

The Implications of Sit-Stand Workstations

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Clinics for Ontario
Workers Inc.

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

IS
SITTING

There's no running away from it:
The more you sit, the poorer your
health and the earlier you may die.

no matter how fit you are

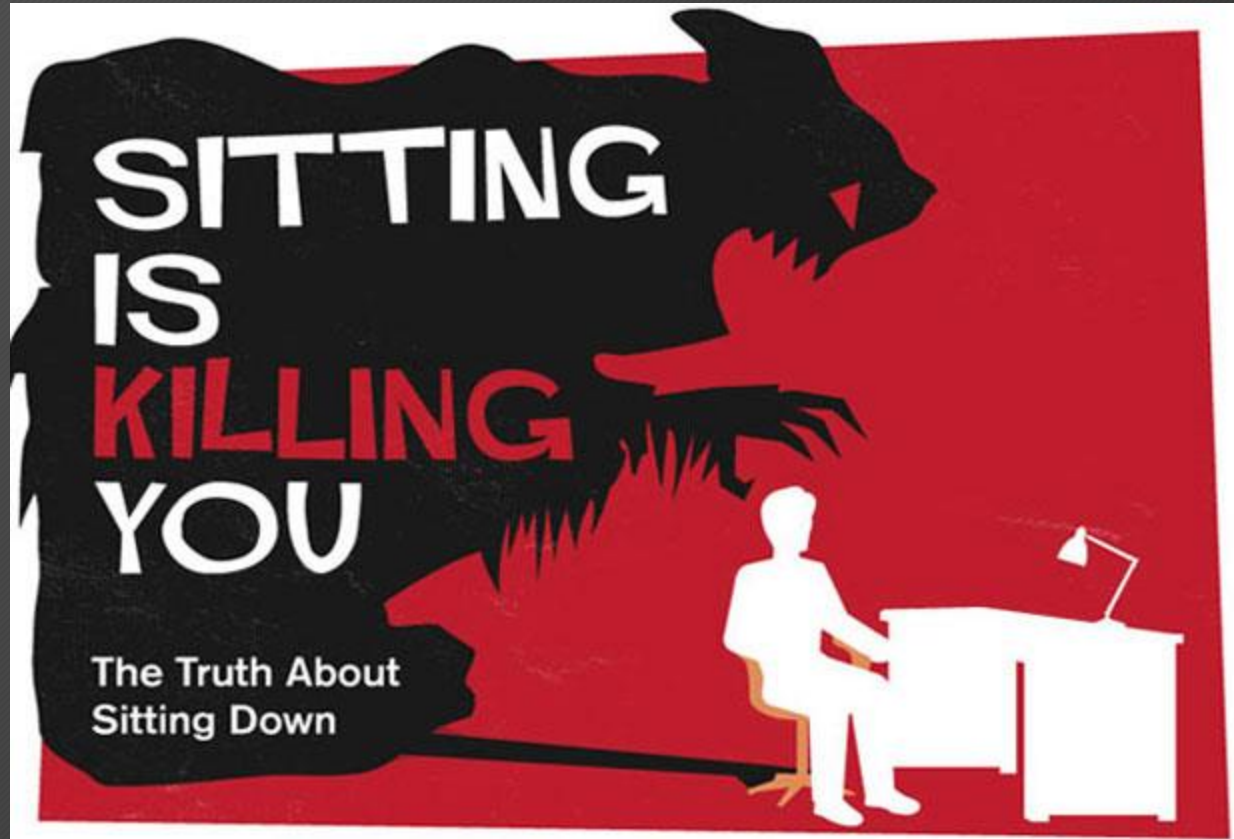


THE NEW
SMOKING

BY SELENE YEAGER

PHOTOGRAPH BY Nick Ferreri





**SITTING
IS
KILLING
YOU**

The Truth About
Sitting Down



HOW SITTING
WRECKS
YOUR BODY

“SITTING IS THE NEW SMOKING”

**Globe and Mail - “Sitting is the new smoking,
and it’s time to quit”,**

**CBC news - “Sitting for too long can kill you,
even if you exercise”,**

**CNN - “Sitting will kill you, even if you
exercise”.**

Sedentary Behaviours



- Individuals spend an average of 9 hours and 43 minutes per day sitting (Statistics Canada, 2015).
- 69% of days are spent being sedentary (Statistics Canada, 2015)
- A standing/walking occupation was associated with lower risk of all-cause deaths and cancer mortalities, compared to sitting occupations (Stamatakis et al., 2013).

Reducing Sedentary Behaviours at Work



- Fitness Programs
- Walking during lunches or breaks
- Promoting stair use
- Workplace-based physical activity programs
- Stretching or resistance training
- Sit-stand workstations

Potential Benefits of a Sit-Stand Workstation



- Musculoskeletal Benefits
- Productivity Improvements
- Vascular Benefits

Musculoskeletal Benefits



- Back pain and discomfort are significantly reduced when comparing sit-only workstations to sit-stand stations
- Decreases the slumped posture



Productivity Improvements



- Washington State University - Median productivity increase of 12% following the introduction of a sit-stand workstation
- Gifford (2013) - Standing led to up to 10% more productivity.
- Increases energy level in the office
- Share ideas more actively

Vascular Benefits



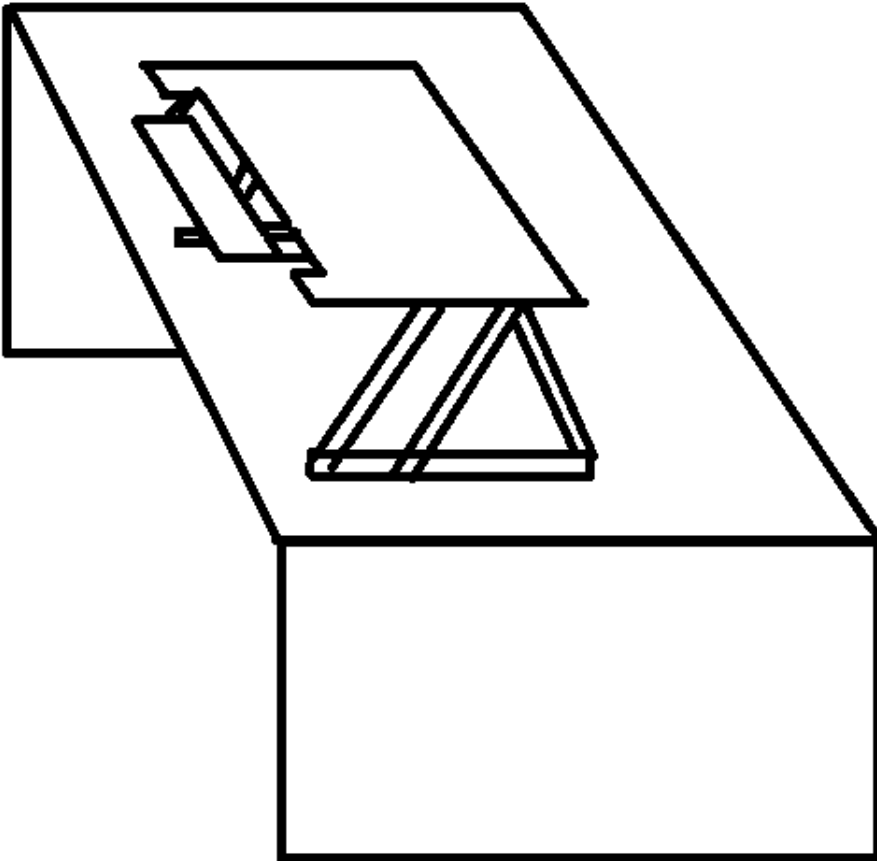
- Prolonged static seated computer work negatively influences the oxygen saturation and blood flow
- Swelling of the lower extremities produces a sense of cold, numbness, and discomfort. In the long term, chronic edema may result in circulatory disorders including varicose veins.
- Pressure in the popliteal ford, the posterior region, or the knee where major blood vessels and nerves course the lower leg and foot, can restrict blood flow

Types of Sit-Stand Workstations



- 1) Desk surface system
- 2) Desk-mount sit-stand workstations
- 3) Fully Height-adjustable workstations

Desk Surface System



Benefits

- Cost-effective
- Fits in small spaces and on any work surface

Risks

- Awkward posture when lifting to stand position
- Force required to lift to stand position
- In the seated position, the keyboard is above desk height

Desk Surface System



Average Desk Height = 75cm

Men Anthropometric Data - Seated Elbow Height

Mean	5 th percentile	95 th percentile
68.8	59.4	78.2

Women Anthropometric Data - Seated Elbow Height

Mean	5 th percentile	95 th percentile
64.3	56.0	72.1

Desk-Mount Workstations



Source: Ergotron, 2017

<http://www.ergotron.com/en-us/products/product-details/33-341#/>

Desk-Mount Workstations



Benefits

- Cost-effective
- Easy to maneuver
- Fits in small spaces and on any work surface
- Keyboard sits below desk height

Downfall

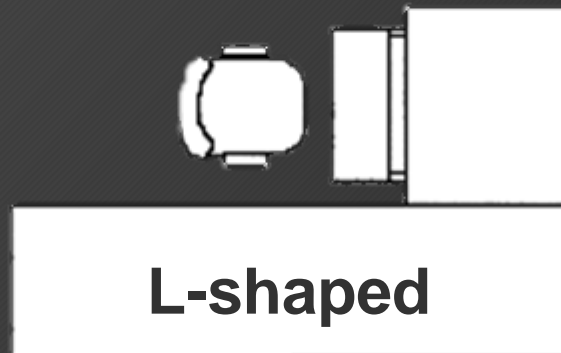
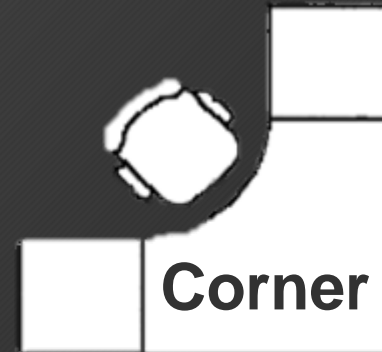
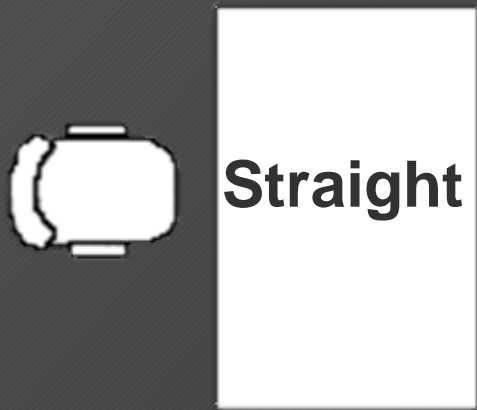
- Re-adjust every time
- Keyboard too high for shorter individuals
- Can't adjust distance of monitors
- No height-adjustable work surface



Source: Ergotron, 2017

<http://www.ergotron.com/en-us/products/product-details/33-341#/>

Height-Adjustable Workstation



Height-Adjustable - Crank



Risk

- L-shaped sit-stand workstations with crank are difficult to lift
- Effort needed to crank - Less likely to change position

Model: Ikea Skarsta

Source: Ikea, 2016

<http://www.ikea.com/ca/en/catalog/products/S49084965/>

Height-Adjustable - Lever



Risks

- L-shaped sit-stand workstations with lever are heavy to lift

Model: Ergotron WorkFit-D

Source: Ergotron, 2017

<http://www.ergotron.com/en-us/products/product-details/24-271#/>

Height-Adjustable - Electric



Height-Adjustable - Electric



Benefits

- Permits the entire work surface to be adjusted
- Ergonomically the best option

Downfalls

- Price
- Some are not available/purchased with an extended range (standard is 27 ½ inches or 70cm)

Anthropometrics



Sit-stand desk without extended range = 70 cm

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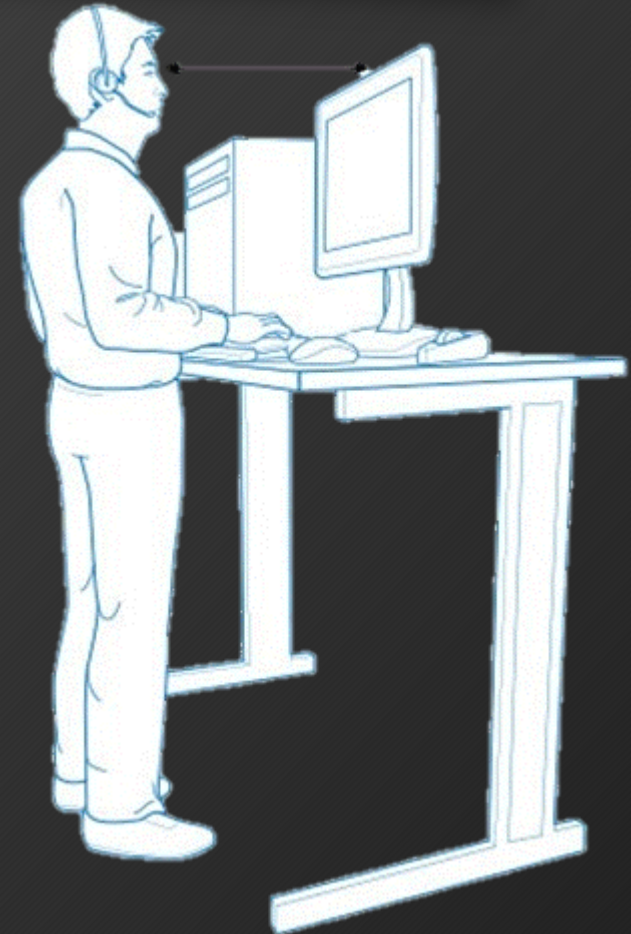
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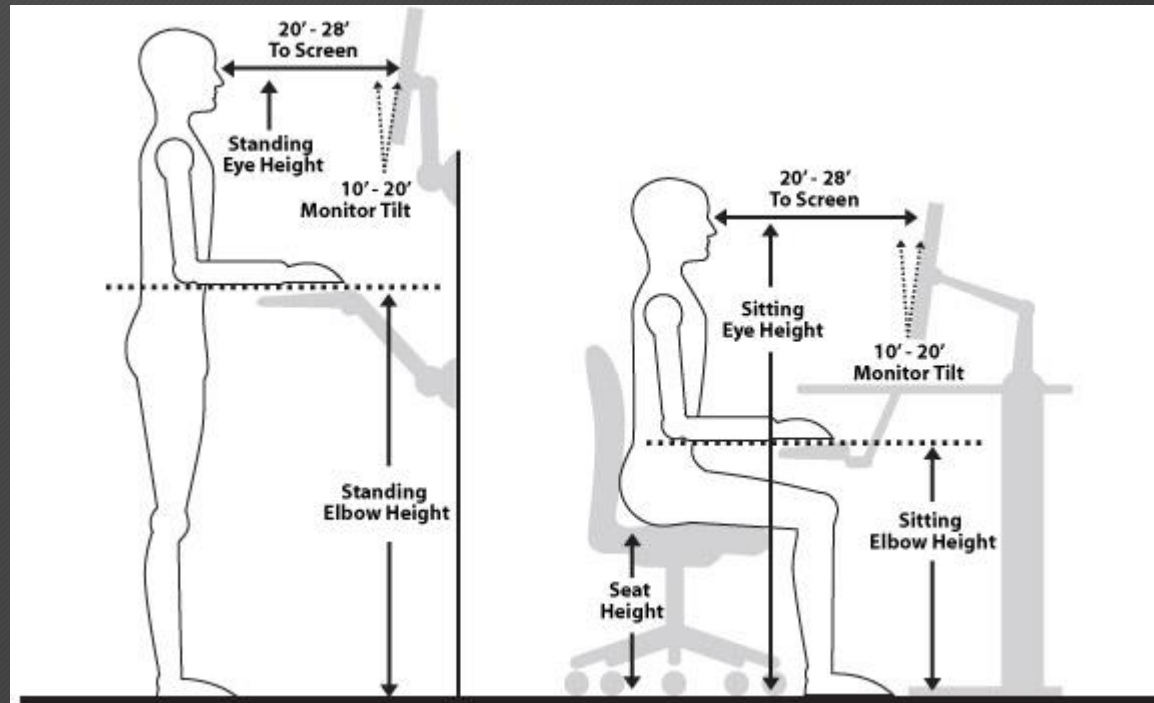
Keyboard Height



- Want elbow joint at 90° with shoulders relaxed
- Some may feel more comfortable with elbow joint greater than 90°
- Keep arms close to body



Keyboard Height



Wrist Rest



Improves wrist angle while typing and reduces pressure point on wrists

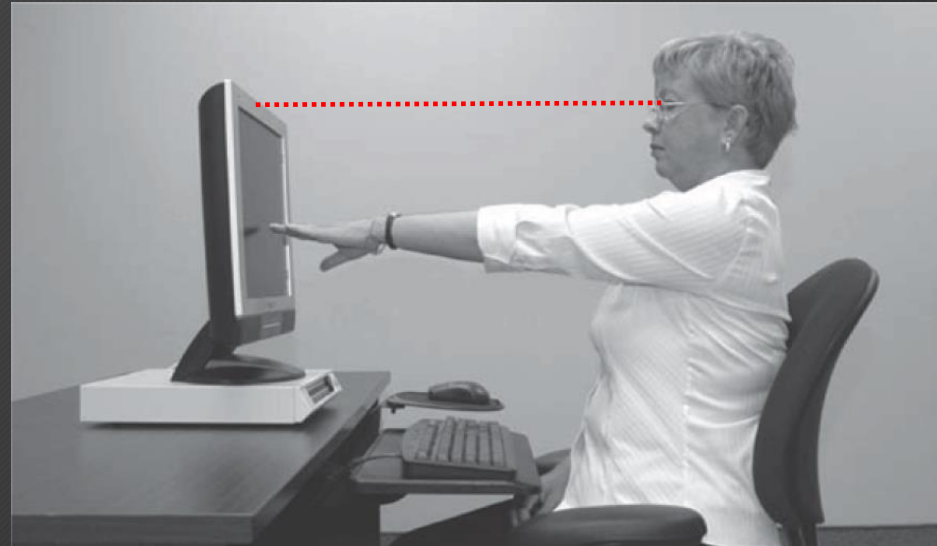


Screen Height - Ideal



The monitor should be:

- Directly in front of user
- Situated at seated eye level
- Arm's length away from user



Screen Height - AVOID



When the monitor is too low, the neck is flexed

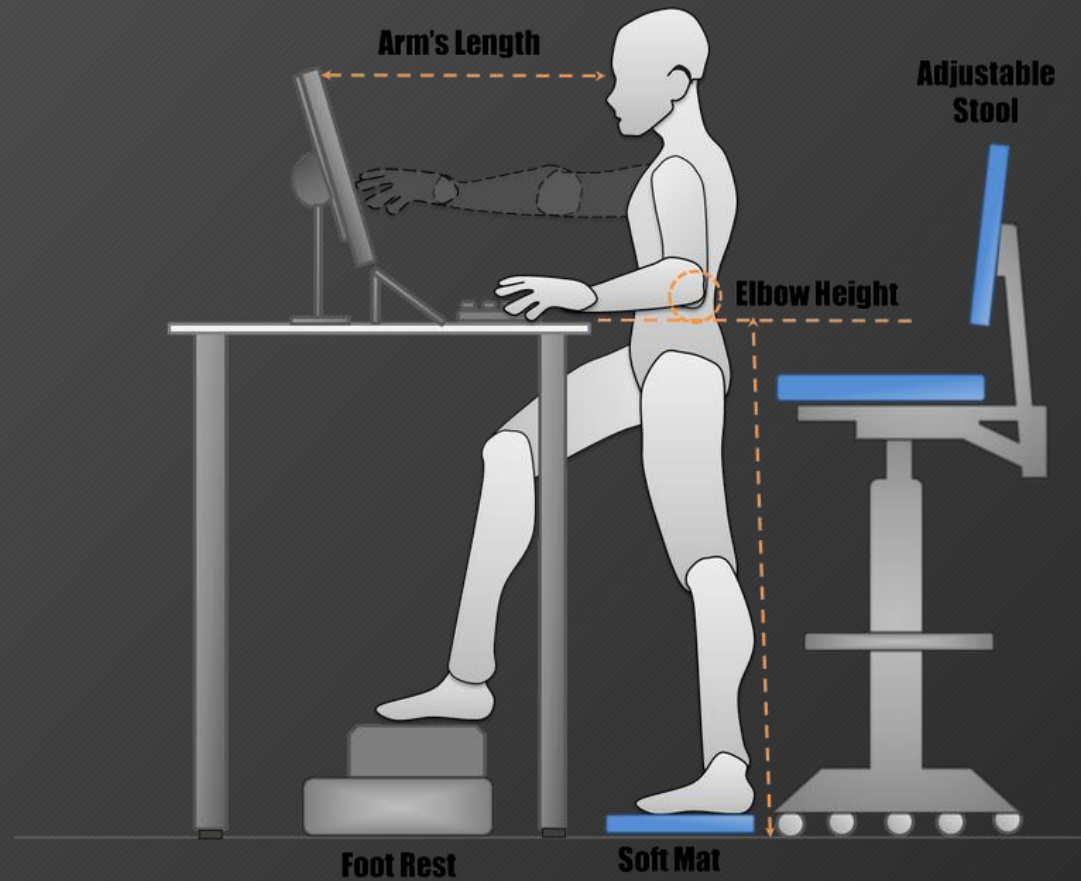


When the monitor is too high, the neck is extended

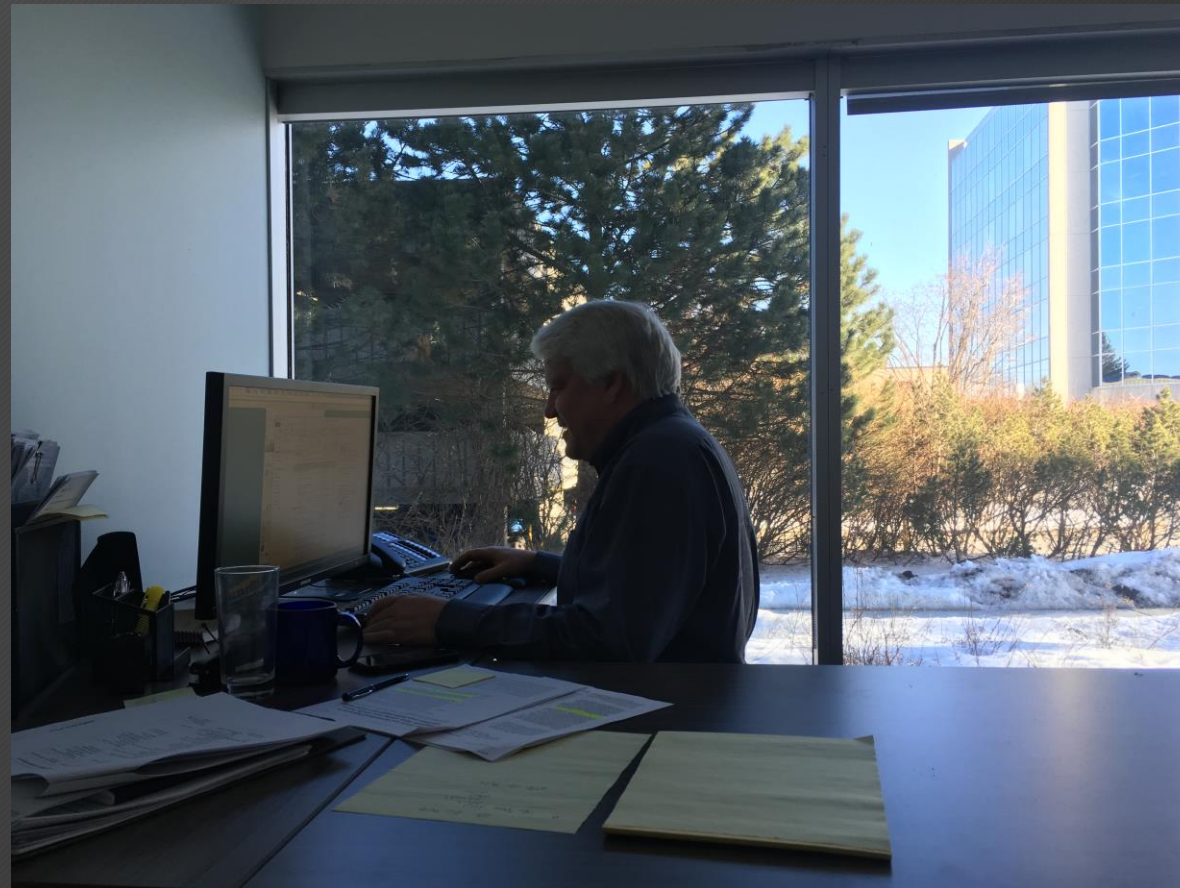


When the monitor is not directly in front of the user, the neck is twisted

Summary



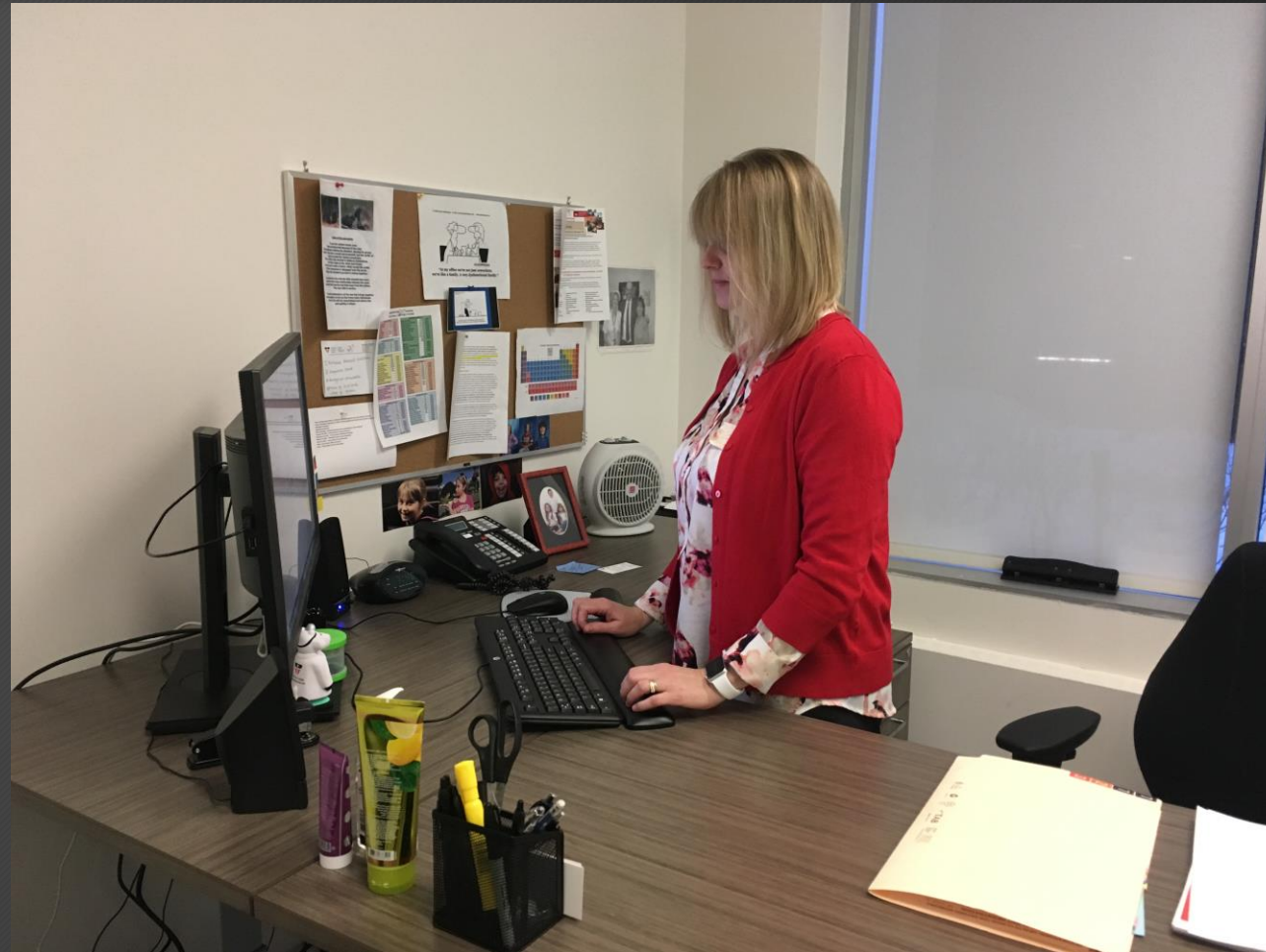
Quiz: What's the problem?



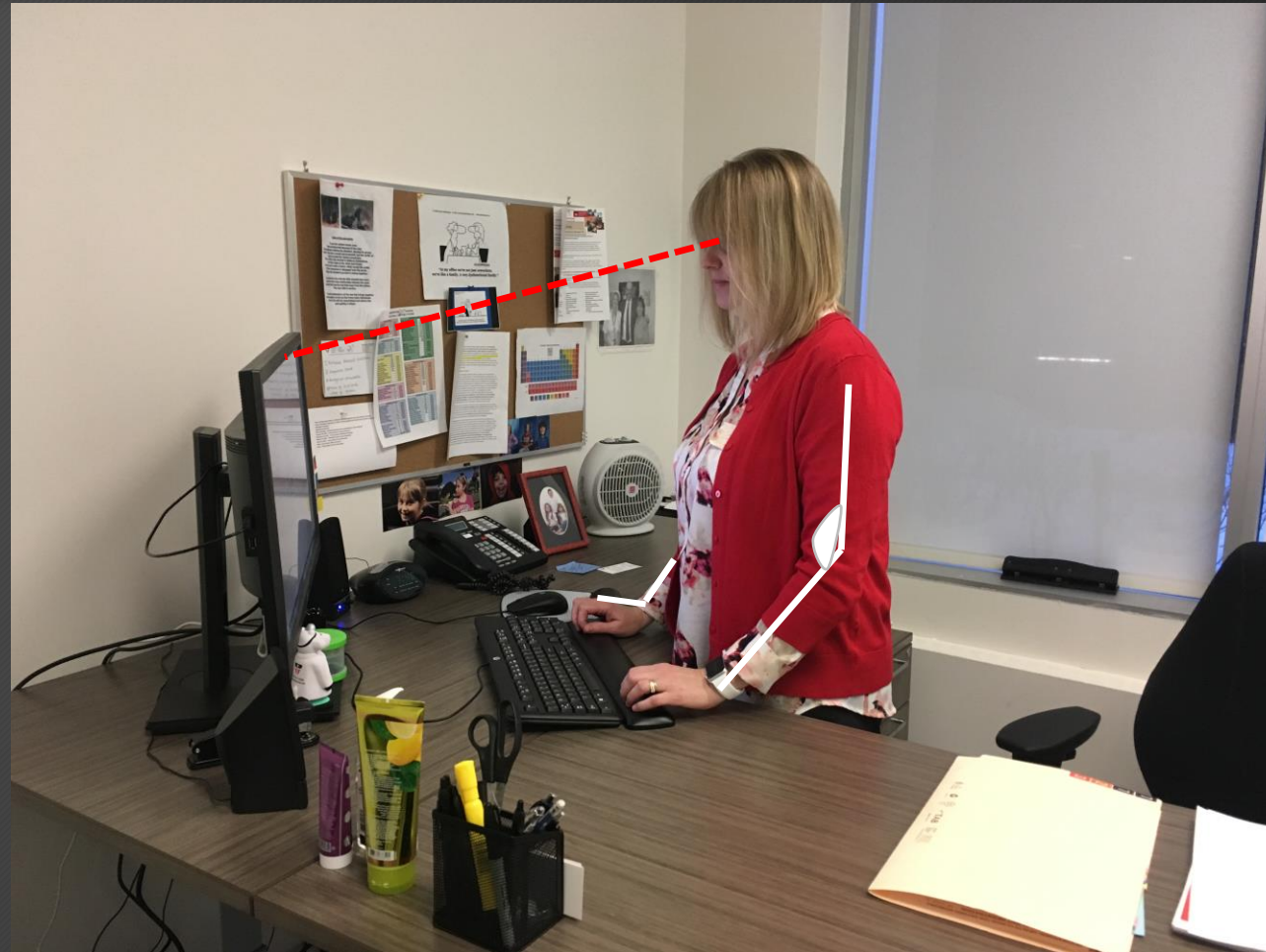
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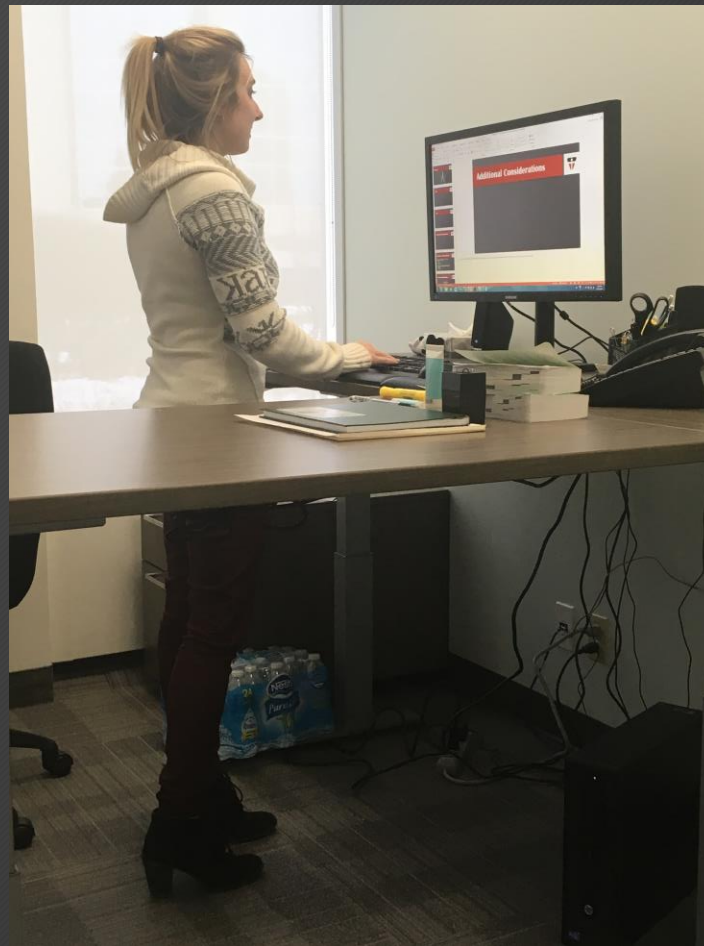
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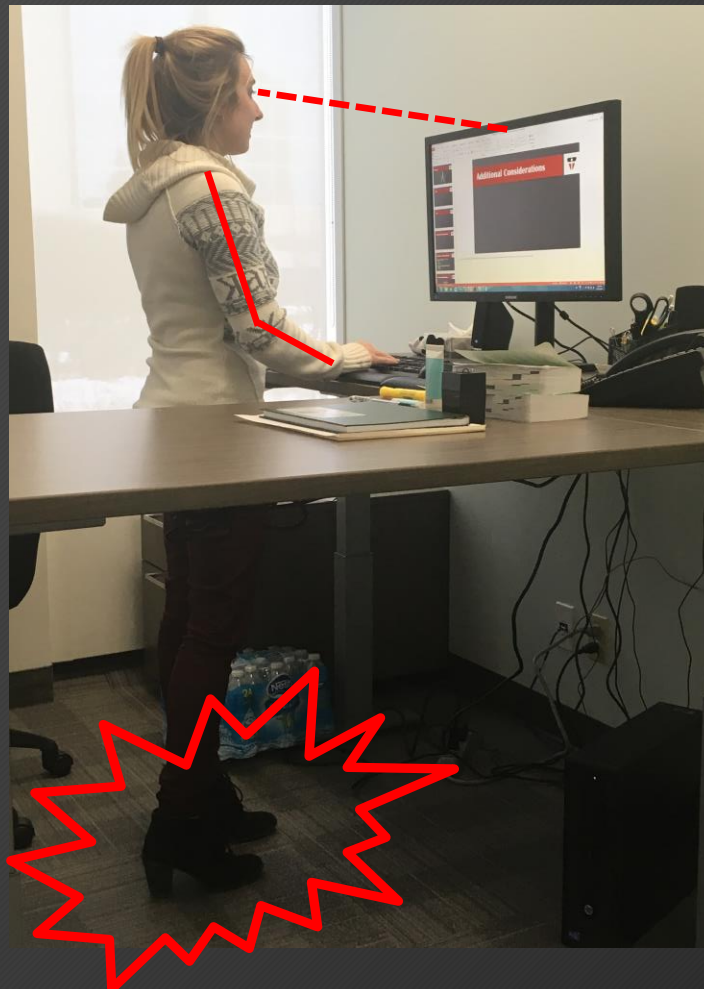
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Quiz: What's the problem?



Quiz: Choose a Workstation



Case 1

- Medical Secretary
- 5 foot 2 inches
- Performs a lot of paperwork

Case 2

- Individual of average height
- Works in a cubicle with limited space
- Paperwork seldom performed

Quiz: Choose a Workstation



Case 1

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Additional Considerations



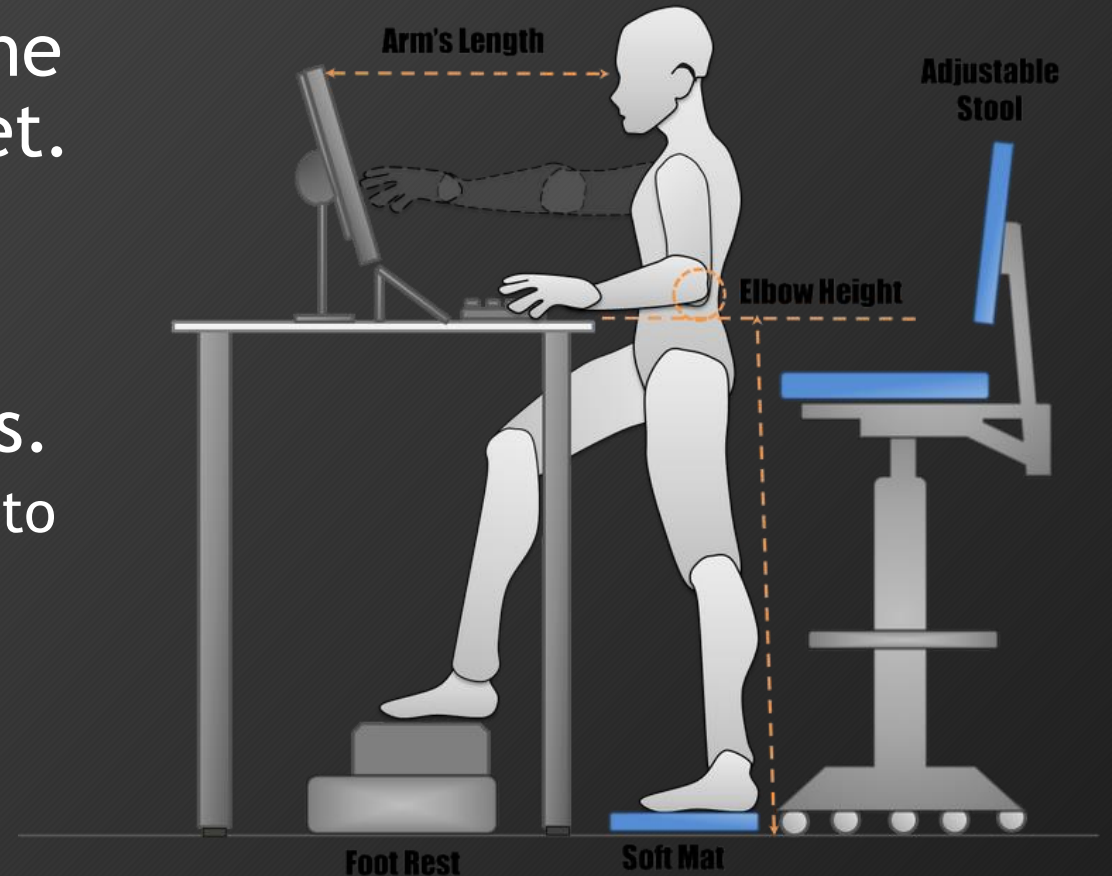
- Footrest
- Anti-fatigue mats
- Proper footwear
- Insoles or orthotics
- Sit-to-stand ratios



Footrests



- A footrest should be used under the desk to provide support to the feet.
- Helps your position vary, reducing the opportunity for static postures.
 - Shift your balance - this allows one leg to rest on the footrest while the other supports your body.



Anti-Fatigue Mats



- Anti-fatigue mats come in many different sizes and forms and are suited for different environments.
- There is evidence that very soft and/or very thick mats actually increase a workers' leg and back fatigue. Thicker and softer is not always better.
- Anti-slip mats and other regular mats are not anti-fatigue mats. Anti-fatigue mats should still be designed so that they do not slide on the floor.

Footwear



- Wear shoes that do not change the shape of your foot.
- Shoes should have a firm grip for the heel, but allow freedom to move the toes.
- Your feet should not slip inside your shoes as the instability will lead to soreness and fatigue.
- Shoes with laces allow more control of how your shoe fits.
- Wear shoes with arch supports
- Shoes with flat soles are not recommended. - Your heel should be elevated by at least $\frac{1}{4}$ inch.
- Shoes with heels higher than 2 inches are not recommended.

Insoles or Orthotics



- When standing for prolonged periods, orthotics can help to improve posture, relieve joint stress, support ligaments, treat over-pronation, increase comfort and can help to reduce other foot conditions such as heel (plantar fasciitis) and forefoot (metatarsalgia) pain (BioPed, 2015).
- Be aware that insoles will change the fit of your shoe. Shoes that don't fit can cause other foot, leg or back problems. It may be necessary to buy both shoes and insoles together to ensure a proper fit.

Sit-to-Stand Ratios



- Jack Callaghan recommends a 1:1 ratio or a 1:3 ratio (users should stand for 30 to 45 minutes every hour)
 - Kinesiology professor at University of Waterloo
 - Canada Research Chair for Spine Biomechanics
 - Director of CRE-MSD
- Timers and alarms can help to achieve this
- Motivate your colleagues

For More Information...



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