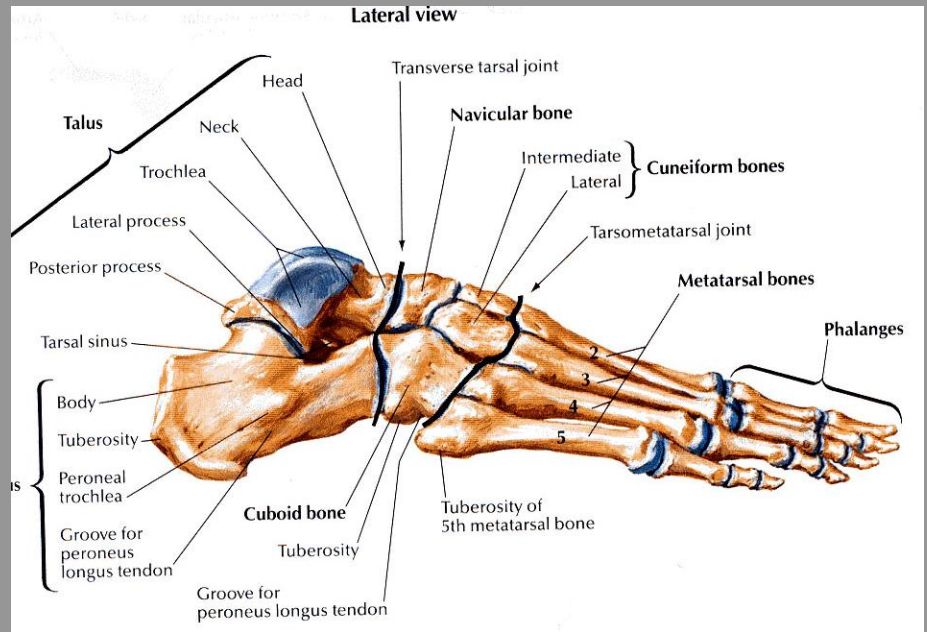
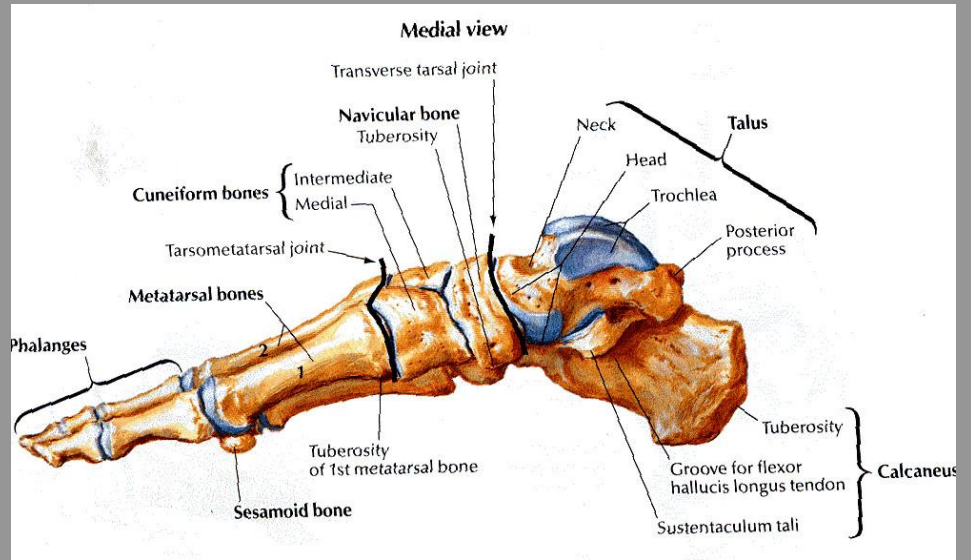
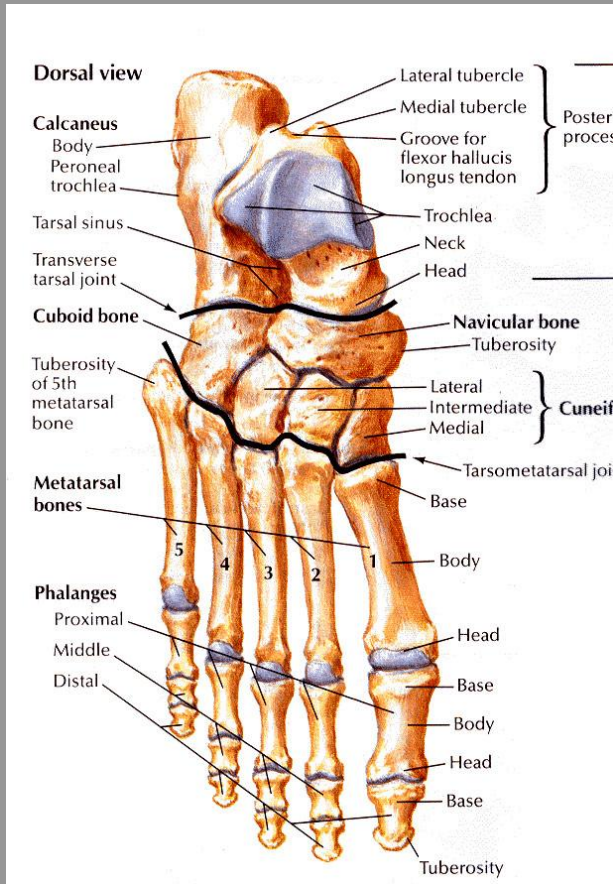


**The anatomy of the foot. Diseases of the leg: flat foot, bunion, hammer toe.
Congenital deformities: clubfoot, vertical talus.**



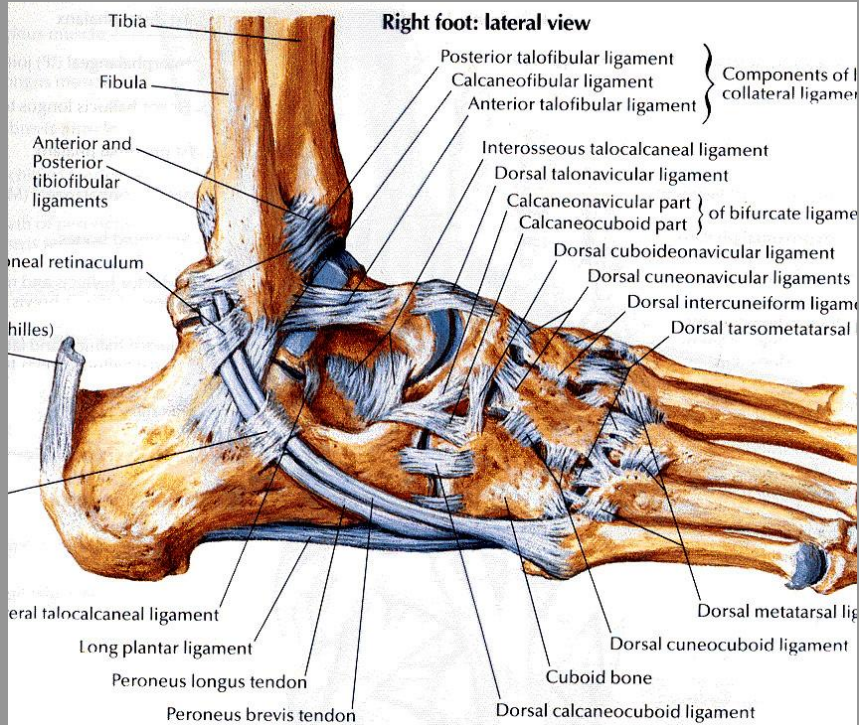
University of Debrecen
Department of
Orthopaedic Surgery



26 bones

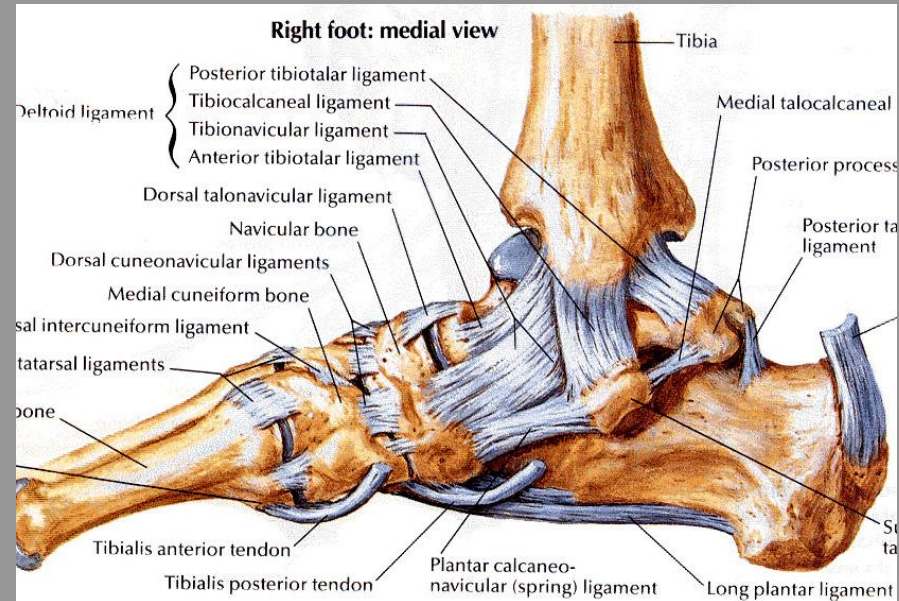
57 joints

Joints of the foot



Subtalar
Chopart
Lisfranc

I MTP



Functions of the foot

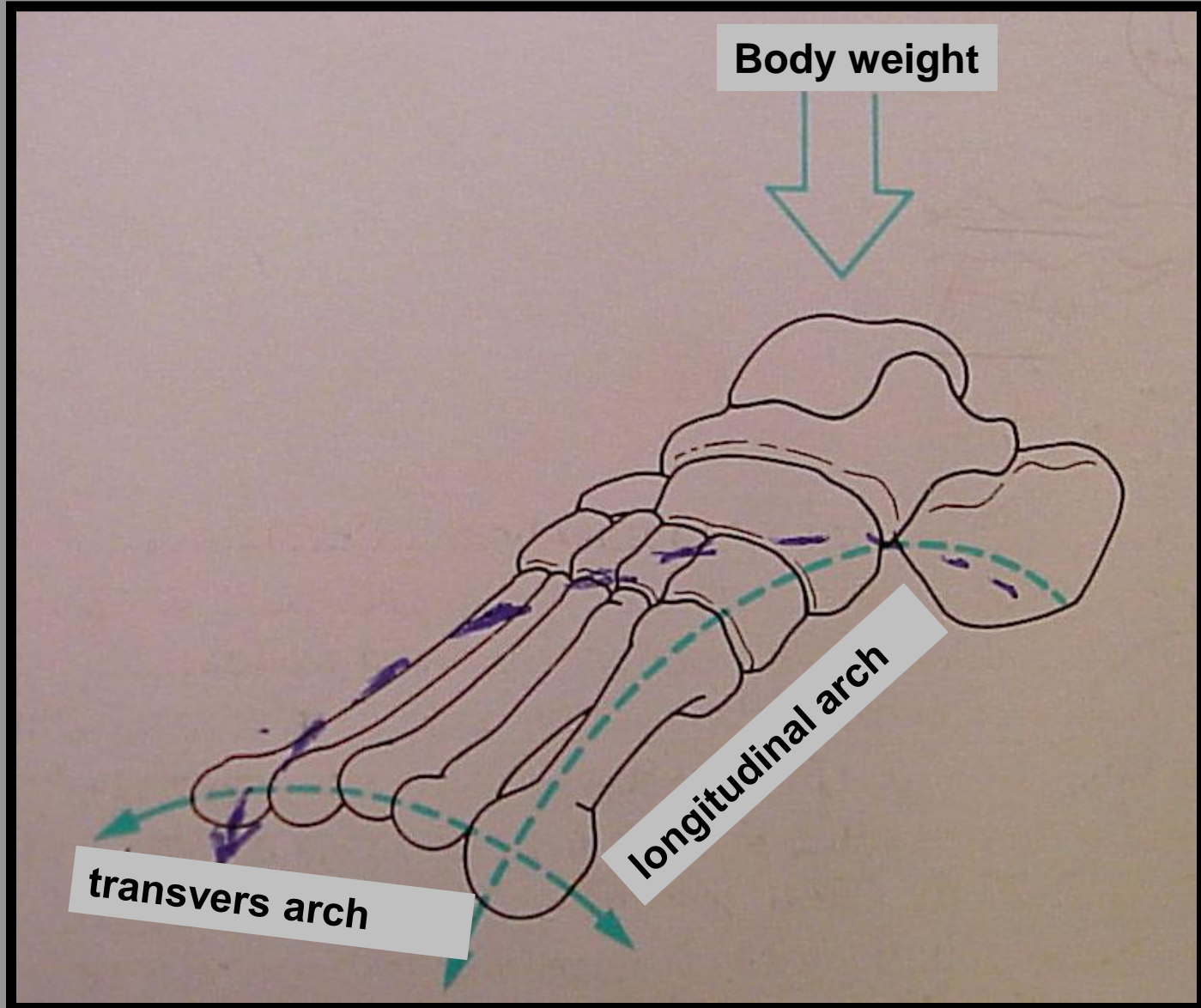
- **Static functions:**

- **Lateral column of the foot: calcaneus, cuboideum, IV, V metatarsus → weight bearing, support**

- **Dinamic functions:**

- **Medial column of the foot: talus, naviculare, cuneiform I, II, III → walking, energy absorption**

Construction of the foot



Muscles responsible for holding the longitudinal arch:

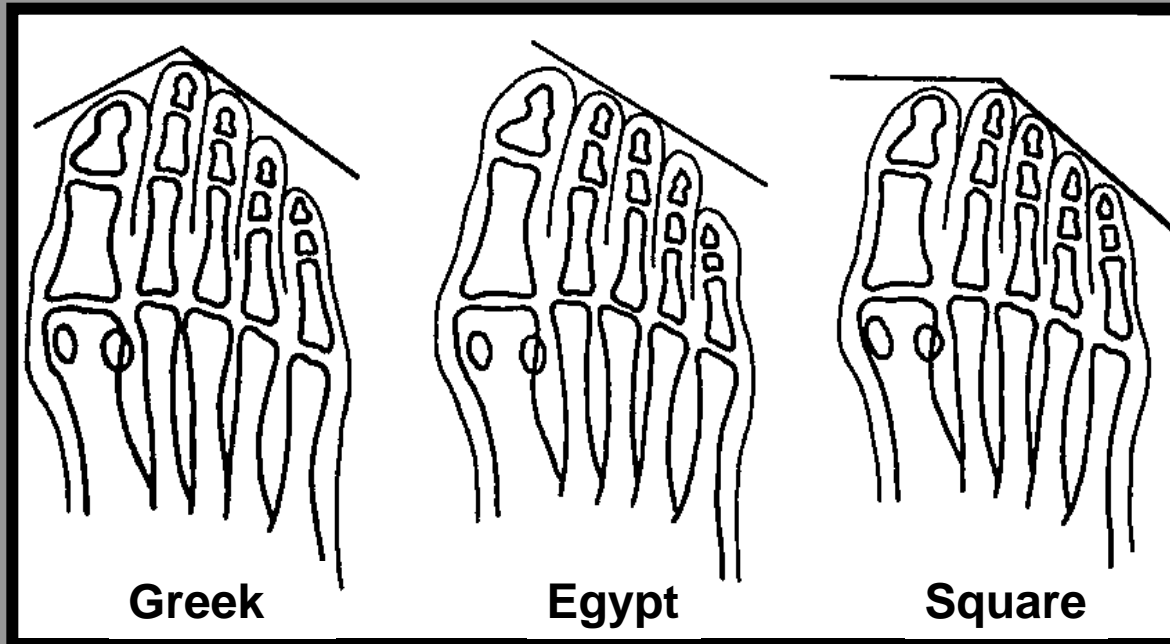
- posterior tibial muscle
- flexor digitorum longus muscle
- flexor hallucis longus muscle
- peroneal muscle

Muscles responsible for holding the transversal arch :

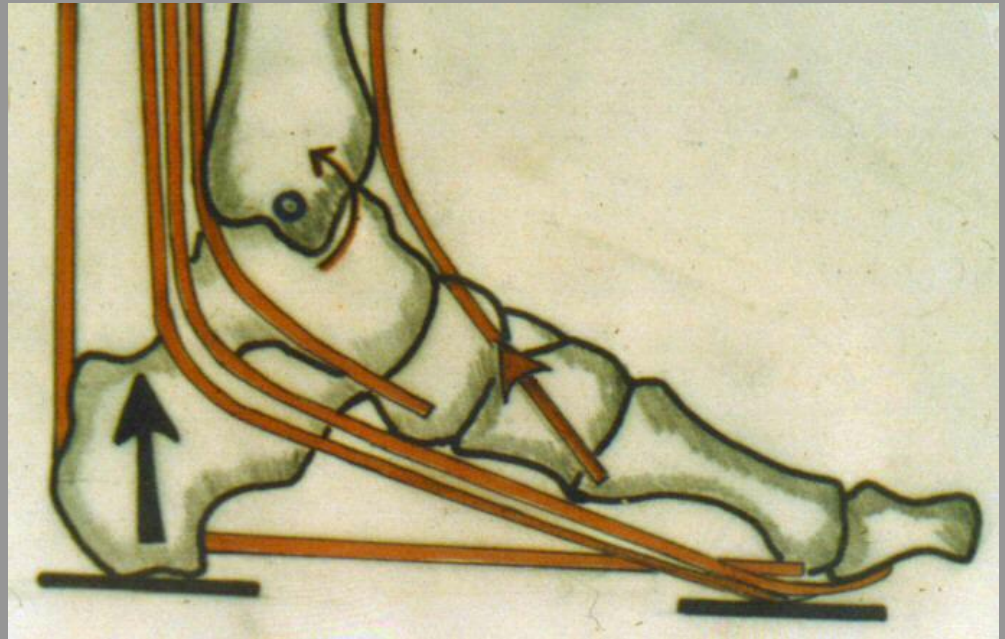
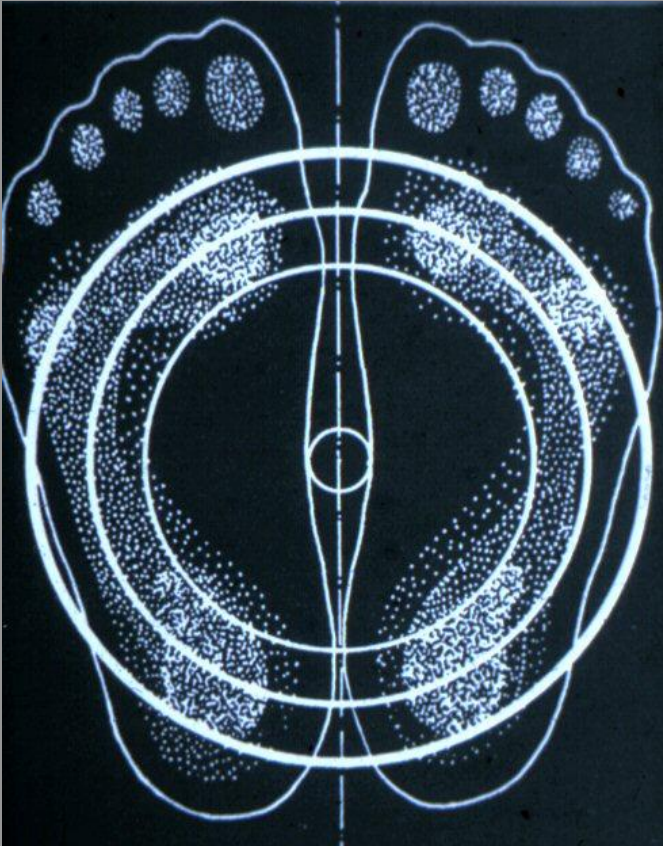
- adductor hallucis muscle
- long peroneal muscle
- anterior tibial muscle

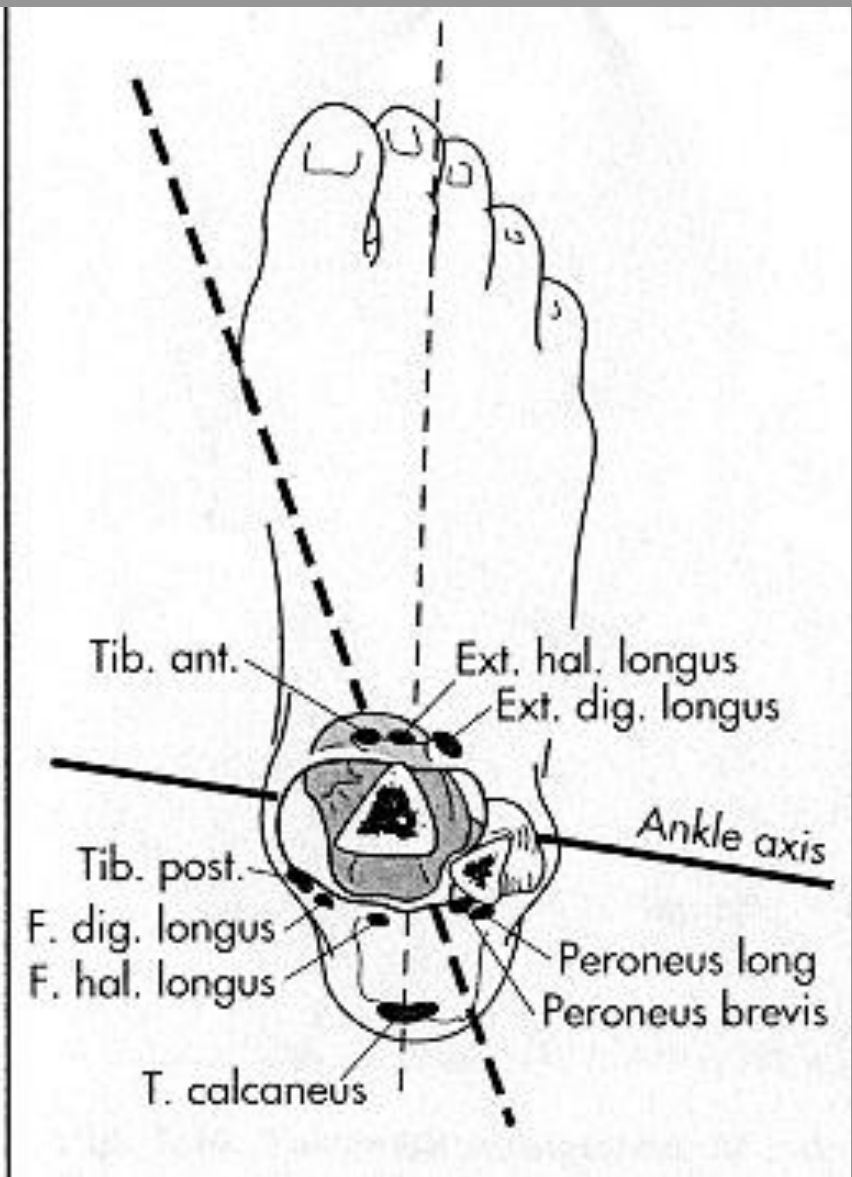
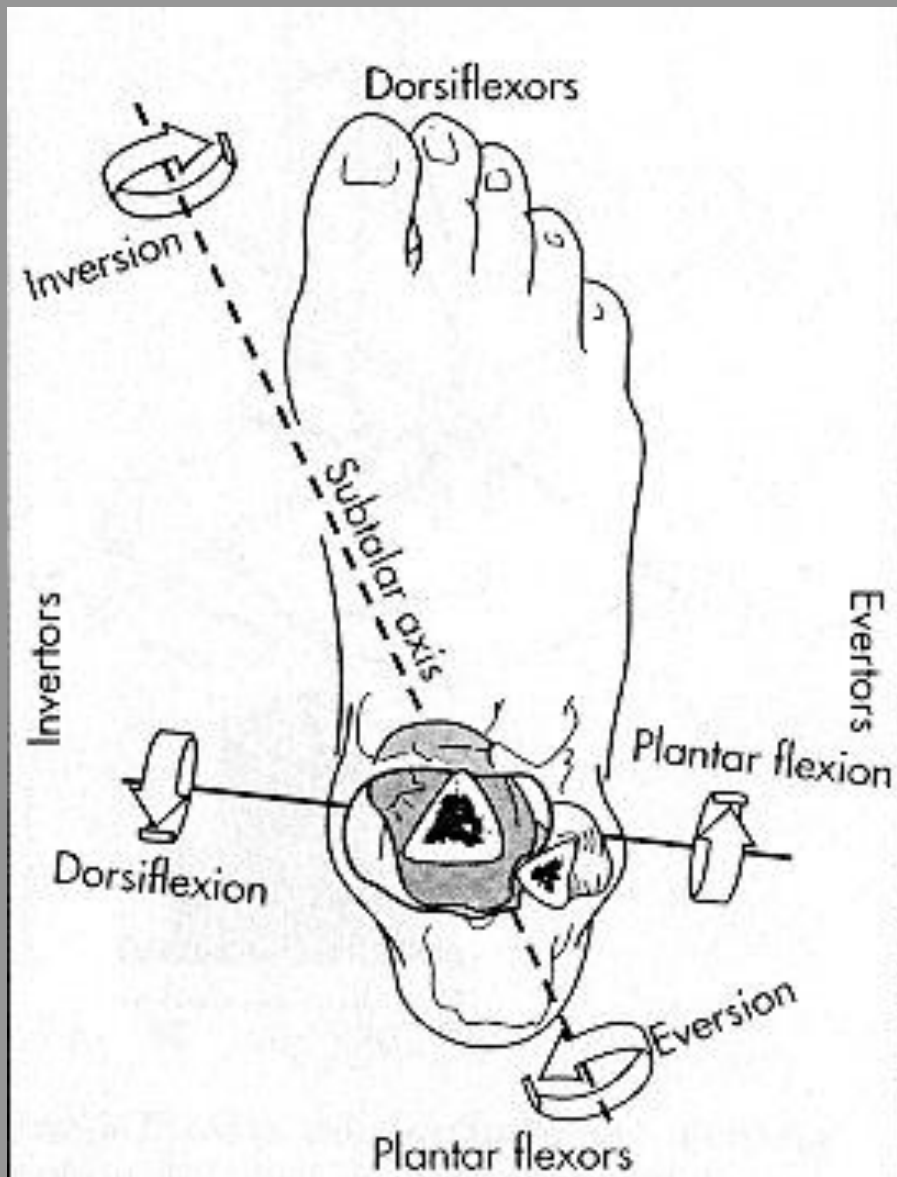


Normal versions of the forefoot



Functional anatomy





Deformities in the sagittal plane

- **Pes equinus (talpies equinus):** plantarflexion in the talocrural joint
- **Pes calcaneus:** the foot is in dorsal extension
- **Pes cavus (excavated foot):** forefoot is in flexion compared to the hindfoot, high longitudinal arch

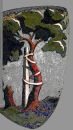


Deformities in the frontal plane

- **Pes varus:** the calcaneus turns inward at the subtalar joint
- **Pes valgus:** the calcaneus turns outward at the subtalar joint
- **Pes adductus (metatarsus varus, intoe):** the forefoot turns medially in the Chopart-joint
- **Pes supinatus (inverted foot):** the forefoot is in supination in the Chopart-joint
- **Pes abductus:** the forefoot turns laterally in the Chopart-joint

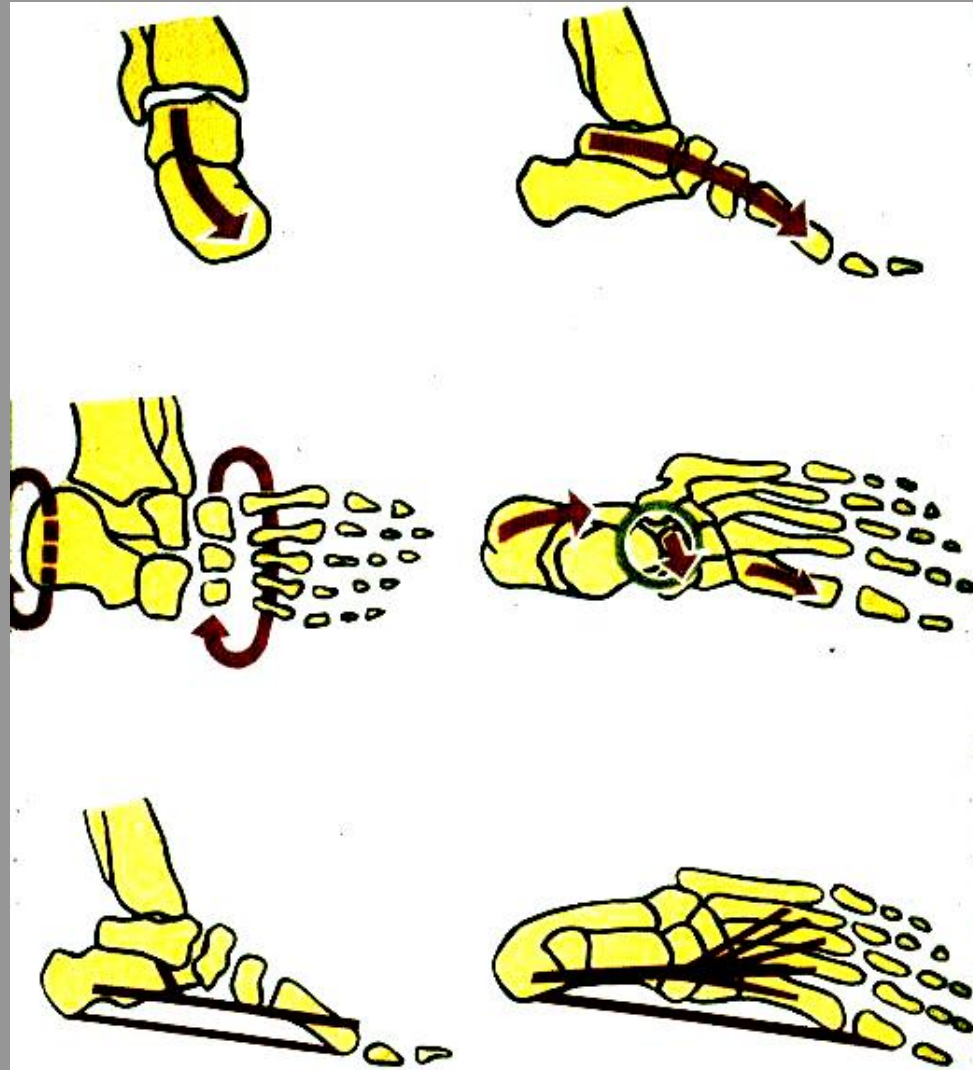


Pes equinovarus adductus et plantiflexus congenitus (clubfoot)



Deformities in clubfoot

- pes
- equino
- varus
- adductus et
- plantiflexus
- congenitus

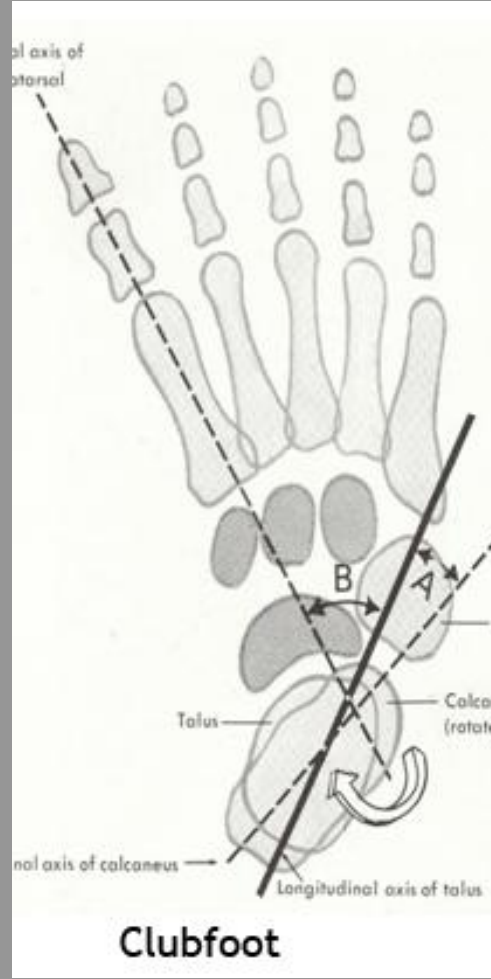
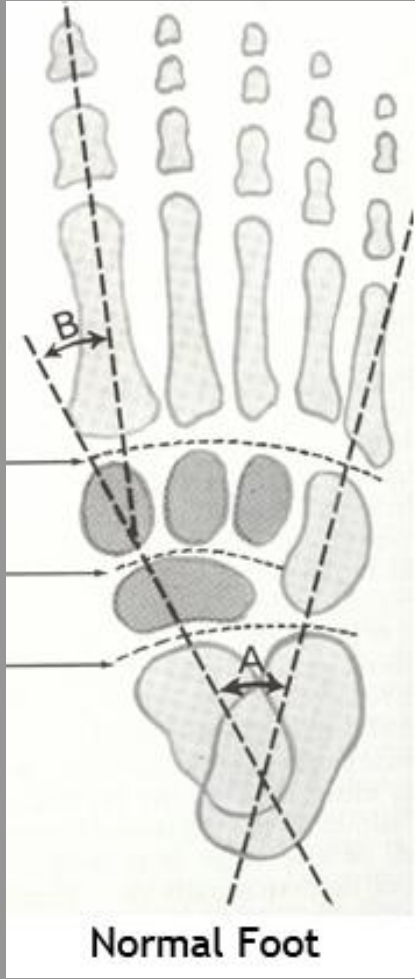


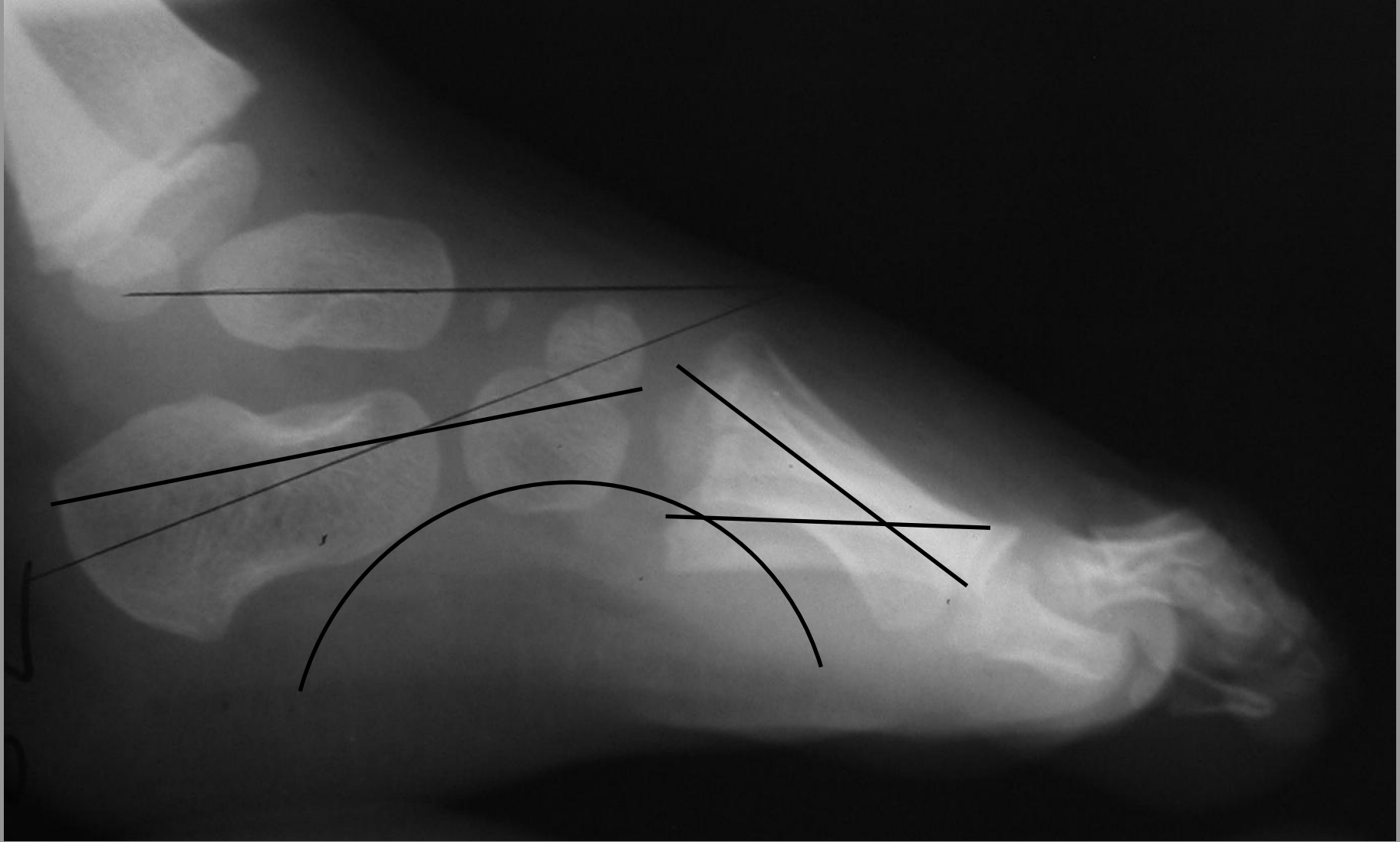
Pes equinovarus adductus et plantiflexus congenitus (clubfoot)



Pes equinovarus adductus et plantiflexus congenitus (clubfoot)

- Boys: girls = 2:1
- Often 2 sided
- Prevalence in Europe 1-2 ‰
- Etiology: multifactorial = genetic + environmental factors
- Familial aggregation

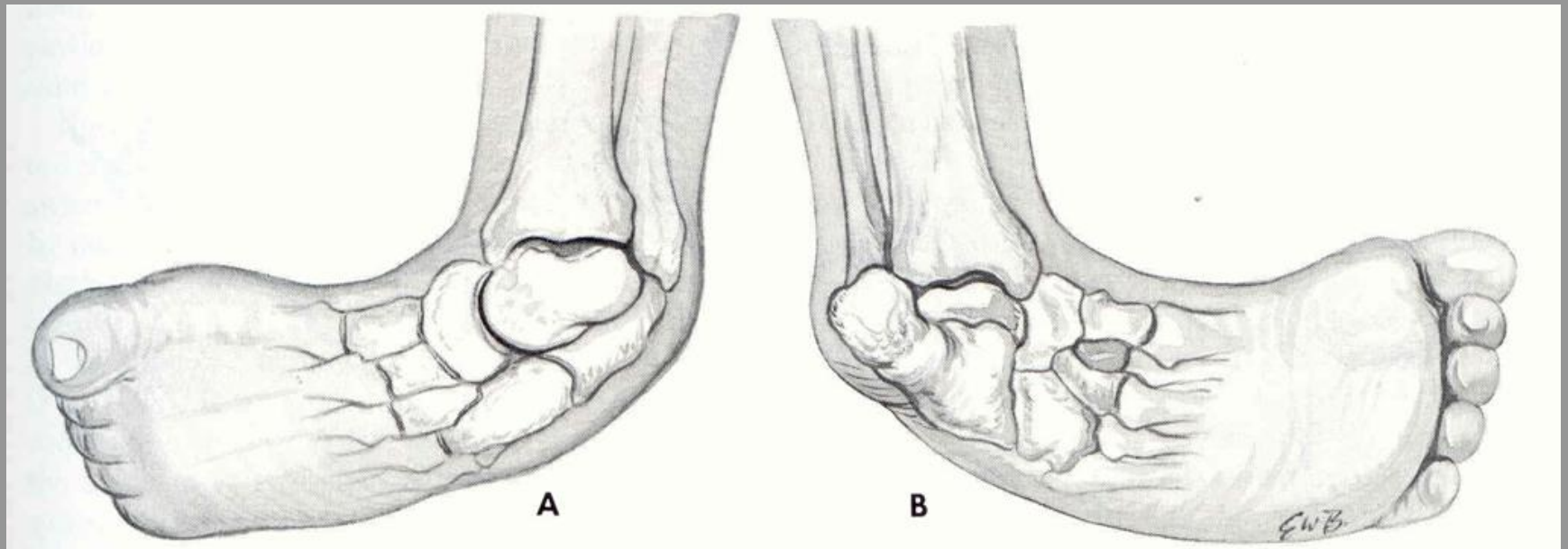




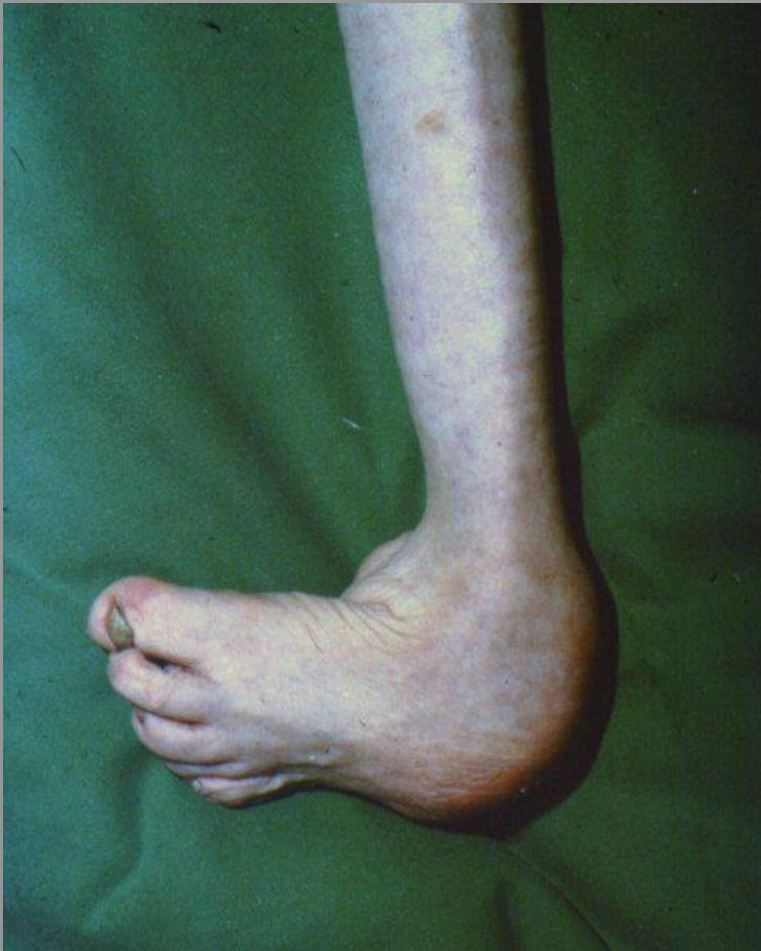
Pes equinovarus adductus et plantiflexus congenitus (clubfoot)



Pes equinovarus adductus et plantiflexus congenitus (clubfoot)



Pes equinovarus adductus et plantiflexus congenitus (clubfoot)



Cheselden 1768.



Pes equinovarus adductus et plantiflexus congenitus (clubfoot)



Pes equinovarus adductus et plantiflexus congenitus (clubfoot)





IOWA (Ponseti) Clubfoot Protocol

Igancio Ponseti

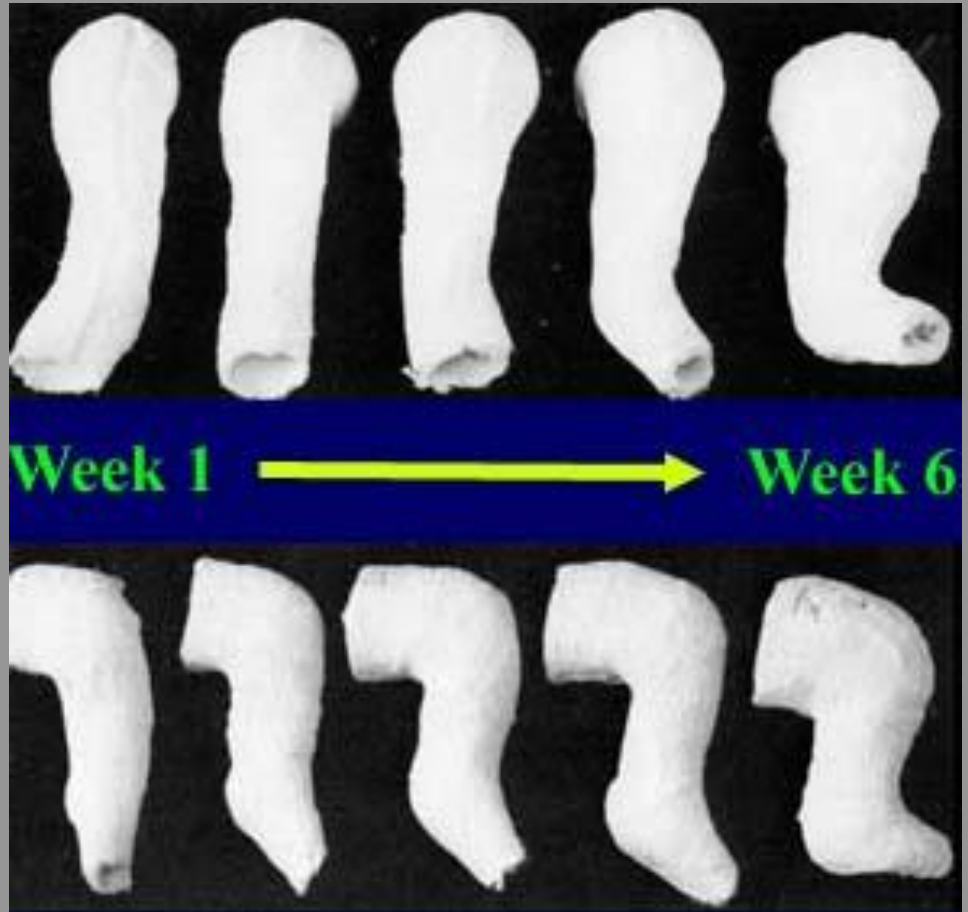
Casting technique

Forefoot supination

Holding the head of the talus laterally

No pronation

No dorsalexension



IOWA (Ponseti) Clubfoot Protocol

Igancio Ponseti



Total, horizontal percutaneous Achillotomy to correct the equinus at the 6-7th week of casting.

Further casting:

15° dorsal extension
70° abduction

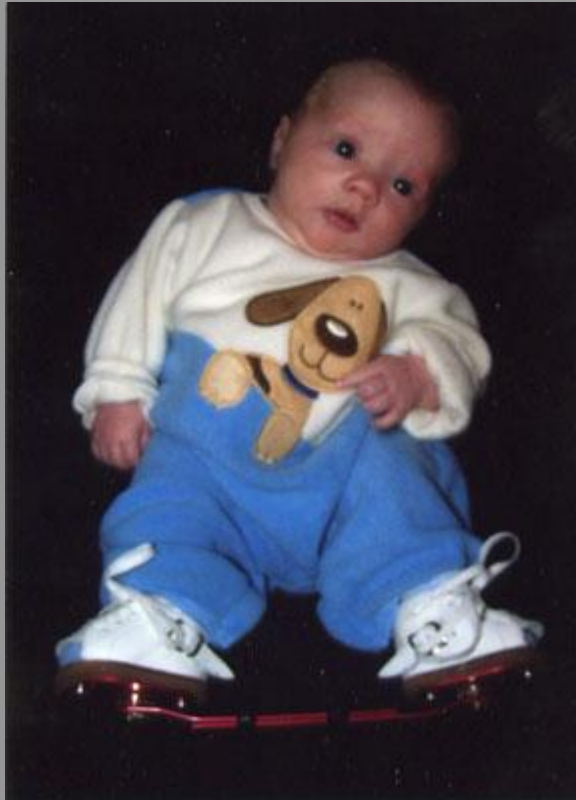


IOWA (Ponseti) Clubfoot Protocol

Igancio Ponseti



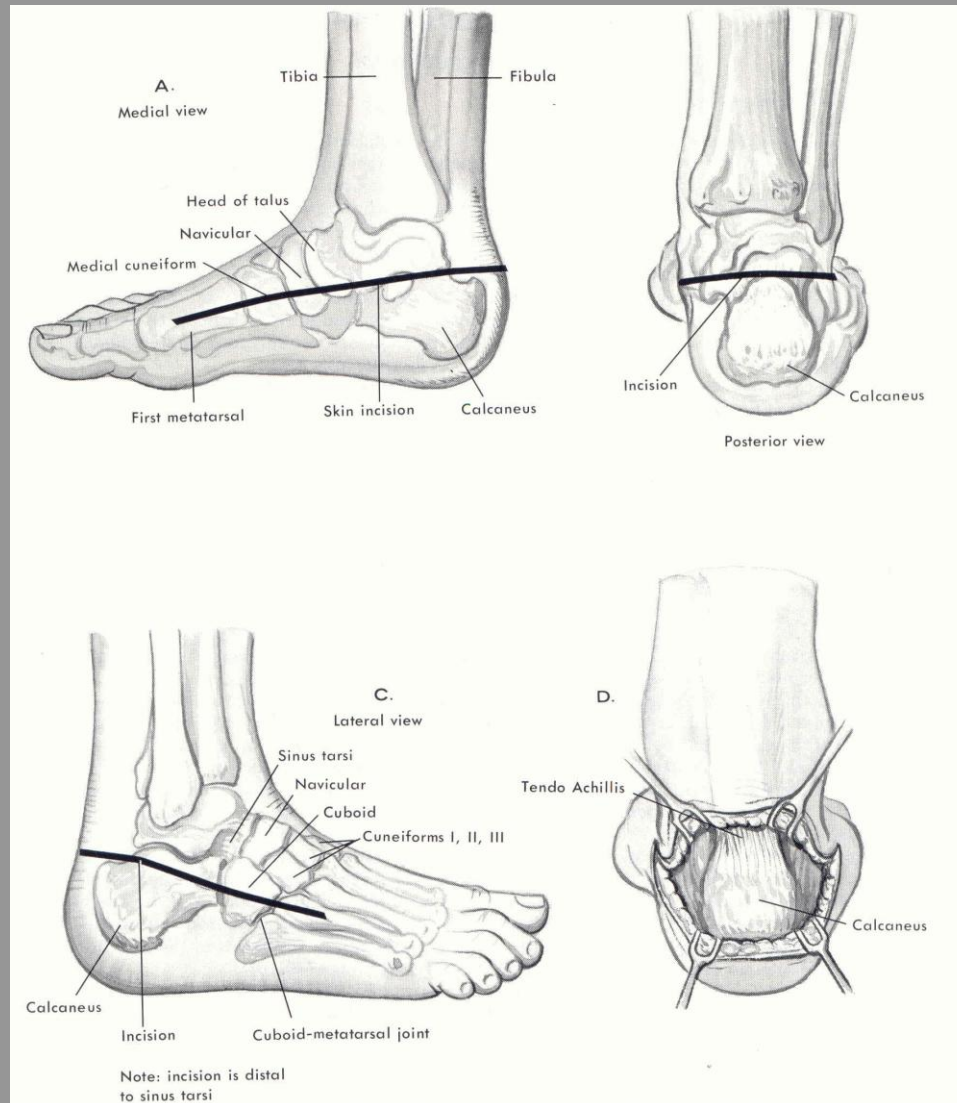
Postoperative care
Ponseti brace until
the age of 3-4
years.



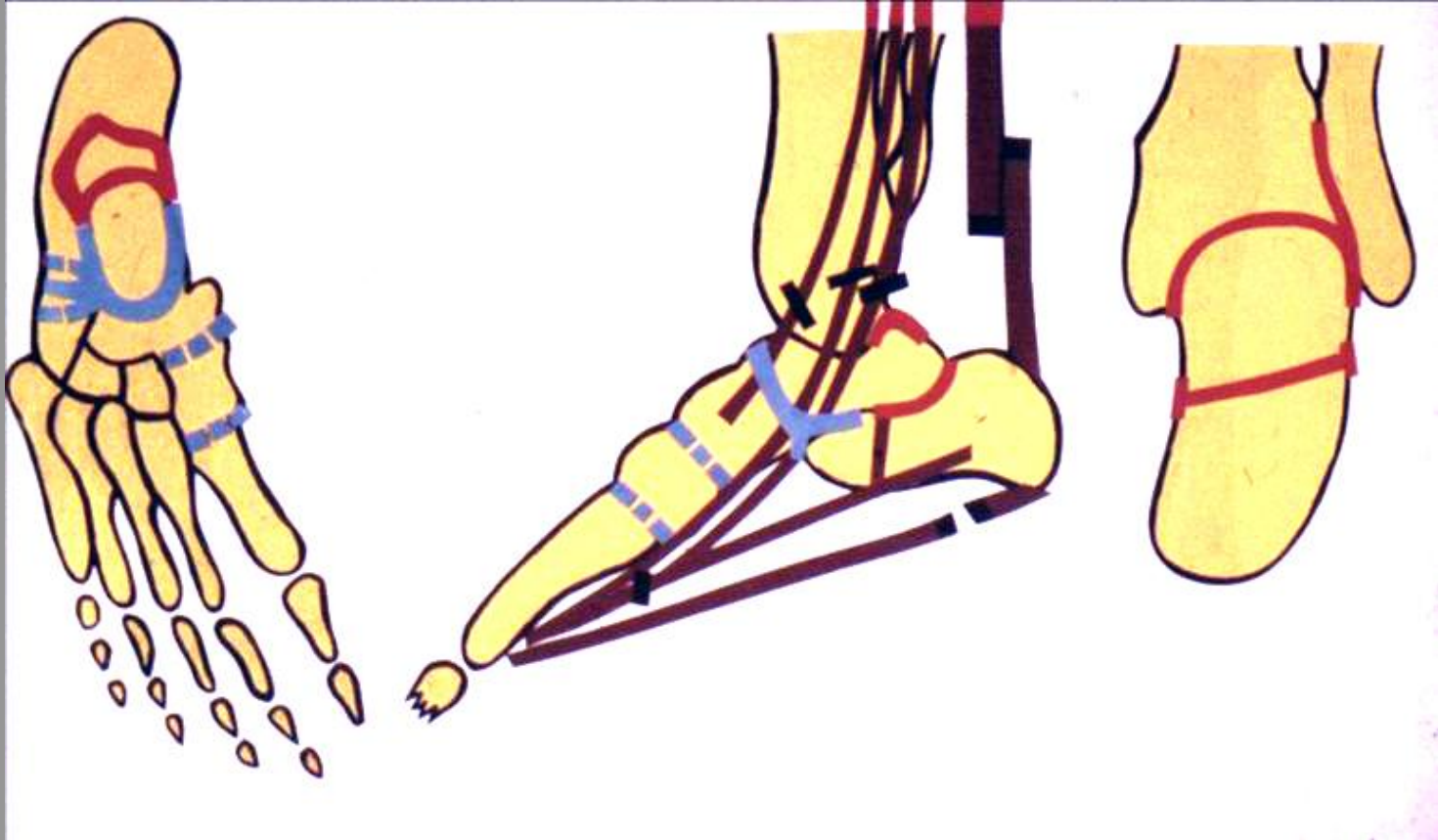
Surgical treatment (Cincinnati incision)



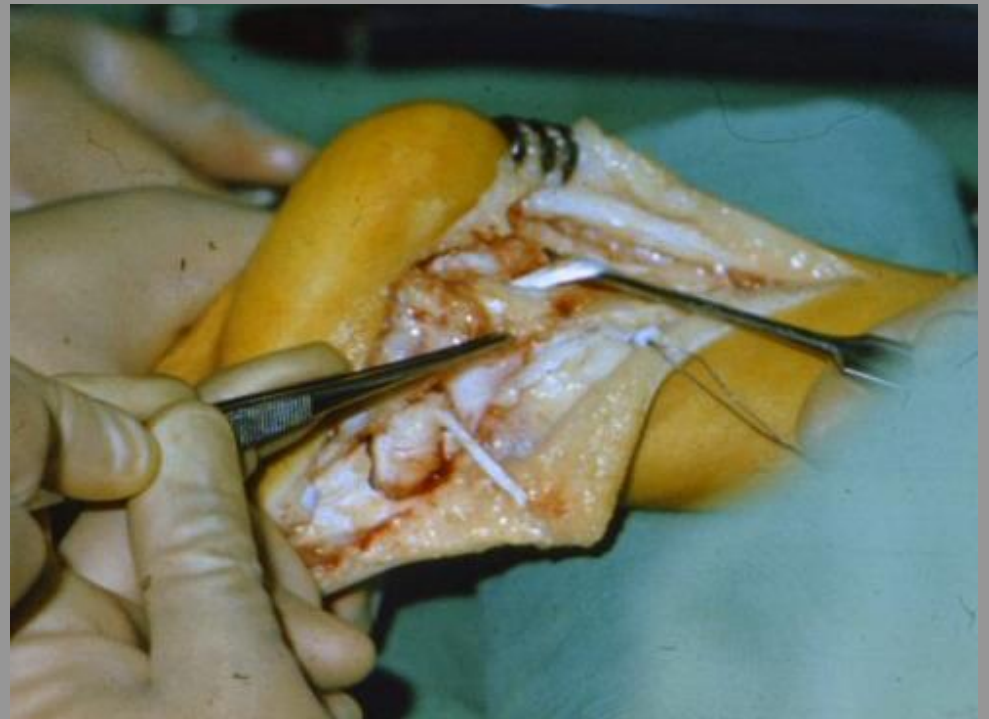
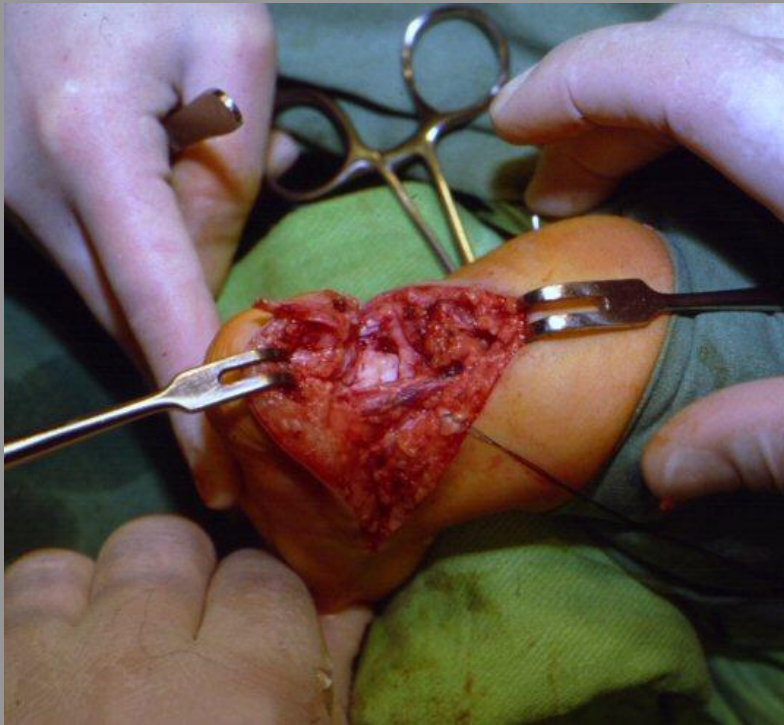
Surgical treatment (Cincinnati incision)



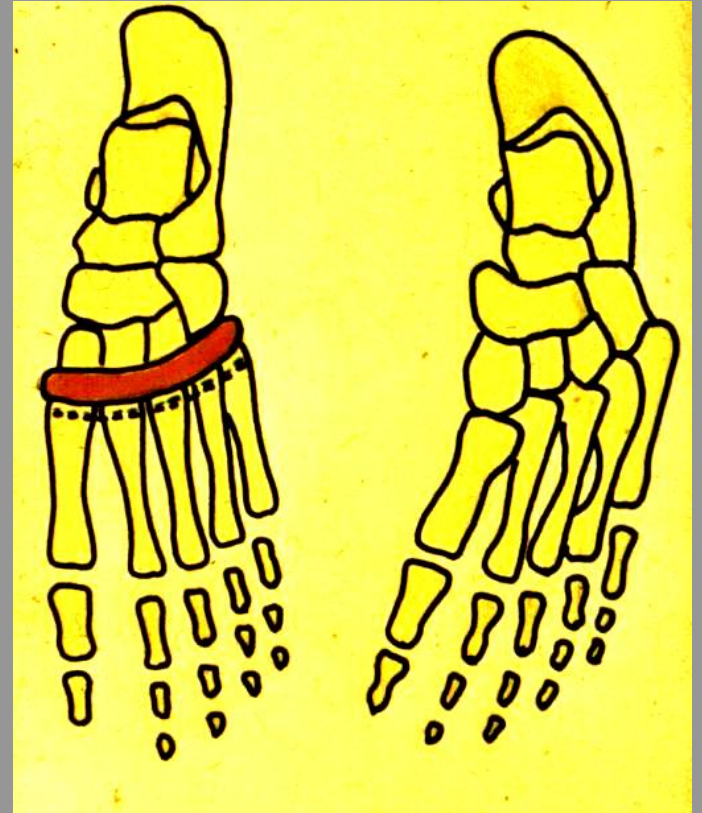
Surgical treatment



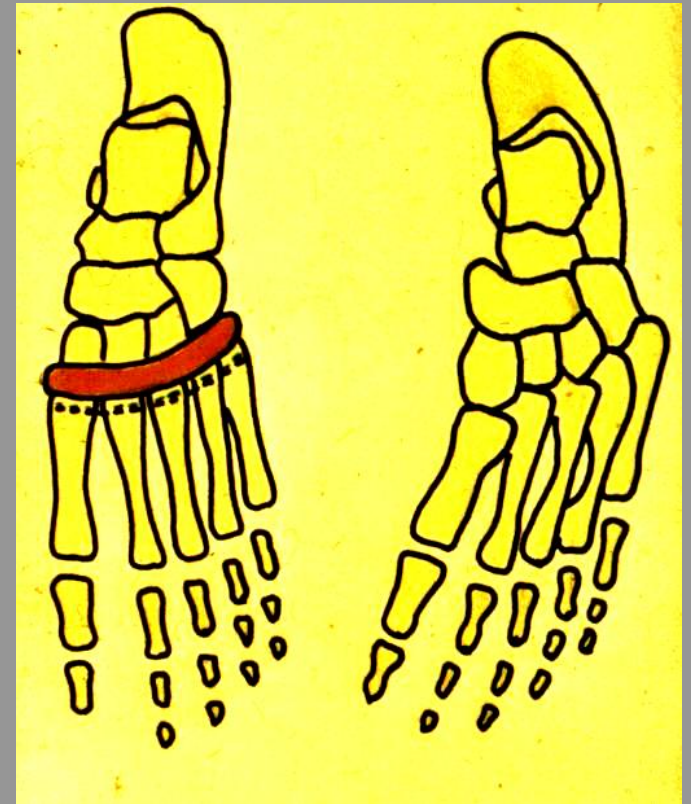
Surgical treatment (Cincinnati incision)



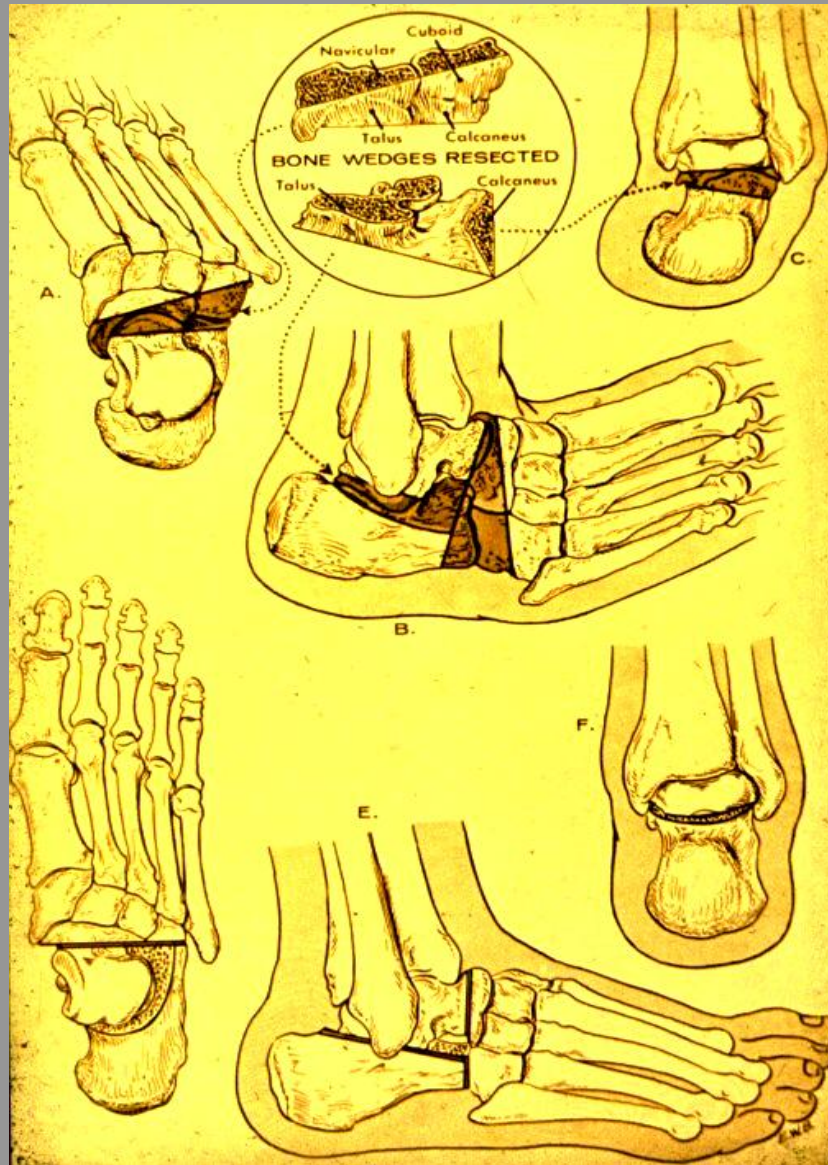
Pes adductus



Pes adductus



Surgical treatment



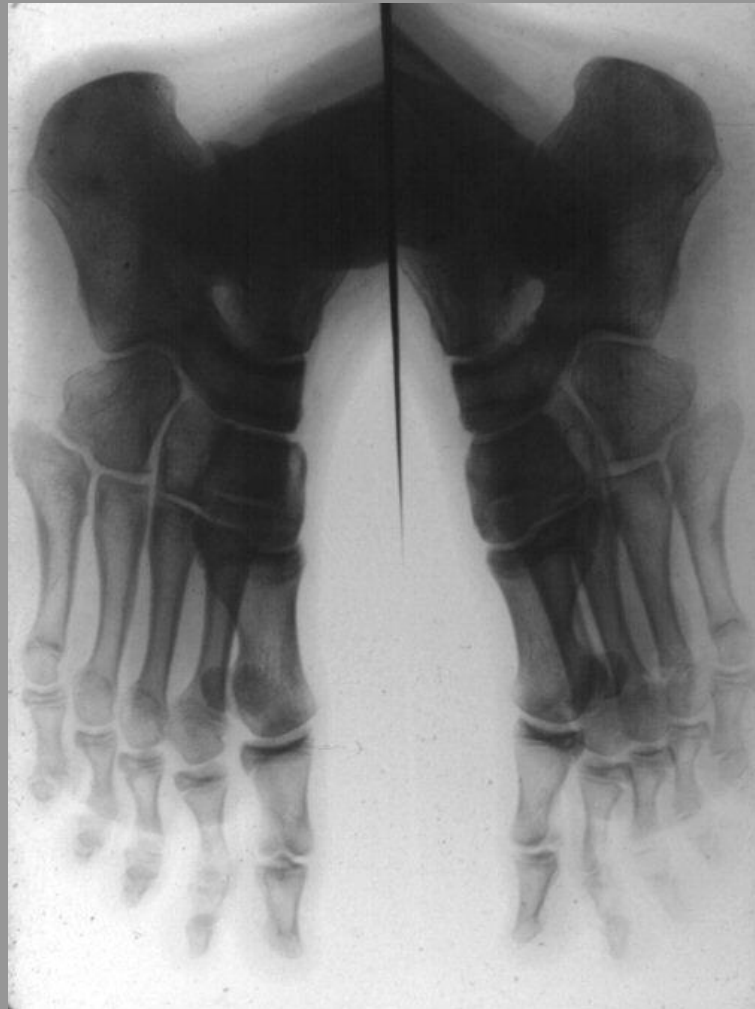
Pes excavatus



Vertical talus (Pes calcaneovalgus congenitus)



Synostosis calcaneo-navicularis, tarsal coalition



Developmental diseases

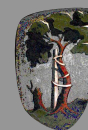








Fejlődési rendellenességek









Fejlődési rendellenességek



Aseptic necrosis of the navicular bone Köhler I.



Aseptic necrosis of the head of the II. metatarsus; Köhler II.



Calcaneal apophysitis; Morbus Schinz



Static foot deformities

- **Flattened longitudinal arch (flat foot)**
- **Flattened transversal arch**
- **Hallux valgus/Bunion**
- **Other toe-deformities**

Pes planus/ Pes planovalgus/ Calcaneovalgus/ Fallen arch/ Flat foot)

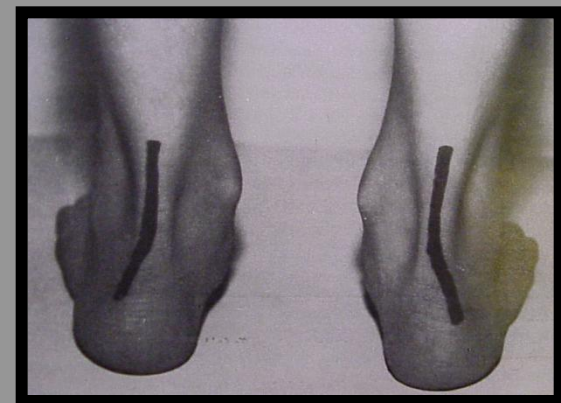


Pes planus (flat foot)



Pes planus (flat foot)

- The arches develop until the age of 2-3
- Symptomless in childhood
- The inner side of the shoe is worn off
- Risk: pregnancy, obesity





Treatment of pes planus (flat foot)

Prevention:

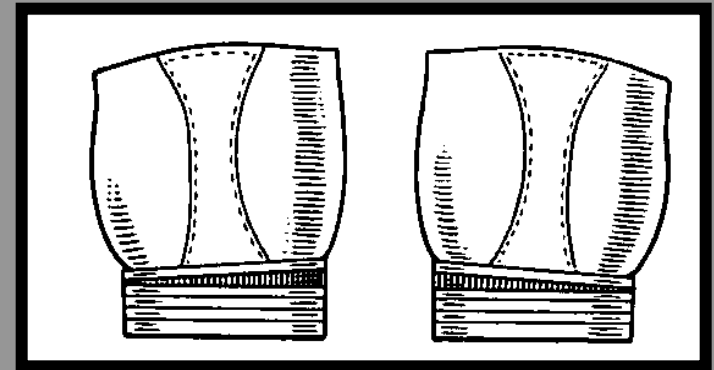
- Walking on uneven surface;
- Pick up the child, when tired;
- Foot-gymnastic

In childhood:

- gymnastic
- shoe sole – supinating wedge
- surgery

Adulthood, in case of complain:

- shoe sole
- surgery



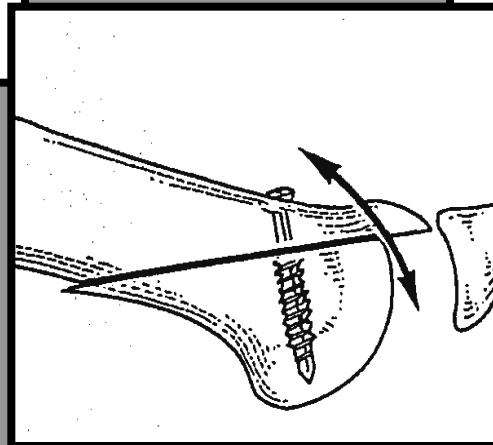
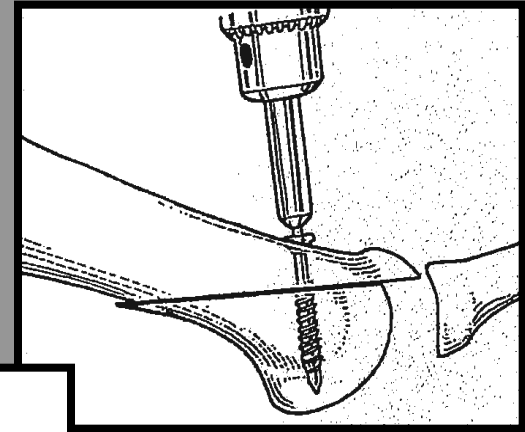
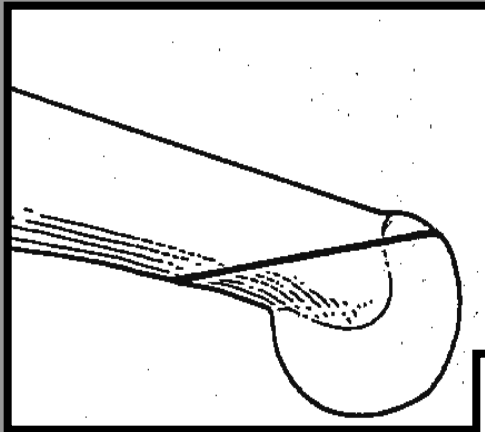
Pedes transversoplani (flattened transversal arch)

- Leads to:
 - metatarsalgia
 - toe deformities (hammer toe, hallux valgus)
- Treatment: gymnastic, shoe sole, surgery

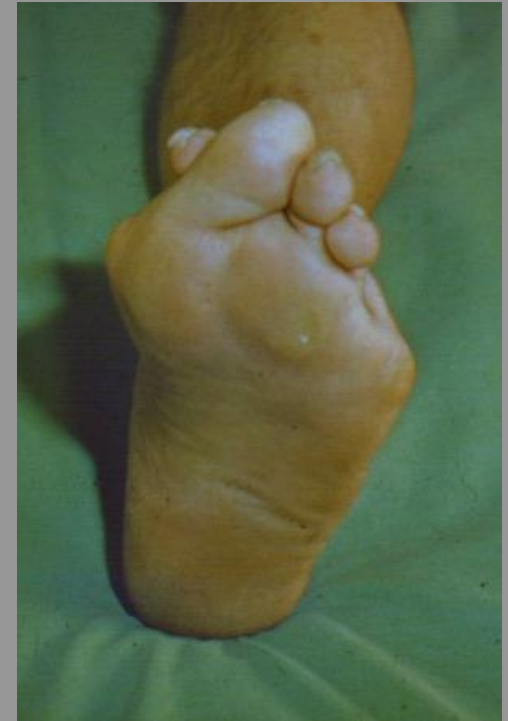
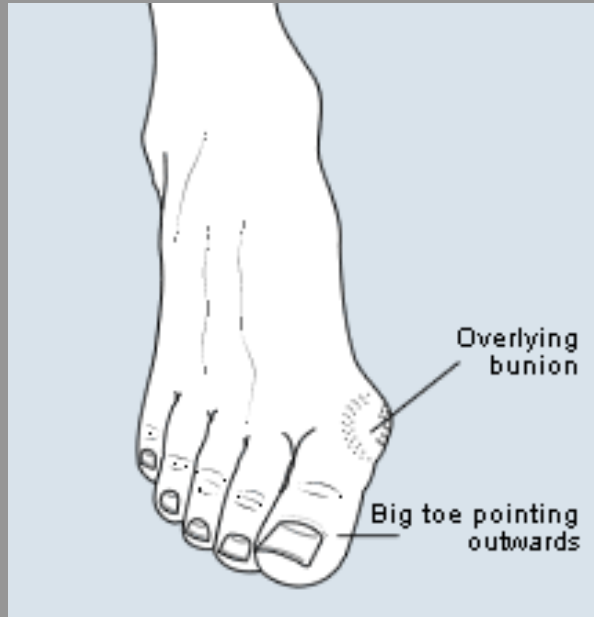
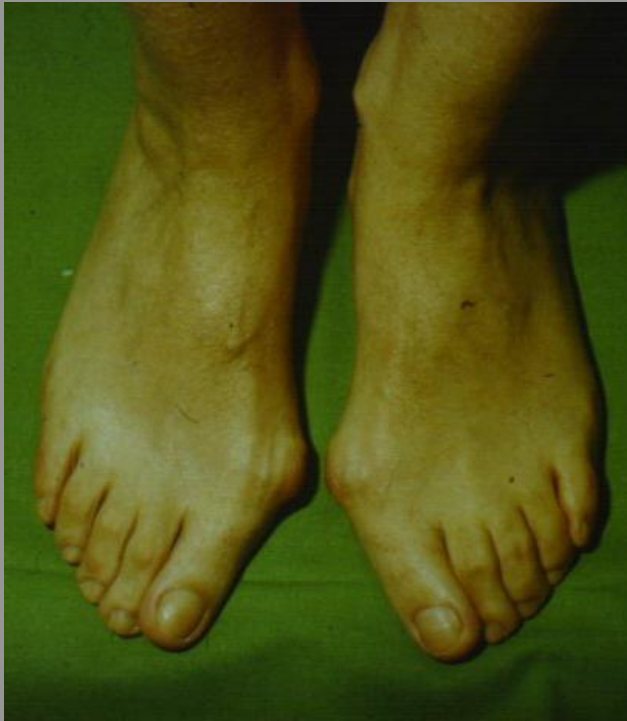


Pedes transversoplani (flattened transversal arch)

- Weil OT

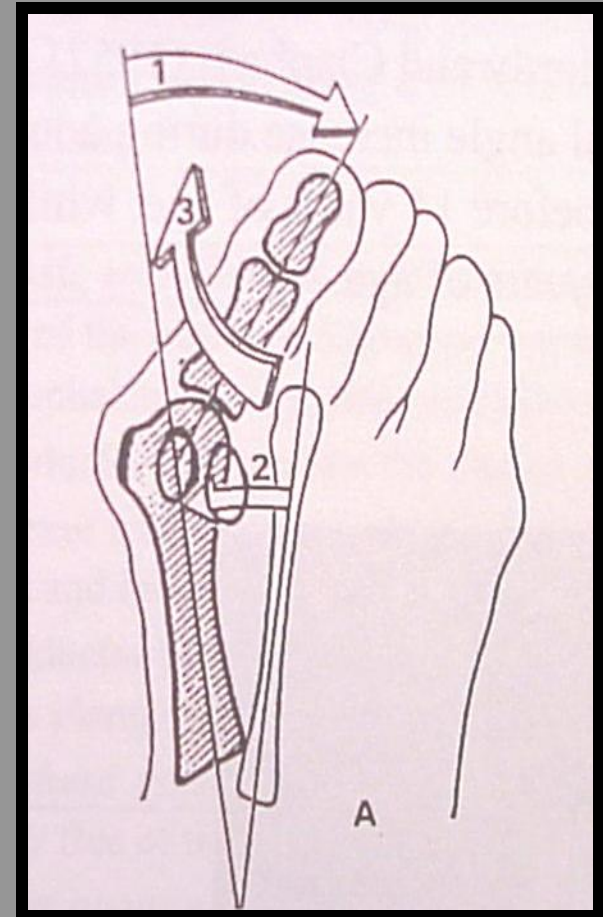


Hallux valgus (Bunion)



Hallux valgus

- **1. Lateral deviation of the hallux**
- **2. Medial deviation of the I. MT**
- **3. Pronation of the hallux**



Hallux valgus (Bunion)

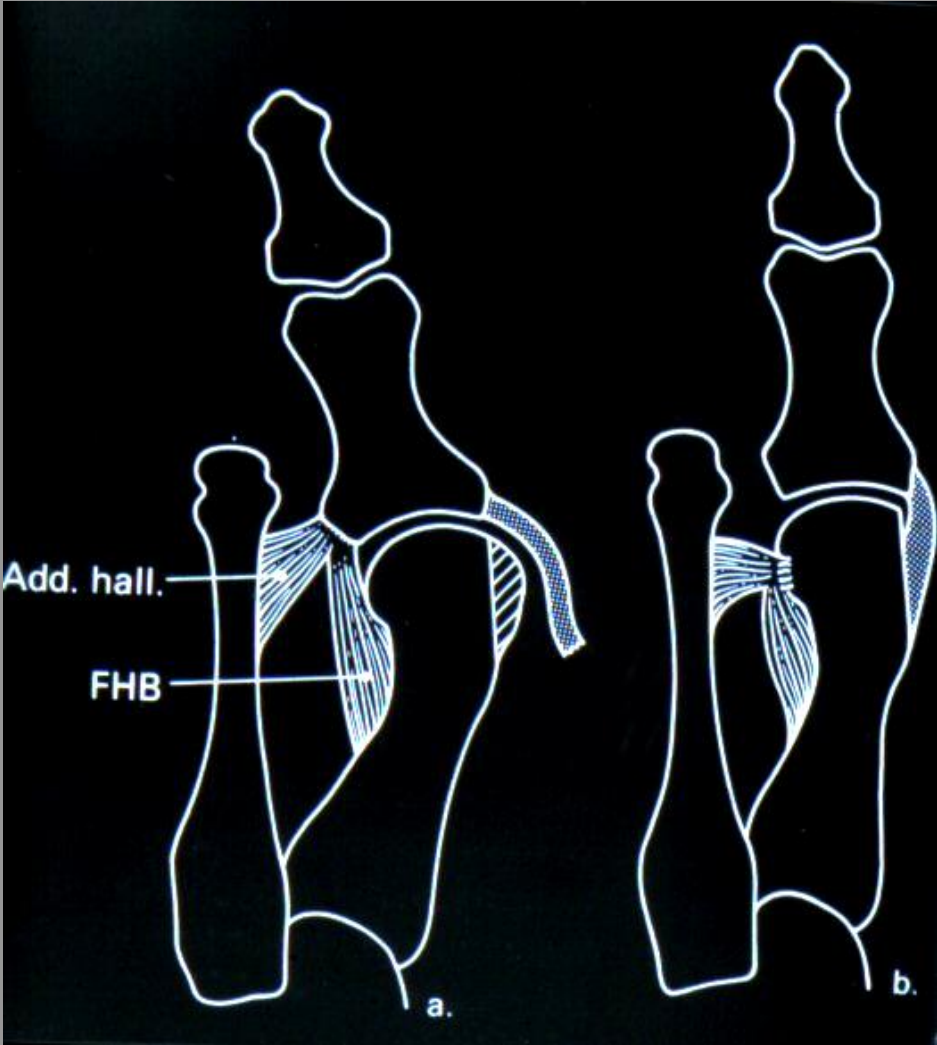
Treatment:

- Hallux valgus correction orthosis
- Shoe sole
- Orthopedic shoes
- Surgeries: soft tissue - surgery, removing exostosis, osteotomies, arthrodesis, resection arthroplasties

Surgical solutions



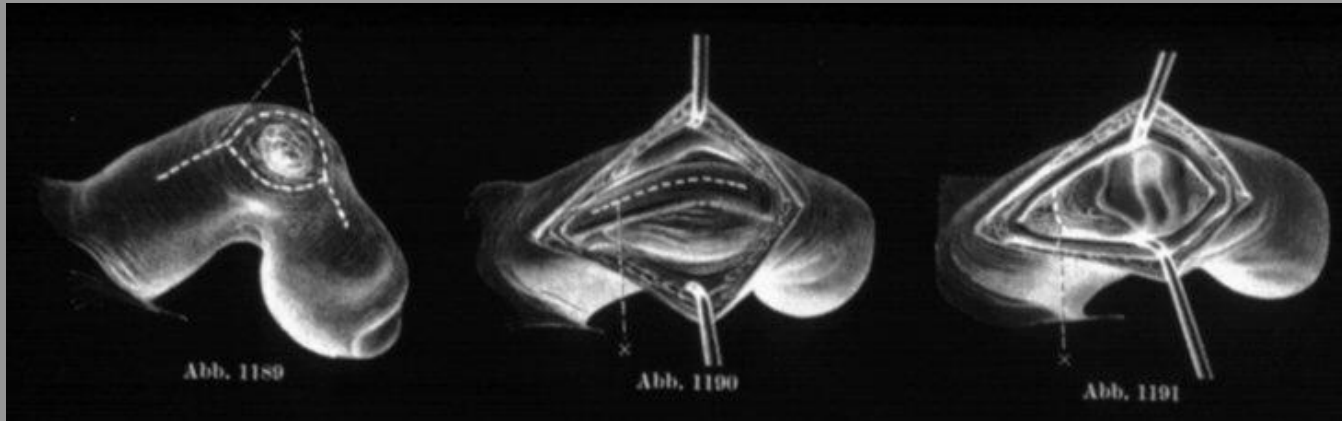
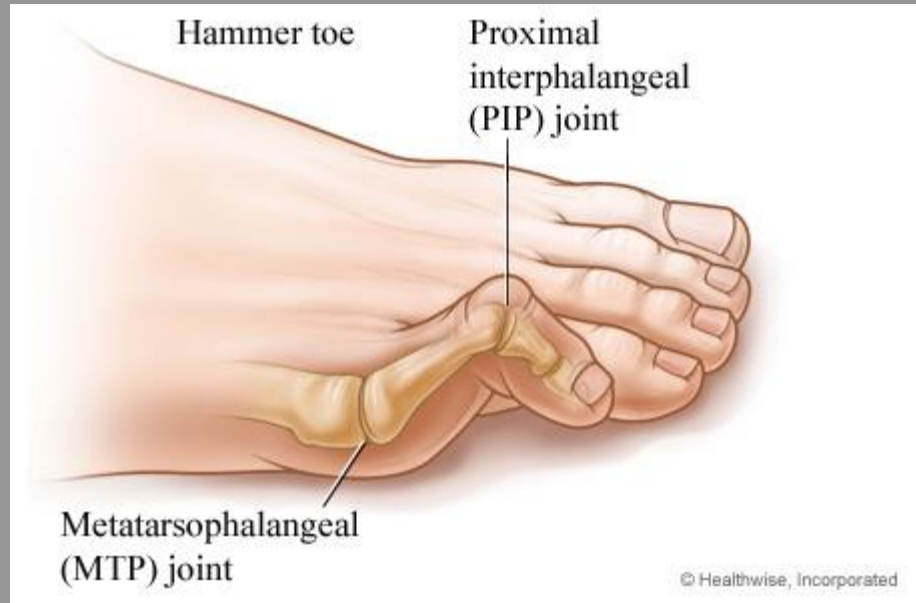
Surgical solutions



Surgical solutions



Hammer toe



Calcar calcanei



Haglund heel

