

ORTHOTICS AND PROSTHETICS

[PT 308]

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LECTURE NOTES FOR 3rd GRADE BPT STUDENTS

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DEPARTMENT OF PHYSIOTHERAPY, FACULTY OF APPLIED HEALTH SCIENCES

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LECTURE OUTLINE

- **Learning objectives**
- **Walking aids**
 - **Canes**
 - **Crutches**
 - **Walkers**
 - **Wheelchairs**
- **Review**
- **Reading resources/additional materials**

ORTHOSIS AND PROSTHESIS

LEARNING OBJECTIVES

- At the end of the lecture, the students should be able to:
- Identify types and uses/indications for canes, crutches, walkers, & wheelchairs.
- Demonstrate proper techniques for using walking aids to ensure safety & posture.
- Compare benefits and limitations of canes, crutches, walkers, & wheelchairs.
- Understand when to prescribe specific walking aids based on patient needs.
- Perform practical demonstrations of adjusting & fitting walking aids.

Walking Aids

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Walking aids

What are walking aids?

- Are devices used to support & assist in walking for individuals with mobility impairments.
- Primarily used to:
 1. Improve balance & stability
 2. Enhance mobility & independence
 3. Offload weight from injured or affected limbs

Types of walking aids

- Common types include
 1. Canes
 2. Crutches
 3. Walkers
 4. Wheelchairs



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Walking aids

Canes (also called “walking stick”)

- **Types:** Single-point cane, tripod, & quadraped canes.
- **Uses:** Minimal support for balance & coordination.
- **Indications:** Mild to moderate weakness, pain, or balance issues on one side (example of condition where cane can be prescribed include OA, hemiparesis, post-surgical recovery [THR or TKR], strains, sprains, fractures)



Tripod and quadraped canes are typically used for moderate pain or weakness or balance

Soft Foam Grip

provides comfort

Wrist Strap

keeps the cane in your hand without falling

Push Buttons

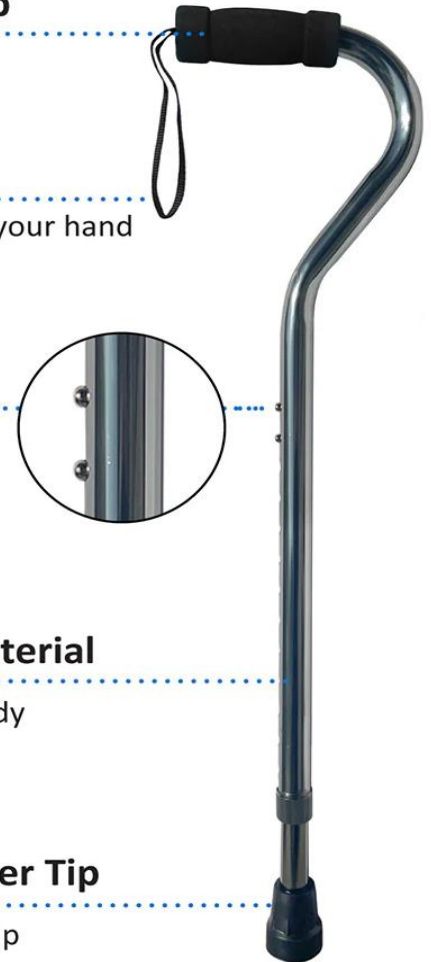
for easy height adjustment

Aluminum Material

lightweight & sturdy

Anti-slip Rubber Tip

provides strong grip



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Canes

- **Proper technique:**
 - Hold in opposite hand of the weaker leg.
 - Move the cane with the weaker leg to maintain proper body alignment.



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Walking aids

Crutches

Axillary crutches:

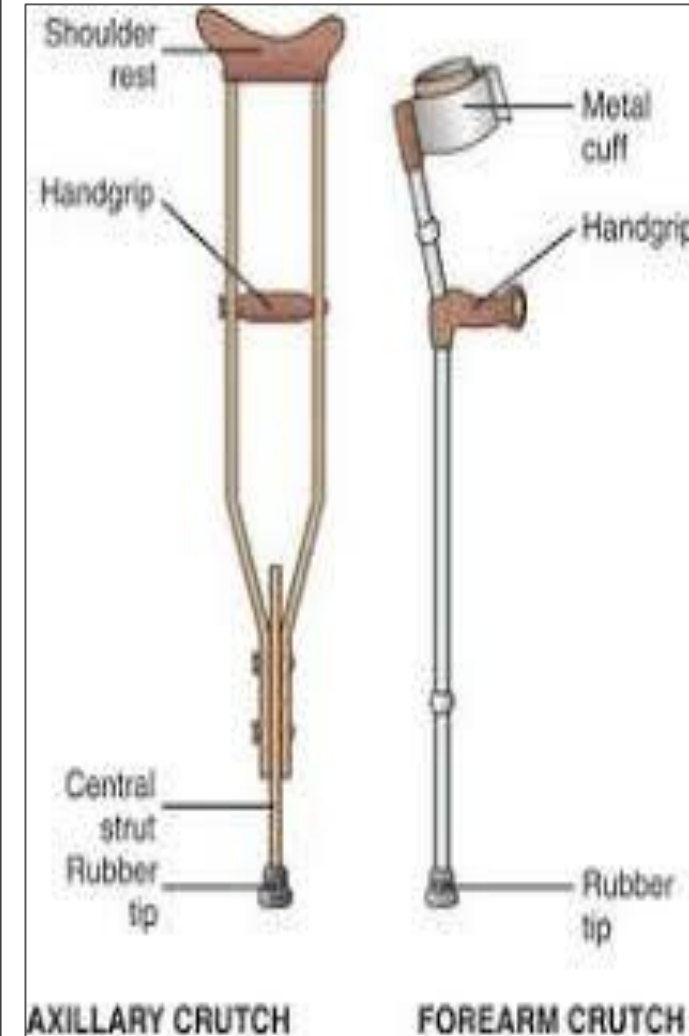
- Crutches that fit under the armpits, providing support for both legs.
- Indicated for severe lower limb injury or after surgery (e.g. LL fracture, amputation).

Forearm (Lofstrand) crutches:

- Crutches that provide support via forearm cuffs, more functional for long-term use.
- Indicated for chronic neurological conditions, long-term rehabilitation (e.g. knee/hip surgeries, fractures when partial-weight bearing is required).

Proper Technique:

- Ensure proper crutch height: about 2-3 fingers below the armpit.
- Elbows should be slightly bent (30 degree) when holding the hand grips.
- Use a tripod gait (crutch, good leg, crutch, bad leg).



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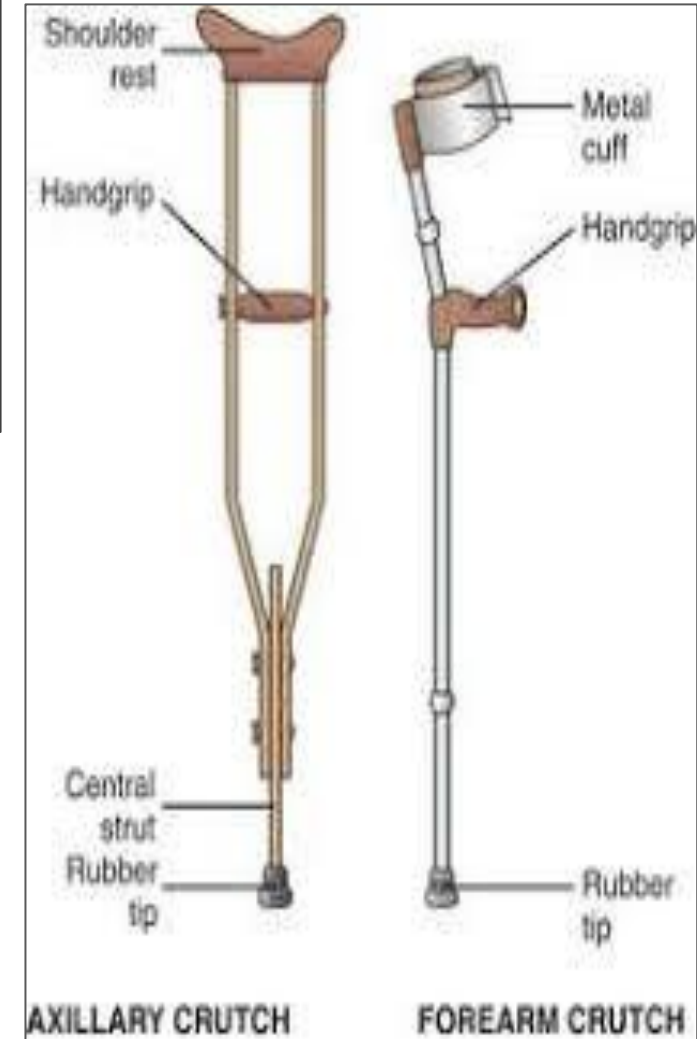
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Crutches

Proper Technique cond.

- Do not rest on the crutches, instead use a good hand grip to avoid compression of the brachial plexus
- When using a single crutch, use the crutch on the opposite limb of the injured leg.



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To see videos on crutch walking

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Walker

Standard walker:

- Four-legged walker, non-wheeled for full support.
- Indicated for significant weakness or post-surgical recovery (e.g. THR, TKR).

Wheeled walker:

- Walker with wheels on the front for ease of movement.
- Indicated for moderate balance issues or limited strength but with some mobility.

Rollator:

- Walker with four wheels, seat, and brakes.
- Indicated for older adults needing stability, rest options, or extra support during long walks.



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Standard walker



Wheeled walker



Rollator

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Wheelchair

- Provide complete support when walking is not possible.
- Two types of wheelchair:
 1. **Manual wheelchairs:** Self-propelled or attendant-assisted.
 2. **Powered wheelchairs:** Battery-operated, with joystick or sip-and-puff controls.
- Indicated for severe immobility due to chronic illness, injury, or neurological conditions e.g.. Spinal cord Injury
- **Proper use:**
 - Ensure correct positioning: hips & knees at 90 degrees, feet flat on footrests.
 - Educate on proper propulsion techniques to avoid shoulder strain.



Manual wheelchairs



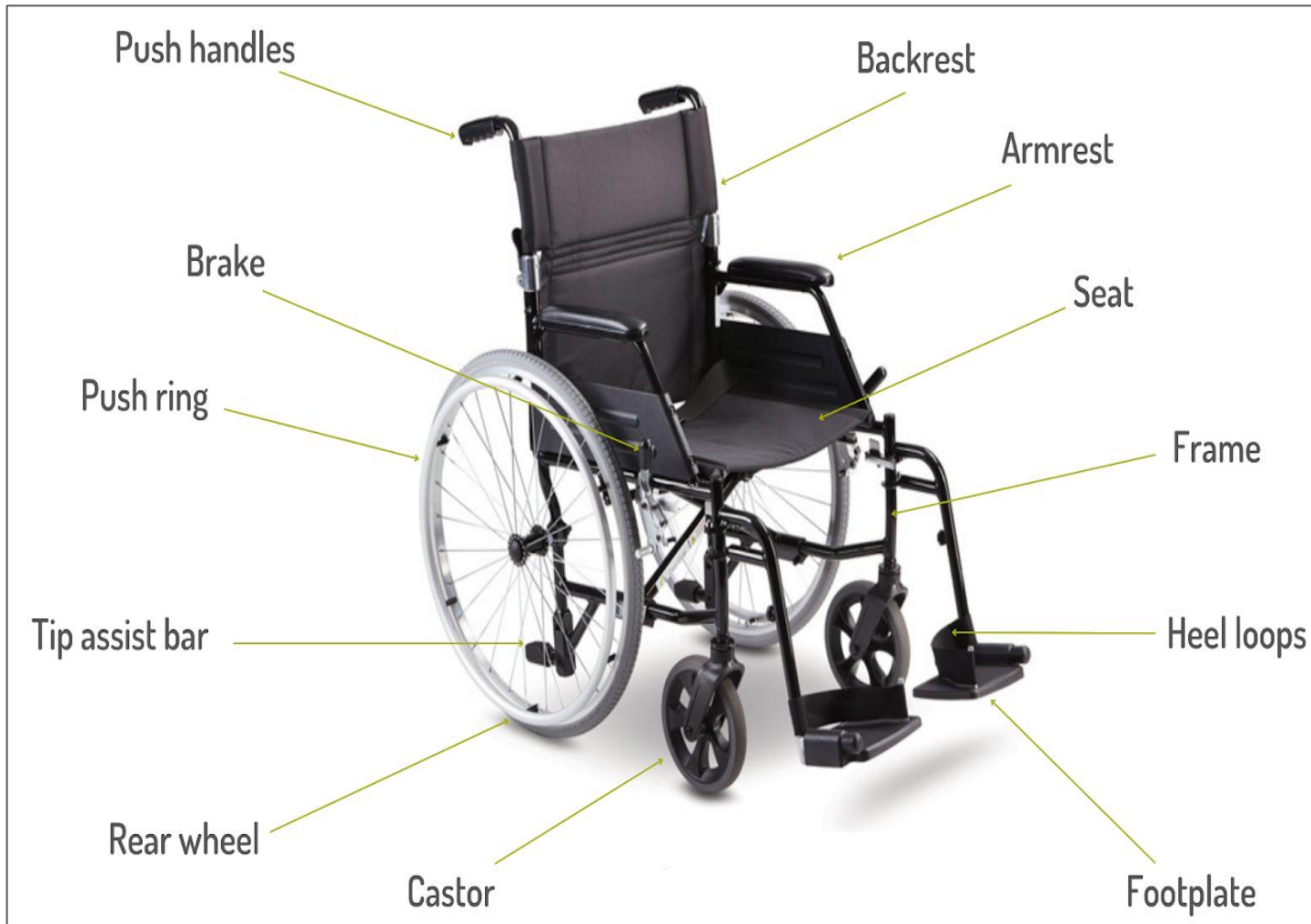
Powered wheelchairs

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Manual wheelchair



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Powered wheelchair

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Manual wheelchairs



Powered wheelchairs



Powered wheelchairs

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Walking aids

Challenges and considerations

- **Patient education:**
 - Ensure the patient understands the proper use of the walking aid.
 - Educate on proper posture & walking mechanics to avoid additional strain.
- **Skin and soft tissue issues:**
 - Check for pressure sores, especially under crutches or canes.
 - Adjust padding and fit if necessary
- **Environmental considerations:**
 - Ensure the patient's home is safe for mobility with walking aids (ramps, clear pathways).

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R_{EV}IEW

OTHER READING SOURCES

TEXT

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THANKS
FOR
LISTENING



Tishk International University