Gait with Assistive Devices
Review Last Lecture

- Weak dorsiflexors?
- Vaulting?
- Hip hiking?
- Weak hip abductors?
- Hip circumduction?
- Ataxic gait?
- Antalgic gait?
- Explain the line of gravity
Ambulation with Assistive Devices

Allows some patients who cannot ambulate without an assistive device to ambulate safely
Indications for Ambulatory Assistive Devices

- Structural deformity, amputation, injury, or disease resulting in decreased ability to WB through LE
- Muscle weakness or paralysis of the trunk or LE
- Inadequate balance
Ambulatory Assistive Device Selection

- Dependent upon
  - amount of support assistive device offers
  - coordination required
  - pts strength, ROM, balance, stability, general condition, and WB restrictions
Types of Ambulatory Assistive Devices

- **NWB Devices**
  - parallel bars
  - walker
  - Two axillary crutches

- **PWB Devices**
  - parallel bars
  - walker
  - axillary crutches (one or two)
  - Cane (one or two)
  - Lofstrands crutches
Assistive Devices & Support

- List of AD ordered from those providing the most stability & support to those providing the least stability & support
  - Parallel bars
  - Walker
  - Axillary crutches
  - Forearm crutches (Lofstrand)
  - Two canes
  - One cane
Assistive Devices & Coordination

- List of AD ordered from those requiring the least coordination by a patient to those requiring the most:
  - Parallel bars
  - Walker
  - One cane
  - Two canes
  - Axillary crutches
  - Forearm (Lofstrand) crutches
Parallel Bars

- Gait training with AD often begins in parallel bars
- They provide maximum stability while requiring the least amount of coordination from patients
- Patients can practice being upright & a gait pattern with relative safety
- AD can be measured while pt stands in parallel bars
Walkers

- pts with poor balance and coordination, decreased weight bearing on 1 or 2 LE. Used more often with elderly
  - adjustable
    - Height
    - Wheels?
    - Collapsible
Axillary Crutches

- Need to decrease weight bearing on 1 LEs,
- Need UE strength & coordination
- Need some trunk support
  - available aluminum or wood
  - adjustable
    - height
    - hand grips
Lofstrand Crutches

- Slightly more difficult to use than axillary crutches, but provide more ease of movement
- Forearm cuff allows patients to use hands without dropping the crutch
- Need good trunk stability
CANES

Used with pts with slight weakness of LE, pain in LE, or with pts who need assistance with balance during ambulation:

- aluminum or wood
- adjustable
- quad cane or single point
- offset handle
Measuring for an Ambulatory Assistive Device

- LE Bony Landmarks
  - during bilateral, supported stance
    - toes slightly out
    - ankle in neutral
    - knee in neutral extension
    - hip in neutral extension
  - greater trochanter (level for the handgrips)
Measuring for an Ambulatory Assistive Device

- **UE Bony Landmarks**
  - during bilateral supported stance
    - ulnar styloid process (@ top of handgrip)
    - elbow flexion to 20 or 30°
    - shoulders relaxed and level
Measuring for Crutches

- crutch tip 6” from the foot and @ a 45° angle
- hand grip @ the ulnar styloid process
  - with the elbow in about 20-30 degrees of flexion
  - OR
- hand grip @ the level of the greater trochanter
- axillary distance to the top of the crutch = 2-3 finger widths
Measuring for a Cane

- top of the cane
  - @ the level of the greater trochanter
    - OR
  - @ the level of the styloid process of the ulna
    - with the elbow in about 20-30° of flexion

- cane tip
  - about 3-4” from the foot and @ a 45° angle
Weight Bearing

- Amount of weight that may be borne on a LE during standing or ambulation

- This patient obviously did not learn how to use their crutch in physical therapy. It’s on the wrong side and much too tall for him!
Weight Bearing

- Determined by pts. condition and medical management of that condition
  - Changes in weight bearing status are determined by the patient’s **physician**!
Weight Bearing

- Common types of weight bearing WB
  - NWB-involved LE not to be WB or touching floor
  - TTWB-Pt can rest toes on the floor for balance, but not WB
Weight Bearing

- PWB-
  - limited amount of WB permitted on LE (example: 25% PWB = 25% of pt’s total body weight is allowed to be transmitted through the involved LE)
Weight Bearing

- **WBAT** - pt. allowed to place as much or as little weight through the involved LE, depending on pt. tolerance
- **FWB** - pt. permitted full weight bearing through involved extremity
Gait with an Assistive Device

- Weight is born on the hands, to make up for the weight that cannot be born on the involved LE
Definitions

- **Ambulation vs. Gait Training**
  - **Ambulation**: to walk from place to place, to move about
  - **Gait Training**: refers to assisting a patient to relearn to walk safely and efficiently. Gait training includes stair climbing. Gait training can occur without an assistive device.
Ambulation vs. Gait Training

- The most important difference between ambulation and gait training is that gait training requires skill on the clinician’s part to improve the gait pattern.
- It is important to be able to identify the difference so that we can document and bill for our services appropriately.
Clinical Examples

- Inpatient setting
  - Ambulation
  - Gait training

- Outpatient setting
  - Ambulation
  - Gait training
Why learn about Gait Training

- This is a skill that you are going to use every day with every age group in every region in every setting that you work in
Gait Training

- Gait training starts with assessing the abnormalities (or deviations) of a patient’s gait and then addressing them to establish a more “normal” gait pattern.
- Gait training includes *more* than just teaching a patient how to use an assistive device.
- Teaching a patient how to use an assistive device is just one part of gait training and that is what we will review today.
Guarding

- Guarding is the process of protecting the patient from excessive weight bearing, loss of balance, or falling.
- Proper guarding requires the use of a gaitbelt.
Guarding continued

- In & Out of a Chair
- Walking on level surfaces
- On stairs & curbs
- Progression
Falling

- If a patient starts to fall, the PTA must decide whether to
  - maintain the patient in an upright position or
  - permit a controlled descent to the floor in a manner that will prevent injury to that patient or yourself
Sit to Stand

- Engage wheel locks
- Pt moves to front edge of seat
- Both feet flat on floor with knees flexed 110 & ankles slight DF
- Feet side by side or stride position
- Hands on armrests
- Patient leans forward & pushes on armrests
- Initially, you hand AD to pt, then progress to one on armrest & other on AD
Stand to Sit

- Engage wheel locks
- Patient approaches front edge of seat & turn away from the chair
- The back of the patient’s legs must touch the seat
- Patient must have at least one hand on the armrest during stand to sit
Gait Patterns

- 4 point pattern
- Modified 4 point pattern
- 2 point pattern
- Modified 2 point pattern
- 3 point pattern
- Modified 3 point pattern
4 Point Gait Pattern

- Bilateral assistive devices
- Slow gait speed
- Provides maximum stability for patient
- Low energy required by patient
- Pattern: advance right crutch, then left foot, left crutch, right foot
- Modified: same pattern with only one assistive device
2 Point Gait Pattern

- Bilateral assistive devices
- Gait speed is faster than 4 point
- Provides good stability for patient, but less than the 4 point pattern
- Low energy required by patient
- **Pattern**: advance right crutch & left foot together, then advance the left crutch & right foot together
- **Modified**: same pattern with only one assistive device
3 Point Gait Pattern

- Used when patient has one FWB and one NWB LE
- Two crutches or a walker (no canes)
- Most rapid gait speed
- Provides the least amount of stability for the patient
- High energy required by patient
- Pattern: advance walker/crutches & NWB LE first, followed by FWB LE in a step through or step to pattern
Modified 3 Point Gait Pattern

- Used when patient has one FWB LE and one PWB LE
- Bilateral assistive device (can use canes)
- It is more stable, slower, and requires less strength and energy that the 3 Point gait pattern
- Pattern: advance PWB LE & A.D. followed by the FWB LE
Gait Patterns with Assistive Devices

- **PWB**
  - **step to**: Progress the involved extremity to the uninvolved extremity
  - **step through**: Progress the involved extremity past the uninvolved extremity

- **NWB**
  - swing to
  - swing through
Gait Patterns for Stairs

3 rules:

1. “up with the good and down with the bad”
   - lead with uninvolved for ascending
   - lead with involved for descending

2. the assistive device remains with the involved extremity

3. the clinician always guards the patient from below
   - so behind an ascending patient & in front of a descending patient
Patient Instruction

- Patient concentration
- Safe environment, free from distraction
- Demonstration is the primary mode of instruction for gait training using assistive devices
- Start training on level surfaces and advance to curbs, stairs, busy corridors, sit to stand from different surfaces
- Educate patients in creating a safe home environment
Problem Solving with Assistive Devices

- Getting out of a Chair
  - with arm rests/ without arm rests
- Getting back into a Chair
  - with arm rests/ without arm rests
- Stairs
  - railings for stairs/ no railings for stairs
  - living in a house with 2 floors & using a walker
Documentation

- Gait 15’ X 2: Patient walks 30 feet, but she stopped halfway and sat to take a short break.

- Gait 30’ X 1: Patient walks 30 feet, she paused at the halfway point before turning around and walking back.
Recap Lecture

- Types of Assistive Devices
- Measuring Assistive Devices
- Wbing status
- Ambulation vs. Gait Training
- 4 point
- 2 point
- 3 point
Looking Ahead

- Palpation & Massage
QUESTIONS???