

Evidence Table 1
Nonoperative Treatment
Included and Excluded Articles

Author	Title	Included or Reason for Exclusion
Alexander MJL; Butcher JE; MacDonald PB	Effect of water exercise program on walking gait, flexibility, strength, self-reported disability and other psycho-social measures of older individuals with arthritis	Not specific to OA in shoulders
Schank JA;Herdman SJ;Bloyer RG;	Physical therapy in the multidisciplinary assessment and management of osteoarthritis	Not specific to OA in shoulders
Suomi R; Lindauer S	Effectiveness of arthritis foundation aquatic program on strength and range of motion in women with arthritis	Patients with hip and knee arthritis only
Norton CO;Hoobler K;Welding AB;Jensen GM;	Effectiveness of aquatic exercise in the treatment of women with osteoarthritis	Less than 10 patients per arm
Gilbertson B;Wenner K;Russell LC;	Acupuncture and arthroscopic acromioplasty	Patients with shoulder impingement syndrome
Bingol U;Altan L;Yurtkuran M;	Low-power laser treatment for shoulder pain	Shoulder Diagnosis not reported
Osmotherly P;Higginbotham N;	Assessing patient intention to perform a home based exercise program for back and shoulder pain	Patients with rotator cuff problems
Lafortuna CL;Rossi E;	The treatment of chronic shoulder pain with wrist-ankle acupuncture	Shoulder Diagnosis not reported

Evidence Table 2
Pharmacotherapy
Included Excluded Articles

Author	Title	Included or Reason for Exclusion
Diamond HS;	Double-blind crossover study of fenoprofen and aspirin in osteoarthritis	Includes patients with shoulder, hip, and knee OA
Yelland MJ;Nikles CJ;McNairn N;Del Mar CB;Schluter PJ;Brown RM;	Celecoxib compared with sustained-release paracetamol for osteoarthritis: a series of n-of-1 trials	Less than ten patients with OA shoulder
Geis GS;	Arthrotec(registered trademark): A therapeutic option in the management of arthritis	Not relevant
Thompson PW;Tee L;McBride J;Quincey D;Liddiard GS;	Long-term NSAID use in primary care: Changes over a decade and NICE risk factors for gastrointestinal adverse events	No Diagnosis
Schumacher J;	Aspiration and injection therapies for joints	No Quantitative Data

**Evidence Table 3
Injectable Pharmacologic Agents
Included and Excluded Articles**

Author	Title	Included or Reason for Exclusion
Silverstein E;Leger R;Shea KP;	The use of intra-articular hylan G-F 20 in the treatment of symptomatic osteoarthritis of the shoulder: a preliminary study	Included
Shanahan EM;Smith MD;Wetherall M;Lott CW;Slavotinek J;FitzGerald O;Ahern MJ;	Suprascapular nerve block in chronic shoulder pain: are the radiologists better?	Not relevant
Wollstein R; Chaimsky G; Carlson L; Watson H; Wollstein G; Saleh J;	Evaluating Short-Term Pain After Steroid Injection	Not specific to OA
Naredo E; Cabero F; Beneyto P; Cruz A; Mondejar B; Uson J; Palop M Crespo M	A randomized comparative study of short term response to blind injection versus sonographic guided injection of local corticosteroids in patients with painful shoulder	Not specific to patients with OA
Leardini G;Perbellini A;Franceschini M;Mattara L;	Intra-articular injections of hyaluronic acid in the treatment of painful shoulder	No validated outcome measures
Blaine T;Moskowitz R;Udell J;Skyhar M;Levin R;Friedlander J;Daley M;Altman R;	Treatment of persistent shoulder pain with sodium hyaluronate: a randomized, controlled trial. A multicenter study	Patients with rotator cuff tear
Skedros JG;Hunt KJ;Pitts TC;	Variations in corticosteroid/anesthetic injections for painful shoulder conditions: comparisons among orthopaedic surgeons, rheumatologists, and physical medicine and primary-care physicians	Not relevant
Gado I;Emery P;	Intra-articular guanethidine injection for resistant shoulder pain: A preliminary double blind study of a novel approach	Less than 80% of patients with glenohumeral osteoarthritis
Shea KP;	Intra-articular viscosupplementation with hyaluronic acid for symptomatic osteoarthritis of the glenohumeral joint	No Quantitative Data
Cameron B; Galatz L; Ramsey M; Williams G; Iannotti J	Non-prosthetic management of grade IV osteochondral lesions of the glenohumeral joint	Retrospective Case Series

Evidence Table 3
Injectable Pharmacologic Agents
Included and Excluded Articles

Author	Title	Included or Reason for Exclusion
Diamond HS;	Double-blind crossover study of fenoprofen and aspirin in osteoarthritis	Includes patients with hip, shoulder and knee

**Evidnece Table 4
Viscosupplementation
Design and Quality**

<p align="center">● = Yes ○ = No × = Not Reported n/a = not applicable</p>					Consecutive enrollment of patients	Follow Up - 80% or more	All patients evaluated using same outcome measures	All patients receive same treatment	All pateints have approximately equal follow-up times
Author	Outcome	N	Treatment(s)	Level of Evidence					
Silverstein, et al. 2007	VAS	26	Hylan G-F 20	Level IV	●	●	●	●	●
Silverstein, et al. 2007	UCLA	26	Hylan G-F20	Level IV	●	●	●	●	●
Silverstein, et al. 2007	SST	26	Hylan G-F20	Level IV	●	●	●	●	●
Silverstein, et al. 2007	VAS	26	Hylan G-F 20	Level IV	●	●	●	●	●
Silverstein, et al. 2007	VAS	25	Hylan G-F 20	Level IV	●	●	●	●	●
Silverstein, et al. 2007	SST	26	Hylan G-F20	Level IV	●	●	●	●	●
Silverstein, et al. 2007	SST	25	Hylan G-F20	Level IV	●	●	●	●	●

Evidence Table 5
Viscosupplementation
Study Data

<u>Author</u>	<u>Outcome</u>	<u>N</u>	<u>Duration</u>	<u>Treatment(s)</u>	<u>Result</u>
Silverstein, et al. 2007	VAS Pain	30	baseline	intra-articular hylan G-F 20 injections	54 ± nr
Silverstein, et al. 2007	VAS Pain	26	1 month	intra-articular hylan G-F 20 injections	42 ± nr
Silverstein, et al. 2007	VAS Pain	26	3 months	intra-articular hylan G-F 20 injections	36 ± nr
Silverstein, et al. 2007	VAS Pain	25	6 monts	intra-articular hylan G-F 20 injections	30 ± nr
Silverstein, et al. 2007	UCLA	30	baseline	intra-articular hylan G-F 20 injections	15.7 ± nr
Silverstein, et al. 2007	UCLA	26	1 month	intra-articular hylan G-F 20 injections	20 ± nr
Silverstein, et al. 2007	UCLA	26	3 months	intra-articular hylan G-F 20 injections	20.8 ± nr
Silverstein, et al. 2007	UCLA	25	6 months	intra-articular hylan G-F 20 injections	24.1 ± nr
Silverstein, et al. 2007	SST- Percent of patients able to sleep comfortably	30	baseline	intra-articular hylan G-F 20 injections	15 ± nr
Silverstein, et al. 2007	SST- Percent of patients able to sleep comfortably	26	1 month	intra-articular hylan G-F 20 injections	38.5 ± nr
Silverstein, et al. 2007	SST- Percent of patients able to sleep comfortably	26	3 months	intra-articular hylan G-F 20 injections	46 ± nr

Evidence Table 5
Viscosupplementation
Study Data

<u>Author</u>	<u>Outcome</u>	<u>N</u>	<u>Duration</u>	<u>Treatment(s)</u>	<u>Result</u>
Silverstein, et al. 2007	SST- Percent of patients able to sleep comfortably	25	6 months	intra-articular hylan G-F 20 injections	56 ± nr
Silverstein, et al. 2007	SST- Number of "yes" responses	30	baseline	intra-articular hylan G-F 20 injections	5.7 ± nr
Silverstein, et al. 2007	SST- Number of "yes" responses	26	1 month	intra-articular hylan G-F 20 injections	7.2 ± nr
Silverstein, et al. 2007	SST- Number of "yes" responses	26	3 months	intra-articular hylan G-F 20 injections	7.2 ± nr
Silverstein, et al. 2007	SST- Number of "yes" responses	25	6 months	intra-articular hylan G-F 20 injections	7.6 ± nr

Evidence Table 6
Arthroscopic Treatment
Included and Excluded Articles

Author	Title	Included or Reason for Exclusion
Weinstein DM;Bucchieri JS;Pollock RG;Flatow EL;Bigliani LU;	Arthroscopic debridement of the shoulder for osteoarthritis	No Validated Outcome Measures
Safran MR;Baillargeon D;	The role of arthroscopy in the treatment of glenohumeral arthritis	Includes Patients with AVN and rotator cuff arthropathy
Peidro L;Segur JM;Poggio D;Fernandez de RP;	Use of freeze-dried bone allograft with platelet-derived growth factor for revision of a glenoid component	Case Report
Kerr BJ;McCarty EC;	Outcome of arthroscopic debridement is worse for patients with glenohumeral arthritis of both sides of the joint	Less than 2 year follow up
Ogilvie-Harris DJ;Wiley AM;	Arthroscopic surgery of the shoulder. A general appraisal	Retrospective Case Series
Matthews LS;LaBudde JK;	Arthroscopic treatment of synovial diseases of the shoulder	Less than 80% of patients with glenohumeral osteoarthritis
Richards DP;Burkhart SS;	Arthroscopic debridement and capsular release for glenohumeral osteoarthritis	Less than 10 patients per group

Evidence Table 7
Debridement or Nonprosthetic or Biologic Interposition Arthroplasty
Included and Excluded Articles

Author	Title	Included or Reason for Exclusion
Nicholson GP;Goldstein JL;Romeo AA;Cole BJ;Hayden JK;Twigg SL;McCarty LP;Dettlerline AJ;	Lateral meniscus allograft biologic glenoid arthroplasty in total shoulder arthroplasty for young shoulders with degenerative joint disease	Includes patients with arthrosis post-instability surgery and post-traumatic
Peidro L;Segur JM;Poggio D;Fernandez de RP;	Use of freeze-dried bone allograft with platelet-derived growth factor for revision of a glenoid component	Case Report
Spencer R; Skirving AP;	Silastic interpositional arthroplasty of the shoulder	Less than 10 patients with OA
Krishnan SG;Nowinski RJ;Harrison D;Burkhead WZ;	Humeral hemiarthroplasty with biologic resurfacing of the glenoid for glenohumeral arthritis. Two to fifteen-year outcomes	50% with Osteoarthritis
Krishnan SG;Reineck JR;Nowinski RJ;Harrison D;Burkhead WZ;	Humeral hemiarthroplasty with biologic resurfacing of the glenoid for glenohumeral arthritis. Surgical technique	No Quantitative Data
Elhassan B; Ozbaydar M; Diller D; Warner J	Soft Tissue Resurfacing of the Glenoid in the Treatment of Glenohumeral Arthritis in Active Patients Less Than Fifty Years Old	Less than 10 patients with OA

Evidence Table 8
Hemiarthroplasty and Total Shoulder Arthroplasty
Included and Excluded Articles

Author	Title	Included or Reason for Exclusion
Fehringer EV;Kopjar B;Boorman RS;Churchill RS;Smith KL;Matsen FA;	Characterizing the functional improvement after total shoulder arthroplasty for osteoarthritis	Included
Lynch JR;Franta AK;Montgomery WH;Lenters TR;Mounce D;Matsen FA;	Self-assessed outcome at two to four years after shoulder hemiarthroplasty with concentric glenoid reaming	Included
Raiss P;Aldinger PR;Kasten P;Rickert M;Loew M;	Total shoulder replacement in young and middle-aged patients with glenohumeral osteoarthritis	Included
Boorman RS;Kopjar B;Fehringer E;Churchill RS;Smith K;Matsen FA;	The effect of total shoulder arthroplasty on self-assessed health status is comparable to that of total hip arthroplasty and coronary artery bypass grafting	Included
Wirth MA;Tapscott RS;Southworth C;Rockwood CA;	Treatment of glenohumeral arthritis with a hemiarthroplasty: a minimum five-year follow-up outcome study	Included
Lo IK;Litchfield RB;Griffin S;Faber K;Patterson SD;Kirkley A;	Quality-of-life outcome following hemiarthroplasty or total shoulder arthroplasty in patients with osteoarthritis. A prospective, randomized trial	Included
Gartsman GM;Roddey TS;Hammerman SM;	Shoulder arthroplasty with or without resurfacing of the glenoid in patients who have osteoarthritis	Included
Norris TR;Iannotti JP;	Functional outcome after shoulder arthroplasty for primary osteoarthritis: a multicenter study	Included
Cofield RH;Frankle MA;Zuckerman JD;	Humeral head replacement for glenohumeral arthritis	Included
Iannotti JP;Norris TR;	Influence of preoperative factors on outcome of shoulder arthroplasty for glenohumeral osteoarthritis	Included

Evidence Table 8
Hemiarthroplasty and Total Shoulder Arthroplasty
Included and Excluded Articles

Author	Title	Included or Reason for Exclusion
Orfaly RM;Rockwood CA;Esenyel CZ;Wirth MA;	A prospective functional outcome study of shoulder arthroplasty for osteoarthritis with an intact rotator cuff	Included
Torchia M; Cofield R; Settergren C;	Total shoulder arthroplasty with the Neer prosthesis: Long term results	Retrospective Case Series
Worland RL;Arredondo J;	Bipolar shoulder arthroplasty for painful conditions of the shoulder	Not Relevant
Levine WN;Djurasovic M;Glasson JM;Pollock RG;Flatow EL;Bigliani LU;	Hemiarthroplasty for glenohumeral osteoarthritis: results correlated to degree of glenoid wear	Retrospective Case Series
Boileau P;Walch G;Noel E;Liotard JP;	Neer shoulder prosthesis: Outcome according to the shoulder disease	No validated outcome measures for osteoarthritis
Merolla G;Paladini P;Campi F;Porcellini G;	Efficacy of anatomical prostheses in primary glenohumeral osteoarthritis	Retrospective Case Series
Seneriz R;Deliz E;Delgado J;Vilella FE;Ramirez N;	Results of Shoulder Arthroplasty in Nontraumatic Conditions: Third-generation Prosthesis Experience	Retrospective Case Series
Matsen FA;Antoniou J;Rozencwaig R;Campbell B;Smith KL;	Correlates with comfort and function after total shoulder arthroplasty for degenerative joint disease	Retrospective Case Series
Edwards TB;Kadokia NR;Boulahia A;Kempf JF;Boileau P;Nemoz C;Walch G;	A comparison of hemiarthroplasty and total shoulder arthroplasty in the treatment of primary glenohumeral osteoarthritis: results of a multicenter study	Retrospective Case Series
Brenner BC;Ferlic DC;Clayton ML;Dennis DA;	Survivorship of unconstrained total shoulder atthroplasty	Retrospective Case Series

**Evidence Table 8
Hemiarthroplasty and Total Shoulder Arthroplasty
Included and Excluded Articles**

Author	Title	Included or Reason for Exclusion
Edwards TB;Boulahia A;Kempf JF;Boileau P;Nemoz C;Walch G;	Shoulder arthroplasty in patients with osteoarthritis and dysplastic glenoid morphology	Incorrect Patient Population
Clinton J;Franta AK;Lenters TR;Mounce D;Matsen FA;	Nonprosthetic glenoid arthroplasty with humeral hemiarthroplasty and total shoulder arthroplasty yield similar self-assessed outcomes in the management of comparable patients with glenohumeral arthritis	Retrospective Case Series
Levy O;Copeland SA;	Cementless surface replacement arthroplasty (Copeland CSRA) for osteoarthritis of the shoulder	Retrospective Case Series
Szabo I;Buscayret F;Edwards TB;Nemoz C;Boileau P;Walch G;	Radiographic comparison of flat-back and convex-back glenoid components in total shoulder arthroplasty	No Patient Oriented Outcomes
Lazarus MD;Jensen KL;Southworth C;Matsen FA;	The radiographic evaluation of keeled and pegged glenoid component insertion	No Patient Oriented Outcomes
Krishnan SG;Nowinski RJ;Harrison D;Burkhead WZ;	Humeral hemiarthroplasty with biologic resurfacing of the glenoid for glenohumeral arthritis. Two to fifteen-year outcomes	50% with Osteoarthritis
Mileti J;Sperling JW;Cofield RH;	Shoulder arthroplasty for the treatment of postinfectious glenohumeral arthritis	Patients with shoulder arthritis due to infection
Bigliani LU;Weinstein DM;Glasgow MT;Pollock RG;Flatow EL;	Glenohumeral arthroplasty for arthritis after instability surgery	Incorrect Patient Population
Rispoli DM;Sperling JW;Athwal GS;Schleck CD;Cofield RH;	Humeral head replacement for the treatment of osteoarthritis	Retrospective Case Series
Tammachote N;Sperling JW;Vathana T;Cofield RH;Harmsen WS;Schleck CD;	Long-term results of cemented metal-backed glenoid components for osteoarthritis of the shoulder	Retrospective Case Series

**Evidence Table 8
Hemiarthroplasty and Total Shoulder Arthroplasty
Included and Excluded Articles**

Author	Title	Included or Reason for Exclusion
Goldberg BA;Smith K;Jackins S;Campbell B;Matsen FA;	The magnitude and durability of functional improvement after total shoulder arthroplasty for degenerative joint disease	Retrospective Case Series
Wallace AL;Walsh WR;Sonnabend DH;	Dissociation of the glenoid component in cementless total shoulder arthroplasty	Case Report
Chen AL;Bain EB;Horan MP;Hawkins RJ;	Determinants of patient satisfaction with outcome after shoulder arthroplasty	less than 2 year follow up
Edwards TB;Sabonghy EP;Elkousy H;Warnock KM;Hammerman SM;O'Connor DP;Gartsman GM;	Glenoid component insertion in total shoulder arthroplasty: comparison of three techniques for drying the glenoid before cementation	less than 2 year follow up
Fenlin JM;	Total glenohumeral joint replacement	No Quantatative Data
Frankle M;Siegal S;Pupello D;Saleem A;Mighell M;Vasey M;	The Reverse Shoulder Prosthesis for glenohumeral arthritis associated with severe rotator cuff deficiency. A minimum two-year follow-up study of sixty patients	Less than 80% of patients with glenohumeral osteoarthritis
Buchner M;Eschbach N;Loew M;	Comparison of the short-term functional results after surface replacement and total shoulder arthroplasty for osteoarthritis of the shoulder: a matched-pair analysis	Less than 2 year follow up
Green A;Norris TR;	Shoulder arthroplasty for advanced glenohumeral arthritis after anterior instability repair	Retrospective Case Series
Krishnan SG;Reineck JR;Nowinski RJ;Harrison D;Burkhead WZ;	Humeral hemiarthroplasty with biologic resurfacing of the glenoid for glenohumeral arthritis. Surgical technique	No Quantatative Data
Matsen FA;	Early effectiveness of shoulder arthroplasty for patients who have primary glenohumeral degenerative joint disease	Less than 2 year follow up

**Evidence Table 8
Hemiarthroplasty and Total Shoulder Arthroplasty
Included and Excluded Articles**

Author	Title	Included or Reason for Exclusion
Matsoukis J;Tabib W;Guiffault P;Mandelbaum A;Walch G;Nemoz C;Edwards TB;	Shoulder arthroplasty in patients with a prior anterior shoulder dislocation. Results of a multicenter study	patients with shoulder dislocation
Neer CS;	Replacement arthroplasty for glenohumeral osteoarthritis	No Validated Outcome Measures
Nicholson GP;Goldstein JL;Romeo AA;Cole BJ;Hayden JK;Twigg SL;McCarty LP;Dettlerline AJ;	Lateral meniscus allograft biologic glenoid arthroplasty in total shoulder arthroplasty for young shoulders with degenerative joint disease	Less than 80% of patients with glenohumeral osteoarthritis
Skirving AP;	Total shoulder arthroplasty -- current problems and possible solutions	No Quantatative Data
Sperling JW;Cofield RH;Rowland CM;	Neer hemiarthroplasty and Neer total shoulder arthroplasty in patients fifty years old or less. Long-term results	Retrospective Case Series
Cofield RH	Total Shoulder Arthroplasty with the Neer Prosthesis	Osteoarthritis results are combined with other diagnosis
Godeneche A; Boileau P; Favard L; Le Huec JC; Levigne C; Nove-Josserand L; Walch G; Edwards B	Prosthetic replacement in the treatment of osteoarthritis of the shoulder: Early results of 268 cases	Retrospective Case Series
Haines JF;Trail IA;Nuttall D;Birch A;Barrow A;	The results of arthroplasty in osteoarthritis of the shoulder	Less than 80% of patients with glenohumeral osteoarthritis

Evidence Table 9
Hemiarthroplasty
Design and Quality

<p>● = Yes ○ = No × = Not Reported n/a = not applicable</p>					Consecutive enrollment of patients	Follow up - 80% or more	All patients evaluated using same outcome measures	All patients receive same treatment	All patients have approximately equal follow-up times
Author	Outcome	N	Treatment(s)	Level of Evidence					
Wirth, et al. 2006	Pain	46	HHS	Level V	●	○	●	●	○
Wirth, et al. 2006	Pain	49	HHS	Level V	●	○	●	●	○
Wirth, et al. 2006	Pain at rest	46	HHS	Level V	●	○	●	●	○
Wirth, et al. 2006	Pain at rest	49	HHS	Level V	●	○	●	●	○
Wirth, et al. 2006	Pain during sleep	46	HHS	Level V	●	○	●	●	○
Wirth, et al. 2006	Pain during sleep	49	HHS	Level V	●	○	●	●	○
Wirth, et al. 2006	Shoulder function	45	HHS	Level V	●	○	●	●	○
Wirth, et al. 2006	Shoulder function	49	HHS	Level V	●	○	●	●	○
Wirth, et al. 2006	Work and play	46	HHS	Level V	●	○	●	●	○
Wirth, et al. 2006	Work and play	49	HHS	Level V	●	○	●	●	○

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Hemiarthroplasty
Design and Quality

<p>● = Yes ○ = No × = Not Reported n/a = not applicable</p>					Consecutive enrollment of patients	Follow up - 80% or more	All patients evaluated using same outcome measures	All patients receive same treatment	All patients have approximately equal follow-up times
Author	Outcome	N	Treatment(s)	Level of Evidence					
Wirth, et al. 2006	Quality of life	46	HHS	Level V	●	○	●	●	○
Wirth, et al. 2006	Quality of life	49	HHS	Level V	●	○	●	●	○
Iannotti, et al. 2003	ASES Pain	33	HHS	Level V	●	●	●	●	○
Iannotti, et al. 2003	ASES Satisfaction	33	HHS	Level V	●	●	●	●	○
Iannotti, et al. 2003	ASES Quality of Life	33	HHS	Level V	●	●	●	●	○
Iannotti, et al. 2003	ASES Score	33	HHS	Level V	●	●	●	●	○
Orfaly, et al. 2003	ASES	28	HHS	Level V	●	●	●	●	○
Norris, et al. 2002	Pain	32	HHS	Level V	●	○	●	○	○
Norris, et al. 2002	Function	32	HHS	Level V	●	○	●	○	○
Norris, et al. 2002	Use	32	HHS	Level V	●	○	●	○	○

**Evidence Table 9
Hemiarthroplasty
Design and Quality**

<p align="center">● = Yes ○ = No × = Not Reported n/a = not applicable</p>					Consecutive enrollment of patients	Follow up - 80% or more	All patients evaluated using same outcome measures	All patients receive same treatment	All patients have approximately equal follow-up times
Author	Outcome	N	Treatment(s)	Level of Evidence					
Norris, et al. 2002	ASES	32	HHS	Level V	●	○	●	○	○
Gartsman, et al. 2000	ASES Pain	24	HHS	Level V	●	●	●	●	○
Gartsman, et al. 2000	ASES Activites of Daily Living	24	HHS	Level V	●	●	●	●	○
Gartsman, et al. 2000	ASES	24	HHS	Level V	●	●	●	●	○
Gartsman, et al. 2000	UCLA Pain	24	HHS	Level V	●	●	●	●	○
Gartsman, et al. 2000	UCLA Satisfaction	24	HHS	Level V	●	●	●	●	○
Gartsman, et al. 2000	UCLA Function	24	HHS	Level V	●	●	●	●	○
Gartsman, et al. 2000	UCLA Motion	24	HHS	Level V	●	●	●	●	○
Gartsman, et al. 2000	UCLA Strength	24	HHS	Level V	●	●	●	●	○
Gartsman, et al. 2000	UCLA	24	HHS	Level V	●	●	●	●	○

Evidence Table 9
Hemiarthroplasty
Design and Quality

<p>● = Yes ○ = No × = Not Reported n/a = not applicable</p>					Consecutive enrollment of patients	Follow up - 80% or more	All patients evaluated using same outcome measures	All patients receive same treatment	All patients have approximately equal follow-up times
Author	Outcome	N	Treatment(s)	Level of Evidence					
Gartsman, et al. 2000	Unsatisfactory Results	24	HHS	Level V	●	●	●	●	○
Lynch et al 2007.	Complications	34	HHS	Level V	●	●	●	●	○
Cofield, et al. 1995	Complications	35	HHS	Level V	○	●	○	●	●

**Evidence Table 10
Hemiarthroplasty
Study Data**

Author	Outcome	Duration	N	Treatment(s)	Results
Gartsman,et al. 2000	ASES	0 years	24	Hemiarthroplasty	27.4 [95% CI, 25.9, 29.3]
Gartsman,et al. 2000	ASES	34 months	24	Hemiarthroplasty	65.2 [95% CI55.2, 75.1]
Gartsman,et al. 2000	ASES Activities of Daily Living	0 years	24	Hemiarthroplasty	13.2 ± nr
Gartsman,et al. 2000	ASES Activities of Daily Living	34 months	24	Hemiarthroplasty	34.9 ± nr
Gartsman,et al. 2000	ASES Pain	0 years	24	Hemiarthroplasty	9.4 ± nr
Gartsman,et al. 2000	ASES Pain	34 months	24	Hemiarthroplasty	30.2 ± nr
Iannotti, et al. 2003	VAS Pain	0 days	33	Hemiarthroplasty	73 [95% CI 66.18, 79.82]
Iannotti, et al. 2003	VAS Pain	46 months	33	Hemiarthroplasty	20 [95% CI 11.67, 27.23]
Iannotti, et al. 2003	VAS Quality of Life	0 days	33	Hemiarthroplasty	61 [95% CI 51.45, 70.55]
Iannotti, et al. 2003	VAS Quality of Life	46 months	33	Hemiarthroplasty	17 [95% CI 7.79, 26.21]

**Evidence Table 10
Hemiarthroplasty
Study Data**

Author	Outcome	Duration	N	Treatment(s)	Results
Iannotti, et al. 2003	VAS Satisfaction	0 days	33	Hemiarthroplasty	78 [95% CI 71.52, 84.48]
Iannotti, et al. 2003	VAS Satisfaction	46 months	33	Hemiarthroplasty	18 [95% CI 9.81, 26.19]
Iannotti, et al. 2003	ASES Total Score	0 days	33	Hemiarthroplasty	35 [95% CI 29.88, 40.12]
Iannotti, et al. 2003	ASES Total Score	46 months	33	Hemiarthroplasty	79 [95% CI 71.83, 86.17]
Gartsman, et al. 2000	UCLA Function	0 years	24	Hemiarthroplasty	1.5 ± nr
Gartsman, et al. 2000	UCLA Function	34 months	24	Hemiarthroplasty	6.2 ± nr
Gartsman, et al. 2000	UCLA Motion	0 years	24	Hemiarthroplasty	2.4 ± nr
Gartsman, et al. 2000	UCLA Motion	34 months	24	Hemiarthroplasty	4.1 ± nr
Gartsman, et al. 2000	UCLA Pain	0 years	24	Hemiarthroplasty	1.5 ± nr
Gartsman, et al. 2000	UCLA Pain	34 months	24	Hemiarthroplasty	6 ± nr

**Evidence Table 10
Hemiarthroplasty
Study Data**

Author	Outcome	Duration	N	Treatment(s)	Results
Gartsman,et al. 2000	UCLA Satisfaction	0 years	24	Hemiarthroplasty	0.3 ± nr
Gartsman,et al. 2000	UCLA Satisfaction	34 months	24	Hemiarthroplasty	3.2 ± nr
Gartsman,et al. 2000	UCLA Strenght	0 years	24	Hemiarthroplasty	2.6 ± nr
Gartsman,et al. 2000	UCLA Strenght	34 months	24	Hemiarthroplasty	3.7 ± nr
Gartsman,et al. 2000	UCLA Total Score	0 years	24	Hemiarthroplasty	8.3 [95% CI 6.9, 9.7]
Gartsman,et al. 2000	UCLA Total Score	34 months	24	Hemiarthroplasty	23.2 [95% CI 20.9, 25.9]
Orfaly et al. 2003	VAS Function	0 dyas	28	Hemiarthroplasty	59 ± nr
Orfaly et al. 2003	VAS Function	4.3 years	28	Hemiarthroplasty	13 ± nr
Norris and Iannotti 2002	VAS Function	0 days	32	Hemiarthroplasty	78 [95% CI 71.53, 84.47]
Wirth, et al. 2006	VAS Pain	0 days	49	Hemiarthroplasty	58.4 ± nr

Evidence Table 10
Hemiarthroplasty
Study Data

Author	Outcome	Duration	N	Treatment(s)	Results
Wirth, et al. 2006	VAS Pain	2 years	46	Hemiarthroplasty	14.9 ± nr
Wirth, et al. 2006	VAS Pain	5-7 years	49	Hemiarthroplasty	18.6 ± nr
Orfaly et al. 2003	VAS Pain	0 dyas	28	Hemiarthroplasty	56 ± nr
Orfaly et al. 2003	VAS Pain	4.3 years	28	Hemiarthroplasty	17 ± nr
Wirth, et al. 2006	VAS Pain at Rest	0 days	49	Hemiarthroplasty	32.3 ± nr
Wirth, et al. 2006	VAS Pain at Rest	2 years	46	Hemiarthroplasty	3.1 ± nr
Wirth, et al. 2006	VAS Pain at Rest	7.5 years	49	Hemiarthroplasty	6.9 ± nr
Wirth, et al. 2006	VAS Pain during Sleep	0 days	49	Hemiarthroplasty	69.5 ± nr
Wirth, et al. 2006	VAS Pain during Sleep	2 years	46	Hemiarthroplasty	11 ± nr
Wirth, et al. 2006	VAS Pain during Sleep	7.5 years	49	Hemiarthroplasty	12.4 ± nr

Evidence Table 10
Hemiarthroplasty
Study Data

Author	Outcome	Duration	N	Treatment(s)	Results
Wirth, et al. 2006	VAS Quality of life	0 days	49	Hemiarthroplasty	59.2 ± nr
Wirth, et al. 2006	VAS Quality of life	2 years	46	Hemiarthroplasty	13.3 ± nr
Wirth, et al. 2006	VAS Quality of life	7.5 years	49	Hemiarthroplasty	14.7 ± nr
Wirth, et al. 2006	VAS Shoulder function	0 days	49	Hemiarthroplasty	66.9 ± nr
Wirth, et al. 2006	VAS Shoulder function	2 years	46	Hemiarthroplasty	14 ± nr
Wirth, et al. 2006	VAS Shoulder function	7.5 years	49	Hemiarthroplasty	20.3 ± nr
Wirth, et al. 2006	VAS Work and Play	0 days	49	Hemiarthroplasty	68.6 ± nr
Wirth, et al. 2006	VAS Work and Play	2 years	46	Hemiarthroplasty	15.7 ± nr
Wirth, et al. 2006	VAS Work and Play	7.5 years	49	Hemiarthroplasty	21 ± nr

**Evidence Table 11
Total Shoulder Arthroplasty
Quality and Design**

<p align="center">● = Yes ○ = No × = Not Reported n/a = not applicable</p>					Consecutive enrollment of patients	Follow up - 80% or more	All patients evaluated using same outcome measures	All patients receive same treatment	All patients have approximately equal follow-up times
Author	Outcome	N	Treatment(s)	Level of Evidence					
Raiss, et al. 2008	Survival and Complications	21	TSA	Level V	●	●	●	●	○
Raiss, et al. 2008	Constant and Murley Score	21	TSA	Level V	●	●	●	●	○
Raiss, et al. 2008	Pain	21	TSA	Level V	●	●	●	●	○
Raiss, et al. 2008	Power	21	TSA	Level V	●	●	●	●	○
Raiss, et al. 2008	Activity	21	TSA	Level V	●	●	●	●	○
Raiss, et al. 2008	Mobility	21	TSA	Level V	●	●	●	●	○
Raiss, et al. 2008	Constant and Murley Score	24	TSA	Level V	●	●	●	●	○

**Evidence Table 11
Total Shoulder Arthroplasty
Quality and Design**

<p align="center">● = Yes ○ = No × = Not Reported n/a = not applicable</p>					Consecutive enrollment of patients	Follow up - 80% or more	All patients evaluated using same outcome measures	All patients receive same treatment	All patients have approximately equal follow-up times
Author	Outcome	N	Treatment(s)	Level of Evidence					
Boorman, et al. 2003	SF-36 Physical Function	91	TSA	Level V	○	●	●	●	○
Boorman, et al. 2003	SF-36 Social Function	91	TSA	Level V	○	●	●	●	○
Boorman, et al. 2003	SF- 36 Physical role function	91	TSA	Level V	○	●	●	●	○
Boorman, et al. 2003	Sf- 36 Mental health	91	TSA	Level V	○	●	●	●	○
Boorman, et al. 2003	SF-36 Emotional role function	91	TSA	Level V	○	●	●	●	○
Boorman, et al. 2003	SF-36 Energy	91	TSA	Level V	○	●	●	●	○
Boorman, et al. 2003	SF-36 General health perception	91	TSA	Level V	○	●	●	●	○

**Evidence Table 11
Total Shoulder Arthroplasty
Quality and Design**

<p align="center">● = Yes ○ = No × = Not Reported n/a = not applicable</p>					Consecutive enrollment of patients	Follow up - 80% or more	All patients evaluated using same outcome measures	All patients receive same treatment	All patients have approximately equal follow-up times
Author	Outcome	N	Treatment(s)	Level of Evidence					
Boorman, et al. 2003	SF-36 Comfort	113	TSA	Level V	○	●	●	●	○
Iannotti, et al. 2003	ASES Pain	95	TSA	Level V	●	●	●	●	○
Iannotti, et al. 2003	ASES Satisfaction	95	TSA	Level V	●	●	●	●	○
Iannotti, et al. 2003	ASES Quality of Life	95	TSA	Level V	●	●	●	●	○
Iannotti, et al. 2003	ASES Score	95	TSA	Level V	●	●	●	●	○
Orfaly, et al. 2003	ASES	-	TSA	Level V	●	●	●	●	○
Seneriz, et al. 2003	VAS Pain	25	TSA	Level V	○	×	●	○	○

**Evidence Table 11
Total Shoulder Arthroplasty
Quality and Design**

<p align="center">● = Yes ○ = No × = Not Reported n/a = not applicable</p>					Consecutive enrollment of patients	Follow up - 80% or more	All patients evaluated using same outcome measures	All patients receive same treatment	All patients have approximately equal follow-up times
Author	Outcome	N	Treatment(s)	Level of Evidence					
Fehringer, et al. 2002	Numer of Functions Performable After Surgery	102	TSA	Level V	●	●	●	●	○
Fehringer, et al. 2002	change in number of functions performable	102	TSA	Level IV	●	●	●	●	●
Fehringer, et al. 2002	Improvement	102	TSA	Level IV	●	●	●	●	●
Fehringer, et al. 2002	Ability to carry twenty pounds at side	102	TSA	Level IV	●	●	●	●	●
Fehringer, et al. 2002	Ability to carry twenty pounds at side	102	TSA	Level IV	●	●	●	●	●
Fehringer, et al. 2002	Ability to lift eight pounds to shoulder level	102	TSA	Level IV	●	●	●	●	●
Fehringer, et al. 2002	Ability to lift eight pounds to shoulder level	102	TSA	Level IV	●	●	●	●	●

**Evidence Table 11
Total Shoulder Arthroplasty
Quality and Design**

<p align="center">● = Yes ○ = No × = Not Reported n/a = not applicable</p>					Consecutive enrollment of patients	Follow up - 80% or more	All patients evaluated using same outcome measures	All patients receive same treatment	All patients have approximately equal follow-up times
Author	Outcome	N	Treatment(s)	Level of Evidence					
Fehringer, et al. 2002	Ability to lift one pound to shoulder level	102	TSA	Level IV	●	●	●	●	●
Fehringer, et al. 2002	Ability to lift one pound to shoulder level	102	TSA	Level IV	●	●	●	●	●
Fehringer, et al. 2002	Ability to place arm comfortably at side	102	TSA	Level IV	●	●	●	●	●
Fehringer, et al. 2002	Ability to place arm comfortably at side	102	TSA	Level IV	●	●	●	●	●
Fehringer, et al. 2002	Ability to place hand behind head	102	TSA	Level IV	●	●	●	●	●
Fehringer, et al. 2002	Ability to place hand behind head	102	TSA	Level IV	●	●	●	●	●
Fehringer, et al. 2002	Ability to toss softball twenty yards overhand	102	TSA	Level IV	●	●	●	●	●

**Evidence Table 11
Total Shoulder Arthroplasty
Quality and Design**

<p align="center">● = Yes ○ = No × = Not Reported n/a = not applicable</p>					Consecutive enrollment of patients	Follow up - 80% or more	All patients evaluated using same outcome measures	All patients receive same treatment	All patients have approximately equal follow-up times
Author	Outcome	N	Treatment(s)	Level of Evidence					
Fehringer, et al. 2002	Ability to toss softball twenty yards overhand	102	TSA	Level IV	●	●	●	●	●
Fehringer, et al. 2002	Ability to toss softball twenty yards underhand	102	TSA	Level IV	●	●	●	●	●
Fehringer, et al. 2002	Ability to toss softball twenty yards underhand	102	TSA	Level IV	●	●	●	●	●
Fehringer, et al. 2002	Ability to tuck in shirt	102	TSA	Level IV	●	●	●	●	●
Fehringer, et al. 2002	Ability to tuck in shirt	102	TSA	Level IV	●	●	●	●	●
Fehringer, et al. 2002	Ability to work full time in a regular job	102	TSA	Level IV	●	●	●	●	●
Fehringer, et al. 2002	Ability to work full time in a regular job	102	TSA	Level IV	●	●	●	●	●

**Evidence Table 11
Total Shoulder Arthroplasty
Quality and Design**

<p align="center">● = Yes ○ = No × = Not Reported n/a = not applicable</p>					Consecutive enrollment of patients	Follow up - 80% or more	All patients evaluated using same outcome measures	All patients receive same treatment	All patients have approximately equal follow-up times
Author	Outcome	N	Treatment(s)	Level of Evidence					
Fehringer, et al. 2002	Ability to wash back of contralateral shoulder	102	TSA	Level IV	●	●	●	●	●
Fehringer, et al. 2002	Ability to wash back of contralateral shoulder	102	TSA	Level IV	●	●	●	●	●
Fehringer, et al. 2002	Ability to place coin on shelf	102	TSA	Level IV	●	●	●	●	●
Fehringer, et al. 2002	Ability to place coin on shelf	102	TSA	Level IV	●	●	●	●	●
Fehringer, et al. 2002	Sleep comfortably	102	TSA	Level IV	●	●	●	●	●
Fehringer, et al. 2002	Sleep comfortably	102	TSA	Level IV	●	●	●	●	●
Norris, et al. 2002	Pain	94	TSA	Level V	●	●	●	○	○

**Evidence Table 11
Total Shoulder Arthroplasty
Quality and Design**

<p align="center">● = Yes ○ = No × = Not Reported n/a = not applicable</p>					Consecutive enrollment of patients	Follow up - 80% or more	All patients evaluated using same outcome measures	All patients receive same treatment	All patients have approximately equal follow-up times
Author	Outcome	N	Treatment(s)	Level of Evidence					
Norris, et al. 2002	Function	94	TSA	Level V	●	●	●	○	○
Norris, et al. 2002	Use	94	TSA	Level V	●	●	●	○	○
Norris, et al. 2002	ASES	94	TSA	Level V	●	●	●	○	○
Norris, et al. 2002	SST	94	TSA	Level V	●	●	●	○	○
Gartsman, et al. 2000	ASES Pain	-	TSA	Level V	●	●	●	●	○
Gartsman, et al. 2000	ASES Activites of Daily Living	-	TSA	Level V	●	●	●	●	○
Gartsman, et al. 2000	ASES	-	TSA	Level V	●	●	●	●	○

**Evidence Table 11
Total Shoulder Arthroplasty
Quality and Design**

<p align="center">● = Yes ○ = No × = Not Reported n/a = not applicable</p>					Consecutive enrollment of patients	Follow up - 80% or more	All patients evaluated using same outcome measures	All patients receive same treatment	All patients have approximately equal follow-up times
Author	Outcome	N	Treatment(s)	Level of Evidence					
Gartsman, et al. 2000	UCLA Pain	-	TSA	Level V	●	●	●	●	○
Gartsman, et al. 2000	UCLA Satisfaction	-	TSA	Level V	●	●	●	●	○
Gartsman, et al. 2000	UCLA Function	-	TSA	Level V	●	●	●	●	○
Gartsman, et al. 2000	UCLA Motion	-	TSA	Level V	●	●	●	●	○
Gartsman, et al. 2000	UCLA Strength	-	TSA	Level V	●	●	●	●	○
Gartsman, et al. 2000	UCLA	-	TSA	Level V	●	●	●	●	○
Gartsman, et al. 2000	Unsatisfactory Results	-	TSA	Level V	●	●	●	●	○

Evidence Table 12
Total Shoulder Arthroplasty
Study Data

Author	Outcome	Duration	N	Treatment(s)	Results
Boorman, et al. 2003	SF-36 Comfort	0 days	91	Total Shoulder Arthroplasty	39.2 ± nr
Boorman, et al. 2003	SF-36 Comfort	30-60 months	91	Total Shoulder Arthroplasty	63.8 ± nr
Boorman, et al. 2003	SF-36 Emotional role function	0 days	91	Total Shoulder Arthroplasty	72.8 ± nr
Boorman, et al. 2003	SF-36 Emotional role function	30-60 months	91	Total Shoulder Arthroplasty	79.2 ± nr
Boorman, et al. 2003	SF-36 Energy	0 days	91	Total Shoulder Arthroplasty	54.5 ± nr
Boorman, et al. 2003	SF-36 Energy	30-60 months	91	Total Shoulder Arthroplasty	56.3 ± nr
Boorman, et al. 2003	SF-36 General health perception	0 days	91	Total Shoulder Arthroplasty	67.2 ± nr
Boorman, et al. 2003	SF-36 General health perception	30-60 months	91	Total Shoulder Arthroplasty	63.1± nr
Boorman, et al. 2003	SF-36 Mental heal	0 days	91	Total Shoulder Arthroplasty	74.8 ± nr
Boorman, et al. 2003	SF-36 Mental heal	30-60 months	91	Total Shoulder Arthroplasty	78.6 ± nr

**Evidence Table 12
Total Shoulder Arthroplasty
Study Data**

Author	Outcome	Duration	N	Treatment(s)	Results
Boorman, et al. 2003	SF-36 Physical function	30-60 months	91	Total Shoulder Arthroplasty	64.1 ± nr
Boorman, et al. 2003	SF-36 Physical function	0 days	91	Total Shoulder Arthroplasty	60.9 ± nr
Boorman, et al. 2003	SF-36 Physical function	0 days	91	Total Shoulder Arthroplasty	60.9 ± nr
Boorman, et al. 2003	SF-36 Physical role function	0 days	91	Total Shoulder Arthroplasty	34.6 ± nr
Boorman, et al. 2003	SF-36 Physical role function	30-60 months	91	Total Shoulder Arthroplasty	55.6 ± nr
Boorman, et al. 2003	SF-36 Social Function		91	Total Shoulder Arthroplasty	81.6 ± nr
Boorman, et al. 2003	SF-36 Social Function	0 days	91	Total Shoulder Arthroplasty	75 ± nr
Boorman, et al. 2003	SF-36 Social Function	0 days	91	Total Shoulder Arthroplasty	75 ± nr
Fehringer, et al. 2002	Ability to carry twenty pounds at side	0 days	102	Total Shoulder Arthroplasty	67%
Fehringer, et al. 2002	Ability to carry twenty pounds at side	30-60 months	102	Total Shoulder Arthroplasty	87%

**Evidence Table 12
Total Shoulder Arthroplasty
Study Data**

Author	Outcome	Duration	N	Treatment(s)	Results
Fehringer, et al. 2002	Ability to lift eight pounds to shoulder level	0 days	102	Total Shoulder Arthroplasty	16%
Fehringer, et al. 2002	Ability to lift eight pounds to shoulder level	30-60 month	102	Total Shoulder Arthroplasty	71%
Fehringer, et al. 2002	Ability to lift one pound to shoulder level	0 days	102	Total Shoulder Arthroplasty	47%
Fehringer, et al. 2002	Ability to lift one pound to shoulder level	30-60 month	102	Total Shoulder Arthroplasty	91%
Fehringer, et al. 2002	Ability to place arm comfortably at side	0 days	102	Total Shoulder Arthroplasty	70%
Fehringer, et al. 2002	Ability to place arm comfortably at side	30-60 months	102	Total Shoulder Arthroplasty	96%
Fehringer, et al. 2002	Ability to place hand behind head	0 days	102	Total Shoulder Arthroplasty	27%
Fehringer, et al. 2002	Ability to place hand behind head	30-60 month	102	Total Shoulder Arthroplasty	90%
Fehringer, et al. 2002	Ability to toss softball twenty yards overhand	0 days	102	Total Shoulder Arthroplasty	4%
Fehringer, et al. 2002	Ability to toss softball twenty yards overhand	30-60 month	102	Total Shoulder Arthroplasty	59%

**Evidence Table 12
Total Shoulder Arthroplasty
Study Data**

Author	Outcome	Duration	N	Treatment(s)	Results
Fehringer, et al. 2002	Ability to toss softball twenty yards underhand	0 days	102	Total Shoulder Arthroplasty	51%
Fehringer, et al. 2002	Ability to toss softball twenty yards underhand	30-60 month	102	Total Shoulder Arthroplasty	51%
Fehringer, et al. 2002	Ability to tuck in shirt	0 days	102	Total Shoulder Arthroplasty	25%
Fehringer, et al. 2002	Ability to tuck in shirt	30-60 month	102	Total Shoulder Arthroplasty	87%
Fehringer, et al. 2002	Ability to work full time in a regular job	0 days	102	Total Shoulder Arthroplasty	38%
Fehringer, et al. 2002	Ability to work full time in a regular job	30-60 month	102	Total Shoulder Arthroplasty	75%
Fehringer, et al. 2002	Ability to wwash back of contralateral shoulder	0 days	102	Total Shoulder Arthroplasty	8%
Fehringer, et al. 2002	Ability to wwash back of contralateral shoulder	30-60 month	102	Total Shoulder Arthroplasty	77%
Fehringer, et al. 2002	Abllility to place coin on shelf	0 days	102	Total Shoulder Arthroplasty	58%
Fehringer, et al. 2002	Ability to place coin on shelf	30-60 months	102	Total Shoulder Arthroplasty	93%

Evidence Table 12
Total Shoulder Arthroplasty
Study Data

Author	Outcome	Duration	N	Treatment(s)	Results
Fehringer, et al. 2002	Sleep comfortably	0 days	102	Total Shoulder Arthroplasty	9%
Fehringer, et al. 2002	Sleep comfortably	30-60 months	102	Total Shoulder Arthroplasty	88%
Gartsman, et al. 2000	ASES	0 years	27	Total Shoulder Arthroplasty	22.7 [95% CI 17.2, 28.2]
Gartsman, et al. 2000	ASES	36 months	27	Total Shoulder Arthroplasty	8.1 (95% CI 7.0, 9.2]
Gartsman, et al. 2000	ASES Activities of Daily Living	0 years	27	Total Shoulder Arthroplasty	13.1 ± nr
Gartsman, et al. 2000	ASES Activities of Daily Living	36 months	27	Total Shoulder Arthroplasty	36.1 ± nr
Gartsman, et al. 2000	ASES Pain	0 years	27	Total Shoulder Arthroplasty	9.6 ± nr
Gartsman, et al. 2000	ASES Pain	36 months	27	Total Shoulder Arthroplasty	41.1 ± nr
Gartsman, et al. 2000	UCLA Function	0 years	27	Total Shoulder Arthroplasty	1.3 ± nr
Gartsman, et al. 2000	UCLA Function	36 months	27	Total Shoulder Arthroplasty	7.3 ± nr

Evidence Table 12
Total Shoulder Arthroplasty
Study Data

Author	Outcome	Duration	N	Treatment(s)	Results
Gartsman,et al. 2000	UCLA Motion	0 years	27	Total Shoulder Arthroplasty	2.6 ± nr
Gartsman,et al. 2000	UCLA Motion	36 months	27	Total Shoulder Arthroplasty	4.2 ± nr
Gartsman,et al. 2000	UCLA Pain	0 years	27	Total Shoulder Arthroplasty	1.5 ± nr
Gartsman,et al. 2000	UCLA Pain	36 months	27	Total Shoulder Arthroplasty	8.2 ± nr
Gartsman,et al. 2000	UCLA Satisfaction	0 years	27	Total Shoulder Arthroplasty	0.1 ± nr
Gartsman,et al. 2000	UCLA Satisfaction	36 months	27	Total Shoulder Arthroplasty	3.8 ± nr
Gartsman,et al. 2000	UCLA Strenght	0 years	27	Total Shoulder Arthroplasty	2.7 ± nr
Gartsman,et al. 2000	UCLA Strenght	36 months	27	Total Shoulder Arthroplasty	3.9 ± nr
Gartsman,et al. 2000	UCLA Total Score	0 years	27	Total Shoulder Arthroplasty	8.1 [95% CI 7.0, 9.2]
Gartsman,et al. 2000	UCLA Total Score	36 months	27	Total Shoulder Arthroplasty	27.4 [95% CI 25.9, 29.3]

**Evidence Table 12
Total Shoulder Arthroplasty
Study Data**

Author	Outcome	Duration	N	Treatment(s)	Results
Iannotti, et al. 2003	VAS Pain	0 days	95	Total Shoulder Arthroplasty	74 [95% CI 63.97, 78.63]
Iannotti, et al. 2003	VAS Pain	46 months	95	Total Shoulder Arthroplasty	14 [95% CI 9.98, 18.02]
Iannotti, et al. 2003	VAS Quality of Life	0 days	95	Total Shoulder Arthroplasty	65 [95% CI 59.77, 70.23]
Iannotti, et al. 2003	VAS Quality of Life	46 months	95	Total Shoulder Arthroplasty	36 [95% CI 8.18, 63.82]
Iannotti, et al. 2003	VAS Satisfaction	0 days	95	Total Shoulder Arthroplasty	75 [95% CI 71.38, 78.62]
Iannotti, et al. 2003	VAS Satisfaction	46 months	95	Total Shoulder Arthroplasty	15 [95% CI 10.58, 19.42]
Iannotti, et al. 2003	ASES Total Score	0 days	95	Total Shoulder Arthroplasty	33 [95% CI 29.38, 36.62]
Iannotti, et al. 2003	ASES Total Score	46 months	95	Total Shoulder Arthroplasty	86 [95% CI 82.58, 89.42]
Norris and Iannotti 2002	Ability to use arm	0 days	94	Total Shoulder Arthroplasty	77.4 [95% CI 73.28, 81.52]
Norris and Iannotti 2002	Ability to use arm	46 months	94	Total Shoulder Arthroplasty	15.9 [95% CI 11, 20.8]

Evidence Table 12
Total Shoulder Arthroplasty
Study Data

Author	Outcome	Duration	N	Treatment(s)	Results
Norris and Iannotti 2002	SST	0 days	94	Total Shoulder Arthroplasty	2.0 [95% CI 1.61, 2.39]
Norris and Iannotti 2002	SST	46 monts	94	Total Shoulder Arthroplasty	9.9 [95% CI 9.31, 10.49]
Norris and Iannotti 2002	VAS Function	0 days	94	Total Shoulder Arthroplasty	75.3 [95% CI 71.58, 79.02]
Norris and Iannotti 2002	VAS Function	46 monts	94	Total Shoulder Arthroplasty	14.7 [95% CI 10.19, 19.12]
Orfaly et al. 2003	VAS Function	0 dyas	37	Total Shoulder Arthroplasty	69 ± nr
Orfaly et al. 2003	VAS Function	4.3 years	37	Total Shoulder Arthroplasty	6 ± nr
Orfaly et al. 2003	VAS Pain	0 days	37	Total Shoulder Arthroplasty	69 ± nr
Orfaly et al. 2003	VAS Pain	4.3 years	37	Total Shoulder Arthroplasty	9 ± nr
Raiss, et al. 2008	Activity	0 days	21	Total Shoulder Arthroplasty	7.1 [95% CI 6.07, 8.13]
Raiss, et al. 2008	Activity	2 years	21	Total Shoulder Arthroplasty	17.1 [95% CI 15.77, 18.43]

Evidence Table 12
Total Shoulder Arthroplasty
Study Data

Author	Outcome	Duration	N	Treatment(s)	Results
Raiss, et al. 2008	Constant Score	0 days	21	Total Shoulder Arthroplasty	24.1 [95% CI 20.12, 28.08]
Raiss, et al. 2008	Constant Score	2 years	21	Total Shoulder Arthroplasty	64.5 [95% CI 57.5, 71.47]
Raiss, et al. 2008	Mobility	0 days	21	Total Shoulder Arthroplasty	10.9 [95% CI 8.8, 13]
Raiss, et al. 2008	Mobility	2 years	21	Total Shoulder Arthroplasty	26.4 [95% CI 22.9, 30.28]
Raiss, et al. 2008	Pain	0 days	21	Total Shoulder Arthroplasty	3.4 [95% CI 2.5, 4.3]
Raiss, et al. 2008	Pain	2 years	21	Total Shoulder Arthroplasty	12.6 [95% CI 11.36, 13.84]
Raiss, et al. 2008	Power	0 days	21	Total Shoulder Arthroplasty	2.8 [95% CI 1.35, 4.25]
Raiss, et al. 2008	Power	2 years	21	Total Shoulder Arthroplasty	8.9 [95% CI 6.12, 11.86]

Evidence Table 13
Total Shoulder Arthroplasty vs. Hemiarthroplasty
Included and Excluded Articles

Author	Title	Included or Reason for Exclusion
Lo IK;Litchfield RB;Griffin S;Faber K;Patterson SD;Kirkley A;	Quality-of-life outcome following hemiarthroplasty or total shoulder arthroplasty in patients with osteoarthritis. A prospective, randomized trial	Included
Gartsman GM;Roddey TS;Hammerman SM;	Shoulder arthroplasty with or without resurfacing of the glenoid in patients who have osteoarthritis	Included
Norris TR;Iannotti JP;	Functional outcome after shoulder arthroplasty for primary osteoarthritis: a multicenter study	Not best available evidence
Edwards TB;Kadokia NR;Boulaia A;Kempf JF;Boileau P;Nemoz C;Walch G;	A comparison of hemiarthroplasty and total shoulder arthroplasty in the treatment of primary glenohumeral osteoarthritis: results of a multicenter study	Not best available evidence
Clinton J;Franta AK;Lenters TR;Mounce D;Matsen FA;	Nonprosthetic glenoid arthroplasty with humeral hemiarthroplasty and total shoulder arthroplasty yield similar self-assessed outcomes in the management of comparable patients with glenohumeral arthritis	Not best available evidence
Sperling JW;Cofield RH;Rowland CM;	Neer hemiarthroplasty and Neer total shoulder arthroplasty in patients fifty years old or less. Long-term results	Not best available evidence
Iannotti JP;Norris TR;	Influence of preoperative factors on outcome of shoulder arthroplasty for glenohumeral osteoarthritis	Not best available evidence
Levy O;Copeland SA;	Cementless surface replacement arthroplasty (Copeland CSRA) for osteoarthritis of the shoulder	Not best available evidence
Sarris IK;Papadimitriou NG;Sotereanos DG;	Bipolar hemiarthroplasty for chronic rotator cuff tear arthropathy	Not relevant
Pfahler M;Jena F;Neyton L;Sirveaux F;Mole D;	Hemiarthroplasty versus total shoulder prosthesis: results of cemented glenoid components	Retrospective Case Series

Evidnece Table 13
Total Shoulder Arthroplasty vs. Hemiarthroplasty
Included and Excluded Articles

Author	Title	Included or Reason for Exclusion
Franta AK;Lenters TR;Mounce D;Neradilek B;Matsen FA;	The complex characteristics of 282 unsatisfactory shoulder arthroplasties	Retrospective Case Series
Cuomo F;Birdzell MG;Zuckerman JD;	The effect of degenerative arthritis and prosthetic arthroplasty on shoulder proprioception	No Patient Oriented Outcomes
Sperling JW;Kozak TK;Hanssen AD;Cofield RH;	Infection after shoulder arthroplasty	Less than 10 patients
Buchner M;Eschbach N;Loew M;	Comparison of the short-term functional results after surface replacement and total shoulder arthroplasty for osteoarthritis of the shoulder: a matched-pair analysis	Less than 2 year follow up
Orfaly RM;Rockwood CA;Esenyel CZ;Wirth MA;	A prospective functional outcome study of shoulder arthroplasty for osteoarthritis with an intact rotator cuff	Not best available evidence
Bishop JY;Flatow EL;	Management of glenohumeral arthritis: a role for arthroscopy?	No Quantitative Data
Godeneche A; Boileau P; Favard L; Le Huec JC; Levigne C; Nove-Josserand L; Walch G; Edwards B	Prosthetic replacement in the treatment of osteoarthritis of the shoulder: Early results of 268 cases	Retrospective Case Series
Boyd a; Thomas W; Scott R; Sledge C; Thornhill T	Total Shoulder Arthroplasty Versus Hemiarthroplasty: Indications for Glenoid Resurfacing	OA group contains patients with rotator cuff tears and OA results are combined with AVN results

Evidence Table 14
Hemiarthroplasty vs. Total Shoulder Arthroplasty
Quality and Design

<p align="center">● = Yes ○ = No × = Not Reported n/a = not applicable</p>					Stochastic Randomization	Allocation Concealment	Patients Blinded	Those rating outcome Blinded	Follow up - 80% or more	All groups have similar outcome performance at entry
Author	Outcome	N	Treatment(s)	Level of Evidence						
Lo, et al. 2005	McGill Pain Questionnaire	41	HHS vs. TSA	Level II	○	●	○	●	●	●
Lo, et al. 2005	McGill Pain VAS	41	HHS vs. TSA	Level II	○	●	○	●	●	●
Lo, et al. 2005	SF-36	41	HHS vs. TSA	Level II	○	●	○	●	●	●
Lo, et al. 2005	SF-36 Physical Component	41	HHS vs. TSA	Level II	○	●	○	●	●	●
Lo, et al. 2005	ROM	41	HHS vs. TSA	Level II	○	●	○	●	●	●
Lo, et al. 2005	ASES	41	TSA vs. HHS	Level II	○	●	○	●	●	●
Lo, et al. 2005	Constant	41	HHS vs. TSA	Level II	○	●	○	●	●	●
Lo, et al. 2005	UCLA	41	HHS vs. TSA	Level II	○	●	○	●	●	●
Lo, et al. 2005	Failures	41	HHS vs. TSA	Level II	○	●	○	●	●	●
Gartsman, et al. 2000	ASES Pain	51	TSA vs. HHS	Level II	●	●	×	×	●	●

Evidence Table 14
Hemiarthroplasty vs. Total Shoulder Arthroplasty
Quality and Design

<p align="center">● = Yes ○ = No × = Not Reported n/a = not applicable</p>					Stochastic Randomization	Allocation Concealment	Patients Blinded	Those rating outcome Blinded	Follow up - 80% or more	All groups have similar outcome performance at entry
Author	Outcome	N	Treatment(s)	Level of Evidence						
Gartsman, et al. 2000	ASES Activities of Daily Living	51	TSA vs. HHS	Level II	●	●	×	×	●	●
Gartsman, et al. 2000	ASES	51	TSA vs. HHS	Level II	●	●	×	×	●	●
Gartsman, et al. 2000	UCLA Pain	51	TSA vs. HHS	Level II	●	●	×	×	●	●
Gartsman, et al. 2000	UCLA Satisfaction	51	TSA vs. HHS	Level II	●	●	×	×	●	●
Gartsman, et al. 2000	UCLA Function	51	TSA vs. HHS	Level II	●	●	×	×	●	●
Gartsman, et al. 2000	UCLA Motion	51	TSA vs. HHS	Level II	●	●	×	×	●	●
Gartsman, et al. 2000	UCLA Strength	51	TSA vs. HHS	Level II	●	●	×	×	●	●
Gartsman, et al. 2000	UCLA	51	TSA vs. HHS	Level II	●	●	×	×	●	●
Gartsman, et al. 2000	Unsatisfactory Results	51	TSA vs. HHS	Level II	●	●	×	×	●	●

Evidence Table 15
Total Shoulder Arthroplasty vs. Hemiarthroplasty
Study Data

<u>Author</u>	<u>Outcome</u>	<u>Duration</u>	<u>N</u>	<u>Treatment(s)</u>	<u>Hemiarthroplasty</u>	<u>Total Shoulder Arthroplasty</u>
Gartsman, et al. 2000	ASES Pain	35 months	51	Hemiarthroplasty vs. Total Shoulder Arthroplasty	30.2	41.1
Gartsman, et al. 2000	ASES Activities of Daily Living	35 months	51	Hemiarthroplasty vs. Total Shoulder Arthroplasty	34.9	36.1
Gartsman, et al. 2000	ASES Total Score	35 months	51	Hemiarthroplasty vs. Total Shoulder Arthroplasty	65.2 [SD,24.9]	77.3 [SD, 18.2]
Gartsman, et al. 2000	UCLA Pain	35 months	51	Hemiarthroplasty vs. Total Shoulder Arthroplasty	6	8.2
Gartsman, et al. 2000	UCLA Satisfaction	35 months	51	Hemiarthroplasty vs. Total Shoulder Arthroplasty	3.2	3.8
Gartsman, et al. 2000	UCLA Function	35 months	51	Hemiarthroplasty vs. Total Shoulder Arthroplasty	6.2	7.3
Gartsman, et al. 2000	UCLA Motion	35 months	51	Hemiarthroplasty vs. Total Shoulder Arthroplasty	4.1	4.2
Gartsman, et al. 2000	UCLA Strenght	35 months	51	Hemiarthroplasty vs. Total Shoulder Arthroplasty	3.7	3.9
Gartsman, et al. 2000	UCLA Total Score	35 months	51	Hemiarthroplasty vs. Total Shoulder Arthroplasty	23.2 [SD, 5.9]	27.4 [SD, 4.9]
Lo, et al. 2005	WOOS Total Quality of Life	2 years	41	Hemiarthroplasty vs. Total Shoulder Arthroplasty	81.5 [SD, 24.1]	90.6 [SD, 13.2]
Lo, et al. 2005	WOOS Physical Symptoms	2 years	41	Hemiarthroplasty vs. Total Shoulder Arthroplasty	82.7 [SD, 23.5]	91.9 [SD, 12.8]

Evidence Table 15
Total Shoulder Arthroplasty vs. Hemiarthroplasty
Study Data

<u>Author</u>	<u>Outcome</u>	<u>Duration</u>	<u>N</u>	<u>Treatment(s)</u>	<u>Hemiarthroplasty</u>	<u>Total Shoulder Arthroplasty</u>
Lo, et al. 2005	WOOS Sports/Recreation/Work	2 years	41	Hemiarthroplasty vs. Total Shoulder Arthroplasty	75.2 [SD, 28.9]	86.1 [SD, 20.8]
Lo, et al. 2005	WOOS Lifestyle	2 years	41	Hemiarthroplasty vs. Total Shoulder Arthroplasty	82.5 [SD, 25.4]	89.7 [SD, 13.8]
Lo, et al. 2005	WOOS Emotions	2 years	41	Hemiarthroplasty vs. Total Shoulder Arthroplasty	87.1 [SD, 23.7]	97.0 [SD, 4.6]
Lo, et al. 2005	SF-36 Mental Component Scale	2 years	41	Hemiarthroplasty vs. Total Shoulder Arthroplasty	57.4 [SD, 10.9]	58.4 [SD, 9.1]
Lo, et al. 2005	SF-36 Physical Component Scale	2 years	41	Hemiarthroplasty vs. Total Shoulder Arthroplasty	42.9 [SD, 10.9]	42.1 [SD, 13.2]
Lo, et al. 2005	ASES	2 years	41	Hemiarthroplasty vs. Total Shoulder Arthroplasty	83.1 [SD, 25.6]	91.1 [SD, 14.3]
Lo, et al. 2005	Constant Score	2 years	41	Hemiarthroplasty vs. Total Shoulder Arthroplasty	67.1 [SD, 19.6]	70.8 [SD, 17.2]
Lo, et al. 2005	UCLA	2 years	41	Hemiarthroplasty vs. Total Shoulder Arthroplasty	24.2 [SD, 5]	26.7 [SD, 3.8]

Evidence Table 16
Surgeon Volume and Surgery Outcome
Included and Excluded Articles

Author	Title	Included or Reason for Exclusion
Hammond JW;Queale WS;Kim TK;McFarland EG;	Surgeon experience and clinical and economic outcomes for shoulder arthroplasty	Included
Jain N;Pietrobon R;Hocker S;Guller U;Shankar A;Higgins LD;	The relationship between surgeon and hospital volume and outcomes for shoulder arthroplasty	Included
Hasan SS;Leith JM;Smith KL;Matsen FA;	The distribution of shoulder replacement among surgeons and hospitals is significantly different than that of hip or knee replacement	No Patient Oriented Outcomes
Lyman S;Jones EC;Bach PB;Peterson MG;Marx RG;	The association between hospital volume and total shoulder arthroplasty outcomes	No data on surgeon volume only hospital volume

**Evidence Table 17
Surgeon Volume and Surgery Outcome
Design and Quality**

<p align="center">● = Yes ○ = No × = Not Reported n/a = not applicable</p>					Completion rate - less than 20% difference between groups	All groups concurrently treated	All groups receive same treatment	All groups evaluated using same outcome measures	All groups have approximately equal follow-up times	Follow up - 80% or more	Same center for experimental and control group data	All groups have similar performance at study entry	All groups have similar patient characteristics at study entry
<u>Author</u>	<u>Outcome</u>	<u>N</u>	<u>Treatment(s)</u>	<u>Level of Evidence</u>									
Hammond, et al 2003	Complications	1868	Shoulder Arthroplasty	IV	●	●	●	●	●	●	○	●	●
Hammond, et al 2003	Length of Stay	1868	Shoulder Arthroplasty	IV	●	●	●	●	●	●	○	●	●
Jain, et al. 2004	Complication Rate	30046	HHS and TSA	IV	●	●	●	●	●	●	○	●	●
Jain, et al. 2004	Length of Stay	30046	HHS and TSA	IV	●	●	●	●	●	●	○	●	●
Jain, et al. 2004	Non routine Discharge	30046	HHS and TSA	IV	●	●	●	●	●	●	○	●	●
Jain, et al. 2004	Mortality	30046	HHS and TSA	IV	●	●	●	●	●	●	○	●	●

Evidence Table 18
Surgeon Volume and Surgery Outcome
Study Data

Author	Outcome	Treatment	N	Comparison	TSA	HHS	SA
Jain, et al. 2004	Mortality	SA	30,046	Low <2 procedures vs. High (≥ 4 procedures per year)	Adjusted OR 4.4 (95% CI, 0.6- 31.2)	Adjusted OR 0.9 (95% CI, 0.3-2.3)	
Jain, et al. 2004	Mortality	SA	30,046	Medium (≥ 2 < 4 procedures per year) vs. High (≥ 4 procedures per year)	Adjusted OR 4.2 ((95% CI, 0.6- 29.6)	Adjusted OR 0.7 (95% CI , 0.2-1.9)	
Jain, et al. 2004	Post operative complications	SA	30,046	Low (< 2 procedures per year) vs. High (≥ 4 procedures per year)	OR 1.36 (sd, 1.36, 2.51)	OR 1.85 (sd, 1.11, 2.07)	
Jain, et al. 2004	Post operative complications	SA	30,046	Medium (≥ 2 < 5 procedures per year) vs. High (≥ 4 procedures per year)	Adjusted OR 1.5 (95 % CI, 0.7- 3.0)	Adjusted OR, 1.5 (95 % CI, 0.7-3.2)	
Jain, et al. 2004	Non routine disposition of patient on discharge	SA	30,046	Low (< 2 procedures per year) vs. High (≥ 4 procedures per year)	Adjusted OR, 1.1 (95 % CI, 0.8-1.4)	Adjusted OR 1.3 (95% CI, 1.1-1.5)	
Jain, et al. 2004	Non routine disposition of patient on discharge	SA	30,046	Medium (≥ 2 < 4 procedures per year) vs. High (≥ 4 procedures per year)	Adjusted OR< 0.98 (95 % CI, 0.8- 1.2)	Adjusted OR, 1.3 (95 % CI, 1.1-1.6)	
Jain, et al. 2004	Length of Stay	SA	30,046	Low (< 2 procedures per year)	4 ± 0.7	5.4 ± 1.3	
Jain, et al. 2004	Length of Stay	SA	30,046		3.6 ± 0.7	4.6 ± 1.2	
Jain, et al. 2004	Length of Stay	SA	30,046	High (≥ 5 procedures per year)	3.3 ± 0.7	4.1 ± 1.1	

Evidence Table 18
Surgeon Volume and Surgery Outcome
Study Data

Author	Outcome	Treatment	N	Comparison	TSA	HHS	SA
Hammond, et al. 2003	Complication Rate	SA	1868	High (>30 procedures in 7 years)			9%
Hammond, et al. 2003	Complication Rate	SA	1868	Medium (6-30 procedures per year)			9%
Hammond, et al. 2003	Complication Rate	SA	1868	Low (1-5 procedures in 7 years)			15%
Hammond, et al. 2003	Mean Length of Stay (days)	SA	1868	High (>30 procedures in 7 years)			2.8 ± nr
Hammond, et al. 2003	Mean Length of Stay (days)	SA	1868	Medium (6-30 procedures per year)			2.9 ± nr
Hammond, et al. 2003	Mean Length of Stay (days)	SA	1868	Low (1-5 procedures in 7 years)			4.2 ± nr
TSA= Total Shoulder Arthroplasty							
HHS= Hemiarthroplasty							
SA=Shoulder Arthroplasty							

Evidence Table 19
DVT Prophylaxis
Included and Excluded Articles

Author	Title	Included or Reason for Exclusion
Amarasekera, et al. 2008	Pulmonary embolism after acromioplasty and rotator cuff repair	Case Report
Cortes, et al. 2007	Pulmonary embolism after shoulder arthroscopy: could patient positioning and traction make a difference?	Case Report
Rockwood, et al. 2003	Warning: pulmonary embolism can occur after elective shoulder surgery-report of two cases and survey of the members of the American Shoulder and Elbow Surgeons	Case Report
Scott, et al. 2001	Pulmonary embolism after elective glenohumeral joint debridement	Case Report
Starch, et al. 2001	Thrombosis of the brachial vein and pulmonary embolism after subacromial decompression of the shoulder	Case Report
Arcand, et al. 1997	Pulmonary embolism caused by thrombosis of the axillary vein after shoulder arthroplasty	Case Report
Rapp, et al. 2007	Database study shows low incidence of post-shoulder arthroplasty VTE disease	Commentary
Hoffmeister, et al. 2006	Risk of thromboembolic events: is shoulder arthroplasty heads above THA and TKA?	Commentary
Brockenbrough, et al. 2006	Thromboembolic complication rates lower in shoulder compared with THR and THA	Commentary
Molina, et al. 2005	Letter regarding article by Martinelli et al, 'Risk factors and recurrence rate of primary deep vein thrombosis of the upper extremities'	Commentary
Drez, et al. 1990	Deep venous thrombosis after shoulder arthroscopy	Commentary
Willis, et al. 2009	Deep vein thrombosis after reconstructive shoulder arthroplasty: a prospective observational study	Study does not answer the question
Jain, et al. 2005	Total arthroplasty versus hemiarthroplasty for glenohumeral osteoarthritis: role of provider volume	Study does not answer the question
Nowinski, et al. 2005	Biologic resurfacing of the glenoid: Longer term results and newer innovations	Duplicate - data reported in more recent study
Krishnan, et al. 2008	Humeral hemiarthroplasty with biologic resurfacing of the glenoid for glenohumeral arthritis. Surgical technique	No Quantatative Data
Hoxie, et al. 2007	Pulmonary embolism after operative treatment of proximal humeral fractures	No shoulder arthroplasty patients included

Evidence Table 19
DVT Prophylaxis
Included and Excluded Articles

Brislin, et al. 2007	Complications after arthroscopic rotator cuff repair	No shoulder arthroplasty patients included
Deguara, et al. 2005	Upper limb ischemia: 20 years experience from a single center	No shoulder arthroplasty patients included
Shindo, et al. 2004	Arterial reconstruction in the upper extremities	No shoulder arthroplasty patients included
Muramatsu, et al. 2003	Recalcitrant post-traumatic nonunion of the humerus: 23 Patients reconstructed with vascularized bone graft	No shoulder arthroplasty patients included
Cejna, et al. 2001	rt-PA thrombolysis in acute thromboembolic upper-extremity arterial occlusion	No shoulder arthroplasty patients included
Travis, et al. 2001	Diagnosis and treatment of paradoxical embolus	No shoulder arthroplasty patients included
Burihan, et al. 1993	Upper-extremity deep venous thrombosis: analysis of 52 cases	No shoulder arthroplasty patients included
Champion, et al. 1973	Arterial embolus to the upper limb	No shoulder arthroplasty patients included
Bialostozky, et al. 1971	Massive venous thrombosis of the upper extremity	No shoulder arthroplasty patients included
Ebner, et al. 2004	The role of intraoperative angiography in arterial thromboembolectomy for non-traumatic acute upper limb ischaemia	Not relevant
Pingsmann, et al. 2002	Thrombophlebitis associated with intravenous injection anaesthetics: influence of arm positioning	Not relevant
Benko, et al. 2001	Graduated compression stockings: Knee length or thigh length	Not relevant
Hernandez-Richter, et al. 2001	Acute ischemia of the upper extremity: long-term results following thrombembolctomy with the Fogarty catheter	Not relevant
Keen, et al. 1995	Surgical management of atheroembolization	Not relevant
Romanowski, et al. 1992	Percutaneous transluminal angioplasty of the subclavian and axillary arteries: Initial results and long term follow-up	Not relevant
Mercier, et al. 1973	Venous thrombosis of the upper limb: effort or compression	Not relevant

Evidence Table 20
Glenoid Component
Included and Excluded Articles

Author	Title	Included or Reason for Exclusion
Nuttall D;Haines JF;Trail II;	A study of the micromovement of pegged and keeled glenoid components compared using radiostereometric analysis	Included
Boileau P;Avidor C;Krishnan SG;Walch G;Kempf JF;Mole D;	Cemented polyethylene versus uncemented metal-backed glenoid components in total shoulder arthroplasty: a prospective, double-blind, randomized study	Not relevant
Lazarus MD;Jensen KL;Southworth C;Matsen FA;	The radiographic evaluation of keeled and pegged glenoid component insertion	Insufficient follow up
Gartsman GM; Elkousy HA; Warnock M; Edwards B; O'Connor D	Radiographic comparison of pegged and keeled glenoid components	Insufficient follow up
Fehring EV;Kopjar B;Boorman RS;Churchill RS;Smith KL;Matsen FA;	Characterizing the functional improvement after total shoulder arthroplasty for osteoarthritis	Not relevant
Matsen FA;Antoniou J;Rozencwaig R;Campbell B;Smith KL;	Correlates with comfort and function after total shoulder arthroplasty for degenerative joint disease	Not relevant
Raiss P;Aldinger PR;Kasten P;Rickert M;Loew M;	Total shoulder replacement in young and middle-aged patients with glenohumeral osteoarthritis	Not relevant
Gartsman GM;Roddey TS;Hammerman SM;	Shoulder arthroplasty with or without resurfacing of the glenoid in patients who have osteoarthritis	Not relevant
Iannotti JP;Norris TR;	Influence of preoperative factors on outcome of shoulder arthroplasty for glenohumeral osteoarthritis	Insufficient data
Szabo I;Buscayret F;Edwards TB;Nemoz C;Boileau P;Walch G;	Radiographic comparison of flat-back and convex-back glenoid components in total shoulder arthroplasty	Retrospective Case Series

Evidence Table 20
Glenoid Component
Included and Excluded Articles

Author	Title	Included or Reason for Exclusion
Merolla G;Paladini P;Campi F;Porcellini G;	Efficacy of anatomical prostheses in primary glenohumeral osteoarthritis	Not relevant
Levine WN;Djurasovic M;Glasson JM;Pollock RG;Flatow EL;Bigliani LU;	Hemiarthroplasty for glenohumeral osteoarthritis: results correlated to degree of glenoid wear	Retrospective Case Series
Szabo I;Buscayret F;Edwards T	Radiographic comparison of two glenoid preparation techniques in total shoulder arthroplasty	Not relevant
Taunton MJ;McIntosh AL;Sperling JW;Cofield RH;	Total shoulder arthroplasty with a metal-backed, bone-ingrowth glenoid component. Medium to long-term results	Retrospective Case Series
Terrier A;Buchler P;Farron A;	Bone-cement interface of the glenoid component: stress analysis for varying cement thickness	Not relevant
Norris BL;Lachiewicz PF;	Modern cement technique and the survivorship of total shoulder arthroplasty	Less than 80% of patients with glenohumeral osteoarthritis
Rahme H;Mattsson P;Larsson S;	Stability of cemented all-polyethylene keeled glenoid components. A radiostereometric study with a two-year follow-up	Less than 10 patients per arm
Cheung EV;Sperling JW;Cofield RH;	Polyethylene insert exchange for wear after total shoulder arthroplasty	Retrospective Case Series
Barwood S;Setter KJ;Blaine TA;Bigliani LU;	The incidence of early radiolucencies about a pegged glenoid component using cement pressurization	Retrospective Case Series
Mileti J, Boardman D, Sperlin J, Cofield R, Torchia M, O'Driscoll S, Rowland C,	Radiographic analysis of polyethylene glenoid components using modern cementing techniques	Retrospective Case Series
Sperling J, Cofield R, O'Driscoll S, Torchia M, Rowland C	Radiographic assessment of ingrowth total shoulder arthroplasty	Retrospective Case Series

**Evidence Table 21
Glenoid Components
Design and Quality**

<p align="center">● = Yes ○ = No × = Not Reported n/a = not applicable</p>					Completion rate - less than 20% difference between groups	All groups concurrently treated	All groups receive same treatment	All groups evaluated using same outcome measures	All groups have approximately equal follow-up times	Follow up - 80% or more	Same center for experimental and control group data	All groups have similar performance at study entry	All groups have similar patient characteristics at study entry	Consecutive enrollment of patients	Follow up - 80% or more	All patients evaluated using same outcome measures	All patients receive same treatment	All patients have approximately equal follow-up times	Stochastic Randomization	Allocation Concealment	Patients blinded	Those rating outcome blinded	Follow up - 80% or more	All groups have similar outcome performance at entry
<u>Author</u>	<u>Outcome</u>	<u>N</u>	<u>Treatment(s)</u>	<u>LoE</u>																				
Nuttall, et al 2007	Pain VAS	20	Keeled and Pegged	IV	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	●	●	●	●	●	n/a	n/a	n/a	n/a	n/a	n/a
Nuttall, et al 2007	ASES	20	Keeled and Pegged	IV	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	●	●	●	●	●	n/a	n/a	n/a	n/a	n/a	n/a
Nuttall, et al 2007	UCLA	20	Keeled and Pegged	IV	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	●	●	●	●	●	n/a	n/a	n/a	n/a	n/a	n/a

Evidence Table 22
Keeled vs. Pegged
Study Data

Author	Outcome	Comparison	N	Treatment(s)	Pre Operative	Post Operative
Nuttall, et al 2007	Pain 10 cm VAS	Change from Baseline	10	TSA with Pegged Glenoid	5.6	0.6
Nuttall, et al 2007	Constant-Murley Score	Change from Baseline	10	TSA with Pegged Glenoid	32	62
Nuttall, et al 2007	ASES Score	Change from Baseline	10	TSA with Pegged Glenoid	25	78
Nuttall, et al 2007	Pain 10 cm VAS	Change from Baseline	10	TSA with Keeled Glenoid	6.6	0.6
Nuttall, et al 2007	Constant-Murley Score	Change from Baseline	10	TSA with Keeled Glenoid	20	65
Nuttall, et al 2007	ASES Score	Change from Baseline	10	TSA with Keeled Glenoid	13	84

Evidence Table 23
Total Shoulder Arthroplasty in patients with intact vs. irreparable cuff tear
Included and Excluded Articles

Author	Title	Included or Reason for Exclusion
Orfaly RM;Rockwood CA;Esenyel CZ;Wirth MA;	A prospective functional outcome study of shoulder arthroplasty for osteoarthritis with an intact rotator cuff	Not Relevant
Iannotti JP;Norris TR;	Influence of preoperative factors on outcome of shoulder arthroplasty for glenohumeral osteoarthritis	Less than 10 patients with rotator cuff tears and TSA
Norris TR;Iannotti JP;	Functional outcome after shoulder arthroplasty for primary osteoarthritis: a multicenter study	Less than 10 patients with rotator cuff tears and TSA
Edwards TB;Boulaia A;Kempf JF;Boileau P;Nemoz C;Walch G;	The influence of rotator cuff disease on the results of shoulder arthroplasty for primary osteoarthritis: results of a multicenter study	Retrospective Case Series
Sirveaux F;Favard L;Oudet D;Huquet D;Walch G;Mole D;	Grammont inverted total shoulder arthroplasty in the treatment of glenohumeral osteoarthritis with massive rupture of the cuff. Results of a multicentre study of 80 shoulders	Includes Patients with Rotator Cuff Arthropathy
Sanchez-Sotelo J;Cofield RH;Rowland CM;	Shoulder hemiarthroplasty for glenohumeral arthritis associated with severe rotator cuff deficiency	Retrospective Case Series
Goldberg SS; Bell JE; Kim HJ; Bak SF; Levine WN; Bigliani LU	Hemiarthroplasty for the rotator cuff deficient shoulder	Patients receive hemiarthroplasty rather than TSA
Franklin JL, Barrett WP, Jackins SE Matsen FA	Glenoid loosening in total shoulder arthroplasty. Association with rotator cuff deficiency	Less than 10 patients included

Evidence Table 24
Biceps tenotomy or tenodesis
Included or Excluded Articles

Author	Title	Included or Reason for Exclusion
Godeneche A; Boileau P; Favard L; Le Huec JC; Levigne C; Nove- Josserand L; Walch G; Edwards B	Prosthetic replacement in the treatment of osteoarthritis of the shoulder: Early results of 268 cases	Retrospective Case Series
Fama G; Edwards B; Boulahia A; Kempf JF; Boileau P; Nemoz C; Walch G	The role of concomitant biceps tenodesis in shoulder arthroplasty for primary oseoarthritis: results of a multicentric study	Retrospective Case Series

Evidence Table 25
Subscapularis trans tendonous vs. Lesser tuberosity osteotomy
Included and Excluded Articles

Author	Title	Included or Reason for Exclusion
Ponce BA; Ahluwalia RS; Mazzocca AD; Gobezie RG; Warner JJ; Millett PJ	Biomechanical and clinical evaluation of a novel lesser tuberosity repair technique in total shoulder arthroplasty	Less than 2 years avg. follow up
Qureshi S; Hsiao A; Klug R; Lee E; Braman J; Flatow E;	Subscapularis function after total shoulder replacement: Results with lesser tuberosity osteotome	Not specific to OA
Gerber C; Yian E; Pfirrmann C; Zumstein M; Werner C	Subscapularis muscle function and structure after total shoulder replacement with lesser tuberosity osteotomy and repair	Results for OA grouped with other diagnosis

Table 26
Humeral Component
Included and Excluded Articles

Author	Title	Included or Reason for Exclusion
Bailie DS; Llinas PJ; Ellenbecker TS;	Cementless humeral resurfacing arthroplasty in active patients less than fifty-five years of age	Not specific to OA
Matsen FA; Iannotti JP; Rockwood CA;	Humeral fixation by press-fitting of a tapered metaphyseal stem: a prospective radiographic study	No Patient Oriented Outcomes
Fehringer EV;Kopjar B;Boorman RS;Churchill RS;Smith KL;Matsen FA;	Characterizing the functional improvement after total shoulder arthroplasty for osteoarthritis	Not relevant
Merolla G;Paladini P;Campi F;Porcellini G;	Efficacy of anatomical prostheses in primary glenohumeral osteoarthritis	Retrospective Case Series
Levy O, MCh, Copeland, S	Cementless surface replacement arthroplasty (Copeland CSRA) for osteoarthritis of the shoulder	Retrospective Case Series

Evidence Table 26
Range of Motion Exercise
Included and Excluded Articles

Author	Title	Included or Reason for Exclusion
Mileti J;Sperling JW;Cofield RH;	Shoulder arthroplasty for the treatment of postinfectious glenohumeral arthritis	Not Relevant
Lynch JR;Franta AK;Montgomery WH;Lenters TR;Mounce D;Matsen FA;	Self-assessed outcome at two to four years after shoulder hemiarthroplasty with concentric glenoid reaming	Not Relevant
Wirth MA;Tapscott RS;Southworth C;Rockwood CA;	Treatment of glenohumeral arthritis with a hemiarthroplasty: a minimum five-year follow-up outcome study	Not Relevant
Cofield RH;Frankle MA;Zuckerman JD;	Humeral head replacement for glenohumeral arthritis	Not Relevant