



Body Mechanics and Injury Prevention

A guideline for
safe work practices

Presented by Ongwanada's
Occupational and Physical Therapists

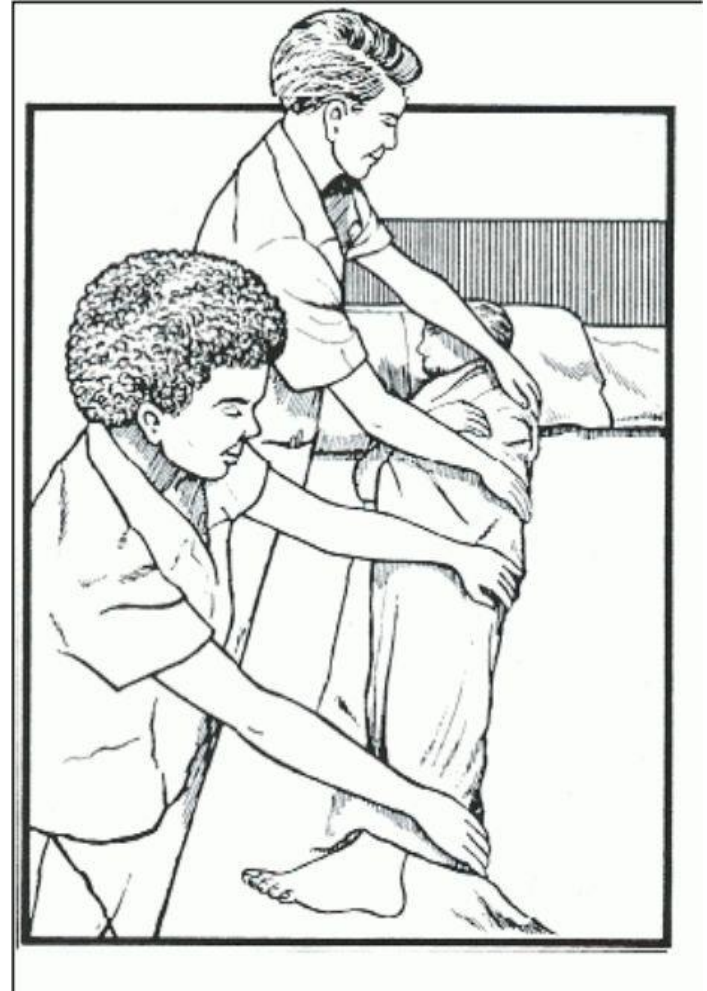
Why are good body mechanics important?

- Good body mechanics means using the body's strength to the best mechanical advantage to do a task efficiently and without injury.
- A task does not have to be “heavy” or seem difficult to put us at risk for injury; many injuries occur because of the wear and tear of *poor* body mechanics on our bodies over time.



Why are good body mechanics important?

- Using good body mechanics ensures that our jobs will be safer for our clients, our co-workers and ourselves.
- This presentation has been created to train Ongwanada staff in general safe work practices. Specific issues can be addressed in Mandatory Education Sessions, or by consulting with either Occupational Health or OT/PT.



Injury Risk Factors

Injuries usually occur as a result of not one, but multiple factors. Some are preventable.



Task

- Weights
- Forces
- Height or distance
- Duration
- Repetitions
- Awkward positions
- Equipment

Environment

- Surfaces
- Confined spaces
- Clutter
- Noise
- Distractions
- Working conditions

Individual

- Fitness
- Diet
- Fatigue
- Stress
- Smoking
- Age
- Knowledge/training

Types of Injuries

Sprains

- the stretching or tearing of *ligaments*, which are the short, tough bands of tissue that connect bones together in a joint
- usually injured during sudden forceful movement



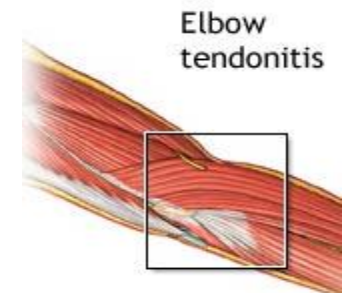
Strains

- the stretching or tearing of the *muscle* tissue itself, commonly called a “pulled” muscle
- can occur from a sudden forceful movement but may also occur with relatively “easy” movements if task is awkward or repetitive



Tendonitis

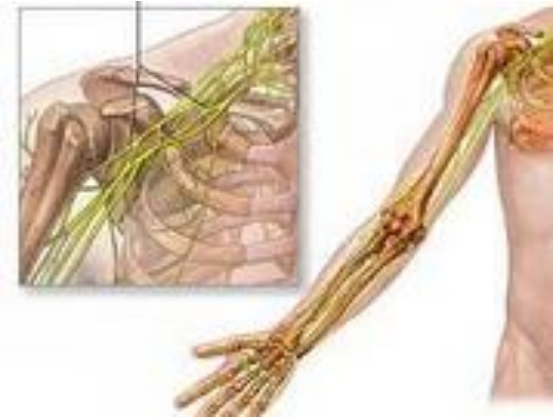
- the inflammation of a *tendon*, the thick, cord-like tissue that attaches a muscle to a bone
- usually occurs over time with awkward positions or repetitive movements (even with little weight/force)



Types of Injuries

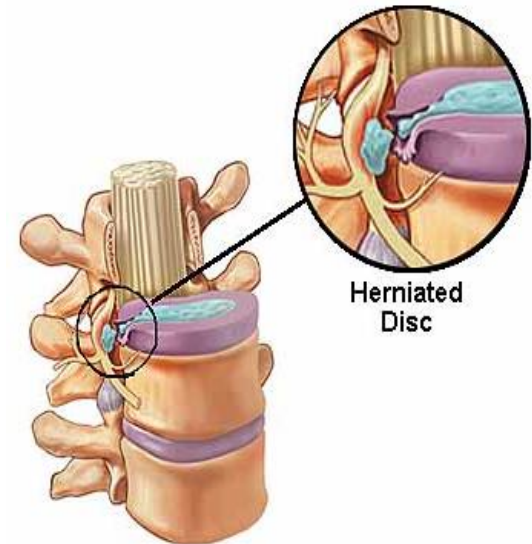
Nerve Entrapments

- often called “pinched” nerves
- pressure on nerves from inflammation or from other body tissues (muscles, tendons, bones)
- may cause pain or numbness/tingling or weakness (in area that nerve supplies)
- usually caused by poor alignment of body structures while working (ie: awkward postures)



Disc Injuries

- often called “slipped” disc, but is actually just herniated (ie: squeezing outwards)
- becomes painful when protruding part presses on the nerves in that area (ie: a type of Entrapment!)
- usually caused by awkward/repetitive movements of the spine (ie: forward bending, twisting)



General Principles



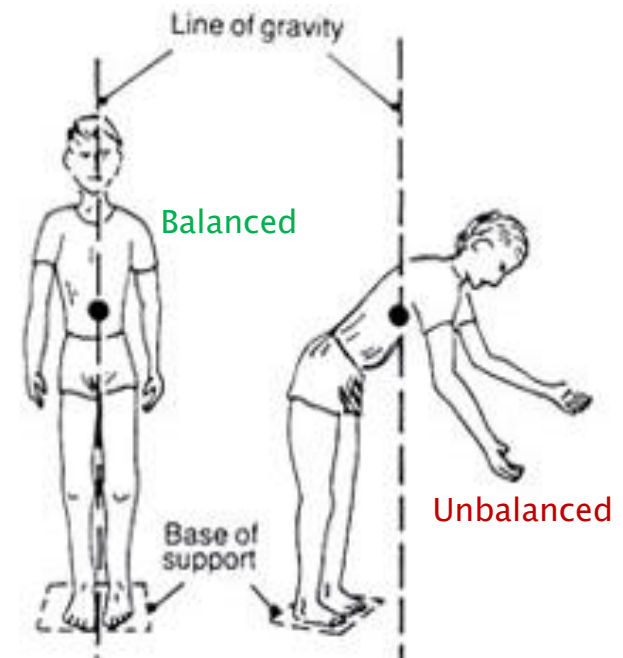
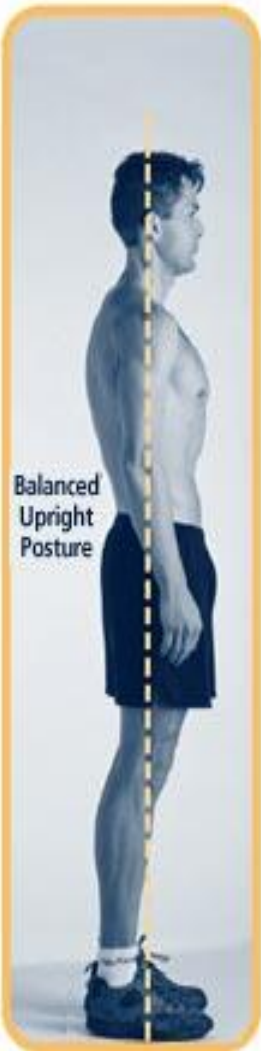
Whenever doing a physical task:

- ❖ Plan first.
- ❖ Use appropriate equipment whenever possible.
- ❖ Keep working postures as close to “neutral” as possible.
- ❖ Avoid working in the same posture for long durations.
- ❖ Avoid heavy loads and high forces.
- ❖ Avoid repetitions.
- ❖ Pay attention to what your body is telling you (including fatigue and stress!)
- ❖ Ask for assistance whenever needed.

“Neutral” Postures



- To avoid “awkward” postures that cause injuries, try to keep your body close to “neutral” or normal position while working.
- This means a straight spine with your centre of gravity being within your base of support.
- Of course, we move in and out of “neutral” posture all the time! (ie: walking, reaching, etc.) The idea is to be as close to neutral as possible and do not use heavy forces (ie: pushing, pulling, lifting) when outside of our base of support.



Basic Lift

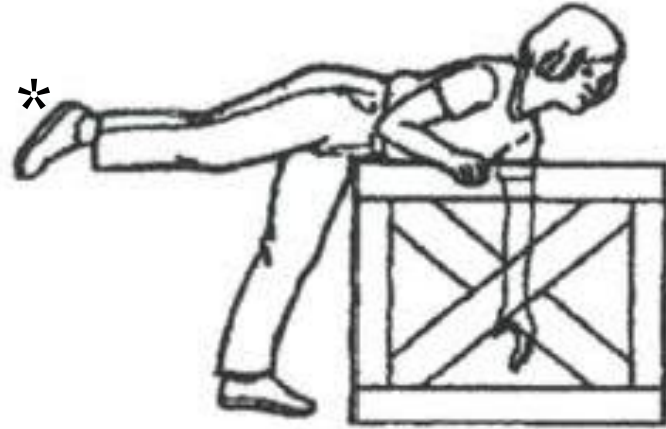


- Back is curved forward (increased stress on spine)
- Legs straight (unable to use leg muscle power)
- Arms extended (more stress on shoulders)
- Feet together (load being lifted is outside base of support)



- Back is neutral
- Staggered stance (makes base of support bigger)
- Bend at knees and use legs to push up
- Keep load as close to your body as possible (ie: lift up within your base of support)

Other Lifts: “Golfer’s” Lift



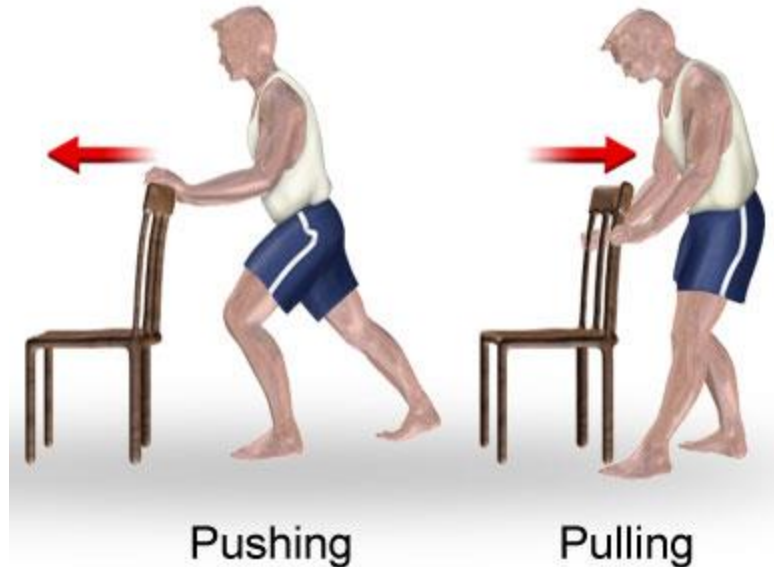
- For lightweight, low to ground items, or;
- For lightweight items beyond a barrier for your legs (ie: across a bench or bed, in a trunk, into a deep receptacle, etc.)
- This position keeps pelvis, and thus spine, neutral for less strain on back.
- *Note: you do not necessarily have to lift your leg this high! Lifting your leg slightly will do: move in the way that feels “balanced” to you.

Other Lifts: “Tripod” Lift



- For heavy, low to ground items
- Rise up in stages: item to knee, then stand up once you have readjusted your balance
- Use the large, powerful muscles of your legs rather than the small, weaker muscles of your back

Pushing/Pulling



- Pushing and pulling can require heavy forces and it is beneficial to use the same principles as with lifting (ie: increase your base of support, use your legs, face object and do not twist, etc.)
- Generally, it is easier and safer to push than pull.
- Consider the coupling (how & where you hold an object) and the friction (the ease of movement on the surface) as well.

Warm-Up to Work



- Most of us wouldn't begin an intense gym work-out or sport without warming up first: the same should be true of doing very physical tasks in our jobs.
- The following exercises are examples of simple, general exercises that can be done before or during work to prepare body for physical tasks or prevent injury.

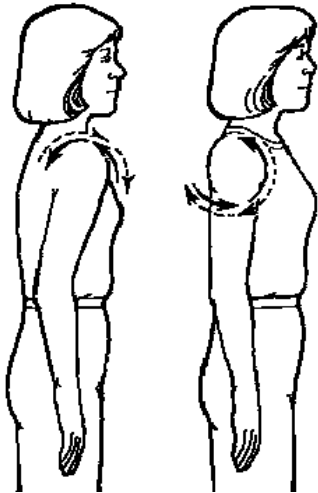
NOTE: Exercise should NOT cause pain.

Do not do these exercises if they do not feel right for your body.

***Remember that you can ask your doctor, physiotherapist
or the Occupational Health Dept. for assistance.***

Upper Body

Begin with a few minutes of walking or other full body movement before stretching:



Shoulder Rolls

- Stand with neutral posture
- Roll shoulders slowly in forward direction 5–10 times
- Repeat in backward direction

* You can also do this exercise by circling arms around as well



Shoulder Stretch

- Reach one hand across to opposite shoulder
- Hold arm above elbow and pull gently into body
- Hold for 20–30 seconds, then release and repeat 2–3 times per arm.

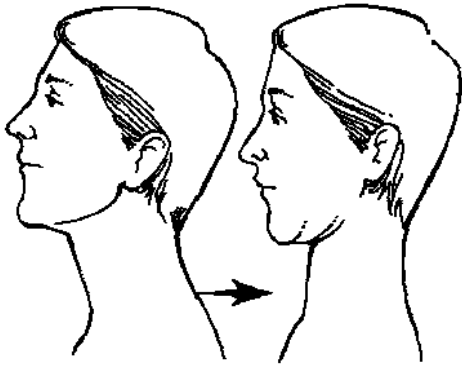


Shoulder Stretch

- Reach one hand behind neck and opposite shoulder
- Hold at elbow and pull gently downward
- Hold for 20–30 seconds, then release and repeat 2–3 times per arm.
- *Keep neck straight: do not pull neck forward!

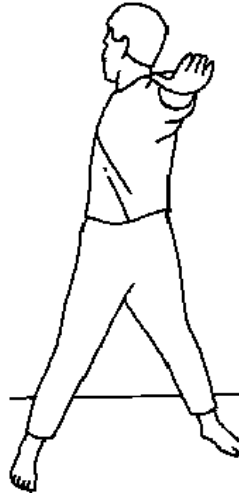
Neck & Trunk

Begin with a few minutes of walking or other full body movement before stretching:



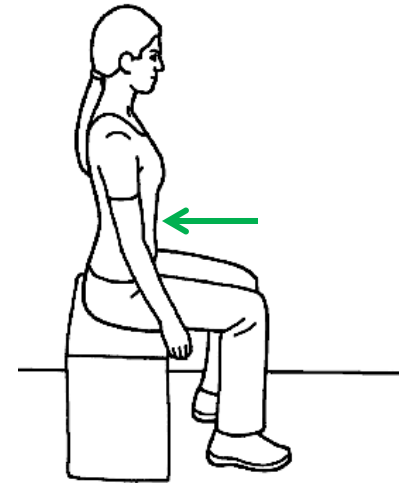
Cervical Spine Setting

- Sit or stand with neutral posture and tuck chin straight backwards
- Hold for a count of 5, relax, then repeat 5 times.
- *Do not extend neck (i.e. tipping head backwards)



Spine Rotation Stretch

- Sitting or standing, rotate full trunk to look over one shoulder.
- Hold for a count of 5, relax, then repeat 2–3 times per direction.
- *Do not twist knees! If knees are a concern, do trunk rotations in sitting.

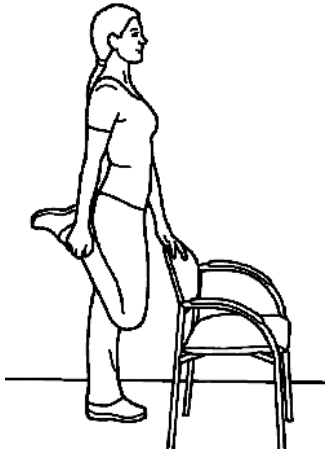


Lumbar Spine Setting

- Sit comfortably with neutral posture.
- Contract stomach muscles by drawing belly-button backwards.
- Hold for a count of 5, then release and repeat 5–10 times.
- *Breathe normally throughout: do not hold breath when contracting!

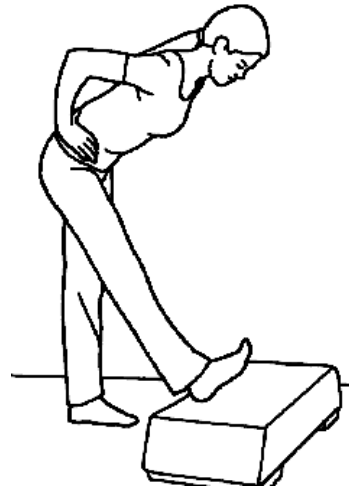
Lower Body

Begin with a few minutes of walking or other full body movement before stretching:



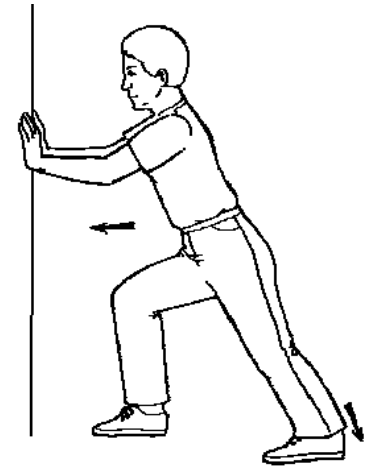
Quadriceps Stretch

- Hold onto a chair or counter and stand on one foot.
- Hold opposite leg above ankle and gently pull foot towards body
- Hold for 20–30 seconds, then release and repeat 2–3 times per leg.
- * Point knee down: do not twist knee!



Hamstrings Stretch

- With heel on a step or low stool, straighten leg and pull toes up
- Bend forward at the hip until you feel a stretch at the back of the knee.
- Hold for 20–30 seconds, then release and repeat 2–3 times per leg.



Calf Stretch

- Face wall and place forward foot ~1 ft. away
- Step other foot backward ~2–3 ft. with toes pointed forward.
- Lean forward until you feel a stretch behind the knee and ankle of your back leg.
- Hold for 20–30 seconds, then release and repeat 2–3 times per foot.

Working with Clients



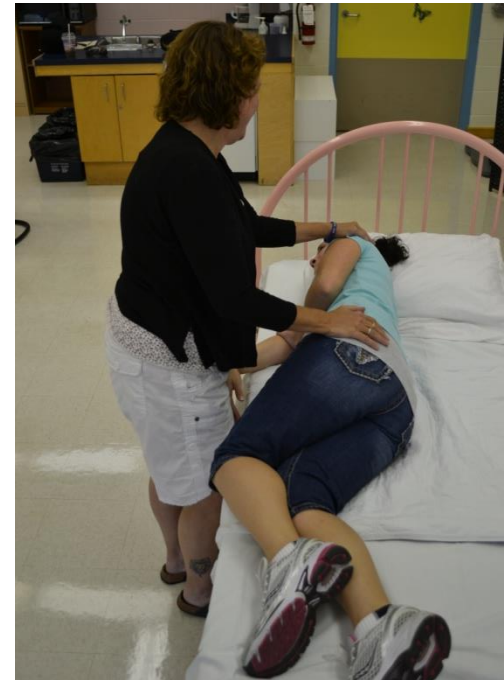
In General:

- ❖ Plan first and set-up equipment properly.
- ❖ Clear area of obstacles.
- ❖ Transfer or lift a client over the shortest possible distances.
- ❖ Communicate with client and other staff.
- ❖ Allow the client to assist as much as they are able to.
- ❖ Use general body mechanics principles.
- ❖ Always ask for assistance if you are not sure.
- ❖ NEVER lift or carry a client alone manually (must be lifted by at least two staff or by mechanical lift if alone)

Repositioning in Bed – Rolling



- Back bent
- Rolling client away
- Client's body stiff and straight with top leg behind



- Back straight
- Rolling client toward
- Cross client's top leg over in direction they are rolling toward (helps momentum!)

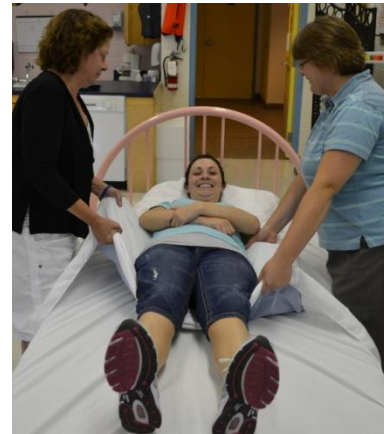
Repositioning in Bed – Sideways



- Back bent
- Feet together
- Reaching and pulling from across client's body

- Back straight
- Staggered stance
- Slide hands beneath client's shoulders and pull towards you
- Repeat under their pelvis
- ie: move body over in segments

Repositioning in Bed – Up



- Back bent
- Neck/arms twisted
- Pulling “upwards” from beside client

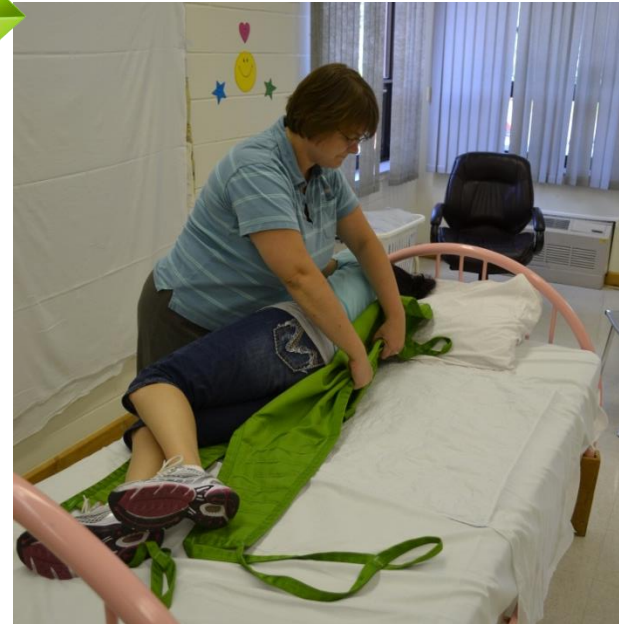
- Use two staff!
- If alone:
- Use lift to reposition, or;
- Move bed away from wall and pull drawsheet from above*

*Use only if client is light and head of bed is low!

Placing a Sling – Lying



- Lifting or sitting client up to place sling
- Holding client with one arm (especially at the front or back of their neck!) while placing sling with the other



- Roll client to place sling
- Align sling underneath so that it will be centered along their back (“bunch” up the edges)
- Roll client to the other side to straighten sling out

Repositioning in Wheelchair



- Reaching over back to the wheelchair
- Grabbing beneath client's armpits
- Pulling backward while client is in upright position



- If able, tilt the wheelchair back
- *If client has no hip/knee problems:
- Lean client gently to each side so that their weight is shifted
- Push their un-weighted leg backwards from the front

Placing a Sling – Sitting



- Pulling client forward by the back of their neck
- Holding client while reaching over them to place sling
- Bending and reaching across client and/or wheelchair



- If possible, remove armrest!
- Lean client to one side and pull sling down to their tailbone
- Hold their knee (so they don't slide) and tug the legstrap forward so it wraps around hip
- Lift leg and place legstrap under
- Repeat on other side

Two Person Lift (Front-Back)



- Staff at shoulders is twisted sideways; reaching over
- Staff at knees is bent at hips with feet together
- Far away from destination
- Armrest is in the way



- Staff at shoulders facing forward
- Staff at knees has staggered stance, straight back
- Right next to change table
- Armrest is removed

Two Person Lift (Side-by-side)



- Trolley or supine wheelchair is placed parallel to change table (or bed)
- Client is on the wrong side of staff's body to get to their destination without readjustment

- Trolley or supine wheelchair is placed at 90° to change table or bed (at bottom)
- Staff lift from side and step over to turn and place client on bed (head ends up at the top)

Using Mechanical Lifts



- “Driving” from the back of lift (ie: just at the “steering” bars)
- When needing to hold client, reaching forward over lift
- Feet together and twisting body while turning lift

- Pushing lift from side and controlling client’s sway
- Can push with a hand on the lift arm or foot on lift leg (as well as using the “steering” bars)
- Stepping while turning (no twist in spine!)

Standing or Pivot Transfer



- Client leaning backward with feet off the ground
- Bending and reaching forward to support client
- Wheelchair is far away and not set up (i.e. brakes off, footrests in the way, etc.)



- Client encouraged to assist by coming forward and using arms
- Use transfer/walking belt
- Use staggered stance and weight-shift when moving
- Set up wheelchair as close as possible with no obstacles

Assisting an Unsteady Client



- Assisting too far away from client
- Holding a loose walking belt (too high: in armpits) *or* holding only arm or clothing
- Feet close together (ie: unprepared if client falls)

- Close to client, behind or at their weaker side
- Use snug walking belt (at client's ribs)
- Keep a staggered strong stance (ie: ready if fall occurs)
- May also support arm or hold hand, but do not pull

Assisting Client Up from Floor



- Trying to lift client from behind them and under their armpits
- Trying to lift client alone
- Trying to lift a client that is too heavy or non-cooperative

- Encourage client to turn over to kneeling
- Provide a stable chair or encourage them to move toward one
- Assist them to climb up into chair, but do not lift!

Emergency – Up from Floor

- If at all possible, use mechanical lift! (most will go low enough)



- If no lift available, always use two people (never alone!)
- Place chair and remove armrest if possible
- Place a stable stool, bench, thick couch cushion or other “intermediate” object between client and chair
- Perform level two-person lift to intermediate level, readjust stance and continue to lift to chair
- Do not attempt if you feel that client is too heavy to lift!

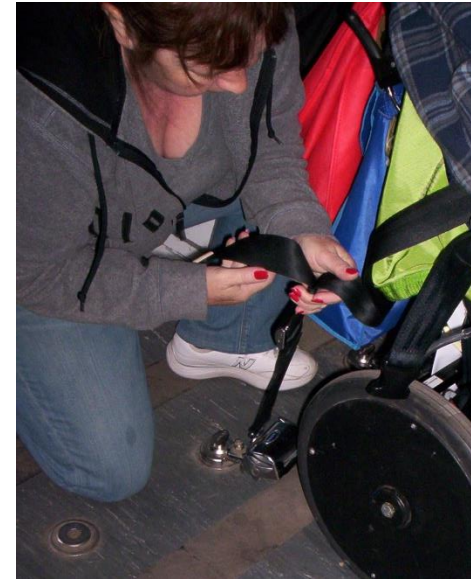
Other “Emergencies”

Staff often have questions about protecting oneself in extraordinary situations. Always refer to the emergency policies and procedures for your work area and remember:

- In all emergency protocols, the first step is to call for assistance. Remember that help is on the way.
- If it is difficult to move someone, ensure that they truly must be moved first (ie: close fire doors first instead, etc.)
- If moving is necessary, consider alternatives to lifting/carrying, such as sliding, blanket carry, etc.
- Do not place yourself at risk of injury, as this will only worsen everyone’s situation. This is especially important if you are temporarily alone.



Using Q-straints



- Lifting wheelchairs over the Q-straints already in place
- Bending back while keeping legs straight
- Twisting back while reaching over chairs

- Floor of van obstacle-free
- Squat or kneel if possible
- Leave space for yourself to apply first row of Q-straints, then allow them to tighten up after you move out of the way
- Apply back row of Q-straints through open back door
- Use a seating plan for placing wheelchairs efficiently

Household Tasks



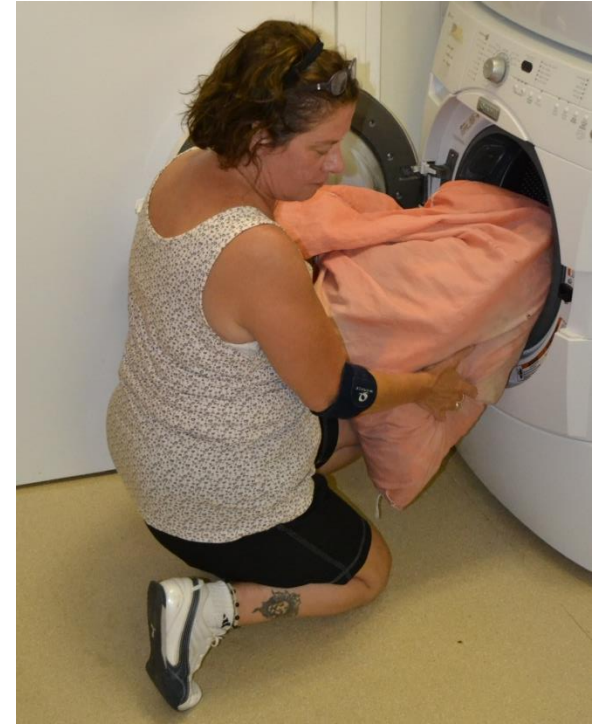
In General:

- ❖ Plan first and set-up equipment properly.
- ❖ Keep areas clear of obstacles.
- ❖ Use equipment to make a task easier.
- ❖ Use general body mechanics principles.
- ❖ Always ask for assistance if you are not sure.
- ❖ Share ideas (ie: about what works/what doesn't!) with your coworkers and always report hazards, problems, repairs, etc.
- ❖ NEVER lift more than about 1 / 3 of your own body weight OR a weight that you feel is too heavy for you to lift safely.

Laundry



- Neck in awkward extension
- Working bent over at waist
- Reaching and pulling heavy clothes (when wet)
- Sustained posture and repetitions

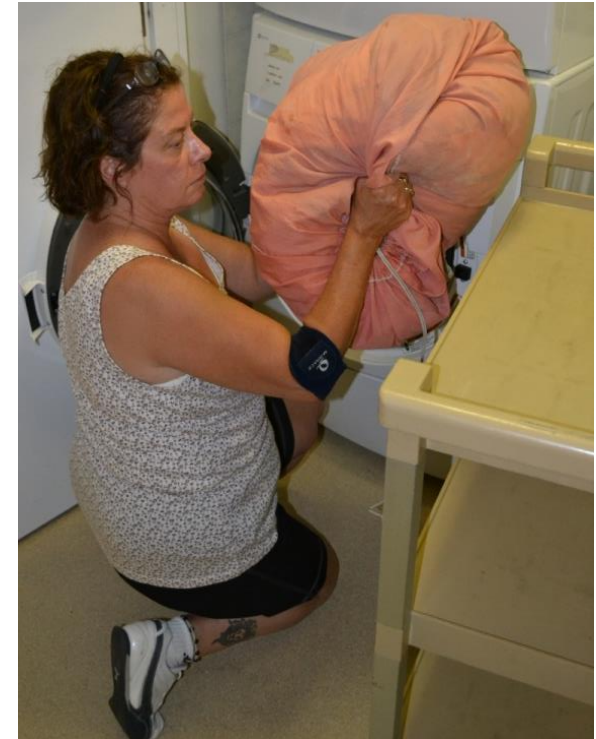


- Squat or “tripod” position when reaching low (esp. if lifting heavier clothes)
- Avoid long periods of time squatting or kneeling; sit on a rolling stool if necessary

Laundry



- Lifting straight up from washer to dryer
- Lifting entire heavy load at once, or
- Moving small amounts at a time, but repeating bending/twisting to do so
- Bending and twisting while folding laundry



- Use a cart so the wet clothes need only be lifted halfway at one time
- When emptying dryer, allow clothes to drop to cart/basket
- When folding laundry, work at a table or counter, facing forward

Making Beds



- Obstacles (bedrails) in way
- Feet together
- Bent back
- Reaching
- No room to work



- Obstacles removed
- Knee on bed to stabilize pelvis/spine while reaching
- Get as close as possible to working area
- Pull bed out away from wall to reach both sides if possible

Unloading Groceries



- Feet planted together
- Bending over at waist
- Reaching with both arms
- Lifting heavy items right out with both hands



- Kick one leg up behind (helps to keep back straight)
- Stabilize with one arm on edge if possible
- Pull heavy items as close as possible before lifting

Unloading Groceries



- Too much weight
- Carrying groceries long distances
- Unbalanced (ie: all in one hand to use other for door)

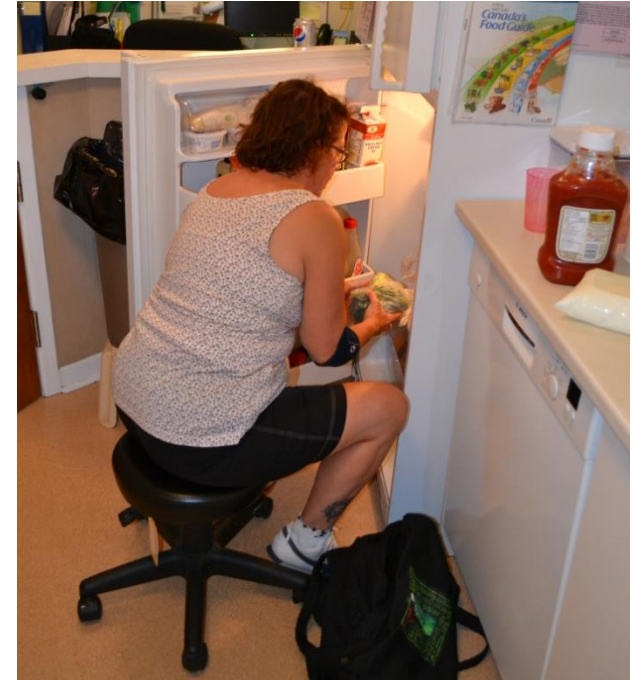


- Use a cart/wagon and load from back of van, or
- Carry equal load in each hand (keeps back straight)
- If possible, leave a doorstop in door so it can be opened with foot or body.

Organizing Fridge



- Bending forward from waist to reach lower shelves
- Twisting to place items to/from counter
- Sustained posture and repetitions (esp. if cleaning fridge or putting away groceries)



- Squat or kneel (if in position briefly) to reach lower areas
- For long periods of time, sit on a rolling stool
- Keep back straight and face counter/shelves
- Use a tray/box to load up a few items to move together

Reaching into Deep Appliances



- Feet planted together
- Bending over at waist
- Reaching with both arms
- Lifting heavy items directly to/from the bottom

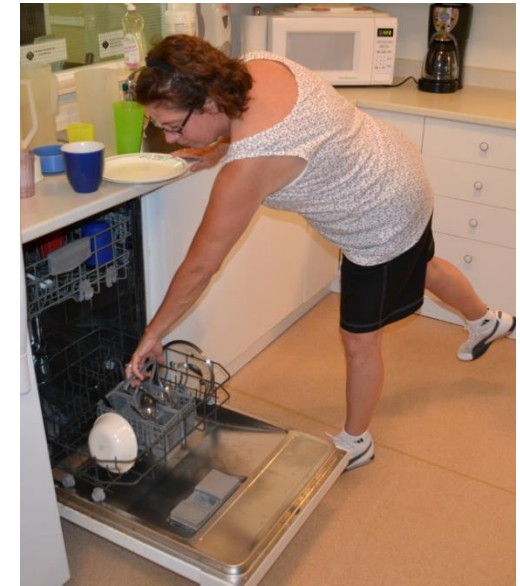


- Kick one leg up behind (helps to keep back straight)
- Stabilize with one arm on edge if possible
- Keep large heavy items in the bottom in bags (ie: handles)
- Lift heavy items halfway first

Emptying Dishwasher



- Bending forward from waist to reach lower areas
- Twisting to place items to/from counter
- Sustained posture and repetitions (esp. if doing entire load at once)

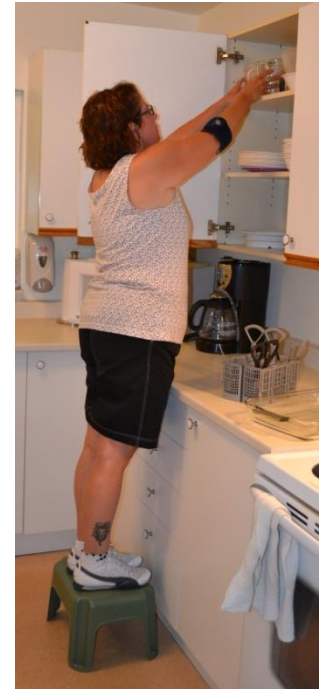


- Use “golfer’s lift” position when bending down
- For long periods of time, sit on a rolling stool
- Keep back straight and face counter/shelves
- Take out cutlery basket rather than reaching for utensils individually

Reaching to Shelves



- Neck in awkward extension
- Bending at waist, or
- Reaching while unbalanced
- Sustained posture and repetitions (esp. if cleaning or organizing shelves)



- Use a stable step-stool
- Keep neck as neutral as possible
- Squat or “tripod” position when reaching low (esp. if lifting heavy item)
- Avoid long periods of time in awkward posture

Changing Garbage



- Feet planted together
- Lifting with back (bending backward)
- (Also: using one arm only and straining shoulder)
- Too much weight

- Feet apart, keep back straight
- Use weight shift to lift
- Use both hands
- Try to keep loads small (change bags often)

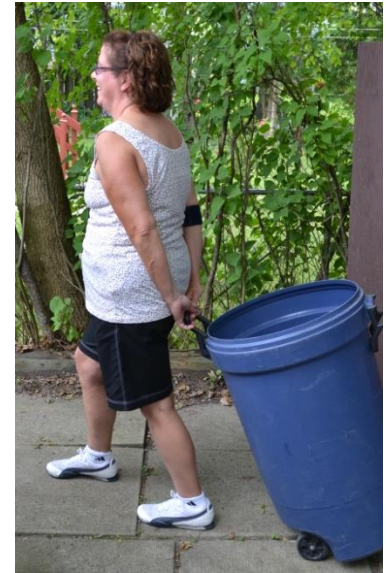
Carrying Garbage



- Holding weight in one hand, far out away from body
- Leaning toward other side to compensate (spine bent)
- Body off balance
- Too much weight

- Hold weight as close as possible
- Use two hands, stabilize arms against body
- Keep back straight
- Try to keep loads small (change bags often)

Transporting Garbage



- Two at once
- Leaning backward, or
- Twisting back while taking one in front/one behind
- Too much weight

- One at a time
- Push with two hands together, or
- Pull with two hands (keeps back straight)
- Try to keep loads small (change bags often)

Shoveling (imagine snow!)



- Feet planted together
- Bending at waist
- Twisting back while tossing shovelful to one side
- Too much weight on shovel



- Feet staggered
- Shift weight into back leg when lifting
- Shovel straight forward
- Try to keep shovelful small (esp. with wet heavy snow)

Mopping (also Sweeping/Vacuuming)



- Feet together, twisting body as the mop is swept around
- Bending to reach under objects



- Face forward and step to turn with mop ("dance with mop")
- Keep feet staggered wide and use slight lunge or "golfer's lift" position to bend

Mopping (emptying bucket)



- Bending forward from waist
- Holding heavy bucket far out in front of body
- Wet slippery floor, poor footing
- Bucket too full (unnecessary weight)



- Keep back straight
- Brace bucket on your leg or edge of toilet and keep as close to body as possible
- Fill only to fill line (about $\frac{1}{2}$)

Cleaning Tubs



- Bending forward from waist
- Reaching far away from centre of gravity, across tub
- No padding for knees against tub wall
- Sustained posture and repetitions



- Use a long-handled brush
- If cleaning with hand-held sponge, kneel on folded towel at side of tub to reach, or
- Sit on bench or stool at same height as edge of tub (also good for when bathing clients)
- Try not to stay in one posture for too long

Paperwork

- Remember that sitting can be a strenuous posture as well.
- Sitting poorly can put more strain on the spine than standing, walking and running.
- Set-up desk and counter workstations so that you can work effectively in neutral postures.



BAD POSTURE (EXAMPLES OF)



"It's called Ergonomics."

Paperwork



- Rounding shoulders and neck forward to get closer to page or computer screen
- Sitting slouched or bent over
- Twisting/craning neck to reach phone



- Sit with back straight and elbows, hips and knees all at about 90°
- Paperwork, computer or phone: face straight on!
- Take breaks: do not stay in one position (even a good one!) for long periods of time

Final Word: *If a task seems difficult...*

- ...it probably is! If you catch yourself disliking a task, it is worth a moment to stop and ask yourself:
 - *What is it that makes this hard, tiring or painful?*
 - *Is the load too heavy for me?*
 - *Do I have to reach/push/pull outside of my centre of gravity?*
 - *Am I bending or twisting?*
 - *Am I repeating movements or spending too much time in one posture?*
 - *Do I feel rushed, stressed or unprepared to do this?*
- ...and if so:
 - *Is there a technique, a change in routine or a piece of equipment that would make this easier?*
 - *Where can I go for help?!*



Remember...



- ❖ Sometimes the *fastest* way to do something is not actually the easiest or safest way.
- ❖ Although accidents happen, many injuries are preventable and occur when we take short-cuts.
- ❖ An injury at work will effect your life everywhere.
- ❖ It is much easier to take the time to prevent an injury than to take the time to recover from one.
- ❖ If you have trouble with something, chances are you are not the only one! Report problems/hazards and share solutions with your coworkers.

Thank you for viewing this module!

Please call OT/PT or Occupational Health with any questions, concerns or feedback about this presentation.