Rotator Cuff Repair: How Fast Can I Go?

Mike Reinold, PT, DPT, SCS, ATC, CSCS

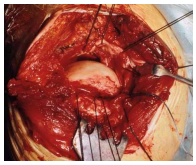
MikeReinold.com
Feel Better, Move Better, Perform Better

CHAMPION
PHYSICAL THERAPY • PERFORMANCE

No Disclosures

Evolution of Rotator Cuff Repair

- Understanding of the anatomy, approach, technique, and fixation have all evolved
- As surgical technique progresses, rehab recommendations have slowed down



Re-Tear Rate

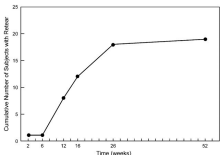
- Historically re-tear rates have not improved
  - Range from 15-92% recurrence
  - Boileau: JBJS '05
  - Galatz: JBJS '04
- Essentially larger tears, poor tissue quality, and older individuals
- Greater re-tear rates but NOT functional outcome
  - Heerspink: JSES '14

Re-Tear Timing

- 100% occurring during first 6 months
  - Ultrasound
  - PT:
    - Standardized
    - PROM week 4
    - Strength week 12
  - 41% recurrence rate
    - 2/9 within 2 weeks
    - 5/9 within between week 6 and 12
    - 2/9 within between month 3 and 6
  - Miller: AJSM '11

Re-Tear Timing

- 95% occurring within first 6 months
  - MRI evaluation
  - PT
    - Not standardized
    - PROM immediate
    - Strength Week 12
  - 17% reoccurrence rate
    - 50% week 12-26
    - 1/19 within 2 weeks
    - 1/19 within 6 weeks
  - Iannotti: JBJS '13



Re-Tear Timing

- 100% occurring during first 6m
  - MRI and ultrasound
  - PT:
    - Varied per person
    - PROM immediate for small to medium tears
    - PROM week 6 for large tears
    - Strength week 12
  - 33% recurrence rate
    - 26% at 3 months
    - 7% from 3-12 months
    - All in large tears
  - Kim: AJSM '14

Does Delaying Rehab Help?

Does Delaying Rehab Help?

- Miller: AJSM '11
  - No PROM for 4 weeks
  - 22% failed during this period
- Ianotti: JBJS '13
  - Immediate PROM
  - 10% failed during this period
- Kim: AJSM '14
  - Immediate PROM for small/med – no failure
  - No PROM for 6 weeks in large - 33% failure

Does Delaying Rehab Help?

- Several recent meta-analyses
  - Improved ROM and function for 3-6m
  - No difference in re-tear rates
  - Larger tears may benefit from delay PROM
    - Saltzman: JSES '17
    - Houck: AJSM '17
    - Gallagher: Phys SM '15
    - Yi: Sports Health '15
    - Shen: Arthroscopy '14
  - Challenging because no standardized approach to surgical or postoperative intervention

What Should We Do?

The Body Adapts to Both Stress Applied and NOT Applied

Gradual Application of Load

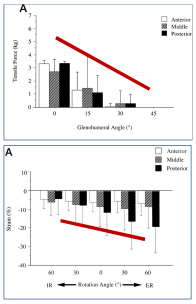
- Underloading of tissue and loss of motion could lead to issues down the road
- Tendon healing responds best to controlled loads
  - Phase 1: 0-7 days
  - Phase 2: 1-8 weeks – Proliferation and reparative phase
  - Phase 3: 6-8 weeks+ - Remodeling and increase order of collagen structure in response to stress
- Too much stress and too little stress both deleterious
- Hsu: Ortho Clin NA '16

Gradual Application of Load

- Fiber healing in sheep model
  - 30% strength at 6 weeks
  - 52% strength at 3 months
  - 81% strength at 6 months
  - Gerber: JBJS '99
- Full histological maturity by 12-15 weeks in primate model
  - Sonnabend: JBJS '10

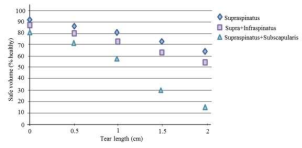
Stress with ROM

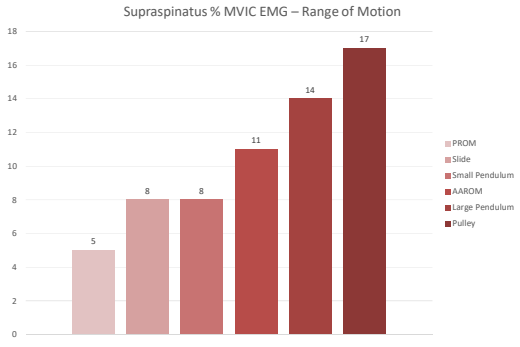
- Hatakeyama AJSM '01
- 14 Cadaveric specimens with 2cm tears
- Significant decrease in strain on repair:
  - Elevation > 30°
  - External rotation
  - IR = significant increase in strain



Stress with ROM

- RTC Stress with PROM
  - Increased tear size decreased safe ROM
  - Elevation below 30 deg and IR most stress
  - Haering: Clin Biom '15

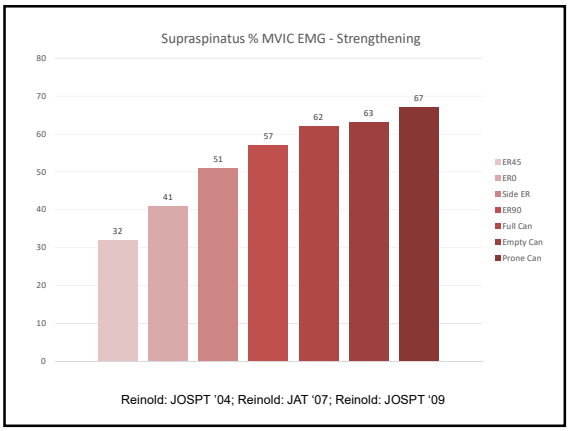




Edwards: JOSPT '18; Gurney: JOSPT '16; Yoon: Am J Phys Med '16; Long: JOSPT '14;

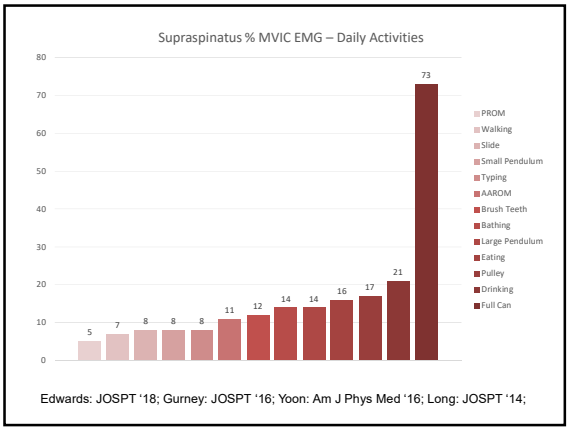

R: 18% D: 21%
R: 25% D: 43%
McCann: CORR '93; Dockery: Ortho '98


↑ 20%
McCann: CORR '93

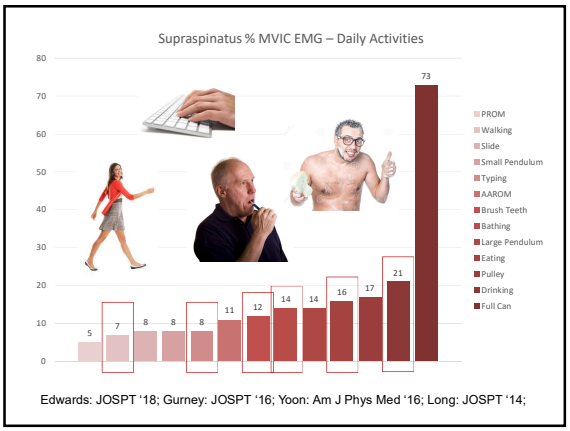


Reinold: JOSPT '04; Reinold: JAT '07; Reinold: JOSPT '09

What About Daily Life?



Edwards: JOSPT '18; Gurney: JOSPT '16; Yoon: Am J Phys Med '16; Long: JOSPT '14;



Edwards: JOSPT '18; Gurney: JOSPT '16; Yoon: Am J Phys Med '16; Long: JOSPT '14;

So How Fast Should We Go?

It Depends

Factors for Rate of Rehab

- Size of tear
- Tissue quality
- Number of tendons involved
- Surgical technique
- Concomitant procedures
- Age of person
- Psychosocial factors

Factors for Rate of Rehab

- Wilk & Andrews
  - Type I - Small
  - Type II - Medium
  - Type III - Large
  - Type IV – Massive

Small to Medium Tears

- PROM start week immediately
- Controlled and gradual application
- AROM and basic strength week 6
- Advanced strength week 12

Large Tears

- PROM delayed 4-6 weeks
- Controlled and gradual application
- AROM and basic strength week 8
- Advanced strength week 12

Individualized Approach

Communication is Key

Thank You!

MikeReinold.com
Feel Better, Move Better, Perform Better

CHAMPION
PHYSICAL THERAPY • PERFORMANCE