Understanding and Managing Hallux Valgus: A Comprehensive Approach

Miss Jade Tang SpR Podiatric Surgeon

Mr James Cowden Consultant Podiatric Surgeon

RCPod Conference 2024

Understanding and Managing Hallux Valgus:

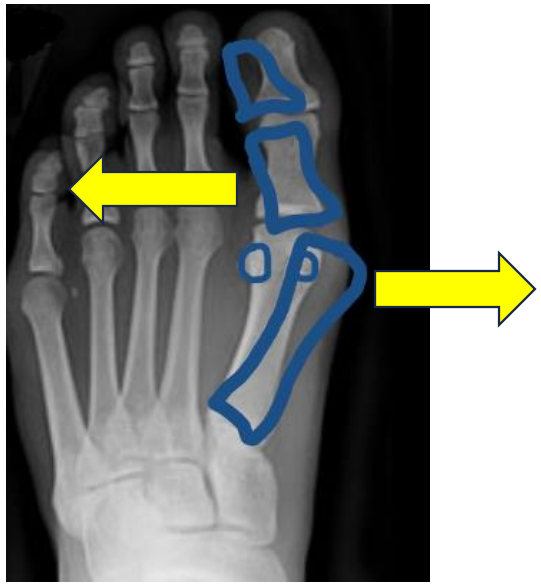
Objectives and Outcomes

Define Hallux Valgus

Refresh anatomy and biomechanics of the 1st Ray

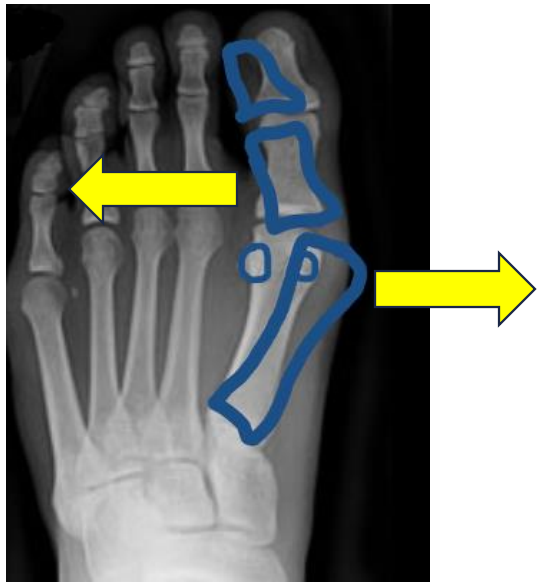
Be able to perform a basic clinical assessment for Hallux Valgus

Discuss treatment options with an understanding of when each is appropriate



What is Hallux Valgus? (HV)

HV is.....



What is Hallux Valgus? (HV)

HV is a first ray malalignment characterised by

- Lateral deviation of the proximal phalanx
- Medial deviation of first metatarsal head

Why is HV important to us (podiatrists) ?

How many have seen Hallux Valgus clinically?

Signs and Symptoms of HV

Clinical Signs of Hallux Valgus

?

Clinical Symptoms of Hallux Valgus

?

Signs and Symptoms of HV

Clinical Signs of Hallux Valgus

- Lateral deviation of the hallux (big toe)
- Medial prominence
- Redness, swelling, or thickened skin over the medial eminence
- Altered range of motion in the 1st MTP joint
- Visible valgus deformity during gait
- Callus formation on the medial or plantar aspect of the 1st MTP joint (? 2nd MTPJ)
- Overlapping or underlapping of adjacent toes
- Rotation of hallux

Clinical Symptoms of Hallux Valgus

- Pain or tenderness at the 1st MTP joint
- Ache at the 1st MTP joint
- Discomfort aggravated footwear
- Difficulty walking or wearing shoes comfortably
- A sense of instability in the 1st MTP joint
- Recurrent inflammation or bursitis over the bunion
- Aching or throbbing in the forefoot after prolonged activity
- Transfer pain at 2nd MTPJ

Anatomy and Pathophysiology

Get ready—your anatomy knowledge is about to be tested!

Challenge Time!

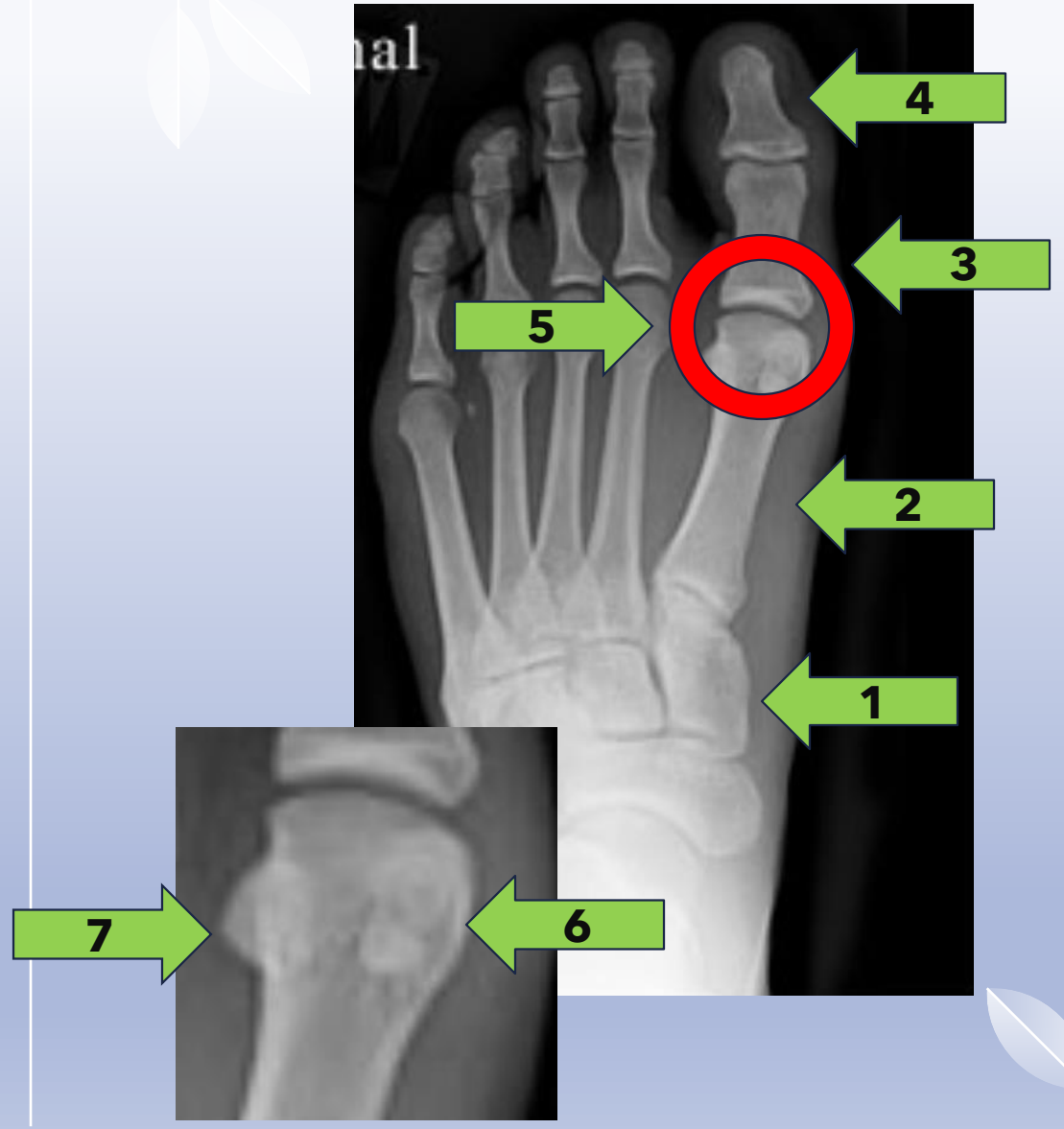
Name as many of the numbered foot structures as possible on the next slides.

💡 **Tip: Be specific and accurate!**

🏆 **Prize: The team with the most correct answers wins!**

Bones

1.
2.
3.
4
5.
6.
7.



Bones

1. Medial cuneiform

2. First metatarsal

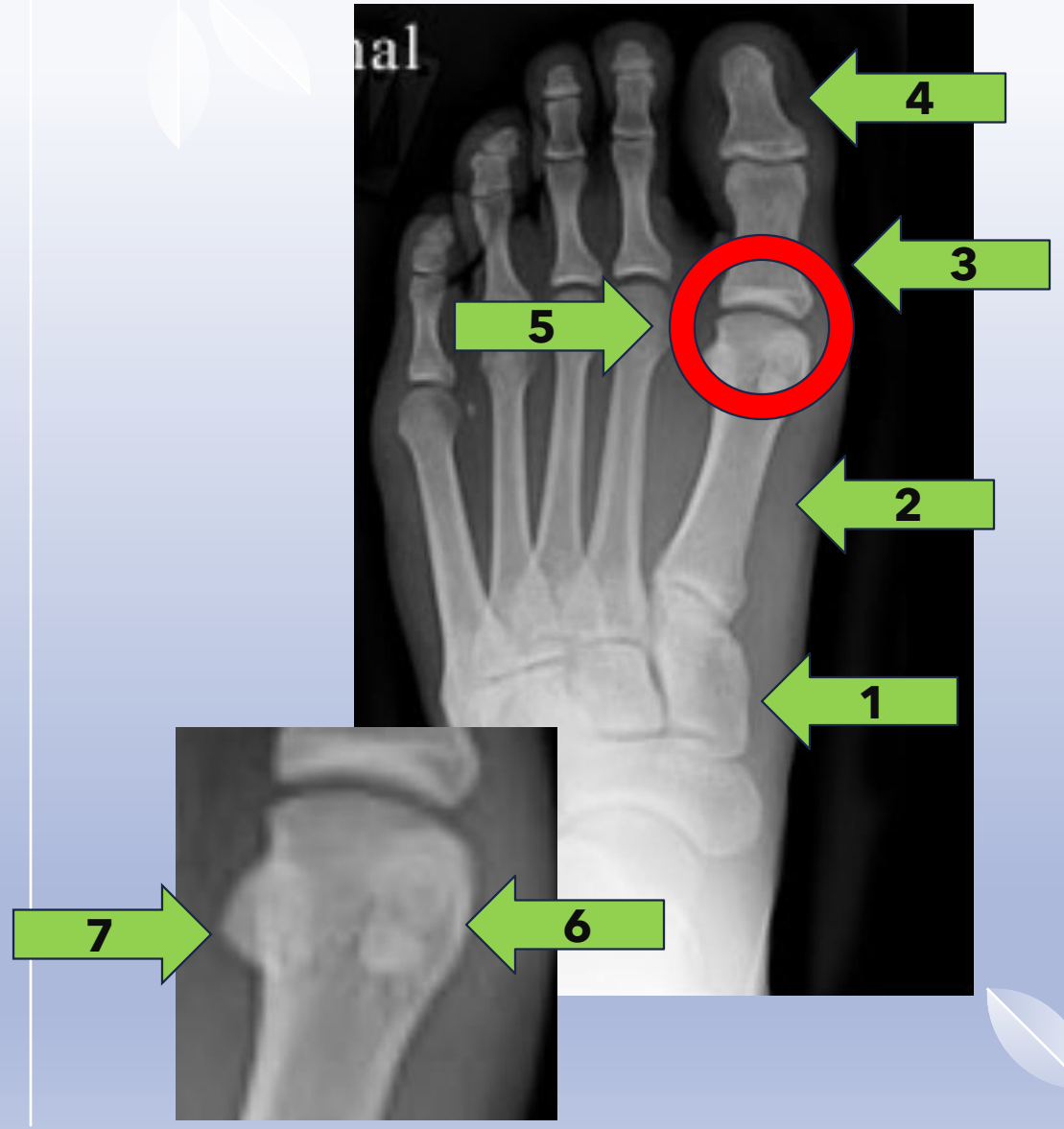
3. Proximal phalanx

4. Distal phalanx

5. 1st MTPJ

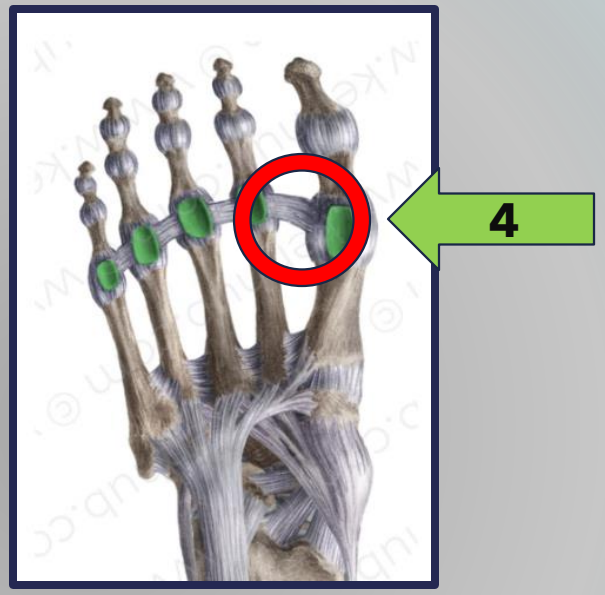
6. Medial/Tibial sesamoid

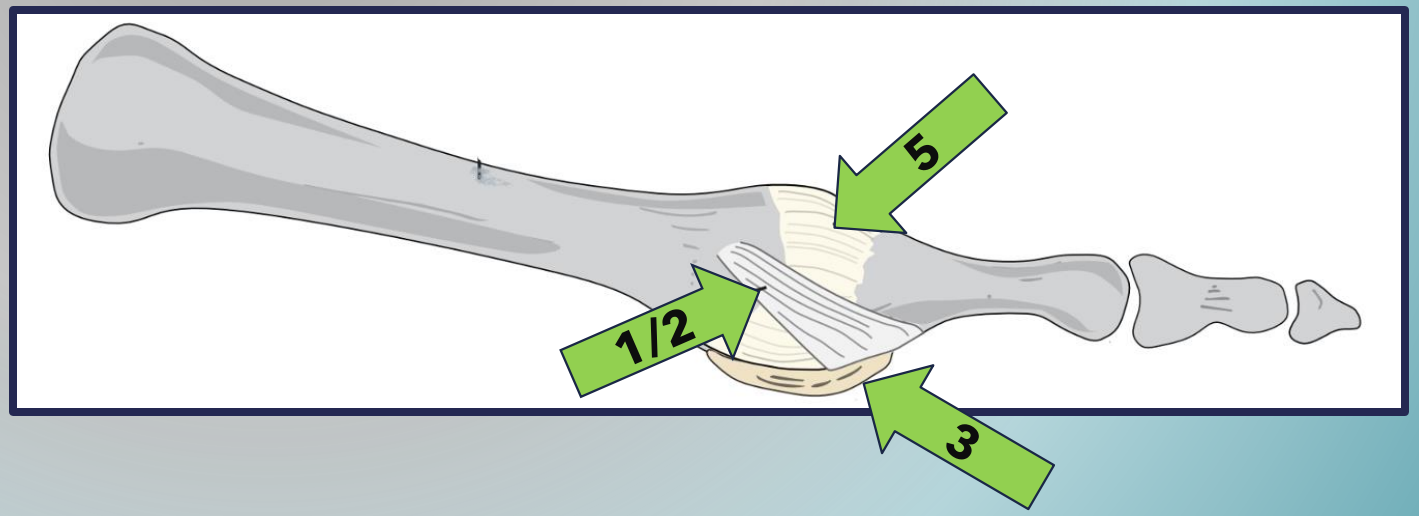
7. Lateral/Fibular sesamoid



Ligaments surrounding the 1st MTPJ

1.
2.
3.
4.
5.





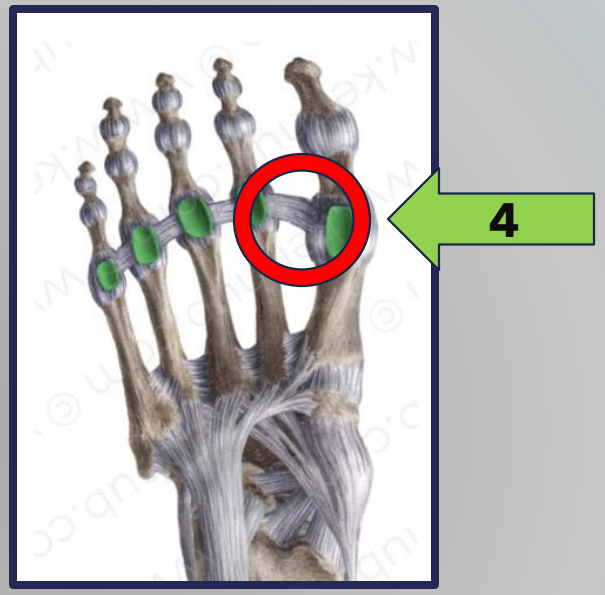
Ligaments surrounding the 1st MTPJ

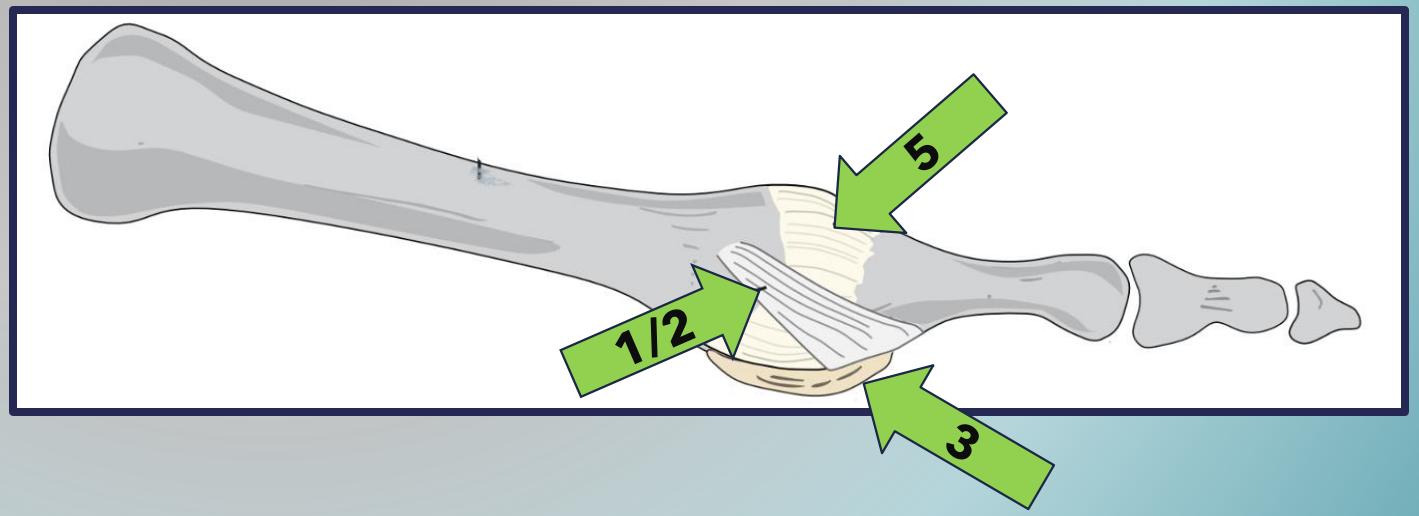
1 / 2. Medial/lateral collateral ligaments

3. Plantar plate

4. Deep transverse intermetatarsal ligament

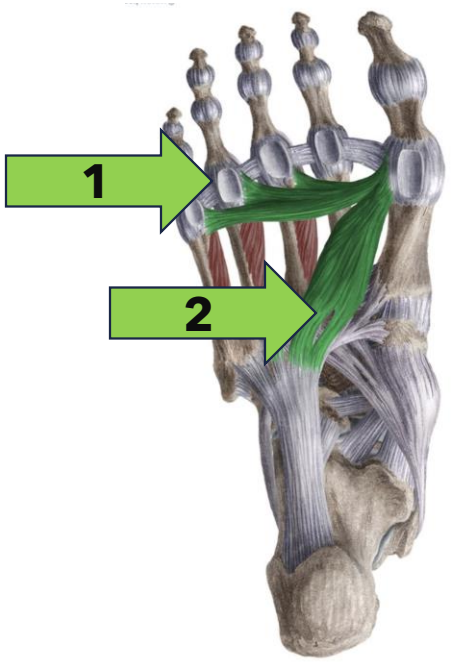
5. Joint capsule

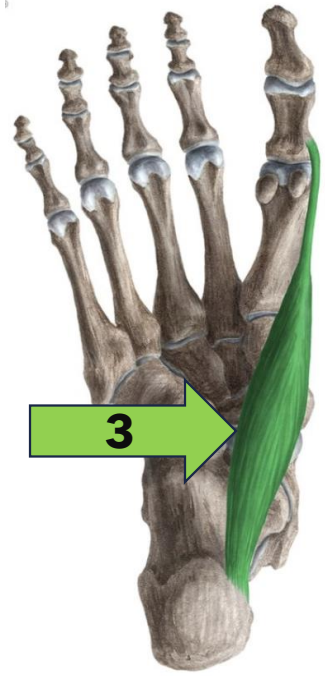


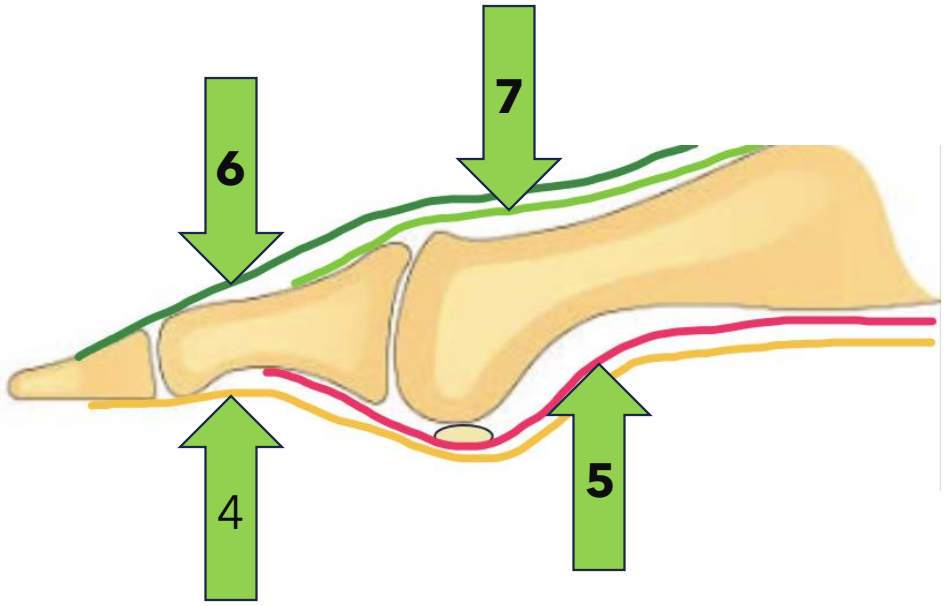


Muscles

1.
2.
3.
4.
5.
6.
7.







Muscles

1. Adductor hallucis (transverse head)

2. Adductor hallucis (oblique head)

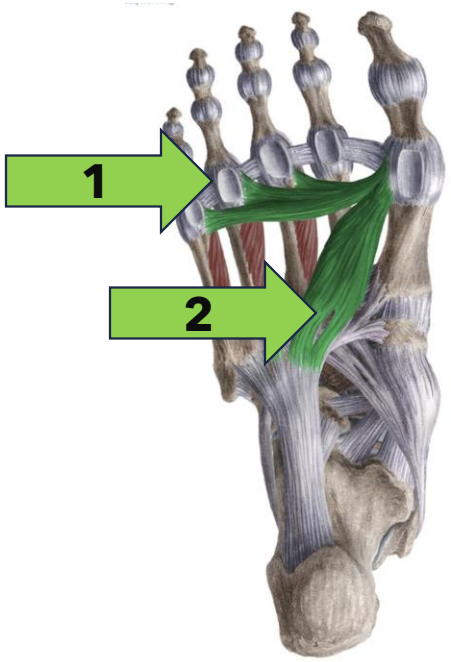
3. Abductor hallucis

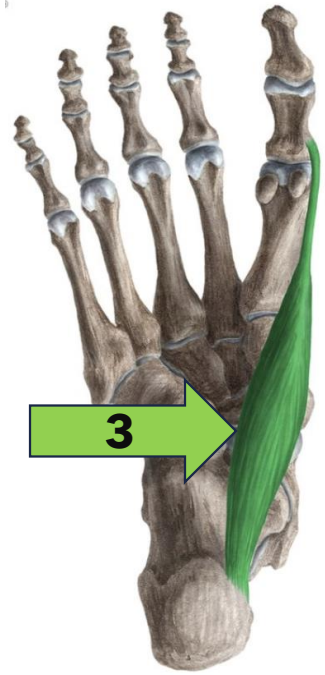
4. Flexor hallucis longus

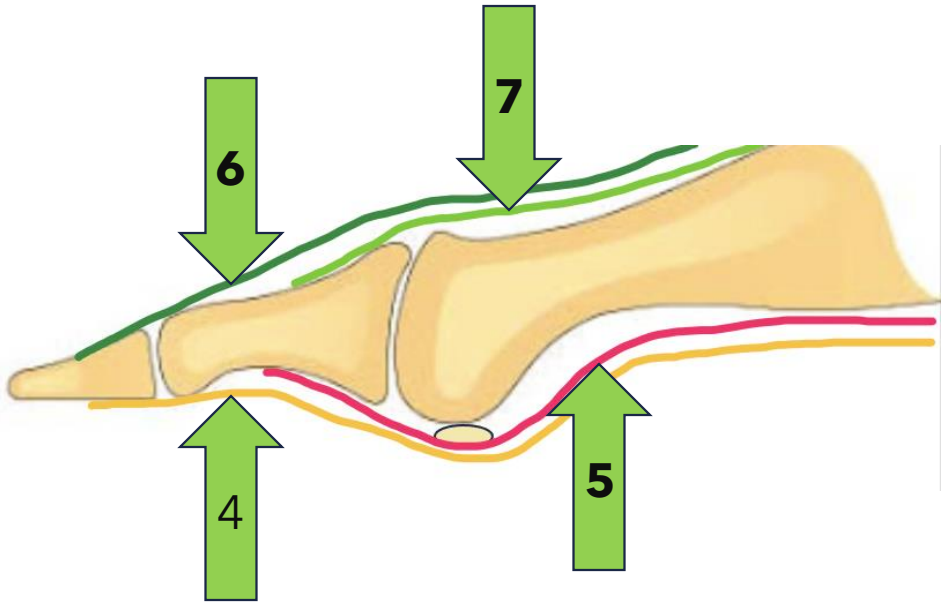
5. Flexor hallucis brevis

6. Extensor hallucis longus

7. Extensor hallucis brevis



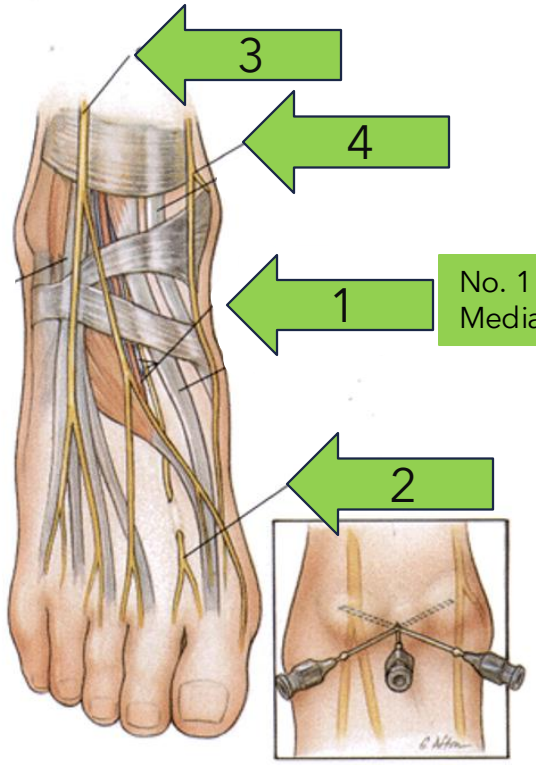




Nerves

The **1st MTP joint** is supplied by both sensory and motor branches of the nerves of the foot

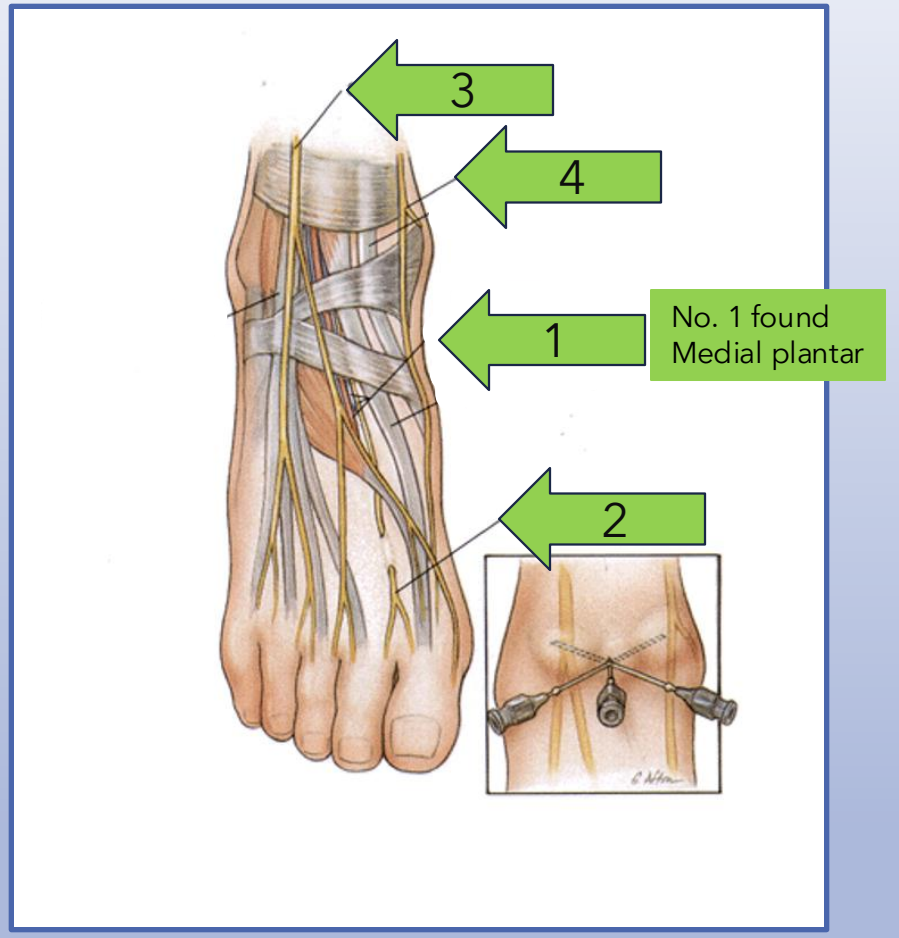
Nerve	Region Supplied
1.	Plantar aspect of the joint
2.	Dorsal aspect (1st web space)
3.	Dorsal aspect (lateral/overlying skin)
4.	Medial side (variable contribution)

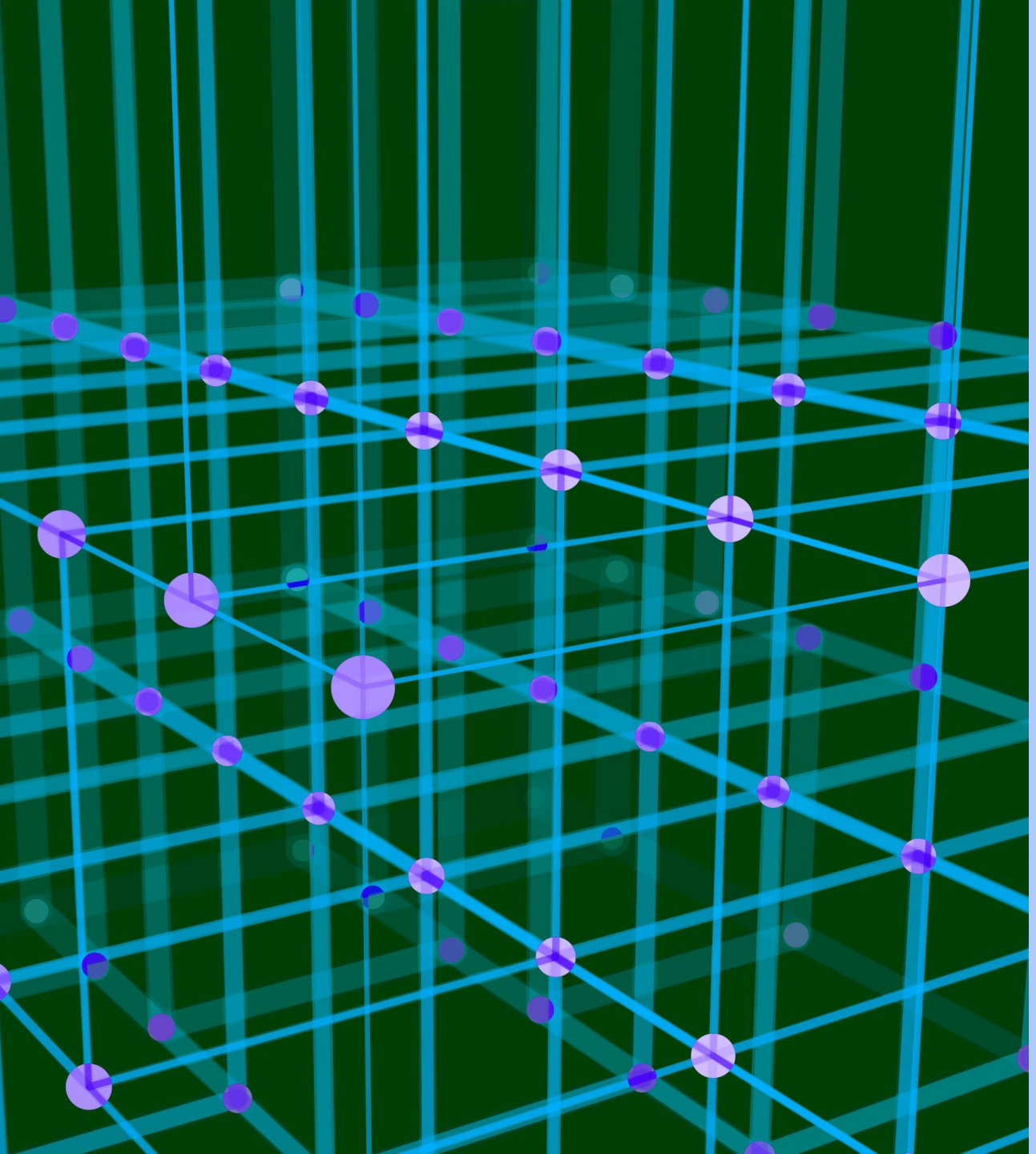


Nerves

The **1st MTP joint** is supplied by both sensory and motor branches of the nerves of the foot

Nerve	**Region Supplied**
1. Medial Plantar Nerve	Plantar aspect of the joint
2. Deep Peroneal Nerve	Dorsal aspect (1st web space)
3. Superficial Peroneal Nerve	Dorsal aspect (lateral/overlying skin)
4. Saphenous Nerve	Medial side (variable contribution)





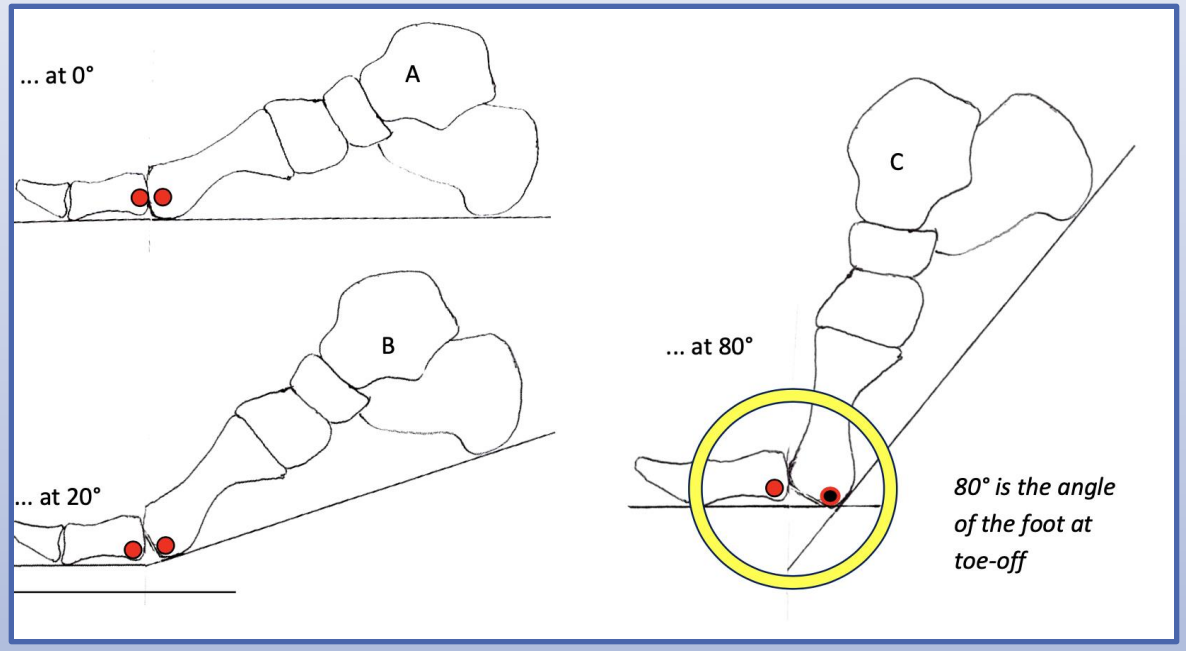
First MTPJ function

The forefoot dorsiflexes in toe off during gait.

For the first 20° following heel lift, the head of the first metatarsal pivots against the base of the proximal phalanx of the hallux like a hinge (ginglymoid action)

To lift the heel beyond this, point the first metatarsal slides along the articulating surface of the phalanx (ginglymoarthrodial action)

The metatarsal then plantarflexes and moves backwards to further dorsiflex the hallux



1st Ray Anatomy and Pathophysiology Key Points

Bones and Joints:

- 1st Metatarsal, proximal phalanx, sesamoids.
- 1st MTP joint, Lisfranc joint.

Biomechanics:

- 1st Ray instability can lead to medial drift of the 1st metatarsal.
- Overload on the lateral forefoot can exacerbate deformity.

Pathophysiology of Hallux Valgus:

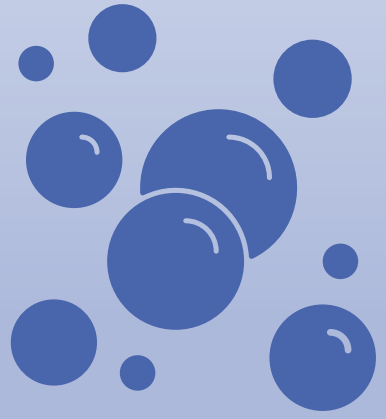
- Muscle imbalance: Adductor hallucis pulls the hallux laterally.
- Genetic predisposition.
- External factors: Narrow footwear.

What do you think causes HV?

Intrinsic & Extrinsic

Intrinsic predisposing factors to consider

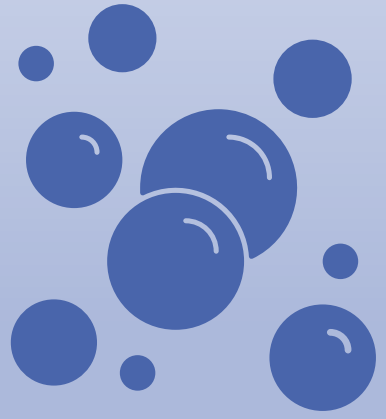
Extrinsic predisposing factors to consider



Intrinsic & Extrinsic

Intrinsic predisposing factors to consider

- Genetics
- Short/long first metatarsal
- Dorsiflexed/plantarflexed first metatarsal
- Flexible or rigid forefoot varus
- Rigid or flexible pes planovalgus
- Gastrocnemius equinus
- Abnormal foot mechanics
- Joint hypermobility
- Inflammatory arthritis (gouty, psoriatic, rheumatoid)
- Connective tissue disorders (Marfan syndrome, Ehlers-Danlos syndrome)
- Down syndrome



Extrinsic predisposing factors to consider

- Footwear: tight or narrow shoes, high heels (increase forefoot load), poorly designed/fitting shoes
- Occupational Factors: prolonged standing or walking, activities involving repetitive movements that strain the forefoot, (e.g., ballet)
- Biomechanical Imbalances: abnormal, excessive pronation
- Trauma: ligament damage, dislocations

Clinical Assessment and Diagnosis

Clinical Examination

History Taking

- Duration and progression of symptoms.
- Aggravating factors (e.g., shoes, activity).
- Previous treatments.

Physical Exam

1. Observe (standing and sitting):
    1. Hallux position, medial prominence, skin condition.
2. Palpate:
    1. Tenderness over 1st MTP joint or medial eminence.
3. Functional Assessment:
    1. Range of motion of 1st MTPJ.
    2. Gait analysis.
4. Imaging:
    1. X-ray: Assess intermetatarsal angle.

Diagnosis

Clinical History

- **Symptoms:** Pain, discomfort, or difficulty wearing shoes.
- **Onset and progression:** Gradual worsening or sudden change.
- **Impact:** Functional limitations or reduced quality of life.
- **Footwear:** History of narrow or tight-fitting shoes.
- **Family history:** Genetic predisposition to bunions or foot deformities.

Physical Examination

- **Visual inspection:**
  - *Medial prominence of the 1st metatarsophalangeal (MTP) joint.*
  - *Lateral deviation of the big toe.*
  - *Callosities, bursitis, or skin irritation over the bunion.*
  - 2nd MTPJ involvement
- **Range of Motion:** Assess for stiffness or instability of the 1st MTP joint.
- **Gait analysis:** Observe for compensatory patterns or pain during ambulation.
- **Toe alignment:** Check for overlapping or crowding of toes.

Diagnosis

Radiographic Evaluation

- X-rays:
  - *Measure **hallux valgus angle (HVA)** (>15° abnormal).*
  - *Assess **intermetatarsal angle (IMA)** (>9° abnormal).*
  - *Evaluate joint degeneration, sesamoid displacement, or subluxation.*

Differential Diagnosis

- Exclude other conditions such as gout, arthritis, or soft tissue masses.

A combined assessment of history, clinical signs, and imaging ensures an accurate diagnosis of hallux valgus.

Skeletal Radiology (2020) 49:1441–1447
https://doi.org/10.1007/s00256-020-03441-9

SCIENTIFIC ARTICLE

Non-weightbearing compared with weightbearing x-rays in hallux valgus decision-making

Andrzej Boszczyk[1] · Sławomir Kwapisz[1] · Maciej Kiciński[1] · Bartłomiej Kordasiewicz[1] · Henryk Liszka[2,3]

Hallux Valgus severity

Mild >9°

Moderate>13°

Severe > 16°

Treatment Options

CONSERVATIVE

- Orthoses
- Footwear modification
- Exercises
- Bunion pads to reduce pressure
- Toe spacers or splints
- Do nothing

SURGICAL

Indications: pain, failure of conservative treatment, significant deformity, age

Common Procedures:

1. Chevron osteotomy: mild deformities.
2. Scarf osteotomy: moderate deformities.
3. Lapidus procedure: severe deformities and/or hypermobility.
4. 1st MTPJ Fusion: joint involvement

Q & A and Wrap-Up

Case Study

- ***Mrs. Jane Walker, Age: 52***
- **Occupation:** Office worker
- **Chief Complaint:** "My big toe has been hurting and looks more crooked."
- **History:**
  - Onset: Gradual worsening over 2 years.
  - Pain: Located over the medial 1st MTP joint, worse with prolonged walking or tight shoes.
  - Shoes: Frequently wears heels with narrow toe boxes.
  - Previous Treatments: Tried over-the-counter bunion pads and wider shoes with limited relief.
  - Medical History: No diabetes or other systemic illnesses.
- **Clinical Findings:**
  - Hallux abducted with a visible medial prominence.
  - Tenderness over the medial eminence.
  - Reduced dorsiflexion of the 1st MTPJ.
  - Weight-bearing X-ray shows an intermetatarsal angle of 15°.

Quiz Questions for Wrap-Up

What is the intermetatarsal angle threshold for diagnosing Hallux Valgus?

A) >9°
B) 15°
C) 20°
D) 25°

Name one non-surgical treatment option for Hallux Valgus.

True or False: Hallux Valgus is primarily caused by wearing high heels.

Which surgical procedure is suitable for severe hypermobility in the 1st Ray?

That’s it!

Thank you