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Update On Therapeutic Casting:

A Modern Clinical Pathway to Improve Outcomes

Amanda Hall, PT, MPT
Board-Certified Clinical Specialist in Pediatric Physical Therapy
Assistive Technology Professional

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Disclosure

- No relevant financial relationships exist
- While we will discuss casting products, the goal is to provide a framework to evaluate any product you may come across, and encourage objective selection of materials based on your individual patient's needs.

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Housekeeping

1

- Lab assistants
- Final handout available on amandahallpt.com.
- Some projected photos have been removed from reproducible handouts.

Learning Objectives

2

Upon completion of this course, you will be able to:

- Select candidates for therapeutic casting using the ICF model.
- Differentiate contributing factors influencing restricted ROM at the ankle, including structural alignment, ground reaction forces, muscular pull, joint and soft tissue mobility, and directional susceptibility to movement.
- Apply a therapeutic cast with efficient body mechanics, selecting among casting techniques and materials based on patient presentation to direct forces to target structures and protect compromised tissues.
- Design casts to maximize therapeutic gait, using strategies to impact gait kinematics and kinetics with ground reaction force.

Introduction

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Introduction
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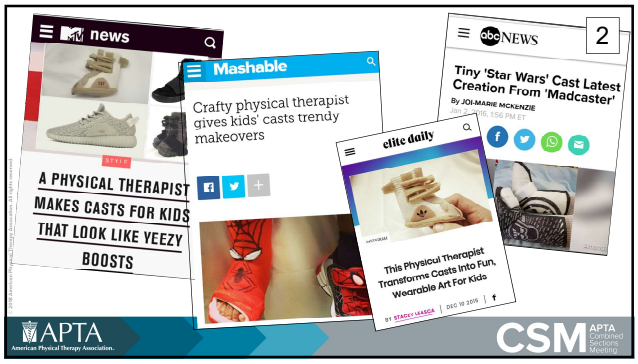
news
A PHYSICAL THERAPIST MAKES CASTS FOR KIDS THAT LOOK LIKE YEEZY BOOSTS
Mashable
Crafty physical therapist gives kids' casts trendy makeovers
abc NEWS
Tiny 'Star Wars' Cast Latest Creation From 'Madcaster'
By JOI-MARIE MCKENZIE
elite daily
This Physical Therapist Transforms Casts Into Fun, Wearable Art For Kids
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Dorsiflexion (DF) Restriction Significance

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- For those of us who stand or ambulate, the foot and ankle are the interface of our bodies with the contact surface.
- Altered function of this Body Structure can contribute significantly to Activity limitations and Participation restrictions.

Dorsiflexion Restriction: Causes

2

- DF is achieved through regular terminal stance
- Anyone lacking this movement experience is at risk for restricted DF

The ankle is biased to lose ROM in the direction of DF:

3

- Intrinsic resistance in posterior structures—which allows the system to store energy at terminal stance to power swing.

The ankle is biased to lose ROM in the direction of DF:

3

- The key arc of motion for gait is at end of the range in the direction of DF, not mid-range

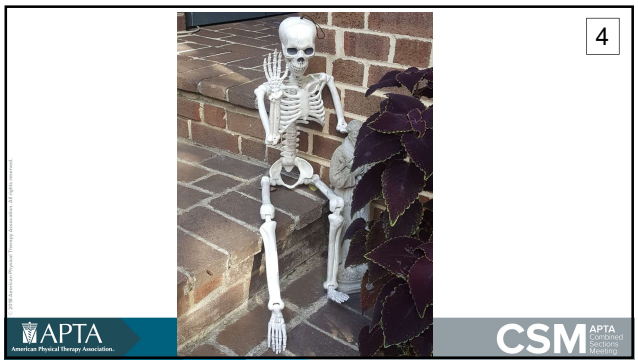
The ankle is biased to lose ROM in the direction of DF:

3

- The resting position of the joint when non-weightbearing is in plantarflexion.

Anatomy

4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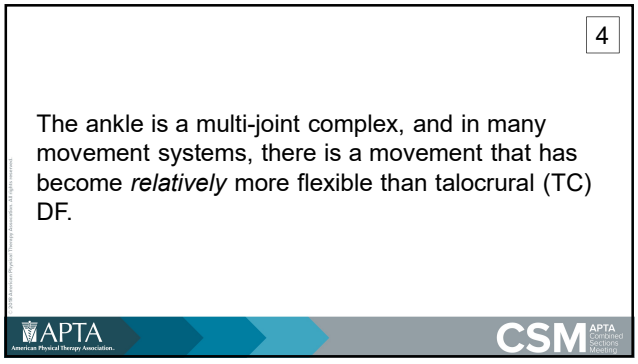
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The ankle is a multi-joint complex, and in many movement systems, there is a movement that has become *relatively* more flexible than talocrural (TC) DF.
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- In this case, ambulation does not give the movement experience necessary to improve range.

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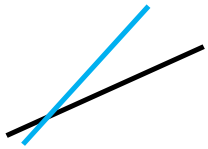

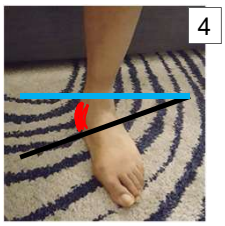

- Forces are directed to relatively more flexible structures and away from TC dorsiflexion.

4

"Tone"???

- Definitions
- Reliability
- Tissue changes
- Tonic contraction

Dorsiflexion restriction: Casting

4

- Is casting an effective treatment for DF restriction?

Systematic Reviews

4

- Tustin and Patel: Physiotherapy Research International, 2017 (CP)
- Craig et al: Pediatric Physical Therapy, 2016 (CP)
- van Kuijk et al: J of Rehabilitation Medicine, 2014 (Toe walking)
- Novak 2013: Systematic review of interventions for children with cerebral palsy.

Systematic Reviews

5

- "Green light"
- Low grade evidence

A resounding "meh" from the literature

Research Challenges

5

- Study design

Research Challenges

5

- Ethical considerations in pediatric research
  - Intention to treat…

Smith, GS. Parachute use to prevent death and major trauma related to gravitational challenge: systematic review of randomised controlled trials. BMJ 2003;327:1459

Research Challenges

5

- Heterogeneity

Bony structure based on genetics

↓ Tissue qualities based on genetics

↓

Driving pathophysiology – heterogeneous neurological insults ↓

Heterogeneity

6

Movement experience during development

↓ Weightbearing experience during development

↓

Structure based on experience during development

Heterogeneity

6

Structure based on experience during development ↓

Musculoskeletal pathophysiology (cumulative)

↓ Musculoskeletal pathophysiology (traumatic)

↓

Heterogeneity

6

Recent movement experience ↓

Recent weightbearing experience

↓

"10 year old with spastic diplegic cerebral palsy"

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Heterogeneity

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- Evidence is showing that muscle properties and stretch reflex response are highly variable and unpredictable, among patients with CP, stroke, and TBI even among cohorted patients

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Research Challenges: Methods

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- ***The Parable of the Roast***

Following a recipe vs. clinically applying methods depending on individual presentation?

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Research Challenges

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Casting Method Variables

- Materials
- Position
- Number, training of clinicians
- **Method of application (at each step in the process)**
- Posting

Alternatives…

7

- Live with functional consequences
- Stretching
- Serial splinting
- Night-stretch splints
- Botox
- Surgery
- **Manual Therapy**

Framework for Therapeutic Casting

8

Kinesiopathological model (Sahrmann)

8

Sahrmann S, Azevedo DC, Dillen LV. ***Diagnosis and treatment of movement system impairment syndromes.*** *Braz J Phys Ther. 2017 Nov - Dec;21(6):391-399. doi: 10.1016/j.bjpt.2017.08.001. Epub 2017 Sep 27. http://dx.doi.org/10.1016/j.bjpt.2017.08.001*

Kinesiopathological model (Sahrmann)

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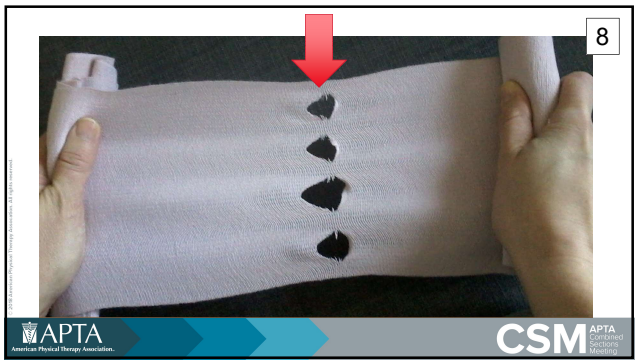
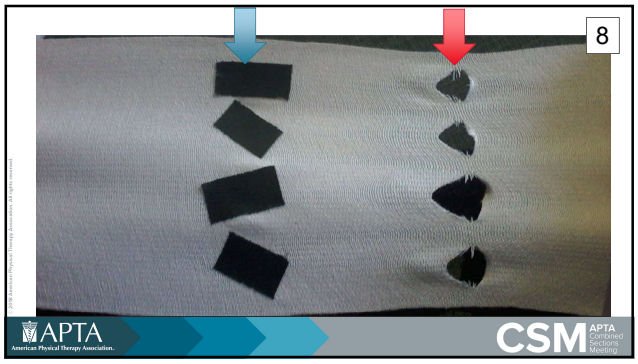
- Musculoskeletal, Nervous, Cardiopulmonary systems
- Biomechanics
- Repeated Movements
- Sustained Alignments
- Personal Characteristics

Kinesiopathological model (Sahrmann)

8

- Activity Demands
- Tissue Adaptations
- Path of Least Resistance
  - Relative stiffness of tissues
  - Intra and Inter joint relative flexibility
  - Motor learning
- Joint accessory Hypermobility
- Micro-trauma
- Macro-trauma





Framework for Therapeutic Casting

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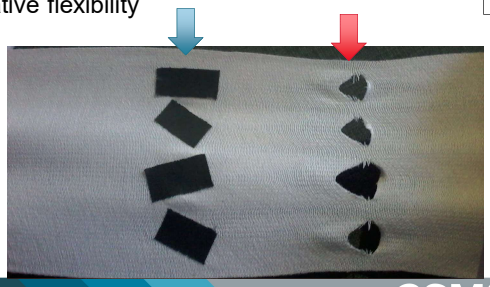
Chronically restricted DF ROM is likely to result in:

- Pathoanatomical changes in tissues and joint structures

- Relative flexibility



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Framework for Therapeutic Casting

Chronically restricted DF ROM is likely to result in:

- Changes in relative flexibility of TC DF versus accessory motions

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Framework for Therapeutic Casting

Chronically restricted DF ROM is likely to result in:

- Changes in muscle stiffness

8

Framework for Therapeutic Casting

8

Chronically restricted DF ROM is likely to result in:

- Changes in motor performance and learning

Framework for Therapeutic Casting

9

Ankle with chronic ROM restriction, altered motion, and weightbearing experience

What structures might be altered?

Muscle Structure and Function

9

Muscle Structure and Function

- It is important to note that there variability in neuromotor function in these muscle groups, even for patients with the same medical diagnosis… differential diagnosis versus focusing on just the GS/TA couple concept is key.

Muscle Structure and Function 9

- Tonic muscle contraction
  - Which muscles can demonstrate tonic muscle contraction?
  - What are possible causes of tonic muscle contraction?

Muscle Structure and Function 9

- Tonic muscle contraction

Muscle Structure and Function

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- Change in length with change in # of sarcomeres
- Altered timing of contraction
- Altered line of pull
- Altered functional recruitment

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Muscle Structure and Function

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- Altered response to stretch (tissue level)

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Muscle Structure

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- Growing body of evidence that for patients with CP, stroke, and TBI, passive muscle properties are altered and are difficult to distinguish clinically from hyper-responsive stretch reflexes

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Muscle Function

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Altered neuromotor control
Altered accessory recruitment
Altered line of pull

Muscle Function

10

Altered line of pull

Framework for Therapeutic Casting

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Connective tissues

- Altered ability to lengthen, fold, glide, compress, and expand

Framework for Therapeutic Casting

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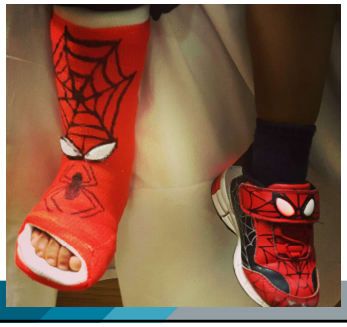
Joints

- Talocrural joint function
- Accessory joint function
- Relative intra- and inter- joint flexibility and stiffness



Framework for Therapeutic Castin I. Differential Diagnosis

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Using a kinesiopatholgoical, movement system approach

I. Differential Diagnosis

11

What is the anatomical structure?

I. Differential Diagnosis

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Which structures and systems are preventing DF from occurring in the TC joint?

- Muscle and tendon
- Connective tissue
- Joint
- Relative flexibility
- Habitual patterns of movement

II. Preparatory Treatment

12

If connective tissue and joint function are contributing to DF limitations, they should be addressed coordination with casting

II. Preparatory Treatment

12

Joint mobilization (posterior talar glide) has been shown to increase DF range of motion for those with chronic ankle musculoskeletal impairment and patients with stroke.

- Lee 2017
- Kang 2015
- Kim 2018

III. Efficient, Effective treatment

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Intentional use of the therapist's body in line with the target structures of the patient maximizes efficiency, clinical efficacy, and safety for both patient and therapist.

IV. Specificity of Cast Application

13

Forces from cast materials should be directed encourage mobility of target restricted structures to protect compromised structures

IV. Specificity of Cast Application

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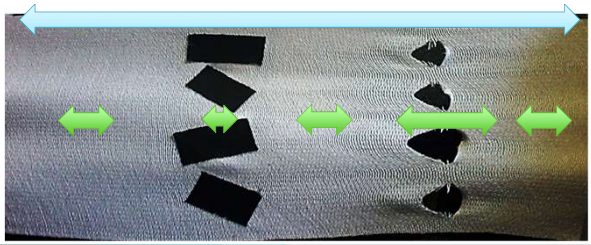

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Segmental Application

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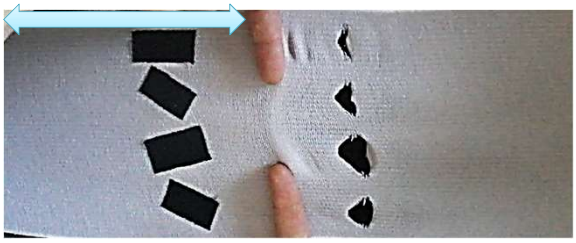

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Targeting forces

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Direction of Forces

Segmental Application

Directional wrapping

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Multi-directional input v. static hold in linear direction

IV. Specificity of Cast Application

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- If the talus cannot be aligned to allow for DF within the TC joint, initial casts should address hindfoot alignment versus dorsiflexion

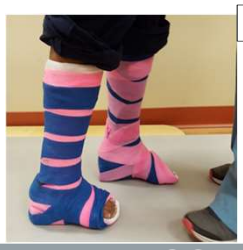
V. Aligning Casts for Weightbearing

14

Alignment of cast for weightbearing as a gait training intervention.

V. Aligning Casts for Weightbearing

14



VI. Reducing Patient Stress

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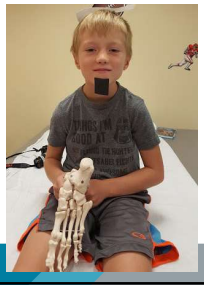

VI. Reducing Patient Stress

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- Stress hormones, both systemic and local, are detrimental to tissue healing
- Tonic muscle contraction can impede results
- Participation in a preparation program for procedures has been shown to significantly reduce the negative psychological sequelae experienced by children before and up to a month after procedures

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VI. Reducing Patient Stress

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Key elements of effective procedure preparation:

1. The provision of developmentally appropriate information
2. The encouragement of emotional expression
3. The formation of a trusting relationship with a health care professional

Child Life Counsel, 2008

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- PASSIVE visual distraction, such as a video. This is preferred to a toy or game, as activity may increase tonic muscle contractions.

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- Talk about, allow the patient to touch, and play with the casting materials like padding.
- Talk about each step of the process to allow them to anticipate.
- Allow them to "help," including donning gloves.
- Give choices (e.g. color, personalization) whenever possible.

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VI. Reducing Patient Stress

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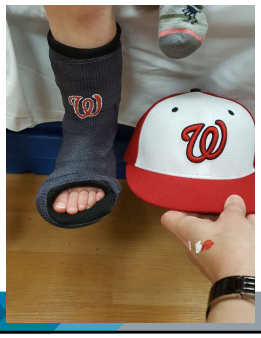
- Physical therapists have an ethical responsibility to support the autonomy of patients, especially those who may have decreased abilities to make choices in their lives and particularly to set boundaries around their bodies.



Differential Diagnosis

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Diagnostic groups

Differential Diagnosis: Hindfoot

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Insufficient dorsiflexion with:

I. Neutral hindfoot

II. Pronated hindfoot

III. Supinated hindfoot

I. Neutral Hindfoot

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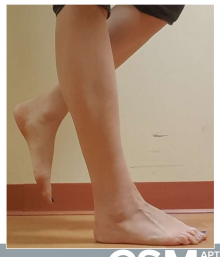
Limited DF range, without significant coronal or transverse plane findings



Associated gait patterns:

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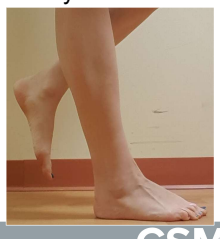
Toe walking

Excessively reclined shank



Casting considerations:

- Prone casting may provide a better lever-arm for effective GS stretch.

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II. Pronated Hindfoot

- false “DF” (foot toward tibia) occurs through the subtalar and midfoot joints

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II. Pronated Hindfoot

Hindfoot pronation is relatively more flexible than TC DF

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II. Pronated Hindfoot

18

Medial rotation throughout the movement system

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II. Pronated Hindfoot

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Associated with:

- Relative stiffness for hindfoot supination versus pronation
- Hypermobility at midfoot structures and first ray
- Decreased hip and knee extension during stance and altered gait

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II. Pronated Hindfoot

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May present with supinated posture in non-weightbearing

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II. Pronated Hindfoot

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Altered function of muscles, loss of response for balance around ankle

May be paired with excessive shank inclination

- Lack of ankle DF with knee extension moment at terminal stance
- Lack of hip extension

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Casting considerations:

- Structural forefoot varus and adductus are often present
- Medial tibial torsion, varus of the tibia or LE system may be present

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Casting considerations:

Must accommodate for structural variants

Must be precise to avoid stretching compromised structures and stretch true DF

Compromised joints need to be protected by positioning in closed pack position during hindfoot casting

Cast may need to be toward inversion first if TC DF is not achieved

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III. Supinated Hindfoot

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III. Supinated Hindfoot

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Lack of mobility in the TC joint is NOT compensated for within the foot or ankle.

Ground reaction forces during initial contact and weight acceptance through an inflexible foot/ankle translate up the kinetic chain.

Associated with:

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- Prominent head of the talus laterally
- Limited eversion ROM
- Restricted plantar fascia
- Restricted midfoot mobility

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Associated with:

- Toe or flat contact at initial contact
- Extension versus flexion moment at loading response
- Lack of ankle DF and hip extension with knee extension moment at terminal stance(hip flexes and stride shortens)

21

Associated with:

Attempt to use long flexors for balance with toe gripping

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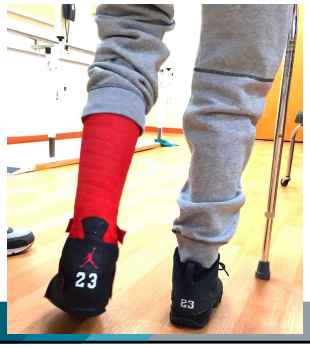
Casting Considerations:

Manual therapy to the foot/ankle complex prior to casting may be key to progress

Associated with: 22

**Knee extension moment for stance can be adaptive for stability in stance when knee extensors are compromised



Examination

Examination

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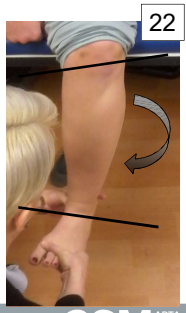
Structural Variants

Leg

- Torsions



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Structural Variants

Leg

Torsions (masked)

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Torsion (+ varum)

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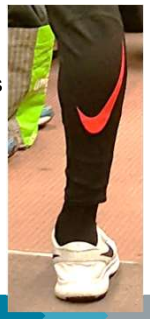
Structural Variants
Leg
Varum



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Structural Variants
Leg
• Valgum

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Structural Variants
Hindfoot
Altered position or structure of malleoli

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Posteriorly set lat. malleolus (versus tibial torsion)

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…the case of the missing malleoli?

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Structural Variants

Hindfoot

Calcaneal alignment

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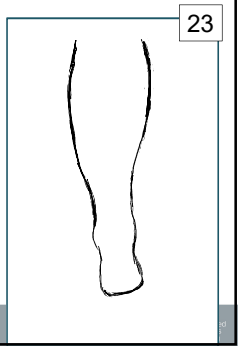

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Structural Variants

Midfoot, forefoot

Tarsal coalition (hindfoot/midfoot)

Transverse plane

Forefoot adductus

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Structural Variants

Midfoot, forefoot

Frontal plane

Forefoot varus

(vs. limited midfoot mobility)

*Dropped first ray may obscure

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Examination

- Structural variants MUST be noted for casting set up. The patient and therapist must be positioned to ensure that DF is occurring at the TC joint during casting.
- The system will try to “trick” the therapist to apply forces through the past of least resistance, further compromising fragile structures and leaving true DF unchanged.

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Structural variants

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Examination

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Musculoskeletal Impairments

- Hyper, hypo-mobilities
- Relative flexibility/stiffness

Examination

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Musculoskeletal Impairments

Alignment of:

- Subtalar joint
- Midfoot
- Soft tissue
- Forefoot
- Digits

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Examination: Neuromotor

25

Ability to:

- Initiate contraction
- Maintain contraction against required force
- Relax
- Time and coordinate movement

Tonic Muscle Contraction

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Tonic Muscle Contraction

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Demonstration and lab

Position of patient,
therapist 1, therapist 2

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Demonstration

Position of patient,
therapist 1, therapist 2

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Demonstration and lab

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Lower extremity examination, evaluation, and manual intervention to address ankle alignment and dorsiflexion in preparation for casting

Demonstration and lab

26

Weightbearing examination

Demonstration and lab

26

Non-weight bearing examination

Position: prone, supine, sitting?

Demonstration and lab

27

Non-weight bearing examination

- Integumentary

Demonstration and lab

27

- Bony structure

Demonstration and lab

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Muscular activity and length

-identifying stiff, short, and tonic contraction vs. "tight"

- Techniques to address patient stress, guarding, and tonic muscle contraction

Soft tissue extensibility

- Techniques to improve soft tissue mobility

Demonstration and lab

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Muscular activity and length

-identifying stiff, short, and tonic contraction vs. "tight"

- Techniques to address patient stress, guarding, and tonic muscle contraction

Soft tissue extensibility

- Techniques to improve soft tissue mobility

- Techniques to address patient stress, guarding, and tonic muscle contraction

- -unweighting
- -deep pressure
- -contact on the active structures
- -movement into tone-inhibiting positions
- -NOT yelling at them to relax
- *Cast should replicate this calming input

Demonstration and lab

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- Techniques to improve soft tissue mobility

Demonstration and lab

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Alignment and joint motion: hindfoot, midfoot, forefoot

- Techniques to improve joint alignment and mobility
- Joint mobilizations
  - Direct
  - Indirect

Demonstration and lab

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Talocrural range of motion *without compensatory motion*

1. Dorsiflexion Stress Test
2. Blocking compensatory motion
3. TC Axis Test

Demonstration and lab

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1. Dorsiflexion
Stress Test

Demonstration and lab

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2. Blocking compensatory motion

-placing mid and forefoot joints in closed pack position to "lock out" hypermobile segments during hindfoot motion

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Demonstration and lab

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3. TC Axis Test:
Determine

-axis

-range

-limiting structures

-end feel

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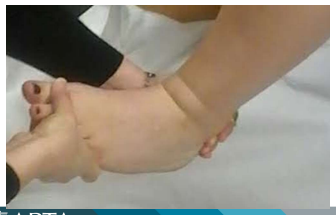

Demonstration and lab

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Preparatory Treatment:
Addressing
-axis
-range
-limiting structures
-end feel

- Decreasing tonic muscle contraction
- Soft tissue mobilizations
- Joint mobilizations

Demonstration and lab

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Dorsiflexion goniometry: techniques to improve intra- and inter-rater reliability

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Aligning Casts for Therapeutic Gait

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Review of Key Gait Concepts

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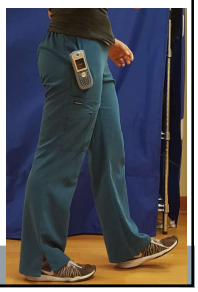
Loading response:
Flexion moment at the knee
Posterior chain is on stretch

Weight acceptance:
Flexion moment at the knee



Review of Key Gait Concepts

31

Midstance and quiet standing:
Weight line: anterior to the knee
posterior to hip

Mild incline of the shank

Review of Key Gait Concepts

31

Terminal
Stance

GS, hip flexors
on stretch

31

Terminal Stance

- heel in contact as the knee and hip extend

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Aligning Casts for Therapeutic Gait

32

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Aligning Casts for Therapeutic Gait

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2 angles within a cast:

- Angle of the ankle in the cast
- Angle of the shank (lower leg) to the floor: determined by gait training or weightbearing goals.

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Differential Diagnosis: Gait

32

Insufficient dorsiflexion with:

I. Shank angle within functional limits

II. Excessively inclined shank (crouch)

III. Excessively reclined shank (knee hyperextension)

IV. Primary knee extensor insufficiency

I. Shank angle within functional limits (toe walking)

33

Movement system not impacted proximal to foot/ankle

I. Shank angle within functional limits

33

Movement system is able to compensate for limited DF

-or-

Movement system is ***driving*** the DF limitation

33

Goals for cast alignment:

- Hindfoot weightbearing
- Heel contact at initial contact
- Increase step length and time in terminal stance

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I. Shank angle within functional limits

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DF limitation is likely to reoccur if initial driver is not addressed

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II. Excessively inclined shank (crouch)

34

Weight line is anterior to the hip and posterior to the knee.

All of the GRF moments are flexion, in all phases of gait.

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II. Excessively inclined shank (crouch)

34

Old conventional wisdom: set shank in a negative angle to push the shank backwards.

In reality, the foot has an inefficient lever arm for this to be effective, and the patient lifts the heel.

II. Excessively inclined shank (crouch)

35

Current theory: Bring the floor up to the heel to provide:

- Heel contact at initial contact and midstance
- Provide a base for the thigh to move from reclined to inclined

35

- Begin to each the motor system to load through the posterior aspect
- Compromise towards the chosen shank angle to get heel contact

35

- Gradually reduce the shank angle as posterior structures lengthen and motor learning occurs

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- Gradually reduce the shank angle as posterior structures lengthen and motor learning occurs

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II. Excessively inclined shank (crouch)

Treatment focuses on learning to bring the thigh from reclined to inclined over a stable base in midstance and quiet stance.

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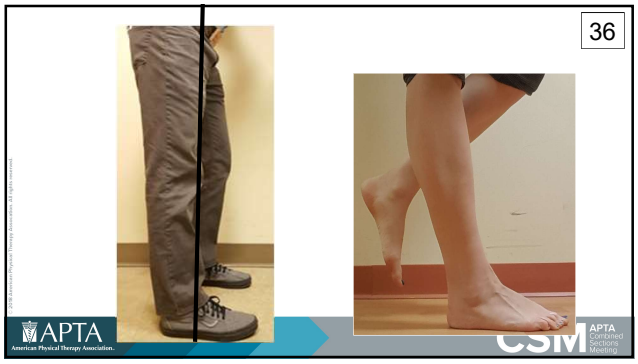
III. Excessively reclined shank (knee hyperextension)

36

Reversal of the forces around the knee during initial contact and weight acceptance, causing a knee extension moment.



36

- Goal: bring the shank angle forward enough to overcome the tendency for the system to create an extension moment.

37

Treatment: bring shank forward to block the knee extension moment at loading response so that the patient experiences:

1. Flexion moment at loading response.
2. Weight line posterior to the hip in quiet stance.

37

IV. Primary knee extensor insufficiency

37

- Weight line is aligned anterior to knee to maintain knee stability
- Shank angle be reclined
- Associated with muscular dystrophies

Beyoncé. **Instagram,** 2017, https://www.instagram.com/p/BP-rXUGBPJa/

Aligning Casts for Therapeutic Gait

38

Aligning for weightbearing in the coronal plane

- Hindfoot

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Forefoot

Coronal plane

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Aligning Casts for Therapeutic Gait

38

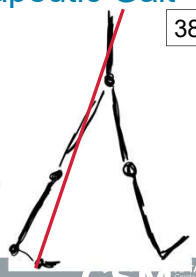
Forefoot

Sagittal plane

-Position – extension required for terminal stance and windlass mechanism

-Flexiblity of the MTPs during gait with the hind foot positioned on axis can lead to functional mobilizations with gait (!)

If… casts are sufficiently long anteriorly on the plantar surface



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Aligning Casts for Therapeutic Gait
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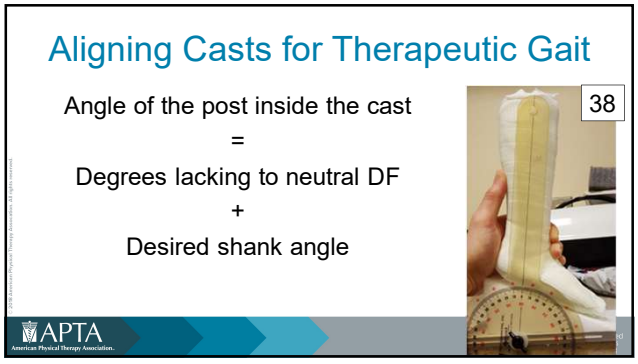
Aligning Casts for Therapeutic Gait
Angle of the post inside the cast
=
Degrees lacking to neutral DF
+
Desired shank angle
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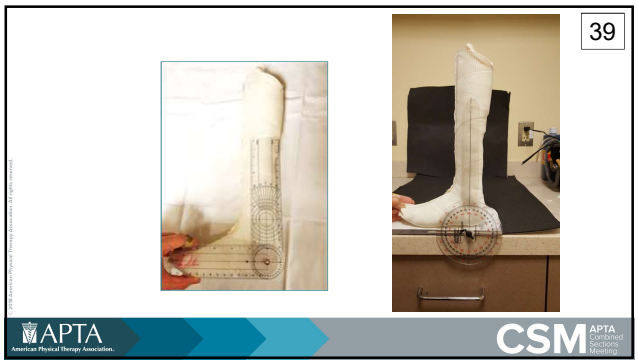
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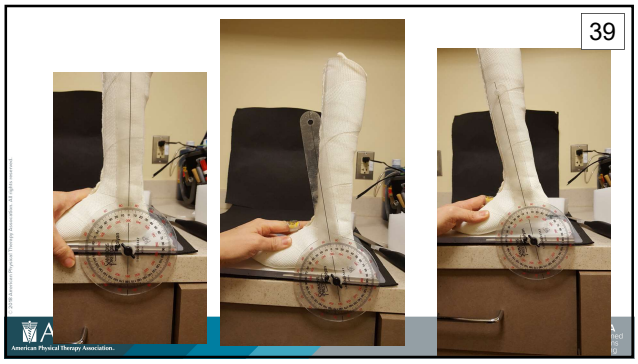
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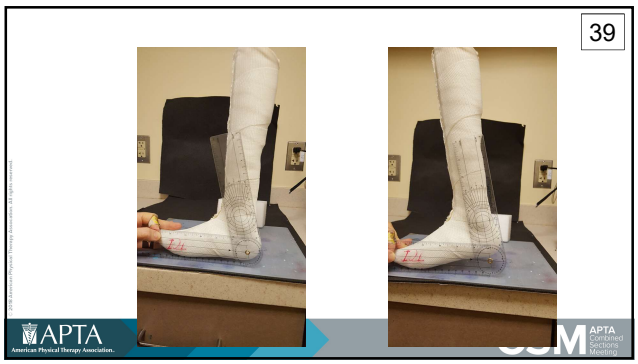
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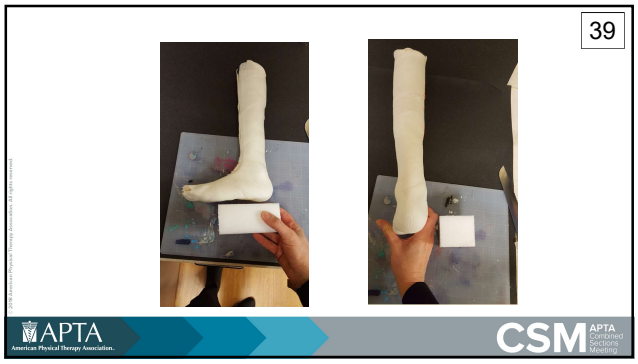
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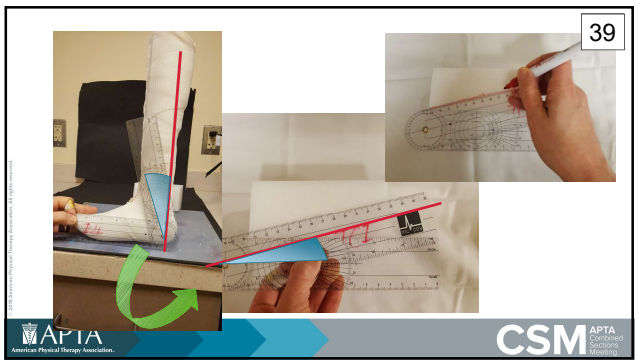
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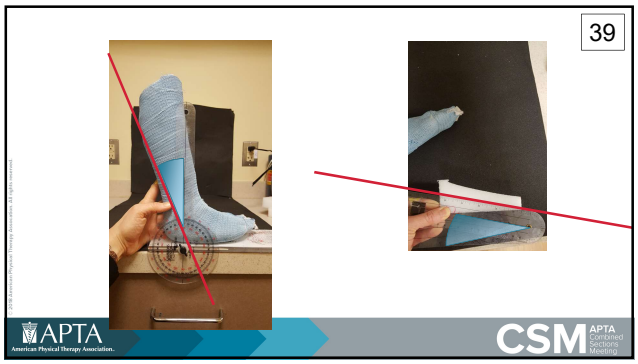
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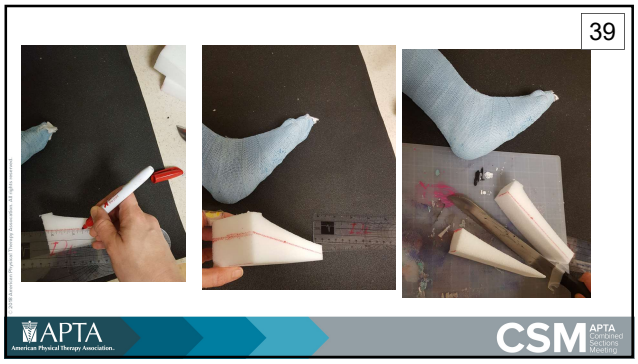
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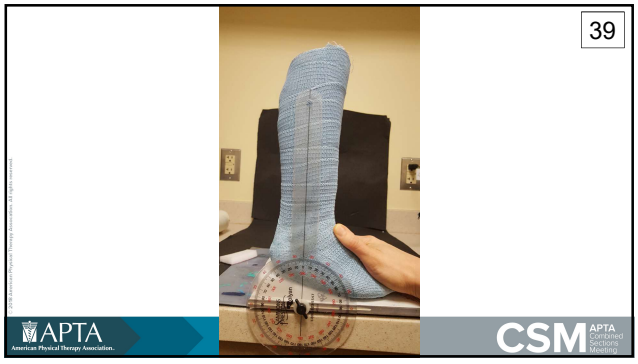
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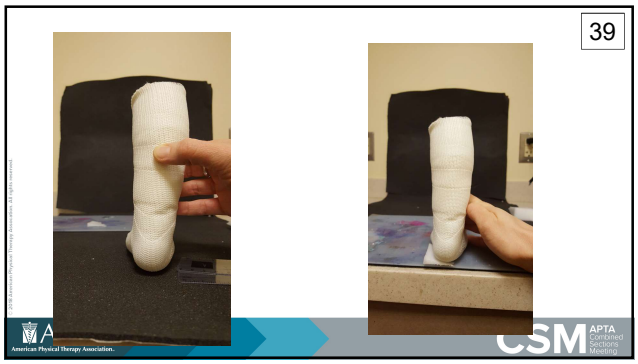
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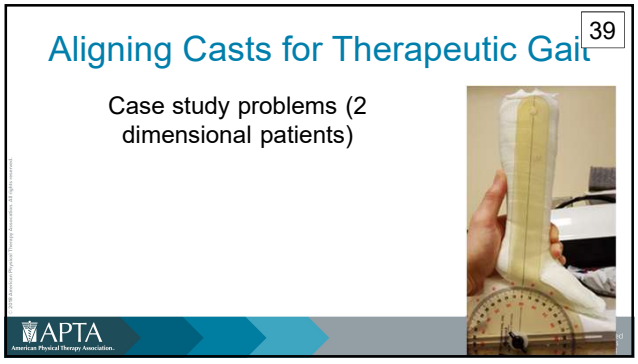

39
Aligning Casts for Therapeutic Gait
Case study problems (2 dimensional patients)

Casting techniques

39

Casting techniques

39

1. Creating an anchor
2. Circumferential wrapping
3. Use of elastic tension and direction of pull to influence tissue and joint mobilization
4. Creating a heel lock

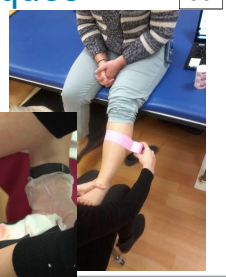
-inversion

-eversion

Casting techniques

39

1. Creating an anchor



Casting techniques

39

2. Circumferential wrapping

- Holding roll center to control tension
- % of overlap

Casting techniques

39

3. Use of elastic tension and direction of pull to influence tissue and joint mobilization

-"roll off", 50%, 90%, no tension

Casting techniques

39

3.

First layer, over fleshy areas:

- needs to be consistent to avoid tourniquet. Generally “roll off” tension
- Direction of wrap can be important

Hindfoot: variable tension, variable direction of wrap

Casting techniques

39

4. Creating a heel lock

-inversion

-eversion

Casting techniques

40

5. Use of spacers

Casting techniques

40

6. Selective reinforcement (creating a “stay”)
7. Combination of materials

Casting techniques

40

8. Forming a contoured forefoot support



Casting techniques

40

9. Posting for weightbearing


Casting techniques

40

10. Types of holds

a. soft lumbrical grip: support limb, allow casting material to conform to limb as placed. “Helper” generally uses this type of hold.

Casting techniques

40

10. Types of holds

b. molding: shaping the cast material after placement with the hands to mold the cast to have a desired shape or input

Casting techniques

40

10. Types of holds

c. prolonged static hold: using the hands to create a shape into the cast. Maintaining contact without motion is key to capturing shape

Casting techniques

40

10. Types of holds

d. dynamic hold: frequent movement of the hands while shaping and fine-tuning a cast shape or position

Casting techniques

40

10. Types of holds

e. mobilization through casting material: after placing casting material, performing mobilization (joint, soft tissue) through material to capture the mobilization in the cast

Casting techniques

40

10. Types of holds

f. prolonged linear force: providing input in the direction of the desired material for a prolonged period (e.g. DF). Position of therapist to the joint/movement should be aligned to use gravity for force

Casting Materials: Plaster

40

Rigid after 24 hours.

Can be reinforced with fiberglass externally until completely set to prevent cracking.

Highly moldable, wrinkles easily, requires use of webril for padding; increased cast application time.

Casting Materials: Plaster

40

Increased weight.

Requires cast saw to remove.

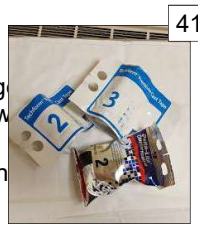
Cast must be well padded.

Wrinkles in material can cause pressure sores.

Material will crack if joint position is changed during casting.

Casting Materials: Fiberglass

41



- Rigid
- Removes via hook blade or bandage scissors when semi-set, or cast saw when set, or thickly layered.
- Lay properties vary greatly between products.
- Used for taking molds to make orthoses, for traditional serial casting, or for focal reinforcement.

Casting Materials: Fiberglass

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- Requires sharp scissors, blade, or cast saw to remove.
- Requires competency/training for safety.
- Cast must be padded or cutting strip used.
- Cut edges become razor sharp and can pierce through padding.

Casting Materials: “soft” cast products

41

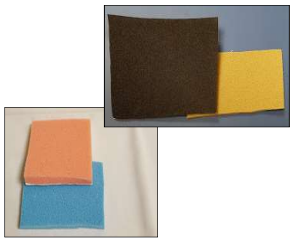
- Most flexible
- Remove via unwrapping
- Properties vary between products
- Those with ***elastic properties*** can be used to apply rotation force during casting
- May require reinforcement

Casting Materials: Padding materials

42

Consider:

thickness, density, elastic qualities, firmness, resiliency, strength of adhesive



Padding

42

- all boney prominences
- weightbearing surfaces
- areas where sensitive structures sit beneath the skin (e.g. tendons along the dorsum of the ankle)
- areas where therapeutic force is applied through the cast or splint
- distal and proximal ends
- any additional areas of concern or fragile skin

Padding

42

- Padding that does NOT bottom out is required.
- pressure (as in a cast), CAN AND WILL lead to cast-induced pressure sore.

Stockinette and skin protectors

43

Cast Application 1

43

"Dry Run"

Cast Application 1

43

Keys:

- Position of patient and therapists
- Attention to directionality
- Segmental application
- Hindfoot mobilization
- Forming a contoured forefoot support

Cast Application 1

44

Partner A leads, B holds, C is casted

Group Activity

44

Review of casts: alignment, function, trouble-shooting and clinical fixes

Feedback from “patient”

Cast Application 2

44

Partner B leads, C holds, A is casted

Addition of stockinette, padding, casting materials

Group Activity

45

Review of casts: alignment, function, trouble-shooting and clinical fixes

Feedback from “patient”

Cast Application 3

45

Partner C leads, A holds, B is casted

Group Activity

45

Review of casts: alignment, function, trouble-shooting and clinical fixes

Feedback from "patient"

Questions

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amanda@allstaralignment.com

Therapeutic Casting Forum

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