

# Examination of the Hand

## ***Introduction***

Examination of the hand is always disease-specific. In other words the site and nature of the pain or deformity will determine your approach to the examination.

The broad topics in examination of the hand are:

1. Deformity conditions – Dupuytren’s disease, Congenital conditions
2. Neurological conditions – nerve injuries, peripheral neuropathies, neuromuscular disorders
3. Painful conditions

Below is a general approach, if you have no idea which of the above groups you are dealing with. The principles of Look-Feel-Move-Tests apply.

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## ***Look***

Expose the whole forearm & hand.

Look at the:

- Dorsum, Palm,
  - Muscles - Thenar, Hypothenar, first dorsal interosseus, ADM, FCU (in forearm)
  - Congenital abnormalities
  - Open & close hand to quickly assess mass movement of the hand
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## ***Feel***

- - ask for & feel the tender area
  - - muscles
  - - swellings
  - Palmar fascia & 1st web space (for nodules)
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## ***Move***

- Make a fist (active mass motion) and then extend all fingers
- Thumb:
  - Opposition to all fingers in turn
  - Adduction, Abduction, Flexion
  - EPL = tested by asking patient to lift thumb up off a table whilst hand held palm down on table
- EDC - extend fingers at MCPJ's
- Interossei - Ask patient to abduct fingers (dorsal interossei); ask patient to adduct fingers (palmar interossei)
- FDS - individually tested by holding other fingers in hyperextension
- FDP - tested by fixing the PIPJ & thus isolating the DIPJ

- **Quadriga phenomenon** (*a Quadriga = an ancient Greek four horse chariot*)
  - When testing for FDS the FDP is defunctioned because the FDP tendons are combined, while the FDS muscles are separate in the forearm.
  - Following repair or reconstruction of an FDP tendon the tension must be identical to the other FDPs, since the **excursion of the combined tendons is equal to the shortest tendon.**

## Neurological Tests

### Sensory:

- Autogenous zones:
  - Median nerve = volar aspect of index finger
  - Ulna nerve = volar aspect of little finger
  - Radial nerve = over 1st dorsal interosseous muscle (dorsum of 1<sup>st</sup> web space)
- Superficial branch of median nerve - over thenar eminence. Discriminates between a high or low median nerve lesion.
- Dermatomes - C6 = thumb & index finger; C7 = middle finger; C8 = ring & little fingers.

### Motor:

**1. Median nerve** - test APB with examiners hand over the thenar muscles from the first web space (like shaking hands)

### 2. Ulna nerve -

- ADM & 1st dorsal interosseous muscle together, by abducting fingers against resistance.
- Test ADM alone whilst palpating it's contraction.
- **Wartenburg's sign** - little finger lies abducted due to the unopposed action of EDM.
- **Froment's test** (Froment described this after watching a train commuter reading his newspaper with on thumb flexed & the other straight). There are numerous ways of doing this test. The key point is to ensure that the thumb is performing an adducting manoeuvre.



- **Ulna Paradox** = less clawing of the fingers than in a high ulnar nerve lesion than a low lesion, because FDP is involved in high lesions, thus relaxing the interphalangeal joints.

**3. Anterior Interosseous nerve** - loss of precise pinch (unable to make 'OK' sign, instead make a square) due to loss of FPL & FDP to index finger.

**4. Posterior Interosseous nerve** - Wrist dorsiflexion results in radial deviation (since ECU supplied by PIN, but brachioradialis & ECRL are supplied by the Radial nerve)



*Dorsiflexed and radially deviated wrist in PIN palsy. Note flexed fingers as well.*

#### **5. Superficial Branch of Radial Nerve:**

- Wartenburg's Neuritis (compression at the insertion of Brachioradialis)
- **Dellon's sign** = active forceful pronation of the forearm & ulnar deviation of the wrist with the elbow extended by the side.
- Tinel's test at the insertion of Brachioradialis



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### **Functional Tests**

Power grip / Grasp  
Precision Pinch (AIN)  
Key Grip Pinch  
Strength - tested on Dynamometer or Sphygmomanometer

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### **Pulses**

**Allen's test** - Ask patient to clench fist; compress both the radial & ulna arteries together with thumbs; Patient relaxes hand; Release one artery & observe capillary refill

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## ***Intrinsic Tests (Deformity)***

### **1. Differentiate Intrinsic contracture from forearm flexor contracture**

Flexing the wrist relaxes the FDS & FDP (long flexor) tendons; if patient can then flex the IPJ's, with the wrist flexed there is intrinsic tightness, if they cannot it is a Volkmann's contracture (long flexors).

### **2. Bunnel-Littler Test** For intrinsic tightness.

1) With the MCPJ in extension the intrinsics are put on a stretch. Try to flex the PIPJ with MCPJ in extension. If it doesn't flex = tight intrinsics or joint capsule contracture.

2) With MCPJ in flexion the intrinsics are relaxed. Thus if unable to flex PIPJ= tight capsule.

NB- prior to test check that passive motion of PIPJ is possible (i.e. normal PIPJ)

Tight intrinsics occur in: 'Intrinsic Plus' hands due to ischaemia or fibrosis of intrinsics or RA.

### **4. Bouvier's Test**

- To determine if PIPJ capsule & ext. mech. are working normally.
- If PIPJ capsule & ext. mech. are functioning normally then blocking MCPJ hyperextension allows IPJ extension.
- Positive test occurs as a result of: attenuation of central slip, adherent central slip at PIPJ or volar subluxation of lateral bands.

### **5. Tests for Traumatic Bouttoniere Deformity**

1. **Elson's Test** = Put finger over edge of table, with PIPJ flexed to 90deg. & ask Pt to extend against resistance. Weakness of resisted extension of PIPJ & hyperextension of DIPJ occurs if the central slip is ruptured.
2. **Passive test** = flex wrist & MCPJs. Poor passive resistance to pushing over middle phalanx indicates weak extensor mechanism.
3. **Boye's Test** (1970) - If the PIPJ is held passively extended, it is then possible for the normal individual to flex the terminal interphalangeal joint in isolation. However, if the central slip has been ruptured, there is increasing difficulty in performing this action. This test only becomes positive when the proximal part of the ruptured central slip has retracted and become adherent to the surrounding tissues.

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### **HOW TO MEASURE FIXED CONTRACTURES IN THE MCPJs AND PIPJs IN DUPUYTREN'S ETC.**

- Pronate the hand so that the dorsum faces you.
- Then keep a goniometer on the dorsum of the MCPJ.
- For assessing the PIPJ flex the MCPJ as much as possible - this reduces the possible chance for a fixed contracture of the MCPJ to contribute to a contracture of the PIPJ



## **RHEUMATOID HAND**

Expose above elbow. Quick elbow, shoulder & neck assessment

Look (most NB):

1. Extensor surface
  2. Flexor surface
- swelling
  - wasting
  - zig-zag deformity - coronal / sagittal
  - MCPJs - dropped fingers, ulnar drift
  - finger deformities – swan necking, boutonnières deformities
  - Nodules
  - Features of SLE, Psoriasis, scleroderma
  - Note DRUJ when wrist supinated

Feel:

1. Tender areas
2. Passive correctability of deformed joints (correctable = soft tissue procedures indicated)
  - Must be tested with ligaments tight (i.e. MCPJs in flexion)
3. Ulnar collat. lig of thumb
4. Sensation

Move:

1. Ask patient to extend & flex all joints fully, & oppose thumb.
  - Note extensor lag - tendon rupture or subluxation
2. Intrinsic Tightness - Bunnell's Test in both deformed & corrected positions.
3. Individual joint movements

General Medical Assesment:

1. cervical spine
2. TMJ
3. Pulmonary
4. General