HAND SURGERY, THERAPY AND RHEUMATOLOGY
- THE INTERFACE

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The Interface

Team Work

- Rheumatologist
- Hand Surgeon
- Hand Therapist
- Radiologist
- Psychologist
- The Patient!
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- What is Hand Therapy?
  - Undergraduate training in Occupational Therapy or Physiotherapy
  - Postgraduate training in Hand and Upper Limb Rehabilitation, Master of Science (Hand Therapy)
  - Hospital based work
  - Associated with Plastics, Orthopaedics, Rheumatology clinics
  - Private practice (generally associated with a Hand Surgeon)
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What is Hand Surgery?

PRINCIPALS

Painfree anaesthesia

Minimally invasive incisions

Consideration of Anatomy and Pathological processes

Early Protected Mobilisation

Troublefree recovery

Manage patients expectations
The Interface

ANATOMY
The Interface

ANATOMY
The Interface Overview

Common conditions referred to Hand Therapists and Hand Surgeons by Rheumatologists

- Rheumatoid arthritis
  - MCP joints
  - PIP joints
  - Thumb
- OA CMC joint
  - IP joints
- DIP ganglions
- Scleroderma
- Tenosynovitis- Trigger finger / thumb / De Quervains
- Carpal Tunnel Syndrome
- Dupuytren’s disease
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RHEUMATOID ARTHRITIS

Assessment

- Clinical
- Serological
- Radiological
- Functional
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RHEUMATOID ARTHRITIS

Soft Tissues- Nodules
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RHEUMATOID ARTHRITIS

Flexor Tendons

- Carpal Tunnel Syndrome
- Flexor Tendon rupture
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RHEUMATOID ARTHRITIS

Extensor Tendons

- Wrist
- Rupture
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RHEUMATOID ARTHRITIS

Extensor Tendons
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RHEUMATOID ARTHRITIS

Extensor Tendons

- Rupture
- Tendon Subluxation
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RHEUMATOID ARTHRITIS

Joints

- MP

Ulnar Drift Deformity
Palmar Subluxation
Weak Grip and Pinch
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RHEUMATOID ARTHRITIS

Joints

- MP- Synovitis-destruction-replacement
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RHEUMATOID ARTHRITIS

Joints

- MP replacement
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RHEUMATOID ARTHRITIS

Joints

- MP replacement
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RHEUMATOID ARTHRITIS

Joints

PIP – Boutonniere

- Soft tissue rebalance/fusion
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RHEUMATOID ARTHRITIS

Joints

PIP and DIP – Swan neck

- Soft tissue rebalance/fusion
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Swan neck deformities

Boutonniere deformities
### The interface - Rheumatoid thumb

<table>
<thead>
<tr>
<th>Classification</th>
<th>Primary site of joint deformity</th>
<th>Deformity</th>
<th>Splint</th>
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</thead>
<tbody>
<tr>
<td>Type 1 (Boutonniere)</td>
<td>MCP joint</td>
<td>MCP flexed, IP hyperextended</td>
<td>Custom made thumb MCP joint extension immobilisation splint</td>
</tr>
<tr>
<td>Type 2</td>
<td>CMC joint</td>
<td>CMC flexed and adducted, MCP flexed, IP hyperextended</td>
<td>CMC and MCP extension immobilisation splint</td>
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<tr>
<td>Type 3 (Swan neck)</td>
<td>CMC joint</td>
<td>CMC subluxed, flexed and adducted, MCP hyperextended, IP flexed</td>
<td>CMC immobilisation splint with block to prevent MCP joint hyperextension</td>
</tr>
<tr>
<td>Type 4 (Gamekeeper's)</td>
<td>MCP joint</td>
<td>Laxity of UCL</td>
<td>MCP joint immobilisation splint</td>
</tr>
<tr>
<td>Type 5</td>
<td>MCP joint</td>
<td>MCP hyperextended, IP joint flexed</td>
<td>Extension restriction splint</td>
</tr>
<tr>
<td>Type 6</td>
<td>General</td>
<td>Bone loss and loss of joint stability</td>
<td>CMC, MCP and IP splint as indicated</td>
</tr>
</tbody>
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The Interface

RHEUMATOID ARTHRITIS

Thumb
The Interface

SPLINTS
The interface - RA

Conservative

- Splinting
- Education (joint protection)
- Heat (hot packs / wax baths)
- Gentle range of motion
The Interface - Treatment of RA

Splinting

- Anti-deformity Splints
- Night resting splints
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VASCULAR
- Scleroderma
- Raynauds

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Scleroderma

- Skin care
- Hand and nail care
- Protection from heat and cold
  - Raynaud’s phenomenon
- Housework and activities
- Exercises
- Splints
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PSORIATIC ARTHRITIS
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OSTEOARTHRITIS

- Joints - CMC
- Joints - MP
- Joints - PIP
- Joints - DIP
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- 1st CMC OA
The Interface

Ist CMC OA
The Interface - Signs of thumb base OA

- Deformity
- Tenderness
- Stiffness
- Swelling
- Weak pinch and grip
- Poor function
The interface - CMC Assessment

- X-rays
- Reported history of pain and function
- Clinical assessment (palpation and grind test)
- Lateral pinch strength assessment
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Eaton Radiological Classification

- **Stage 1**  almost normal
- **Stage 2**  decreased Jt space
  Osteophyte<2mm
- **Stage 3**  Subluxation >1/3
  Osteophyte>2mm
- **Stage 4**  ST/ TT / IFcmc

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The Interface – 1st CMC

Conservative management - Splinting
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1\textsuperscript{st} CMC OA

- Splinting
- Education (joint protection)
- Heat (hot pack / wax baths)
- Gentle range of motion
- Steroid Injection
- Surgery
The Interface
CMC joint surgical procedures

- Ligament Reconstruction (LR)
- MC osteotomy
- CMC joint arthrodesis
- Denervation
- CMC joint replacement
- Trapeziectomy +/- LR or TI or LRTI
- Trapeziectomy (complete/partial) + interpositional arthroplasty
The Interface - Interposition Materials

Biological (Autograft / Allograft)
- FCR / PL
- Costochondral interposition graft
- Fascia Lata / Graft jacket (acellular dermis)

Prosthetic Material
- Silicone rubber button
- Gelfoam
- Gortex
- Polypropylene (Marlex)
- Polyurethane Urea (Artelon)
- Pyrocarbon- Ascension PyroDisk
  - Tornier Pyrocardan

Artelon
PyroDisk
Pyrocardan
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Pyrocardan CMC Interposition Implant

Indications
- Stage 1, 2 and early 3 CMC OA (Eaton Classification)

Benefits
- Short term - Minimally invasive and short recovery period
- Trapezium preserving, offers greater salvage opportunities
- Long Term results
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Partial trapeziectomy and interposition with the Pyrocardan CMC joint implant.

Pain/function score improved

Good overall satisfaction with procedure

Pinch strength comparable to traditional procedures
The Interface - STT joint OA

Scaphotrapezio-trapezoid joint
Radio-scaphoid joint
Radio-lunate joint
Distal radioulnar joint
Head of capitate

STT osteoarthritis
The Interface - PAN TRAPEZIAL OA

- Trapeziectomy alone
- Trapeziectomy + tendon interposition
- Trapeziectomy + Suspension (APL or FCR)

Results – Excellent Pain Relief
- Very Good Movement
- Good Functional strength
The Interface
The Interface
PIP OA
The Interface

GANGLIONS in OA

- PIP (Dorsal)
The Interface – Signs of DIP joint OA

- Pain and swelling
- Enlargement
- Deformity
- Instability
- Heberden’s nodes
- Mucoid cysts
The Interface – Signs of DIP joint OA

DIP Fusion

- Severe Pain
- Deformity
- Instability
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GANGLIONS in OA

- DIP (Mucoid)
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Post Traumatic Arthritis

Digits
- Joints – DIP
- Joints – PIP
- Joints – MP
- Joints - CMC
The Interface

Post Traumatic Arthritis

Digits
- Joints – DIP
- Joints – PIP
- Joints – MP
- Joints- CMC
The Interface

Post Traumatic Arthritis

PIP Replacement
The Interface - IP Joint OA management

Conservative

- Splinting
- Education (joint protection)
- Heat (hot packs / wax baths)
- Gentle range of motion
The Interface - Splinting for OA and RA

- Minimise deformities
- Decrease pain
- Decrease inflammation
- Decrease stress to the joints
- Provide support for increased function
- Assist with joint stability
The Interface - Splints
The Interface - Joint Protection Principles

- Rest
- Spread the strain
  - use more joints to do work
  - use larger joints to do work
- Avoid gripping narrow and small objects
- Avoid deforming positions (RA)
- Energy Conservation
Joint Protection Principles

Activity Of Daily Living (ADL) Devices
Joint protection

Pain free exercises

Splinting

Increased Function

The Interface - Hand Exercises

- Increasing grip strength
- Improving function
- Must be pain free
- Overall body conditioning
- Reducing pain
- Improving ROM
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De Quervain's Tenosynovitis

- Compression of the APL and EPB within the 1st dorsal compartment

- Finklestein’s test - ulnar deviation of the wrist with the thumb adducted
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DEQUERVAIN’S TENOSYNOVITIS
The Interface

De Quervain's Tenosynovitis

Treatment
- Splinting
- Cortisone injection
- Iontophoresis with dexamethasone
- Surgery
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TRIGGER FINGER

Inflamed Nodule of Tendon

Nodule gets trapped behind tendon sheath and finger becomes stuck in bent position
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TRIGGER FINGER
The Interface

TRIGGER FINGER
The Interface

TRIGGER THUMB

Common Cause of Trigger Thumb
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Lateral Epicondylitis (tennis elbow)

- Pathology at the common extensor origin (lateral epicondyle)
- ECRB tendon involved (Also EDC 30%)
- Dominant arm more involved (2:1)
- Peak incidence in the fourth decade
- More prevalent in occupation (70%) as compared to sports
The Interface  Treatment Modalities

Immobilisation, Ultrasound, Splinting (proximal brace and/or wrist brace), Laser, Education, Transverse Friction Massage, Electrotherapy, Oral NSAIDS, Topical NSAIDS, CSIs, Mobilisation, Botox, Extracorporeal Shock Wave Therapy, Ice, Stretching, Strengthening, Phonophoresis, Iontophoresis, Wait and See, Activity Modification, Elbow Joint Mobilisation, Cervical Spine mobilisation, Acupuncture, Myofascial Release, Ergonomic Adjustments, Autologous Blood Injection (ABI), GTN, etc, etc, etc…. 
The Interface  Rehabilitation

Establishing what phase of injury the pt is in
1) Reactive
2) Degenerative

Rehab Principles

- Reduce pain (topical steroids, iontophoresis or cortisone injection)
- Unload tendon (Load management – education, rest, postural advice, splinting)
- Facilitate tendon adaptation, strengthening and stretching
Prolotherapy (Proliferative Injection Therapy):

• **Autologous Blood Injection (ABI)**

Thought to trigger inflammatory cascade and healing by either:

i) ? mediators in the blood itself or

ii) the injection itself

No difference between ABI and Saline (*de Vos et al, 2010*)

• **High Volume Injections (HVI) – 20-30mls saline**

Developing Evidence
NERVE COMPRESSIONS

- Carpal Tunnel
- Guyons Tunnel
- Cubital Tunnel
The Interface - Carpal Tunnel Syndrome

- Caused by compression of the median nerve at the wrist - many aetiologies
- Nocturnal paraesthesia in median innervated digits
- (also daily when holding phone/steering wheel/brushing hair)
- Wasting of APB
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CARPAL TUNNEL SYNDROME

- Tinel’s Test
- Phalens Test -variants
- NCS-amplitude
  latency
  action potential
  velocity
The Interface - Carpal Tunnel Syndrome

Conservative Treatment

- Splinting overnight
The Interface - Carpal Tunnel Syndrome

Treatment

- Surgical decompression open
The Interface - Carpal Tunnel Syndrome

- **Treatment**
  - Splinting overnight
  - Surgical decompression - endoscopic

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- DUPUYTRENS CONTRACTURE
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- DUPUYTREN'S CONTRACTURE

Superficial fibromatosis affecting the palmar fasciae
The Interface - Dupuytren’s contracture

History
- Felix Platter 1614
- Astley Cooper 1822
- Von Dupuytren 1832

Features
- Palmar pitting
- Nodules
- Cords
- Contractures
The Interface - Dupuytren’s contracture

AETIOLOGY

- Genetic - autosomal dominant Celtic
  - HLA B 27
- Diabetes
- Epilepsy ? Medication
- Trauma
- Alcohol-? coincidence

ASSOCIATIONS

- Garrod’s Pads  40%
- Lederhosen’s Disease  15%
- Peyronie’s Disease  5%

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The Interface - Dupuytren’s contracture

Surgery indicated

- when MCP joint contracture reaches 30°
- when PIP joint starts contracting
- triggering
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DUPUYTRENS CONTRACTURE

Minimal Surgical Approaches

Percutaneous Needle Aponeurotomy (+- Fat Injections)

Cord Fasciotomy

Segmental Fasciectomy
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DUPUYTRENS CONTRACTURE

Less Minimal Surgical Approaches

Digital Fasciectomy

DermoFasciectomy +/− Skin Graft

Total Fasciectomy
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DUPUYTRENS CONTRACTURE

Collagenase

Inject

Nerve Block/”Manipulate”/Rupture

Splint
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DUPUYTRENS CONTRACTURE

Collagenase - Problems

Not yet TGA approved
?$1300 out of pocket per injection
Only One cord treatable per month
Post “op” pain, swelling, haematoma
?Long term results
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DUPUYTRENS CONTRACTURE

Collagenase

Oh No! Tendon Rupture

What does it mean?
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COMPLEX REGIONAL PAIN SYNDROME
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HAND INFECTIONS

- Septic Arthritis
- Suppurative Tenosynovitis
- Deep Space infection
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Perioperative Management of Medications

Prednisolone

Methotrexate

Allopurinol
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Thankyou.
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Any Questions?