Prevention of Cumulative Trauma Injuries
Objectives

To gain an understanding of:

- The prevalence and socioeconomic impact of cumulative trauma injuries in healthcare.
- The principles of body mechanics including spinal alignment, center of gravity, base of support, leverage, force, and friction.
- The use of the principles of body mechanics with safe patient handling procedures for bed mobility and transfers.
- The ways to prevent overuse syndromes, such as wrist tendonitis, when working on a computer.
- Positioning and mobility techniques that are safe for the patient/resident and caregiver.
Statistics for Musculoskeletal Injury

- The most common type of musculoskeletal injury (MSD), also known as ergonomic injuries, in healthcare providers is a back injury related to repeated manual patient/resident handling activities.
- Among nurses, 52 percent complain of chronic back pain (ANA, 2012)
- The financial burden of back injuries in the healthcare industry is estimated to be $20 billion annually (CDC, 2009).
- The CDC states that 12% of nurses leave the profession because of back injuries sustained on the job (ANA, 2012; Li, Wolf, & Evanoff, 2004)
- Working at a computer work station all day can take a toll on the body – especially the neck, eyes, and wrists – due to poor posture and repetitive motion.
  - Repetitive Strain Injury (RSI) is a potentially debilitating condition resulting from overusing the hands to perform a repetitive task, such as working at a computer.
Body Mechanics Principles

- Body Alignment
  - The spine has natural curves which create an S-shape
  - Maintaining the S-shape of the spine gives it better mechanical advantage and protects it
  - Stooping and twisting movements deviate from the S-shape and create the potential for back injuries
Body Mechanics Principles

- Balance is best maintained when the center of gravity falls directly over the Base of support
  - Objects closer to the center of gravity are moved with the least effort.

- Greater stability and balance is enhanced when:
  - The base of support is widened (spreading feet further apart)
  - The center of gravity is lowered (bending the knees)

- Try to keep the work directly in front to avoid rotation of the spine.

- Put the bed at the correct height (waist level when providing care; hip level when moving a patient)
Body Mechanics Principles

- Lift using large muscle groups in the buttocks, legs, and arms instead of smaller, less efficient muscles in the back.
- Pull rather than push to create less friction and resistance.
- Move an object along a level surface requires less energy than moving an object up an incline or against the force of gravity.
Safe Patient Handling

- Safe patient handling (SPH) techniques, where healthcare providers use assistive equipment during transfers, is effective in reducing the incidence of MSDs related to the handling of patients/residents (Water, Nelson, Hughes & Menzel, 2009).
  - It is estimated by the National Institute for Occupational Safety and Health (NIOSH) that the average person can safely lift 51 lbs under ideal conditions.
  - Because of the complex forces involved, NIOSH has established 35 lbs as the limit for safe patient handling tasks.
  - Research on patient/resident transferring has found little difference in the physical stresses on the body when using a two-person transfer as opposed to a single transfer.
During any patient/resident transferring task, if any caregiver is required to lift more than 35 lbs. of a patient's/resident’s weight, then the patient/resident should be considered to be fully dependent and assistive devices should be used for the transfer.

(AHRQ, 2013, Water, 2007)
Preparing for patient movement and handing

- Assess patient/resident ability to participate.
- Gather appropriate SPH equipment and other staff members as needed.
- Organize the physical environment to ensure safe completion of the task.
- Position self using principles of body mechanics.
- Explain to the patient/resident what activities you plan and what you expect of them.
Application of Body Mechanics Principles with SPH: Bed Mobility

- **Moving a Patient/Resident Up in Bed**
  - May use a lift/pull sheet if patient/resident able to assist or SPH equipment (friction reducing device, lift, etc.) if patient/resident unable to assist.
  - Flatten the head of the bed.
  - Move pillow away.
  - Ask the patient/resident to help if able by bending their legs and pushing.
  - Supporting the buttocks and chest, slide the patient/resident up in bed with the lift/pull sheet if patient/resident able to assist or with SPH equipment if the patient unable to assist.
  - Shift your weight in that direction the patient/resident is moving.
Turning a Patient/Resident

- Raise the side rail and the bed equal to the center of gravity.
- May use a lift/pull sheet if patient/resident is able to assist or SPH equipment (friction reducing device, lift, patient/resident turning equipment, etc.) if patient/resident is unable to assist.
- Lower the head of the bed.
- Move the patient/resident closer to the side of the bed opposite the turn.
- Ask the patient/resident to help if able by bending and crossing their leg and having them grab the side rail to pull him/herself over on to their side.
- Pull the patient/resident to a side-lying position with the lift/pull sheet if the patient/resident is able to assist, or use SPH equipment if the patient/resident unable to assist.
Application of Body Mechanics Principles with SPH: Bed Mobility

- Moving a Patient/Resident onto a Stretcher
  - Have patient/resident transfer from one bed on to stretcher if patient/resident is able to assist and can bear weight.
  - Use SPH equipment (friction reducing devices, lifts, etc.) if patient/resident unable to transfer self.
  - Adjust the height of the bed to slightly below the stretcher.
  - Head of the bed should be flat.
  - Maintain normal curves your spine throughout the transfer.
Transfer Technique Normal Movement: Sit to Stand

- **Foot Placement**
  - Ball of foot under knees
  - Feet shoulder width apart

- **Center of Gravity**
  - Start at edge of seat
  - Push off of the seat with hand and lean forward slightly
  - Raise seated surface if able

- Lift chest and tuck bottom to achieve upright posture
Assisting a Patient/Resident to a Sitting Position

- Raise the side rail and the bed to the height of your center of gravity.
- Turn the patient/resident to their side. Use a lift/pull sheet if patient/resident able to assist or SPH equipment (lift) if patient/resident unable to assist.
- Ask the patient/resident to help if able by bending and crossing their legs and grabbing the side rail to pull over on to their side.
- Supporting the trunk and thighs, simultaneously swing the legs over the edge while raising the trunk. Don’t forget to bend your knees!
- Be sure to keep supporting the patient/resident until they are well-balanced.
Application of Body Mechanics Principles with SPH: Transferring

- If patient/resident able to assist use a gait/transfer belt. Transfer towards stronger side.
- Have the patient/resident scoot to edge of chair. Feet on floor, shoulder width apart, and have them lean forward.
- Bend your knees and provide assistance by grasping the gait belt.
- Maintain lumbar curve (stick your butt out!).
- Pivot/small turning steps to chair or bed.
- If patient/resident unable to assist, gather SPH equipment and two or more caregivers to assist.
Use of Mechanical Lifts for SPH

- There are many types of lifts
  - Powered, mechanical full body mobile or ceiling lifts
  - Powered Hoyer lifts
  - Powered, mobile Sit-to-stand lifts

- All students and healthcare providers need to be educated in the use of the equipment prior to use.
Transfer Problem-Solving

D – Diagnosis
Know the diagnosis, precautions, and transfer status.

E – Environment
De-clutter and organize your surroundings prior to transfer.

C – Communication
Talk with the patient/resident and other healthcare providers about the transfer.

O – Options
What is the safest option for transfer? Has the patient’s/resident’s status changed?

D – Decision
Make the best decision about the type of transfer to use.

E – Equipment
Do you have the required equipment nearby and setup? Is it safe? Is the wheelchair locked? Is the patient/resident wearing non-skid socks or shoes?
Remember When Handling Patients/Residents

**Do**
- Transfer towards the patient’s/resident’s stronger side
- Squat: bend your knees and use your legs to lift
- Know the patient’s status and abilities; encourage participation
- Raise objects and surfaces to your waist and keep objects close to the body
- Use SPH equipment and get help if patient/resident unable to assist (if more than 35 pounds)

**Don’t**
- Let a patient’s/resident’s hang onto your neck
- Pull patient’s/resident’s arms to lift
- Bend forward only at the waist
- Rotate or twist your back during lifting activities
Prevention of Overuse Syndrome When Working on a Computer

- Get out of chair & move around several times a day
- After prolonged use:
  - Turn head from side to side
  - Roll shoulders backwards
  - Stretch out arms and wrists/fingers
Prevention of Overuse Syndrome When Working on a Computer

- Properly position equipment to minimize muscle, spine, and eye strain:
  - Keyboard
  - Monitor
  - Chair
  - Wear Glasses
References


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