I. Fundamental Features

1. Types of Wheelchairs

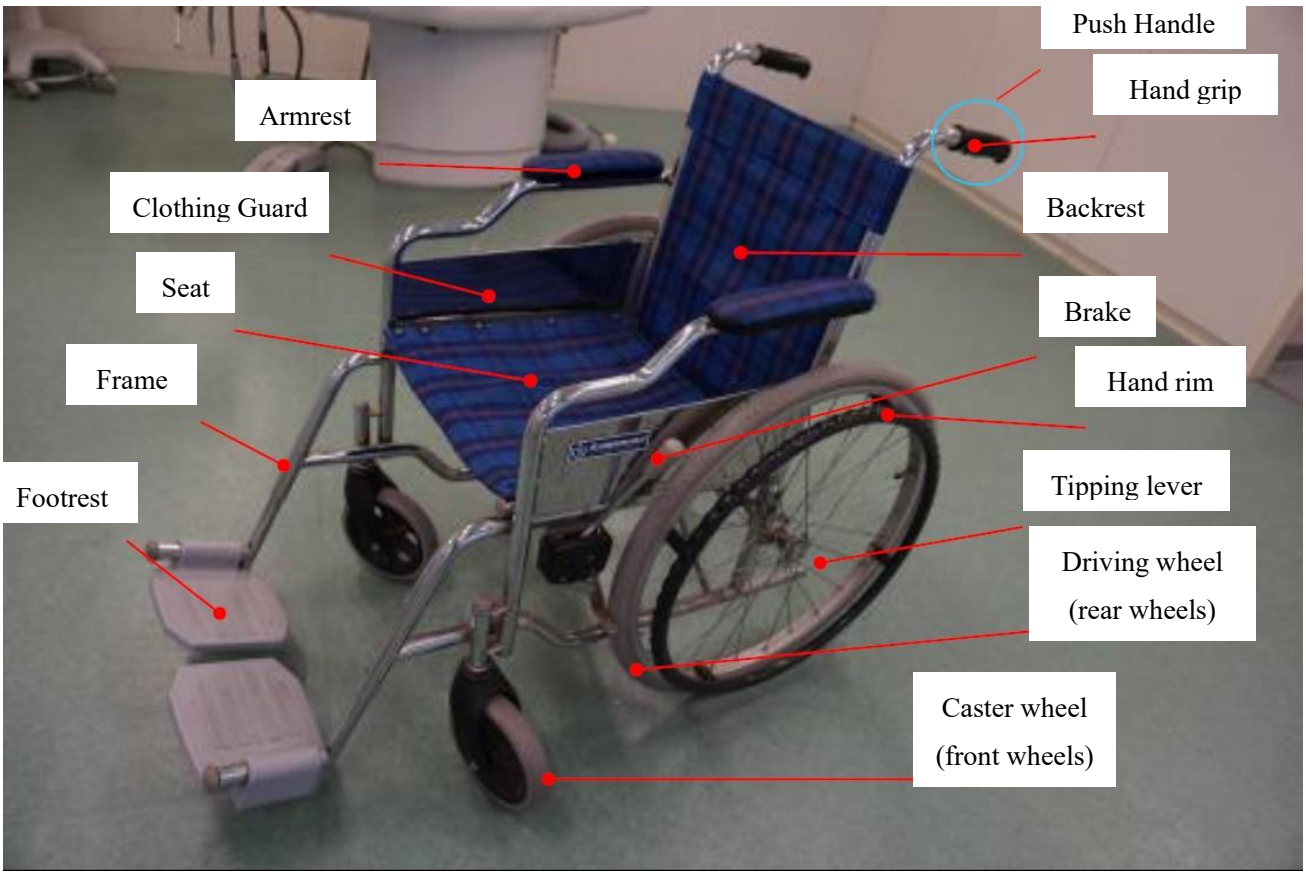
① Self-propelled Wheelchair
- For user who can propel the wheelchair by themself
- Can also be propelled by an attendant

② Attendant-propelled Wheelchair
- For user who is unable to propel the wheelchair by themself

③ Tilt-in-space and Recliner Wheelchair
- For individuals who cannot maintain their posture
- Mainly used indoors
- Tilt function (tilt-in-space): Backrest can be tilted while maintaining a seated position
- Reclining function: Ability to tilt backrest for reclining position

④ Power Wheelchair
- Powered by electric motor and operated by users with a joystick

2. Wheelchair Basic Structure



1) Armrest

- Provides support for the elbows of the user
- Two types: normal arm type and desk arm type
- The desk arm type is lower in front, making it easy to place in front of a table
- Detachable type and flip-up type armrests are available
- These facilitate transfer in and out of the wheelchair; for example, to bed, etc.

Normal arm type

Desk arm type

2) Clothing Guard

- To prevent clothes from becoming dirty or catching in a wheel

Clothing Guard

3) Seat

Materials used

- Vinyl: stain-resistant
- Nylon: durable

Folding state

Backrest

- Helps with postural retention
- Reclining type can be tilted backward for user who has difficulty with maintaining a seated position for a long period of time

Reclining type

Frame

- Provides support for the entire wheelchair
- Main component is aluminum alloy, a high-strength material

Frame

Footrest

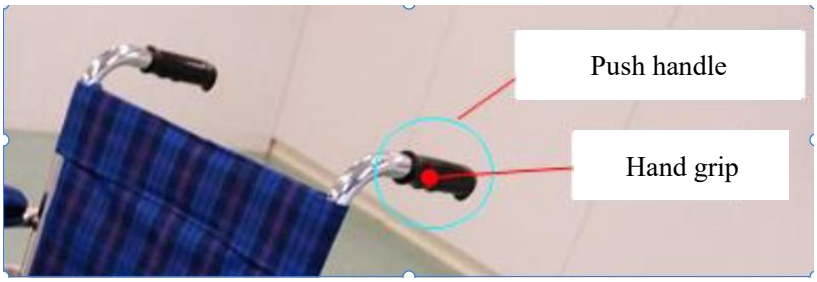
- Plates on lower part of the frame where feet are placed
- Both can be individually folded up

Push Handle

- Used by attendant for moving the wheelchair
- The handle is a right-angle or curved shape
- Set at a height that is easy for attendant to walk and move chair

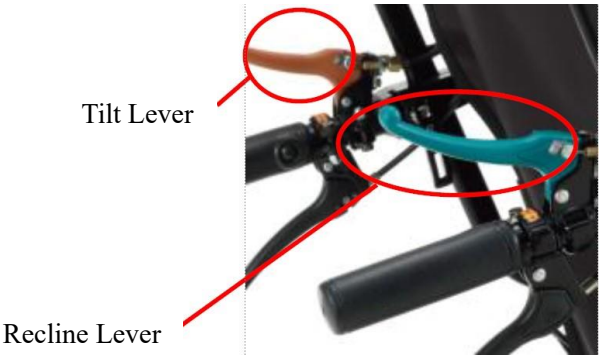
Hand Grip

- Shape that is easy for attendant to grasp



Tilt Lever and Recline Lever

- Tilt lever: used to adjust seat angle while maintaining backrest angle
- Recline lever: used to adjust backrest angle



Brake

- Wheel brake: apply by pulling backward

- Assist brake: used for control of wheelchair by attendant

- Foot brake: used to stop large wheel from the rear by attendant with one-touch operation

Hand Rim

- Attached to driving wheels (rear wheels)
- The user uses the hand rims to propel wheelchair by themself
- Materials: stainless steel, aluminum alloy, plastic

Hand Rim

Tipping Lever

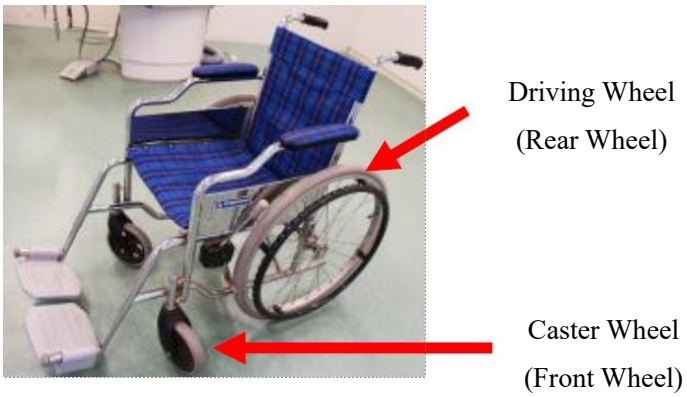
- Used to lift wheelchair so as to go on steps or over ledges
- The attendant can easily lift the wheelchair's caster wheels (front wheels) by stepping on the tipping lever with their foot

Caster Wheel (Front Wheel)

- Smaller diameter than rear wheel and ability to rotate 360 degrees
- Used for changing direction

Driving Wheel (Rear Wheel)

- Wheel used to transmit driving force
- Tire is often the same thickness as a regular bicycle tire



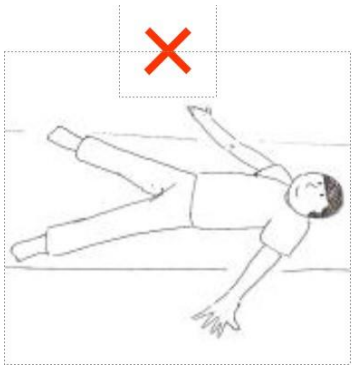
3. Body Mechanics

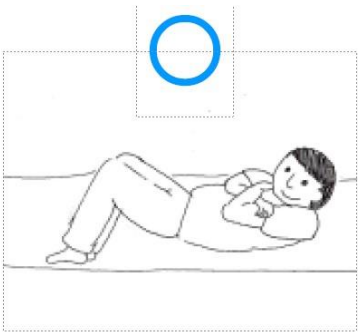
- Techniques for promoting physical fitness, with focus on the skeleton, muscles, internal organs, etc.
- Safe movements must be performed without placing a burden on either the person requiring assistance or caregiver

① Set the patient's body close and into a small sphere
② Set the caregiver's body as close as possible to the patient's body
③ The caregiver makes the supporting surface wider by spreading their legs
④ Establish the center of gravity as low as possible.
⑤ Avoid bending from the waist (be aware of large leg muscles and lumbar muscles)
⑥ Avoid twisting the body
⑦ Move in horizontal directions

① Set the patient's body close and into a small sphere

- Weight percentage of each body part in a supine position:
  head 7%, chest/abdomen 33%, buttocks 44%, lower extremities 16%
- It is easy to become unstable when forces are distributed
- Make the body as spherical as possible
- Place arms over chest and bend knees up
- A compact posture makes it easier to provide assistance





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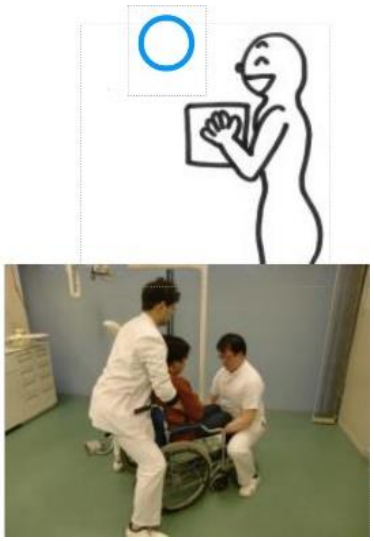
② Set the caregiver’s body as close as possible to the patient's body

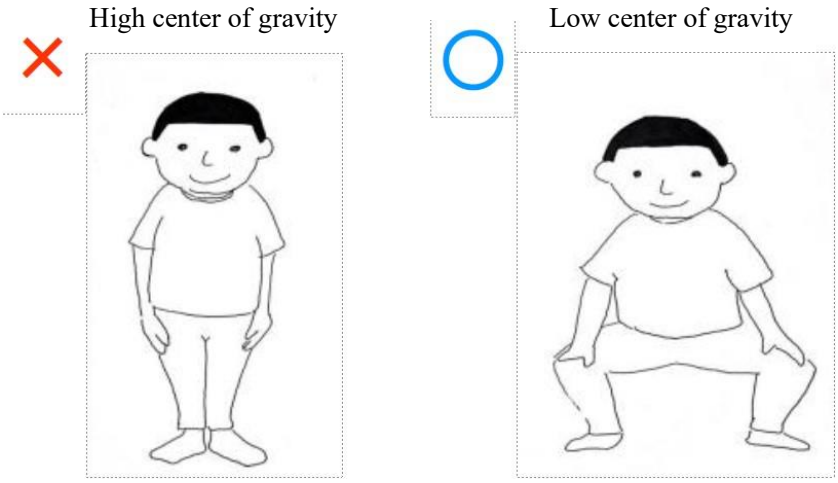


③ The caregiver makes the supporting surface wider by spreading their legs (stability)

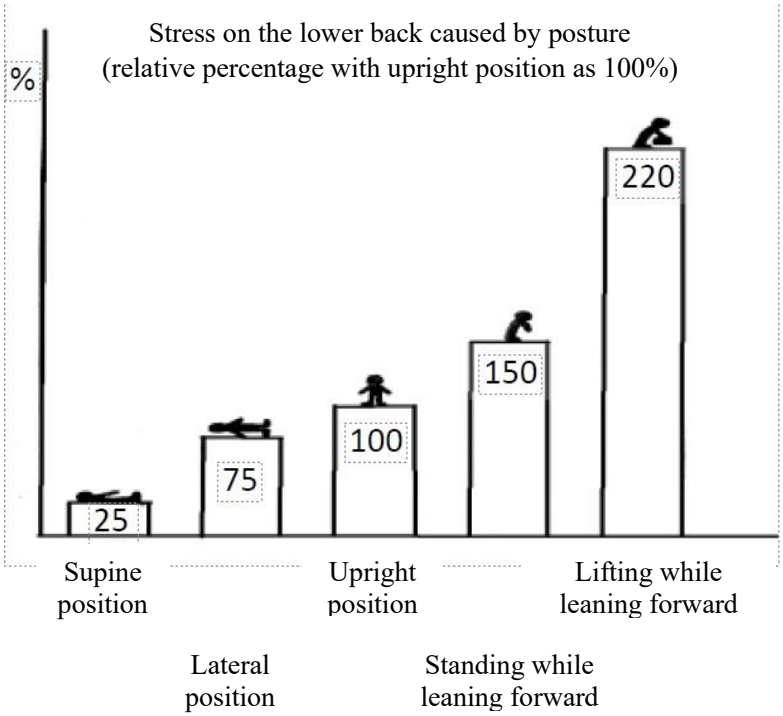
Standing with feet too close together

Standing with feet too far apart

④ Set the center of gravity as low as possible (stability, helps patient to not fall over)



⑤ Avoid bending from the waist (be aware of large leg muscles and lumbar muscles; i.e., rectus abdominis, back muscles, pectoralis major, gluteus maximus, quadriceps)



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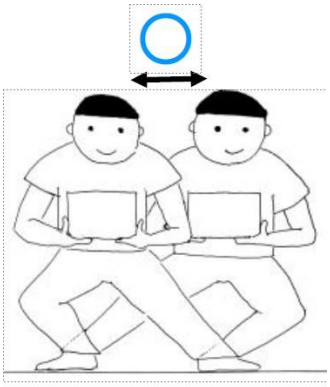
⑥ Avoid twisting the body



Change position by shifting weight

⑦ Move in horizontal directions

Adjust wheelchair armrest height to match seat height of dental chair

II. Transfer: From wheelchair to dental chair

1. Approaching the patient

(1) Talk to the patient and explain:

“Hello, Mr./Ms. △△. I am a clinical intern and my name is ○○.”

“I would like move you to the dental chair. May I do that now?”

2. Wheelchair positioning and braking

(1) Position wheelchair close to the dental chair.

The wheelchair and dental chair should be parallel if possible, or up to 20 to 30 degrees to reduce the travel distance

(2) Lock the wheels

(3) Position the dental chair to be at the same height as the wheelchair

Adjust the dental chair seat to the same height as the wheelchair seat

Reduce the horizontal movement distance as much as possible

If the armrest can be removed, make sure the wheelchair seat and dental chair are at the same height

3. Caregiver position and posture

(1) The caregiver stands behind the wheelchair

(2) Asks/helps patient to cross their arms across their chest

(3) Caregiver places their arms under patient’s upper arms and grasps their wrists

(4) When caregiver is on the upper body side, both legs should be opened

(5) When caregiver is on the lower body side, both legs should be opened and patient's knees held

Widen the angle of the feet

Lower the center of gravity

Keep close to the patient's body.

Bend the back as little as possible.

Step with both legs open

4. Transferring patient to dental chair

(1) Caregiver on upper body side initiates and leads the lift with a prearranged count (ex., “1-2-3-lift”)

Caregiver lowers their center of gravity.

Use muscles in the lower extremities

Caregiver should bend their back as little as possible

Perform transfer by caregiver shifting their weight

(2) Caregiver supports patient until stabilized with their back against the backboard of the dental chair

Caregiver should remain on the upper body side and support the patient's body until the end of the examination

III. Transfer: From dental chair to wheelchair

1. Talk to the patient and explain

Inform the patient that they will be transferred to a wheelchair:

“We are now going to move you to a wheelchair.”

2. Wheelchair positioning and braking

(1) Position the wheelchair close to the dental chair

The wheelchair and dental chair should be as parallel as possible, with no more than 20 to 30 degrees difference

(2) Lock the wheels

(3) Position the dental chair to be at the same height as the wheelchair.

3. Caregiver position and posture

(1) Caregiver stands behind wheelchair.

(2) Caregiver places their arms under patient’s upper arms and grasps their wrists.

(3) Stay close to patient’s body

(4) The caregiver on the lower body side holds the patient's knees

4. Transferring

(1) Transfer on cue (ex., “1-2-3-now”)

Transfer slowly on upper body side following caregiver cue

Shift in horizontal direction

Reduce travel distance

(2) Place patient's body into wheelchair

Seat the patient deeply

Ensure that the patient's body is not leaning to one side

Place the patient's feet on footrests

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