Non-Operative Treatment Of Rotator Cuff Tears: When Not To Operate

Joseph Hannon
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Houston Methodist Orthopedics & Sports Medicine

Weill Cornell Medical College

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OPTIMIZING THE MANAGEMENT OF ROTATOR CUFF PROBLEMS

GUIDELINE AND EVIDENCE REPORT

Adopted by the American Academy of Orthopaedic Surgeons Board of Directors December 4, 2010

- Defines what treatment the literature supports
  - Based on multiple systematic reviews

Appropriate-Use Criteria

Management of full-thickness rotator cuff tears: appropriate use criteria

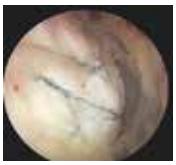
Christopher C. Schmidt, MD[a,*], Bernard F. Morrey, MD[b]

Journal of Shoulder and Elbow Surgery

- Established decision analysis
- Uses same literature as CPG
  - Adds clinician clinical experience and patient and disease factors to arrive at ***"appropriateness"*** of a given treatment
- Determines when treatment is indicated

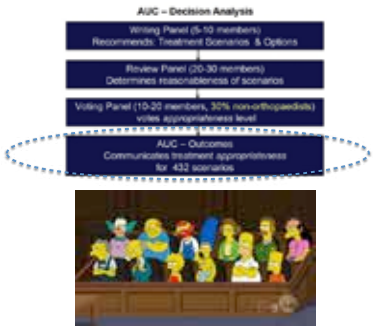
CPG vs AUC

- CPG
  - Designed to limit the effect of expert opinion



- AUC
  - Embraces expert opinion
  - Can identify a treatment in certain scenarios efficacious (ideal situation) or effective (practical situation) even without the support of high-level evidence

Appropriate-Use Criteria



Appropriate-Use Criteria

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Appropriateness of treatment
Appropriate: benefits outweigh risks
Maybe appropriate: benefits equal risks
Rarely appropriate: risks outweigh benefit

Non-Operative Treatment Success

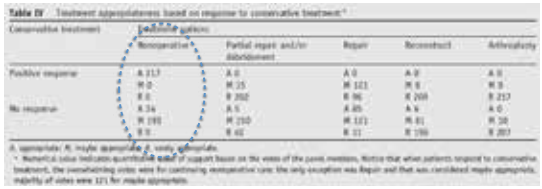


Table IV Treatment appropriateness based on response to conservative treatment.*

Conservative treatment	Additional options: Nonoperative	Partial repair and/or debridement	Repair	Reconstruct	Arthroplasty
Positive response	A 217 M 0 R 0	A 0 M 25 R 202	A 0 M 121 R 96	A 0 M 0 R 269	A 0 M 0 R 217
No response	A 34 M 190 R 0	A 5 M 250 R 60	A 85 M 121 R 11	A 6 M 61 R 190	A 0 M 28 R 207

A, appropriate; M, maybe appropriate; R, rarely appropriate.
* Numerical value indicates quantitative ranking of support based on the votes of the panel members. Notice that when patients respond to conservative treatment, the overwhelming votes were for continuing nonoperative care; the only exception was Repair and that was considered maybe appropriate, majority of votes were 121 for maybe appropriate.

Non-Operative Treatment Success

Table VI Results of regression analysis show the relative importance in determining appropriate treatment attributed to patient and disease factors*

Variables	β-value†	*P* value
Nonoperative treatment (R^2 = 0.879)		
Response to conservative treatment	2.593	<.001
ASA status	0.406	<.001
Symptom severity	0.372	<.001
Snyder tear classification	0.161	<.001
Identifiable factors to affect healing	0.148	<.001
Identifiable factors to affect outcome	NS‡	.194
Atrophy/fatty infiltration	NS	.363

* β is a statistical quantification of relative importance. Any numeric value indicates this parameter had some effect on the voting pattern.
† Indicates the presence of this variable had no influence on the voting panel referable to the given procedure.

Non-Operative Treatment Success

- Most salient observation of AUC for rotator cuff tear:
  - Response to initial non-operative treatment justifies ***continuation*** of non-operative care
  - Rotator cuff repair is ***appropriate*** in moderate to severe symptoms following failure of non-surgical treatment and ***maybe appropriate*** even with a positive response to non-surgical treatment

Prediction of Non-op Treatment Outcome

The Rotator Cuff Quality-of-Life Index Predicts the Outcome of Nonoperative Treatment of Patients with a Chronic Rotator Cuff Tear

- 93 patients with chronic full-thickness tear
- 3 months structured PT, 2 years follow-up
- 75% of patients successfully treated – no surgery
  - 89% of these patients maintained outcome at 2 years
- RC-QOL index most significant predictor of outcome (p=0.017)

Does The Tear Get Bigger With Non-op?

Evolution of Nonoperatively Treated Symptomatic Isolated Full-Thickness Supraspinatus Tears

- 24 subjects with full-thickness tear (mean 52 years)
  - Coronal size: 18 mm (Dx); 17 mm (3.5 year follow-up)
- Number of subjects with tear:
  - Tear smaller: 9 (disappeared in 2)
  - Tear same size: 9
  - Tear bigger: 6
- Significant (p=0.03) increase in fatty infiltration of supraspinatus (however, all but 2 were stage 0 or 1)

MOON Shoulder

Effectiveness of physical therapy in treating atraumatic full-thickness rotator cuff tears: a multicenter prospective cohort study

John E. Kuhn, MD, MS*, Warren R. Dunn, MD, MPH, Rosemary Sanders, BA, Qi An, MS, Keith M. Baumgarten, MD, Julie Y. Bishop, MD, Robert H. Brophy, MD, James L. Carey, MD, MPH, Brian G. Holloway, MD, Grant L. Jones, MD, C. Benjamin Ma, MD, Robert G. Marx, MD, MS, Eric C. McCarty, MD, Steven R. Poddar, MD, Matthew V. Smith, MD, Edwin E. Spencer, MD, Armando F. Vidal, MD, Brian R. Wolf, MD, MS, Rick W. Wright, MD, for the MOON Shoulder Group

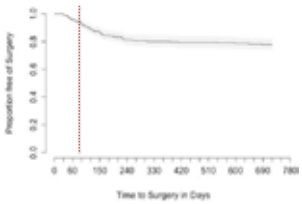
- Multicenter investigation of non-surgical treatment for atraumatic full-thickness rotator cuff tears
- Formal PT for 12 weeks
- Evaluations at 0, 6, 12 weeks

MOON Shoulder

Effectiveness of physical therapy in treating atraumatic full-thickness rotator cuff tears: a multicenter prospective cohort study

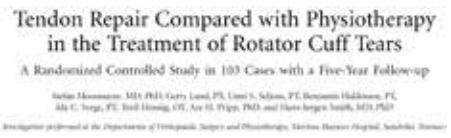
- 452 patients; Mean age 62 years
- Significantly (statistical and clinical) improved PRO's (ASES, WORC, SANE) at both 6 and 12 weeks
- Eventually underwent surgery:
  - 6 weeks: 9% (35 subjects)
  - 12 weeks: 15% (59)
  - 1 year: 21% (82)
  - 2 years: 26% (82)

MOON Shoulder



- Patients that undergo surgery do so within 12 weeks
- If patient avoids surgery in first 12 weeks, it is unlikely going to have surgery at up to 2 years

Non-op vs Op


Tendon Repair Compared with Physiotherapy in the Treatment of Rotator Cuff Tears

A Randomized Controlled Study in 103 Cases with a Five-Year Follow-up

- Single-center, 5 year follow-up, randomized trial
- 103 subjects, less than 3 cm cuff tear
  - Surgery better than PT in Constant (5.3 points), ASES (9 points)
  - 12 subjects in PT group converted to surgery
- In 37% of tears treated with PT alone, increasing tear sizes > 5 mm associated with inferior outcome

What Can We Do In PT?


Predictors of Pain and Function in Patients With Symptomatic, Atraumatic Full-Thickness Rotator Cuff Tears

A Time-Zero Analysis of a Prospective Patient Cohort Enrolled in a Structured Physical Therapy Program

- 389 subjects with symptomatic, atraumatic full-thickness cuff tears
- Higher WORC, ASES scores:
  - Absence of scapular dyskinesis
  - Strength in FE, abduction

Massive Tears

- Role of anterior deltoid strengthening:
- Zingg, Gerber, et al; 2007 JBJS Am
  - 19 pts, mean age 64 years, low demand, 4 year follow-up
  - Satisfactory shoulder function; 136/39/66
- Levy, Copeland, et al; 2008 JSES
  - 17 pts, mean age 80 years, low demand, 1 year follow-up
  - Constant increased 34 points; FE increased 120°

Cost of Non-Surgical Treatment

The costs associated with the evaluation of rotator cuff tears before surgical repair

Michael G. Yeranosian, MD, Rodney D. Terrell, MD, Jeffrey C. Wang, MD, David R. McAllister, MD, Frank A. Petrigliano, MD*

- PearlDiver Database
- 90 day period before undergoing surgery
  - 65%: Diagnostic imaging
  - 18%: Outpatient physician visits
  - 9%: Physical therapy
  - 3%: Injections
  - 5%: Miscellaneous

Conclusions

- Initial non-operative treatment may be recommended for most partial- and small full-thickness cuff tears
- Especially:
  - Medically unfit, does not want surgery
  - >70 years of age, irreversible changes (atrophy, infiltration, head migration), significant arthritis
  - Successful non-surgical treatment program
    - Especially if can succeed within 6-12 weeks
- Future study:
  - Clear need to determine which tears will progress and warrant early surgery

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