

Quick Guide

Manual Wheelchair Fit

The evidence-based recommendation from RESNA’s position paper “The Application of Ultralight Manual Wheelchairs” states that, “The person cannot conform to the wheelchair, but the wheelchair must conform to the individual.

By doing this, we...

- Decrease risk of upper extremity pain or RSIs
- Contribute to short and long-term functional success
- Decrease the incidence of secondary complications
- Optimize roll efficiency of the manual wheelchair
- Aid in postural alignment and improve sitting tolerance
- Reduce risk of pressure injury
- Improve function
- Overall improvements of quality of life and independence

Important considerations when completing wheelchair specifications:

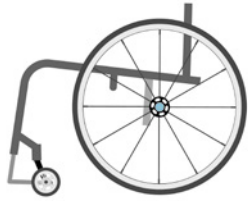
- Choose the wheelchair you will use for the evaluation (the client’s existing wheelchair or demo) – stay with this wheelchair throughout the measuring process
- Measure the demo being used for your records and as a reference for new wheelchair specifications. Be sure to include overall width and overall frame length – this is the functional footprint of the wheelchair and may be crucial for the client’s environmental access and function
- Place the client in the demo wheelchair and ask the client to sit in their most typical and desired position – the position they are in 80% of the time
- Now you are ready to complete your measurements using the selected wheelchair as a reference, changing what needs to change for optimal configuration

Below is a model for how to achieve the best fit:



Width

- Seat width
- Front seat width
- Footrest width



Length

- Overall frame length
- Seat depth
- Frame depth
- Front frame angle



Wheel access

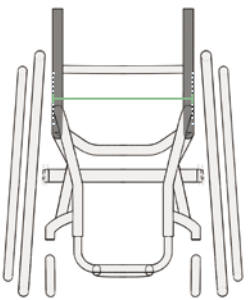
- Seat-to-floor heights
- Center of gtavity
- Camber
- Wheel spacing

WC width quick reference

Seat width + front seat width + footrest width
(standard or V)

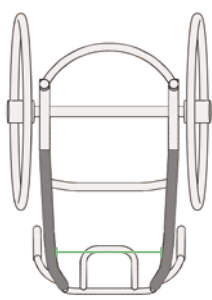
Seat width

Outside of seat tube at back post to the outside of the opposite seat tube



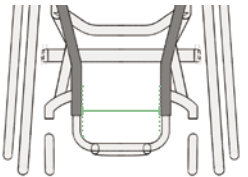
Front seat width (seat taper)

Inside of front frame tube to inside of opposite front frame tube



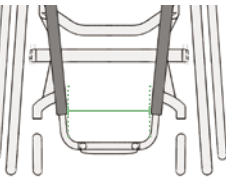
Footrest width - Standard

Inside of front frame tube to inside of opposite front frame tube



Footrest width - V

Inside of front frame tube to inside of opposite front frame tube 2 1/2" above footres



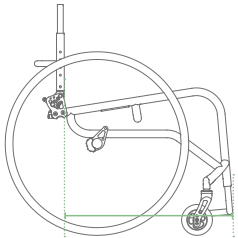
WC length quick reference

Overall frame length = seat depth + frame depth + frame angle.

Using the overall frame length to determine the front frame angle is the most accurate way of measuring it.

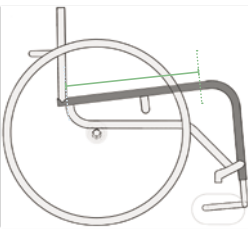
Overall frame length

Front edge of footrest to front edge of back post



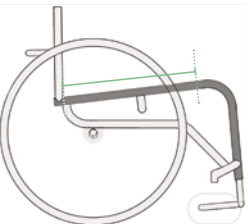
Seat depth

Front of back post to front of seat sling



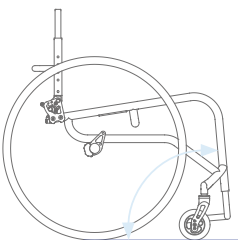
Custom frame depth

Front of back post to beginning of bend



Front frame angle

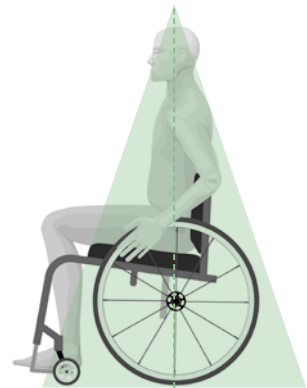
Frame front to floor (behind front frame



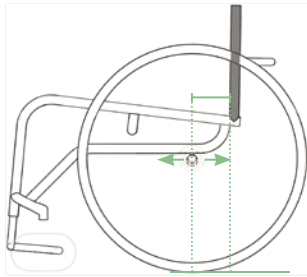
Wheel access quick reference

Horizontal rear wheel axle positioning

Every full-time, long-term wheelchair user should have the rear wheel positioned uniquely for them to prevent injury and ensure full access to their environment.



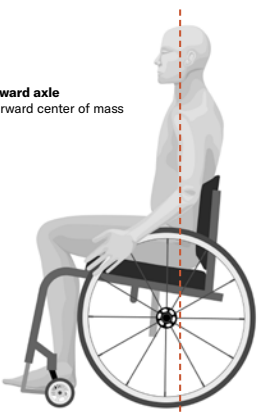
The horizontal axle position will determine the wheelchair center of gravity (COG)



Horizontal axle measurement, is the horizontal distance from the front of the back post to the center of the rear axle of the wheelchair.

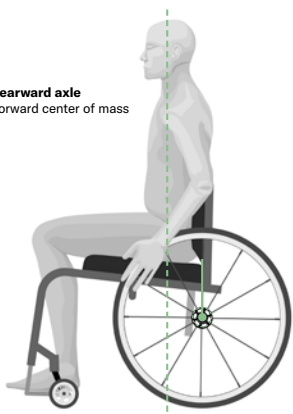
Forward axle

Rearward center of mass



Rearward axle

Forward center of mass



Benefits	Benefits
Allows for more efficient upper extremity position for propulsion	The WC will be more stable in the rear*
Increases frontward stability of the WC. WC is less likely to tip forwards when rolling down, reaching forward, or scooting forward for transfers	Considerations
Decreases turning radius and overall footprint of the wheelchair, making it easier to navigate small spaces	Less efficient upper extremity position to reach rims, could lead to injury over time
Increases ease of performing a wheelie to maneuver obstacles	Increases the forces necessary to turn the wheelchair
	Increased rolling resistance makes it harder to propel
	Increases difficulty of performing a wheelie to maneuver obstacles
	Increases the turning radius and length of the wheelchair footprint, making it difficult to navigate small spaces
	*Increases risk of WC tipping forward
Considerations	
If too far forward, it increases the risk of wheelchair tipping backwards	

Dimension and tips

Seat width

Width should only be as wide as necessary, allowing for use of frame to promote postural alignment, improve wheel access, and maximize environmental access

Seat depth

Maximize support of the upper leg and pressure distribution without interfering with posterior aspect of lower leg

Frame depth

Match frame to client proportionally to the upper leg Bend of frame should start at popliteal fossa

Front Seat-to-Floor Height

Must consider the cushion being utilized when selecting Consider transfers, access under tables, desks, and clearance required under foot plate

Rear Seat-to-Floor Height

Use rear seat height to maximize wheel access and achieve a more efficient push

Overall frame length or front frame angle

Select so that frame is proportional to the length of the client’s side profile while sitting in the desired position

Footrest width

Select a width that allows for adequate space for the client’s feet and tapers to the client’s desired position

Seat back height

Select a seat back height that allows the prescribed back support to reach desired height for adequate postural support

Seat back angle

Select seat back angle that results in desired support, balance, and optimal spinal curves when seated

Center of gravity

Ideally 80% of the client’s body weight on the rear wheel. Achieve this by bringing the rear wheel forward, reducing the amount of weight on the front casters and improving wheel access

Camber

Eases initiation of movement and turns, increases lateral stability and, therefore, functional width of wheelchair

Wheel spacing

May use in combination with camber to achieve a neutral shoulder alignment during propulsion, impacts functional width of the WC

Wheel size

Select a wheel size that allows for 100-120° of elbow flexion when the client is at the start of a push stroke

TiLite Manual Wheelchair Range

Custom-made to meet unique needs



TiLite wheelchairs are known for their precision engineering and customisable solutions. Every TiLite rigid chair is made to measure, ensuring an individualised fit to enhance comfort, mobility and performance.

Focused on personalisation, precision and performance, TiLite wheelchairs enhance user mobility, propulsion efficiency and long-term independence by minimising mechanical load and rolling resistance.

- Fully adjustable and configurable, allowing customisation to the user’s measurements, lifestyle and functional requirements
- Lightweight titanium frames, for superior strength-to-weight ratio and long-term durability, providing a smoother ride and optimised efficiency
- Rear axle adjustability, which enhances manoeuvrability and propulsion biomechanics
- Ergonomic seat to match an individual’s shape and improve sitting tolerance

Panthera Manual Wheelchair Range

Ultra-lightweight for responsive movements



With a focus on lightweight design and easy handling, Panthera wheelchairs are designed for users looking for effortless propulsion and superior control. The pinnacle of ultralightweight mobility, every element is designed to reduce strain, enabling users to focus on living freely, efficiently and independently.

Panthera combines ultralightweight construction with exceptional durability, supporting users with both daily life and active lifestyles.

- Carbon fibre frame for strength and lightness - Panthera X boasts a transport weight of just 2.1kg
- Optimum weight distribution: minimal lifting effort supports independent transportation
- Built with an active, high-performance user in mind, ensuring efficiency and minimum rolling resistance
- Reduced risk of RSIs due to superior vibration dampening, shock absorption and biomechanical efficiency
- Minimal maintenance required due to simplified, rigid design

Progeo Manual Wheelchair Range

Tailored fit for comfort and efficiency



Progeo manual wheelchairs deliver sleek Italian design and advanced technology, providing improved mobility and a modern, personalised aesthetic.

Combining lightweight durability with custom-made personalisation, Progeo provides a balance between aesthetics, mobility and comfort through personalised configurations tailored to the user’s lifestyle.

- Hybrid design, combining the benefits of rigid and folding frames
- Aluminium and carbon fibre technology for a lightweight yet durable frame and improved manoeuvrability
- Unique colour customisations and sleek finishes enable users to express their style and personality
- Custom fit for every user: adjustable backrest heights, seat depths, footplate positions and camber options
- Optimised rolling efficiency for reduced strain and a smooth ride
- Precision-balanced frame geometry and lightweight Spinerge Flexrim wheels improve push efficiency and reduce fatigue

A quick-reference clinical guide to:

Active Manual Wheelchairs

permobil

To find out more about Permobil Power Assist Devices and to access the in-depth clinical guide visit

