

Workplace Health and Safety Bulletin



Push It or Pull It?

Carts and wheeled equipment help to make work safer and more efficient in almost every workplace. For example, dollies move heavy equipment parts on shop floors, and wheeled carts carry supplies and materials in office buildings. It's important, though, to understand how best to work with wheeled equipment since between 9 and 20 per cent of the injury claims for low back pain are the result of pushing and pulling activities.

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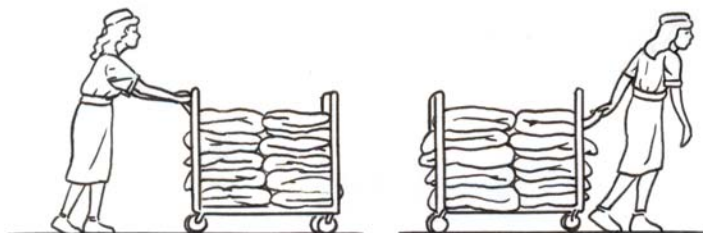
Push rather than pull

Whenever possible, push a load instead of pulling it (Figure 1).

- The cart can run over your feet or strike your ankles when you are pulling it.
- If you pull a load while facing the direction of travel, your arm is stretched behind your body, placing your shoulder and back in an awkward position that increases the likelihood of injury.
- If you pull a load while walking backwards, you can't see where you are going.
- Most of us can develop higher push forces by leaning our body weight into the load.

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Figure 1



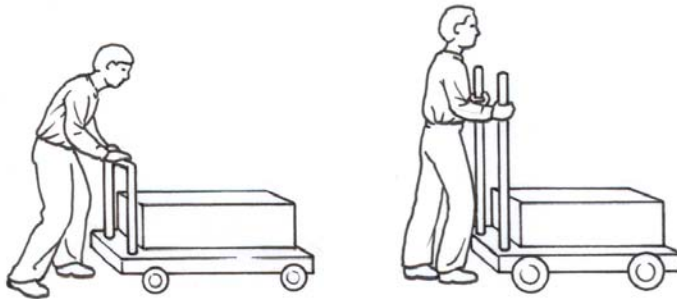
Handle height

Each of us has a preferred height at which pushing or pulling is most efficient. Unfortunately, few carts are equipped with height-adjustable handles. For pushing, the handle should be between your elbow and hip. For pulling, the handle should be between your hip and knee. If pushing will not cause the load to shift or slide off the cart or dolly, you can push on the load instead of the handle, for example, a refrigerator on a wheeled dolly. Pulling a load almost always requires a handle.

For pushing, the handle should be between your elbow and hip. For pulling, the handle should be between your hip and knee.

You can also use carts and equipment with continuous vertical handles (Figure 2) that allow you to place your hands at an appropriate height. To accommodate workers of various heights, vertical handles for pushing should cover a range of approximately 76 cm to 120 cm above the rolling surface (66 cm to 100 cm for pulling).

Figure 2



Maintenance

Properly selected and well-maintained wheels and swivel casters can make an important difference. Think how a jammed or locked swivel caster on a shopping cart makes it more difficult to change directions and often requires you to exert significant force in an awkward body position. What if the load weighed 200 kg rather than the 20 or 30 kg you are likely to have in your shopping cart?

Other suggestions:

- Use high-quality wheels or casters that are appropriate for the rolling surface.
- Keep rolling surfaces clear of debris and other contaminants. Avoid rough or uneven surfaces.
- In general, choose larger diameter wheels, which roll better, particularly over rough surfaces and over narrow gaps such as the spaces in front of elevators.
- Keep in mind that the hardness or softness of a wheel affects its rolling resistance and how noisy it is when rolling.
- Ensure that handles do not extend beyond the sides of the cart or equipment (to prevent crushing fingers on walls or other obstacles).
- Ensure that the loaded cart or equipment is stable. Trying to catch a falling load in an awkward posture may lead to an overexertion injury.
- Wear appropriate footwear to minimize slipping.
- Minimize the distance that loads need to be pushed or pulled.
- Reduce the weight or size of loads.

For more information:



www.darcor.com/pdf/Darcor_Whitepaper.pdf

The Ergonomics of Manual Material Handling – Pushing and Pulling Tasks



www.ergonomics.healthandsafetycentre.org/calculator/ergo/ppcc/resources/PPCGuidanceSheet.pdf

MSI Prevention Guidance Sheet: Risk Factor – Pushing/Pulling/Carrying (Workers' Compensation Board of B.C.)




Hoozemans, M.J.M. et al. Mechanical loading of the low back and shoulders during pushing and pulling activities. *Ergonomics*, 15 January, 2004; Vol 47, No.1: pp 1-18. Available from the Alberta Government Library – Labour Building.

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