Pushing and Pulling in the Healthcare Environment

Pushing and pulling a wheelchair, lift assist device, food, med or laundry cart create forces on the body. When pushing straight at about elbow height the force is transferred through the forearm to the larger muscles of the trunk and back. When turning/cornering a device the forces transfer to the smaller muscles of the shoulders and arms making the movement less efficient.

Pushing is the preferred method of moving a device. Pulling is often done with one hand and with the body twisted. The possibility of the device striking the heel or foot of the operator increases.

GENERAL GUIDELINES

Guidelines assume the force is being exerted at waist high or a little higher with a coefficient of friction of the handler's shoes of 1.0.

- Keep starting forces below 50 foot pounds of force.
- The rolling force should be less than 40 foot pounds of force. If the force has to be sustained for more than a minute or the device has to be pushed greater than 10 feet, the force should drop 25 foot pounds or less.
- If the force is sustained for 4 minutes without a break the acceptable force drops to 7.5 foot pounds of force.

SUGGESTIONS FOR CART/DEVICE DESIGN

- Use swivel caster at one end of the cart and place the handles at the opposite end.
- Fixed horizontal handles should be 36 inches above the floor not to exceed 44 inches.
- Vertical handles should range between 36 inches to 50 inches.
- Width between handles should be kept at 18 inches.
- Handles should have 5-6 inches for hand clearance, at least 6 inches long and 1.5 inches in width for a comfortable grip.
- Carts and devices should be no longer than 4 feet or wider than 3 feet.
- Preferred height of a cart should not exceed 50 inches so the shorter handler can see over them.
- Shelf heights should range between 20-45 inches.

(Guidelines and suggestions from Kodak's Ergonomic Design for People at Work, Second Edition 2004.)