✊ MUSCLES OF HAND

🟢 CLASSIFICATION

I. Extrinsic Muscles ⭐

👉 Originate in forearm, insert in hand

🔸 Examples:

- Flexor digitorum superficialis
- Flexor digitorum profundus
- Flexor pollicis longus
- Extensor digitorum

💡 Function:

- Powerful gross movements of hand & fingers

2. Intrinsic Muscles ⭐

👉 Originate & insert within hand

- 🔸 Groups:
  - Thenar muscles
  - Hypothenar muscles
  - Lumbricals
  - Interossei
  - Adductor pollicis

🟢 THENAR MUSCLES (Thumb Muscles) 👍

👉 Form thenar eminence

- 🔹 Muscles:

- Abductor pollicis brevis
- Flexor pollicis brevis
- Opponens pollicis

🔹 Actions:

Muscle	Action
Abductor pollicis brevis	Abduction of thumb
Flexor pollicis brevis	Flexion of thumb
Opponens pollicis	Opposition ⭐

🔹 Nerve Supply:

👉 Median nerve (Recurrent branch) ⭐

🟢 ADDUCTOR POLLICIS ⭐

- 🔹 Parts:
  - Oblique head
  - Transverse head
- 🔹 Action:
  - Adduction of thumb
- 🔹 Nerve Supply:

👉 Ulnar nerve (IMPORTANT EXCEPTION ⭐)

🟢 HYPOTHENAR MUSCLES (Little Finger) 👋

👉 Form hypothenar eminence

🔹 Muscles:

- Abductor digiti minimi
- Flexor digiti minimi
- Opponens digiti minimi

🔹 Actions:

- Movement of little finger (abduction, flexion, opposition)

🔹 Nerve Supply:

👉 Ulnar nerve

🟢 LUMBRICALS ⭐

- Number:

👉 4 muscles

- Origin:

👉 Tendons of flexor digitorum profundus

- Insertion:

👉 Extensor expansion

- Action (VERY IMPORTANT ⭐):

👉 Flex MCP + Extend IP joints

- Nerve Supply:

Lumbrical	Nerve

1st & 2nd	Median nerve
3rd & 4th	Ulnar nerve

🟢 INTEROSSEI MUSCLES 🔥

👉 Located between metacarpals

🔹 Types:

🔸 1. Dorsal Interossei (4)

👉 DAB = Dorsal ABduct

🔸 2. Palmar Interossei (3)

👉 PAD = Palmar ADduct

🔹 Actions:

- Abduction & adduction of fingers
- Assist lumbricals (MCP flexion + IP extension)

🔹 Nerve Supply:

👉 Ulnar nerve

🟢 SUMMARY TABLE ⭐

Muscle Group	Function	Nerve
Thenar	Thumb movement	Median

Adductor pollicis	Thumb adduction	Ulnar
Hypothenar	Little finger movement	Ulnar
Lumbricals	Flex MCP, extend IP	Median + Ulnar
Interossei	Abduct/adduct fingers	Ulnar

🔥 CLINICAL CORRELATION

- Ulnar Nerve Injury ("Claw Hand") ⭐
  - Interossei + medial lumbricals lost
  - Loss of finger ab/adduction

- Median Nerve Injury ("Ape Thumb") ⭐

- Thenar muscle paralysis
- Loss of opposition

🔸 Froment's Sign

👉 Indicates ulnar nerve palsy

👉 Patient uses thumb flexion (FPL) instead of adduction

🔥 MUST REMEMBER:

✔ DAB = Dorsal ABduct

✔ PAD = Palmar ADduct

✔ Lumbricals = Flex MCP + Extend IP

✔ Adductor pollicis = Ulnar nerve exception

💡 QUICK RECALL:

- Intrinsic Hand Muscles:
  - Thenar → Median
  - Hypothenar → Ulnar
  - Interossei → Ulnar
  - Lumbricals → Mixed
- Function:
  - Grip + Fine movements

🟢 INTRINSIC MUSCLES OF THE HAND (DETAILED)

🔹 OVERVIEW

👉 Intrinsic muscles = originate & insert within the hand

👉 Responsible for fine movements, precision grip, coordination

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🟢 CLASSIFICATION

- 1. Thenar Muscles (Thumb)
- 2. Hypothenar Muscles (Little finger)
- 3. Lumbricals
- 4. Interossei
- 5. Palmaris brevis

🟢 THENAR MUSCLES

👉 Form thenar eminence

🔹 MUSCLES + DETAILS

🔸 1. Abductor Pollicis Brevis

- Origin: Scaphoid, trapezium, flexor retinaculum
- Insertion: Base of proximal phalanx of thumb
- Action: Abduction of thumb
- Nerve: Median nerve

🔸 2. Flexor Pollicis Brevis

- Origin: Flexor retinaculum
- Insertion: Base of proximal phalanx
- Action: Flexion of thumb (MCP joint)
- Nerve: Median nerve

- 3. Opponens Pollicis ⭐
  - Origin: Flexor retinaculum + trapezium
  - Insertion: Shaft of 1st metacarpal
  - Action: Opposition of thumb
  - Nerve: Median nerve

- 4. Adductor Pollicis ⭐ (EXCEPTION)
  - Origin:
    - Oblique head → 2nd & 3rd metacarpals
    - Transverse head → 3rd metacarpal
  - Insertion: Base of proximal phalanx of thumb
  - Action: Adduction of thumb
  - Nerve: Ulnar nerve (deep branch) ⭐

🟢 SUMMARY (THENAR)

APB → Abduct

FPB → Flex

OP → Oppose

Adductor → Adduct (ULNAR NERVE!)

🟢 HYPOTHENAR MUSCLES ⭐

👉 Form hypothenar eminence

🔹 MUSCLES + DETAILS

🔸 1. Abductor Digiti Minimi

- Origin: Pisiform

- Insertion: Base of proximal phalanx (5th digit)
- Action: Abduction of little finger
- Nerve: Ulnar nerve

- 2. Flexor Digiti Minimi Brevis
  - Origin: Hook of hamate + flexor retinaculum
  - Insertion: Base of proximal phalanx
  - Action: Flexion of little finger
  - Nerve: Ulnar nerve

- 3. Opponens Digiti Minimi
  - Origin: Hook of hamate + flexor retinaculum
  - Insertion: Medial border of 5th metacarpal
  - Action: Opposition of little finger
  - Nerve: Ulnar nerve

🟢 PALMARIS BREVIS

- Origin: Flexor retinaculum + palmar aponeurosis
- Insertion: Skin of palm
- Action: Wrinkles skin → improves grip
- Nerve: Superficial branch of ulnar nerve

🟢 LUMBRICALS

- Origin: Tendons of flexor digitorum profundus
- Insertion: Extensor expansion

🔹 Action:

👉 Flex MCP + Extend IP joints ⭐

- Nerve Supply:

Lumbrical	Nerve
1st & 2nd	Median
3rd & 4th	Ulnar

🟢 INTEROSSEI MUSCLES

- TYPES

- Dorsal Interossei (4)

👉 DAB = Dorsal ABduct

🔸 Palmar Interossei (3)

👉 PAD = Palmar ADduct

🔹 Action:

- Abduction/adduction of fingers
- Assist lumbricals

🔹 Nerve:

👉 Ulnar nerve

🔥 CLINICAL CORRELATIONS

🔸 1. Median Nerve Injury

👉 Thenar muscle paralysis

👉 Loss of opposition → Ape thumb deformity

🔸 2. Ulnar Nerve Injury ⭐

👉 Interossei + adductor pollicis affected

Signs:

- Claw hand
- Loss of finger abduction/adduction
- Positive Froment's sign

🔸 3. Froment's Sign

👉 Patient holds paper using thumb

- Normal → Adductor pollicis
- Ulnar palsy → uses FPL (thumb flexion)

🔥 MUST REMEMBER:

✔ Thenar = Median nerve

✔ Hypothenar = Ulnar nerve

✔ Adductor pollicis = Ulnar (exception)

✔ Lumbricals = Flex MCP + Extend IP

✔ DAB / PAD rule

💡 QUICK RECALL:

- Thenar → Median
- Hypothenar → Ulnar
- Interossei → Ulnar

- Lumbricals → Mixed
- Function: Fine movements + grip

🟢 LUMBRICALS

🔹 GENERAL FEATURES

- Number: 4
- Unique feature:

  👉 Arise from tendons (not bones) ⭐
- Located in anterior hand
- Connect flexor system → extensor system

🔹 ORIGIN

- Tendons of flexor digitorum profundus (FDP)

Type:

- 1st & 2nd: Unipennate
- 3rd & 4th: Bipennate

🔹 INSERTION

- Extensor expansion (dorsal digital expansion)
- On radial side of digits 2–5

🔹 ACTION ⭐ (VERY IMPORTANT)

👉 Flex MCP joints + Extend IP joints

💡 This is a key viva question

🔹 NERVE SUPPLY ⭐

Lumbrical	Nerve
1st & 2nd (lateral)	Median nerve
3rd & 4th (medial)	Ulnar nerve

🔹 BLOOD SUPPLY

- Dorsal metacarpal arteries

🔥 CLINICAL NOTE

👉 Loss →

- Clawing of fingers
- Loss of coordinated finger movement

🟢 INTEROSSEI MUSCLES

🔹 TYPES

🔸 I. DORSAL INTEROSSEI (4)

- Type: Bipennate
- Location: Between metacarpals

ORIGIN:

- Adjacent sides of metacarpals

INSERTION:

- Proximal phalanges + extensor expansion

ACTION:

👉 Abduct fingers (DAB)

🔸 2. PALMAR INTEROSSEI (3)

ORIGIN:

- Metacarpals (1st, 2nd, 4th, 5th)

INSERTION:

- Proximal phalanges + extensor expansion

ACTION:

👉 Adduct fingers (PAD)

🔹 COMMON ACTION (IMPORTANT ⭐)

- Assist lumbricals:

  👉 Flex MCP + Extend IP joints

🔹 NERVE SUPPLY ⭐

👉 Deep branch of ulnar nerve (C8, T1)

🔹 BLOOD SUPPLY

- Dorsal metacarpal arteries

🔥 CONCEPT

– Lumbricals + Interossei = Intrinsic hand muscles

- Function: Flex MCP + Extend IP joints

🟢 IMPORTANT MNEMONICS ⭐

🔸 DAB & PAD

- DAB → Dorsal ABduct
- PAD → Palmar ADduct

🔸 MEDIAN NERVE MUSCLES (LOAF) ⭐

👉 Muscles supplied by median nerve in hand:

- L → Lateral 2 lumbricals
- O → Opponens pollicis
- A → Abductor pollicis brevis
- F → Flexor pollicis brevis

🟢 CONCEPT

👉 No intrinsic hand muscle is supplied by radial nerve

🔥 CLINICAL CORRELATIONS

- 🔸 Ulnar Nerve Injury ("Claw Hand") ⭐
  - Interossei + medial lumbricals lost
  - Loss of:
    - Finger abduction/adduction
    - MCP flexion + IP extension

- 🔸 Median Nerve Injury

- Loss of:
    - Thenar muscles
    - Lateral lumbricals
- Leads to:

    👉 Poor precision grip

⭐ MUST REMEMBER:

✔ Lumbricals arise from FDP

✔ Insert into extensor expansion

✔ Flex MCP + Extend IP

✔ Dual nerve supply

✔ DAB / PAD

✔ LOAF mnemonic

💡 QUICK RECALL:

- Lumbricals:
    - FDP → Extensor expansion
    - Flex MCP, Extend IP
- Interossei:
    - DAB / PAD
    - Ulnar nerve

-> The End <-