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**EARLY PHYSICAL REHABILITATION AND PROSTETIC MANAGEMENT**

- 1) Rehabilitation
- 2) Prosthetic considerations
- 3) Pre-post fitting phases
- 4) Conclusion



Physical Rehabilitation Programme




- **Objectives:** improve the accessibility, quality and sustainability of services
- **Beneficiaries:** people injured during armed conflicts and other situations of violence as well as other persons with physical disabilities

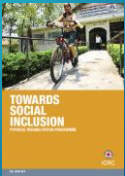

in 2014: close to **300,000 people** benefited from various services at ICRC-assisted centres

- **ICRC's leadership in PR:** scope of its activities, the development of its in-house technology, its acknowledged expertise and its long-term commitment to assisted projects


1) Rehabilitation



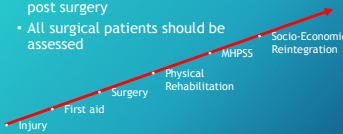

- "A set of measures that assist individuals who experience, or are likely to experience, disability to **achieve and maintain optimal functioning** in interaction with their environment..."
- ... provided along a continuum of care ranging from hospital care to rehabilitation in the community - it can improve health outcomes, reduce costs by shortening hospital stays, reduce disability, and improve quality of life" (World Disability Report 2011)

Surgeon: multidisciplinary team member



- **Physiotherapy** is part of post surgical management to provide early rehabilitation
- Starts during (e.g. POP) or post surgery
- All surgical patients should be assessed


## Physiotherapy objectives



- 1) **Functional recovery:** reducing morbidity, preventing complications and regaining mobility
- 2) **Psychological improvement:** stimulating autonomy, self-esteem, education and information
- 3) **Cost management:** assisting with triage, reducing length of stay, facilitation discharge (Plassman, 2010 and 1)




## Post surgical physiotherapy activities



**Structure & function ICF levels**

- Manual therapy
- Active and passive mobilisation
- Strengthening
- Pain management
- Bandaging & splinting
- Positioning
- Respiratory exercise
- Cardio-vascular training
- Balance training

- Traction management
- POP application

**Activity & participation ICF levels**

- Mobilisation & transfers
- Gait training
- Wheelchair skills
- Activities of daily life training
- Education, information & self care
- Outdoor functional training

## 2) Prosthetic considerations



- Regular follow up and prosthetic maintenance is of utmost importance
- A **permanent prosthesis** is actually not permanent and does not last a lifetime:
  - childrens' devices last approx 6 months
  - adults' devices last approx 3 year
- **Polypropylene technology:** low cost technology is not low quality management




## Prosthetic considerations: fitting




### Bandaging: the must (practice based)


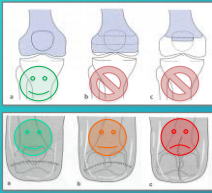


- Improves blood circulation (facilitate wound healing?)
- Improves scar
- Forms the stump
- Protects the skin
- Reduces oedema
- Accustoms to pressure
- Triggers stump care






### Surgical recommendations

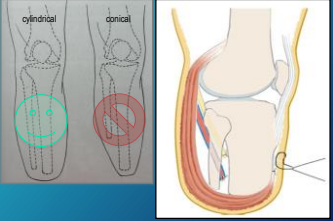



- Conserve femur; the longer the stump, the longer the lever arm and consequently the movement control
- Conserve condyles (through knee amputees are not more difficult to be fitted)
- Conserve patella
- The more intact tissue and skin area, the better the distribution of pressure
- Place suture ventral


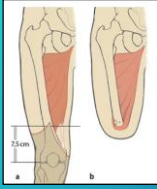
### Surgical recommendations



- Cylindrical stump (fibula 5-10 mm shorter)
- Long posterior muscular flap covering the distal end, attached ventrally to a shorter anterior flap (ventral suture)




### Surgical considerations







- Do myoplasty of antagonist muscles
- Perform Gottchaltk myodesis (adductor magnus trans-oseously fixed and covering the distal femoral end)

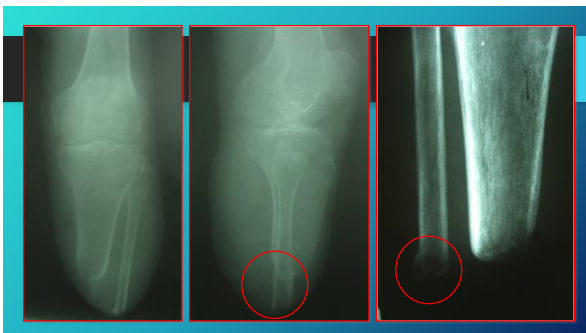
### Surgical recommendations



- Ultimate goal: distal end contact
- **CAVE:** the quality of the stump is more important than its length

Drawing: Courtesy BUFA



### Stump complications




**Consequences**

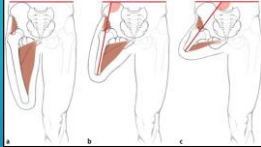
- Pain
- Stump revision(s)
- Delayed mobility
- Reduced functional outcome
- Possible psychological depression
- Restricted social reintegration
- Increased costs




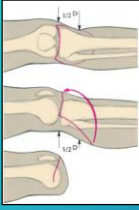

### Amputation level: transfemoral



- Long stump (1/3 distal)
  - best lever
  - better muscular balance while preserving the strength of the adductors
  - energy efficient
- Medium-length stump (1/3 medial)
  - reduced strength of the adductors
  - increased flexion and abduction
  - increased energy expenditure
- Short stump (1/3 proximal)
  - weak adductor muscles, causing severe imbalance
  - position of the stump in flexion and abduction
  - causes massive energy expenditure (effort)



### Amputation level: knee disarticulation






*During: Courtesy: Baumgartner*

**Prosthetic advantages**



- Excellent level
- Full weight bearing on intercondylar fossa
- Ideal proprioception
- **ADD PIC KNEE DISARTIC PROSTHESIS**

### Amputation level: transtibial

- Very short stump
  - (at the level of the tibial tubercle)
- Short stump
  - (1/3 proximal)
  - supports the most weight (up to 60%)
- Medium-length stump
  - (1/3 medial)
  - most adequate
  - best muscle action
- Long stump
  - (1/3 distal)
  - best lever

### Amputation level: fore-mid-hind foot


*During: Courtesy: Baumgartner*

- Transmetatarsal, Lisfranc, Bona-Jäger, Chopart, Pirogow and Syme
- With each reduction the footprint gets smaller and the pressure on the sole increases
- **Challenging: requires well trained and experienced prosthetists**

### 3) Pre and post fitting phases


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- **Pre-fitting**
  - Information & education
  - Goal setting
  - Hygiene & self care
  - Cf. general activities
  - Mobilisation and gait after 1-3 days
  - Balance training
  - Gait training with crutches (jumping on one foot is not recommended until full stump healing)



### Positioning (to add a picture or sketch of BKA positioning with wooden board)


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### Post-fitting

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- **Some activities**
  - Donning & doffing
  - Weight bearing and balance
  - Gait training
  - Endurance
  - Functional training
  - Activities of daily living
  - Initiation to sports activities
  - Home exercises
  - Information



### Ultimate goal: well-being and integration

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#### 4) Conclusion



- 1) Surgery and rehabilitation go hand in hand
- 2) Early rehabilitation is patient centred and interdisciplinary
- 3) Timely referral for rehabilitation services following surgery is key for mobility restoration
- 4) The quality of the stump is more important than its length
- 5) The latest in prosthetic technology does not guarantee best functional outcomes

#### Thank you for your attention



- Rehabilitation is a long process starting with surgery and ending when a person reaches its optimal function in interaction with his environment

