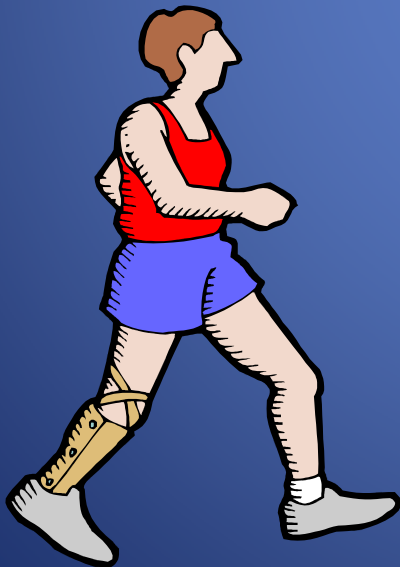


# Rehabilitation of the Lower Limb Amputee



Shirley Wyndham

# Stages of Rehabilitation

- Acute (pre-op, surgical, immediate post surgical)
- Pre-prosthetic rehab (includes prescription)
- Prosthetic training
- Community and vocational
- Life long management and follow-up



# Acute

- Wound healing
  - Reduce oedema
  - Shape stump
    - RRD vs bandaging, shrinkers
- Prevent injury, contractures
- Education
- Prepare for Prosthetic Management
- Pain control (phantom pain)



# Stump Shaping

- Stump Shrinker
- Conco bandage
- Removable rigid dressing



## Removable Rigid Dressings / Rigid Casts Nursing Information

Patient's sticker

This patient has been fitted with a removable rigid dressing / rigid cast.

The cast was fitted on (date):

The dressings present at the time of casting were:

The number of socks applied at the time of fitting:

The cast is held on using a suspension sock.

- Please keep the profile / thickness of the wound dressing consistent as it will affect the fit of the cast.
- Do not remove the rigid dressing for more than 10 minutes at a time.
- Wool socks should be added as the volume of the residual limb decreases.
- When the patient requires 3 or more wool socks or if there are problems fitting the rigid cast, it is time to have a new cast fitted.



■ TUBIGRIP SOCK  
■ LIMB SOCKS  
■ RIGID CAST

Adapted from publication by C. Evans  
HNE Area Health Service 2008



## Removable Rigid Dressings / Rigid Casts

### Patient Information

You have been fitted with a Removable Rigid Dressing. They are fitted for two main reasons:

- To reduce the swelling in your residual limb
- To protect your residual limb from trauma in the case of a fall or knock

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The cast may also help to:

- Reduce your pain and prevent stump complications
- Reduce the time between amputation and fitting an artificial leg
- Reduce your hospital stay
- Improve your confidence with walking / hopping
- Prevent de-conditioning and muscle weakness by allowing you to progress more quickly through your rehabilitation.

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In order to get the maximum benefit from the cast you should:

- Wear the cast at all times (day and night) except when the dressing is being changed or when you are having a wash.
- **ALWAYS have your cast on for ALL transfers and mobility**
- Keep your leg elevated on a stool when sitting out of bed
- Alert staff when the cast becomes slightly loose or is causing pressure areas on your residual or intact lower limbs
- **Do not remove the cast for longer than 10 minutes at a time**

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If you notice any of the following symptoms or problems related to wearing the cast, please alert one of the members of staff:

- Pins and needles or numbness not present before
- Pressure areas on either your residual limb or your intact limb
- The cast feels too loose
- Your residual limb isn't fitting all the way into the cast
- The cast is causing you pain



### The cast should be applied in this manner:

1. Ensure the appropriate dressings have been applied



2. Apply the correct number of stump socks – there should be no wrinkles in the socks.



3. Apply the cast over the top of the socks, making sure the "FRONT" indicator on the cast is in the correct position on the front of your leg.



**\*\*\* Note: If the cast remains loose, an extra stump sock may be required \*\*\***

Stump socks under the RRD/cast must be removed and washed regularly.



4. Pull the elasticised sock up over the cast and limb. There should be no wrinkles in this sock either. Do not double this sock over.



*Adapted from publication by C. Evans  
HNE Area Health Service 2008*



# Pre- prosthetic Rehab

- Stump shaping and shrinking
- Care of stump
- Desensitisation
- ROM and strengthening
- Education



# Falls

- 50% have at least 1 fall per year
- Increased risk for AKA and co-morbidities
- Often while reaching or transferring from wheelchair



# Falls Prevention

- Education re increased risk
- Falls prevention education
- Getting up from floor
- What to do if unable to get up



# Guidelines for the Prevention of Falls in Lower Limb Amputees

To be revised April 2011

## Tools to assess risk of falling include:

- ▶ Timed Up and Go 5,5,10,12,15,20,21,41
- ▶ Berg Balance Scale 3
- ▶ Functional Reach Test 3,21
- ▶ Lawton and Brody Instrumental ADL Scale 6
- ▶ Activities Specific Balance Confidence Scale 6,10,11,12,13,17,22,24
- ▶ Falls Efficacy Scale 3,13
- ▶ Prosthetic Profile of the Amputee 11,12
- ▶ Tinetti's Performance orientated mobility assessment

## Assessment Tools

- ▶ Quadriceps Strength 5,6,30
- ▶ Timed Stair Climb 5
- ▶ Timed Walk 5,10,12,21
- ▶ Four Square Step Test 41
- ▶ 180° Turn Test 41

### Objective

This guideline is based on current best evidence for the prevention of falls in amputee patients. Due to the paucity of evidence specific to amputees some information has been extrapolated from literature regarding falls in the elderly.

### Definition of a Fall

An unintentional event which results in a person coming to rest on the ground, floor, or other lower level, other than as a consequence of loss of consciousness, overwhelming external force, sudden onset of paralysis, stroke or epileptic seizure. 43

### Incidence

Studies found 20% – 53% of amputees experienced at least one fall a year. 4,10,11,12,13,14

### Risk Factors

- ▶ Presence of Co-morbidities 3,6,7,14,15,16,17,18,19,20,21,22,23,26
- ▶ Increasing age 3,5,7,8,11,13,15,18,19,20,21,22,23,24,25,26,27
- ▶ Poor Balance 3,15,16,17,18,19,20,22,23,27,28,29,30,31,32,33,34,35,36
- ▶ Reduced muscle strength 3,5,15,16,18,19,20,21,23,26,30,36
- ▶ Medication 1,6,8,14,15,16,17,18,19,20,21,22,23
- ▶ Environmental hazards 3,4,6,9,15,16,19,20,23,38
- ▶ Gait deficiencies 15,16,17,18,20,22,23,30,37,39
- ▶ Reduced confidence / fear of falling 6,10,11,12,13,16,17,18,19,21,24,30
- ▶ Level of Amputation 4,14,28
- ▶ Poor functional ability 3,10,11,13,17,18,19,21,22,23,27,38,39
- ▶ Level of activity 19,20,21,23
- ▶ Sensory deficits 17,19,20,23,28,30,32,38,39
- ▶ Decreased flexibility 16,30
- ▶ Length of hospital stay 8,14,26
- ▶ Female gender 5,25
- ▶ Previous Falls 6,20,39

### Multi-factorial Falls Prevention Programmes

These should include:

- ▶ MDT approach 36,38 (B)
- ▶ Environmental modifications 15,20,25,29,38,40 (B)
- ▶ Exercise 2,15,20,29,36,40 (B)
- ▶ Medication review 2,15,20,25,29,40 (B)
- ▶ Gait training and provision of walking aid 15,20,29 (B)
- ▶ Education 2,15,25,40 (B)
- ▶ Treatment of any acute illness 15,25 (C)
- ▶ A comfortable fitting prosthesis 36

**Overall Grade of Recommendation = B**

### Other Interventions

Education of healthcare professionals regarding risk factors, safe use of prosthesis and environmental hazards 2,4,40  
Tapering and discontinuing of psychotropic medications 15  
Using a strap across the inlet of a walking frame to prevent the patient stepping too close to the front of the frame 28

**Overall Grade of Recommendation = B**

### Future Research

The current available evidence suggests that a multi-factorial approach with an emphasis on exercise, in particular balance exercises is most effective in reducing falls. Further high quality, large scale studies, specific to amputees 33 are required to determine:

- ▶ The most appropriate clinical balance tool for this population 3,14
- ▶ The most appropriate type, amount and specificity of exercise in reducing falls 14,15,18,29
- ▶ The ideal intensity, frequency and duration of exercise programmes 15,18,29,42
- ▶ The relative value of different components of falls prevention programmes 18,39
- ▶ Specific interventions to assist in improving balance confidence and therefore quality of life among this population 10,11,12,17,22

### Additional Good Practice Points

- ▶ Teach patients how to get up off the floor in the event of a fall 4,18
- ▶ Exercise programmes should include adequate intensity frequency and duration, with monitoring of compliance 6,15,16,18,29
- ▶ Measures to prevent injury should be taken in all patients with a high risk of falling e.g. stump protectors 26

### Target Users of Guidelines

Multi-disciplinary team directly involved in amputee rehabilitation.

### Exercise Programmes

Exercise programmes recommended to reduce the risk of falls include:

- ▶ Balance exercises 2,5,6,16,18,19,20,29,40,42 (B)
- ▶ Strengthening exercises 2,5,16,18,19,20,21,24,29,42 (B)
- ▶ Tai Chi 2,5,6,16,18,29 (B)
- ▶ Endurance exercises 5,20,29 (B)
- ▶ Stretching 16,18,20 (D)
- ▶ Multiple task practice 13,16,18 (D)
- ▶ Functional floor work 16,18
- ▶ Co-ordination 20
- ▶ Agility training 24,42
- ▶ Gait 2
- ▶ Transfers 2
- ▶ Aerobic exercise 2,42

Programmes should include a combination of exercises to be effective in reducing falls. 5,18,20,42

**Overall Grade of Recommendation = B**

### Environmental Modifications

Specific assessment by an Occupational Therapist to check for environmental hazards such as poor lighting, recommendations of modifications and assistance with their implementation. 2,9,15,23,38,40

**Overall Grade of Recommendation = B**

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Document available at:  
[http://www.bacpar.org.uk/downloads/Amputee\\_guidline.pdf](http://www.bacpar.org.uk/downloads/Amputee_guidline.pdf)

# Pre-prosthetic Training

- Cardiovascular training
- Strengthening UL and core
- Balance in sitting and standing
- Hopping in bars
- Wheelchair mobility and transfers



# Basic Prosthesis

- Patella tendon bearing
- Pellite liner
- Cuff suspension



# Prosthetic Training

- Education
- Donning and Doffing
- Gait training



# Gait Training

- Posture
- Even weight bearing
- Proprioception with weight shifting
- Weight transfer in stance



# Wii fit for training weight shifting



<http://www.crossgatestoday.co.uk>

# Advanced Gait Training

- Stairs, slopes, uneven ground
- On/off floor
- Crowded environments
- Public transport



# Life Long Management

- Regular clinic visits
- Information re contacting prosthetist and rehab team
- Support groups

# Client Resources

Amputee Coach    [theamputeecoach.com](http://theamputeecoach.com)

Amputee Association of NSW    <http://www.amputeesnsw.org.au>

Limbs 4 life    Limbs 4 Life

Wheelchair Sports Association    <http://www.wsnsw.org.au/>



# Resources

Enable NSW [www.enable.health.nsw.gov.au](http://www.enable.health.nsw.gov.au)

AUSTPAR [www.austpar.com](http://www.austpar.com)

BACPAR [www.bacpar.org.uk](http://www.bacpar.org.uk)

US Department of Vet Affairs [www.healthquality.va.gov](http://www.healthquality.va.gov)

