Does one protocol fit all?

• What factors do we consider?
• It’s more than the implant!
Learning objectives

• Identify factors to consider in the post operative planning following MPJ arthroplasties
• Identify variances in motor learning feedback strategies to include in the treatment program

1. Diagnoses where MP implants might be used

• Rheumatoid arthritis
• OA (often single joint)
• Other arthritic conditions
• Whole person diseases
• Trauma, other failed procedures, deformities, lack of function
Understanding deformity: RA

- Soft tissue disease
- Wrist radial deviation MP ulnar drift
- Dynamic flexion forces
- Deformities distal and proximal to MPJ - fixed or mobile
- Motor learning adaptations - important post-op consideration for all patients
  – Chim, JHT 2014

Without biological management
OA

• Primary or secondary
• Degrading enzymes impacting chondrocyte function
• Pain, osteophytes, stiffness
• Soft tissue involvement too!
• Other joint involvement-fixed or mobile
  – Martin JHS(Am) 2015

Other arthritic conditions

• Psoriatic arthritis
• SLE
• Scleroderma
Trauma, infection, deformity

- Initial injury review, secondary deficits
- Fixed or mobile joint/soft tissue deficits
- Infection free
  - Houdek, JHS (Am) 2015

2. Arthroplasty options

- Swanson (Linked): [https://youtu.be/3MSSYi7hOds](https://youtu.be/3MSSYi7hOds)
  - Extended or Pre Flexed
- Pyrocarbon Pyrolytic carbon implant (unlinked)
3. Surgical procedures

• OTHER tissue reconstruction:
  – Local: collateral ligament; extensor re-alignment; intrinsic
    release/cross transfer; tenosynovectomy; tendon transfers;
    RCL repair; degree of bone shortening: PROTECT FROM
    ULNAR DEVIATION
  – Adjacent joint procedures: wrist, thumb, PIP/DIP

4. Tissue status

• Skin fragility
• Edema
• Quality of bone stock and tissue reconstructions
• Delayed wound healing potential
• Management of disease process
• “Input deficits” for motor performance
5. The whole person and environment

- Social and home
- Engagement with the program
- Other functional limitations
- Compensatory patterns and duration
- Joint protection during post op phase and activity
6. Functional demands/goals

- Patient expectations
- Capacity of implants
- Prevent rotation and maintain radial alignment
- Longer term protection orthoses

Decision making

- Evaluation guides intervention: do you have all the data before beginning orthotic fabrication? (1-6)
- Instability spectrum: most fragile tissue guides time frame and degree of mobility.
- Why we do what we do-hanging onto old habits
High Profile

Outrigger to supinate digits

Mid Profile
Low Profile

Small finger may be buddy taped instead of in extension assist

Protect PIP fusion/modify for former fusions

Alternative - Fingers together in one finger pan
Protect extensors from sliding ulnarly

Uh oh
Static orthoses

Burr, JHT 2002
Alternate orthosis daily
Full digit and wrist AROM,
Rarely release intrinsics-
shorten bone instead

Add IP extension component if
active IP extension is not full

Not patient images
Not patient images
Not patient images
Vary MP flexion angle based on secondary surgery. 
Add alignment straps or supination straps as needed.

Not patient images

Consider PIP deformities
Exercise...how much and when?

Does allowing 70 flexion day one destabilize the tissues?

Limit degree of flexion/Target flexion
Stabilize to avoid ulnar deviation

Add a visual goal, activity oriented

Not patient images

Edema control and uninvolved joint ROM

• Chip bag
• MEM
• Positioning (pooling of edema at elbow)
• Functional mobility
• ADL/Joint protection
• Timing for ROM of involved joints
• Neuromotor control: increase cutaneous receptor function, increase tactile perception
Early functional tasks

- Adapt distally to engage in whole limb rehabilitation
- Benefit of functional tasks for kinesthesia and JPS
  input → Motor output

Protection during function
Protection during function

May limit MP motion and observe for finger abduction or MP ulnar deviation

Remaining limitations

• What to do and when to do this?
What can the patient perform and what does the patient expect?

- Positioning and protection?
- Mechanical problem?
- Motor learning problem?

Limited MP flexion

- Active or passive limitation?
- Edema and co-contraction?
- Pain?
- Motor control limitation? Other med hx impacting?

Paper roll  Proximal end too short  Proximal end adjusted
Feedback strategies

• ONE PART of the motor learning approach
• Motivate the learner-facilitate acquisition of movement.
• Timing:
  – BEFORE: mental practice, demonstration
  – DURING: manual assistance, blocking orthoses, verbal
  – AFTER: Knowledge of results and performance
    • Duff, S: JHT 2013
    • Shumway-Cook A, Woollacott M: Motor Control, Lippincott Williams and Wilkins, 2012

BEFORE

• Benefits of observing correct performance
• Watching a peer struggle-sees HOW the peer alters movement to be more successful.
• Demo usually should proceed practice
DURING

• Task intrinsic-feeling and seeing results
• Augmented (extrinsic) feedback: add to above. Manual or verbal either during or at the end of the task.
  – Manual: PROM: get the patient in the ‘ballpark”; holding a portion of the limb stable; constrain limb so successful motion has to occur
  – Manual: Remove this type of feedback quickly—or learner becomes dependent

DURING

• Augmented (extrinsic) feedback: add to above. Manual or verbal either during or at the end of the task.
  – Verbal: direct attention, short, limit quantity, focus on OUTCOME rather than movement; specific to goal (accuracy vs. speed)
DURING OR AFTER

• Augmented:
  – Knowledge of results-outcome of task or goal: you were able to hold onto a smaller object. When the patient can’t tell what the outcome is.
  – Knowledge of performance-movement characteristics that lead to outcome: you still need to limit the bending at your middle knuckles. When the task is complex or a specific movement is desired
  – Transitional: the patient’s perspective of their outcome.

DURING OR AFTER

• Augmented
  – The value of video taping the performance-and feedback
  – AVOID-dependence upon therapist feedback
DURING OR AFTER

- Content of augmented feedback
  - Errors - more effective for skill learning
  - Determine how much error is acceptable before providing feedback

FEEDBACK FREQUENCY

- Current view: less than 100% of the time to let the patient be actively involved in finding a better movement pattern and not DEPENDENT upon the feedback.
- Provide when asked
- Provide a summary after a number of trials
- RESULTS measured: Retain knowledge and transfer to tasks
MP Arthroplasty Summary

• Review considerations before choosing a post operative plan.
• Determine causes of limitations to identify your treatment interventions
• Titrate stresses to tissues based on six considerations
• Re-evaluate and change the plan if needed.

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