


Surface Replacement for the Active Patient with GH DJD

**2018 CURRENT SOLUTIONS IN SHOULDER & ELBOW SURGERY**  
FEBRUARY 1-3, 2018  
TAMPA, FL

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MS Sports Medicine  
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Disclosures

- Consultant for Exactech
- No royalties from any company
- Fellowship support from Mitek, S&N, Arthrex
- I've done only 2 resurfacings in my entire career

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Popularized by Copeland



Copeland CSRA Mark I      Copeland CSRA Mark II

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## Why Consider??

- No worry of glenoid loosening
- “Bone Preserving”
- “Easier Revision”
- “More Anatomic”

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### Cementless surface replacement arthroplasty of the shoulder for osteoarthritis: results of fifty Mark III Copeland prosthesis from an independent center with four-year mean follow-up.

[Al-Hadithy N<sup>1</sup>, Damos P, Sewell MD, Naleem A, Papanna MC, Pandit R.](#)

- 50 Mark III Copeland resurfacings in patients with OA
- Mean age of 69 yrs old. Mean follow up of 4.2 yrs.
- Average postoperative Constant score of 75.1
- Moderate glenoid erosion in 12% of cases, correlated with oversizing of components.
- Overall revision rate of 2%, due to one case of periprosthetic fracture

JSES 2012

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**Cementless Humeral Resurfacing Arthroplasty in Active Patients Less Than Fifty-five Years of Age**

By David S. Baillie, MD, Paulo I. Llinas, MD, and Todd S. Ellenbecker, DPT, MS, SCS, OCS, CSCS  
*Investigation performed at The Orthopaedic Clinic Association, Scottsdale, Arizona*

- **36 patients** (Mark II implant)
- Mean age: 42.3
- Mean f/u: **38.1 months**
- Sig improvement VAS, ASES, SANE
- Only **1 revision** to TSA for erosion
- 5 with biologic resurfacing of glenoid, 3 microfracture, 8 glenoid “recontouring”

*JBJS, 2008*

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**Long-term follow-up of the Copeland mark III shoulder resurfacing hemi-arthroplasty**

Paul Rai<sup>a</sup>, Owain Davies<sup>b</sup>, Jon Wand<sup>a</sup>, Ewan Bigsby<sup>b,\*</sup>

<sup>a</sup>Cheltenham General Hospital, Cheltenham GL53 7AN, UK  
<sup>b</sup>Royal United Hospital, Bath BA1 3NG, UK

- **40 SRA** (Mark IIIs)
- Avg age **73 yrs**, Mean **12 yr f/u**
- Avg. Oxford SS 35.2; SF-12 = 83
- 3 revisions (fracture)
- **95% survivorship at 18 yrs**
- Conclusion = **Good in elderly**

*J Orthop. 2015*

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**Results and limitations of humeral head resurfacing: 105 cases at a mean follow-up of 5 years.**  
Soudy K<sup>1</sup>, Szymanski C<sup>2</sup>, Lalanne C<sup>2</sup>, Bourgault C<sup>2</sup>, Thiounn A<sup>2</sup>, Cotten A<sup>3</sup>, Maynou C<sup>2</sup>.

- **40** Copeland and **65** Aequalis resurfacings
- Avg age **64 yrs**. Mean f/u 56 months.
- complication rate of **23%** and **revision rate 17%**.
- Constant score of 64. Only **65%** satisfied/very satisfied
- Mean increase in glenoid cavity depth **2.4 mm**.
- Pre-operative factors associated with failure were rotator cuff tear (p=0.017) and glenoid erosion (p=0.001).

*Orthop Traumatol Surg Res 2017*

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**Humeral surface replacement for osteoarthritis.**  
[Smith T](#), [Gettmann A](#), [Wellmann M](#), [Pastor F](#), [Struck M](#).

- 50 Global CAPs.
- Avg age 66 yrs. Mean f/u 30 months.
- Average Constant score of 73%.
- Significant radiographic glenoid erosion in 38 cases (62%)
- Revision arthroplasty performed in 11 cases (18%), after an average of 28 months.

Acta Orthop. 2013

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**Surface replacement arthroplasty for glenohumeral arthropathy in patients aged younger than fifty years: results after a minimum ten-year follow-up**

Ofer Levy, MD, MCh(Orth), FRCS\*, Oren Tsvieli, MD, Julia Merchant, MRCS, Lora Young, FRCS (Tr&Orth), Alberto Trimarchi, MD, Rupen Dattani, MD, FRCS (Tr&Orth), Ruben Abraham, FRCA, Stephen A. Copeland, FRCS, Ali Narvani, FRCS (Tr&Orth), Ehud Atoun, MD

- 54 resurfacings, average age 38.9 y.o.
- improved constant scores (78%)
- 8.7/10 satisfaction
- 18.5% revision rate



JSES, 2014

Figure 2 Copeland surface replacement arthroplasty—humeral surface arthroplasty.

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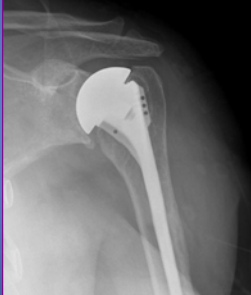
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**HHA for GH arthritis: Cofield et al, 1995**

- 67 HHA's (OA & RA)
- 18% required revision to TSA
- 51% unsatisfactory @ mean 10 yr f/u



Seminars in Arthroplasty, Vol 6, No 4 (October), 1995: pp 214-221

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### TSA v/s HHA: Columbia Meta-analysis; 2007, JSES

- 23 studies
- TSA significantly better pain relief, FE, ER, and patient satisfaction
- 6.5% revision of TSA's (1.7% all poly)
- 10.2% revision of HHA's

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### Risk factors for glenoid erosion in patients with shoulder hemiarthroplasty: an analysis of 118 cases

Ramin Herschel, MD\*, Karl Wieser, MD, Mark E. Morrey, MD, Carlos H. Ramos, MD, Christian Gerber, MD, FRCSEd (Hon), Dominik C. Meyer, MD

- 118 hemiarthroplasties (88 OA, 30 fx)
- Moderate erosion 29 %, Severe 28%
- 2.5 yr f/u
- Factors that resist erosion: NO glenoid cysts, NO glenoid cartilage loss, NO cuff fatty infiltration.

JSES, 2017

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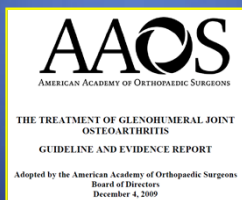
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#### RECOMMENDATION 8

We suggest total shoulder arthroplasty over hemiarthroplasty when treating patients with glenohumeral joint osteoarthritis.

AAOS Strength of Recommendation: **Moderate**

- Gartsman, et al. 2000
- Lo, et al. 2005




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### Glenoid Component Loosening: Mayo Clinic Survival Analysis; JSES, 2009

- 1524 TSA's ('84-'04)
- 6 glenoid types
- Neer all poly cemented: 96% @ 5yr, 96% @ 10yr, 94% @ 15 yr
- Cofield pegged all poly cemented: 99% @ 5yr

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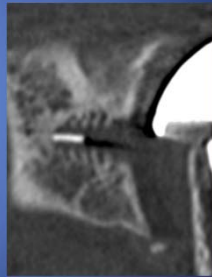
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### Five- to ten-year follow-up with a partially cemented all-polyethylene bone-ingrowth glenoid component

- 42 TSAs
- 80 mo avg f/u
- 97% survivorship
- 81% showed complete incorporation of central fluted peg



J Shoulder Elbow Surg (2015)

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### Resurfacing

- Why not just do a resurfacing and convert to TSA if still painful??
- TSA after Hemi is worse than primary TSA!!
  - Second hit to subscap
    - Carroll et al JSES 2004
    - Gartsman et al JBJS 2000
    - Sperling/Cofield JBJS 1998
    - Streubel et al IJSS 2016

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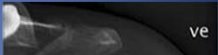
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**The Copeland resurfacing humeral head implant does not restore humeral head anatomy. A retrospective study**

- 71 Copeland resurfacings
- Avg age 61 yrs



In conclusion, the LGHO was significantly increased after Copeland RHHI and the high rate of revisions points to a problem with overstuffing associated with this prosthesis design. The design of the Copeland HHRI has been changed by the manufacturer to comply with the concerns



Arch Orthop Trauma Surg (2013) 133:615-619

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**Resurfacing humeral prosthesis: do we really reconstruct the anatomy?**

Pierre Mansat, MD, PhD\*, Anne-Sophie Coutié, MD, Nicolas Bonnevalle, MD, Michel Rongières, MD, Michel Mansat, MD, Paul Bonnevalle, MD

- HH height and radius of curvature restored of variation of this angle.<sup>3,14,15,25,30</sup> These results depend directly on the surgical technique and show the difficulty of implanting the prosthesis in a perfect position. The diffi-
- Avg. 57 yrs, Avg. 36 mo f/u
- 11 (17%) remained painful secondary to glenoid erosion

JSES, 2013

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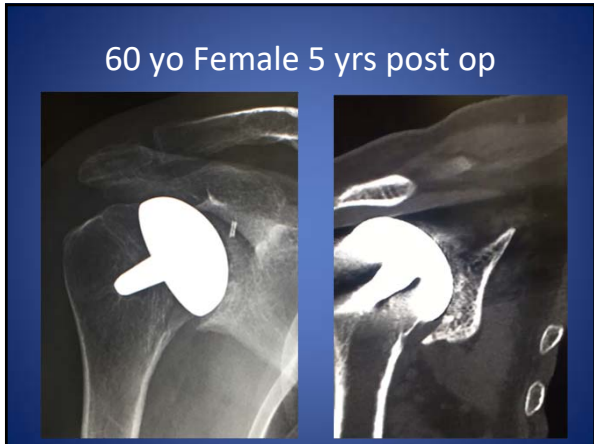
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### Sizing

- Create an "inset" resurfacing, NOT an "onlay"
- Goal is to pick a size that will leave a rim of bone for the implant to seat
- Seems to be a head thickness / head size mismatch that promotes overstuffing

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### Stemless Designs

Clinical and Radiographic Outcomes of the Simpliciti Canal-Sparing Shoulder Arthroplasty System: A Prospective Two-Year Multicenter Study.  
[Churchill RS<sup>1</sup>](#), [Chuinard C<sup>2</sup>](#), [Wiater JM<sup>3</sup>](#), [Friedman R<sup>4</sup>](#), [Freehill M<sup>5</sup>](#), [Jacobson S<sup>6</sup>](#), [Spencer E Jr<sup>7</sup>](#), [Holloway GB<sup>7</sup>](#), [Wittstein J<sup>8</sup>](#), [Lassiter T<sup>9</sup>](#), [Smith M<sup>9</sup>](#), [Blaine T<sup>10</sup>](#), [Nicholson GP<sup>11</sup>](#).

- 149 cases follow for a minimum of 2 yrs
- 2% revision rate
- Constant and ASES scores at 2 yrs : 104% and 92 score
- There was no evidence of migration, subsidence, osteolysis, or loosening of the humeral components or surviving glenoid components.

*JBJS* 2016 Apr 6;98(7):552-60.

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## Resurfacing (Hemiarthroplasty)

### Indications

- Osteoarthritis
- Rheumatoid
- Avascular necrosis
- Articular malunion
- Shaft malunion
- Chronic dislocations
- Large osteochondral defects
- Chondrolysis

### Contraindications

- Infection
- Rotator cuff deficient
- Severe stiffness
- B and C morphology glenoids
- Non-congruent humerus

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31 yo female - AVN



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31 yo female - AVN



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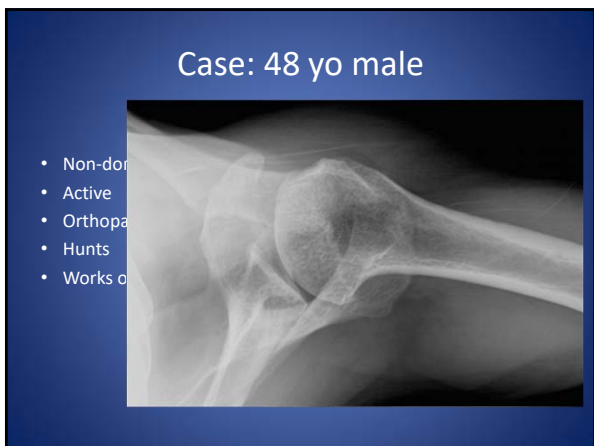
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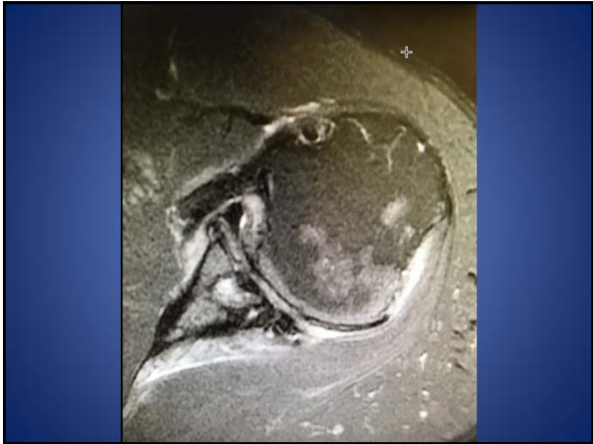
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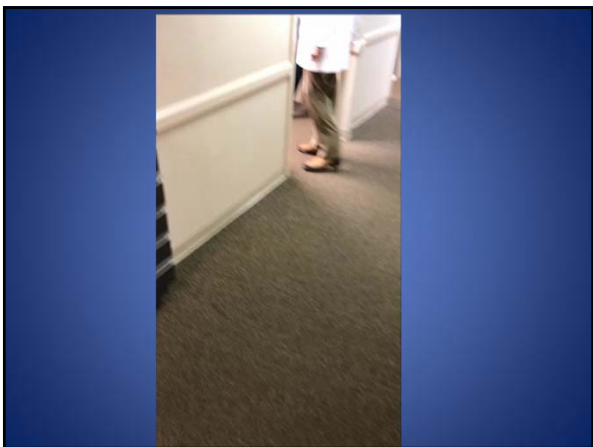
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### Summary

1. Longevity of resurfacing implants associated with minimal initial glenoid erosion, overall cuff integrity, > 60 yrs old.
3. Resurfacing failure rate of approx. 20% with non-ideal patient selection.
4. Avoid overstuffing with resurfacing
5. Normal glenoid ideal – AVN (NOT DJD)
6. You'll be quicker to revise a resurfacing for erosion than a TSA for glenoid loosening.

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