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)
  - Lofstrand 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 LE,
- Need UE strength & coordination
- Need some trunk support
  - available aluminum or wood
  - adjustable
    - height
    - hand grips

MobiLegs Crutches

- [http://www.youtube.com/watch?v=MyV1uxP0pPY](http://www.youtube.com/watch?v=MyV1uxP0pPY)
- More expensive than traditional ($50-$130 per pair)
- Might be good for those using crutches > 6 weeks
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

StrongArm Crutch
- Used for patients who require more lateral support or when wrists are painful
  - Could be used as a cane if only one is purchased
  - It shifts some weight off of the wrist and forearm
  - http://www.strongarmmobility.com/reviews.php

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
Knee Walker

- [http://www.youtube.com/watch?v=ggmYionI3us](http://www.youtube.com/watch?v=ggmYionI3us)
- Patient required to be NWB beyond a few weeks may benefit from a knee walker
- Negative: cannot be used on stairs

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 than the 3 Point gait pattern
- Pattern: advance AD, then PWB LE, 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

**Question**

- You read a patient’s chart and see that they have a weight bearing restriction. You realize that you will need to transfer the patient from the w/c to the bed. **What is your first thought?**

**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???