1st CMC Joint Osteoarthritis Surgical and Therapeutic Management

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1st CMC joint OA… in brief

- Most common hand OA (after DIPJs)
- 6:1 Female:Male (high as 10-15:1)
- Major cause of thumb & hand dysfunction
Signs & Symptoms of CMC joint OA

- Tenderness
- Deformity
- Stiffness
- Swelling
- Weak pinch and grip
- Poor function
CMC Joint OA Causes

Ligamentous Laxity
- AOL becomes lax with adjacent palmar degeneration of trapezium (or dorsoradial laxity and adjacent dorsal degeneration)

Joint Impingement
- Degeneration secondary to joint impingement during functional pinch (lateral pinch)
- High contact stresses through pinch initiate and/or exacerbate OA

CMC Joint Basics.....

Thumb MC rests in plane perpendicular to palm – enabling functional pinch

3 Planes of movement
- Flexion / Extension (RA)
- Abduction / Adduction
- Opposition / Retropulsion
The Saddle Joint

- Bi concave / convex (imperfect)
- Shallow (bony congruity / stability poor)
- Stability largely from ligaments (16) and muscle tendon units (9)
- Large contact forces at CMCJ from tip pinch (factor of $x \ 6 - 24$ at CMCJ)
- Degeneration at volar-ulnar quadrant
Ligaments x 16

- Anterior Oblique Ligament (AOL) the major (static) stabilising structure – limits dorso-radial translation of the MC on the trapezium in pinch

- Dorso-Radial Ligament (DRL) is now considered to be just as important a stabiliser – taut during MC dorsoradial subluxing forces

- AOL attenuation causes degeneration to the adjacent volar / ulnar aspect of the trapezium

- Lateral (key) pinch causes concentrated forces in same zone

Bettinger 2001,
Functional Biomechanics

- Maximal contact area between Trapezium and Metacarpal (53%) during opposition (abduction, flexion and pronation)

- Ligaments taut in this position

- Most stable "close packed" position is opposition "screw-home-torque position"

Neumann and Bielefield 2003
Adductor Pollicus

- Strong thumb adductor (flexor and supinator)
- Transverse and Oblique heads
- Strong in lateral (key) pinch
- Significant contributor to thumb OA deformity (adduction contracture)
What about the APL?

- Serves as an important CMCJ stabiliser (counteracts action of AP)

- Aberrent accesory tendons of APL (Metacarpal + Trapezium)

- ? minimises OA prevalence as pull of APL on both Metacarpal and Trapezium causes concurrent pulling (less shear)

- No correlation found

The Collapse Deformity

MCPJ hyperextension
- VP stretches
- EPL/EPB bowstringing accentuates deformity

IPJ flexion
- Tight FPL

Adduction Contracture
- AP shortens
- Reduces web space

Dorsoradial Subluxation of MC
- AOL becomes attenuated

The Collapse Deformity
Is the MCP joint relevant?

- CMCJ instability causative of MCPJ deformity but divergent theory of MCPJ being causative

- MCPJ flexion unloads volar surface of trapezium (30° causes 60% dorsal shift of contact along trapezium)

- CMCJ congruence facilitated in MCPJ position of 30° flexion

CMC joint Clinical Assessment

- X-rays

- Patient history of pain and dysfunction

- Clinical assessment
  - shoulder sign / deformity
  - palpation
  - grind test
Outcome Measures

- Pain
- Function
  - DASH / PRWHE / AUSCAN
- Thumb AROM
  - CMC / MCP / IP / composite
    eg. Kapandji
- Strength (Pinch and Grip)
The AUSCAN – a more valid OM?

15 items scored on 5 point scale 0 (none) to 4 (extreme)

- Pain (5 items)
  (at rest, gripping, lifting, turning, squeezing)
- Stiffness (1 item)
  (on waking)
- Physical Function (9 items)
  (turning taps/faucets on, turning a round doorknob or handle, doing up buttons, fastening jewellery, opening a new jar, carrying a full pot with one hand, peeling vegetables/fruits, picking up large heavy objects, wringing out wash cloths)
Conservative Rx of CMCJ OA

- Rest
- Splinting
- Heat
- Exercise
- NSAIDS
- CSIs
- Activity Modification and JPE
- Assistive devices
Exercise...
Exercise…

Aims:

- Maximise (painfree) functional ROM
- Maximise functional strength and endurance
- Maintain stability of the CMCJ
- Reduce pain
- Avoid fixed deformities

Kjeken 2011, Neumann and Bielefeld 2003, Felson 2000
But which approach?

Traditional
(Flexibility and Strengthening)

CMC Stability Approach
(Abductor / Extensor Strengthening)

Dynamic Stability Approach
(Kinematic Functional Approach)
Traditional

Aims

- Encourage joint motion and tissue elasticity (cartilage nutrition and joint lubrication)
- Restore web space
- Maintain functional strength for pinch and grasp
- Condition muscles to absorb damaging impact loads

Principles

- A/PROM (all planes) as well as conventional strengthening for functional pinch and grasp

Felson 2000, Neumann and Bielefeld 2003
Traditional

A/PROM

- CMCJ Abduction/Adduction/
  Flexion/Extension/
  Opposition/Retropulsion/
  Composite
- “Place and Hold”

Resistance

- Pinch (Lateral / Tip)
- Grip
- Isometrics / Putty / etc

Evidence (Systematic R/Vs)

Kjeken et al (2011)
may reduce pain and increase ROM and strength

Ye et al (2011)
exercise has no effect on hand pain / dysfunction although may be able to improve hand strength

Valdes and Marik (2010)
moderate evidence to support hand exercises for increasing grip, improving function, ROM and pain reduction

Not specific to thumb OA / thumb exercises
A word on Evidence…

Sackett et al (2000) Scale

**Level of Evidence / Type of Study**

1a  Systematic reviews of RCTs
1b  Individual RCTs with narrow confidence interval
2a  Systematic reviews of cohort studies
2b  Individual cohort studies and low-quality RCTs
3a  Systematic reviews of case-control studies
3b  Case-controlled studies
4   Case series, cohort and case control studies
5   Expert opinion
Evidence (specific studies)

Rogers & Wilder (2009)

**Study Type:** Crossover trial (level 2b), n=46 with hand OA in 1 joint

**Program:**
16 week program for each (16 week washout in between)
Exercise vs Sham (hand cream daily)

**Exercises:** x 1 daily, 10 reps → 20 reps over 16 weeks
AROM - table top / hook / full fist / opposition all digits
/ finger spread / thumb flexion
Strengthening - Theraband Ball - grip / lat pinch / tip pinch

High attrition rate – 40% (n=30), mostly in exercise group

*No change in AUSCAN or dexterity but significant improvement in grip and key pinch*
Evidence (specific studies)


**Study Type:** RCT (level 1b), n=19 with hand OA in 1 joint

**Program:**
6 week program of strengthening x 3 p/week –
- 10 reps isometric (6s) at 40-60% maximum
- 10-15 rep isotonic 40% maximum and 6-8 rep isotonic 60% maximum

**Exercises:**
(1) Rice grabs, (2) 5 finger pinch grip lifting (sand bags) / wrist rolls with PVC pipe attached to 250g sand bag

*Sig improvement in grip and ROM but not pain or pinch strength*
Evidence (specific studies)

Wajon & Ada (2005)

**Study Type:** RCT (level 2b), n=40 with thumb OA

**Program:**

4 week program, 5-10 reps
(and increasing as pain allows) x 3 p/day

**Exercises:**

Thumb abduction against gravity (and thumb strap splint)
vs foam block finger tip pinch (and short opponens splint)

High bias risk – differing splints (major confounding variable)

*No significant difference between the 2 programs*
CMC Stability Approach

Aims

- promote muscular (dynamic) stability of the CMCJ
- maintain first web space (limit adduction deformity)

- **APB** – small & weak but positions thumb for pinch and palmarly abducts and pronates (screwing action) – puts CMC joint in maximal stability (bony and ligamentous)

- **APL** – strong muscle that abducts thumb and pulls MC radially. Opposes the powerful adductors of the thumb and limits dorso-radial collapse of MC and narrowing of 1\textsuperscript{st} web space.

- **EPL** - not desirable as acts as adductor. Use sparingly to maintain flexibility in absence of established deformity

Wajon & Ada 2005, Neumann and Bielefeld 2003, Poole & Pellegrini 2001
APB / APL Strengthening

- Isometrics
- Rubber band
- Theraputty
CMC Stability – Dosing?

- early stages, as later can destabilising and contribute to subluxation (eg. EPL)
- painfree (non-inflammed) state
- close packed position or end range
- active or resisted (isometrics less traumatic alternative)
- pain following performance < 2 hours acceptable
Dynamic Stability Approach

(O’Brien & Giveans, 2013, JHT)

- Based on Jan Albrecht’s approach “Caring for the painful thumb; more than a splint…”
- Use of thumb muscles during function to stabilise the CMCJ to reduce / prevent subluxating shear forces.
- Functional kinematic approach superior to traditional strengthening
- Entire set of muscles around joint to centralise / restore function
- Concept of “pertubation” training
Dynamic Stability Approach

In Summary:

- Indicated for painful thumbs (irrespective of stage / pathology)
- Restoration of thumb web space
- Re-education of intrinsics / extrinsics (esp FDI, OP and abductors and extensors)
- Joint mobilisation techniques
- Strengthening to reinforce muscle patterns for joint stability (restore order & strength of muscle recruitment through full ROM)
- Combined interventions (Splintage / JPE / Adaptive equip)
- Order of intervention a clinical decision
First Dorsal Interosseous

- “lateral thenar muscle”

- distal / ulnar forces of FDI counteract the dorso-radial forces of lateral pinch and grip

- causes distraction rather than compression of CMCJ

Brand & Hollister 1993
Dynamic Stability Approach

Study
Retrospective, n=35, (Level 4)
Unstructured JPE / splintage intervention
QuickDASH scores x 2 (initial / last)

Results
Pain score reduced 17.9% (significant)
Function score improved 19.3% (significant) (DASH MCID of 15%)
Positive results achieved at 2\textsuperscript{nd} visit over 6 weeks

Poor study design, retrospective and confounders (splintage / JPE)
Radiographic subluxation change not measured (only DASH)
Their Program...

Splinting:

Pain -
- At rest (with / out splint)
- During activity (with / out splint)

Splint weaned when fx pinch painfree

Exercises:
- Opposition
- AP myofascial release
  (contract / relax)
- “Web space comparison”
  CMC joint extension
Their Program...

Joint Mobilisation

- Distraction of joint using other hand. Behind back or in front

- Dorsal subluxation reduction – roll thumb column atop head for 1-3 mins

- Retroposition – hold 1-3 mins
Their Program...

Strengthening

- FDI (AROM → resistance)
  10-15 x 3 → 1 p/day

- APB / EPB / OP “C” position

- Oppositional pinch P+H
  (support MC collapse)
Their Program...

Taping

- Proprioceptive taping day and night

JPE / Adaptive Equipment

- As needed
Dosage? – ACSM Recommendations

(Valdes and Heyde, 2012, JHT)

- Based on the American College of Sports Medicine (ACSM) recommendations for “developing muscular strength and flexibility in older frail adults”

- Explored exercise dosage (not specifically goal of exercise)

- Dosage parameters
  - (load, reps/set, sets, sets/day, duration, max or painfree)
Dosage? – ACSM Recommendations

General Principles

- Strengthening should be 40-50% of 1 rep max effort.
- LP strengthening avoided in advanced OA (III and IV) (contributes to joint subluxation and pain)
- Given x 6-24 factor of load at CMC, consider these loads when performing pinch and grip exercise
- Painfree Principle
- Pain to not exceed > 2 hrs after activity
- Heat or low intensity aerobic exercise beforehand
- Minimum 12 weeks
Flexibility – A/PROM

- Composite thumb flexion to base of LF
- Abduction + Opposition
- Isolated IP and MCP joint flexion
- CMC extension (watch MCPJ hyperextn)
Flexibility – A/PROM

Principles

- 2-4 reps and > 2-3 days per week – but daily is best

- Stretch to point of tightness or slight discomfort
  (+/- assisted stretch of 10-30 secs)

- 10-30 secs hold static stretch but 30-60 secs in older persons

- Heat beforehand
Strengthening

All thenar intrinsics (except AP), extrinsic thumb extensors, abductors and wrist extensors

- thumb extension and abduction against resistance (rubber band, velcro board, putty)

- Isometrics

- Pinch (if appropriate) using putty / pegs

- Grip using putty / hand grippers / foam wedge squeeze
**Strengthening**

**Principles**

- Lateral (key) pinch avoided in advanced OA or presence of instability / deformity

- Each muscle group trained x 2-3 p/week

- 10-15 reps x 1 set (minimum) with 2-3 mins rest between

- > 48 hrs rest between sessions
Exercise Summary

- Minimal evidence available overall and especially of thumb

- Dynamic stability of thumb CMC joint through targeted muscle strengthening considered to be important – no evidence as yet to prove this
  - Avoidance of AP strengthening
  - Avoidance of LP strengthening

- Some guidelines for dosage now established
  - Flexibility, daily performance and to point of stretch discomfort
  - Strengthening, x 2-3 per week – painfree principle
  - At least 12 weeks (?indefinately)
Splint goals

- Prevent first webspace contracture
- Minimise deformities
- Provide support for increased function
- Prevent adduction of the metacarpal head into the palm & dorsoradial subluxation of the MC base on the trapezium
- Reduce mechanical stress that may cause instability
- Decrease pain
- Assess the severity of the symptoms
- Decrease inflammation
- Decrease stress to the joints
- Increase stability
- Assist with joint stability
- Gives the therapist time to develop a therapeutic rapport with the pt
Splints – which one?
## Considerations

<table>
<thead>
<tr>
<th>Splint design features</th>
<th>Type of Splint</th>
<th>Custom / Prefabricated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Rigid / Soft / Combination</td>
<td></td>
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<tr>
<td>Joints Immobilised</td>
<td>CMCJ / wrist / MCPJ</td>
<td></td>
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<tr>
<td>Wearing regime</td>
<td>Wearing regime</td>
<td>Continuously (rest &amp; function) Vs Intermittently (function)</td>
</tr>
<tr>
<td>Goal of splint</td>
<td>• Pain reduction • To increase function • Maintenance of webspace • Involving the MCP to unload the palmer compartment of the CMC joint</td>
<td>Type of splint / material used / wearing regime</td>
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</table>
**Review of articles**


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<tr>
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<th>Results</th>
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<tbody>
<tr>
<td>Low-quality RCT (2b)</td>
<td>40 patients</td>
<td>Thermoplastic splint to stabilise the CMC, IP joint free, functional position</td>
<td>Rx group – Splint for ADL’s for 180 days</td>
<td>180 days</td>
<td>No improvement in function in both groups.</td>
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<td>Control group – Splint for the Ax’s, then ADL’s for 90 days.</td>
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<td>No change in grip strength in both groups.</td>
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<td></td>
<td></td>
<td></td>
<td><strong>Outcome measures</strong></td>
<td></td>
<td>Pinch strength reduced in both groups following splinting.</td>
</tr>
<tr>
<td></td>
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<td>VAS pain scale</td>
<td></td>
<td>No change in dexterity with both groups.</td>
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<tr>
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<td>DASH questionnaire</td>
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<td><strong>Pain</strong> reduced in the treatment group (from the first evaluation at 45 days) and the control group once they commenced wearing the splint at day 90.</td>
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<td>Grip strength (Jamar)</td>
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<td>Pinch strength (pinch guage)</td>
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<td></td>
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<td>UL dexterity test</td>
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<tbody>
<tr>
<td>Cross over 2b</td>
<td>26 subjects</td>
<td>1) CMC splint</td>
<td>Wear splints whenever symptoms are felt (day or night)</td>
<td>2 weeks</td>
<td>Both splint groups had a reduction of pain, but there was no significant difference between the 2 groups.</td>
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<tr>
<td></td>
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<td>2) CMC splint and MCP splint</td>
<td></td>
<td></td>
<td>No change in pinch strength or in reducing pain during pinch with both groups.</td>
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<td>Both splints reduce CMC subluxation. Pts with grades 1 and 2 had better stabilisation of the first CMC joint with each splint than did pts with grade 3 or 4.</td>
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<td>CMC splint was the preferred splint</td>
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Outcome measures

- VAS pain scale
- Tip pinch gauge
- CMC subluxation (X-rays)
- ADL self rated scale

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<tr>
<td>Cross over (2b)</td>
<td>25 subjects</td>
<td>1) Custom-made short opponens thermoplastic splint 2) Prefabricated neoprene splint</td>
<td>Pts instructed to wear splint whenever they felt symptoms (day or night) Wear splint 1 for one week, then swap to splint 2 for one week.</td>
<td>2 weeks Each splint was used for one week.</td>
<td>Thumb pain decreased after wearing each of the splints. Pain was significantly less when wearing neoprene splint. Pain at rest and pain during pinch improved more significantly in the neoprene group compared to thermoplastic group. Tip pinch strength (splint on) improved more significantly in the neoprene group. Neoprene group more satisfied with the splint vs thermoplastic group. The CMC joint subluxation was more significantly reduced in the thermoplastic group compared to the neoprene group.</td>
</tr>
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<tr>
<td>CMC subluxation (X-rays)</td>
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<tr>
<td>Pinch strength (with pinch meter)</td>
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<tr>
<td>VAS splint satisfaction</td>
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<td>Self rated scale of ADL’s</td>
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<tr>
<td>RCT (1b)</td>
<td>112 subjects</td>
<td>1) Custom-made splint</td>
<td>Wear at night only</td>
<td>One year</td>
<td>At 1 month no difference between the 2 groups in all areas measured.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2) Usual care</td>
<td></td>
<td></td>
<td>At 12 months there was a significant improvement in pain and function in the splinted group compared to the control group.</td>
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<td></td>
<td>The splint had no effect on the radiographic progression of OA.</td>
</tr>
</tbody>
</table>

### Outcome measures

- VAS pain scale
- VAS pts perceived disability
- Cochin Hand Functional Scale
- Pt global assessment
- Pinch strength (dynamometer)
- ROM (kapandji score)
- X-rays

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</table>
| 2b (RCT) | 40              | 1) Treatment group: Thumb strap splint and abduction ex  
2) Control group: Short opponens splint and pinch grip ex | Splint full time | 2 weeks of splinting alone (either thumb strap or short opponens splint)  
Then exercises were introduced at 2 weeks, (and splinting continued) | At week 2 and week 6, no differences in VAS scores, tip pinch strength or Sollerman Test of Hand Function scores between the 2 groups.  
However, both groups improved in regards to pain, tip pinch strength and function. |

**Outcome measures**

- VAS pain scale
- Pinch strength (pinch guage)
- Sollermann hand function test

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<tbody>
<tr>
<td>3 (Cohort study)</td>
<td>130 subjects</td>
<td>Long opponens splint incl. wrist</td>
<td>Full time wear for 3-4 weeks, then weaning period of 3-4 weeks.</td>
<td>6 months</td>
<td>Reduction in the severity of symptoms, allowing function without significant pain.</td>
</tr>
</tbody>
</table>

**Outcome measures**

- X-ray to Ax stage
- Questionnaire

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<tbody>
<tr>
<td>Randomised cross over (2b)</td>
<td>10 subjects</td>
<td>1) Semi-rigid 2) Firm elastic 3) Supple elastic</td>
<td>No instruction</td>
<td>12 weeks Each splint used for 4 weeks</td>
<td>Better hand function in gripping with soft splint and better tolerated No difference between the 3 groups with pain.</td>
</tr>
</tbody>
</table>

**Outcome measures**

- VAS pain scale
- Pinch test (guage)
- Hand function in hand grips (Green test)
- VAS hand function
- VAS cosmesis of splint

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</thead>
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<tr>
<td>2b (cross over trial)</td>
<td>56 subjects</td>
<td>1) Hybrid splint 2) Comfort cool CMC splint</td>
<td>Wear in the day when symptomatic and at night as desired</td>
<td>9 weeks 4 weeks wearing one splint One week off 4 weeks wearing the other splint</td>
<td>Comfort cool was the preferred splint Hybrid splint group had a significant reduction in pain than those in comfort cool group Both groups reported improved hand function</td>
</tr>
</tbody>
</table>

**Outcome measures**

- AUSCAN
- Grip strength (Jamar)
- Pinch strength (pinch meter)
- Scale re: preference with fit, appearance, convenience, and durability
Conclusion of literature review

- Splint wear does seem to decrease pain
- Splint wear does appear to decrease subluxation on pinch for pts with stage 1 and 2 CMC joint OA (Weiss et al 2000)
- Splint wear does not appear to decrease the eventual need for surgery (Berggren et al 2001, Swigart et al 1999)
- Choice of short vs long opponens is purely based on pts preference (Buurke et al 1999, Weiss et al 2000)
- Different splint have different characteristics that make them better choices
Conclusion of literature review

- Pts should be offered a course of splinting for pain relief (Swigart et al 1999, Weiss et al 2000, 2004)

- Pts should be instructed to wear their splint during heavy or painful activities and may wear them for longer periods during the day and at night for the first 3-4 weeks. (Berggren et al 2001, Buurke et al 1999, Swigart et al 1999, Weiss et al 2000)

- Individuals with stage 1&2 arthritis should be enc to wear their splints during activities promoting CMC joint subluxation (Weiss et al 2000, 2004)

- Patients should splint to maintain the first webspace (Poole & Pelligrini 2000)
Splinting algorithm

Material
- Neoprene
- Thermoplastic
- Neoprene with thermoplastic

Joint affected
- Custom made
- Off the shelf

Wearing Regime
- Heavy tasks
- Full-time
- Off for sedentary tasks

Joint affected
- With STT joint
- With MCP joint
- With IP joint
- CMC joint only

Wearing Regime
- Day
- Night
- Day & Night

Maintain web space stretch
Involve MCP to unload CMC
Stabilise the base of the 1st MC during pinch

Heavy tasks
Full-time
Off for sedentary tasks

Day
Night
Day & Night
General joint protection principles

- Respect Pain
- Avoid positions of deformity
- Balance rest and activity
- Use larger /stronger joints
- Exercise in a pain free range
- Reduce the effort and force

Conservative management

- **Heat**


  The authors conclude that low-level continuous heat wraps can help in the treatment of OA. It's likely that the heat increases blood flow to the area. Blood helps remove cells of inflammation in the area of tissue injury. The collagen tissue and muscles then become more flexible.

- **Wax baths**

  In the Cochrane review 2010 = there is weak evidence to support the use of paraffin wax for pain reduction, ROM and improved hand function. Moderate evidence to support the use of continuous heat packs for pain reduction and increased grip strength.
CMC Joint Procedures...

- Ligament Reconstruction (LR)
- MC osteotomy
- TMCJ arthrodesis
- Denervation
- TMCJ replacement
- Trapeziectomy +/- LR or TI or LRTI
- Trapeziectomy (complete/partial) + interpositional arthroplasty
Demystifying the language…

**Interposition** = any material / tissue interposed between the thumb MC and scaphoid or thumb MC and trapezium (in partial trapeziectomy)

**Arthroplasty** = any procedure where the joint is reconstructed (partially or completely)

**Trapeziectomy** – any procedure where the complete or partial removal of the trapezium bone is performed

**Partial trapeziectomy** = Hemiarthroplasty / Resurfacing arthroplasty

**Ligament reconstruction (LR)** = reconstructing the AOL, with tendon graft – not always performed

**Suspensionplasty** = technical variation using the APL tendon to suspend the first MC through its base and to the IF MC to minimise collapse during pinch
What does evidence say?

So which procedure is best?

Cochrane Review:
Wajon et al, (2009), Surgery for Osteoarthritis of the Thumb

“...although no one procedure produces greater benefit in terms of pain and physical function, there was insufficient evidence to be conclusive. Trapeziectomy has fewer complications than trapeziectomy with LRTI.”
Post-op Management…

- Varies, depending on procedure, surgeon and therapist

- Main considerations/parameters:
  - Period of immobilisation (1-6 weeks)
  - Spica cast removal timing (1-6 weeks)
  - Short or Long opponens splint
  - Position of thumb in splint (encourage/discourage fx pinch)
  - Splint weaning process (rigid splint / soft splint)
  - Time to mobilise thumb base (limited arc or limited motions)
  - Time to strengthen (grip / pinch)
  - Time to resume ADLs
Protocols – literature search

Scant Evidence!

- EBSCOHost (Cinahl/Medline)
  - Various MeSH search terms and strategies used
  - Protocols enmeshed in trials where dependent variable was sx technique, not therapeutic mx

- Google search
  - 1 trial in progress: (Postoperative Rehabilitation Following Trapeziectomy and Ligament Reconstruction Tendon Interposition). Comparing casting vs splint and mobilisation)
  - Various protocols (from different facilities)
# Post-op Management

**ROTH / ROTHAUSE (For LRTI)**

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Exercises/Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4 weeks</td>
<td>- Thumb Spica Cast</td>
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</tbody>
</table>
| 4-8 weeks    | - Thumb Spica Splint (removed for AROM only)  
- AROM all except thumb CMC  
- PROM thumb CMC into abduction and extension |
| week 8       | - Add active thumb abduction, opposition and circumduction  
- Thenar isometrics (palmar abduction) |
| week 12      | - Non-isometric thumb strengthening (inc pinch)  
- Splint off light ADLs |
| 13-16 weeks  | - Cease Splint  
- RTW light duties, moderate duties elsewhere |
| 16-24 weeks  | - Resume unrestricted ADLs and work |
Post-op Management...

Hand Clinics (Pyrocarbon disc)

<table>
<thead>
<tr>
<th>0-2 weeks</th>
<th>- Thumb Spica Cast</th>
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</thead>
<tbody>
<tr>
<td>week 2</td>
<td>- ROS and ROM free joints</td>
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</tbody>
</table>
| Weeks 6-12      | - Thumb Spica Splint  
|                 | - AROM of thumb (all jts) and wrist   
|                 | - Scar mx       |
Post-op Management…

Belcher Protocol – Simple Trapeziectomy

<table>
<thead>
<tr>
<th>0-2 weeks</th>
<th>- Thumb Spica Cast</th>
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</thead>
<tbody>
<tr>
<td>week 2</td>
<td>- Thumb Spica Splint</td>
</tr>
<tr>
<td></td>
<td>- Gentle AROM at thumb and wrist</td>
</tr>
<tr>
<td>week 4</td>
<td>- Splint off for light ADLs</td>
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<tr>
<td></td>
<td>- Formal ROM with HT</td>
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</tbody>
</table>
## Post-op Management...

Bellemere et al (2011) – Pyrocardan TMC implant / spacer

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-15 days</td>
<td>Thumb Spica Cast immobilisation</td>
</tr>
<tr>
<td>16-30 days</td>
<td>Mobilisation and discretional splinting</td>
</tr>
</tbody>
</table>
Questions?