

wheelchair management



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Introduction

The first thing to consider about a wheelchair is its importance to its owner. The chair is as valuable to him or her as the body part or function it has replaced. Whatever the disability or assistance needed, the mobility provided by the wheelchair increases the person's opportunities to get the most out of life.



Wheelchair Modifications

There has been considerable growth and diversification from what was once the “standard” or “manual” wheelchair. Though the manual chair still predominates, modifications and accessories for wheelchairs are common, depending upon the needs to the individual. Some of the more prevalent variations you may see include:

EXTENDED BACK: for upper body and neck support.

BRAKE LEVER EXTENSIONS: for those unable to reach the standard brake levers.

REMOVABLE FOOTRESTS: the lever behind the footrest releases the support.

FOOT RESTRAINTS: used with many persons whose involuntary movements would otherwise jerk their feet off of the footrests. They also lend stability to the rest of the body by securely fastening the feet.

WORK TRAY: constructed of wood or plexiglass and attached to the top of the armrests; provides a working and eating surface.

COMMUNICATION BOARD: an alphabet, word or symbol chart attached to the work tray. The person with a verbal impairment points to appropriate letters and words to give a message.

AUTOCOM: one of many types of electronic communication boards. The person uses a magnetic wand to spell messages, which are then displayed on a small screen.

RECLINING BACK: the wheelchair’s back tilts to an angle better suited to the person’s postural needs.

PNEUMATIC TIRES: air filled tires (instead of hard rubber) which give a smoother ride. Bumps are absorbed.

SPORTS CHAIR: lightweight tubing construction lends flexibility and responsiveness for sports events and general purposes.



Overview of the Powered Wheelchair

The powered wheelchair has become an invaluable machine for many people with disabilities. Some people may be physically unable to wheel themselves around in a manual chair, but are able to steer a powered chair with a slight hand movement on a control lever. Those who have sufficient motor skills and perceptual abilities learn to safely steer their powered chairs to any accessible location.

The powered chair is not a complicated device but because of its independent power source, its weight (between 100 and 200 pounds) and its cost (starting at \$3,000), it is important that staff dealing with it become familiar with its operation.

Some of the mechanical and electronic parts of the powered chair include:

- Battery
- Hand control
- Clutch handle

The powered chair operates on two batteries. The batteries power two small motors, one under each side of the chair's seat. Each motor drives a pulley and belt which turns the rear wheel. This whole system is administered from the control box at the occupant's fingertips. The box is installed on the right or left side of the chair. There is a toggle switch behind the box that has three positions: HI, OFF, LOW. On top of the box is a control stick that dictates direction and speed. The stick may be pushed in various angles, and the chair will respond in that direction. When the stick is pushed downward, the chair will accelerate. It requires a great deal of skill to maneuver the chair accurately and steadily using this single stick dual-control function. Manual use of the chair requires the drive belts to be disengaged from the pulleys. Detach the belts by pushing forward on the clutch handles that are located on either side of the chair.



There are two bars with rollers extending out behind the rear of the chair that prevent the chair from tipping backward. These are nicknamed "wheelie-bars." The bars curve downward, and have a tendency to hit a ramp or lift surface when loading. Temporarily move them out of the way by twisting the bars upward. A spring loading button beneath each bar must be pushed to release it. Return the bars to the downward position after unloading the chair. Do not take the bars off as they may get damaged or lost.

Battery Safety

Batteries intended for use on power wheelchairs and scooters contain lead and sulfuric acid which can be quite dangerous. The sulfuric acid is highly caustic and corrosive. During the charging process these batteries produce hydrogen gas, which is highly flammable and explosive. For these reasons, installation, handling and servicing of these batteries should be left to properly trained technicians.

The lead-acid batteries used in wheelchairs are broken down into three categories: Wet Cell, Gel Cell, and Absorbed Glass Mat (AGM). The Wet Cell comes in two different styles; serviceable and maintenance free. The Gel Cell and the AGM are specialty batteries. These store very well and are less likely to sulfate or degrade as easily as Wet Cells. While Gel Cell and AGM batteries are pricey, hydrogen gas explosions or corruptions are not likely to materialize.

Types of Wheelchairs

THE TRAVEL CHAIR

The collapsible travel chair is often used for people who have poor head and body control. It can also be used to bring people up and down the hydraulic lift. The brakes consist of a bar which is forced onto the rubber of the rear tires. There is one lever to set the brake, and one to release it. These levers are operated by a person's feet. The travel chair conveniently collapses down to allow it to be set on a bench seat in a vehicle. Travel chairs are made of lightweight materials and have smaller wheels. Because of their small wheels, people who use travel chairs are not able to propel themselves and therefore require staff assistance for mobility.

To collapse the travel chair:

1. Place one foot on the horizontal bar at the bottom of the frame.
2. Place your right hand on the handle so that you are grasping the release lever located under the handle.
3. Squeeze the handle lever at the same time you push downward on the frame with your foot. This will disengage the positioning pin.
4. When the positioning pin has been released, gently lower the back of the chair down to the reclined position. There is also a middle point between the upright and reclined positions.

THE GROWTH CHAIR

The growth chair, such as the Mulholland, is a multi-adjustable chair to support those who have poor head and trunk control. This chair will “grow” with an individual for up to three years. The frame expands width and length wise to coincide with the growth of its owner. It contains pads and supports to reinforce an individual's posture.

Brakes are set and released with a foot-operated lever on a brake bar behind the chair. An adjustable rod is forced onto the tire to prevent the chair from moving.

THE AMIGO CHAIR

The amigo chair is used by those who are semi-ambulatory and able to walk only short distances. It has gained popularity as it is extremely versatile and affordable. The chair is powered by a small battery-operated motor. This chair enables one to travel longer distances over relatively smooth surfaces. It is ideal for use inside the home and in shopping malls.

Because of its small wheels and high center of gravity, the amigo is not well suited for travel over rough surfaces or for transport on specialized transit vehicles. The design and structure of the chair is such that securement of the passenger and chair cannot be done safely.

Moving the Chair

When handling a wheelchair the safety and comfort of the occupant is priority. Learn to make your movements smooth and gentle as this will decrease the risk of jarring or jolting the individual in your care.



When moving a person who is using a wheelchair, you must be confident of your ability to be in control. Scan at least 3-5 feet ahead for potential barriers. It is this person who is often put in vulnerable situations, as when sitting on a ramp or a lift. There is total dependence on your firm, yet gentle control. Demonstrating confidence not only helps to build a trusting relationship, it also gives your passenger peace of mind.

Prepare the person you are assisting by telling him/her when you are going to start your movement. A verbal cue such as, “Here we go” or “Are you ready?” should prepare the individual for transport. Readiness is especially important when tilting a chair, or when beginning a lift. Once you elevate the casters, they swing freely. Always be aware of their position. While many people in wheelchairs have adapted to the sudden jolting movements of staff, it is still inappropriate and disrespectful to assist any person in that manner.

A wheelchair is a valued component to its occupant’s life. It is very important to be careful while operating the chair. Be sure not to scratch the tubing on the corners of lifts or vehicle seats. The securing brackets should not gouge the inner rims of the wheels.

The wheelchair should be in proper working order. Malfunctions can create hazardous situations when transporting wheelchairs. Spokes should be tight, hand grips secure, and brakes effective. Brakes can lose their grip as tires wear. They may need frequent adjustments. Always be aware of a wheelchair’s condition and report malfunctions to the appropriate person (e.g. supervisor).

Transporting a wheelchair involves a few basic handling maneuvers that when done properly, can move a wheelchair around efficiently, safely and easily. Getting a feel for pushing a wheelchair around a level surface is the first step in becoming accustomed to its movement.

As you push the chair around, you can feel that the weight is distributed fairly evenly between the front and rear wheels. It is easy to steer the chair. The center of gravity in an unoccupied chair is just forward and above the rear axle.

Once the chair is occupied the center of gravity is raised to the top of the armrests. Therefore, though weight is well-distributed, the chair’s short wheelbase and high center of gravity makes it possible to spill a person forward. Hitting a crack in the sidewalk or hitting the base lip of the lift with the front wheels may be enough to cause such a spill. Advise the person who is using the wheelchair to put their hands on their lap and keep their elbows in, to avoid injury.

In all situations be sure you grip the wheelchair firmly. Use good body mechanics by keeping your back straight, bending at the knees and leaning your body into the chair to increase control. Be sure of your footing, especially on wet icy surfaces.

When assisting a person who is using a wheelchair, plan your route. Avoid areas with rough, rocky, grassy, muddy or uneven terrain. These types of surfaces can make for an uncomfortable ride for the wheelchair user and increase the risk of the chair becoming unstable and flipping. When en route, scan for obstacles, gradient changes, and traveling surface and adjust your path accordingly.

Things to Avoid

- ☒ Do not wear open-toed shoes or shoes that will come loose or cause you to trip or turn your ankle. This includes flip-flops, clogs, sandals, and high heels.
- ☒ Do not lift a wheelchair by its wheels. The chair will spin and tip on its back.
- ☒ Do not lift a chair by its armrests. They may be removable and come loose.
- ☒ Do not release a wheelchair from your grasp until the brakes are set. Even when the brakes are set, be aware of their capacity to hold, especially on a grade.
- ☒ Do not hang shopping bags or other materials on wheelchair handles. Doing so alters the center of gravity and makes the wheelchair less stable.
- ☒ Do not neglect wheelchair maintenance. Regular maintenance of the wheelchair, seat, and accessories is important for the safety and comfort of the user.

Tilting a Wheelchair

Tilting a wheelchair back on its rear wheels can make it easier to reposition. This is also a preliminary move in getting a chair into a box lift or up a curb. Before tilting the chair, be sure the occupant's feet are securely on the footrests, and arms and fingers are free of the wheels. Be sure there is enough room to maneuver once the chair is tilted.

TILTING THE WHEELCHAIR

- Give a verbal cue indicating that you will be moving the individual.
- Place one foot on the tilt lever extension and firmly grasp both hand grips.
- Push down on the tilt lever extension with your foot while pulling back and downward on the hand grips.
- Rotate the chair back on the axles of the rear wheels to the “balance point.”
- Operate the balanced chair by pivoting the rear wheels.

RETURNING THE CHAIR TO ITS HORIZONTAL POSITION

- Place your foot on the tilt lever extension.
- Lean into the tilt lever as you lower the chair to its horizontal position. Lower the chair carefully and smoothly, so not to jar the passenger when the front casters touch the ground.

Managing Curbs

Moving a wheelchair up and down a curb is a simple task as it mainly involves tilting.

GOING UP A CURB

- When approaching a curb, stop slightly before the footrests reach the curb's edge.
- Tilt the chair into the balance position.
- Move the chair forward until both rear wheels bump up against the curb.
- Lower the front casters onto the curb surface.
- To roll the rear wheels onto the curb, place one foot forward and bend your knees slightly.
- With a straight back, pull up and lean forward. The wheels will roll up and over the lip of the curb. Do not lift the wheels off the surface.
- Be sure the wheelchair is completely up on the curb before taking a step.



GOING DOWN A CURB

Taking a chair down a curb is simply the reverse of taking it up. When approaching the top of a curb, pivot the chair around so that the rear is facing downward. You are in much greater control being behind and below the chair.

- Back the rear wheels of the chair to the edge of the curb.
- Plant both feet on the lower level (off the curb), one foot ahead of the other and place feet about 18" from the bottom of the curb.
- With a straight back, lean into the chair as you pull it over the edge of the curb. Ease the wheels to the ground.
- Tilt the chair to the balance position. Pull the chair away from the curb until you are sure the footrests will clear.
- Ease the front casters to the ground using the tilt lever.

Securing Passengers in Wheelchairs

It is important to follow proper safety procedures when transporting an individual using a wheelchair in a van.

ENTERING THE VAN

- Inspect the vehicle, lift, tie-down straps, and any other securing device prior to boarding passengers.
- Report any missing parts or malfunctions.
- Do not transport the passenger if securing devices are not in working order.
- Enter the vehicle using a wheelchair lift or ramp.
- Use the safety belt on the lift as recommended by manufacturer.
- Follow operating procedures and safety precautions as labeled.
- Be sure the lift is in good working order prior to use.
- Individual safety protocols have to be reviewed prior to trip. Many will require a safety belt on their chair. It must be fastened to prevent the passenger from rolling out of the chair and off the lift.
- Lower the lift and communicate with the individual in preparation of the next step.
- Place the wheelchair in the center of the lift and lock the wheelchair wheels.
- Operate the lift making sure it is clear of obstructions.
- Once inside the vehicle, unlock wheels and roll the individual into the van.
- Lock wheels.

Once the passenger in a wheelchair is brought into the van, two objectives need to be met:

1. Secure the wheelchair to the van
2. Secure the passenger to the wheelchair and van

TIE-DOWNS

Some vehicles are equipped with floor brackets that lock the rear wheels in place. If tie-down straps are used, follow the guidelines provided by the tie-down manufacturer. All appropriate staff should receive training and refresher courses on safely securing passengers with attention to the specific vans used. Instructions should be readily available in the van to reference.

Attaching Front Tie-Downs

- Center the passenger's wheelchair between the four floor brackets. These will be used to secure the wheelchair.
- The hinges that secure the straps with the floor brackets must be facing away from the center of the chair.
- Tie-down components may be color coded on each van to serve as a guide.
- Attach the two front tie-downs first.
- These are attached above the wheel on a stationary part of the frame.
- Hook the end of the strap around this point and then attach the hooks to the "D" ring located further down the strap.
- Once attached, the straps should be at approximately a 45 degree angle in relation to the floor on the van.
- Do not attach the strap to a movable part of the chair.
- Tighten the front tie-down straps by pulling on the end of the strap which extends past the buckle.

Attaching Rear Tie-Downs

- Move the rear of the chair.
- The rear tie down straps are attached to the chair on a solid non-moving part of the frame at a level higher than the midpoint of the rear wheels.
- Avoid attaching to moving parts, tilt-seating system, as well as the axial of a single arm drive chair.
- Hook each strap around the frame and then connect the hook to the "D" ring of that strap. The rear tie-down often has a ratchet which tightens the system.
- Use one hand to extend the end of the free strap towards the back of the wheelchair.
- With the other hand, repeatedly open and close the hinge until all slack is gone from the strap.



- Close the buckle until you hear a “click” indicating that the rear tie down is locked in place.

The chair is now secured to the floor of the van. Proceed to fasten the seatbelts and shoulder strap securing the passenger.

FASTENING SEATBELTS

- Store seatbelts in a safe location when they are not in use. A patch attached to the van is ideal.
- The shoulder strap is bolted to the upper side of the walk of the van, closest to the tie down location.



- Many vans use two detached seatbelts and the shoulder strap. One seatbelt is short, the other is long.
- The long seatbelt is attached to the rear tie down's “D” ring located on the side of the chair closest to the attached shoulder strap.
- The short seatbelt is attached to the rear tie downs “D” ring on the opposite side of the chair.
- Once both straps are attached, the two straps can be brought to the front of the wheelchair and buckled over the passenger's lap.
- Secure the seatbelt as close to the passenger's body as possible. The seatbelt needs to be threaded under armrests, or trays.
- Do not buckle the seatbelts together over the passenger's lap before attaching the seatbelts to the rear tie-downs, in order to control how tight the seatbelt is fitting at all times.

FASTENING SHOULDER STRAPS

Once the seatbelt is fastened, bring the end of the shoulder strap across the passenger's upper body. Connect it to the buckle of the longer seatbelt, at the point where it connects to the coupling of the shorter seatbelt. The seatbelt and shoulder strap should be snug but not constricting.

**Double check all seatbelts and shoulder straps*

At this point the wheelchair is secured to the floor and the passenger is secured to the wheelchair and van. Each step should be completed correctly. Neglecting to follow the proper procedure puts the passenger's safety at risk.

UNFASTENING

Unbuckle Shoulder Strap

- Unbuckle seatbelts and remove them from the tie-downs.
- Return the two seatbelts to the storage bag.

Remove Rear Tie-Downs

- Release the rear tie-down by using the spring release at the top of the ratchet.
- Loosen the strap and unhook it from the floor in order to make sure it is not in the way when the passenger departs from the van.

Remove Front Tie Downs

- To remove the front tie downs, press the release on the buckle while pulling the buckle towards the floor of the van.
- Once the strap is loose, remove it from the van.



EXIT THE VAN WITH ASSISTANCE

- The driver opens the door and unfolds the lift standing at the end and side of the platform.
- Assistant slowly pushes the chair onto the platform. The driver assists by guiding the chair and stopping it in the proper position.
- As the driver and assistant hold the chair in position, the driver sets both brakes one at a time.
- The driver moves to the side of the lift keeping one hand on the chair.
- The passenger is informed when the lift will be lowered. The assistant releases the handles as the chair lowers out of reach.
- When the lift reaches ground level, the driver releases the brakes and rolls the chair off the platform.

We would like to thank the Connecticut Institute for the Blind for their input in the development of the material above.

A black folding wheelchair is shown from a side-rear perspective, partially cut off by the right edge of the page. It features a black frame, a black seat, and black backrest with horizontal padding. The wheels are small and black. The wheelchair is set against a white background that transitions into the lined paper area.



This loss control brochure is offered in the hope that readers will benefit from it and take adequate steps to avoid conditions that might result in loss. It does not intend to be a complete discussion of the subject, nor do we guarantee that compliance with its suggestions will assure the safety of persons and property.

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