AMPUTATION

Early Rehabilitation and Residual Limb Assessment

Department of PMR

AMPUTATION

- Definition
- Causes
- Levels
- Pre-surgical management
- Postop management
- Complications
- Residual limb Assessment
- Ideal stump

AMPUTATION

Loss of part or all of an extremity as the direct result of trauma or by surgery

AMPUTATION – why ?

DEAD, DANGEROUS or DAMN NUISANCE

DEAD (or dying)

- Severe trauma
-Peripheral vascular disease
-Burns
-Frostbite

AMPUTATION – why ?

DANGEROUS

-- Malignant tumors

-- Potentially lethal sepsis

-- Crush injuries

AMPUTATION- why ?

DAMN NUISANCE—

When retaining the limb may be worse than being having no limb at all

--Gross malformation

--Recurrent severe infections

TYPES OF AMPUTATION

PROVISIONAL-

Done initially when primary healing is unlikely

DEFINITIVE-

Planned amputation

Amputation - Types

Guillotine

- All tissues divided at same level
- Terminal end – Scary

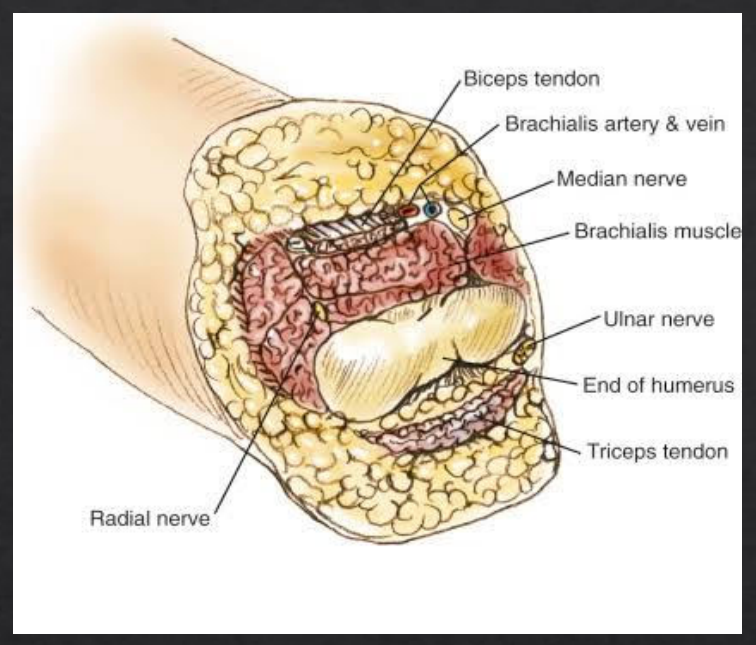
Indications

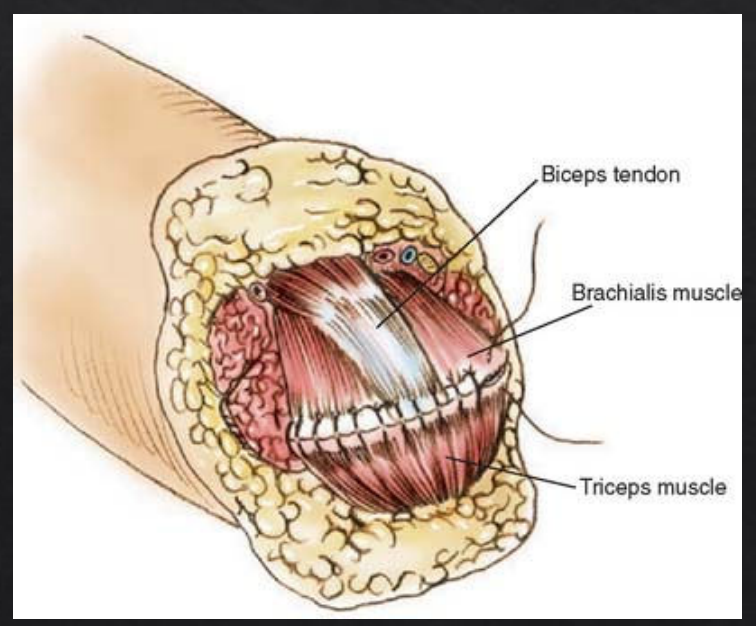
- Life saving
- Stuck limb
- Under war conditions

Amputation - Types

Myoplastic

- Muscles of opposing group sutured together at the end of the bone
- Stump – Bulky
- Muscles roll over the stump end

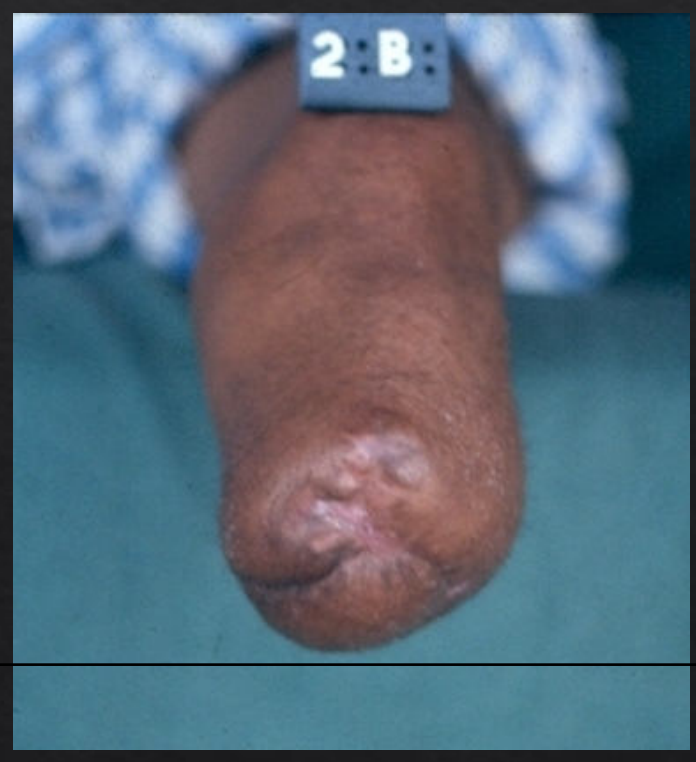




Amputation - Types

Osteoplastic

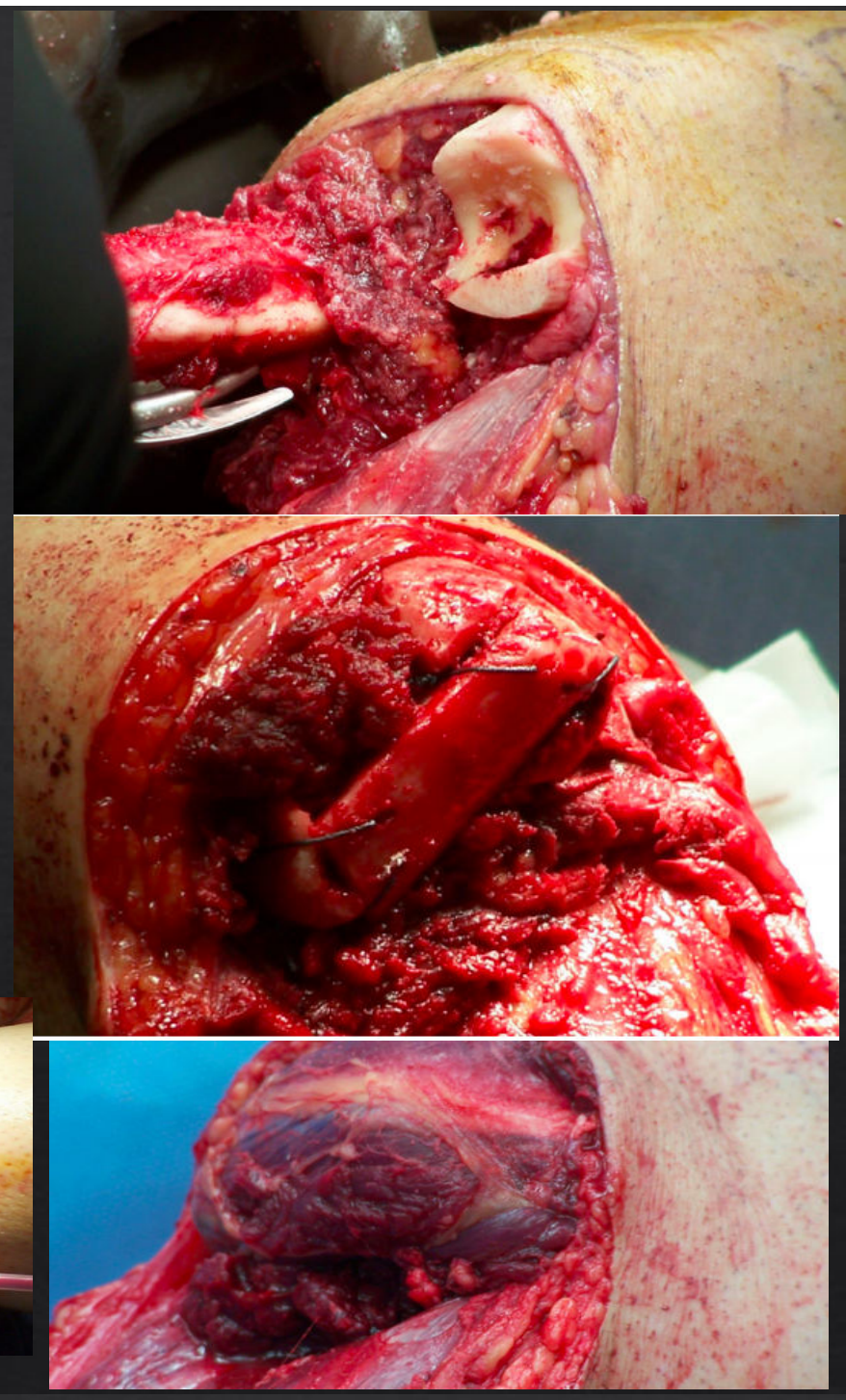
- Muscles sutured at the bone end
- Stump – Conical
- Bony terminal end



Amputation - Types

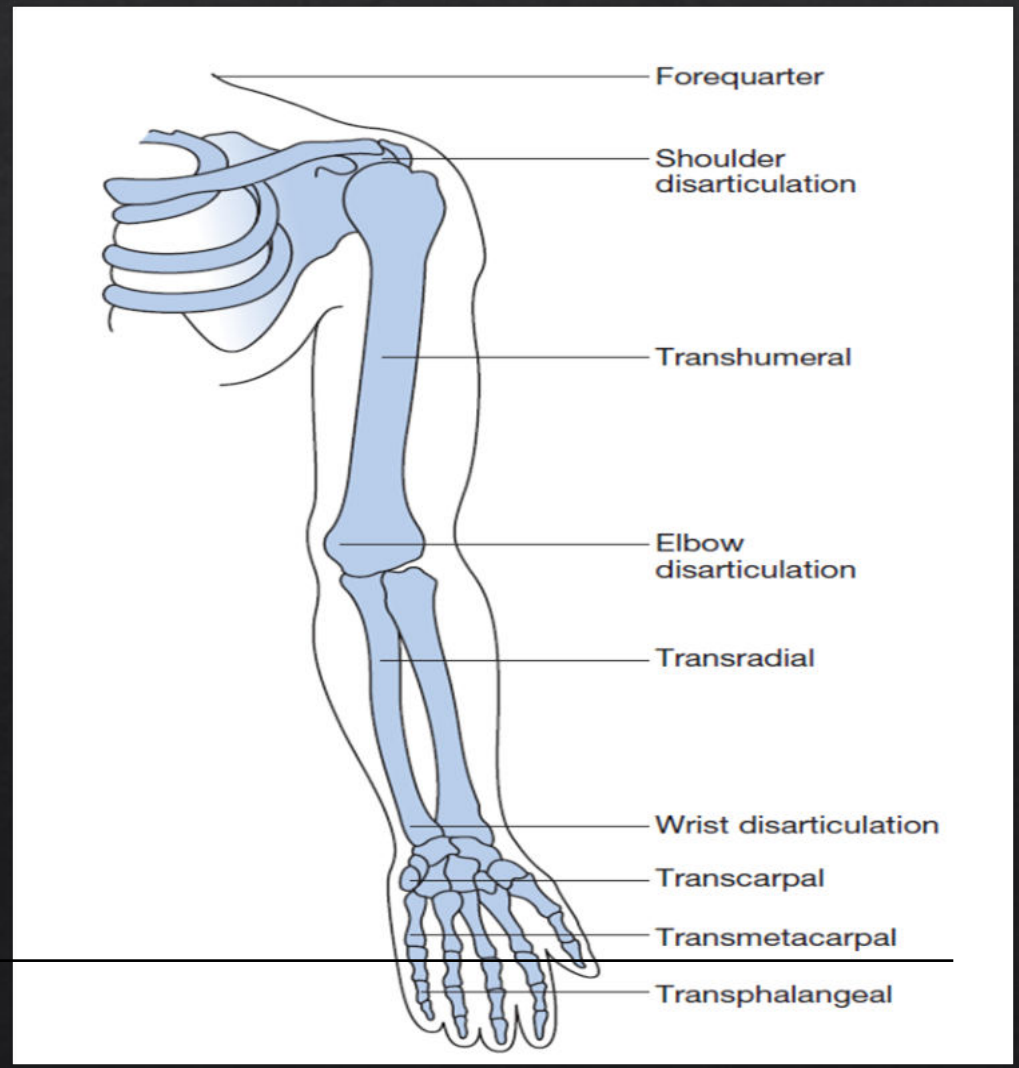
Osteomyoplastic

- Combination of osteoplasty and myoplasty
- Good stump
- Long posterior flap



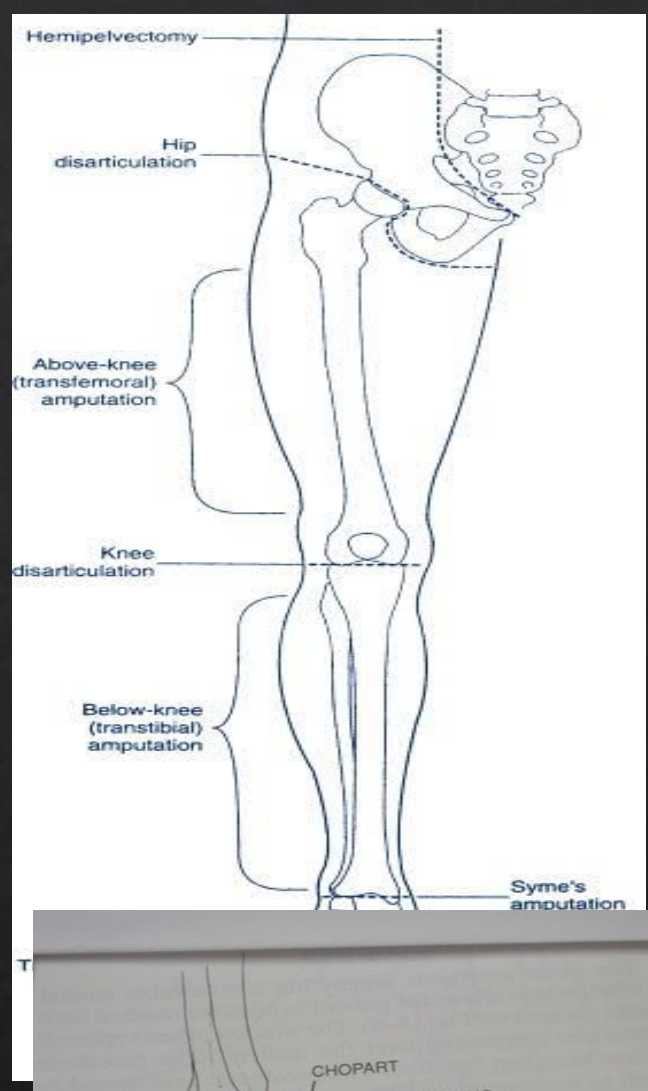
Upper limb amputation Levels

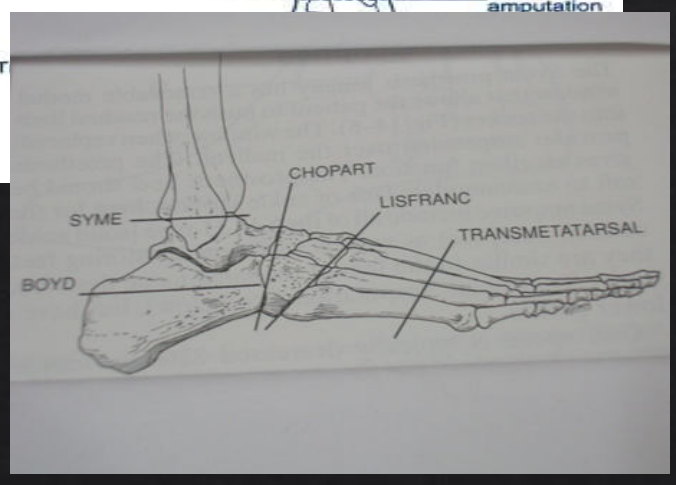
- Transphalangeal
- Transmetacarpal
- Transcarpal
- Wrist disarticulation
- Transradial (below elbow) amputation
- Elbow disarticulation
- Transhumeral (above elbow) amputation
- Shoulder disarticulation
- Forequarter amputation



Lower limb amputation Levels

- Toe amputation
- Ray resections
- Transmetatarsal amputations
- Tarsometatarsal/ Lisfranc amputation
- Transtarsal/ Chopart amputation
- Syme amputation/ Ankle disarticulation
- Transtibial amputation
- Knee disarticulation
- Transfemoral amputation
- Hip disarticulation
- Hemipelvectomy





Pre-surgical Management

Rehabilitation should begin as soon as amputation is considered.

The primary goals of pre-surgical period-

- Medical stabilization
- Patient assessment for amputation level
- Pain control
- Psychological support
- Initiation of a functional rehabilitation program.

Early Post-op care of Amputee

The GOALS of treatment in the early post-op phase are

a) Prevention of post-op complications

b) Promotion of wound healing

c) Prevention of the development of contracture

d) Maintenance of strength and mobility of the whole body

e) Maintenance of psychological support

Prevention of post-op complications

- Breathing exercise
- Anti-embolic exercises e.g.

  a) B-K amputee must imagine performance of alternate PF/DF

  b) T-K or A-K amputee must perform alternate hip flexion/extension and hip adduction/abduction.

These active exercises must be performed at regular intervals throughout the day- 10 repetitions performed hourly is a useful guideline

Promotion of wound healing

Wound healing is a dynamic process and is adversely affected by many factors including

- Wound infection
- Poor blood supply
- Edema
- Systemic disease e. g. DM
- Poor Nutrition

Wound Healing & Edema Control

- **Soft dressings**

- **Rigid dressings**
  - Rigid dressing
  - Immediate Post op Prosthesis (IPOP)
  - Removable Rigid Dressing (RRD)

Soft Dressings

1. Elastic Bandaging 2. Stump shrinkers

Indicated when wound requires frequent observation e.g. infection

Major disadvantage –

- Permits the formation of edema which produces pain and compromises wound healing
- More chance of knee flexion contracture

Rigid Plaster Dressing

- Total contact, POP cast applied in the operating room immediately following wound closure
- Purpose is to reduce edema, promote healing
- Increases tolerance to weight bearing/early ambulation
- Prevents flexion contracture

Rigid Plaster Dressing

Disadvantages

- Difficult to inspect wound
- Tissue damage – mechanical trauma (particularly vascular patients)
- Need a dedicated team/ highly skilled
- Unskilled application could lead to disaster

Rigid Plaster Dressing with IPOP

Rigid Plaster Dressing with IPOP

Rigid Plaster Dressing with IPOP

Advantages

- Reduce edema, promote healing
- Weight bearing within 24 hours
- Prevents flexion contracture
- Emotional/ self imaging benefits

Not all patients are good candidates for IPOPs.

- Damage to the wound can occur from excessive weight bearing too soon after amputation.
- Some patients may develop infected or non-healing surgical wounds.
- In these patients, IPOP use is discontinued while the problem is being resolved.

IPOP – Different types

Removable Rigid Dressings (RRD)

Similar benefits of non IPOP plus:

- Healing more rapid than IPOP
- Ability to remove and inspect wound
- Permits knee flexion
- Ability to adjust fit

Complications

- Skin Problems
- Pain
- Phantom Pain
- Neuroma
- Ulceration
- Infection
- Contractures

Prevention of contractures

Contractures develop as a result of

a) Muscular imbalance

b) Previous disease or poor postural habits

Bed posture control in the post-op phase

a) Elevation of the amputation limb

b) Maintenance of a level pelvis when the patient is lying supine

c) Changing the patient's position frequently

d) Initiation of active exercise and movement of joints.

Do's

No pillows or *one* pillow

Arms positioned wherever comfortable for patient

Stump lying flat (with knee straight if b/k) *no pillow*

Nurse call bell placed within patient's reach

Head turned to sound side

Patient wearing a watch to time period prone

Both hips completely flat on bed

Remaining leg supported on a pillow to prevent toes from digging into bed

Footboard and bedclothes turned right back out of the way

POINTS TO REMEMBER

1. To roll prone, the patient must turn towards the sound side, the nurse ensuring that the stump is lowered gently.
2. Initially the patient lies prone for about 10 minutes.
3. The patient should then build up to lying prone for ½ hour three times a day.

Don'ts

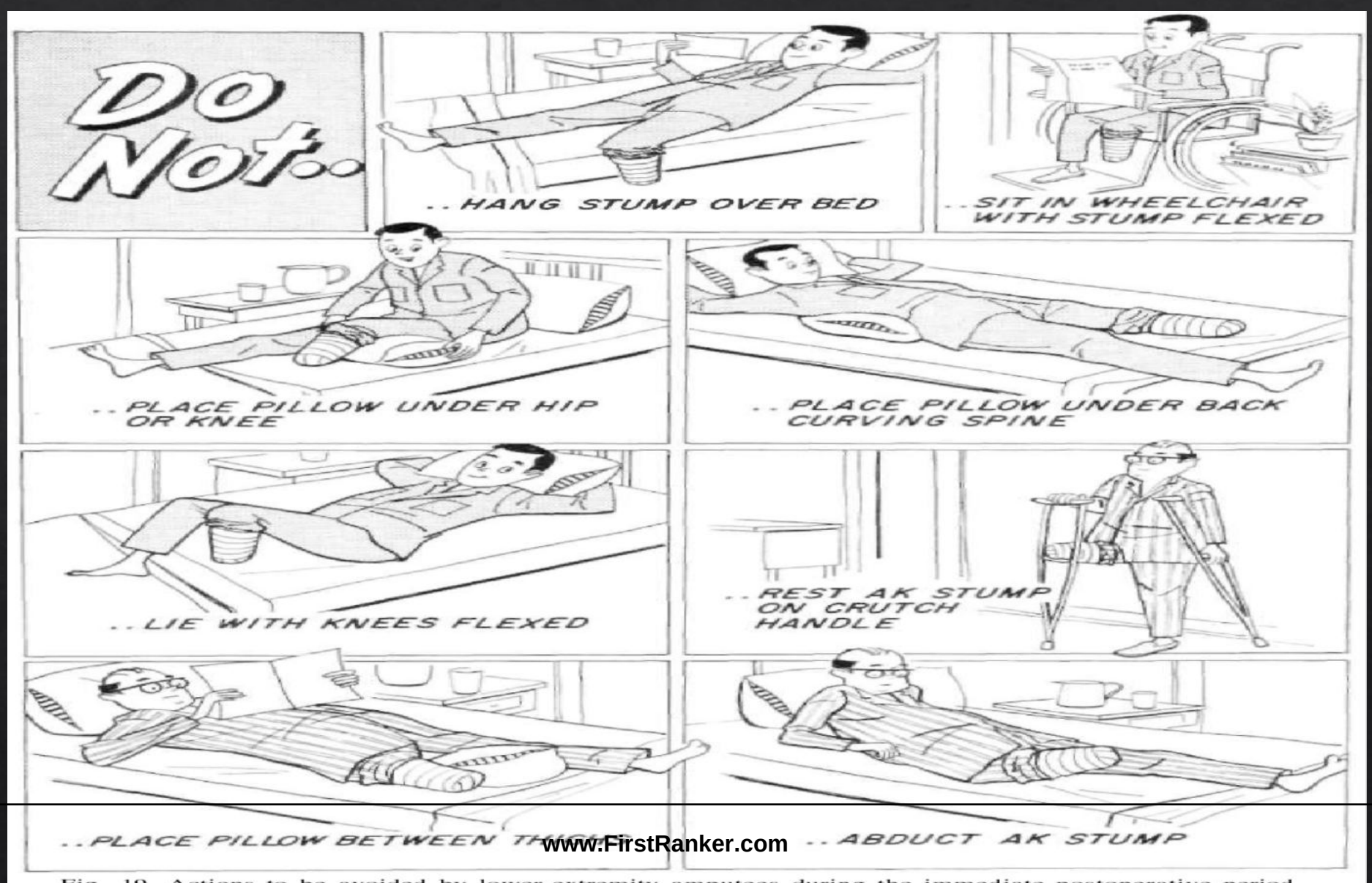


Fig. 12. Actions to be avoided by lower-extremity amputees during the immediate postoperative period

PHANTOM LIMB PAIN

- If the sensation of the absent limb is painful and disagreeable with strong paresthesia, it is referred to as PHANTOM PAIN.
- 1/3rd to ½ of amputees complains of phantom pain.
- IT IS LOCALISED IN THE PHANTOM, NOT IN THE STUMP.

PHANTOM PAIN

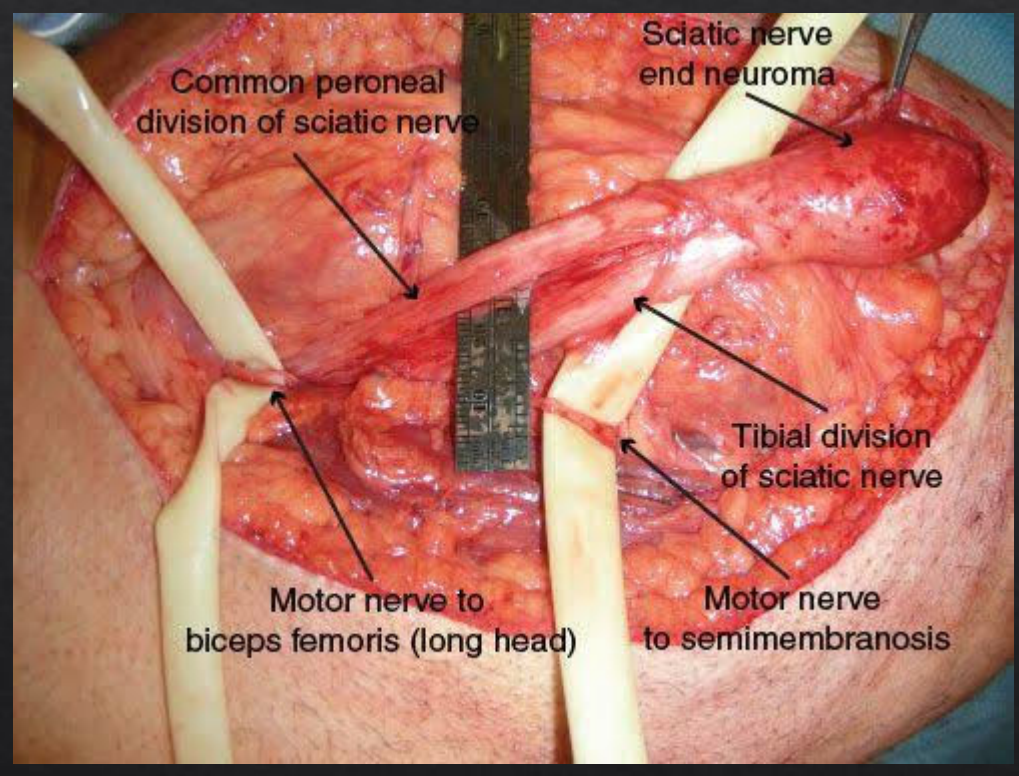
MANAGEMENT :

- Adjuvant therapy - Mirror therapy, TENS, biofeedback, massaging, Prosthesis training).
- Pharmacotherapy – Opioids, Tricyclic Antidepressants, AntiConvulsants, Sodium channel blockers, NMDA receptor blockers
- Neurosurgical procedures : Anterolateral cordotomy. Surgical ablation of the cerebral somatosensory cortex.

NEUROMA

Formation of scar tissue around the distal end of the severed nerve. Every time a nerve is cut it forms a neuroma.

- A painful neuroma is palpable most of the time, & pressure over it reproduces the symptoms.



NEUROMA

MANAGEMENT :

- Desensitization techniques, prosthetic modifications, & at times use of flexible materials with windowed frame construction to decrease pressure over neuroma.
- Neuropathic pain medication.
- Injection with a mixture of local anaesthetics & a corticosteroid reduce the scar tissue. Can be repeated several times at 6 to 8 wks intervals.
- Surgical removal of the neuroma.

Assessment of Patient

FORMAT can be maintained e.g.

- General information and history
- Residual limb information including cast in situ
- Unaffected limb information
- Remaining body information
- Ambulation and independence level information – pre-amp and post-amp
- Treatment plan

Residual Limb Assessment

1. Side: Right Left Both

2. Level of amputation:

3. Length of the residual limb from nearest proximal joint:

4. Girth :

5. Shape of residual limb

6. Redundant tissue

7. Scar on residual limb

8. Wound if any

Residual Limb Assessment

9. Skin of residual limb :
10. Skin Infection:
11. End of residual limb: rounded, bony spur
12. Proximal joint : *Range of motion and Strength*
13. Residual Limb Pain :
15. Neurological Evaluation: Sensation, joint position sense
16. Vascular Evaluation:

The "IDEAL" Stump

For optimum results the stump should be :-

- SHAPE- Conical, SIZE - Proper length to fit with a prosthesis
- Should be covered by healthy skin & have joint senses.
- SCAR- painless, non-adherent, dry & non-hypertrophic
- MUSCLE POWER- adequate
- ROM- Full (or at least desirable)

For optimal prosthetic fitting a best possible stump is needed.

THANK YOU