



**OHCOW**

Occupational Health Clinics  
for Ontario Workers Inc.

Centres de santé des  
travailleurs (ses) de l'Ontario Inc.

# Ergonomics & Everyday Life

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Ergonomist, Toronto Clinic

# Overview: Understanding and Preventing MSDs at Home and Work

- Musculoskeletal disorders (MSDs)
- Lifting/carrying basics
- Pushing/pulling
- MMH at home
- Workstation/tech
- Yard work & chores
- Driving (condensed!)
- Sleeping
- Q&A

# Why MSDs Matter: Beyond the Workplace

- Financial Costs:
- Medical expenses, reduced income, rehabilitation, transportation.
- Human Costs: MSDs can lead to pain, reduced mobility, chronic conditions, or progress into more serious injury when early signs are ignored.
- Family Impact: Increased stress, strained relationships, more healthcare use among family members.
- Work & Community Impact: Lost productivity, early retirement, long-term disability.



# The Cost of MSDs

If an MSD begins at home, does its impact or cost really change?



# Most MSDs Develop Gradually

## Mild

Beginning of physical discomfort such as light pain.

**Symptoms:** Pain, aching, fatigue

**Onset:** Weeks or Months

**Job Performance:** Not affected

**Visible Signs:** None

**Treatment:** May be reversible if treated early



## Moderate

Increased physical discomfort such as more frequent and intense pain.

**Symptoms:** Pain, aching, fatigue, sleep difficulty

**Onset:** Months

**Job Performance:** Decreased

**Visible Signs:** May be present

**Treatment:** Difficult and slower recovery



## Severe

Persistent physical discomfort such as intense and prolonged pain.

**Symptoms:** Constant to intense pain, fatigue, sleep difficulty

**Onset:** Months to years

**Job Performance:** Unable to perform job duties

**Visible Signs:** Often present

**Treatment:** Greater risk of permanent damage



## REACTIVE



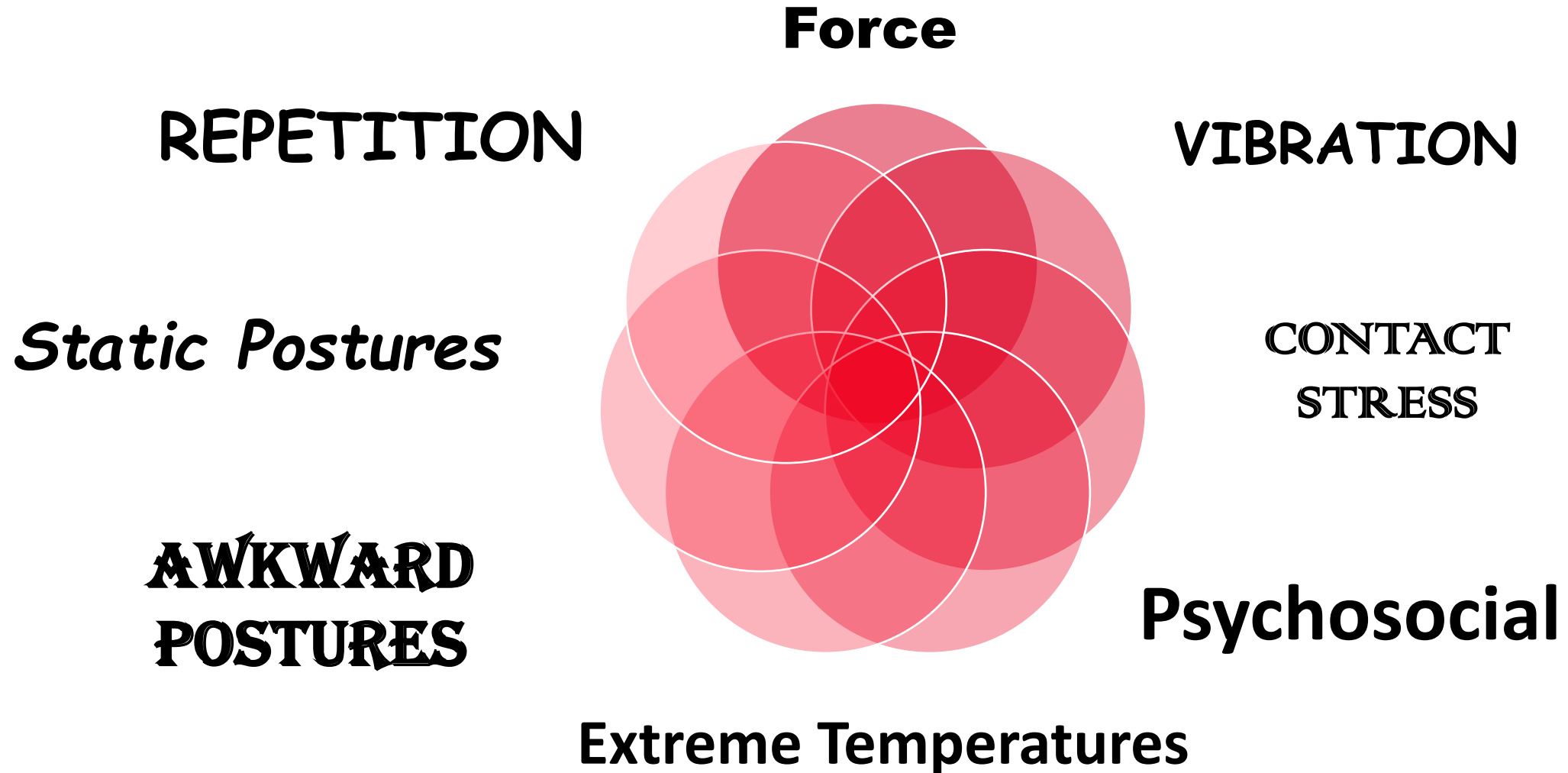
Solutions AFTER problems arise

## PROACTIVE



Solutions BEFORE problems arise

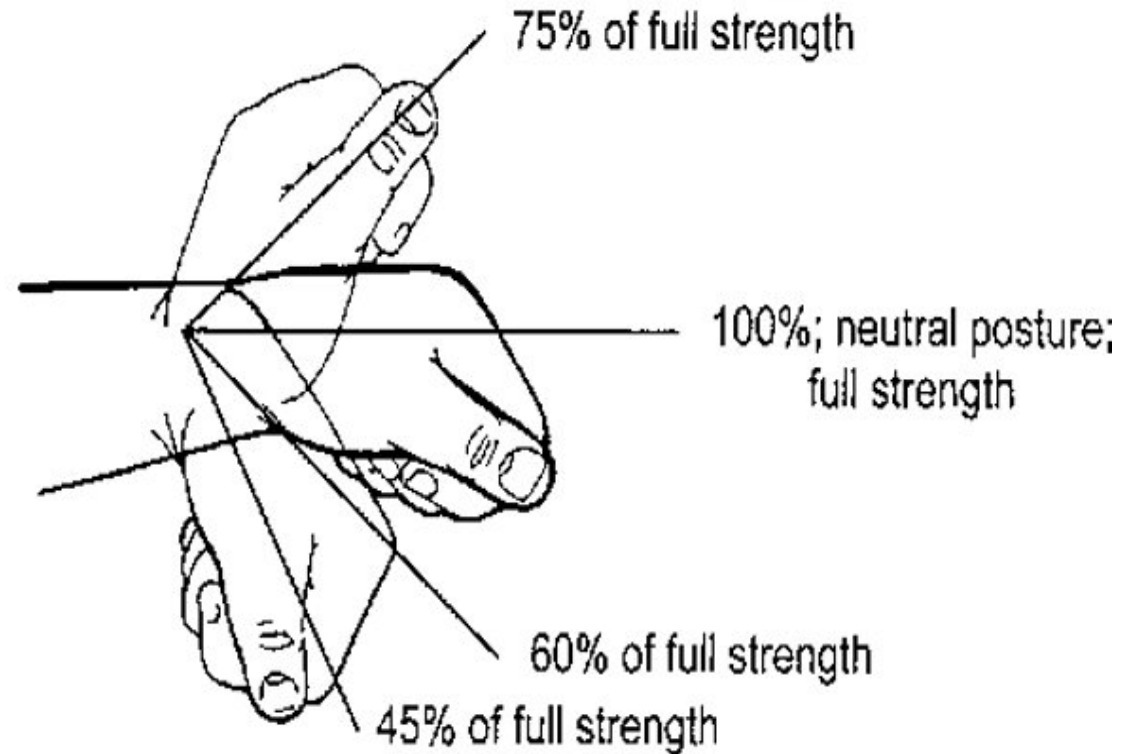
# Risk Factors for MSDs



# Awkward Postures

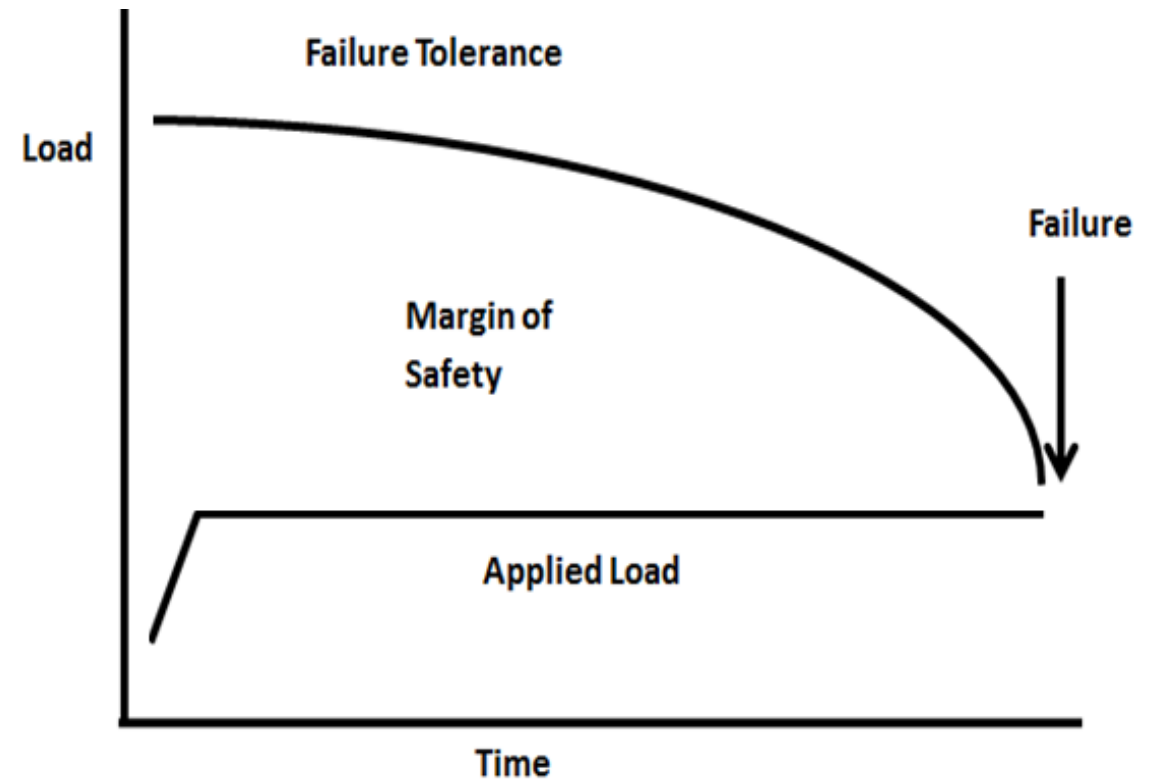


## Wrist Posture and Strength



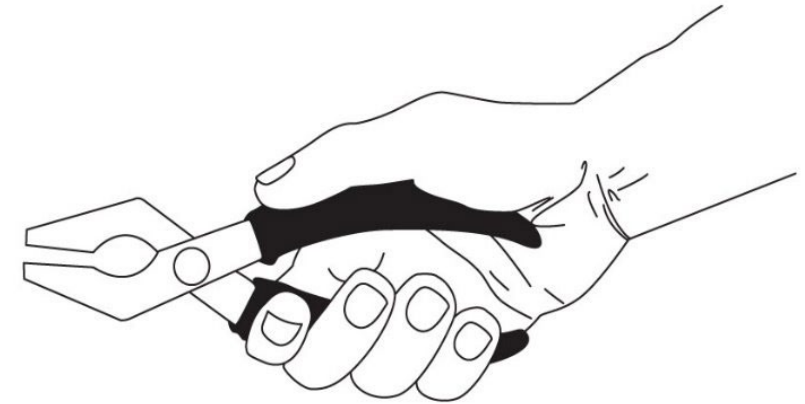
# Static Postures

- Static = held postures → reduced blood flow
- Muscles fatigue faster
- More time in one position = higher strain



# Contact Stress

- Hard surfaces press on tissues
- Decreased blood flow
- Can lead to awkward postures



# Psychosocial hazards

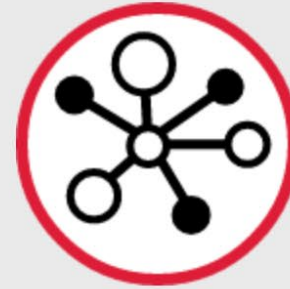
Some psychosocial hazards to look for, according to the Copenhagen Psychosocial Questionnaire, are:



Work Demands



Work Organization



Work Values  
(Social Capital)



Work Relationships



Work-Life Balance

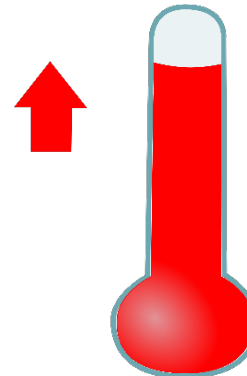
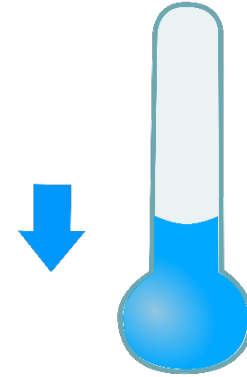


Offensive Behaviours

# Extreme Temperatures

## Extreme Temperatures

- Cold
  - Muscles and Tendons become less flexible
  - Blood circulation is reduced in arms and hands
- Hot/ Humid
  - Imposes strain on the body and increases dehydration

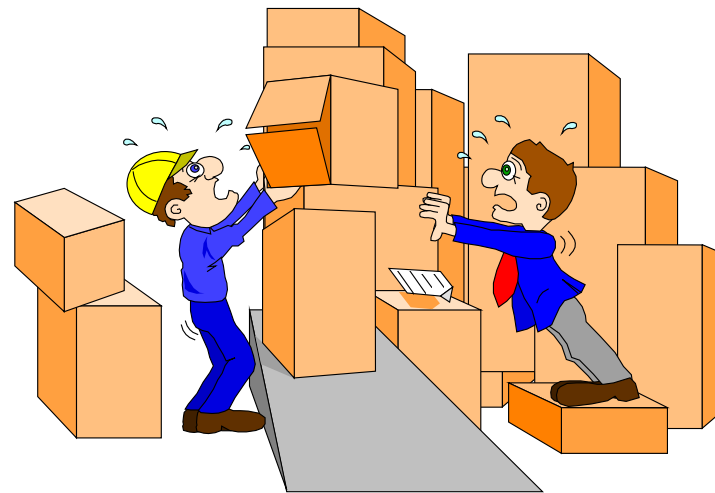


# Lifting is Affected By..

Object Weight

Object Size

Grip



Uneven  
load

Vertical and  
horizontal location

# How to Control for Hazards with an Ergo Mindset

Eliminate the hazard from the job

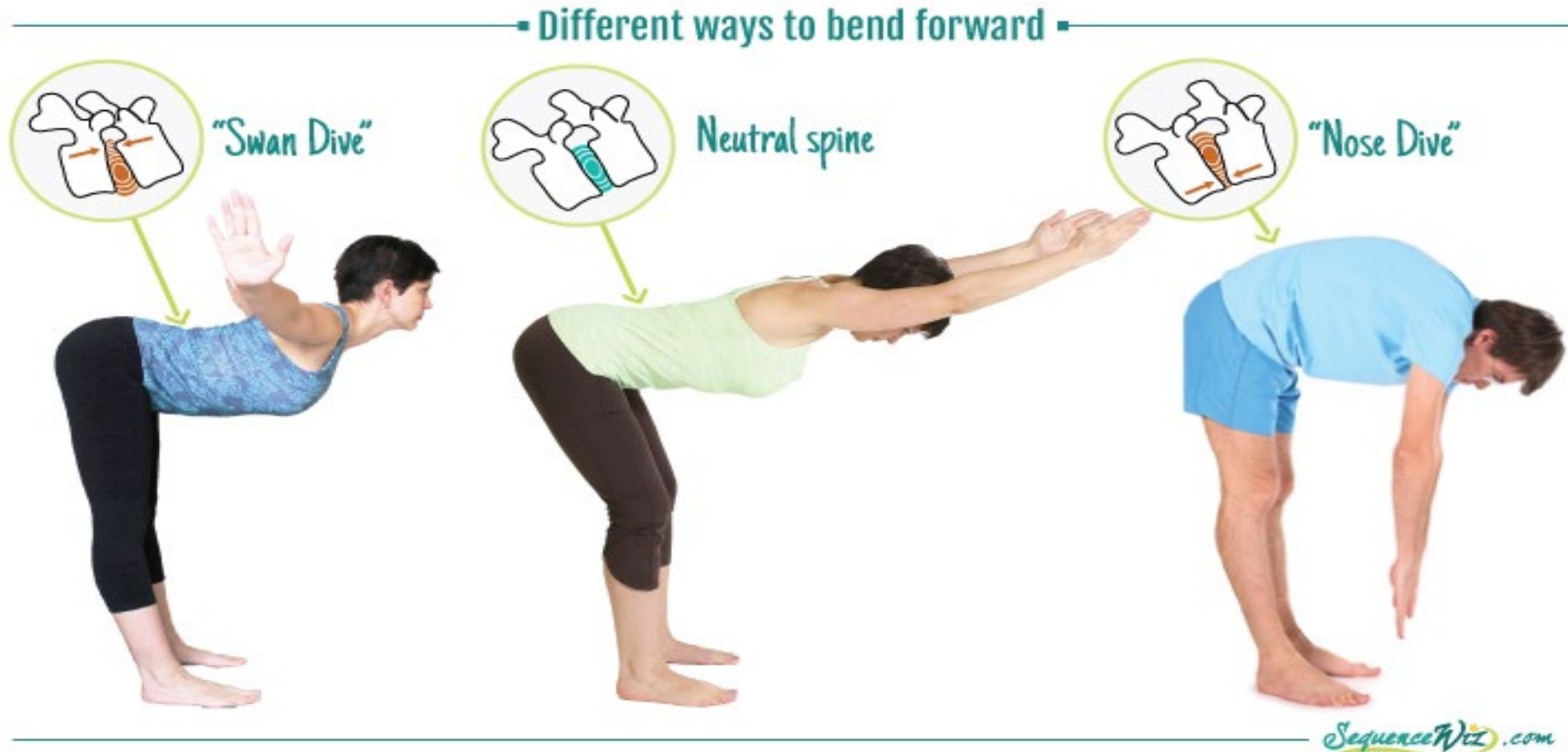
Replace the hazard

Isolate from the hazard

Training, job rotation, policies, etc

Equipment worn to reduce exposure  
(i.e. knee pads, gloves)

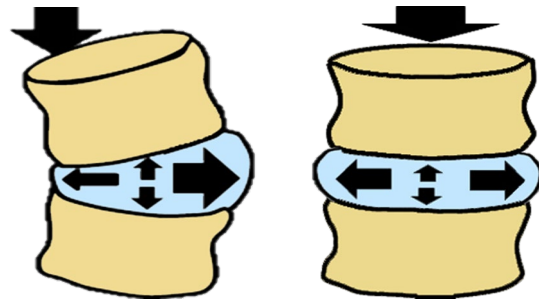
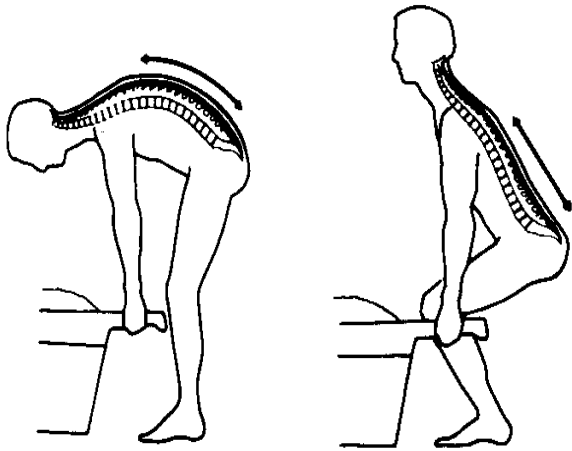
# Movement and the Spine



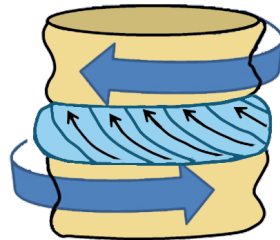
Sequencewiz.org

# A Common Lifting Technique....if appropriate

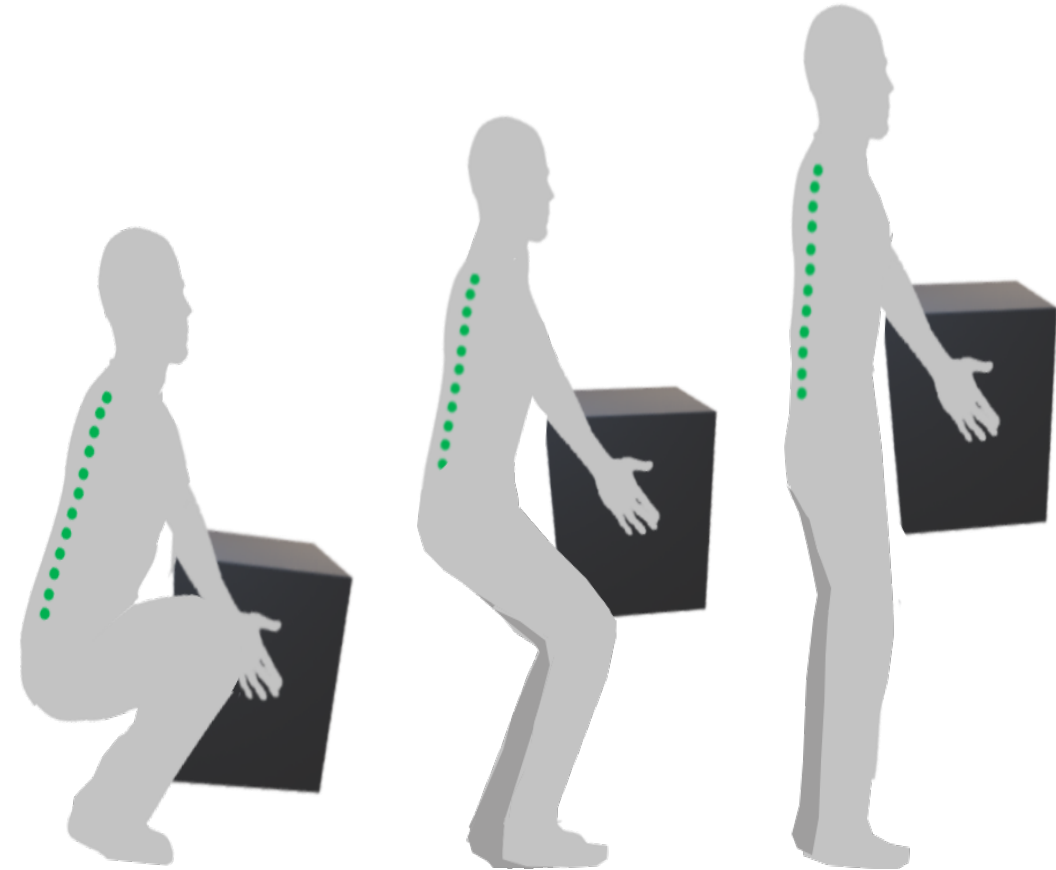
**B**ack Straight



**A**void Twisting



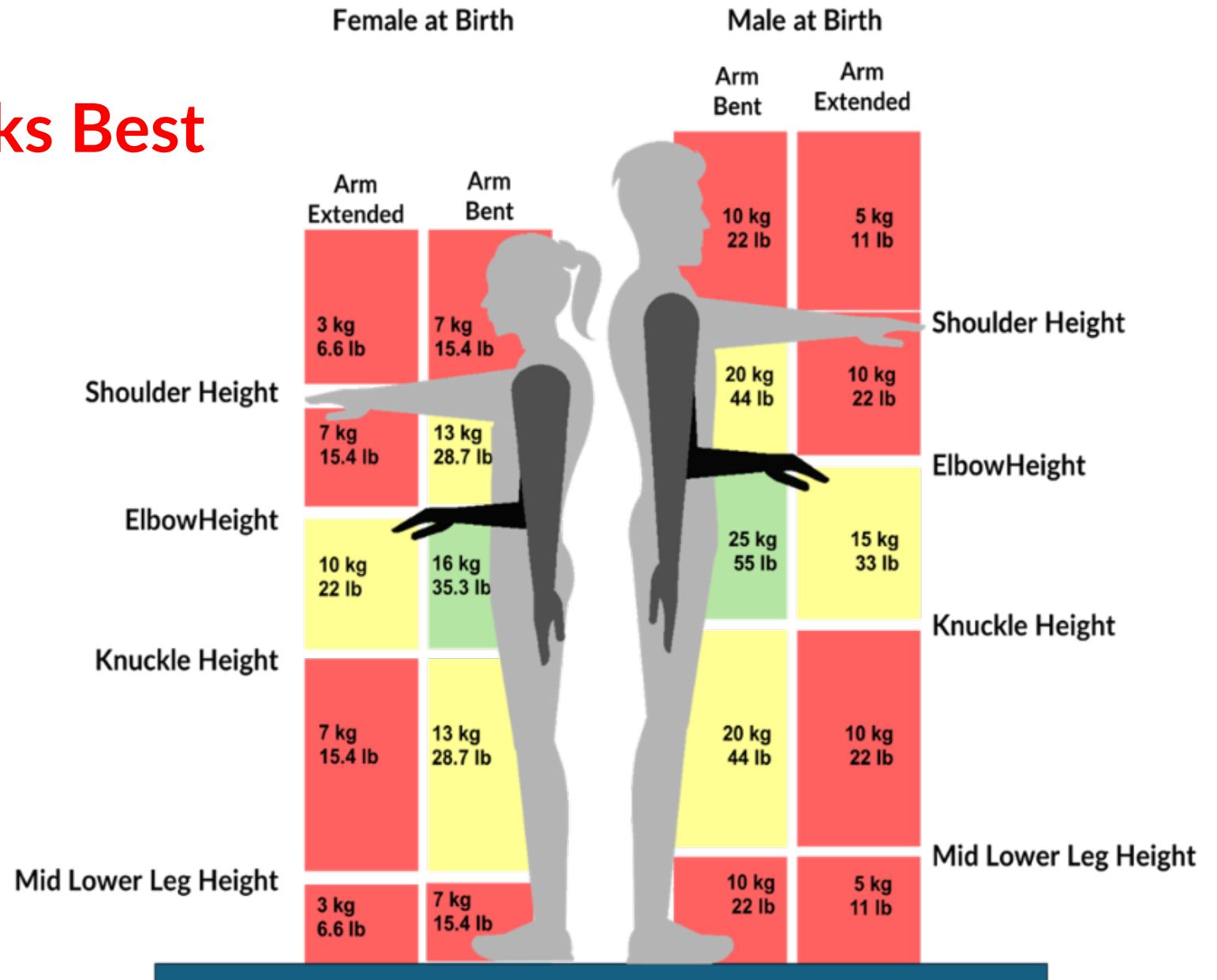
**C**lose to Body



**K**eep Smooth

# The Power Zone: Where Your Body Works Best

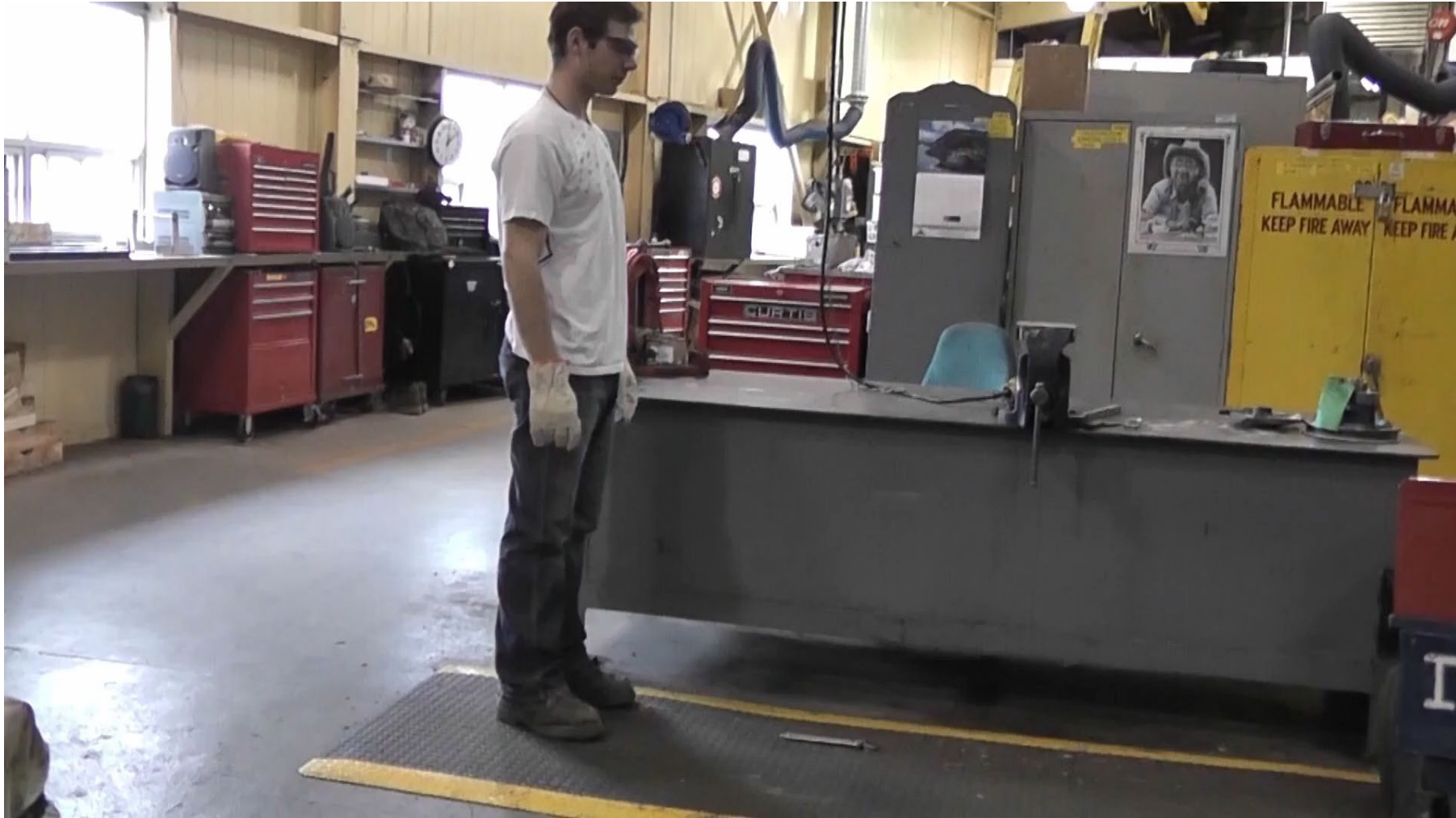
- Keep loads between mid-thigh and mid-chest
- Work close to the body
- Raise the center of gravity before lifting



# Tripod Lift



# Golfer's Lift



# By-Passing the Low Back – Arm on Thigh

Low back is loaded by forces from the long moment arm with the load of snow.



Resting the arm on the thigh directs some of the forces to the ground, by-passing the low back.

# Carrying Loads over a distance

- Use an aid if load is heavier than you can lift (Wheelbarrow, Dolly, Cart)
- Push rather than pull when possible
- Hands below shoulder height
- Neutral spine, move feet (no twisting)
- Use body weight, not arms only



# Why hand height matters



yardbutler.com

Images source: "Low Back Disorders: Evidence based prevention & rehabilitation" by Stuart McGill

# Grip

- Use a grip size that fits your hand comfortably.
- Choose tools that let you work in neutral wrist and arm postures.



# Caution on “Ergonomic” products

- Term is not protected
- Countless random items labeled ergonomic

## What to look for?

- Does it reduce the risk factors?  
Force, Awkward  
Postures, Repetition, Vibration, Workload
- Adjustability
- Fit
- Comfort
- Grip/stability

# Therapeutic/exercise devices vs. Ergonomic devices



<https://uncagedergonomics.com/products/base-standing-balance-board-anti-fatigue-mat>



<https://secretlabchairs.ca/products>

# Therapeutic/exercise devices vs. Ergonomic devices

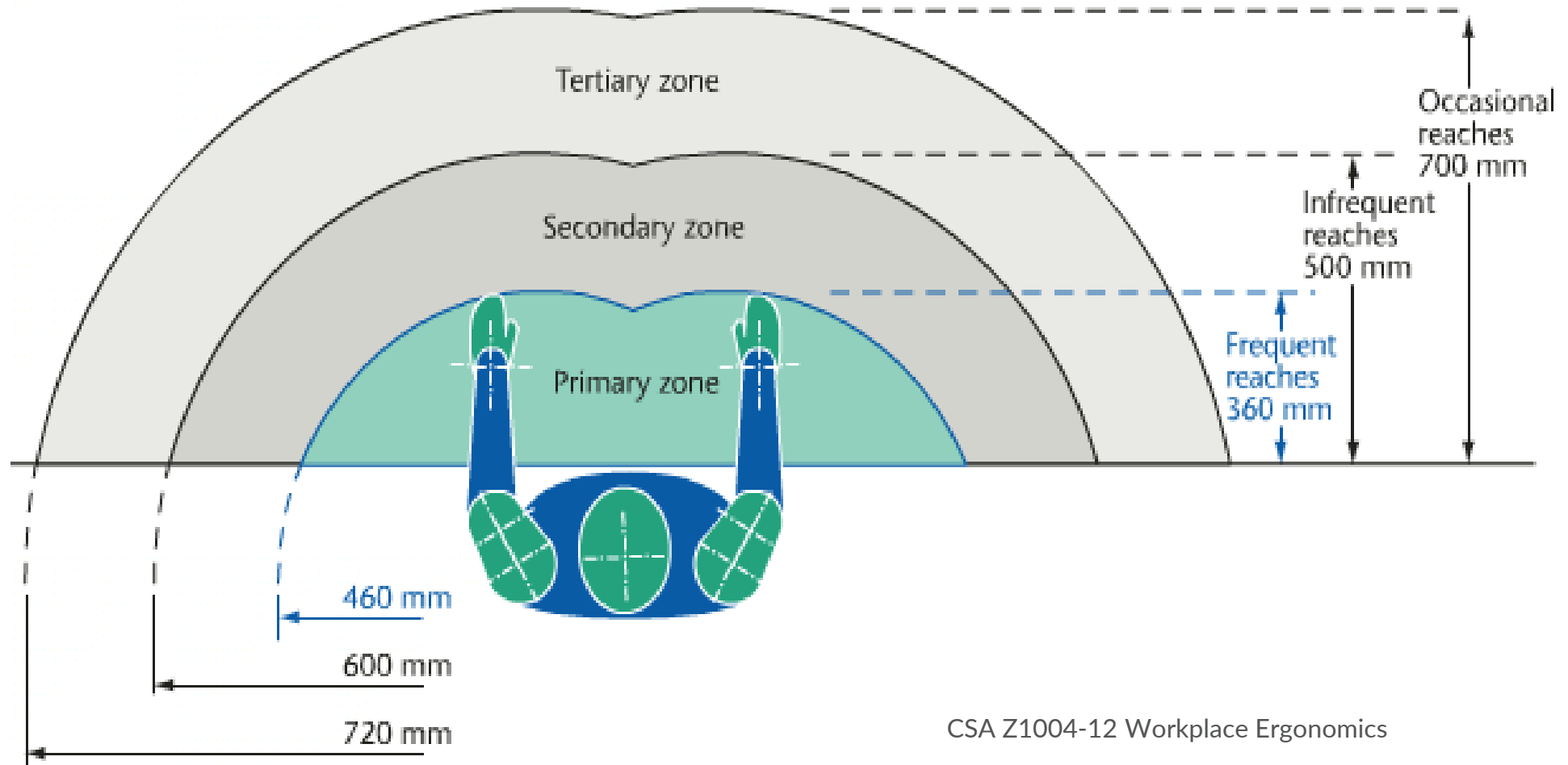


<https://noblepuma.com/under-desk-treadmill/>



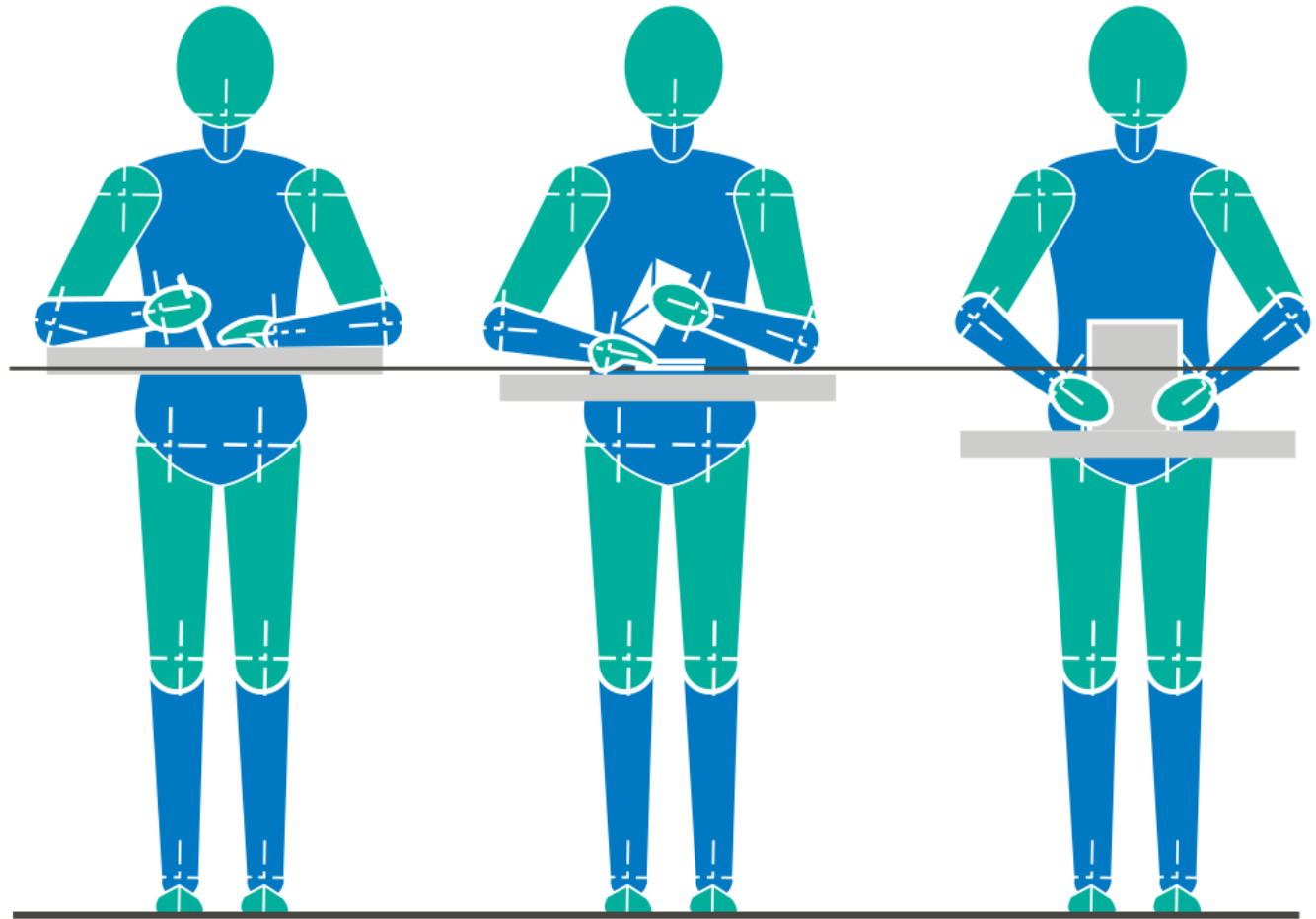
<https://bermuda.desertcart.com/products/380926059-dual-motor-adjustable-sit-standing-corner-desk-55inch-electric-height>

# Work Organization



CSA Z1004-12 Workplace Ergonomics

# Workstation heights



**Precise work:**  
4–6 cm above  
elbow height

**Light work:**  
5–10 cm below  
elbow height

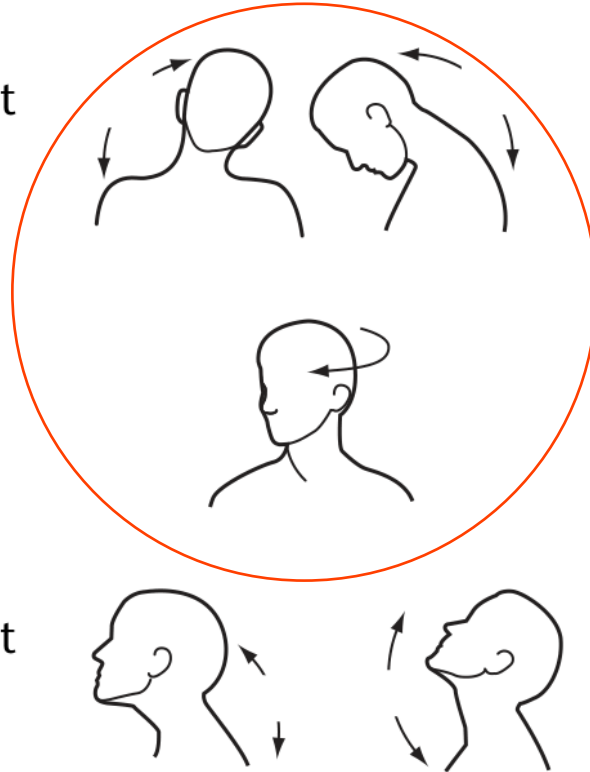
**Heavy work:**  
20–40 cm below  
elbow height

CSA Z1004-12 Workplace Ergonomics

# Design at Home

Maintain neck posture as close to neutral as possible. Avoid repetitive or prolonged use of the following awkward neck postures:

- Working with the neck bent forward or to the side:
- Working with the neck rotated either direction:
- Working with the neck bent forward/back:



CSA Z1004-12 Workplace Ergonomics

# Design at Home

Maintain neck posture as close to neutral as possible. Avoid repetitive or prolonged use of the following awkward neck postures:

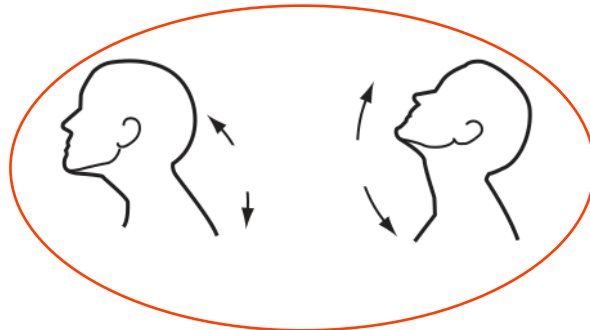
- Working with the neck bent forward or to the side:



- Working with the neck rotated either direction:

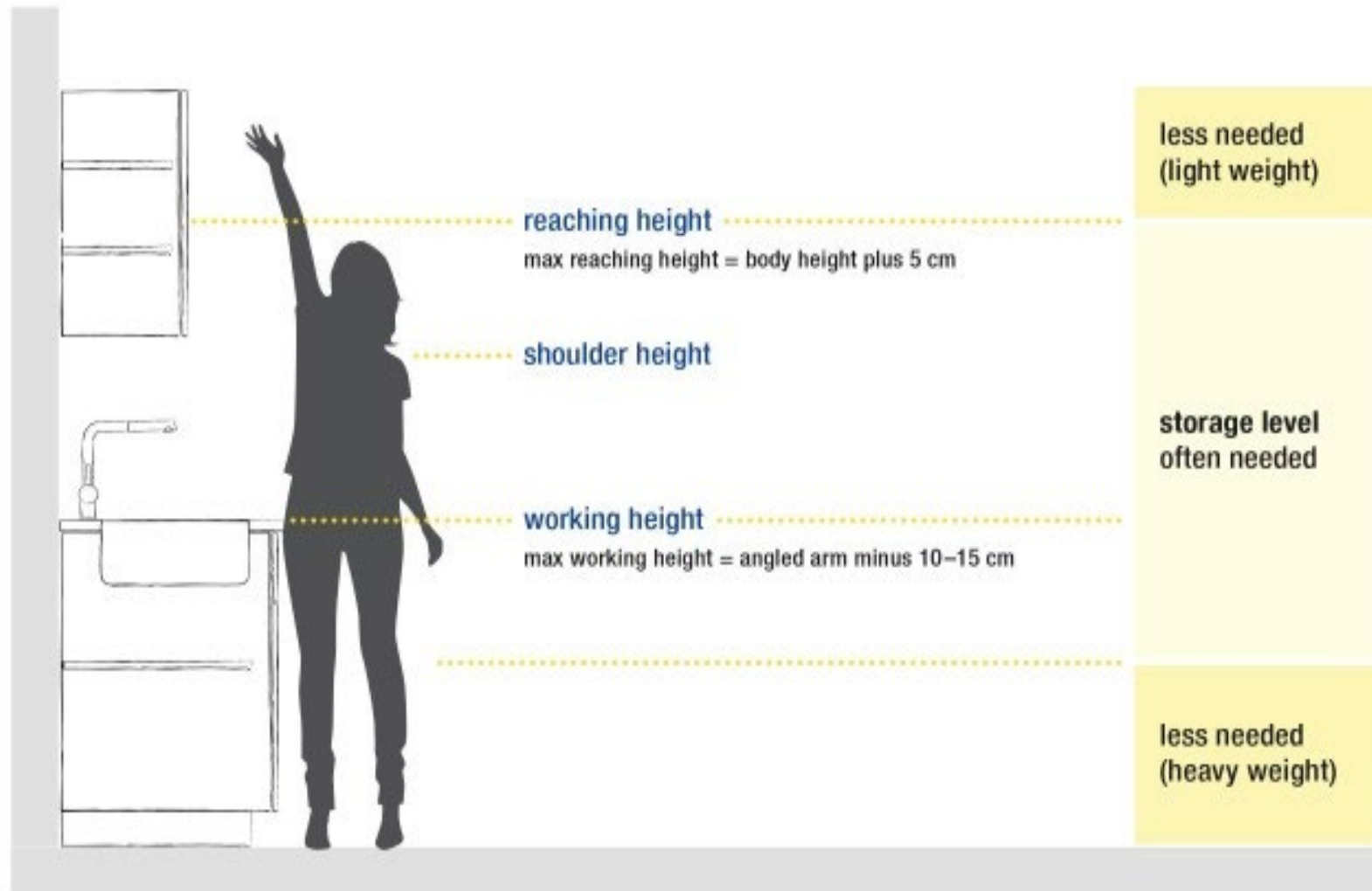


- Working with the neck bent forward/back:



CSA Z1004-12 Workplace Ergonomics

# Organization at Home



# Work Organization at Home

Maintain shoulder posture as close to neutral as possible. Avoid repetitive or prolonged use of the following awkward shoulder postures:

- Working with the hands(s) at or above the head:



- Working with the elbow(s) at or above the shoulder:



CSA Z1004-12 Workplace Ergonomics

Ropox.com

# Work Organization at Home



VS



# Sitting - Posture



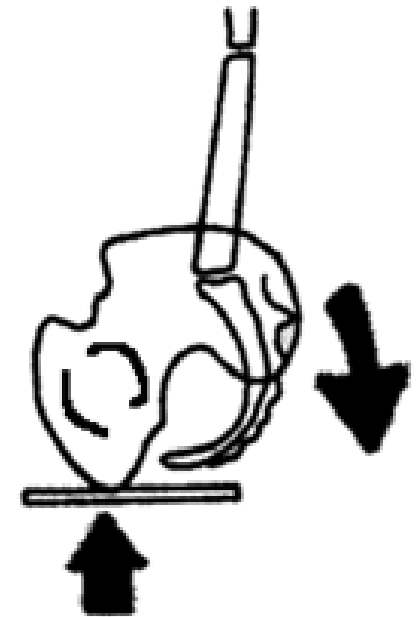
Standing:

- Curved lower back
- Normal disc pressure



Sitting:

- Flat lower back
- Higher pressure on discs



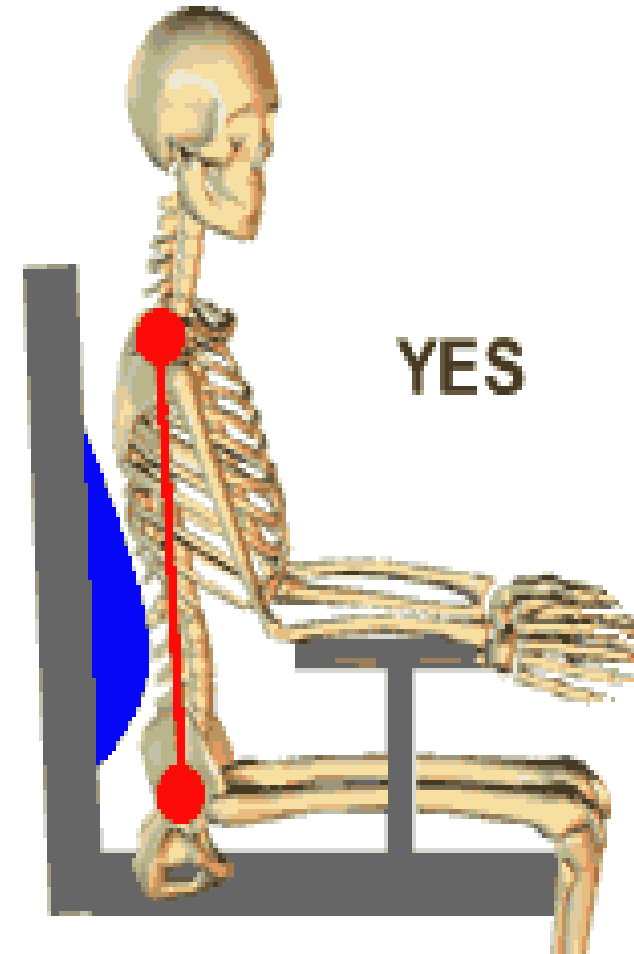
<https://www.pexels.com/photo/photo-of-man-sitting-on-couch-3757065/>

Zimmermann, Cook, & Rosecrance, 1997

# Sitting - Need support for Lumbar Curvature

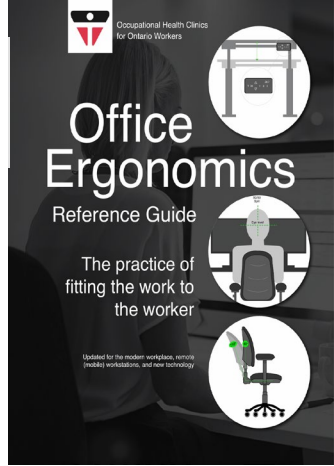
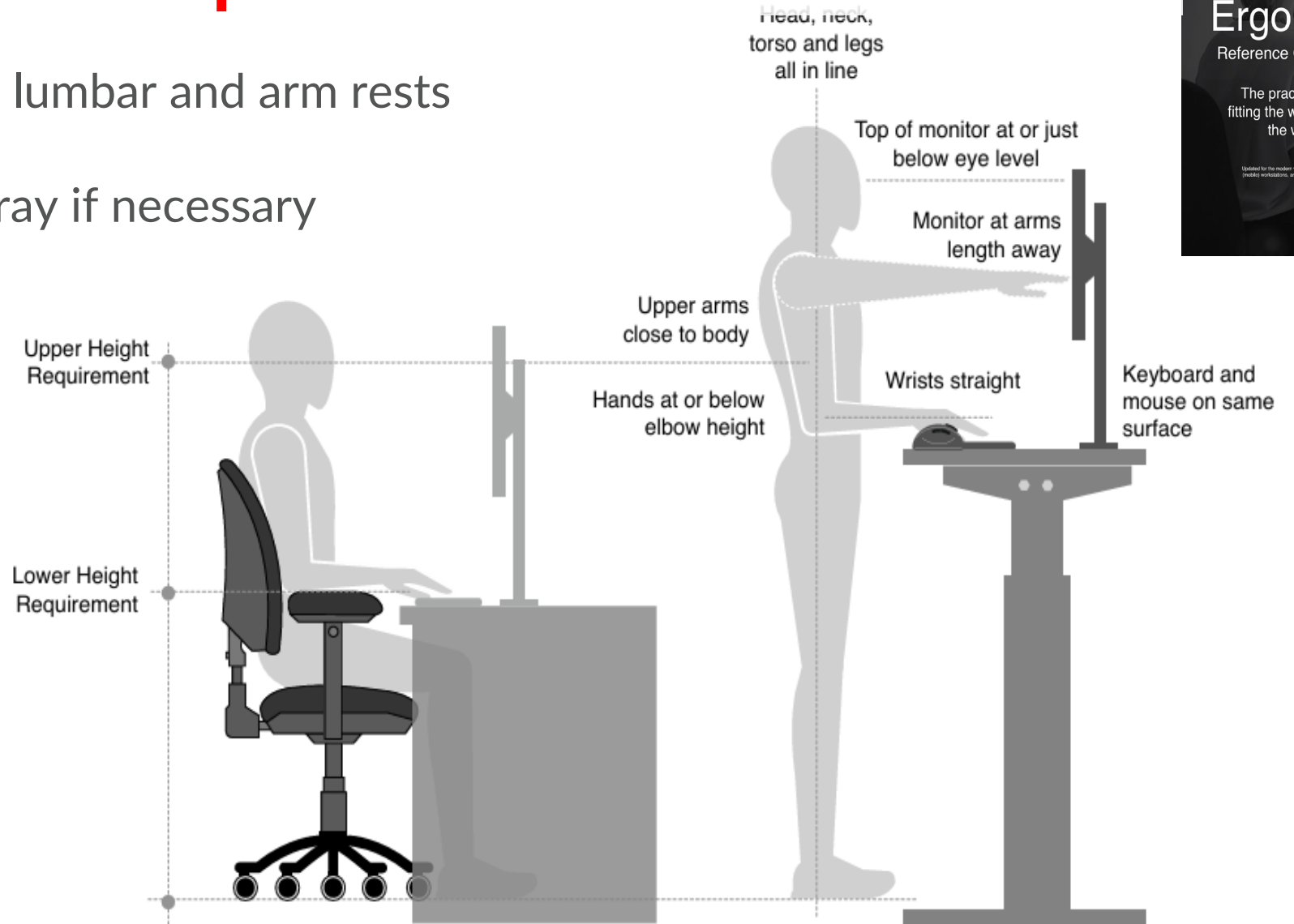


<https://www.youtube.com/watch?v=VWD-wJVmGgl>



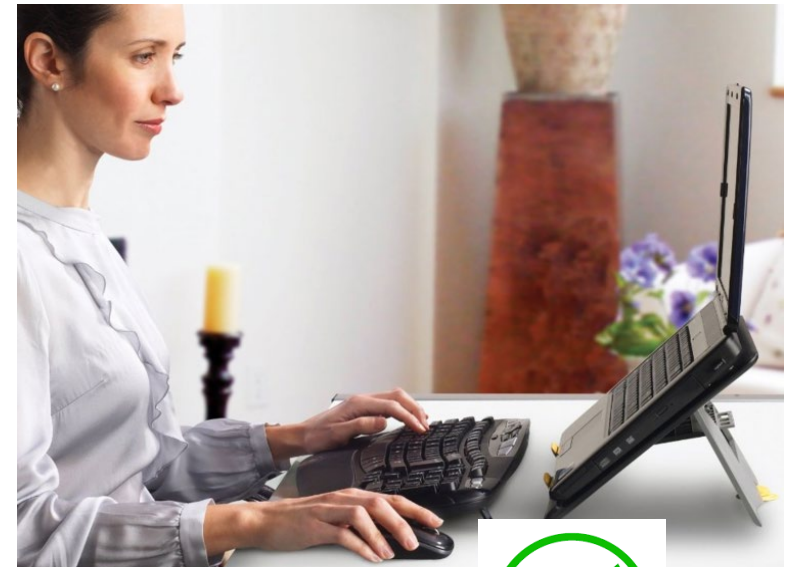
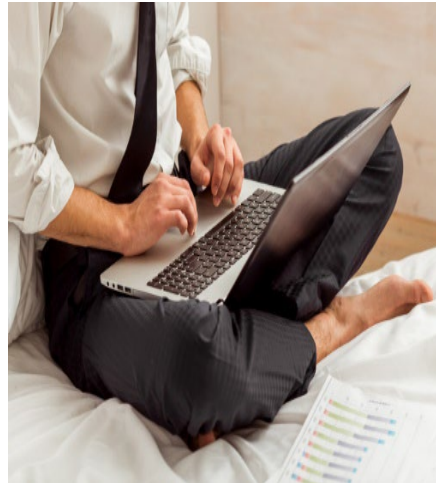
# Technology Use - Computers

- Fully adjustable chair – lumbar and arm rests
- Height adjustable desk
- Footrest or keyboard tray if necessary



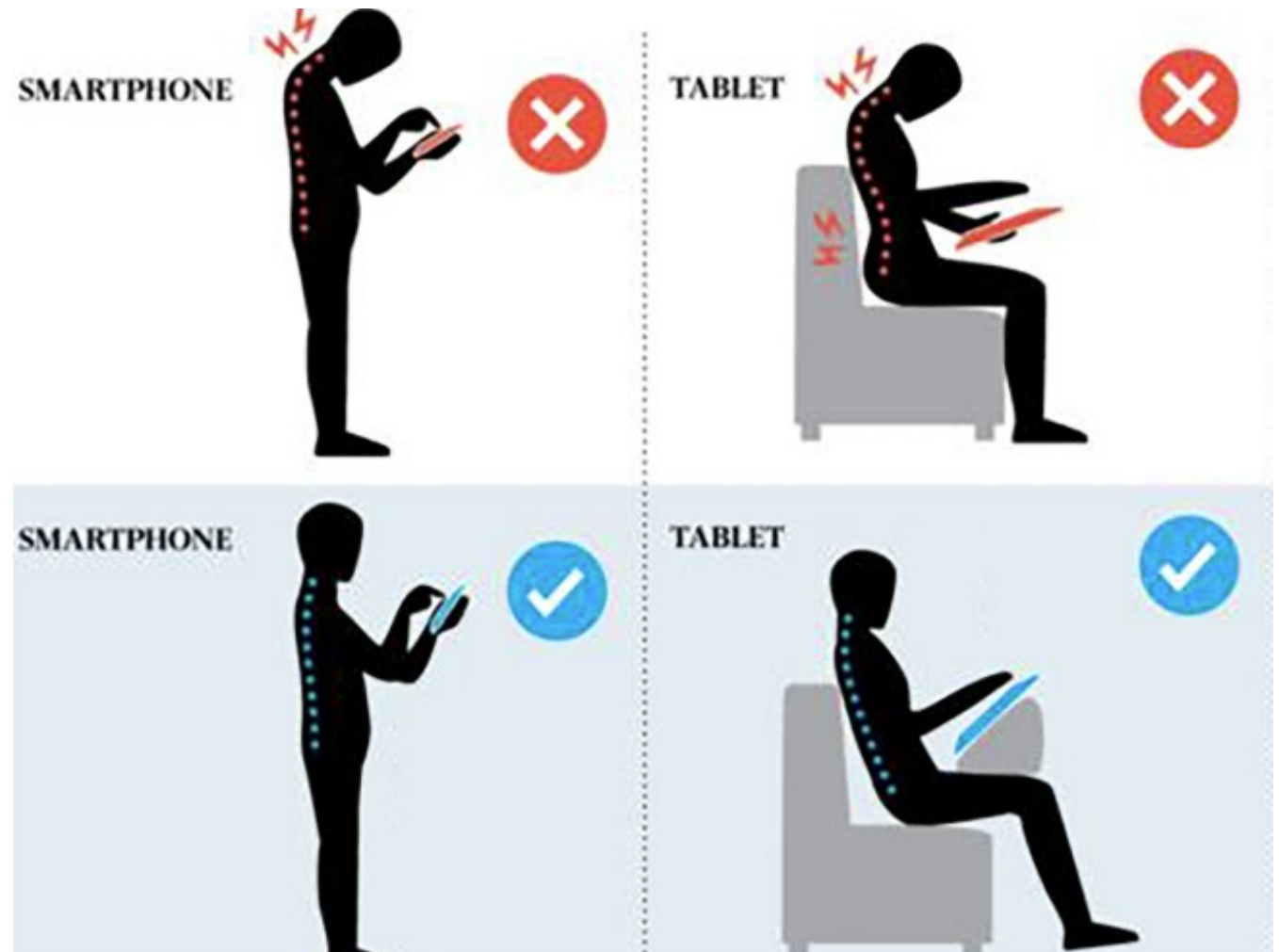
# Technology Use - Laptops

- Separate the keyboard and monitor
  - External monitor, docking station, laptop riser
  - External Keyboard and Mouse

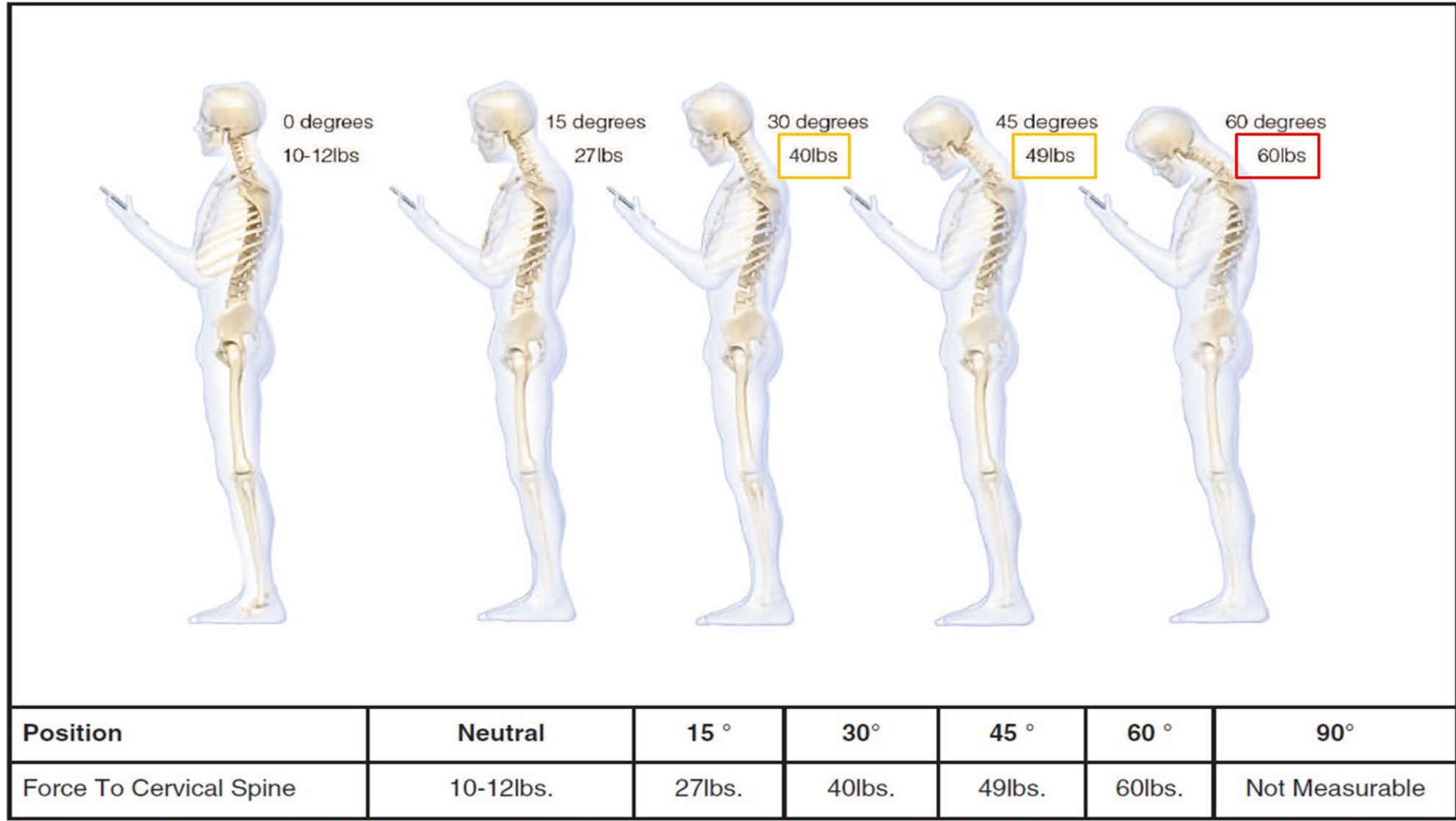


# Technology Use - Tablets and Phones

- Bring phone to eye level, support arms if possible
- Using two hands instead of single-hand
- Explore different grips
- Use voice to text and text to voice



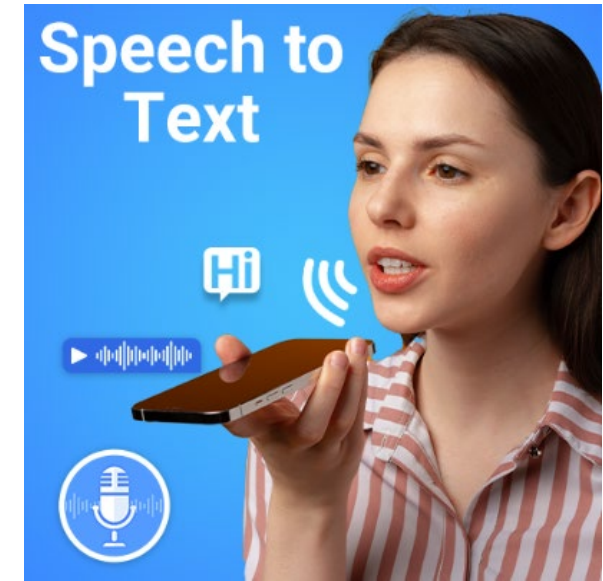
<https://pondic.com/how-to-improve-your-posture-naturally/>



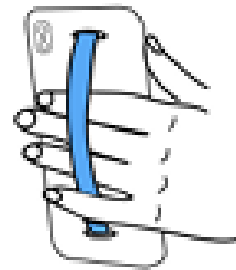
**Figure 1. The weight seen by the spine increases when flexing the neck at varying degrees. An adult head weighs 10-12 pounds in the neutral position. As the head tilts forward the forces seen by the neck surges to 27 pounds at 15 degrees, 40 pounds at 30 degrees, 49 pounds at 45 degrees and 60 pounds at 60 degrees.**

Source: Kenneth K. Hansraj, MD. Assessment of Stresses in the Cervical Spine Caused by Posture and Position of the Head. Neuro and Spine Surgery. Surgical Technology International XXV.

# Texting and Phone use



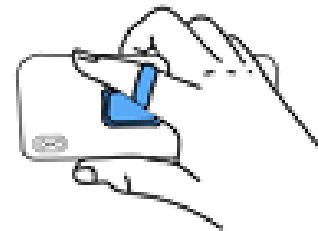
ELASTIC GRIP



RING GRIP



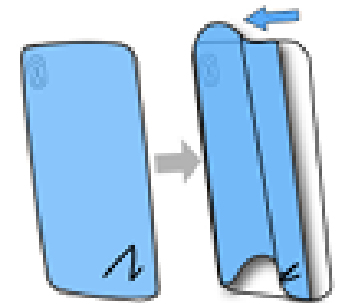
MAGNETIC RING



PERSONAL 3D PRINTED ERGONOMIC CASE



FOLDABLE PHONE BACK



(Teo Babic, Harald Reiterer, and Michael Haller. 2018)

# Ideal driving posture

- Arms close to sides
- Wheel 10-12 inches away
- Elbows slightly bent
- 9 and 3 positions with both hands on the wheel
- Beware resting elbow on window edge
- Foot able to be fully on pedal without back coming off seat

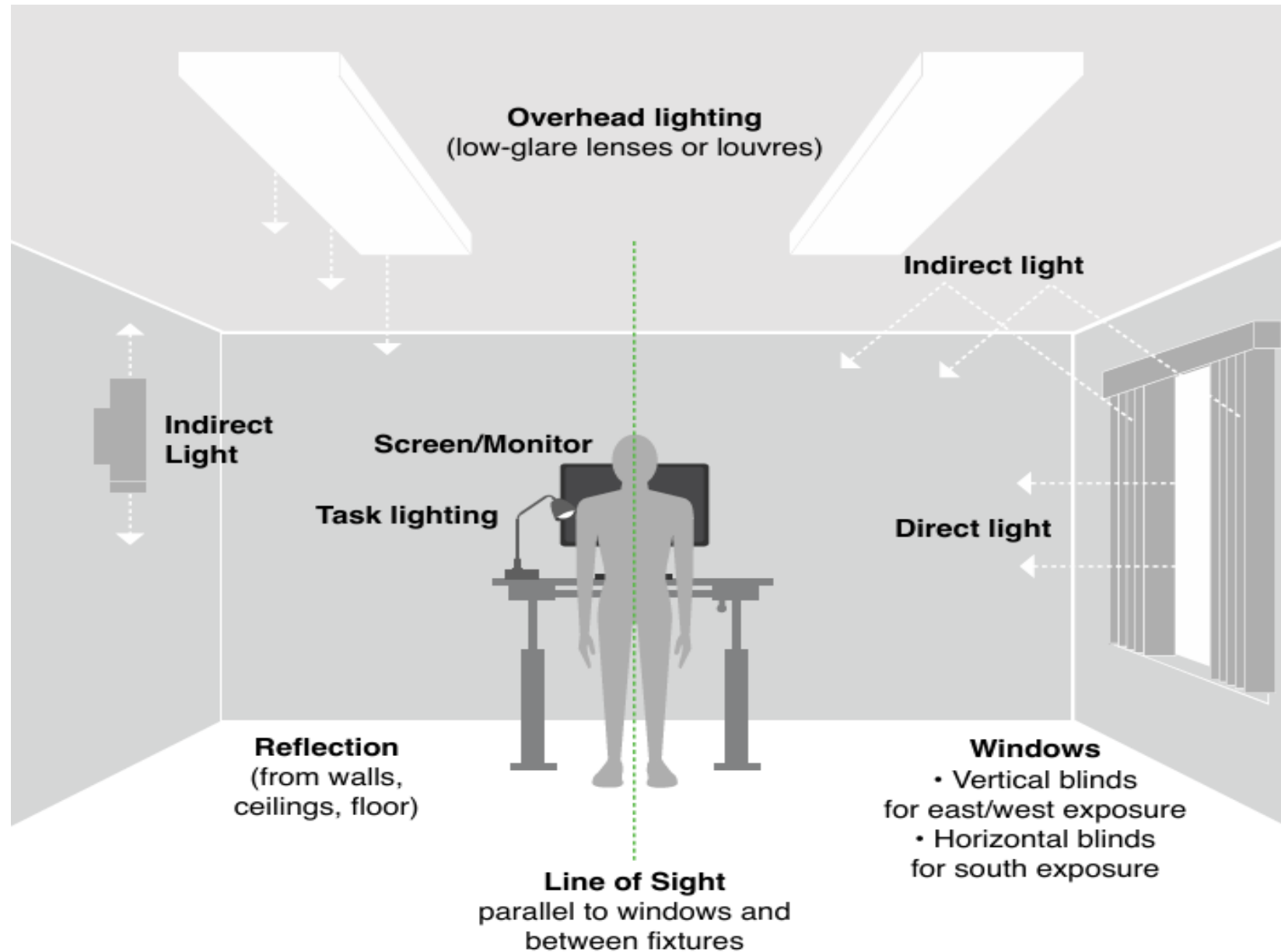


- Head 3 inches above wheel
- Ear in line with collarbone
- Head 1 inch from head restraint
- Back of head positioned in middle of HR

- Seat tilt at 100-110 degrees
- Lumbar support in lumbar curve
- Upper back against seat

- Knees in line with hips
- flat distribution of pressure with leg on seat
- 2-3 fingers space between edge of seat and lower leg

# Lighting



# MMH at Home



# MMH at Home - Controls

## Controls:

- Change from Lifting to Pushing/Pulling: Garbage & Recycling Bins, Strollers
- Automation: self propelled lawn mower, Roomba, hedge trimmers
- Decrease the weight: put less clothes in the laundry basket, light weight tools & vacuum
- Rotate body parts used, have a plan.
- Equipment: proper handle length, ensure it is clean, use gloves to improve grip



# Lifting - children



OHCOW Safe Lifting Techniques of Children

<https://www.youtube.com/watch?v=OJdHdKbAS6s>

# Lifting - Changing the bedsheets

"The marketplace of ideas!"



**Attach the blower to the MattressJack®.**



**Put your mattress on top.**



**Let the MattressJack® lift your mattress.**

# Lifting - Laundry

- Reaching into front-load washer/dryer
- Lifting laundry baskets close to the body
- Avoid twisting when moving wet laundry



VS



# Lifting - Garbage Removal



**Deluxe Polaris**  
with No-Lift, Ergonomic  
Bag Removal



# Accessing your vehicle



chrysler.com

VS



paulstaatiou.com

# Lifting - Removing items from trunk of car

- Warm up after long drives (walk, light movements) before handling loads.
- Get close to the load using good MMH posture and an organized trunk.
- Reduce effort: park close, use wheeled bags, and take multiple small trips.



# Lifting - Removing items from trunk of car



# Shoveling

- Select lightweight shovels with an ergonomic handles
- Push, don't throw
- Select a handle that reaches your chest height
- Avoid twisting
- Metal vs Plastic
- More shoveling > Heavy loads



# Picking the Right Snow Shovel

Weight of Snow per Cubic Foot				
	Light/Dry Snow	Wet/Heavy Snow	Compacted Snow	Ice
Snow Density (lb/cu ft)*	3 lb/cu ft	21 lb/cu ft	30 lb/cu ft	57 lb/cu ft

If an individual were to clear a 16ft by 30ft driveway covered in one foot of wet snow, they would be moving approximately 4 tons of snow!

# Repetition and Awkward Postures - Cleaning/Chores

- Automated cleaning tools
- Long-handled brushes and scrubbers
- Brushes and sprayers with more comfortable grips
- Vacuuming with neutral spine (avoid twisting)
- Mopping/sweeping using body weight vs. arm-only force
- Kneeling vs. squatting when cleaning low surfaces



Picture: <https://www.microfiberwholesale.com>



# Gardening



# Home & Yard Work



<https://mobilizept.com/2016/raking-leaves-dos-donts/>



<https://www.stepsto.com.au/a-guide-to-choosing-an-electric-leaf-blower/>

VS



<https://snowblowerchoice.com/best-snow-blowers/>

# Sleeping Posture

## Do's & Don'ts of Sleeping Positions to Relieve Back and Neck Pain

**Do's**

**Don'ts**

Supine Position



Side Lying



Prone Lying



<https://www.youtube.com/@ohcowclinics>



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the Occupational Health Clinics for Ontario Workers promotes safe and healthy workplace...more

[ohcow.on.ca](http://ohcow.on.ca)

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# OHCOW Video Links

- Ergonomics and sleep <https://www.youtube.com/watch?v=Dr1p-CxEHtMgo>
- Driving and working from your car  
<https://www.youtube.com/watch?v=NfSGfQURbWI>
- Snow shoveling <https://www.youtube.com/watch?v=qKoVA2YNiqo>
- Manual material handling <https://www.youtube.com/watch?v=G76Y6YtYmdA>
- Pushing and pulling techniques  
<https://www.youtube.com/watch?v=1WPHK2YrUdI>

# Thank You

If you have any questions about this presentation,  
please contact me at the email below

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**[www.ohcow.on.ca](http://www.ohcow.on.ca)**