

# ORTHOPAEDICS



FOR PRIMARY  
HEALTH CARE



# LION

LEARNING INNOVATION VIA  
ORTHOPAEDIC NETWORKS

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# Clubfoot (Congenital talipes equinovarus)

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## Learning objectives

1. Will be able to identify a clubfoot.
2. Will be able to differentiate a true clubfoot from a positional foot deformity.
3. Know the basic management principles of a clubfoot.

## Introduction

Clubfoot (congenital talipes equinovarus) is an idiopathic deformity of the foot of unclear aetiology. It is the most common musculoskeletal congenital disability with an overall incidence of 1:1000. The male:female ratio is approximately 2:1, and 50% of the cases are bilateral. A genetic component is strongly suggested with a familial occurrence of 25%

## Applied anatomy

Soft tissue and bony deformities contribute to the characteristic deformity noted in a clubfoot.

## Muscle contractures (CAVE)

### Midfoot

- Cavus (tight intrinsics, flexor hallucis longus, flexor digitorum longus).

### Forefoot

- Adductus of the forefoot (tight tibialis posterior).

### Hind foot

- Equinus (tight Achilles tendon).
- Varus (tight Achilles tendon, tibialis posterior and tibialis anterior).

## Bony deformity

The talar neck is displaced medially and deviated plantarly. The calcaneus (hind foot) is in varus and rotated medially. The navicular and cuboid bones are displaced medially

## Clinical findings

### History

- Birth history: Normal vs Caesarean section, duration of pregnancy, pre- or perinatal complications.
- Developmental history and milestones.
- Family history: Spinal defects, clubfoot in the family.
- Previous treatment: conservative (casting) or surgery.

## Examination

### Look

- Syndromic features: Facial, disproportionality.
- Spinal defects.
- Lower limbs: affected limb smaller and atrophied.
- Foot: smaller posterior and medial crease
  - Hind foot equinus and varus
  - Midfoot cavus

- Forefoot adduction

## Feel

- Palpable talus head (uncovered).
- Empty heel.

## Move

- Mobile or rigid.
- Correction of adduction and equinus.
- Anterior tibialis and abductor response.
- Record ROM for plantar flexion and abduction.

Note: A deformity that completely corrects into abduction and dorsiflexion is positional/postural and not a true clubfoot deformity (intra-uterine position).

## Neurovascular

Standard lower limb neurovascular examination.

## Special investigations

- Radiology: X-rays usually not needed.
- Clubfoot deformity can be diagnosed intra-uterine with ultrasound.

## Commonly associated conditions

- Arthrogyposis
- Myelodysplasia





*Images of children with bilateral clubfeet, highlighting the deformity of pes cavus, adductus, varus and equinus. A series of plaster applications illustrates the progressive correction with treatment*

## Management

### Non-surgical

Ponseti method, including serial casting correcting in sequence the cavus, adductus, varus and equinus. This may include an Achilles tenotomy. Follow-up with foot abduction braces or Dennis Brown boots is also necessary.

### Surgical

#### Soft tissue

- Posterior medial release, Achilles tendon lengthening, Tibialis anterior transfer

#### Bone

- Medial column lengthening and lateral column shortening
- Talectomy
- Triple arthrodesis

### Essential takeaways

- Specific deformity of the clubfoot (CAVE).
- Difference between a postural and clubfoot deformity.
- Management: Ponseti casting.

### References

Lovell and Winter's Paediatric Orthopaedics 7th edition, pp. 1410–1428

Malhotra, R et al. Ponseti technique for the management of congenital talipes equinovarus in a rural set-up in India: experience of 356 patients. *Children* 2018, 5(4), 49.

<https://doi.org/10.3390/children5040049>

### Recommended reading

Malhotra, R et al. Ponseti technique for the management of congenital talipes equinovarus in a rural set-up in India: experience of 356 patients. *Children* 2018, 5(4), 49.

<https://doi.org/10.3390/children5040049>

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## ABOUT THE BOOK

Informed by experts: Most patients with orthopaedic pathology in low to middle-income countries are treated by non-specialists. This book was based on a modified Delphi consensus study\* with experts from Africa, Europe, and North America to provide guidance to these health care workers. Knowledge topics, skills, and cases concerning orthopaedic trauma and infection were prioritised. Acute primary care for fractures and dislocations ranked high.

Furthermore, the diagnosis and the treatment of conditions not requiring specialist referral were prioritised.

\* Held et al. Topics, Skills, and Cases for an Undergraduate Musculoskeletal Curriculum in Southern Africa: A Consensus from Local and International Experts. JBJS. 2020 Feb 5;102(3):e10.

## THE LION

The Learning Innovation via Orthopaedic Network (LION) aims to improve learning and teaching in orthopaedics in Southern Africa and around the world. These authors have contributed the individual chapters and are mostly orthopaedic surgeons and trainees in Southern Africa who have experience with local orthopaedic pathology and treatment modalities but also in medical education of undergraduate students and primary care physicians. To centre this book around our students, iterative rounds of revising and updating the individual chapters are ongoing, to eliminate expert blind spots and create transformation of knowledge.

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The information in this book is meant to supplement, not replace, Orthopaedic primary care training. The authors, editor and publisher advise readers to take full responsibility for their safety and know their limits. Before practicing the skills described in this book, be sure that your equipment is well maintained, and do not take risks beyond your level of experience, aptitude, training, and comfort level.

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