



## Obtaining Wheeled Mobility: Essential Elements to Consider

*“My physical functioning was unchanged, just my mind and my world had finally opened up. With the scooter, I could get around again. And I loved the freedom.”<sup>1</sup>*

Dr. Lisa Iezonni eloquently describes the challenges faced by persons for whom the “acceptable” method of mobility, upright walking, is less than functional in her recent book, *When Walking Fails*. Dr. Iezonni speaks from personal experience as a woman with multiple sclerosis (MS) who after many years of assisted ambulation, with canes, decided to try a scooter. For Dr. Iezonni a scooter promoted independence and participation in activities that were meaningful to her.

The **symbol** for disability is the wheelchair, however, for individuals with limited mobility, like Dr. Iezonni, a wheelchair or any wheeled mobility device is **the tool** allowing them independent and confident access to school, employment, and community activities. Access is the key to participating in a variety of activities and for most of us accessing our community is not challenging. For those of us with limited mobility obtaining the appropriate device that increases our access is crucial.

The purpose of this brief is to describe a variety of wheeled mobility devices that are available for individuals with limited mobility. The brief will describe the essential elements to consider in deciding on what type of device will be most appropriate for an individual's needs.

The mobility device a person chooses is based on a variety of factors. Just like a car purchase, an individual chooses a mobility device based on:

- ◆ how it will be used
- ◆ how often it will be used,
- ◆ the features that make it easiest to use,
- ◆ the features that best match their physical needs

- ◆ the terrain(s) that will be driven on,
- ◆ the reliability record,
- ◆ the cost, and
- ◆ the aesthetics of the device.

There are many options and choices in selecting an appropriate mobility device. Informed decision-making is extremely important during the selection process. This requires the gathering of information and reflection on present and future mobility needs. Just as there is no one best car, there is no one best chair. The best choice is the product that allows you to go where you want to go, when you want to go in the manner and style that matches your lifestyle! There are three major elements to consider when making an informed decision about the most beneficial type of wheeled mobility device: personal mobility needs, style of chair, and the availability of resources.

### Identifying Personal Mobility Needs

The first element that you need to consider is how will you use the chair, where will you need to go, and what are the activities that you would like to participate in? A careful consideration of what things you want to be able to do, while in the device, will assist you in focusing on your choices. As noted earlier, like a car purchasing decision, you may need to prioritize your activities to identify the key features you need a wheeled mobility device for. You may come to the conclusion that more than one device is necessary to participate in various activities. Identifying your top mobility needs is crucial. Your first wheeled mobility device purchase should meet your priorities. Over time you can purchase different items to meet your needs in different environments.

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A strategy that is helpful to many potential wheelchair users is to list what activities are most important and where each of the activities takes place. Listing the activities you currently participate in and ones you would like to will help guide the decisions regarding chair characteristics.

## Matching Critical Chair Features to Activities and Environments

After you have identified the activities you would like to participate in it is important that you think about the chair elements that will increase the likelihood of participation. In addition to considering the characteristics of the home and community environments (outside or inside), it is crucial that you determine your transportation needs to and from these activities. In addition you must consider what type of car or public transportation you have or are able to obtain.

- ◆ **Home**—Critical features of the chair will affect your ability to getting in and out of the chair (transfer): Is the height of the seat from the floor adequate? How does that height compare to your bed, for example? Do the armrests or foot supports move out of the way, to make your transfer easier? What is the width of the chair, not just the seat, will it fit through your doorways or under the kitchen table?
- ◆ **Community**—How do you want to travel in the community? If you are using your arms or your legs to propel a manual wheelchair, will you get too tired, just getting to the store or to visit friends? Would a power option (power assist wheels, power chair or scooter) provide more efficient and less fatiguing method of getting around? Are there sidewalks and curb cuts where you want to travel, or are you “sharing the road” with other vehicles such as cars and trucks? Do you want to be in the great outdoors—trails, grass, gravel or are you a “mall walker”—smooth finished floors, wide-open doorways. Your choice of tires, wheels and type of base can make a world of difference getting around the store versus hitting the trail.
- ◆ **Transportation**—Where you live and your transportation options will have a great impact on your choice of devices. Public transportation—bus or subway are increasingly accessible for passengers using a wheeled mobility device, providing you want to go where the bus is going. Private transportation (owning your own vehicle) gives you the most flexibility and freedom. However, fitting your wheeled mobility device into

the car will present a series of questions: Does the chair fold? Can you store it in the trunk or within the car? Can you get it in the trunk and then walk to the car door? Many wheeled mobility device users find a van or a minivan to accommodate their chair, particularly one adapted with a ramp or a lift, which is the real key to independent mobility. There are also many options to consider when adapting a van or minivan. Will side entry or rear entry work better? If you will be driving the van, will you want the driver’s seat removed so that you can roll up to the steering wheels and controls? Will you want a manual ramp or a motorized lift? Modified vans are expensive and for many people, just not an option.

## Matching Chair Characteristics to Needs

Matching the style of chair to the activity and environmental characteristics is the next critical step. Broadly speaking, there are three categories of products that are referred to as wheeled mobility devices:

- ◆ manual wheelchairs,
- ◆ scooters, and
- ◆ power wheelchairs.

Many long-time wheelchair users have several types of chairs. A variety of chairs provide the most options to the individual allowing the greatest range of community participation. However, keep in mind that some may not be able to use all three categories of wheeled mobility devices. Some people may need more trunk support than a scooter provides, for instance, and some people may not have the strength or coordination to operate a manual wheelchair.

- ◆ **Manual Wheelchairs**—The most common type of wheeled mobility is the manual wheelchair. Manual wheelchairs are pushed by someone other than the rider (Dependent/Transport) or propelled (Self-Prolusion) by the rider.
  - ◆ *Dependent/Transport* mobility bases, not designed for self-prolusion often have small rear wheels and may look and function much like a stroller. For transport purposes, these chairs often fold compactly, provide “light duty” mobility, and are easily transported. For children these chairs are sturdier than some of the specialized stroller type chairs but can be more cumbersome and require transferring from the chair into a car seat. Specialty Positioning bases allow for changes in positioning by tilting the seating system or reclining the backrest or both. These devices are not easy to transport, but are designed to provide comfortable, full day seating for the user.

- ◆ **Self-propelling** manual chairs are equipped with large wheels used for propelling. Riders self-propel using both arms, both legs or one arm/one leg. For persons using their leg(s) for propulsion, seat to floor height is a critical feature to insure maximum mobility. The most active manual wheelchair riders are able to balance the chair just on the back wheels, a “wheelie”. The ability to do a wheelie significantly improves environmental access for the wheelchair user. By “popping a wheelie” the person can negotiate a high threshold, get over a 2” curb and, if able to ride in a wheelie position, cross soft terrain like grass and gravel, without the front casters getting stuck. Manual chairs with rear wheels that can adjust forward and backward on the frame need to be individually fitted to the user to get the best combination of “tippiness” (ease of popping a wheelie) and stability (not tipping over when just pushing on the wheels). Athletes will often use sport specific manual self-propulsion chairs. Often these chairs are easy to control, provide a great deal of agility, and are lightweight.

- ◆ **Scoters**—Scoters provide power mobility, but have the distinct advantage of “not looking like a wheelchair.” Individuals who have lost their ability to ambulate or are easily fatigued and have few postural considerations may choose a scooter over a standard wheelchair because of ease of handling. Scooters are most often 3-wheeled devices (4-wheeled scooters are also available), equipped with a tiller for steering and a seat mounted on a platform, which serves as a footrest. For the scooter rider who can safely walk a short distance from the rear of a car to the car door, there are several car lifts that raise the scooter into the trunk of the car, providing an attractive transportation option. Scooters may be a stylish, “cool” option for children who can walk limited distances, but are slow or become fatigued with longer distances. Functionally, the three-wheel design creates a longer turning radius, when operating indoors as compared to a traditional wheelchair. Most scooters, however, come with a swivel seat, easing transfers from sitting to the standing position.

Unlike many power chairs, which can be adjusted and re-configured with changes in your physical status, scooters are not nearly as flexible, either in drive control options (need to use the tiller to steer) or in seating options. This lack of flexibility must be considered especially with children whose condition is changing.

- ◆ **Power Wheelchairs**—Historically, the power chair was simply a manual wheelchair equipped with motors, batteries and a joystick. Today the power chair is a dramatically different design, having two major components: the power base containing the motors, wheels, batteries and control module and the seating component. Each component (power base and seat) comes in a wide variety of options. The following is a general list of options to consider

- ◆ **Power Base**—Power wheelchair manufacturers offer three types of drive wheels (“drives”). A power chair will be equipped with either a *rear wheel*, *mid wheel* or *front wheel drive*. The placement of the drive wheel has a significant impact on “how” the chair moves, specifically the maneuverability of the chair. Each method has its advantages and disadvantages in both indoor and outdoor driving conditions.

Drive Wheel Position	Advantages	Disadvantages
Rear Wheel Drive	High speed outdoor driving	Maneuvering in tight, indoor spaces
Mid Wheel Drive	Turning in tight indoor spaces	Some fluttering of caster wheels at high speed
Front Wheel Drive	Obstacle climbing ability, outdoors	“Fishtailing”, rear of chair “swings” at high speeds.

A “test drive” of chairs with each of the three types of drive wheels will help you quickly identify the drive wheel placement that is most comfortable for you to control. Once a particular drive wheel placement has been chosen, there are several different models from which to choose. Most major power chair manufacturers (Invacare, Sunrise Medical, Permobil and Pride) offer different model chairs with the different drive wheel positions. Check out the available models on the Internet and then arrange for a test drive.

- ◆ **Seating**—A variety of seating options are available on power drive chairs. Many users of power drive chairs have significant motor limitations and use the chair throughout the day and for most activities. It is critical then that the seat be as comfortable and functional as possible. The options range from fairly simple automotive style seats, often referred to as

“Captain’s seats” to very sophisticated power seating that may tilt, recline, elevate the leg rests, and even provide a standing feature. Molded seating systems are also available, which are customized to comfortably fit the person’s body, if needed. For children, there is even a power-seating feature that lowers the entire seat down to the floor allowing the child to play with other children on the floor.

- ◆ **Drive Controls**—Many power chair and scooter riders are able to use the standard drive controls that come on the chair, either a joystick or the tiller. For those who are unable to use the standard controls, several manufacturers now offer “alternate controls”. These alternate controls replace the joystick and use other voluntary movements to allow the person to operate the chair. Examples include Sip “n Puff, which uses a straw and the person sips and puffs to control the direction of the chair or head arrays—a series of switches mounted into the headrest allowing head movements to operate the chair. Choosing the most efficient drive control will require an assessment by an experienced seating team, a supplier and a therapist who specialize in customized assistive technology solutions.

New technology now offers “cross-over” products, a hybrid of a traditional manual chair and a power wheelchair. **Power-assist systems** are equipped with new wheels that are battery operated and designed to increase the number of revolutions the wheel makes with just one push on the rim. The goal is to increase the efficiency of manual propulsion while reducing the amount of effort the rider must put into the wheels. **Add-on power systems** provide power chair operation while mounted onto a manual wheelchair base. With a **quick release system**, these add-on power systems are more easily transportable than traditional power chairs, but do not have the long-term performance or durability of traditional power chairs. The following chart compares the major characteristics of wheelchairs.

## Resource Allocation

Like buying a new car, the cost of a wheelchair and the options available must be considered. Many times the question, “Who is paying?” is foremost for the consumer. Chairs come in a variety of price ranges, from relatively modest \$300-400 transport chairs designed to fold into a small package, but must be pushed by someone other than the rider to very sophisticated power chairs with power seating

### Comparing Products

An educated comparison of the options available requires gathering as much information. The Internet provides great opportunity for product exploration and comparison prior to attending a wheelchair clinic or a medical store showroom. Each manufacturer has a website describing their own product line. Major manufacturers include Invacare, Permobil, Pride Mobility and Sunrise Medical. Other valuable resources include:

- ◆ [www.usatechguide.org](http://www.usatechguide.org)—large database of available products by category
- ◆ [www.wheelchairjunkie.com](http://www.wheelchairjunkie.com)—consumer direct information regarding commercial products.
- ◆ [www.resna.org](http://www.resna.org)—provides a directory of therapists (Assistive technology Practitioners (ATP) and Suppliers (ATS) who specialize in rehab products.
- ◆ [www.nrrts.org](http://www.nrrts.org)—list of suppliers by state specializing in rehabilitation products.

	Advantages	Disadvantages
<b>Manual Wheelchairs</b>	<ol style="list-style-type: none"> <li>1. Lighter in weight</li> <li>2. Greater reliability</li> <li>3. Easier to transport</li> <li>4. Less expensive</li> <li>5. Provides a level of exercise</li> <li>6. Easier to overcome accessibility problems</li> </ol>	<ol style="list-style-type: none"> <li>1. Possible secondary complications (sore shoulders, wrists and elbows) after long-term use.</li> <li>2. Requires physical effort to be mobile</li> </ol>
<b>Scooters</b>	<ol style="list-style-type: none"> <li>1. Aesthetics, does not look like a wheelchair.</li> <li>2. Increases mobility without increased exertion</li> <li>3. Swivel seat may allow for easier transfers in and out of the seat.</li> </ol>	<ol style="list-style-type: none"> <li>1. More complicated to transport in a car.</li> <li>2. Needs charging</li> <li>3. Less flexible to modify to changing physical conditions than a power chair.</li> </ol>
<b>Power Chairs</b>	<ol style="list-style-type: none"> <li>1. Greater mobility range with little exertion.</li> <li>2. Easier to modify over time, if needed.</li> <li>3. Available with power seating options—tilt and/or recline.</li> </ol>	<ol style="list-style-type: none"> <li>1. More expensive.</li> <li>2. More difficult to transport.</li> <li>3. Less reliable than manual chairs.</li> <li>4. Heavy</li> </ol>

options which can cost over \$25,000. Medical insurance, either private or governmental, is most often “the buyer” of wheeled mobility devices. However, decisions regarding the type of chair needed should be driven by the needs of the user not the insurance carrier. Determine what is most **functional** and then explore the funding options. Private pay, even taking out a loan, is always a purchase option. Also, chairs like cars do not last forever. Take into consideration your changing needs over time,

## Conclusion

The purchase of a wheeled mobility device is not a simple purchase. Much like the car, there are aesthetic considerations, what image do you want to project? Also like a car, what functions do you need to accomplish, may influence your selection. Many a “soccer mom” would love the 2-seater, convertible roadster, too bad there is no room for the kids. Function often wins out.

Our needs and functions change over time. Priorities may change, requiring different types of mobility devices. In making decisions regarding a wheeled mobility device, always do your homework. Ask about function, reliability, and personal experiences of people with similar needs as your own. With routine maintenance and a little tender loving care, your mobility device can provide years of mobility.

Get out there. Talk to other riders, they are a great source of information. Check out the options that can take YOU where you want to GO!

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## Additional Resources

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*The Consortium Consumer Briefs cover critical topics for children and youth with disabilities and special health care needs. The research and training activities conducted by the Consortium focus on access to pediatric rehabilitation issues, health plan utilization, best practices in health care transition, the use of telehealth in rural settings, as well as assistive technology services.*

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