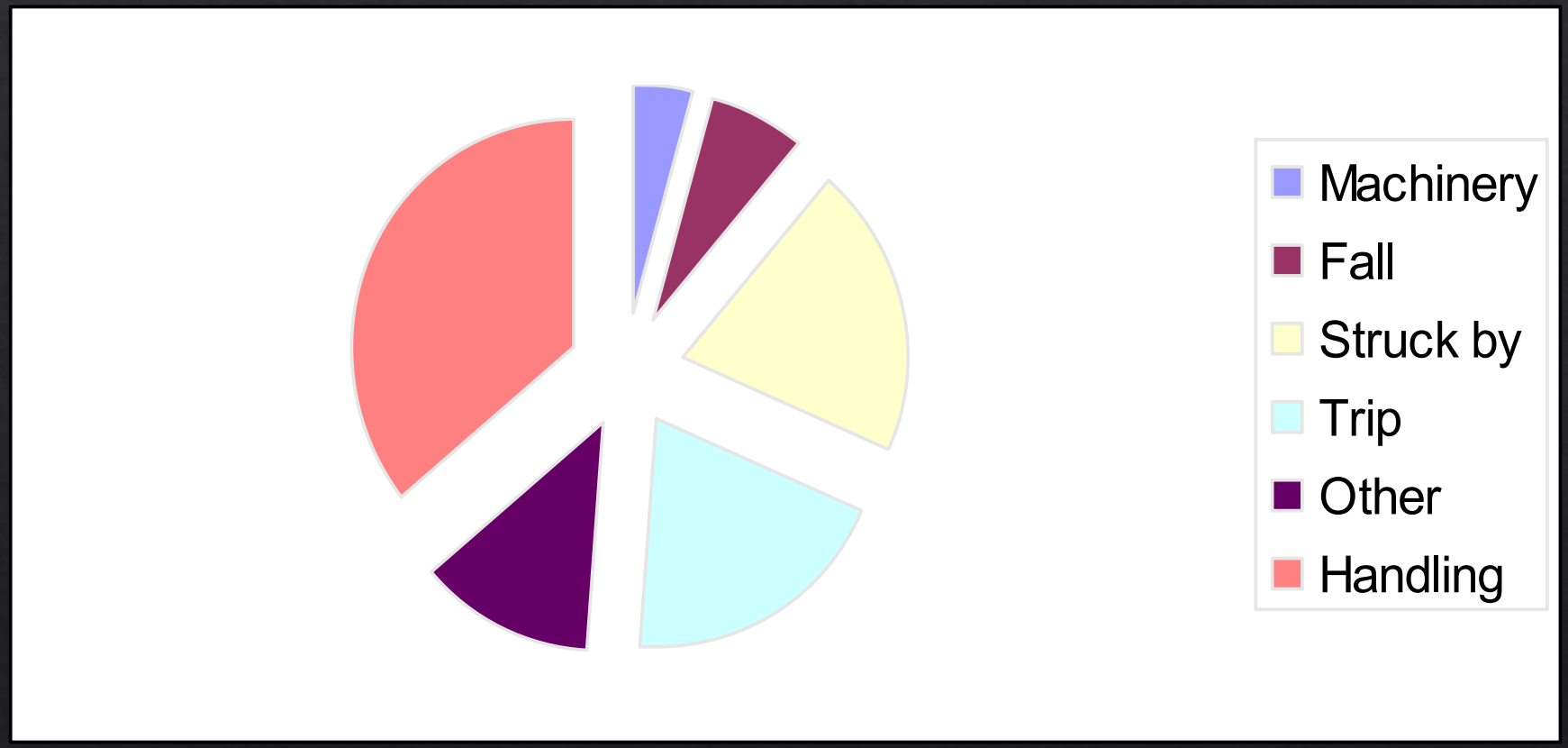
Earmuffs

Earplugs

Ear caps or bands

Manual Handling

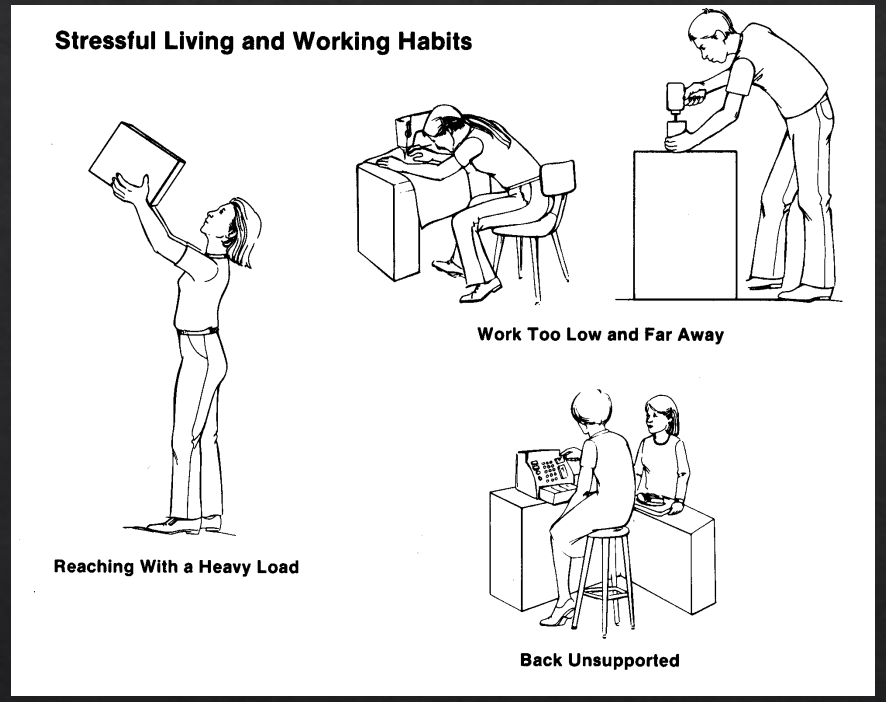
Manual Handling Incidents



How injuries can occur

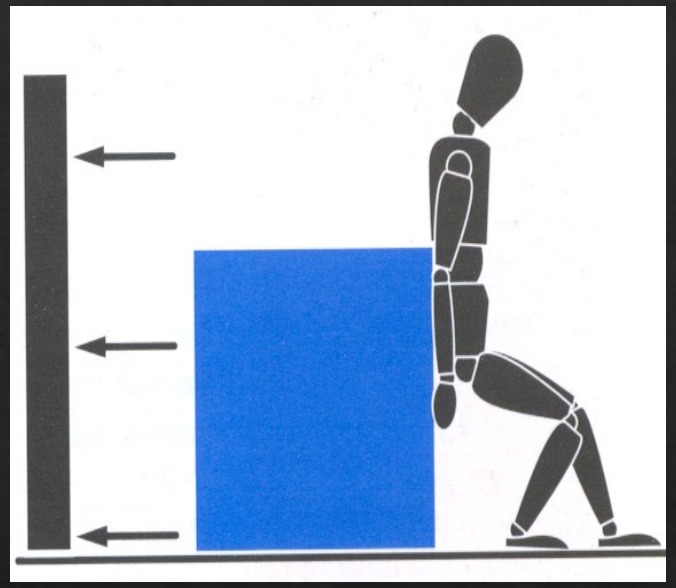
Main factors in injuries

- Fatigue
- Poor posture
- “quickly get the job done” attitude



Manual Handling is -

- The movement of a load by human effort either directly or indirectly
- Supporting a load without moving it
- Pushing or pulling a load
- Intentionally throwing or dropping the load



Manual Handling Operations Regulations

Employers must

- Avoid the need for manual handling where possible
- Assess the risk of injury
- Reduce the risk as far as is practical

Manual Handling Operations Regulations

Employees must

- Follow safe systems of work
- Use any equipment provided
- Cooperate with employer on H&S matters
- Notify of any hazards
- Ensure activities don’t put others at risk

The spine

The spine consists of

- Spinal Cord
- Vertebrae
- Intervertebral discs
- Ligaments
- Tendons
- Muscles

Ligaments, tendons and muscles

- Ligaments – straps which stretch between bones holding them together
- Tendons – the means by which the muscles are attached to the bones
- Muscles – provide the main stability for the vertebral column
- Cumulative strain - Injury caused by twisting and stretching repetitively

Other Injuries

- Hernias
- Fractures
- Bruises
- Cuts / Lacerations

Movement

- How a load is moved will determine how the body is stressed, how quickly it fatigues and how or if it is injured as a result
- Pushing and pulling
- Fixed position

Correct Handling

- Place the feet apart to give a balanced and stable base
- Have the leading leg as far forward as possible

Unlock the knees

- Bend the knees so that the hands when grasping the load are about level with the waist
- But don’t over flex the knees
- Keep the back straight to maintain the natural curves

Using the arms

- Grip
  - Palms up is stronger
  - Hand holds not necessary the best way to lift
- Elbows
  - The arms are stronger when the elbows are closer to the body

Problems of Manual Handling

- The task
- The load
- The working environment
- Individual capacity
- Handling aid and equipment
- Work organisation factors

The Load

- Weight
- Shape
- Size
- Centre of Gravity
- Sudden movements
- Grasping and moving the load
- HSE Guidance

Working Environment

- Space constraints
- Variation in level
- Floor
- Environmental factors

Individual Capacity

- Individual characteristics affect the risk involved in the activity
  - Gender incl pregnancy
  - Age
  - Disability
  - Positive discrimination
  - Health issues

Planning the lift

- Stop and think
- Place the feet
- Good posture
- Get a firm grip
- Smooth movement – don’t jerk
- Move the feet
- Keep the load close to the body
- Put the load down and readjust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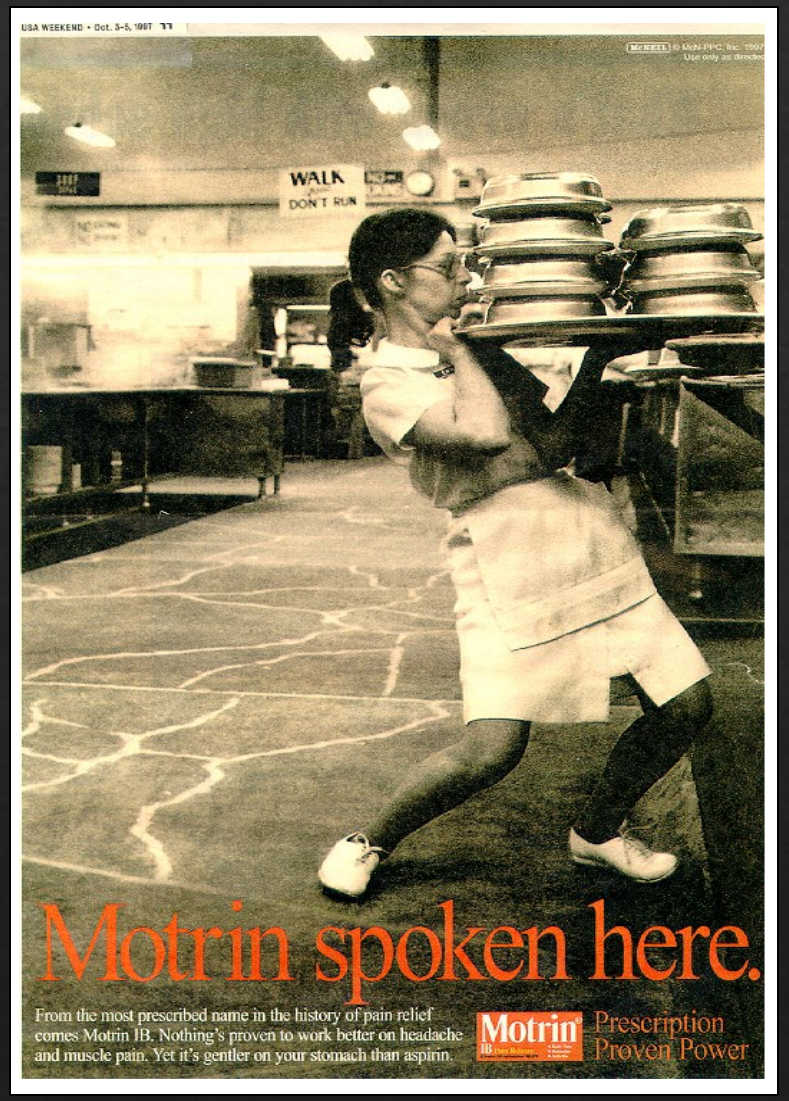
Ways to reduce the risk

- Exercise is the best way to be fit for lifting and carrying
- Abdomen provides natural support for the spine

Ergonomics

Defining Ergonomics

What have you heard about ergonomics?



Ergonomics is…

the science and the art of

fitting the job and the workplace

to workers' needs.

Use your brain, not your back.

Work smarter, not harder.

Fix the job, not the worker.

“Fitting the job to the worker”

Benefits of Ergonomics

- Ergonomics helps to prevent injuries
- Ergonomics has other benefits
  - Improves quality of work
  - Improves quality of life
  - Reduces fatigue and discomfort

CUMULATIVE TRAUMA DISORDERS (CTDs)

Synonymous Terms

Work-related Musculoskeletal Disorders (WRMSD)

Repetitive Motion Injuries (RMI)

Repetitive Strain Injury (RSI)

- Injuries that occur over a period of time
- Disorders of the muscle-tendon unit, peripheral nerves or vascular system
- Caused, precipitated and/ or aggravated by repeated and sustained exertions or motion of body parts, particularly the hands, wrists, elbows, arms, shoulders, neck and back

CTD RISK FACTORS

- Improper Equipment - Furniture and tools not suited to the task or the individual. Examples:
  - Poor condition
  - Improper placement
  - Incorrect use
  - Incorrectly installed/sized/adjusted
  - Manual rather than powered equipment for large tasks
- Repetition - Repeated performance of tasks in a time period that not allowing for full physical recovery. Examples:
  - Pipetting
  - Microscopy
  - Cryostat

CTD RISK FACTORS

- Muscle Strain/ Fatigue - Pain/stiffness in muscle tissue, often in
  - Arm
  - neck
  - Back
- Eye Strain
  - Blurred vision
  - Eye pain
  - Headaches

SYMPTOMS OF CTDs

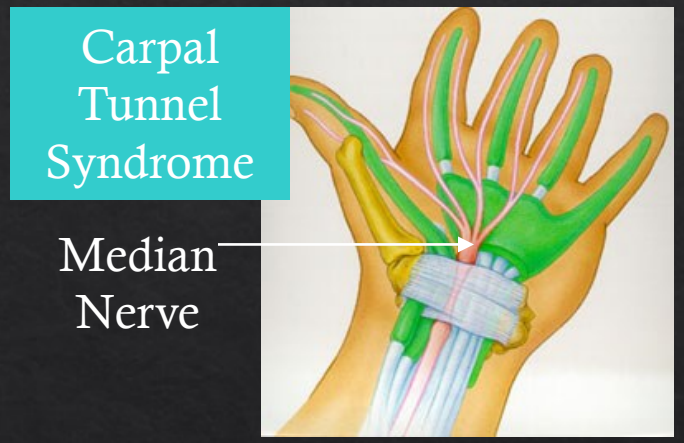
- Tingling sensation in fingers and hands
- Decreased mobility of the fingers, hands, elbows or shoulders
- Dull, aching discomfort or pain
- Decreased hand strength
- Numbness
- Pain at night/ sleep disruption
- Twitching, cysts in the hands and arms

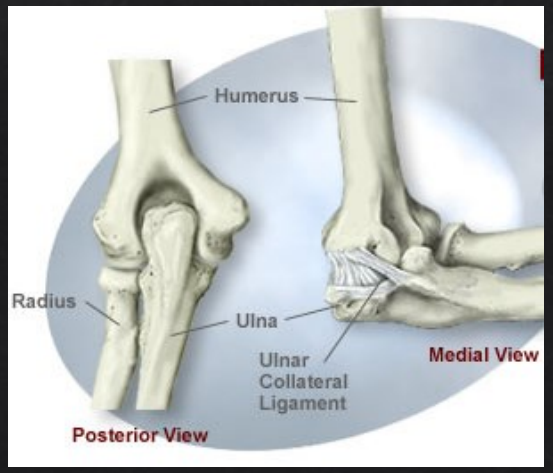
COMMON ERGONOMIC INJURIES

- Nerve Compression

  Can cause pain, numbness, and tingling. Examples include:

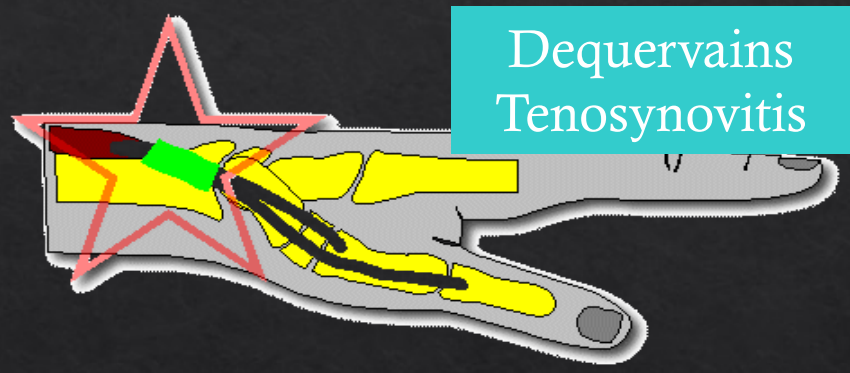
  - Carpal tunnel syndrome (wrist)
  - Ulnar neuritis (elbow/wrist)
  - Pronator syndrome (forearm)





COMMON ERGONOMIC INJURIES

- Tendonitis – Inflammation and pain in the tissue that connects muscle to bone. Types include:
  - Tenosynovitis (thumb)
  - Lateral/medial epicondylitis (elbow)



Dequervains Tenosynovitis

Lateral Epicondylitis

Risk Factors

Risk of injury depends upon:

- duration of exposure
- frequency of exposure
- intensity of exposure
- combinations of risk factors

(how long)

(how often often often)

(how MUCH)

End of lecture!