



Prosthetics III

Lab1

“Upper limb amputation”

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Learning Objectives:

By the end of this lecture, you should be able to

- Define upper limb amputation
- Identify the major causes
- Classify amputation levels
- Match each level with the appropriate prosthesis
- Understand basic socket casting principles
- Analyze real clinical cases.”

Definition:

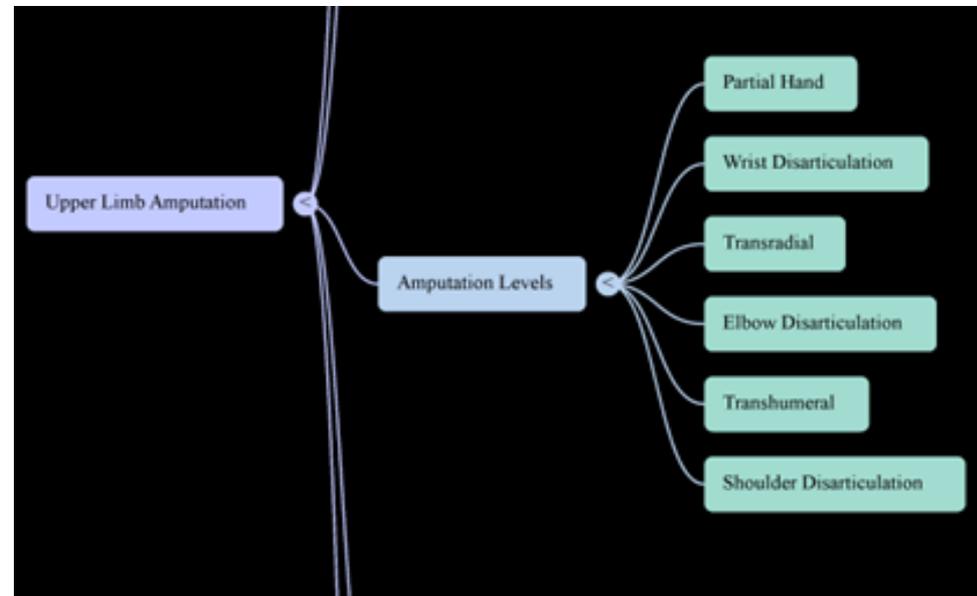
“Upper limb amputation refers to the partial or complete removal of the upper extremity, either surgically or traumatically

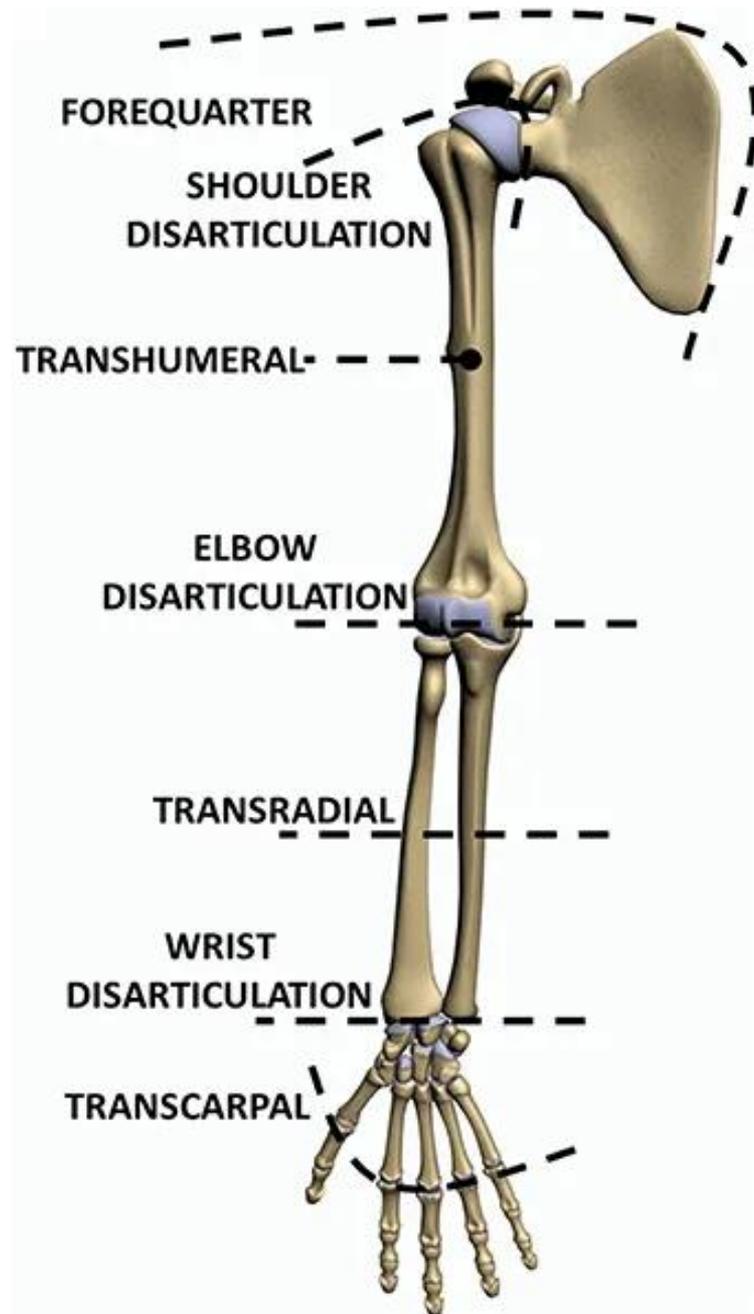
- Causes of Upper Limb Amputation
- The causes of upper limb amputation can be divided into five main categories:
- Trauma
- Tumors
- Infection
- Burns and vascular causes
- Congenital limb deficiency

Levels of Upper Limb Amputation

Upper limb amputations are classified by level:

- Partial hand or finger
- Wrist disarticulation
- Transradial (below elbow)
- Elbow disarticulation
- Transhumeral (above elbow)
- Shoulder disarticulation





Partial Hand Amputation

- Loss of one or more fingers
- Common causes: trauma, congenital absence
- High cosmetic and functional importance
- Partial Hand Prosthesis:

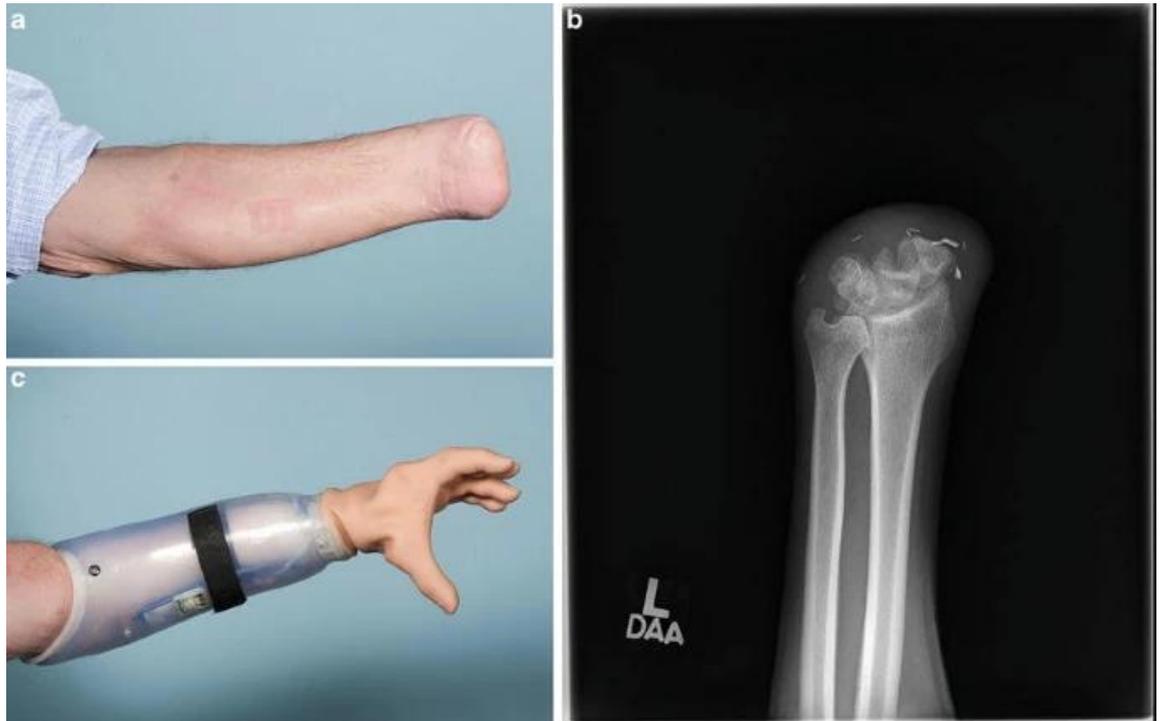
For partial hand amputations, options include:

- Silicone cosmetic fingers
- Mechanical finger prostheses



Wrist Disarticulation

- Amputation through the wrist joint
- Preserves forearm rotation
- Allows good prosthetic control



Transradial Amputation

- Below-elbow amputation
- Most common upper limb amputation
- Best functional outcomes
- Transradial amputation has the best functional prognosis Available prostheses include:
- Body-powered hook or hand
- Myoelectric hand



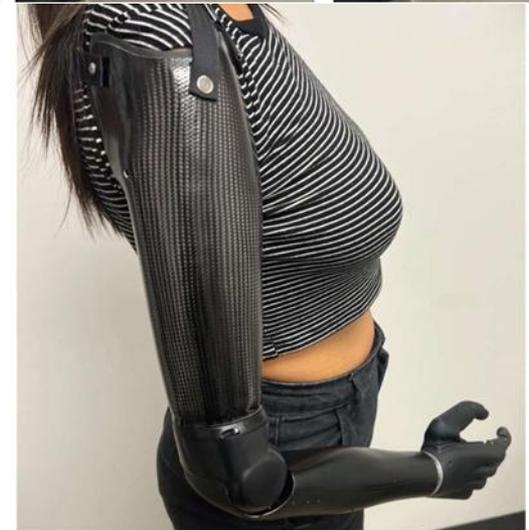
Elbow Disarticulation

- • Amputation through the elbow joint
- • Preserves humeral length
- • Prosthetic elbow required



Transhumeral Amputation

- • Above-elbow amputation
- • Loss of elbow function
- • Requires elbow and hand prosthesis
- Prosthetic options include:
 - Body-powered prosthesis with elbow joint
 - Myoelectric elbow and hand
 - Hybrid systems



Shoulder Disarticulation

- • Removal of entire arm at shoulder joint
- • Severe functional loss
- • Mostly cosmetic or advanced myoelectric prosthesis



(A)



(B)

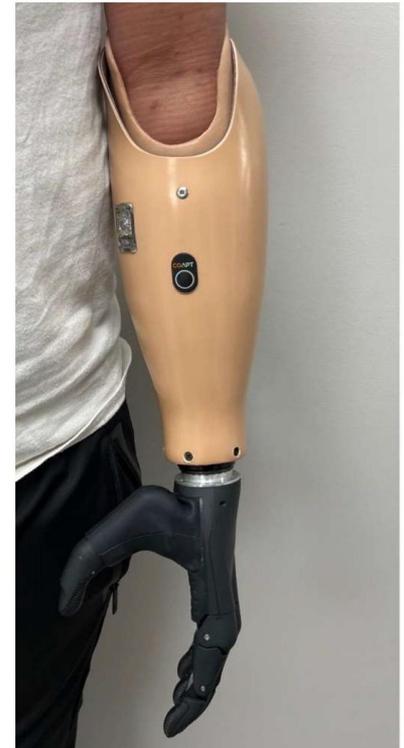
Key Teaching Points

- • Preserve length whenever possible
- • More proximal = more functional loss
- • Socket fit determines success

Prosthesis Types

There are four main prosthetic categories:

- Passive cosmetic prostheses
- Body-powered prostheses
- Myoelectric prostheses
- Hybrid systems



Transradial Casting Technique

For transradial casting:

- Elbow is flexed at 90 degrees
- Forearm in neutral position
- Gentle compression is applied
- Relief is provided over bony prominences”

https://youtu.be/B789ebxFbD8?si=En9tj_36tkk9ASZ8

<https://youtu.be/5LPtZdHUfco?si=bkV4vc4wCt4P3RbS>

Clinical Case Example

A 28-year-old male with traumatic transradial amputation.

He has: Good muscle control, healed scars.

Best option: Myoelectric transradial prosthesis.

Why?

- Functional needs
- Good EMG signals
- High motivation.