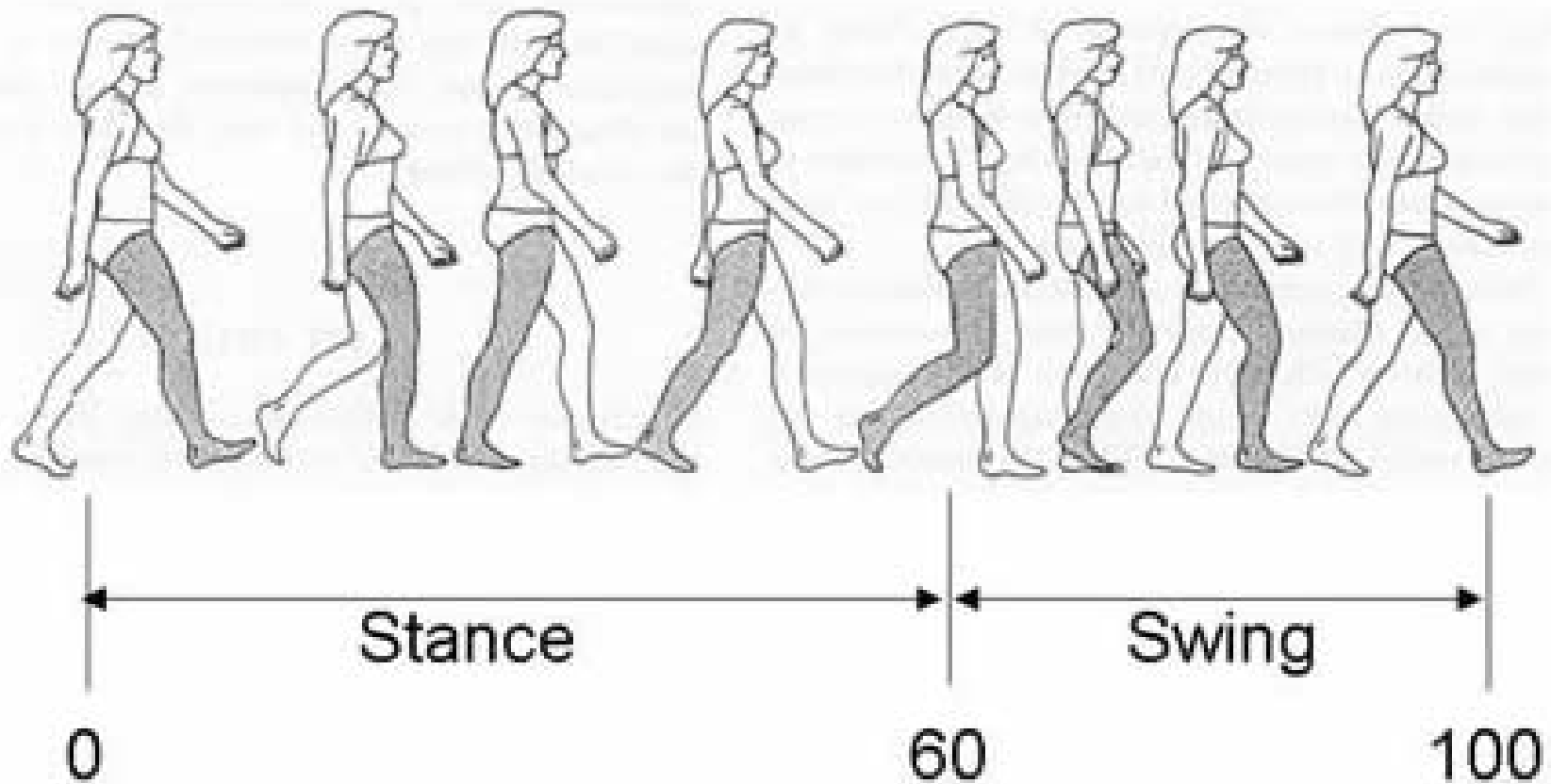


Gait Analysis

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Normal Gait Cycle



Critical Events

Swing Phase

- Hip flexion to 30°
- Initially knee flexion to 60°, then extension to neutral at heel strike
- Ankle dorsiflexion to 0°

Critical Events Stance Phase

- Loading response – knee flexion to 15°
- Controlled tibial advancement
- 2 cm deviation of center of gravity toward stance leg

Most Commonly Seen Gait Faults

Swing Phase

- Decrease foot clearance
- “Pushing”
- Unequal swing length
- Hip Hiking with Vaulting
- Retraction

Stance Phase

- Collapsing in stance
- Knee hyperextension
- “Pushing”
- Unequal step length
- Retraction

1. Decrease Foot Clearance/ Ankle Positioning

Reasons:

- Decreased Strength
 - Decreased ROM
 - Increased / Decreased Tone
- *variable

Treatment Method/Strategy:

- Exercises:
 - strengthening of DF and general ankle exercises (not PF)
 - ROM exercises (standing, wedge, assisted)
 - work on weight shift
- Other Methods – duct tape, curling slider, T strap, alternate footwear, toe strap
- Bracing – AFO (off-shelf, custom, rigid, articulating, etc)

Duct Tape



Curling Slider



2. Collapsing in Stance

Reasons:

- Weakness of stroke side
- Perceptual problems ie) decreased body awareness

Treatment Method /Strategies:

- Work with patient in standing position with P.T three point support
- Do simple and then more complex activities
- Focus on patient alignment/ use wall bar
- Work on posture correction in sitting, mirror may help

3. Knee Hyperextension

Reasons:

- Biomechanics
 - weakness of quads
 - timing
 - tone
 - decreased ROM (PF tightness)
- “in normal gait the knee never locks”

Treatment Methods/Strategies:

- Strengthening of muscles around knees (quads/hams) and hips (extensors)
- Practice the forward progression over the foot
- Cue to NOT ALLOW knee hyperextension (tactile and/or verbal cues)
- AFO, knee cage, manual assistance at knee and hip

Swedish Knee Cage



4. Unequal Step Length

Reasons:

- Affected Side:

Short step because of decreased clearance, hip flexor weakness, DF weakness

Long step because of poor motor control (momentum)

- Unaffected Side:

Short step because of weakness and inability to stand on the affected side. Poor weight shifting.

Treatment Method/Strategy:

- Cueing
- Strengthening
- Treadmill
- Facilitate weight shift

5. “Pushing”

Reasons:

- Perceptual
- Overuse of unaffected side
- Decreased activation of muscles on affected side
- Resistance to passive correction to upright

Treatment Method/Strategy

- Try not to push them straight
- Have patient move themselves toward an erect posture
- Use visual cues and tactile cues (mirror, wall)
- Must achieve success in sitting and standing before walking

6. Hip Hiking with Vaulting off the Strong Side

Reasons:

- Decreased dorsiflexion
- Decreased hip flexion
- Decreased knee flexion

Treatment Method/Strategy

- Assist dorsiflexion with brace etc.
- Strengthen weak muscles

Retraction at Shoulder and/or Hip

Reasons:

- Increased tone on the affected side

Treatment Method/Strategy

- Manual correction
- Incorporate upper extremity on walker
- Encourage functional activities that provide trunk rotation, protraction, and symmetry i.e. reaching

What About the Arm?

- Slings
- Other strategies



Walking Aids

- Large based quad cane
- Walk cane/hemi walker
- Small based quad cane
- Straight cane
- 2 wheeled walker
- 4 wheeled walker
- Arjo

Basics of Handling

- Belt
- Therapist position
- Importance of Patient's position i.e. trunk alignment, foot alignment

Progression of Gait Training

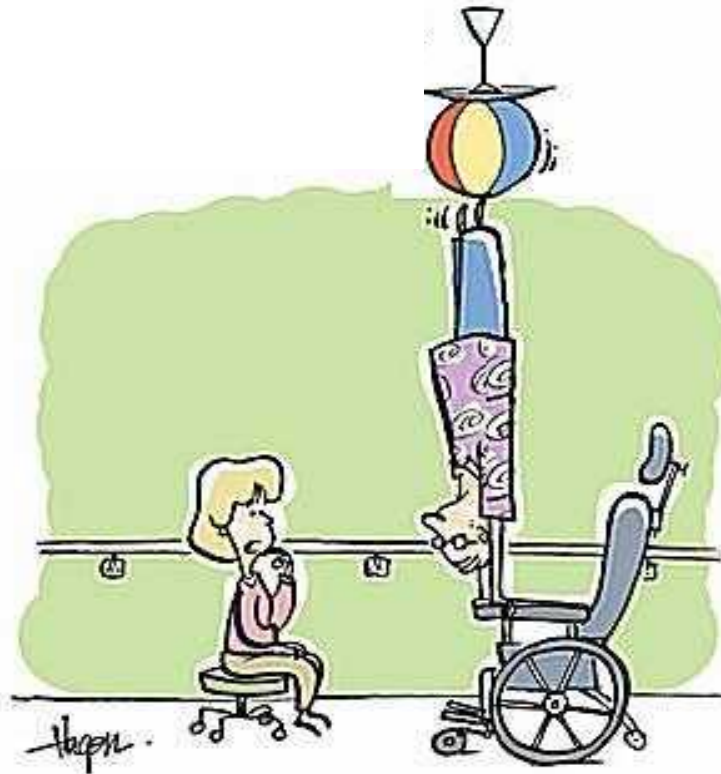
- Need success in standing – wall bar, with aid, work on posture
- Once able to take steps, then need to:
 - increase the distance walked
 - lessen assistance from therapist
 - move to a less supportive walking aid

Gait Progression continued...

- turning, backing up, walking toward chairs
- move to uneven surfaces (over thresholds, carpet, inclines, curbs and ramps, outside)
 - practice outside (grass, gravel, ice, snow)
 - practice stairs with rail and without as able.
- Multi-tasking

PRACTICE WITH THE FAMILY/CAREGIVER

The goal is to improve function, comfort, efficiency.



I THINK MY WORK HERE IS DONE.