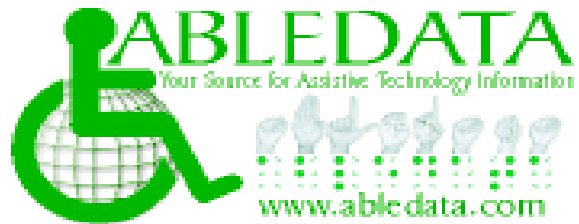


# ABLEDATA Fact Sheet on Manual Wheelchairs



## Introduction

At one time there was little need for a consumer fact sheet on manual wheelchairs as there were no decisions to be made when selecting a wheelchair. Someone needing a wheelchair simply went to a doctor and received a prescription for a wheelchair. That chair was fairly standard in size and appearance. It would have been a boxy chair with a heavy steel frame and black or dark green upholstery. Little else was available.

That era has passed, and today's active wheelchair user has literally hundreds of options available. Manual wheelchairs come in sporty styles and stylish colors, and are often made of lightweight composite materials that greatly reduce the weight of the chair. The challenge today is to select the wheelchair that most directly meets an individual's needs.

This fact sheet provides a basic introduction to manual wheelchairs, including the main types, their components and features, and considerations for selecting a chair. It also offers a list of wheelchair manufacturers and sources of additional information, including publications, organizations, and Internet resources.



**Figure 1: The Invacare MVP is a folding, standard/everyday chair.**

# Types of Manual Wheelchairs

Most manual wheelchairs are designed to be propelled by the user, who grasps a pushrim on each wheel to move the chair forward or back. Many wheelchairs have push handles so they can be propelled by someone other than the user, such as a friend or caregiver. There are also one-hand manual wheelchairs for people with the use of one arm, and for people with limited use of the legs there are wheelchairs with a lower, or hemi, frame that are designed to be propelled by the user's legs.

Manual wheelchairs can generally be placed in one or more of the following basic categories:

- Standard/everyday wheelchairs
- Child/youth/growing wheelchairs
- Institutional/nursing home/depot wheelchairs
- Lightweight wheelchairs
- Reclining/tilt-in-space wheelchairs
- Specialty wheelchairs
- Sport wheelchairs
- Standing wheelchairs
- Transit wheelchairs
- Transport wheelchairs

## Standard/Everyday Wheelchairs

Standard/everyday chairs are the more traditional wheelchair styles featuring a folding crossbrace frame, often made of steel, with swing-away and/or elevating footrests, fixed or detachable armrests, a mid- to high-level back, and push handles to allow a caregiver or other non-occupant to propel the chair. Armrests may be full-length or desk-length; desk-length arms are shorter to allow someone sitting in the chair to fit under a desk or table. Frequently these chairs are also available with a variety of standard and optional features and custom modifications.

## Child, Youth or Growing Wheelchairs

Children and teens need chairs that can accommodate their changing needs as they grow. In addition, it is important that wheelchairs for children or teens are adaptable to classroom environments and “friendly looking” to help the user fit more readily into social situations. Wheelchairs for children and youths usually offer a more streamlined appearance and/or brighter upholstery or frame colors.

Because of the high cost of replacing a chair as well as limitations often placed by insurance providers on how frequently chairs may be replaced, purchasing a new chair each year for a growing child can be prohibitively expensive. Growth chairs or chairs with growth kits allow an existing chair to be adjusted to accommodate a growing child.

Some wheelchairs for children are designed with features that allow them to be converted to accommodate growth such as variable seat width and depth, adjustable axle and seat heights, and height adjustable footrests. Adjustments or adaptations to account for growth may include installing replaceable components or designing the chair with features that can be converted from a smaller size to a larger size.

For more information on wheelchairs for children, including manual and powered models, see ABLEDATA's **Fact Sheet on Wheelchairs for Children**.



**Figure 2: The Levo Kid from Levo USA is a child's standing wheelchair.**

## **Institutional, Nursing Home or Depot Wheelchairs**

An institutional wheelchair is generally the least expensive type of chair available. It is designed for institutional usage only, such as transporting patients in hospitals or nursing homes. An institutional wheelchair is not an appropriate alternative for anyone who requires independent movement, as it is not fitted for a specific individual. These types of chairs are now also used as rental chairs and by businesses and some public facilities (such as grocery stores and airports) for temporary use.

## **Lightweight Wheelchairs**

Lightweight wheelchairs have frames made of lighter materials such as aluminum, titanium, or chrome. Originally developed for racing and wheelchair sports, these chairs have become increasingly popular as daily use chairs. Many active wheelchair users prefer the sportier look of the lightweights compared with the more plain-looking everyday chair. Lighter chairs can also be easier to transport. They offer independence of movement with minimum effort for persons with good upper body mobility. It should be noted, however, that heavy or obese persons may be unable to use these types of chairs because the lighter weight of the frame results in a reduced user capacity as compared to standard everyday chairs. Lightweight chairs typically weigh less than 30 pounds without legrests and/or wheels. Some models have folding frames, some have rigid frames, and a few offer a choice of frame styles.

## Reclining and Tilt-In-Space Wheelchairs

Reclining wheelchairs and tilt-in-space wheelchairs are available for individuals unable to sit upright for sustained periods or who need to change position without leaving their chair. In a reclining chair, the back reclines independently of the rest of the seating system, while in a tilt-in-space chair the back, seat, and legrests all move together, allowing the person sitting in the chair to tilt back without losing balance. These features are available separately, or in some models, together.

## Specialty Wheelchairs

Because of the diverse needs of wheelchair users, wheelchairs have been designed to accommodate many lifestyles and user needs.

- For people who have difficulty walking but can use their legs, there are hemi chairs, which are lower to the floor than standard chairs, allowing the person to propel the chair using leg strength.
- For people who have paralysis or upper extremity amputation on one side, there are chairs with specially modified wheel/axle drives to allow it to be propelled with one hand.
- For obese people, there are oversized chairs and chairs with a high weight capacity.



**Figure 3: The Traveler XD wheelchair from Graham-Field Home Products is designed for large people weighing as much as 400 pounds.**

- For people who enjoy outdoor activities, rugged, specially equipped chairs are available.
- For people who want to participate in marathons and other racing events, aerodynamic three-wheeled racing chairs are available.

These and other specialized chair designs generally are manufactured by independent wheelchair manufacturers who are trying to meet the needs of specific target markets.

## Sport Wheelchairs

Sport wheelchairs come in a variety of configurations designed for specific sports. Many are three-wheeled. Models designed for use in wheelchair contact sports such as wheelchair rugby feature a wide front-end “hammer-head” made of aluminum tubing, suitable for banging against other wheelchairs. Rugby wheelchairs can be seen in use in the 2005 documentary movie *Murderball*, which follows a group of wheelchair rugby players through a series of championship games. Other popular sport configurations include racing, tennis, and basketball chairs. All-terrain chairs have a rugged frame and wheels that can roll safely over many unpaved and irregular surfaces. Beach wheelchairs have wide “balloon wheels” for rolling on sand. Many sport wheelchair manufacturers offer custom design.



**Figure 4: The Hammer from Colours In Motion is a sport wheelchair with rugged construction for use in contact sports such as rugby.**

## Standing Wheelchairs

An individual who needs assistance to stand may be interested in a standing wheelchair, a manual or powered wheelchair equipped with a power lift to raise the user to a standing position. Manual chairs that raise the user to a standing position may be helpful to people who need to be able to stand at their jobs, or who want to stand as part of a physical conditioning routine.

Standing wheelchairs are not the same as mobile standing frames. A standing frame is a frame for holding the user upright; mobile frames are equipped with caster wheels (not big wheels) to enable persons who have difficulty standing to walk short distances. However, some mobile standing frames are available with a standing wheelchair option that includes a seat and big wheels for propulsion.

## Transit Wheelchairs

Wheelchairs of any type may be available in transit models equipped to be tied down safely in buses or vans. The University of Pittsburgh's Rehabilitation Engineering Research Center (RERC) on Wheelchair Transportation Safety maintains a Web site with information on the development of standards for wheelchair transportation safety—<http://www.wheelchairstandards.pitt.edu>.

## Transport Wheelchairs

Transport wheelchairs are designed to be pushed by a caregiver or other person. They have push handles, with brake controls located within the caregiver's reach. On some models, the brakes are located on the rear wheels to enable a caregiver to toggle them using a foot. Transport wheelchairs are often used in hospitals and nursing homes. Other transport chairs are designed for specific environments, such as airports, and may have special features suited for these environments. For example, wheelchairs for boarding airplanes are very narrow in order to fit in airplane aisles.



**Figure 5: The All Terrain Chair from Assistive Technology, Inc. is a beach wheelchair with balloon wheels for moving on sand.**

## Manual Wheelchair Components

### Frame

Frames differ in style and the materials used in their construction. The two most common frame styles are cross-brace frames, which fold for shipping or storage, and rigid frames, which are non-folding. On both frame styles, the wheels, headrests, armrests, and footrests may be removable for storage or shipping.

One of the biggest breakthroughs in wheelchair technology has been the development of new, lightweight materials for wheelchair frames. Stainless steel used to be the only frame material available, but today wheelchair users have their choice of stainless steel,

aluminum, titanium, and lightweight composite materials. The type of material used to construct the frame affects the weight of the frame, and therefore the overall weight of the wheelchair. The type of frame material can also affect the wheelchair's overall strength.

## **Seating Systems and Cushions**

The right seat width and depth are essential for comfort and support. Most wheelchair models are available with a range of seat widths and depths, so the right measurement should be selected when the wheelchair is purchased.

Cushions are important not only for comfort but also to prevent pressure sores and to help keep the user from sliding out of the chair. Cushion types include air, gel, foam, and combinations such as air and foam or gel and foam. Air flotation cushions allow the user to adjust the amount of pressure in the cushion. Cushion thickness may range from 1 to 4 inches. Cushions may be made of moisture-absorbing material that draws perspiration away from the body, or have ridges or bumps to provide some air flow between the body and the surface of the cushion. Cushions may be contoured to reduce pressure on the buttocks. Custom contouring is available to fit the shape of the cushion to the shape of the person sitting on it. To prevent a person from sliding out of the chair, some cushions are higher in front than in the back. Seat belts and harnesses are also available for this purpose.

Seating systems are often sold separately from the wheelchairs themselves, which allows the wheelchair to be adapted to the individual user. It is important when selecting a wheelchair or a seating system to be sure that the two components are compatible.

## **Upholstery**

Upholstery for wheelchairs must withstand daily use in all kinds of weather. Consequently, manufacturers provide a variety of options to users, ranging from cloth to new synthetic fabrics to leather. Many manufacturers also offer a selection of upholstery colors, ranging from black to neon, and patterns (for fabrics) to allow for individual selection and differing tastes among consumers.

## **Brakes**

“Braking” on a manual wheelchair in use is accomplished by applying the hands on the wheels. However, “parking brakes” (wheel locks) are available in several different designs, and can be mounted at various heights to maximize convenience to the user.

## **Wheels and Tires**

Most wheelchairs use four wheels, with two large wheels at the back and two smaller, pivoting wheels (casters) at the front. Other configurations are available, including six

wheels, front and back wheels of equal size, and large wheels in front. The traditional-style wheel has many spokes radiating from a hub similar to a bicycle wheel. Mag wheels have from three to eight spokes that are molded as part of the wheel. Tires can be solid or pneumatic (inflatable). Rear wheels are commonly 24 inches in diameter while casters usually range from six to eight inches in diameter, but smaller and larger sizes may be available. Wheels come with or without handrims for propulsion.

## **Footrests**

For rigid frame chairs, footrests usually are incorporated into the frame of the chair as part of the design. Cross-brace folding chairs often have footrests which swivel, flip up, and/or can be removed.

## **Armrests**

Armrests may be full-length to provide full support for the user's arms, or they may be desk-length (half length) to allow closer access to desks and tables. Armrests of both types may be flip-up, fixed, or detachable. Flip-up armrests can be raised when necessary to fit under a table. Many sports wheelchairs have no armrests, and active wheelchair users may prefer this streamlined look. However, armrests are helpful if the user has difficulty with upper body balance while seated.

## **Highlights in the History of the Manual Wheelchair**

- U.S. Civil War: First record of wheelchairs being used in the United States.
- 1907: First patent applied for a folding wheelchair with a tubular steel frame.
- 1936: First single cross-brace wheelchair patented by Everest & Jennings.
- 1948: Removable armrests introduced.
- 1950's: Lightweight chairs developed for sports use.
- 1980's-present: New composite frame materials developed to further reduce the weight of chairs.

## **Considerations in Wheelchair Selection**

The first considerations in selecting the appropriate wheelchair are the needs of the person using the chair as determined by his or her disabilities and abilities. The person may consult a professional wheelchair prescriber such as a physical or occupational therapist or a physician specializing in orthopedics or rehabilitation medicine, who can offer informed professional advice on what kind of seating system and what special features and adaptations are needed.



The user must also actively participate in the selection process. These individuals are most aware of the environment and circumstances in which the wheelchair will be used. Will it be used primarily indoors or outdoors? Will it be used in the home, at work, for recreation, or in a variety of settings? Will the chair need to be transported? If so, how will it be transported—in a van, a car, or by some form of public transportation? Are there stairs or other barriers to be considered? The answers to these and other questions will help a person to determine which chair best fits their lifestyle.

Finally, personal tastes and values should also be considered. A person using a wheelchair lives with it constantly, and it should therefore be compatible with his or her personality. Style and color may be just as important as how the chair feels to the body.

## **Wheelchair Standards**

Comparison of wheelchair features may be facilitated by reference to the standards approved by the American National Standards Institute (ANSI) in cooperation with the Rehabilitation Engineering Society of North America (RESNA). The ANSI/RESNA standards establish uniform requirements for products as well as procedures for information disclosure and consistent measurement of such qualities as wheelchair strength, weight, and stability. The standards themselves are highly technical documents. A two-volume set of all 21 revised standards is available for \$550 from RESNA, 1700 North Moore Street, Suite 1540, Arlington, VA 22209 USA; (703) 524-6686; <http://www.resna.org>.

## **Cost of Manual Wheelchairs**

Manual chairs range in price from around \$500 for a lightweight transport chair and less than \$1,000 for a basic institutional chair to more than \$5,000 for a customized sports chair, with the average price range for everyday models being \$2,000 to \$3,000. Price is affected by the number and kinds of options selected and any custom or individualized modifications.

## **Funding Sources**

The primary funding sources for wheelchairs are private medical insurance, Medicare, and Medicaid. Worker's Compensation insurance may be another funding source if the wheelchair is needed as the result of a workplace injury. However, insurance plans will only pay for wheelchairs and wheelchair accessories insofar as they are deemed medically necessary, which may exclude coverage of some optional features that would be beneficial to the individual. Sports wheelchairs are generally not covered. There may be other limitations on coverage as well, such as frequency of replacement.

Many States offer an Assistive Technology Alternative Financing Program that help people with disabilities to qualify for and receive low cost loans to purchase assistive products or services. A list of these State projects is available from RESNA at <http://www.resna.org/AFTAP/state/>.

Each State also offers a State Assistive Technology Project that supports consumer-driven, statewide, technology-related assistance for individuals of all ages with disabilities. There are 56 projects (one in each State and in D.C. and the U.S. territories). A list of these projects can be found on the ABLEDATA Web site at <http://www.abledata.com/abledata.cfm?pageid=113573&top=16050&ksectionid=19326&stateorganizations=1>.

## A Good Start ...

New wheelchairs are being introduced to the market every year. One of the easiest ways to keep up-to-date on what is available is to consult the ABLEDATA Web site (<http://www.abledata.com>) where we list information on more than 22,000 currently available assistive products for people with disabilities. Information on all types of wheelchairs available in the United States is included in the ABLEDATA product listings, as well as contact information for wheelchair manufacturers and national distributors. Information on specific models also is available from the manufacturers and distributors; a list of manufacturers and distributors with their respective contact information is found in the next section of this fact sheet.

ABLEDATA offers more detailed information on the wheelchair selection process in our **Informed Consumer's Guide to Wheelchair Selection**. We also offer fact sheets on powered wheelchairs, children's wheelchairs, and scooters. Each of these publications also provides a list of resources and related reading. All ABLEDATA publications may be downloaded free from the ABLEDATA Web site, <http://www.abledata.com>, or paper copies may be ordered for a small fee.

## Manufacturers and Distributors

The following companies sell manual wheelchairs. For each manufacturer or distributor, we have provided full contact information (including street address, telephone [voice unless otherwise noted] and fax numbers, e-mail address, and Web address) and a brief list of the types of wheelchairs sold.

### **Activeaid, Inc.**

101 Activeaid Road

P.O. Box 389

Redwood Falls, MN 56283-0359 USA

Telephone: 800-533-5330 toll free or 507-644-2951.

Fax: 507-644-2468.

E-mail: [activeaid@activeaid.com](mailto:activeaid@activeaid.com).

Web site: <http://www.activeaid.com>.

Chair type(s): Specialty (shower commode wheelchair); adult/pediatric.

### **Amigo Mobility International, Inc.**

6693 Dixie Highway

Bridgeport, MI 48722-9725 USA

Telephone: 800-692-6446 toll free or 517-777-0910.

Fax: 800-334-7274.

E-mail: [info@myamigo.com](mailto:info@myamigo.com).

Web site: <http://myamigo.com>.

Chair type(s): Commercial/specialty (SmartChair Shopper)

### **Assistive Technology Inc.**

21279 Protecta Drive

Elkhart, IN 46516 USA

Telephone: 800-478-2363 toll free or 574-522-7201.

Fax: 574-293-0202.

E-mail: [info@pvcdme.com](mailto:info@pvcdme.com).

Web site: <http://www.pvcdme.com>.

Chair type(s): Lightweight chair in sizes from pediatric to bariatric; specialty (shower/commode chair); beach wheelchair.

### **Better Made Wheelchairs Ltd.**

#8, 4699-61 Street

Red Deer, Alberta T4N 7C9

Canada

Telephone: 403-340-1191.

Fax: 403-340-3143.

E-mail: [bmw@bettermadewheels.com](mailto:bmw@bettermadewheels.com).

Web site: <http://www.bettermadewheels.com>.

Chair type(s): Lightweight/sport.

**Bromac Assistive Technology**, a division of Brown Machine Works

HCR1 Box 29

57899 West Rhodes Avenue

Dateland, AZ 85333 USA

Telephone: 805-797-7989.

E-mail: [bromac@as.net](mailto:bromac@as.net).

Web site: <http://fp1.antelecom.net/bromac/>.

Chair type(s): Electric elevating manual wheelchair.

**Colours in Motion**

860 E. Parkridge Avenue

Corona, CA 92879 USA

Telephone: 800-892-8998 toll free or 951-808-9131.

Fax: 951-808-9949.

Web site: <http://www.colourswheelchair.com>.

Chair type(s): Child/youth; racing; everyday.

**Columbia Medical Mfg. LLC**

13577 Larwin Circle

Santa Fe Springs, CA 90670 USA

Telephone: 800-454-6612 toll free or 310-454-6612.

Fax: 310-305-1718.

E-mail: [info@columbiamedical.com](mailto:info@columbiamedical.com).

Web site: <http://www.columbiamedical.com>.

Chair type(s): Transport.

**Convaid Products Inc.**

PO Box 4209

Palos Verdes, CA 90274 USA

Telephone: 888-266-8243 toll free or 310-618-0111.

Fax: 310-618-8811.

E-mail: [convaid@convaid.com](mailto:convaid@convaid.com).

Web site: <http://www.convaid.com>.

Chair type(s): Standard/everyday; lightweight/sport; child/youth.

**Cyclone Mobility & Fitness Equipment**

Unit 5, Apex Court

Bassendale Road

Croft Business Park

Bromborough, Wirral CH62 3RE

United Kingdom

Telephone: 011-44-151-346-2310.

Fax: 011-44-151-346-2311.

Web site: <http://www.cyclonemobility.com>.

Chair type(s): Lightweight/sport; child/youth.

**Dalton Medical**

1103 Venture

Carrollton, TX 75006 USA

Telephone: 972-418-5129.

Fax: 972-418-5706.

E-mail: [sales@daltonmedical.com](mailto:sales@daltonmedical.com).

Web: <http://www.daltonmedical.com>.

Chair type(s): Standard/everyday; lightweight; extra-wide; child/youth; hemi; recliner.

**Deming Designs Inc.**

1090 Cobblestone Drive

Pensacola, FL 32514 USA

Telephone: 850-478-5765.

Fax: 850-476-3361.

E-mail: [kmdeming@aol.com](mailto:kmdeming@aol.com).

Web site: <http://www.beachwheelchair.com>.

Chair type(s): Beach wheelchairs.

**Drive Medical Design and Manufacturing**

99 Seaview Boulevard

Port Washington, NY 11050 USA

Telephone: 877-224-0946.

Fax: 516-998-4601.

Web site: <http://www.drivemedical.com>.

Chair type(s): Transport; standard/everyday.

**Eagle Sportschairs**

2351 Parkwood Rd.

Snellville, GA 30039 USA

Telephone: 800-932-9380 toll free or 770-972-0763.

Fax: 770-985-4885.

E-mail: [bewing@bellsouth.net](mailto:bewing@bellsouth.net).

Web site: <http://www.eaglesportschairs.com>.

Chair type(s): Child/youth; racing; basketball; quad rugby; tennis; off-road; everyday.

**Freedom Designs, Inc.**

2241 Madera Road

Simi Valley, CA 93065 USA

Telephone: 800-331-8551 toll free or 805-582-0077.

Fax: 888-582-1509 toll free or 805-582-1509.

E-mail: [nancy@freedomdesigns.com](mailto:nancy@freedomdesigns.com).

Web site: <http://www.freedomdesigns.com>.

Chair type(s): Child/youth; standard.

**Gendron, Inc**

400 E. Lugbill Road

Archbold, OH 43502 USA

Telephone: 800-537-2521 toll free or 419-445-6060.

Fax: 419-446-2631.

E-mail: [sales@gendroninc.com](mailto:sales@gendroninc.com).

Web site: <http://www.gendroninc.com>.

Chair type(s): Standard/everyday; lightweight/sport; child/youth; institutional/commercial; specialty.

**Graham-Field Health Products, Inc.**

2935 Northeast Parkway

Atlanta, GA 30360 USA

Telephone: 800-347-5678 toll free.

Fax: 800-726-0601 toll free.

Web site: <http://www.grahamfield.com>.

Chair type(s): Standard/everyday; child/youth.

**Gunnell, Inc.**

8440 State Street

Millington, MI 48746 USA

Telephone: 800-551-0055 toll free or 989-871-4529.

Fax: 800-794-5483 toll free or 989-871-4563.

E-mail: [info@gunnell-inc.com](mailto:info@gunnell-inc.com).

Web site: <http://www.gunnell-inc.com>.

Chair type(s): Child/youth; institutional/commercial; specialty.

**Healthline**

1065 E. Story Rd.

Winter Garden, FL 34787 USA

Telephone: 800-987-3577 toll free.

Fax: 407-656-6328.

E-Mail: [pvcdmeds1@aol.com](mailto:pvcdmeds1@aol.com).

Web site: <http://www.healthlinemedical.com>.

Chair type(s): Beach wheelchair; specialty.

**Innovative Products Unlimited Inc**

4351 W College Ave, Suite 505

Appleton, WI 54914 USA

Telephone: 800-424-3369 toll free or 920-738-9090.

Fax: 920-738-9050.

E-mail: [ipu@ipu.com](mailto:ipu@ipu.com).

Web site: <http://www.ipu.com>.

Chair type(s): Institutional/commercial; pool access.

**Invacare Corporation**

One Invacare Way

PO Box 4028

Elyria, OH 44036 USA

Telephone: 800-333-6900 toll free or 440-329-6000.

E-mail: [info@invacare.com](mailto:info@invacare.com).

Web site: <http://www.invacare.com>.

Chair type(s): Standard/everyday; child/youth; institutional/commercial; specialty.

**J-Mac Industries**

73 UHL Path

Palm Coast, FL 32164 USA

Telephone: 386-437-6539.

Fax: 386-437-6539.

E-mail: [info@j-macindustries.com](mailto:info@j-macindustries.com).

Web site: <http://www.J-macindustries.com>.

Chair type(s): Beach wheelchair.

**Kareco International Inc**

299 Route 22 East

Green Brook, NJ 08812 USA

Telephone: 800-852-7326 toll free or 732-752-9292.

Fax: 732-752-9636.

Chair type(s): Standard/everyday; lightweight/sport; specialty.

**LEVO USA, Inc.**

211 Fulton Court

Peachtree City, GA 30269 USA

Telephone: 888-538-6872 toll free or 770-486-0033.

Fax: 770-486-6096.

E-mail: [request@levousa.com](mailto:request@levousa.com).

Web site: <http://www.levousa.com>.

Chair type(s): Standing wheelchairs.

**Medline Industries, Inc.**

One Medline Place

Mundelein, IL 60060-4486 USA

Telephone: 800-633-5463 toll free or 847-949-5500.

Fax: 800-351-1512 toll free.

E-mail: [service@medline.com](mailto:service@medline.com).

Web site: <http://www.medline.com>.

Chair type(s): Standard/everyday; adult/pediatric.

**Meyra (Wilhelm Meyer GmbH & Co.)**

Meyra-Ring 2

D-32689 Kalletal, Germany

Telephone: 011-49-05733-922-0.

Fax: 011-49-05733-922-143.

E-mail: [info@meyra.de](mailto:info@meyra.de).

Web site: <http://www.meyra.com>.

Chair type(s): Standard/everyday; lightweight/sport; child/youth.

**Mobility Vision**

2 Royal Court

Bow Lane West

Kilmainham, Dublin 8, Ireland

Telephone: 011-353-1-402-3608.

Web site: <http://www.mobility-vision.com>.

Product type(s): Folding lightweight wheelchair

**Mulholland Positioning Systems, Inc.**

215 North 12th Street, PO Box 391

Santa Paula, CA 93061 USA

Telephone: 800-543-4769 toll free or 805-525-7165.

Fax: 805-933-1082.

E-mail: [info@mulhollandinc.com](mailto:info@mulhollandinc.com).

Web site: <http://www.mulhollandinc.com>.

Chair type(s): Tilt-in-space; child/youth.

**Otto Bock Health Care**

North American Headquarters

Two Carlson Parkway North, Suite 100

Minneapolis, MN 55447-4467 USA

Telephone: 800-328-4058 toll free, 800-905-2750 toll free voice mail or 763-553-9464.

Fax: 800-655-4963 toll free or 763-519-6153.

E-mail: [info@ottobockus.com](mailto:info@ottobockus.com).

Web site: <http://www.ottobockus.com>.

Chair type(s): Standard/everyday; child/youth.

**RGK Wheelchairs**

Units 8B/C, Ring Road Zone 2

Burntwood Business Park

Burntwood, Staffordshire WS7 3JQ

United Kingdom

Telephone: 011-44-1543-670077.

Fax: 011-44-1543-670088.

E-mail: [info@rgklife.com](mailto:info@rgklife.com).

Web site: <http://www.rgklife.com>.

Chair type(s): Lightweight/sport; child/youth.



**RJ Mobility Ltd**

Boy Lane  
Wheatley, Halifax, HX3 5AF  
United Kingdom  
Telephone: 011-44-1422-358888.  
Fax: 011-44-1422-355924.  
E-mail: [enquiry@rjmobility.com](mailto:enquiry@rjmobility.com).  
Web site: <http://www.rjmobility.com>.  
Chair type(s): Standard/everyday; lightweight; child/adult.

**Sears Health and Wellness Catalog**

7700 Brush Hill Road, Suite 240  
Burr Ridge, IL 60527 USA  
Telephone: 630-655-8213 or 800-326-1750.  
Fax: 630-850-7623.  
Web site: <http://www.searshealthandwellness.com>.  
Chair type(s): Standard/everyday; lightweight; transport.

**SeatCase, Inc.**

6108 Dedham Lane  
Austin, TX 78739 USA  
Telephone: 800-221-7328 toll free or 512-301-3703.  
Fax: 512-301-3715.  
E-mail: [info@seatcase.com](mailto:info@seatcase.com).  
Web site: <http://www.seatcase.com>.  
Chair type(s): Lightweight / travel.

**Spokes n Motion**

2226 Sth Jason Street  
Denver, CO 80223 USA  
Telephone: 303-922-0605.  
Fax: 303-265-9685.  
Web site: <http://www.spokesnmotion.com>.  
Chair type(s): All-terrain/beach wheelchair.

**Steris Corporation**

5960 Heisley Road  
Mentor, OH 44060-1834 USA  
Telephone: 800-548-4873 toll free or 440-354-2600.  
Web site: <http://www.steris.com>.  
Chair type(s): Institutional/commercial (transport wheelchair/stretchers).

**Stretchair Patient Transfer System, Inc.**

8110 Ulmerton Road  
Largo, FL 33771 USA

Telephone: 800-237-1162 toll free or 727-531-2444.

Fax: 727-536-0666.

Web site: <http://www.stretchair.com>.

Chair type(s): Institutional/commercial (transport wheelchair/stretcher).

**Sunrise Medical**

Mobility Products Division  
7477 East Dry Creek Parkway  
Longmont, CO 80503 USA

Telephone: 888-333-2572 toll free or 303-218-4600.

Fax: 303-218-4590.

Web site: <http://www.sunrisemedical.com>.

Chair type(s): Lightweight/sport; child/youth.

**Theradyne Healthcare Products**, a division of Kurt Manufacturing Company

395 Ervin Industrial Drive  
Jordan, MN 55352 USA

Telephone: 800-328-4014 toll free or 763-502-6190.

Fax: 800-458-7864 toll free.

E-mail: [kurt-theradyne-cs@kurt.com](mailto:kurt-theradyne-cs@kurt.com).

Web site: <http://www.theradyne.com>.

Chair type(s): Standard/everyday; lightweight/sport; child/youth;  
institutional/commercial.

**TiLite**

1426 East Third Avenue  
Kennewick, WA 99337

Telephone: 800-545-2266 toll free or 509-586-6117.

Fax: 866-586-2413 toll free or 509-586-2413.

E-mail: [customerservice@tilite.com](mailto:customerservice@tilite.com).

Web site: <http://www.tilite.com>.

Chair type(s): Lightweight/sports; child/youth.

**Tuffcare, Inc.**

3999 East La Palma Ave.  
Anaheim, CA 92807-1714 USA

Telephone: 800-367-6160 toll free or 714-693-8668.

Fax: 714-632-3998.

E-mail: [contact@tuffcare.com](mailto:contact@tuffcare.com).

Web site: <http://www.tuffcare.com>.

Chair type(s): Standard/everyday; lightweight/sport; child/youth;  
institutional/commercial; specialty.

## **Wheelchairs of Kansas**

204 W. 2nd St.

Ellis, KS 67637 USA

Telephone: 800-537-6454 toll free.

Fax: 800-337-2447 toll free.

E-Mail: [wokinfo@go2wok.com](mailto:wokinfo@go2wok.com).

Web site: <http://www.wheelchairsofkansas.com>.

Chair Type(s): Standard/everyday; specialty.

This list includes all the manufacturers of manual wheelchairs listed in the ABLEDATA product database as of March, 2006.

**The records in the ABLEDATA database are provided for information purposes only. Neither the U.S. Department of Education nor Macro International Inc. have examined, reviewed, or tested any product, device, or information contained in ABLEDATA. The Department and Macro International Inc. make no endorsement, representation, or warranty expressed or implied as to any products, device, or information set forth in ABLEDATA.**

**For an updated list of Web links to manufacturers and distributors, go to the ABLEDATA Web site, <http://www.abledata.com>.**

## **Publications**

"A Key to Independence: Lightweight Chairs for Every Day," *PN/Paraplegia News*, Vol. 57, Issue 3 (March 2003), pp. 27-28.

This special section contains articles on several aspects of owning and using lightweight everyday chairs. The section includes information on wheelchairs from Colours In Motion, Invacare, Mobility Vision, and RGK Wheelchairs.

Annual Survey of Lightweight Wheelchair Manufacturers, *Sports 'n Spokes*.

This annual survey appears every year in the March issue of *Sports 'n Spokes*. It includes pictures of the newest models, a list of manufacturers, and articles on a variety of topics related to lightweight and sports wheelchairs. The 2005 survey appeared under the title "Wheels of Change" in *Sports 'n Spokes*, Vol. 31, Issue 2 (March 2005).

*ANSI/RESNA Wheelchair Standards*, two volumes, Arlington, VA: RESNA Press, 1998.

Volume 1 covers requirements and test methods applying to all wheelchairs and scooters; Volume 2 covers additional requirements for wheelchairs and scooters with electrical systems.

Axelson, Peter, Jean Minkel, and Denise Chesney, *A Guide to Wheelchair Selection: How to Use the ANSI/RESNA Wheelchair Standards to Buy a Wheelchair*, Washington DC: Paralyzed Veterans of America, 1994.

This book provides useful information on wheelchair standards and test procedures in a consumer-friendly format. By explaining how to use the information disclosed by test procedures, the book can help wheelchair users be more informed when selecting a wheelchair.

Axelson, Peter, Denise Chesney, Jean Minkel, and Anita Perr, *The Manual Wheelchair Training Guide*, Santa Cruz, CA: PAX Press, a division of Beneficial Designs, 2001.

This book is designed to help consumers and health care professionals better understand and use manual wheelchairs. It provides detailed, objective information on how to get around in a manual chair, including navigation skills, transportation, and safety issues. Excerpts are available on WheelchairNet at [http://www.wheelchairnet.org/WCN\\_ProdServ/Docs/WCN\\_MWTG.html](http://www.wheelchairnet.org/WCN_ProdServ/Docs/WCN_MWTG.html).

Boninger, Michael L., and Alicia M. Koontz, "Proper Propulsion," *Rehab Management*, Vol. 16, No. 6 (July 2003), pp. 18-21.

<http://www.rehabpub.com/features/72003/3.asp>.

This article discusses the results of research on the prevention of pain and repetitive strain injuries among people who use manual wheelchairs.

Cooper, Rory A., "Top 10 Advances," *PN/Paraplegia News*, Vol. 59, No. 3 (March 2005), pp. 49-50.

Dr. Cooper presents a list of the top ten major improvements made to manual wheelchairs over the past decade.

Cooper, Rory A., Michael L. Boninger, Shirley G. Fitzgerald, and Andrew J. Rentschler, "Comparison of Fatigue Life for Three Types of Manual Wheelchairs," *Archives of Physical Medicine and Rehabilitation*, Vol. 82, No. 10 (October 2001), pp. 1484-1488.

This study compared the fatigue life of three types of manual wheelchairs: (1) ultralight wheelchairs, (2) lightweight wheelchairs, and (3) depot wheelchairs. The authors tested a total of 61 manual wheelchairs, and found that ultralight wheelchairs lasted the longest, while depot wheelchairs lasted the least amount of time.

Cooper, Rory A. and Rosemary Cooper, "Time to Immobilize," *Sports 'n Spokes*, Vol. 29, No. 2 (March 2003), pp. 34-42.

The authors discuss recent innovations and improvements to wheelchairs, including suspension chairs, the use of titanium, and wheelchair customization.

Daus, Carol, "The Right Fit," *Rehab Management*, Vol. 16, No. 7 (August/September 2003), pp. 32-35, 69.

This article discusses selection of bariatric wheelchairs for obese users.

Dworak, Patricia, Robin Folland, and Amy Kirkner, "Age Over Matter," *Rehab Management*, Vol. 17, No. 10 (December 2004), pp. 26-29

This article describes factors that professionals should consider in prescribing wheelchair seating for older adults, highlighting the importance of postural changes that often accompany aging

Karp, Gary, *Choosing a Wheelchair: A Guide for Optimal Independence*, Sebastopol, CA: O'Reilly & Associates, 1998.

This guidebook is written for the wheelchair user. It discusses issues such as "Who Pays for Your Chair?" and power versus manual, and has whole chapters devoted to specific features such as Cushions; Seats and Backs; Footrests; Tires, Casters, and Suspension Systems; Tilt/Recline and Positioning Systems; and Armrests, Clothing Guards, and Accessories. Information and excerpts from this book are available at Gary Karp's disability resource web site, Life on Wheels, <http://www.lifeonwheels.net>.

Meehan, Robert and Robin J. Skolsky, "Navigating the Options," *Rehab Management*, Vol. 18, No. 3 (April 2005), pp. 34-37

This article discusses considerations to weigh in choosing manual wheelchair modifications, components, and accessories.

**For an updated list of publications on manual wheelchairs, go to the AT Library at the ABLEDATA Web site, <http://www.abledata.com>.**

## Resources

### **Paralyzed Veterans of America**

801 Eighteenth Street, NW

Washington, DC 20006-3517 USA

Telephone: 800-424-8200 toll free.

E-mail: [info@pva.org](mailto:info@pva.org).

Web site: <http://www.pva.org>.

PVA is a veterans service organization formed to serve veterans with spinal cord injury or disease. PVA publishes *Sports 'N Spokes* and *Paraplegia News* magazines. Its Web site is a resource center for veterans and others with SCI, and includes much wheelchair-related information.

## **Rehabilitation Engineering Research Center (RERC) on Wheelchair Transportation Safety**

5044 Forbes Tower

Department of Rehabilitation Science and Technology

University of Pittsburgh

Pittsburgh, PA 15260 USA

Telephone: 412-383-6596.

TT: 412-383-6596.

Fax: 412-383-6597.

E-mail: [lerc@shrs.pitt.edu](mailto:lerc@shrs.pitt.edu).

Web site: <http://www.ercwts.pitt.edu>.

Projects of the RERC on Wheelchair Transportation Safety include research and development, information dissemination, training, and technology transfer related to transportation safety for wheelchair-seated passengers and drivers. Its web sites include WheelchairNet (<http://www.wheelchairnet.org>), an informational web site for wheelchair users and others interested in wheeled mobility, and the Wheelchair Standards Information web site, <http://www.wheelchairstandards.pitt.edu>, with information on the development of standards for wheelchair transportation safety. The RERC is sponsored by grants from the National Institute on Disability and Rehabilitation Research (NIDRR).

## **Rehabilitation Engineering Research Center on Wheeled Mobility**

Georgia Institute of Technology

Center for Assistive Technology and Environmental Access (CATEA)

490 Tenth Street, NW

Atlanta, GA 30318 USA

Telephone: 404-385-4691

Fax: 404-894-9320

E-mail: [randy.bernard@arch.gatech.edu](mailto:randy.bernard@arch.gatech.edu).

Web site: <http://mobilityrerc.catea.org>.

Mobility RERC conducts research to identify the needs of wheelchair users and to develop appropriate products to meet their needs. In addition to wheelchairs, it focuses on seating, environmental barriers, and interactive training techniques. Mobility RERC is sponsored by grants from the National Institute on Disability and Rehabilitation Research (NIDRR).

## **Spinal Cord Injury Peer Information Library on Technology (SCI PILOT)**

c/o Toronto Rehabilitation Institute  
520 Sutherland Drive  
Toronto, Ontario MAG 3V9  
Canada  
Telephone: 416-587-3422, ext. 6264.  
Fax: 416-422-5216.  
E-mail: [info@scipilot.com](mailto:info@scipilot.com).  
Web site: <http://www.scipilot.com>.

SCI PILOT is an information resource describing the assistive technology experiences of individuals with spinal cord injury from their own perspective, including consumer reviews of wheelchairs.

## **USA TechGuide**

United Spinal Association  
75-20 Astoria Boulevard  
Jackson Heights, NY 11370 USA  
Telephone: 718-803-3782.  
Fax: 718-803-0414.  
E-mail: [info@unitedspinal.org](mailto:info@unitedspinal.org).  
Web site: <http://www.usatechguide.org>.

The USA TechGuide is an Internet guide to wheelchairs and assistive technology, with reviews of specific wheelchair models, written by caregivers and professionals. It is sponsored by the United Spinal Association, formerly the Eastern Paralyzed Veterans Association.

## **Wheelchair Junkie**

Web site: <http://www.wheelchairjunkie.com>.

This web site, owned and operated by Mark E. Smith, has information for consumers on many aspects of powered and manual wheelchairs and wheelchair accessories, including product reviews written by wheelchair users.

## **Wheels for Humanity**

12750 Raymer Street, Unit 4  
North Hollywood, CA 91605 USA  
Telephone: 818-255-0100  
Fax: 818-255-0233  
Web site: <http://www.wheelsforhumanity.org>.

Wheels for Humanity recycles wheelchairs and delivers and fits them, at no cost, to children and adults in developing countries. The organization works with local healthcare workers in villages and towns to identify those in greatest need of help. With a volunteer team of health care professionals, physical / occupational therapists and rehabilitation seating specialists, each recipient is matched to the wheelchair that best fits his or her needs.

**Whirlwind Wheelchair International (WWI)**

San Francisco State University  
School of Engineering  
1600 Holloway Avenue, SCI 251  
San Francisco, CA 94132-4163 USA  
Telephone: 415-338-6277.  
Fax: 415-338-1290.  
E-mail: [whirlwind@sfsu.edu](mailto:whirlwind@sfsu.edu).  
Web site: <http://www.whirlwindwheelchair.org>.

Whirlwind Wheelchair International (WWI), a program of the Urban Institute at San Francisco State University (SFSU), works to make wheelchairs available to every person in the developing world who needs one. It does this by designing wheelchairs that could be built in developing countries from locally available materials, and providing on-site training in wheelchair assembly, production, and fitting, to support small shop production in Africa, Asia, and Latin America. All of WWI's designs are placed in the public domain in order not to add to the cost of village wheelchair shops using these designs.

**For an updated listing of organizations and other resources for people with disabilities, go to the ABLEDATA Web site, <http://www.abledata.com>.**



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**ABLEDATA**

**8630 Fenton Street, Suite 930**

**Silver Spring, MD 20910 USA**

**Telephone: 800-227-0216 toll free in the U.S.; 301-608-8998 local call in the Washington, D.C. area.**

**TT: 301-608-8912.**

**Fax: 301-608-8958.**

**All ABLEDATA publications, the ABLEDATA database of assistive technology, and other ABLEDATA resources are available on the ABLEDATA Web site, <http://www.abledata.com>.**

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