The University of Michigan
Rotator Cuff Registry:
Lessons we have learned

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No Disclosures

WHY I CHOSE TO
STUDY ROTATOR
CUFF DISEASE
I ENJOY ROTATOR CUFF SURGERY

THE PROBLEM
While surgical repair of cuff tears in the young active adult is a widely accepted treatment option, surprisingly little evidence exists to guide us in the treatment of these tears in the older patient.
There is insufficient evidence to suggest efficacy in operative versus non-operative treatment of rotator cuff tears in older patients.

**Strength of Recommendation: Weak**
MICHIGAN ROTATOR CUFF REGISTRY TIMELINE

SUCCESSFUL FOLLOW-UP
99% AT 6 MONTHS
88% AT 3 YEARS
CURRENT ENROLLMENT = 1200

REGENCY METHODS

DATA AND OUTCOMES COLLECTED
– DEMOGRAPHICS
– ASES
– WORC
– VR-12
– SHOULDER ACTIVITY INDEX
– SANE
– VAS: Patient Satisfaction and Pain

FOLLOW-UP
Baseline, 6 months, 1 year, and annually thereafter

PRAGMATIC CLINICAL TRIAL

-“Real World” Clinical Trial
-Excellent external validity
-Includes both surgical and non-surgical patients
<table>
<thead>
<tr>
<th></th>
<th>Surgical</th>
<th>Non-surgical</th>
<th>P-value</th>
<th>OR</th>
<th>95%CI</th>
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</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Male</td>
<td>121(62.4)</td>
<td>98(55.1)</td>
<td>0.19</td>
<td>1.01</td>
<td>0.91-1.02</td>
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<tr>
<td>Female</td>
<td>74(37.9)</td>
<td>79(44.6)</td>
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<tr>
<td><strong>Age</strong></td>
<td>59.1(10.2)</td>
<td>62.7(9.8)</td>
<td>&lt;.001</td>
<td>0.97</td>
<td>0.95-0.99</td>
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<tr>
<td><strong>Surgeon</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>A</td>
<td>24(48)</td>
<td>26(52)</td>
<td>0.51</td>
<td>0.82</td>
<td>0.45-1.49</td>
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<tr>
<td>B</td>
<td>52(48)</td>
<td>56(52)</td>
<td>0.32</td>
<td>0.80</td>
<td>0.51-1.25</td>
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<tr>
<td>C</td>
<td>117(82)</td>
<td>92(18)</td>
<td>0.09</td>
<td>1.42</td>
<td>0.94-2.14</td>
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<tr>
<td><strong>BMI</strong></td>
<td>29.1(6.4)</td>
<td>28.8(6.1)</td>
<td>0.36</td>
<td>1.01</td>
<td>0.9-1.05</td>
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<tr>
<td><strong>Workers Comp</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Yes</td>
<td>13(6.7)</td>
<td>19(10.7)</td>
<td>0.23</td>
<td>0.49</td>
<td>0.15-1.07</td>
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<tr>
<td>No</td>
<td>171(87.7)</td>
<td>150(84.7)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Diabetes</strong></td>
<td></td>
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<tr>
<td>Yes</td>
<td>27(13.8)</td>
<td>28(15.8)</td>
<td>0.59</td>
<td>0.86</td>
<td>0.48-1.52</td>
</tr>
<tr>
<td>No</td>
<td>168(86.2)</td>
<td>150(84.2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Smoking</strong></td>
<td></td>
<td></td>
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<tr>
<td>Never or Quit &gt;6mo</td>
<td>164(89.6)</td>
<td>148(89.2)</td>
<td></td>
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<tr>
<td>Yes or Quit &lt;6mo</td>
<td>19(10.4)</td>
<td>18(10.8)</td>
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<tr>
<td><strong>Dominant Side</strong></td>
<td></td>
<td></td>
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<tr>
<td>Same as injury</td>
<td>108(60)</td>
<td>103(63.6)</td>
<td>0.49</td>
<td>1.16</td>
<td>0.75-1.80</td>
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<tr>
<td>Opposite to injury</td>
<td>72(40)</td>
<td>59(36.4)</td>
<td></td>
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<tr>
<td><strong>Shoulder Activity Score</strong></td>
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<td></td>
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<tr>
<td>at baseline</td>
<td>10.6(9.7)</td>
<td>10.3(9.3)</td>
<td>0.63</td>
<td>1.01</td>
<td>0.96-1.07</td>
</tr>
</tbody>
</table>

**BASELINE DEMOGRAPHICS**

**SURGICAL vs NON-SURGICAL**

**AGE**

59.1 YEARS SURGICAL
62.7 YEARS NON-SURGICAL

**PREDICTORS OF TREATMENT ALLOCATION:**

**WHO GETS SURGERY?**

LESS LIKELY TO BE ALLOCATED TO SURGERY IF:

- OLDER
- DIABETIC
- SMOKER
- SHORTER DURATION OF SYMPTOMS
Recurrent tears were associated with diminished clinical outcome scores at two year follow-up.

What have we learned about age, smoking, obesity, biceps atrophy, and tear morphology?
**AGE**
Older patients reported better outcomes after surgery (WORC)

**OBESITY**
No significant difference between obese and non-obese patients (WORC)

**SMOKING**
Smokers reported worse scores over time for WORC
Does Concomitant Biceps Surgery Affect the Outcome of Rotator Cuff Repair?

![Graph showing the effect of LHB Procedure on AES Score from baseline to 1 year.](image)

- **P = .002**
- **AES Score 0-100**
- **No LHB Procedure**
- **LHB Procedure**

A  Baseline  16 Weeks  32 Weeks  1 Year

Does rotator cuff tear pattern influence clinical outcome after surgical repair?

Tear pattern does **NOT** appear to be a predictor of patient-reported outcome following arthroscopic rotator cuff repair.

**DOES MUSCLE QUALITY PREDICT OUTCOME?**

- Muscle quality had no effect on non-surgical outcomes
- In the setting of a positive “tangent sign”, there is no apparent benefit of surgery
- Thus, the tangent sign is a reliable prognostic indicator that can help guide treatment of rotator cuff tears
Statistical Significance versus Clinical Relevance

HOW GOOD IS “GOOD ENOUGH”? Establishing the MID

The minimally important difference (MID) is defined as the smallest change in an outcome measure that is perceived by patients as beneficial.

ASES: 20
WORC: 420 (20%)

ASES Score Surgery vs. Non-Surgery
SUMMARY:
Surgery vs Non-Surgery

- Surgical patients improved to a greater degree, more quickly, and with greater clinical relevance.
- Non-surgical patients may not be doing as well as we once thought.
CONCLUSION

ROTATOR CUFF SURGERY IS EFFECTIVE

SUMMARY OF CLINICAL OUTCOMES
McElvany/Matsen AJSM 2014

26% RE-TEAR RATE

CLINICAL IMPROVEMENT OF 85% OF MAXIMUM POSSIBLE SCORE

WHAT’S NEXT?
The power of collaboration