Ergonomics
Ergonomics is the science of adjusting environments, tasks, or procedures to fit you, the healthcare worker.

When tasks or environments are not ergonomically designed, a hazard can be created. These hazards can have a negative effect on your body.

Injuries and illnesses related to poor ergonomics are a significant health concern and a major workplace safety issue in the United States.

Poor ergonomics can result in many different types of injuries, including Musculoskeletal Disorders (MSDs)
Musculoskeletal Disorders

- The Centers for Disease Control and Prevention (CDC) defines a work-related musculoskeletal disorder as an injury of the muscles, tendons, ligaments, nerves, joints, cartilage, bones, or blood vessels in the arms, legs, head, neck, or back that is caused or aggravated by work tasks such as lifting, pushing, and pulling.
- Cumulative trauma disorders, repetitive stress injuries, and repetitive motion injuries are common types of MSDs.
- MSDs can impact almost any part of your body – arms, wrists, hands, fingers, neck, shoulders, back, legs, and feet.
- Symptoms of a developing MSD include: pain, stiffness, swelling, numbness, and tingling.
Musculoskeletal Disorders (cont.)

- The single greatest risk factor for overexertion injuries in healthcare workers is the manual lifting, moving, and repositioning of patients, residents or clients, i.e., manual patient handling.

- Some common MSDs are:
  - **Tendonitis**: inflammation of the tendons that connect bones to muscles.
  - **Epicondylitis**: elbow tendonitis is caused by repeated or forceful rotation of the forearm and bending of the wrist at the same time.
  - **Carpal Tunnel Syndrome**: a condition that occurs when the median nerve in the wrist is compressed.
  - **DeQuervain’s Disease**: caused by repetitive hand twisting and forceful gripping and its main symptom is pain at the base of the thumb.
Thoracic Outlet Syndrome: caused by prolonged shoulder flexion, extending arms above shoulder height, and carrying loads on the shoulder. Its symptoms are pain, numbness, and swelling of the hands.

Tension Neck Syndrome: caused by prolonged restricted posture and its main symptom is pain either in the neck or a headache originating from the neck.

- Data from the Bureau of Labor Statistics (BLS) show that in 2014, healthcare and social assistance had a rate of 121.3 cases per 10,000 full-time workers, the highest among the private industry sectors with greater than 100,000 cases.
- Musculoskeletal disorders accounted for 39 percent of the total injuries and illnesses reported in this industry in 2014.
The Importance of Ergonomics

- Understanding and practicing ergonomics allows you to:
  - Make your job less physically stressful.
  - Increase your safety and productivity.
  - Create a more comfortable environment.
  - Prevent injuries and illnesses.
There are personal risk factors and task-related risk factors that can contribute to these hazards.

**Personal risk factors** may include physical condition, psychological stressors, gender, age, body size, or medical condition. These personal risk factors may make certain types of work more difficult and lead to an increased risk of injury.

**Task-related risk factors** are those specific to a job or task that increase the risk of injury to any person who may perform the job or task. Two general types of task-related risk factors are posture and biomechanics.

- **Posture** refers to your body position. A safe posture is one that places the least amount of stress on your muscles and joints. This may also be referred to as a neutral posture.
  - To maintain good posture and reduce your risk of injury:
    - Keep your body vertically aligned.
    - Look straight ahead.
Risk Factors Affecting Ergonomics (cont.)

- Relax your shoulders; don’t hunch forward.
- Allow arms and hands to hang comfortably.
- Keep your legs straight, but don’t lock your knees.

- Safe posture includes keeping the natural S-curve in your back, whether you’re sitting or standing.
- To support this area, be sure your chair provides good lumbar support to maintain the curve in the small of your back.

- When sitting:
  - Keep forearms is parallel to the floor.
  - Keep elbows by your sides at a 90° angle.
  - Wrists should not be bent.
  - Thighs should be parallel to the ground.
  - Feet should be touching the ground or a foot rest, with your ankles at a 90° angle to the floor.
Risk Factors Affecting Ergonomics (cont.)

- **Biomechanics** focuses on body movements. The human body is intended to work in a certain way, so when actions or movements cause stress on your body, you are at risk for developing injuries and illnesses.
  - You can reduce your risk by minimizing your exposure to the following specific task-related risk factors:
    - Force
    - Repetition
    - Compression or contact stress
    - Vibration
    - Quick motions
    - Cold temperatures
Working with Pipettes: manual pipetting creates a musculoskeletal load on the neck, shoulders and upper limbs that can lead to repetitive stress injuries. To help to minimize the risk of injuries:

◦ Select an appropriate pipette for the task using an electronic pipette for long pipetting sessions.
◦ Arrange pipettes, racks, and other accessories so that you can easily reach them.
◦ Use a chair with an adjustable height function and adjust the chair so that you have a good working posture.
◦ Use an armrest and footrest to reduce fatigue.
◦ Keep your wrists straight and use a relaxed grip while pipetting.
◦ Take a 1- to 2-minute break after every 20 minutes.
◦ Switch between your right and left hand every now and then.
◦ Change body position alternating between sitting and standing positions.
Risk Factors Affecting Ergonomics (cont.)

To protect yourself from injury related to biomechanics, you should:

◦ Reducing the weight and size of items you lift
◦ Using automatic tools, when possible, to avoid repetitive motions
◦ Finding ways to vary your tasks
◦ Using personal protective equipment, such as anti-vibration gloves, when needed
◦ Avoiding sudden movements, especially bending or twisting
◦ Taking short breaks from physical tasks so your body can recover
Safe Patient Handling

- OSHA recommends minimizing manual lifting of patients in all cases and eliminating lifting when possible.
  - Use mechanical equipment where applicable and follow safety procedures to:
    - lift and move patients so that health care workers can avoid using manual exertions and thereby reduce their risk of injury.
    - maximize the safety and comfort of patients during handling.
  - Safe patient handling programs, policies, and equipment protect workers, save money, and improve patient care. To reduce injuries, lessen days away from work as a result of injuries, and have better patient outcomes, follow these guidelines:
    - The recommended weight limit according to NIOSH’s lifting equation is 35 pounds for most patient-lifting tasks, but less when conditions are not ideal.
    - Use items including portable lifts, transfer sheets and other equipment, training on equipment use and maintenance, a “minimal lift” policy, and/or a dedicated “lift team” that travels through the hospital moving patients with proper equipment.
Safe Patient Handling (cont.)

- Though the initial investment can be high, studies have shown the costs are quickly recouped. For example, after investing $800,000 in a safe lifting program, Stanford University Medical Center saw a five-year net savings of $2.2 million.
- Successful safe patient handling programs have also found they can significantly reduce the number of employee injuries and lost work days from injuries.
- It has been shown that the quality of patient care improves when safe patient handling programs are implemented. Patients have fewer falls, skin tears, and pressure ulcers. Patients also feel significantly more comfortable and secure when a mechanical transfer device is used.
Influences on Safe Patient Lifting Policies and Practices

- According to Guy Fragala there are many factors that can influence safe patient lifting policies and practices. These include personnel, patient, environment, and equipment factors.

- **Personnel** Factors include:
  - Staff shortage
  - Healthcare worker general health factors
  - Poor patient handling techniques
  - Repetitive tasks
  - End-of-shift fatigue
  - Lack of equipment training
  - Lack of time
  - Resistance to change
Influences on Safe Patient Lifting Policies and Practices (cont.)

- **Patient Related Factors** include:
  - Decreased consciousness
  - Decreased strength and ability to cooperate
  - Mental status and combativeness
  - Patient size and weight
  - No handles
  - Patient/family resistance to equipment use

- **Environmental** Factors include:
  - Confined space of patient room and bathroom
  - Wet and slippery floors
  - Multiple monitors, IV poles, equipment, etc. in rooms

- **Equipment** Factors include:
  - Lack of proper equipment (lateral transfer equipment, bariatric equipment)
  - Broken and poorly maintained equipment
  - Low height of patient chairs, toilets, or high height of patient bed
There are many different types of lift equipment which can be employed when handling patients. Remember that there are many types and brands of patient handling equipment and each manufacturer has specific operating instructions for its equipment. Here are some examples of equipment:

- **Lateral transfer devices**: Used to laterally transfer a patient/residents for example from bed to gurney.
- **Sliding boards**: Sliding boards are a slick board used under patients/residents to help reduce the need for lifting during transfer of patient/residents from bed to chair, or chair to car.
- **Slip Sheets/Roller Sheets**: Help reduce friction while laterally transferring patients/residents or repositioning patients/residents in bed and reduce the force workers need to exert to move the patient/residents.
- **Repositioning Devices**: Mechanically pull patient/residents up in bed eliminating manual maneuvering by staff.
- **Trapeze lifts**: A bar device suspended above the bed which allows patients/residents with upper muscle strength to help reposition themselves.
Patient Handling Equipment (cont.)

- **Walking or Gait Belts**: Provide stabilization for ambulatory patients/residents by allowing workers to hold onto the belt and support patients/residents when walking.
- **Wheelchairs with Removable Arms**: Allow for easier lateral transfers.
- **Pivot Transfer Disk Devices**: Used for standing pivot transfers and seated pivot transfers for patients/residents that have weight bearing capacity and are cooperative.
- **Roll on Weight Scale**: enables patients who cannot stand can be weighed in their wheelchairs.
Patient Handling Equipment (cont.)

- There are several guidelines you should adhere to when using mechanical equipment. These include:
  - Assess the patient
  - Assess the area
  - Decide on equipment
  - Know how to use equipment
  - Plan lift and communicate with staff and patient
  - Work with another team member
  - Have the right equipment available, in good working order, and conveniently located
Applying Ergonomics

Applying ergonomics to your everyday situations is usually simple. Pay attention to your body, understand the risk factors that affect ergonomics, and eliminate the hazards that could lead to an injury or illness.

Apply the following ergonomic solutions to relieve each upper torso discomfort:

- **Back pain**: Use a safe lifting technique. Adjust your chair’s lumbar support. Avoid awkward, twisting postures, excessive force, quick movements, and repetitive motions.
- **Stiff neck**: Change position to avoid awkward or static postures.
- **Shoulder pain**: Reduce excessive reaching or overhead tasks and avoid repetitive shoulder movements.

Apply the following ergonomic solutions to relieve each upper extremity discomfort:

- **Sore or stiff arms**: Improve posture, avoid excessive force, and eliminate repetitive motions.
Applying Ergonomics (cont.)

- **Sore or cramped fingers**: Eliminate repetitive motions, excessive force, vibration, and intense gripping. Take breaks to give your fingers and hands time to recover from strenuous tasks.

- **Hand pain**: Make sure you are using the right tool for the job and that the handle is the right size for your hand. Eliminate contact stress and excessive force activities.

- **Wrist pain**: Maintain neutral postures and avoid repetitive motions. Adjust the height or angle of your work surface to help keep your wrists in the proper position.

- **Elbow pain**: Don’t rest your elbows on hard or sharp surfaces and avoid repetitive motions.

Apply the following ergonomic solutions to relieve each lower extremity discomfort:

- **Cramped legs**: Take short breaks to stretch your legs or use an anti-fatigue mat if you are required to stand for long periods of time.

- **Cold feet**: Walk around to increase circulation in your legs. Adjust the height of your chair so your feet rest in a neutral position on the floor or foot rest.