Optimising Outcomes for Low to Moderately Active Amputees.

Welcome

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Aims of the Optimising Outcomes Series…

- Provide practitioners with techniques to enable clients to gain improved functioning on their prosthesis.

- Facilitate communication between allied health professionals regarding training goals and techniques.

Aims

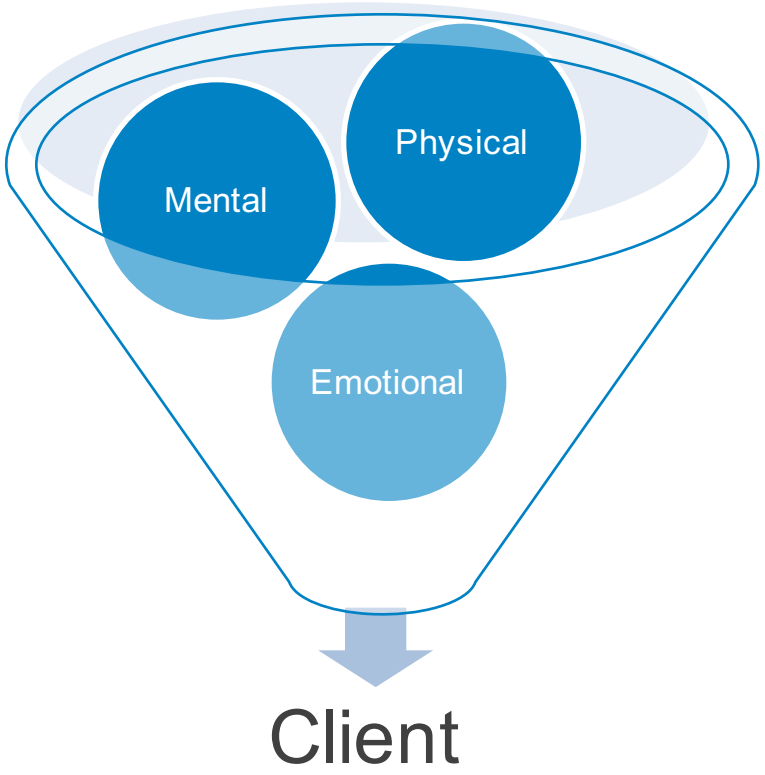
- Promote goal setting with your clients.
- Revise the muscle actions required for amputee gait.
- Familiarise practitioners with correct use of walking aids.

Principles of the series: Rehabilitation should be….

- Holistic
- Goal Orientated
- Empowering.
- “Athletic Focus” - mindset
  - motivation
  - strength and control

Holistic Approach

All of these elements need to be on board for a successful outcome.



Goal Orientated

Short Term

Long term

Effective goal setting is SMART

- Specific - What exactly is to be accomplished?
- Measurable - How will you measure what you are trying to achieve?
- Achievable – it is realistic.
- Relevant - to the individual.
- Time Specific - Set target dates for follow ups and completion.

Optimising Functioning by Creating a Culture of Empowerment

- Client needs to participate in their own improvement of performance.
- Taking ownership gives your client a feeling of control.

Creating a Culture: Everyone needs a degree of Strength and Control.

- Exercising is a healthy and essential part of living…..What is your client doing?

- If you don't use it you'll lose it!

Creating a culture: Treat your body as an athlete not a patient.

- Fitness
- Strengthen
- Stretching(!!)
- Nutrition
- Rest

Creating a Culture: Shifting the Focus from "Sickness" to "Wellness".

• Negative	→	• Positive
• Dependant	→	• Independent
• Powerless	→	• Empowered
• Passive performance on prosthesis	→	• Dynamic performance on prosthesis

Clients in the Low to Moderate Category

- Primary Amputees
- Elderly Amputees
- K1 and K2 Classification
- Transferring
- Mobilising around the home
- Using walking aids

How Amputation Affects Movement Patterns:

- Some muscles are inhibited and become weak.
  - Pain
  - Surgery
  - Positioning
- Some muscles are overactive and become tight.
  - Pain
  - Positioning
  - Adopted movement patterns

Muscle imbalances are created:

- Length related with associated joint restriction. → Contractures
- Related to "**preferred activation**" patterns. → Learned from movement experiences.
- Muscle imbalances will then be reflected in the gait pattern. → Gait deviations

Hip flexor tightness/overactivity reflected in Gait.

Tight and overactive flexors

Result in:

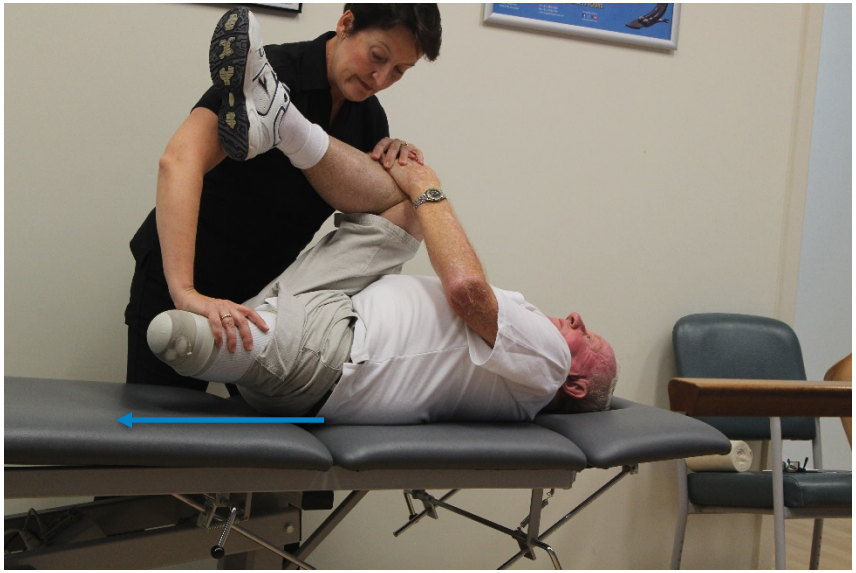
- Hip F throughout prosthetic stance phase.
- ↓intact leg step length.
- "Dropping off" the prosthetic toe.
- Lengthened and inhibited hip extensors.

Hip ROM on the Amputated Side:

Hip flexor tightness

Adequate hip E ROM

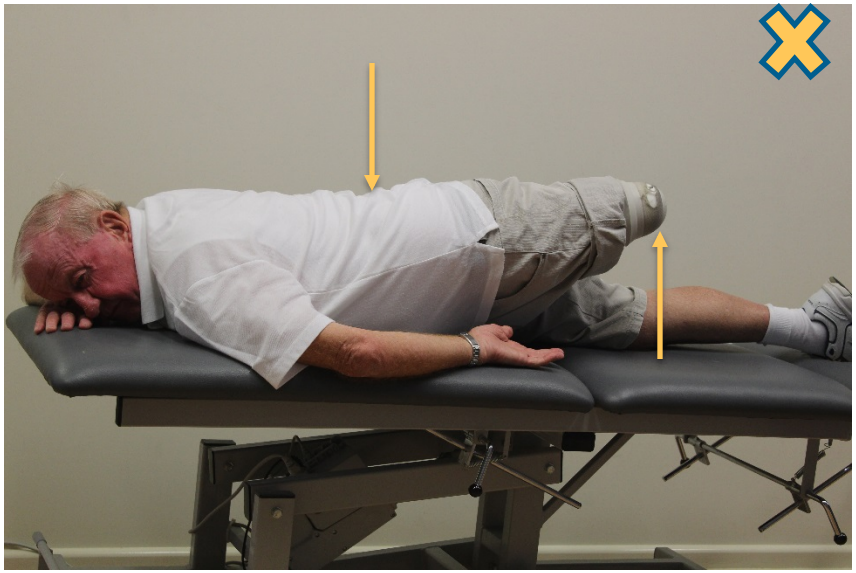
Assessing Hip flexor tightness:



Assessing Active Hip ROM

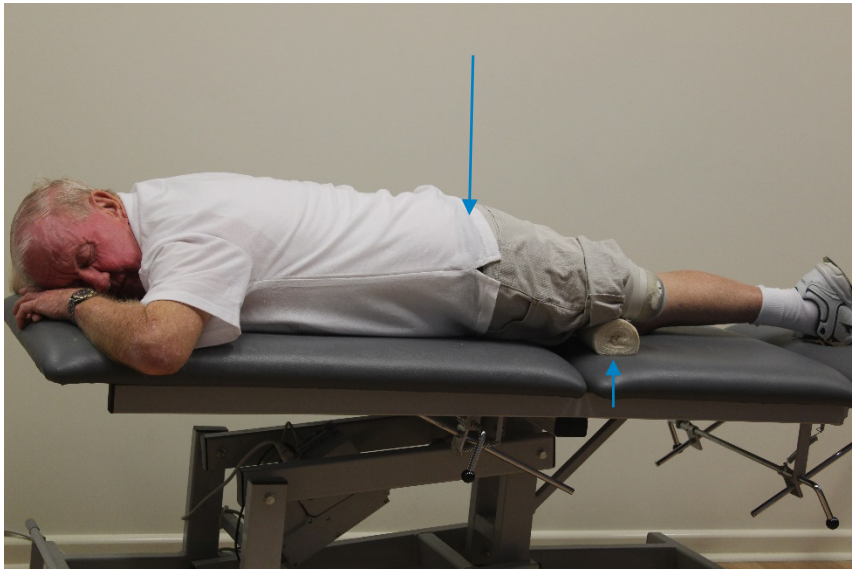
Use the hip joint and control pelvis

Not Lumbar Spine



Hip Flexor Stretches

Beginner:



Advanced:

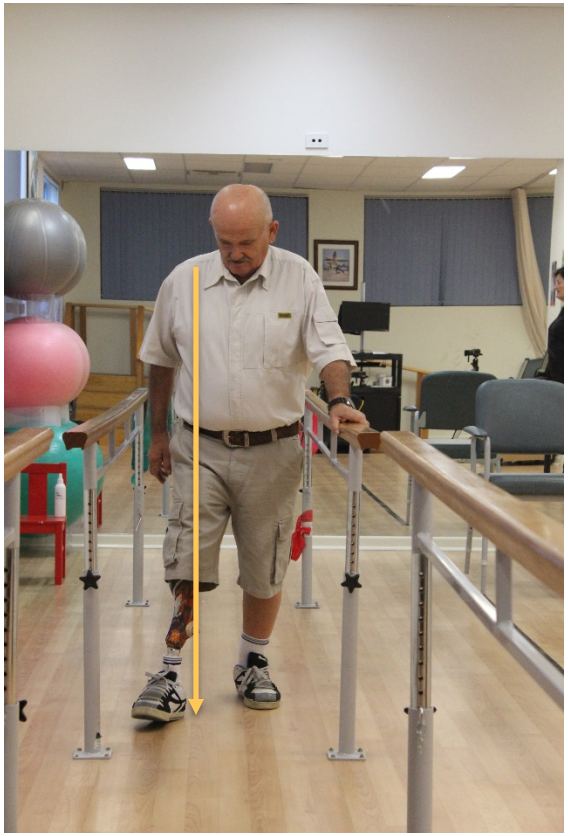
Primary Amputees: Achieving Weight Transference

Weight Transference

Depends on lateral pelvic shift.

Poor Weight Transference

Inadequate Lateral Pelvic Shift.



Results in Lateral Trunk bending.

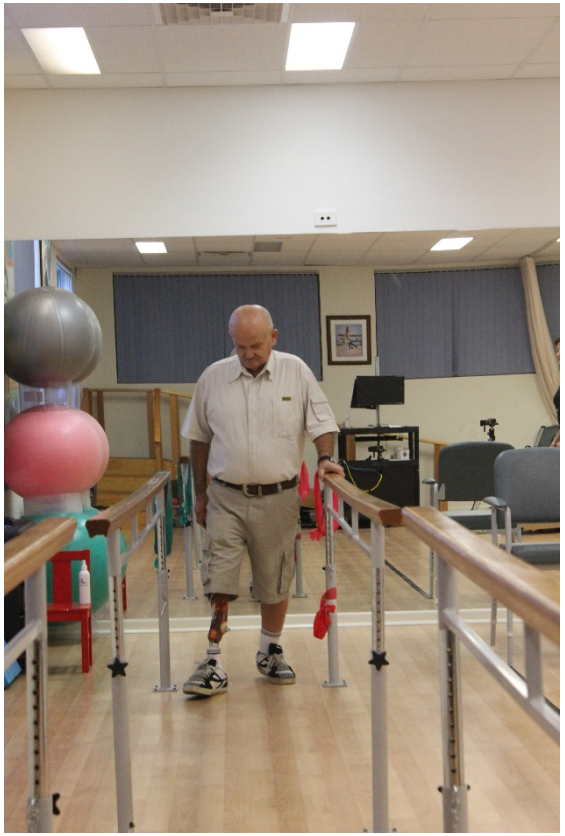
Correct Weight Transference

Adequate Lateral Pelvic Shift

Hip and Shoulder in line & upper body Rotation.

Weight Transference can be influenced by:

Opposing hand support



Correct hand support

Weight transference can be influenced by:

Abductor Strength:

Abductor Strengthening:

How the use of Aids influences Gait:

Sticks too far forward encourage trunk and hip flexion.

- Length of prosthesis is functionally shortened.
- Difficulty breaking the knee for swing phase.
- Problems with toe clearance in swing phase.
- Patient may want the prosthesis shortened.

How the use of Aids influences gait:

Correct stick placement.

Extension of the trunk and hip encouraged.

- Weight can be transferred to the front of the foot.
- Mechanical advantage is achieved to break the knee easily for swing.
- High positioning of the hip facilitates toe clearance without needing to shorten prosthesis.
- Even step length can be achieved.

How the use of Aids influences Gait.

Discouraging weight bearing.

Encouraging weight bearing.

Safety needs to be trained…"The safest place for your prosthesis is underneath you."

Commonly adopted posture to avoid weight bearing produces an:

Unstable Knee

Reinforce correct foot placement and standing posture to produce a:

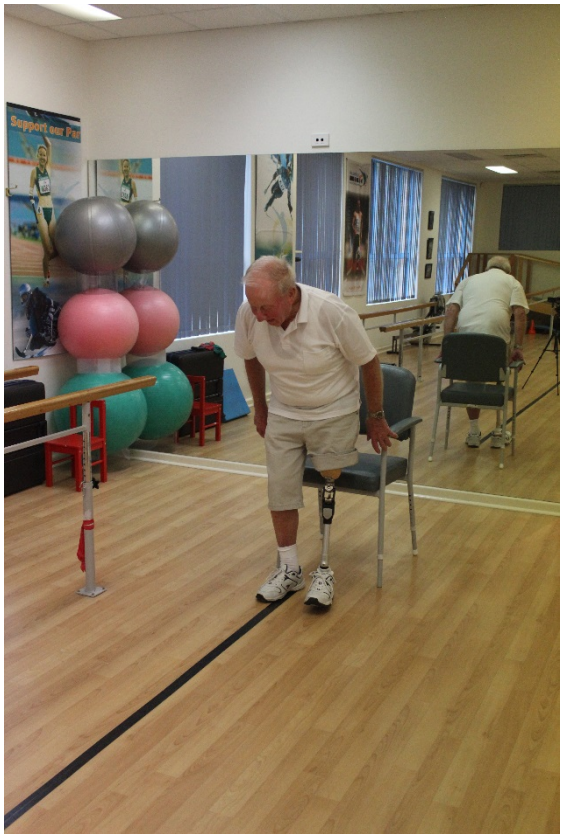
Stable knee

Falls often occur when turning…

Prosthesis is used as a strut:

- Prosthesis is placed in a position where alignment is not safe.
- Knee joints will be forced into flexion.
- Excessive rotation forces around the stump.

Prosthesis is used as a "leg":



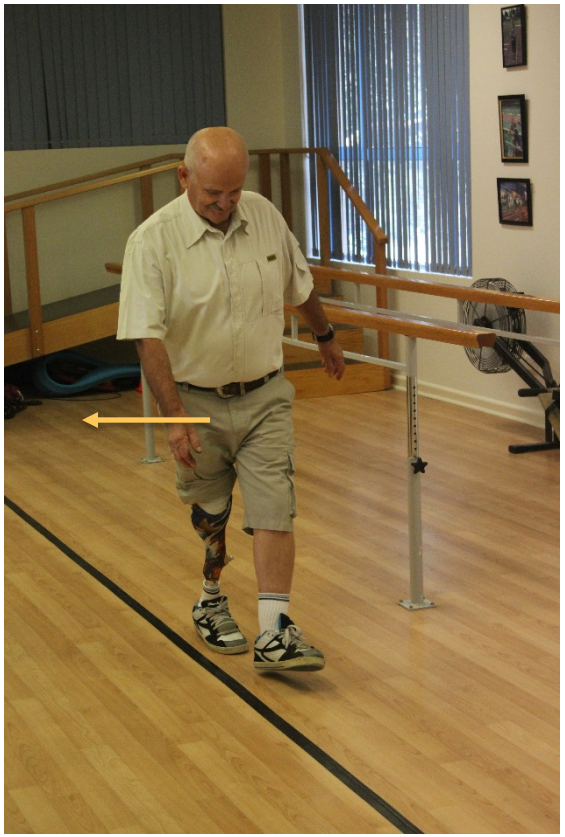
- Inherent alignment stability of the prosthesis is maximised.
- Constant reminders are needed initially to reinforce safe technique.

Accuracy in foot placement:

- Assists in maintaining balance especially Mediolaterally.
- “Walking the Line”.
- Assists dynamic alignment process.

Balance affected by foot placement.

Foot placed too far medially



Foot placed too far laterally

Good Balance is Dynamic

Produce force

Accept force

Aggressive balance training

Getting up off the floor:

- Don’t panic
- Make sure you are unhurt
- Scoot towards sturdy furniture

Getting up off the floor:

- Turn over onto your knees

Getting up off the floor:

- Bring your sound foot forwards

Getting up off the floor:

- Push yourself up with your hands and sound leg

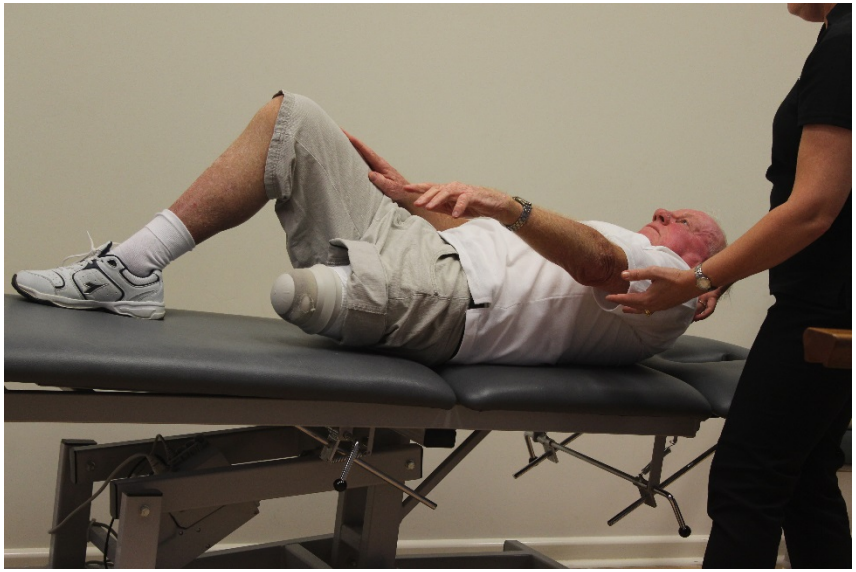
Getting up off the floor:

- Stand up straight.
- Bring your prosthesis underneath you to its “safe” position.
- Pause for a moment before you walk off to make sure you are not dizzy.

Key Exercises for optimising outcomes:

Core:

Abdominals:



Progressive Hip Extensor strengthening:

Adding Upper Body Rotation (Arm Swing) into the Gait Pattern:

- Facilitated Walking.
- Balances the body over the prosthesis.
- Assists in decreasing reliance on walking aids.

Reinforcing Arm Swing:

- Maintenance of momentum when walking.
- Is an important component of normal gait.

Putting it all together….Indicators of a good Gait Pattern.

- Even step lengths
- Extended hips
- Erect trunk

Putting it all together…Indicators of a good gait pattern.

- Using the Entire foot- achieving toe off.
- Even arm swing.
- Lateral trunk bending is minimised.

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