

# Orthotic Management of Brachial Plexus Injury

Brachial Plexus Study Day  
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## Outline

- Orthotics
- Functional loss and orthotic aims in BPI
- Prescription considerations
- Prescription options
- Use of pre-preg. carbon fibre

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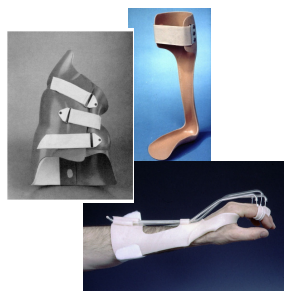
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## Orthosis: definition

"an externally applied device used to modify the structural and functional characteristics of the neuromuscular and skeletal system"

(ISO, 1989)



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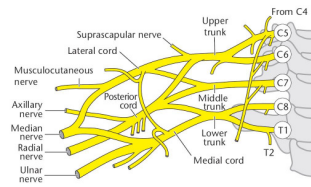
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## Functional losses in BPI



- Loss of motor control
- Loss of sensation
- Pain (mechanical or nerve pain)
- Poor body image



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## Presentation



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## Orthotic Aims in Brachial Plexus



- Prevent shoulder joint pain
- Prevent contractures
- Improve function e.g. enable positioning of hand in space to allow two handed activities
- Improve cosmesis & body image

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## Prescription Considerations



- Prescription should be made based on functional loss
- Custom-made or pre-fabricated
- Motor function
  - Shoulder
  - Elbow
  - Wrist and hand
- Cosmetic appearance
- Patient aims and expectations

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## Orthotic options



- Sling
- Humeral cuff
- Wilmer shoulder orthosis
- Wilmer elbow orthosis
- Steeper Stanmore flail arm orthosis- custom made or kit
- Humeral Cuff combined with customised elbow orthosis

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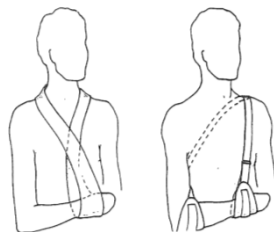
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## Sling



- Reduces shoulder subluxation and pain
- Elbow maintained in flexed position – risk of contractures
- Neck pain may be a problem



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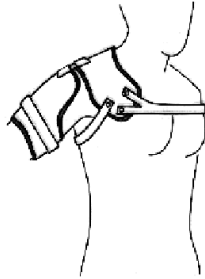
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## Humeral Cuff



- Many “off the shelf” designs available
- Prevents shoulder subluxation, and pain
- Does not control elbow or hand



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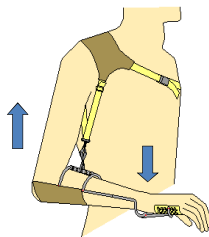
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## Wilmer shoulder orthosis



- Down-strap acts as a fulcrum: weight of forearm pushes humerus upwards into shoulder joint
- Quick and easy to fit
- Not possible for patient to move elbow joint

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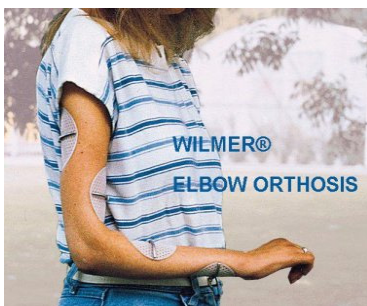
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## Wilmer elbow orthosis



- May need gleno-humeral arthrodesis as shoulder is not supported
- Medial locking steel with 2 fixed positions of flexion

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## Stanmore flail arm Orthosis



- Provided by RSL Steeper – kit
- Weight of arm taken onto shoulder yoke via universal type shoulder joint
- Locking elbow joint
- Can be improved by using custom made shoulder and forearm sections



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## Fishing Appliance



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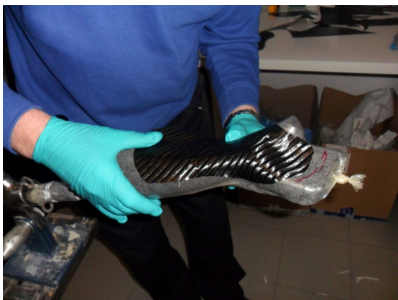
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## Pre-preg. carbon fibre

Carbon Fibre is pre-impregnated with an epoxy resin



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## Use of Pre-preg. Carbon Fibre



### Advantages:

- Very light weight
- Thinner than conventional design
- Improved cosmesis

### Disadvantages

- No adjustability after final fit
- Time consuming to manufacture

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## Humeral cuff and customised Elbow Orthosis



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## Instructions and review



- Donning and doffing orthosis
- Need to check skin frequently
- Wearing-in schedule
- Cleaning the orthosis
- Do not carry out own adjustments / repairs
- 1 month review

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## Conclusion



- Small number of patients
- Team approach essential
- Timing of orthotic intervention
- Establish goals of patient
- Use of customised devices for longer term use

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## Any Questions?



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