

Wheelchair

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BASIC CONCEPTS



Push Handle

Armrest

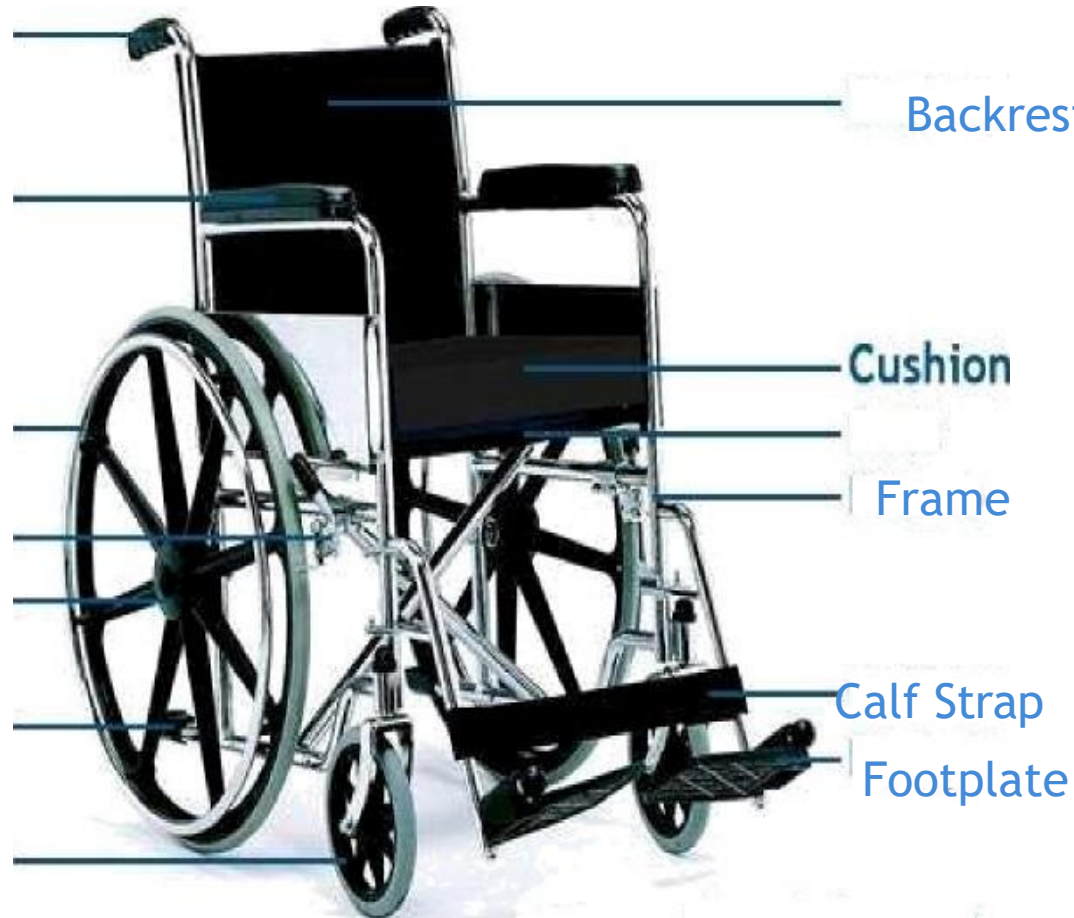
Push Ring

Brake

Rear Wheel

Anti-tip Bar

Castor



Backrest

Cushion

Frame

Calf Strap

Footplate



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TYPES OF WHEEL

CHAIR

Based on-
propulsion

method,
mechanism of

control,

technology used

1. Attendant – propelled chairs
2. Manual chairs
3. Power mobility device
4. Mobility scooters
5. Single – arm drive wheelchair
6. Reclining wheelchair
7. Standing wheelchair
8. Sports wheelchair
9. Smart wheelchair

Designed to be pushed by another individual because of user's inability to propel or operate manual wheelchair in a functional or safe manner



ATTENDANT— PROPELLED CHAIRS

- ❑ For those who can propel and brake using the upper limb.
- ❑ Have variety of frame types, weights and transport feature



MANUAL CHAIRS

Used by individuals-

- ✓ Who cannot propel a chair either using hand or feet
- ✓ For whom the energy expenditure required to walk or propel a manual chair is contraindicated
- ✓ Who are prone to repetitive stress injuries
- ✓ Who have neuromuscular dysfunction



MOTORIZED CHAIRS

- Share some features with power chairs but primarily addressed for people with a limited ability to walk, but who might not otherwise consider themselves disabled.
- Typically 3 wheeled with a base on which is mounted a basic seat at the rear, with a control tiller at the front.



MOBILITY SCOOTERS

- Enables a user to self-propel a manual wheelchair using only a single arm
- Large wheel on the same side as the arm to be used is fitted with two concentric hand rims, one of smaller diameter than the other.
- The outer smaller rim is connected to the wheel on the opposite side by an inner concentric axle



SINGLE ARM DRIVE WHEELCHAIR

- Have seating system which can be tilted to various angles
- Good for person who are unable to sit upright for extended periods because of pain or other reasons
- Various designs are available and wheelchair with the feature may either tilt the seat back and leg rests in relation to seat or may tilt the entire back, seat and leg rest as one depending on the need of user.



**RECLINING
WHEELCHAIR**



❑ Can be used as both a wheelchair and a standing frame

❑ Benefits-

1. Aids independence and productivity
2. Extending access
3. Relief of pressure/ reduction of pressure sores
4. Reduction in abnormal muscle tone/ spasticity and skeletal deformities
5. Raising self- esteem and psychological well being



STANDING
WHEELCHAIR



SPORTS WHEELCHAIR

■ Developed for athletes for –

1. Basketball
2. Rugby
3. Tennis
4. Racing
5. Dancing

■ Cambered wheelchair



- ♣ Use control system to augment or replace user control.
- ♣ Purpose is to reduce or eliminate the user's task of driving a wheelchair
- ♣ Controlled via computer has a suit of sensors and applies techniques in mobile robotics
- ♣ Interface may consist of a conventional wheelchair joystick.

SMART WHEELCHAIRS



FUNDAMENTAL NEEDS OF WHEELCHAIR USERS

- ♣ Main problem of wheelchair users are about moving and working from a sitting position
- ♣ Many requirements are associated with the dimensions and other aspect of wheelchair
- ♣ Length of wheelchair- 1100- 1200mm. User's feet add approximately 50 mm to the overall length
- ♣ Width varies between – 600-700 mm. To propel a chair manually by operating the rims of the main wheels, a clearance of not less than 50mm and preferably 100 mm is needed
- ♣ Space requirements for maneuvering are always related to the activities to be performed.
- ♣ Different users act in different ways depending on individual performance and the type of chair used
- ♣ When planning spaces in building to cater for wheelchair turning, a guide is to impose on the plan to provide a circle of 1800mm diameter

WHEELCHAIR MEASUREMENTS

- **SEAT WIDTH-** across the widest parts of either the thighs or hips while patient is sitting in a chair comparable to that expected. Add $\frac{1}{2}$ to 1 inch on each side of the hip or thigh measurement taken.
- **SEAT DEPTH-** from the rear of buttocks to inside of bent knee. Check the clearance behind the knee to prevent contact of front edge of seat with popliteal space.
- **SEAT HEIGHT-** popliteal fossa to heel.
- **BACK HEIGHT-** for full trunk support, measure from top of the seat to top of shoulder. For minimum trunk support , top of back to inferior angle of scapula.
- **ARM HEIGHT-** with patient in comfortable position, measure from seat post to bottom of bent of elbow.

THANK YOU