



AMERICAN ACADEMY OF
ORTHOPAEDIC SURGEONS

The Management of Osteoarthritis of the Hip Evidence-Based Clinical Practice Guideline

Companion Consensus Statement

All statements in this document reflect the expert opinion of a multidisciplinary panel of experts. Companion consensus statements are created due to a lack of evidence on the topic under study. Prior to the creation of companion consensus statements, a systematic literature search is performed in an effort to find relevant literature. For evidence-based statements, please visit the Clinical Practice Guideline on Management of Osteoarthritis of the Hip.

Disclaimer

This companion consensus statement document was developed by a multidisciplinary physician volunteer guideline development group based expert opinion. This companion consensus statement document is not intended to be a fixed protocol, as some patients may require more or less treatment or different means of diagnosis. Patient care and treatment should always be based on a clinician's independent medical judgment, given the individual patient's clinical circumstances.

Disclosure Requirement

In accordance with AAOS policy, all individuals whose names appear as authors or contributors to this companion consensus statement document filed a disclosure statement as part of the submission process. All panel members provided full disclosure of potential conflicts of interest prior to voting on the companion consensus statement document contained within this document.

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FDA Clearance

Some drugs or medical devices referenced or described in this companion consensus statement document may not have been cleared by the Food and Drug Administration (FDA) or may have been cleared for a specific use only. The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or device he or she wishes to use in clinical practice.

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Table of Contents

Methodology	4
Consensus Statements	5
Weight Loss as a Conservative Statement	5
Diabetes as a Risk Factor for Total Hip Arthroplasty (THA).....	5
Social Comorbidities as a Risk Factor for Total Hip Arthroplasty (THA).....	5
Intraarticular Imaging	5
Prescription Opioids.....	5
Appendices.....	6
Appendix I. Guideline development group Roster	7
Guidelines Oversight Chair.....	7
AAOS Clinical Practice Guidelines Section Leader.....	7
AAOS Council on Research and Quality Chair.....	7
Appendix II. Excluded Studies	8
Weight Loss as a Conservative Statement	8
Diabetes as a Risk Factor for Total Hip Arthroplasty (THA).....	12
Social Comorbidities as a Risk Factor for Total Hip Arthroplasty (THA).....	14
Intraarticular Imaging	19
Prescription Opioids.....	31
Dysplasia.....	32

Methodology

Per current AAOS methodology, guideline development groups have the option to create companion consensus statements for any clinical practice guideline (CPG) PICO questions which return no evidence after the systematic literature review is conducted.

Companion consensus statements are created using the following steps:

- 1) Prior to the final meeting and after the final/updated literature search for a guideline/systematic review topic, AAOS staff provides a list of any PICO questions which did not return relevant literature to the guideline development group (GDG).
- 2) An electronic form is sent to the GDG member(s) assigned to the PICO question of interest. The form contains the original PICO question and an open response box for them to input a consensus recommendation that reflects their clinical experience and expertise. If more than one GDG member is assigned to the PICO question of interest, they each submit a preliminary consensus statement independently. The submitted preliminary consensus statement must remain within the conceptual parameters of the original question.
- 3) The oversight chair and chairs of the guideline/systematic review retain the right to edit, or request edits to, the preliminary statement if they feel the statement commented on items outside the scope of the original PICO question.
- 4) The submitted preliminary consensus statements are reviewed/approved by the GDG at the final meeting and the chairs of the guideline/systematic review will lead a discussion regarding the preliminary recommendation and any work group suggested edits. The GDG is allowed to edit the preliminary consensus statements during the discussion if necessary. Final edits must be motioned and approved by a majority of work group members (60% of group must approve edits).

Consensus Statements

Weight Loss as a Conservative Statement

In the absence of reliable evidence, it is the opinion of the guideline development group that weight loss may be beneficial in the non-operative management of pain, function, and quality of life in patients with osteoarthritis of the hip.

Diabetes as a Risk Factor for Total Hip Arthroplasty (THA)

In the absence of reliable evidence, it is the opinion of the guideline development group that patients with poorly controlled diabetes may be at a higher risk for short-term adverse events after total hip arthroplasty.

Social Comorbidities as a Risk Factor for Total Hip Arthroplasty (THA)

In the absence of reliable evidence, it is the opinion of the guideline development group that while total hip arthroplasty for patients with lower socioeconomic status and educational levels with symptomatic osteoarthritis of the hip remains beneficial, risk adjustment may be appropriate as inferior outcomes and increased complication rates may occur in this population.

Intraarticular Imaging

In the absence of reliable evidence, it is the opinion of the guideline development group that in patients with normal x-rays but a history and physical exam consistent with IA hip pathology, advanced imaging and/or diagnostic IA injection may be indicated.

Prescription Opioids

In the absence of reliable evidence, it is the opinion of the guideline development workgroup that long-term prescription opioids are not recommended in the treatment of symptomatic osteoarthritis of the hip.

Appendices

Appendix I. Guideline development group Roster

Blinded for Peer Review

Guidelines Oversight Chair

Blinded for Peer Review

AAOS Clinical Practice Guidelines Section Leader

Blinded for Peer Review

AAOS Council on Research and Quality Chair

Blinded for Peer Review

Appendix II. Excluded Studies

Weight Loss as a Conservative Statement

Authors	Article Title	Year	Reason for Exclusion
Ottawa (ON): Canadian Agency for Drugs and Technologies in Health	Obesity Management Interventions Delivered in Primary Care for Patients with Osteoarthritis: A Review of the Clinical Effectiveness [Internet].	2014	Narrative review
Nelson,A.E.; Allen,K.D.; Golightly,Y.M.; Goode,A.P.; Jordan,J.M.	A systematic review of recommendations and guidelines for the management of osteoarthritis: The chronic osteoarthritis management initiative of the U.S. bone and joint initiative	2014	Systematic Review
Paans,N.; van,den Akker-Scheek,I; Dilling,R.G.; Bos,M.; van der Meer,K.; Bulstra,S.K.; Stevens,M.	Effect of exercise and weight loss in people who have hip osteoarthritis and are overweight or obese: a prospective cohort study	2013	Repeat article
de Luis,D.A.; Izaola,O.; Garcia,Alonso M.; Aller,R.; Cabezas,G.; de la Fuente,B.	Effect of a commercial hypocaloric diet in weight loss and post surgical morbidities in obese patients with chronic arthropathy, a randomized clinical trial	2012	Analysis includes OA knee
Gill,R.S.; Al-Adra,D.P.; Shi,X.; Sharma,A.M.; Birch,D.W.; Karmali,S.	The benefits of bariatric surgery in obese patients with hip and knee osteoarthritis: a systematic review	2011	Systematic Review
Felson,D.T.; Chaisson,C.E.	Understanding the relationship between body weight and osteoarthritis	1997	review
Felson,D.T.	Weight and osteoarthritis	1996	Narrative review
Gaught,A.M.H.; Carneiro,K.A.	Evidence for determining the exercise prescription in patients with osteoarthritis	2013	Method section/not completed study
Flugsrud,G.B.; Nordsletten,L.; Espehaug,B.; Havelin,L.I.; Meyer,H.E.	Weight change and the risk of total hip replacement	2003	Screening test/ no comparisons
Bischoff,H.A.; Roos,E.M.	Effectiveness and safety of strengthening, aerobic, and coordination exercises for patients with osteoarthritis	2003	review

Authors	Article Title	Year	Reason for Exclusion
Luis,D.A.; Izaola,O.; Garc�a,Alonso M.; Aller,R.; Cabezas,G.; Fuente,B.	Effect of a commercial hypocaloric diet in weight loss and post surgical morbidity in obese patients with chronic arthropathy, a randomized clinical trial	2012	90% of pop isn't Hip OA
Kim,Y.H.; Park,J.W.; Kim,J.S.	Outcome of an ultrashort metaphyseal-fitting anatomic cementless stem in highly active obese and non-obese patients	2015	90% of pop isn't Hip OA- not relevant to PICO
	(untitled)	2014	Systematic Review
Robbins,C.E.; Bono,J.V.; Ward,D.M.; Barry,M.T.; Doren,J.; McNinch,A.	Effect of preoperative exercise on postoperative mobility in obese total joint replacement patients	2010	less than 10 patients per group
Maly,M.R.; Robbins,S.M.	Osteoarthritis year in review 2014: rehabilitation and outcomes	2014	Systematic Review
Quintrec,J.L.; Verlhac,B.; Cadet,C.; Breville,P.; Vetel,J.M.; Gauvain,J.B.; Jeandel,C.; Maheu,E.	Physical exercise and weight loss for hip and knee osteoarthritis in very old patients: a systematic review of the literature	2014	Systematic Review
Fernandes,L.; Hagen,K.B.; Bijlsma,J.W.; Andreassen,O.; Christensen,P.; Conaghan,P.G.; Doherty,M.; Geenen,R.; Hammond,A.; Kjekouk,I.; Lohmander,L.S.; Lund,H.; Mallen,C.D.; Nava,T.; Oliver,S.; Pavelka,K.; Pitsillidou,I.; da Silva,J.A.; de la Torre,J.; Zanolini,G.; Vliet Vlieland,T.P.	EULAR recommendations for the non-pharmacological core management of hip and knee osteoarthritis	2013	Systematic Review
Levine,M.E.; Nace,J.; Kapadia,B.H.; Issa,K.; Banerjee,S.; Cherian,J.J.; Mont,M.A.	Treatment of primary hip osteoarthritis for the primary care physician and the indications for total hip arthroplasty	2013	Narrative review
Roos,E.M.; Juhl,C.B.	Osteoarthritis 2012 year in review: rehabilitation and outcomes	2012	Review was outcome paper

Authors	Article Title	Year	Reason for Exclusion
Yokochi,M.; Watanabe,T.; Ida,K.; Yoshida,K.; Sato,Y.	Effects of physical exercise prescribed by a medical support team on elderly lower extremity osteoarthritis combined with metabolic syndrome and/or type 2 diabetes	2012	Unclear of population
Pinto,D.; Robertson,M.C.; Hansen,P.; Abbott,J.H.	Cost-effectiveness of nonpharmacologic, nonsurgical interventions for hip and/or knee osteoarthritis: systematic review	2012	Systematic Review
Li,L.C.; Sayre,E.C.; Kopec,J.A.; Esdaile,J.M.; Bar,S.; Cibere,J.	Quality of nonpharmacological care in the community for people with knee and hip osteoarthritis	2011	90% of pop isn't Hip OA
Coupe,V.M.; Veenhof,C.; van Tulder,M.W.; Dekker,J.; Bijlsma,J.W.; van den Ende,C.H.	The cost effectiveness of behavioural graded activity in patients with osteoarthritis of hip and/or knee	2007	Not relevant to recommendation
van Dijk,G.M.; Dekker,J.; Veenhof,C.; van den Ende,C.H.	Course of functional status and pain in osteoarthritis of the hip or knee: a systematic review of the literature	2006	Systematic Review
Roddy,E.; Zhang,W.; Doherty,M.; Arden,N.K.; Barlow,J.; Birrell,F.; Carr,A.; Chakravarty,K.; Dickson,J.; Hay,E.; Hosie,G.; Hurley,M.; Jordan,K.M.; McCarthy,C.; McMurdo,M.; Mockett,S.; O'Reilly,S.; Peat,G.; Pendleton,A.; Richards,S.	Evidence-based recommendations for the role of exercise in the management of osteoarthritis of the hip or knee--the MOVE consensus	2005	Systematic Review
van Baar,M.E.; Assendelft,W.J.; Dekker,J.; Oostendorp,R.A.; Bijlsma,J.W.	Effectiveness of exercise therapy in patients with osteoarthritis of the hip or knee: a systematic review of randomized clinical trials	1999	Systematic Review
Le,Quintrec J.-L.; Verlhac,B.; Cadet,C.; Breville,P.; Vetel,J.M.; Gauvain,J.B.; Jeandel,C.; Maheu,E.	Physical exercise and weight loss for hip and knee osteoarthritis in very old patients: A systematic review of the literature	2014	Repeat article

Authors	Article Title	Year	Reason for Exclusion
Fernandes,L.; Storheim,K.; Nordsletten,L.; Risberg,M.	Effect of patient education and supervised exercise in patients with hip osteoarthritis. A randomized clinical trial	2009	Abstract only
Brosseau, Lucie; MacLeay,L.; Welch, Vivian; Tugwell, Peter; Wells, George A.	Intensity of exercise for the treatment of osteoarthritis	2013	The review was flawed and withdrew
Es, P.P.; Luijsterburg, P.A.; Dekker, J.; Koopmanschap, M.A.; Bohnen, A.M.; Verhaar, J.A.; Koes, B.W.; Bierma-Zeinstra, S.M.	Cost-effectiveness of exercise therapy versus general practitioner care for osteoarthritis of the hip: design of a randomised clinical trial	2011	Results section/not completed study
Baar, M.E.; Dekker, J.; Oostendorp, R.A.; Bijl, D.; Voorn, T.B.; Bijlsma, J.W.	Effectiveness of exercise in patients with osteoarthritis of hip or knee: nine months' follow up	2001	90% of pop isn't Hip OA
Baar, M.E.; Dekker, J.; Oostendorp, R.A.; Bijl, D.; Voorn, T.B.; Lemmens, J.A.; Bijlsma, J.W.	The effectiveness of exercise therapy in patients with osteoarthritis of the hip or knee: a randomized clinical trial	1998	90% of pop isn't Hip OA
Ast, M.P.; Abdel, M.P.; Lee, Y.Y.; Lyman, S.; Ruel, A.V.; Westrich, G.H.	Weight changes after total hip or knee arthroplasty: prevalence, predictors, and effects on outcomes	2015	retrospective case series

Diabetes as a Risk Factor for Total Hip Arthroplasty (THA)

Authors	Article Title	Year	Reason for Exclusion
Jamsen,E.; Nevalainen,P.; Eskelinen,A.; Huotari,K.; Kalliovalkama,J.; Moilanen,T.	Obesity, diabetes, and preoperative hyperglycemia as predictors of periprosthetic joint infection: a single-center analysis of 7181 primary hip and knee replacements for osteoarthritis	2012	very low quality
Jamsen,E.; Nevalainen,P.I.; Eskelinen,A.; Kalliovalkama,J.; Moilanen,T.	Risk factors for perioperative hyperglycemia in primary hip and knee replacements	2015	hip and knee oa results combined, and less than 90% were hip oa
Schairer,W.W.; Sing,D.C.; Vail,T.P.; Bozic,K.J.	Causes and frequency of unplanned hospital readmission after total hip arthroplasty	2014	Not relevant, does not answer pico question
Pritchard,J.M.; Papaioannou,A.; Tomowich,C.; Giangregorio,L.M.; Atkinson,S.A.; Beattie,K.A.; Adachi,J.D.; DeBeer,J.; Winemaker,M.; Avram,V.; Schwarcz,H.P.	Bone mineralization is elevated and less heterogeneous in adults with type 2 diabetes and osteoarthritis compared to controls with osteoarthritis alone	2013	no patient oriented outcomes
Jamsen,E.; Nevalainen,P.I.; Eskelinen,A.; Kalliovalkama,J.; Moilanen,T.	Risk factors for perioperative hyperglycemia in primary hip and knee replacements: A prospective observational study of 191 patients with osteoarthritis	2015	seperated hip and knee data not shown
Lovecchio,F.; Beal,M.; Kwasny,M.; Manning,D.	Do Patients With Insulin-dependent and Noninsulin-dependent Diabetes Have Different Risks for Complications After Arthroplasty?	2014	measurements of A1C were unavailable in the database, so they were unable to measure level of diabetic control
Viens,N.A.; Hug,K.T.; Marchant,M.H.; Cook,C.; Vail,T.P.; Bolognesi,M.P.	Role of diabetes type in perioperative outcomes after hip and knee arthroplasty in the United States	2012	hip and knee results combined and unclear if diabetes was poorly controlled
Choong,P.F.M.; Dowsey,M.M.; Carr,D.; Daffy,J.; Stanley,P.	Risk factors associated with acute hip prosthetic joint infections and outcome of treatment with a rifampinbased regimen	2007	less than 90% OA hip

Authors	Article Title	Year	Reason for Exclusion
Harris,A.H.; Bowe,T.R.; Gupta,S.; Ellerbe,L.S.; Giori,N.J.	Hemoglobin A1C as a marker for surgical risk in diabetic patients undergoing total joint arthroplasty	2013	combines Hip and Knee patients, and it is unclear if 90% of the patient population had THA versus TKA
Nielen,J.T.; de,Vries F.; Dagnelie,P.C.; van den Bemt,B.J.; Emans,P.J.; Lalmohamed,A.; De,Boer A.; Boonen,A.	Use of thiazolidinediones and the risk of elective hip or knee replacement: a population based case- control study	2016	not relevant. outcome is needing THA

Social Comorbidities as a Risk Factor for Total Hip Arthroplasty (THA)

Authors	Article Title	Year	Reason for Exclusion
Mnatzaganian,G.; Ryan,P.; Reid,C.M.; Davidson,D.C.; Hiller,J.E.	Smoking and primary total hip or knee replacement due to osteoarthritis in 54,288 elderly men and women	2013	not relevant. Outcome is THA
Davis,A.M.; Perruccio,A.V.; Ibrahim,S.; Hogg- Johnson,S.; Wong,R.; Streiner,D.L.; Beaton,D.E.; Cote,P.; Gignac,M.A.; Flannery,J.; Schemitsch,E.; Mahomed,N.N.; Badley,E.M.	The trajectory of recovery and the inter-relationships of symptoms, activity and participation in the first year following total hip and knee replacement	2011	combined hip and knee data for risk factor analysis
Santaguida,P.L.; Hawker,G.A.; Hudak,P.L.; Glazier,R.; Mahomed,N.N.; Kreder,H.J.; Coyte,P.C.; Wright,J.G.	Patient characteristics affecting the prognosis of total hip and knee joint arthroplasty: a systematic review	2008	systematic review
Wallace,G.; Judge,A.; Prieto-Alhambra,D.; de,Vries F.; Arden,N.K.; Cooper,C.	The effect of body mass index on the risk of post-operative complications during the 6 months following total hip replacement or total knee replacement surgery	2014	unclear if 90% of the patient population had oa hip
Youm,J.; Chan,V.; Belkora,J.; Bozic,K.J.	Impact of socioeconomic factors on informed decision making and treatment choice in patients with hip and knee OA	2015	outcome is decision to have surgery. not relevant to pico question
Peltola,M.; Jarvelin,J.	Association between household income and the outcome of arthroplasty: a register-based study of total hip and knee replacements	2014	The available literature for social comorbidities was deemed unable to adequately answer the original pico question. this study was excluded by the work group
Gonzalez Saenz de,Tejada M.; Escobar,A.; Bilbao,A.; Herrera- Espineira,C.; Garcia- Perez,L.; Aizpuru,F.; Sarasqueta,C.	A prospective study of the association of patient expectations with changes in health-related quality of life outcomes, following total joint replacement	2014	combines hip and knee patients. less than 90% OA hip
Greene,M.E.; Rolfson,O.; Nemes,S.; Gordon,M.; Malchau,H.; Garellick,G.	Education attainment is associated with patient-reported outcomes: findings from the Swedish Hip Arthroplasty Register	2014	less than 50% follow up

Authors	Article Title	Year	Reason for Exclusion
Klit,J.	Results of total joint arthroplasty and joint preserving surgery in younger patients evaluated by alternative outcome measures	2014	relevance to pico questions unclear. the arthroplasty study included resurfacing patients, so it is not relevant to the THA for any diagnosis pico question. it was unclear if the patient population had OA for other risk factors besides age
Heintzbergen,S.; Kulin,N.A.; Ijzerman,M.J.; Steuten,L.M.; Werle,J.; Khong,H.; Marshall,D.A.	Cost-utility of metal-on-metal hip resurfacing compared to conventional total hip replacement in young active patients with osteoarthritis	2013	cost analysis
Ieiri,A.; Tushima,E.; Ishida,K.; Abe,S.; Inoue,M.; Masuda,T.	What predicts 36-item health survey version 2 after total hip arthroplasty	2013	less than 50% follow up. only 138 of 659 patients included.
Krupic,F.; Eisler,T.; Garellick,G.; Karrholm,J.	Influence of ethnicity and socioeconomic factors on outcome after total hip replacement	2013	not relevant. only variable analyzed was swedish immigration status
Okoro,T.; Morrison,V.; Maddison,P.; Lemmey,A.B.; Andrew,J.G.	An assessment of the impact of behavioural cognitions on function in patients partaking in a trial of early home-based progressive resistance training after total hip replacement surgery	2013	not relevant. article is a study of outcomes after post-op rehabilitation programs
Pinto,P.R.; McIntyre,T.; Ferrero,R.; Almeida,A.; Araujo-Soares,V.	Risk factors for moderate and severe persistent pain in patients undergoing total knee and hip arthroplasty: a prospective predictive study	2013	hip and knee results combined
Prokopetz,J.J.; Losina,E.; Bliss,R.L.; Wright,J.; Baron,J.A.; Katz,J.N.	Risk factors for revision of primary total hip arthroplasty: a systematic review	2012	systematic review
Meermans,G.; Corten,K.; Simon,J.P.	Is the infection rate in primary THA increased after steroid injection?	2012	less than 90% OA hip
Piscitelli,P.; Iolascon,G.; Di,Tanna G.; Bizzi,E.; Chitano,G.; Argentiero,A.; Neglia,C.; Giolli,L.; Distante,A.; Gimigliano,R.; Brandi,M.L.; Migliore,A.	Socioeconomic burden of total joint arthroplasty for symptomatic hip and knee osteoarthritis in the Italian population: a 5-year analysis based on hospitalization records	2012	socioeconomic status not evaluated as a risk factor for poor postoperative outcomes
Hoogeboom,T.J.; den Broeder,A.A.; Swierstra,B.A.; de Bie,R.A.; van den Ende,C.H.	Joint-pain comorbidity, health status, and medication use in hip and knee osteoarthritis: a cross-sectional study	2012	not relevant. patients did not have surgery

Authors	Article Title	Year	Reason for Exclusion
van Dijk,G.M.; Veenhof,C.; Lankhorst,G.J.; van den Ende,C.H.; Dekker,J.	Vitality and the course of limitations in activities in osteoarthritis of the hip or knee	2011	patients were recruited from a rehab center, but not all of them had surgery
Singh,J.A.; Kundukulam,J.; Riddle,D.L.; Strand,V.; Tugwell,P.	Early postoperative mortality following joint arthroplasty: a systematic review	2011	systematic review
Judge,A.; Cooper,C.; Arden,N.K.; Williams,S.; Hobbs,N.; Dixon,D.; Gunther,K.P.; Dreinhofer,K.; Dieppe,P.A.	Pre-operative expectation predicts 12-month post- operative outcome among patients undergoing primary total hip replacement in European orthopaedic centres	2011	Not relevant
Clement,N.D.; Muzammil,A.; MacDonald,D.; Howie,C.R.; Biant,L.C.	Socioeconomic status affects the early outcome of total hip replacement	2011	very low quality due to potential for aggregation bias. SES is measured using deprivation index according to geographic location, instead being measured at the individual level
Allen,Butler R.; Rosenzweig,S.; Myers,L.; Barrack,R.L.	The Frank Stinchfield Award: the impact of socioeconomic factors on outcome after THA: a prospective, randomized study	2011	less than 90% OA hip
Howard,K.J.; Ellis,H.B.; Khaleel,M.A.; Gatchel,R.J.; Bucholz,R.	Psychosocial profiles of indigent patients with severe osteoarthritis requiring arthroplasty	2011	outcomes measured before arthroplasty. not relevant to pico question
Pedersen,A.B.; Baron,J.A.; Overgaard,S.; Johnsen,S.P.	Short- and long-term mortality following primary total hip replacement for osteoarthritis: a Danish nationwide epidemiological study	2011	mortality rate compared to healthy controls
Schafer,T.; Krummenauer,F.; Mettelsiefen,J.; Kirschner,S.; Gunther,K.P.	Social, educational, and occupational predictors of total hip replacement outcome	2010	unclear if 90% of the patient population had oa hip
Gonzalez Saenz de,Tejada M.; Escobar,A.; Herrera,C.; Garcia,L.; Aizpuru,F.; Sarasqueta,C.	Patient expectations and health-related quality of life outcomes following total joint replacement	2010	combines hip and knee patients
Gandhi,R.; Razak,F.; Davey,J.R.; Rampersaud,Y.R.; Mahomed,N.N.	Effect of sex and living arrangement on the timing and outcome of joint replacement surgery	2010	hip and knee results combined

Authors	Article Title	Year	Reason for Exclusion
Baumann,C.; Rat,A.C.; Osnowycz,G.; Mainard,D.; Cuny,C.; Guillemin,F.	Satisfaction with care after total hip or knee replacement predicts self- perceived health status after surgery	2009	hip and knee results combined
Jenkins,P.J.; Perry,P.R.; Yew,Ng C.; Ballantyne,J.A.	Deprivation influences the functional outcome from total hip arthroplasty	2009	very low quality due to use of aggregate data to measure individual SES.
Gandhi,R.; Davey,J.R.; Mahomed,N.N.	Predicting patient dissatisfaction following joint replacement surgery	2008	hip and knee results combined
Gandhi,R.; Razak,F.; Davey,J.R.; Mahomed,N.N.	Ethnicity and patient's perception of risk in joint replacement surgery	2008	combines hip and knee results
Gignac,M.A.; Backman,C.L.; Davis,A.M.; Lacaille,D.; Mattison,C.A.; Montie,P.; Badley,E.M.	Understanding social role participation: what matters to people with arthritis?	2008	combines hip and knee results
Rahme,E.; Dasgupta,K.; Burman,M.; Yin,H.; Bernatsky,S.; Berry,G.; Nedjar,H.; Kahn,S.R.	Postdischarge thromboprophylaxis and mortality risk after hip-or knee-replacement surgery	2008	hip and knee results combined
Groeneveld,P.W.; Kwoh,C.K.; Mor,M.K.; Appelt,C.J.; Geng,M.; Gutierrez,J.C.; Wessel,D.S.; Ibrahim,S.A.	Racial differences in expectations of joint replacement surgery outcomes	2008	not relevant. outcome is patient expectation of joint replacement results, which is measured before surgery
Baumann,C.; Rat,A.C.; Osnowycz,G.; Mainard,D.; Delagoutte,J.P.; Cuny,C.; Guillemin,F.	Do clinical presentation and pre-operative quality of life predict satisfaction with care after total hip or knee replacement?	2006	hip and knee results combined
Woo,J.; Lau,E.; Lee,P.; Kwok,T.; Lau,W.C.; Chan,C.; Chiu,P.; Li,E.; Sham,A.; Lam,D.	Impact of osteoarthritis on quality of life in a Hong Kong Chinese population	2004	not all patients had hip replacement.
Ethgen,O.; Vanparijs,P.; Delhalle,S.; Rosant,S.; Bruyere,O.; Reginster,J.Y.	Social support and health- related quality of life in hip and knee osteoarthritis	2004	hip and knee results combined
Judge,A.; Kendal,A.; Prieto-Alhambra,D.; Arden,N.K.; Carr,A.	Mortality following elective total hip replacement and hip resurfacing	2013	abstract only
Luong,M.-L.; Cleveland,R.J.; Nyrop,K.A.; Callahan,L.F.	Social determinants and osteoarthritis outcomes	2012	

Authors	Article Title	Year	Reason for Exclusion
Martire,L.M.; Schulz,R.; Keefe,F.J.; Rudy,T.E.; Starz,T.W.	Couple-oriented education and support intervention: Effects on individuals with osteoarthritis and their spouses	2007	Unclear if 90% of pop is Hip OA
Inoue,K.; Ushiyama,T.; Tani,Y.; Hukuda,S.	Sociodemographic factors and failure of hip arthroplasty	1999	less than 90% OA hip. age results not reported
Krupic,F.; Garellick,G.; Gordon,M.; Karrholm,J.	Different patient-reported outcomes in immigrants and patients born in Sweden	2014	not relevant. only risk factor studied was nationality
Wetterholm,M.; Turkiewicz,A.; Stigmar,K.; Hubertsson,J.; Englund,M.	The rate of joint replacement in osteoarthritis depends on the patient's socioeconomic status	2016	not relevant. joint replacement was the outcome.

Intraarticular Imaging

Authors	Article Title	Year	Reason for Exclusion
Gonzalez Gil,A.B.; Llombart,Blanco R.; Diaz de,Rada P.	Validity of magnetic resonance arthrography as a diagnostic tool in femoroacetabular impingement syndrome	2015	Retrospective case series
Turmezei,T.D.; Fotiadou,A.; Lomas,D.J.; Hopper,M.A.; Poole,K.E.	A new CT grading system for hip osteoarthritis	2014	Not relevant, does not answer pico question
Dorleijn,D.M.; Luijsterburg,P.A.; Bierma-Zeinstra,S.M.; Bos,P.K.	Is anesthetic hip joint injection useful in diagnosing hip osteoarthritis? A meta-analysis of case series	2014	Systematic Review
Xu,L.; Hayashi,D.; Guermazi,A.; Hunter,D.J.; Li,L.; Winterstein,A.; Bohndorf,K.; Roemer,F.W.	The diagnostic performance of radiography for detection of osteoarthritis-associated features compared with MRI in hip joints with chronic pain	2013	Not relevant, does not answer pico question
Kemp,J.L.; Collins,N.J.; Makdissi,M.; Schache,A.G.; Machotka,Z.; Crossley,K.	Hip arthroscopy for intra-articular pathology: a systematic review of outcomes with and without femoral osteoplasty	2012	Systematic Review
Larson,A.N.; Sucato,D.J.; Herring,J.A.; Adolfson,S.E.; Kelly,D.M.; Martus,J.E.; Lovejoy,J.F.; Browne,R.; Delarocha,A.	A prospective multicenter study of Legg-Calve-Perthes disease: functional and radiographic outcomes of nonoperative treatment at a mean follow-up of twenty years	2012	Not relevant, does not answer pico question
Deshmukh,A.J.; Thakur,R.R.; Goyal,A.; Klein,D.A.; Ranawat,A.S.; Rodriguez,J.A.	Accuracy of diagnostic injection in differentiating source of atypical hip pain	2010	
MacFarlane,R.J.; Haddad,F.S.	The diagnosis and management of femoroacetabular impingement	2010	Systematic Review
Kang,A.C.; Gooding,A.J.; Coates,M.H.; Goh,T.D.; Armour,P.; Rietveld,J.	Computed tomography assessment of hip joints in asymptomatic individuals in relation to femoroacetabular impingement	2010	Not relevant, does not answer pico question
Baker,J.F.; Mulhall,K.J.	Femoro-acetabular impingement and hip pain with conventionally normal x-rays	2010	Review

Authors	Article Title	Year	Reason for Exclusion
Jessel,R.H.; Zilkens,C.; Tiderius,C.; Dudda,M.; Mamisch,T.C.; Kim,Y.J.	Assessment of osteoarthritis in hips with femoroacetabular impingement using delayed gadolinium enhanced MRI of cartilage	2009	Medical records review
Pozzi,G.; Stradiotti,P.; Parra,C.G.; Zagra,L.; Sironi,S.; Zerbi,A.	Femoro-acetabular impingement: can indirect MR arthrography be considered a valid method to detect endoarticular damage? A preliminary study	2009	Not relevant, does not answer pico question
Mamisch,T.C.; Zilkens,C.; Siebenrock,K.A.; Bittersohl,B.; Kim,Y.J.; Werlen,S.	Hip MRI and its implications for surgery in osteoarthritis patients	2009	Review
Troelsen,A.; Mechlenburg,I.; Gelineck,J.; Bolvig,L.; Jacobsen,S.; Soballe,K.	What is the role of clinical tests and ultrasound in acetabular labral tear diagnostics?	2009	
Nishii,T.; Tanaka,H.; Sugano,N.; Miki,H.; Takao,M.; Yoshikawa,H.	Disorders of acetabular labrum and articular cartilage in hip dysplasia: evaluation using isotropic high-resolution CT arthrography with sequential radial reformation	2007	Not relevant, does not answer pico question
James,S.; Miocevic,M.; Malara,F.; Pike,J.; Young,D.; Connell,D.	MR imaging findings of acetabular dysplasia in adults	2006	Not relevant, does not answer pico question
Alvarez,C.; Chicheportiche,V.; Lequesne,M.; Vicaut,E.; Laredo,J.D.	Contribution of helical computed tomography to the evaluation of early hip osteoarthritis: a study in 18 patients	2005	Retrospective case series
Nishii,T.; Tanaka,H.; Nakanishi,K.; Sugano,N.; Miki,H.; Yoshikawa,H.	Fat-suppressed 3D spoiled gradient-echo MRI and MDCT arthrography of articular cartilage in patients with hip dysplasia	2005	Not relevant, does not answer pico question
Santori,N.; Villar,R.N.	Arthroscopic findings in the initial stages of hip osteoarthritis	1999	Retrospective case series
Nishii,T.; Nakanishi,K.; Sugano,N.; Masuhara,K.; Ohzono,K.; Ochi,T.	Articular cartilage evaluation in osteoarthritis of the hip with MR imaging under continuous leg traction	1998	Not relevant, does not answer pico question

Authors	Article Title	Year	Reason for Exclusion
Crawford,R.W.; Gie,G.A.; Ling,R.S.; Murray,D.W.	Diagnostic value of intra-articular anaesthetic in primary osteoarthritis of the hip	1998	Not relevant, does not answer pico question
Leunig,M.; Werlen,S.; Ungersbock,A.; Ito,K.; Ganz,R.	Evaluation of the acetabular labrum by MR arthrography	1997	15 abnormal x-ray
Hasegawa,Y.; Fukatsu,H.; Matsuda,T.; Iwase,T.; Iwata,H.	Magnetic resonance imaging in osteoarthrosis of the dysplastic hip	1996	17 abnormal x-ray
Nash,M.S.; Tehranzadeh,J.; Green,B.A.; Rountree,M.T.; Shea,J.D.	Magnetic resonance imaging of osteonecrosis and osteoarthrosis in exercising quadriplegics and paraplegics	1994	Not relevant, does not answer pico question
Kleiner,J.B.; Thorne,R.P.; Curd,J.G.	The value of bupivacaine hip injection in the differentiation of coxarthrosis from lower extremity neuropathy	1991	Not relevant, does not answer pico question
Stoller,D.W.; Genant,H.K.	Magnetic resonance imaging of the knee and hip	1990	Review
Lattanzi,R.; Petchprapa,C.; Ascani,D.; Babb,J.S.; Chu,D.; Davidovitch,R.I.; Youm,T.; Meislin,R.J.; Recht,M.P.	Detection of cartilage damage in femoroacetabular impingement with standardized dGEMRIC at 3T	2014	Not relevant, does not answer pico question
Lattanzi,R.; Petchprapa,C.; Glaser,C.; Dunham,K.; Mikheev,A.V.; Krigel,A.; Mamisch,T.C.; Kim,Y.- J.; Rusinek,H.; Recht,M.	A new method to analyze dGEMRIC measurements in femoroacetabular impingement: Preliminary validation against arthroscopic findings	2012	Not relevant, does not answer pico question
Illgen II,R.L.; Honkamp,N.J.; Weisman,M.H.; Hagenauer,M.E.; Heiner,J.P.; Anderson,P.A.	The Diagnostic and Predictive Value of Hip Anesthetic Arthrograms in Selected Patients Before Total Hip Arthroplasty	2006	Not relevant, does not answer pico question
O'leary,J.A.; Berend,K.; Vail,T.P.	The relationship between diagnosis and outcome in arthroscopy of the hip	2001	Review
McCarthy,J.C.; Busconi,B.	The role of hip arthroscopy in the diagnosis and treatment of hip disease	1995	Abstract

Authors	Article Title	Year	Reason for Exclusion
Jayakar,R.; Merz,A.; Plotkin,B.; Wang,D.; Seeger,L.; Hame,S.	Magnetic resonance arthrography and the prevalence of acetabular labral tears in patients 50 years of age and older: Is it really indicated?	2015	Abstract
Siebenrock,K.A.; Kienle,K.-P.; Steppacher,S.D.; Tannast,M.; Mamisch,T.C.; von,Rechenberg B.	Biochemical MRI Predicts Hip Osteoarthritis in an Experimental Ovine Femoroacetabular Impingement Model	2014	Sheep study
Mofidi,A.; Shields,J.S.; Stubbs,A.J.	Central acetabular osteophyte (saber tooth sign), one of the earliest signs of osteoarthritis of the hip joint	2011	Case report
Ashok,N.; Sivan,M.; Tafazal,S.; Sell,P.	The diagnostic value of anaesthetic hip injection in differentiating between hip and spinal pain	2009	Not relevant, does not answer pico question
Hellman,M.D.; Mascarenhas,R.; Gupta,A.; Fillingham,Y.; Haughom,B.D.; Salata,M.J.; Nho,S.J.	The False-Profile View May Be Used to Identify Cam Morphology	2015	Not relevant, does not answer pico question
Crespo Rodriguez,A.M.; de Lucas Villarrubia,J.C.; Pastrana Ledesma,M.A.; Millan,Santos,I; Padron,M.	Diagnosis of lesions of the acetabular labrum, of the labral-chondral transition zone, and of the cartilage in femoroacetabular impingement: Correlation between direct magnetic resonance arthrography and hip arthroscopy	2015	Not relevant, does not answer pico question
Petchprapa,C.N.; Rybak,L.D.; Dunham,K.S.; Lattanzi,R.; Recht,M.P.	Labral and cartilage abnormalities in young patients with hip pain: accuracy of 3-Tesla indirect MR arthrography	2015	Abnormal x-ray included
Tian,C.Y.; Wang,J.Q.; Zheng,Z.Z.; Ren,A.H.	3.0 T conventional hip MR and hip MR arthrography for the acetabular labral tears confirmed by arthroscopy	2014	Hip and Knee combined
Devitt,B.M.; Philippon,M.J.; Goljan,P.; Peixoto,L.P.; Briggs,K.K.; Ho,C.P.	Preoperative diagnosis of pathologic conditions of the ligamentum teres: is MRI a valuable imaging modality?	2014	Abnormal radiograph not defined

Authors	Article Title	Year	Reason for Exclusion
Ellermann,J.; Ziegler,C.; Nissi,M.J.; Goebel,R.; Hughes,J.; Benson,M.; Holmberg,P.; Morgan,P.	Acetabular cartilage assessment in patients with femoroacetabular impingement by using T2* mapping with arthroscopic verification	2014	Not relevant, does not answer pico question
Khanna,V.; Harris,A.; Farrokhyar,F.; Choudur,H.N.; Wong,I.H.	Hip arthroscopy: prevalence of intra-articular pathologic findings after traumatic injury of the hip	2014	Not relevant, does not answer pico question
Le Duff,M.J.; Johnson,A.J.; Wassef,A.J.; Amstutz,H.C.	Does femoral neck to cup impingement affect metal ion levels in hip resurfacing?	2014	Not relevant, does not answer pico question
Sutter,R.; Zubler,V.; Hoffmann,A.; Mamisch-Saue,N.; Dora,C.; Kalberer,F.; Zanetti,M.; Hodler,J.; Pfirrmann,C.W.	Hip MRI: how useful is intraarticular contrast material for evaluating surgically proven lesions of the labrum and articular cartilage?	2014	Not relevant, does not answer pico question
Jung,J.Y.; Kim,G.U.; Lee,H.J.; Jang,E.C.; Song,I.S.; Ha,Y.C.	Diagnostic value of ultrasound and computed tomographic arthrography in diagnosing anterosuperior acetabular labral tears	2013	Not relevant, does not answer pico question
Lu,M.; Zhou,Y.X.; Du,H.; Zhang,J.; Liu,J.	Reliability and validity of measuring acetabular component orientation by plain anteroposterior radiographs	2013	Not relevant, does not answer pico question
Aprato,A.; Masse,A.; Faletti,C.; Valente,A.; Atzori,F.; Stratta,M.; Jayasekera,N.	Magnetic resonance arthrography for femoroacetabular impingement surgery: is it reliable?	2013	Not relevant, does not answer pico question
Yu,R.; Hofstaetter,J.G.; Sullivan,T.; Costi,K.; Howie,D.W.; Solomon,L.B.	Validity and reliability of the Paprosky acetabular defect classification	2013	Not relevant, does not answer pico question
Ha,Y.C.; Choi,J.A.; Lee,Y.K.; Kim,J.Y.; Koo,K.H.; Lee,G.Y.; Kang,H.S.	The diagnostic value of direct CT arthrography using MDCT in the evaluation of acetabular labral tear: with arthroscopic correlation	2013	Not relevant, does not answer pico question
Imai,N.; Ito,T.; Suda,K.; Miyasaka,D.; Endo,N.	Pelvic flexion measurement from lateral projection radiographs is clinically reliable	2013	Not relevant, does not answer pico question

Authors	Article Title	Year	Reason for Exclusion
Park,S.Y.; Park,J.S.; Jin,W.; Rhyu,K.H.; Ryu,K.N.	Diagnosis of acetabular labral tears: comparison of three-dimensional intermediate-weighted fast spin-echo MR arthrography with two-dimensional MR arthrography at 3.0 T	2013	Not relevant, does not answer pico question
Hananouchi,T.; Yasui,Y.; Yamamoto,K.; Toritsuka,Y.; Ohzono,K.	Anterior impingement test for labral lesions has high positive predictive value	2012	Not relevant, does not answer pico question
Nepple,J.J.; Larson,C.M.; Smith,M.V.; Kim,Y.J.; Zaltz,I.; Sierra,R.J.; Clohisey,J.C.	The reliability of arthroscopic classification of acetabular rim labrochondral disease	2012	Not relevant, does not answer pico question
Fujii,M.; Nakashima,Y.; Sato,T.; Akiyama,M.; Iwamoto,Y.	Acetabular tilt correlates with acetabular version and coverage in hip dysplasia	2012	would be very low quality diagnostic study for using healthy controls
Reurink,G.; Jansen,S.P.; Bisselink,J.M.; Vincken,P.W.; Weir,A.; Moen,M.H.	Reliability and validity of diagnosing acetabular labral lesions with magnetic resonance arthrography	2012	Not relevant, does not answer pico question
Saddik,D.; Tran,P.; Troupis,J.; Tirman,P.; O'Donnell,J.; Howells,R.; Farish,S.; Tartaglia,C.	Are extra-labral MR findings useful in the diagnosis of a labral tear?	2012	Not relevant, does not answer pico question
Botser,I.B.; Ozoude,G.C.; Martin,D.E.; Siddiqi,A.J.; Kuppuswami,S.; Domb,B.G.	Femoral anteversion in the hip: comparison of measurement by computed tomography, magnetic resonance imaging, and physical examination	2012	Not relevant, does not answer pico question
Larson,A.N.; Rabenhorst,B.; De La Rocha,A.; Sucato,D.J.	Limited intraobserver and interobserver reliability for the common measures of hip joint congruency used in dysplasia	2012	Not relevant, does not answer pico question
Dietrich,T.J.; Suter,A.; Pfirrmann,C.W.; Dora,C.; Fucentese,S.F.; Zanetti,M.	Supraacetabular fossa (pseudodeflect of acetabular cartilage): frequency at MR arthrography and comparison of findings at MR arthrography and arthroscopy	2012	Not relevant, does not answer pico question
Kutty,S.; Schneider,P.; Faris,P.; Kiefer,G.; Frizzell,B.; Park,R.; Powell,J.N.	Reliability and predictability of the centre-edge angle in the assessment of pincer femoroacetabular impingement	2012	Not relevant, does not answer pico question

Authors	Article Title	Year	Reason for Exclusion
Jin,W.; Kim,K.I.; Rhyu,K.H.; Park,S.Y.; Kim,H.C.; Yang,D.M.; Park,J.S.; Park,S.J.; Ryu,K.N.	Sonographic evaluation of anterosuperior hip labral tears with magnetic resonance arthrographic and surgical correlation	2012	Not relevant, does not answer pico question
Tiberi,J.V.; Pulos,N.; Kertzner,M.; Schmalzried,T.P.	A more reliable method to assess acetabular component position	2012	Not relevant, does not answer pico question
Nho,J.H.; Lee,Y.K.; Kim,H.J.; Ha,Y.C.; Suh,Y.S.; Koo,K.H.	Reliability and validity of measuring version of the acetabular component	2012	Not relevant, does not answer pico question
Kim,H.T.; Kim,I.B.; Lee,J.S.	MR-based parameters as a supplement to radiographs in managing developmental hip dysplasia	2011	Not relevant, does not answer pico question
Nunley,R.M.; Keeney,J.A.; Zhu,J.; Clohisy,J.C.; Barrack,R.L.	The reliability and variation of acetabular component anteversion measurements from cross-table lateral radiographs	2011	Not relevant, does not answer pico question
Wakabayashi,K.; Wada,I.; Horiuchi,O.; Mizutani,J.; Tsuchiya,D.; Otsuka,T.	MRI findings in residual hip dysplasia	2011	Not relevant, does not answer pico question
Lazennec,J.Y.; Rousseau,M.A.; Rangel,A.; Gorin,M.; Belicourt,C.; Brusson,A.; Catonne,Y.	Pelvis and total hip arthroplasty acetabular component orientations in sitting and standing positions: measurements reproductibility with EOS imaging system versus conventional radiographies	2011	Not relevant, does not answer pico question
Smith,T.O.; Hilton,G.; Toms,A.P.; Donell,S.T.; Hing,C.B.	The diagnostic accuracy of acetabular labral tears using magnetic resonance imaging and magnetic resonance arthrography: a meta-analysis	2011	Systematic Review
Kim,H.T.; Oh,M.H.; Lee,J.S.	MR imaging as a supplement to traditional decision-making in the treatment of LCP disease	2011	Not relevant, does not answer pico question
Barton,C.; Salineros,M.J.; Rakhra,K.S.; Beaulé,P.E.	Validity of the alpha angle measurement on plain radiographs in the evaluation of cam-type femoroacetabular impingement	2011	Not relevant, does not answer pico question
Wang,W.G.; Yue,D.B.; Zhang,N.F.; Hong,W.; Li,Z.R.	Clinical diagnosis and arthroscopic treatment of acetabular labral tears	2011	Not relevant, does not answer pico question

Authors	Article Title	Year	Reason for Exclusion
Konan,S.; Rayan,F.; Haddad,F.S.	Is the frog lateral plain radiograph a reliable predictor of the alpha angle in femoroacetabular impingement?	2010	Not relevant, does not answer pico question
Douira-Khomsni,W.; Smida,M.; Louati,H.; Hassine,L.B.; Bouchoucha,S.; Saied,W.; Ladeb,M.F.; Ghachem,M.B.; Bellagha,I.	Magnetic resonance evaluation of acetabular residual dysplasia in developmental dysplasia of the hip: a preliminary study of 27 patients	2010	Not relevant, does not answer pico question
Oh,C.W.; Joo,S.Y.; Kumar,S.J.; MacEwen,G.D.	A radiological classification of lateral growth arrest of the proximal femoral physis after treatment for developmental dysplasia of the hip	2009	Not relevant, does not answer pico question
Graves,M.L.; Mast,J.W.	Femoroacetabular impingement: do outcomes reliably improve with surgical dislocations?	2009	Not relevant, does not answer pico question
Zaragoza,E.; Lattanzio,P.J.; Beaule,P.E.	Magnetic resonance imaging with gadolinium arthrography to assess acetabular cartilage delamination	2009	Not relevant, does not answer pico question
Borrelli,J.,Jr.; Peelle,M.; McFarland,E.; Evanoff,B.; Ricci,W.M.	Computer-reconstructed radiographs are as good as plain radiographs for assessment of acetabular fractures	2008	Not relevant, does not answer pico question
Yamamoto,Y.; Tonotsuka,H.; Ueda,T.; Hamada,Y.	Usefulness of radial contrast-enhanced computed tomography for the diagnosis of acetabular labrum injury	2007	Not relevant, does not answer pico question
James,S.L.; Ali,K.; Malara,F.; Young,D.; O'Donnell,J.; Connell,D.A.	MRI findings of femoroacetabular impingement	2006	Not relevant, does not answer pico question
Tallroth,K.; Lepisto,J.	Computed tomography measurement of acetabular dimensions: normal values for correction of dysplasia	2006	Not relevant, does not answer pico question
Burnett,R.S.; Della Rocca,G.J.; Prather,H.; Curry,M.; Maloney,W.J.; Clohisy,J.C.	Clinical presentation of patients with tears of the acetabular labrum	2006	Not relevant, does not answer pico question

Authors	Article Title	Year	Reason for Exclusion
Chan, Y.S.; Lien, L.C.; Hsu, H.L.; Wan, Y.L.; Lee, M.S.; Hsu, K.Y.; Shih, C.H.	Evaluating hip labral tears using magnetic resonance arthrography: a prospective study comparing hip arthroscopy and magnetic resonance arthrography diagnosis	2005	Not relevant, does not answer pico question
Lubovsky, O.; Liebergall, M.; Mattan, Y.; Weil, Y.; Mosheiff, R.	Early diagnosis of occult hip fractures MRI versus CT scan	2005	Not relevant, fracture study
Mintz, D.N.; Hooper, T.; Connell, D.; Buly, R.; Padgett, D.E.; Potter, H.G.	Magnetic resonance imaging of the hip: detection of labral and chondral abnormalities using noncontrast imaging	2005	Not relevant, does not answer pico question
Dinauer, P.A.; Murphy, K.P.; Carroll, J.F.	Sublabral sulcus at the posteroinferior acetabulum: a potential pitfall in MR arthrography diagnosis of acetabular labral tears	2004	Not relevant, does not answer pico question
Keeney, J.A.; Peelle, M.W.; Jackson, J.; Rubin, D.; Maloney, W.J.; Clohisy, J.C.	Magnetic resonance arthrography versus arthroscopy in the evaluation of articular hip pathology	2004	Not relevant, does not answer pico question
Bruce, W.; van der Wall, H.; STOREY, G.; Loneragan, R.; Pitsis, G.; Kannangara, S.	Bone scintigraphy in acetabular labral tears	2004	Retrospective case series
Schmid, M.R.; Notzli, H.P.; Zanetti, M.; Wyss, T.F.; Hodler, J.	Cartilage lesions in the hip: diagnostic effectiveness of MR arthrography	2003	Not relevant, does not answer pico question
Elbourne, D.; Dezateux, C.; Arthur, R.; Clarke, N.M.; Gray, A.; King, A.; Quinn, A.; Gardner, F.; Russell, G.	Ultrasonography in the diagnosis and management of developmental hip dysplasia (UK Hip Trial): clinical and economic results of a multicentre randomised controlled trial	2002	Not relevant, does not answer pico question
Brown, G.A.; Firoozbakhsh, K.; Gehlert, R.J.	Three-dimensional CT modeling versus traditional radiology techniques in treatment of acetabular fractures	2001	Not relevant, does not answer pico question

Authors	Article Title	Year	Reason for Exclusion
Mayer,S.W.; Stewart,J.R.; Fadell,M.F.; Kestel,L.; Novais,E.N.	MRI as a reliable and accurate method for assessment of posterior hip dislocation in children and adolescents without the risk of radiation exposure	2015	Not relevant, does not answer pico question
Burge,A.J.; Gold,S.L.; Lurie,B.; Nawabi,D.H.; Fields,K.G.; Koff,M.F.; Westrich,G.; Potter,H.G.	MR Imaging of Adverse Local Tissue Reactions around Rejuvenate Modular Dual-Taper Stems	2015	Retrospective case series
Datir,A.; Xing,M.; Kang,J.; Harkey,P.; Kakarala,A.; Carpenter,W.A.; Terk,M.R.	Diagnostic utility of MRI and MR arthrography for detection of ligamentum teres tears: a retrospective analysis of 187 patients with hip pain	2014	Not relevant, does not answer pico question
Testoni,M.; Baruffaldi,F.; Mattioli,P.; Sudanese,A.; Terzi,S.; Barbanti-Brodano,G.; Toni,A.	Evaluation of radiolucency condition in total hip arthroplasty: a statistical comparison of the diagnostic capability of digitised image vs. conventional X-ray film	2000	Not relevant, does not answer pico question
Kruczynski,J.	Avascular necrosis of the proximal femur in developmental dislocation of the hip. Incidence, risk factors, sequelae and MR imaging for diagnosis and prognosis	1996	Abstract
Liu,S.H.; Henry,M.H.; Nuccion,S.; Shapiro,M.S.; Dorey,F.	Diagnosis of glenoid labral tears. A comparison between magnetic resonance imaging and clinical examinations	1996	Not relevant, patient population
Robertson,D.D.; Sutherland,C.J.; Chan,B.W.; Hodge,J.C.; Scott,W.W.; Fishman,E.K.	Depiction of pelvic fractures using 3D volumetric holography: comparison of plain X-ray and CT	1995	Not relevant, does not answer pico question
Ochi,M.; Sumen,Y.; Kanda,T.; Ikuta,Y.; Itoh,K.	The diagnostic value and limitation of magnetic resonance imaging on chondral lesions in the knee joint	1994	Not relevant, patient population
Shih,T.T.; Su,C.T.; Chiu,L.C.; Erickson,F.; Hang,Y.S.; Huang,K.M.	Evaluation of hip disorders by radiography, radionuclide scanning and magnetic resonance imaging	1993	Not relevant, does not answer pico question

Authors	Article Title	Year	Reason for Exclusion
Petchprapa,C.N.; Rybak,L.D.; Dunham,K.S.; Lattanzi,R.; Recht,M.P.	Labral and cartilage abnormalities in young patients with hip pain: accuracy of 3-Tesla indirect MR arthrography	2014	Not relevant, does not answer pico question
Miyamoto,T.; Tomita,M.; Koseki,H.; Hozumi,A.; Goto,H.; Shindo,H.; Osaki,M.	Morphology of the femoral neck in Japanese persons: Analysis using CT data	2014	Not relevant, does not answer pico question
Hughes,P.M.; Gafoor,A.	MR imaging of hip and groin pain	2002	Narrative review
Case,R.D.; Gargan,M.F.; Grier,D.; Portinaro,N.M.A.	Confirmation of the reduction and containment of the femoral head with CT or MRI scans in DDH: The need for repeated scans	2000	Not relevant, does not answer pico question
Castelein,R.M.	Ultrasonography in developmental dysplasia of the hip	1997	Narrative review
Backer,M.W.; Lee,K.S.; Blankenbaker,D.G.; Kijowski,R.; Keene,J.S.	Correlation of ultrasound-guided corticosteroid injection of the Quadratus Femoris with MRI findings of ischiofemoral impingement	2014	Not relevant, does not answer pico question
Darge,K.; Papadopoulou,F.; Ntoulia,A.; Bulas,D.I.; Coley,B.D.; Fordham,L.A.; Paltiel,H.J.; McCarville,B.; Volberg,F.M.; Cosgrove,D.O.; Goldberg,B.B.; Wilson,S.R.; Feinstein,S.B.	Safety of contrast-enhanced ultrasound in children for non-cardiac applications: A review by the Society for Pediatric Radiology (SPR) and the International Contrast Ultrasound Society (ICUS)	2013	Narrative review
Nepple,J.J.; Martel,J.M.; Kim,Y.-J.; Zaltz,I.; Clohisy,J.C.	Do plain radiographs correlate with CT for imaging of cam-type femoroacetabular impingement?	2012	Not relevant, does not answer pico question
Battaglia,M.; Vannini,F.; Guaraldi,F.; Rossi,G.; Biondi,F.; Sudanese,A.	Validity of preoperative ultrasound-guided aspiration in the revision of hip prosthesis	2011	Not relevant, does not answer pico question
Domayer,S.E.; Ziebarth,K.; Chan,J.; Bixby,S.; Mamisch,T.C.; Kim,Y.J.	Femoroacetabular cam-type impingement: Diagnostic sensitivity and specificity of radiographic views compared to radial MRI	2011	Not relevant, does not answer pico question

Authors	Article Title	Year	Reason for Exclusion
Kodali,P.; Islam,A.; Andrish,J.	Anterior knee pain in the young athlete: Diagnosis and treatment	2011	Not relevant to recommendation
Choi,J.-A.; Sung,H.K.; Hong,S.-H.; Yong,H.K.; Choi,J.-Y.; Kang,H.S.	Rheumatoid arthritis and tuberculous arthritis: Differentiating MRI features	2009	Not relevant, does not answer pico question
Malfair,D.	Therapeutic and Diagnostic Joint Injections	2008	Review
Ni,G.X.; Lu,W.W.; Chiu,K.Y.; Fong,D.Y.	Cemented or uncemented femoral component in primary total hip replacement? A review from a clinical and radiological perspective	0	Review
Stoffelen,D.; Urlus,M.; Molenaers,G.; Fabry,G.	Ultrasound, radiographs, and clinical symptoms in developmental dislocation of the hip: a study of 170 patients	1995	Not relevant to recommendation
MacDonald,J.; Barrow,S.; Carty,H.M.; Taylor,J.F.	Imaging strategies in the first 12 months after reduction of developmental dislocation of the hip	1995	Not relevant, does not answer pico question
Ducou Le,Pointe H.; Haddad,S.; Silberman,B.; Filipe,G.; Monroc,M.; Montagne,J.-P.	Legg-Perthes-Calve disease: Staging by MRI using gadolinium	1994	Not relevant, does not answer pico question
Magee,T.	Comparison of 3.0-T MR vs 3.0-T MR arthrography of the hip for detection of acetabular labral tears and chondral defects in the same patient population	2015	

Prescription Opioids

Authors	Article Title	Year	Reason for Exclusion
Vase,L.; Vollert,J.; Finnerup,N.B.; Miao,X.; Atkinson,G.; Marshall,S.; Nemeth,R.; Lange,B.; Liss,C.; Price,D.D.; Maier,C.; Jensen,T.S.; Segerdahl,M.	Predictors of the placebo analgesia response in randomized controlled trials of chronic pain: A meta-analysis of the individual data from nine industrially sponsored trials	2015	meta-analysis
Diaz-Heredia,J.; Loza,E.; Cebreiro,I.; Ruiz Iban,M.A.	Preventive analgesia in hip or knee arthroplasty: a systematic review	2015	Systematic Review
Fujii,T.; Takana,K.; Orita,S.; Inoue,G.; Ochiai,N.; Kuniyoshi,K.; Aoki,Y.; Ishikawa,T.; Miyagi,M.; Kamoda,H.; Suzuki,M.; Sakuma,Y.; Kubota,G.; Oikawa,Y.; Inage,K.; Sainoh,T.; Sato,J.; Yamauchi,K.; Toyone,T.; Nakamura,J.; Kishida,S.; Takahashi,K.; Ohtori,S.	Progressive change in joint degeneration in patients with knee or hip osteoarthritis treated with fentanyl in a randomized trial	2014	90% of pop isn't Hip OA
Kirkness,C.S.; McAdam- Marx,C.; Unni,S.; Young,J.; Ye,X.; Chandran,A.; Peters,C.L.; Asche,C.V.	Characterization of patients undergoing total hip arthroplasty in a real- world setting and pain- related medication prescriptions for management of postoperative pain	2013	90% of pop isn't Hip OA
Wieser,K.; Zingg,P.O.; Betz,M.; Neubauer,G.; Dora,C.	Total hip replacement in patients with history of illicit injecting drug use	2012	retrospective comparative
Murphy,T.P.; Byrne,D.P.; Curtin,P.; Baker,J.F.; Mulhall,K.J.	Can a periarticular levobupivacaine injection reduce postoperative opiate consumption during primary hip arthroplasty?	2012	Not relevant to recommendation
Howes,F.; Buchbinder,R.; Winzenberg,T.	Opioids for osteoarthritis? Weighing benefits and risks: A Cochrane Musculoskeletal Group review	2011	Systematic Review

Dysplasia

Authors	Article Title	Year	Reason for Exclusion
Kaneuji,A.; Sugimori,T.; Ichiseki,T.; Fukui,K.; Takahashi,E.; Matsumoto,T.	Rotational Acetabular Osteotomy for Osteoarthritis with Acetabular Dysplasia: Conversion Rate to Total Hip Arthroplasty within Twenty Years and Osteoarthritis Progression After a Minimum of Twenty Years	2015	Not relevant to recommendation
Nepple,J.J.; Thomason,K.M.; An,T.W.; Harris- Hayes,M.; Clohisy,J.C.	What is the utility of biomarkers for assessing the pathophysiology of hip osteoarthritis? A systematic review	2015	Systematic Review
Kobayashi,D.; Satsuma,S.; Kinugasa,M.; Kuroda,R.; Kurosaka,M.	Does Salter innominate osteotomy predispose the patient to acetabular retroversion in adulthood?	2015	Not relevant, does not answer pico question
Okanoue,Y.; Kawakami,T.; Izumi,M.; Aso,K.; Sugimura,N.; Ikeuchi,M.	Less invasive modified Spitzzy shelf procedure for patients with dysplasia of the hip	2015	Not relevant, does not answer pico question
Stambough,J.B.; Clohisy,J.C.; Baca,G.R.; Zaltz,I.; Trousdale,R.; Millis,M.; Sucato,D.; Kim,Y.J.; Sink,E.; Schoenecker,P.L.; Sierra,R.; Podeszwa,D.; Beaule,P.	Does previous pelvic osteotomy compromise the results of periacetabular osteotomy surgery?	2015	Not relevant, does not answer pico question
Ettinger,M.; Berger,S.; Floerkemeier,T.; Windhagen,H.; Ezechieli,M.	Sports activity after treatment of residual hip dysplasia with triple pelvic osteotomy using the Tonnis and Kalchschmidt technique	2015	Retrospective case series
Kemp,J.L.; MacDonald,D.; Collins,N.J.; Hatton,A.L.; Crossley,K.M.	Hip arthroscopy in the setting of hip osteoarthritis: systematic review of outcomes and progression to hip arthroplasty	2015	systematic review
Hasegawa,Y.; Iwase,T.; Kitamura,S.; Kawasaki,M.; Yamaguchi,J.	Eccentric rotational acetabular osteotomy for acetabular dysplasia and osteoarthritis: follow-up at a mean duration of twenty years	2014	Not relevant, patient population of osteoarthritis
Buchler,L.; Beck,M.	Periacetabular osteotomy: a review of swiss experience	2014	review

Authors	Article Title	Year	Reason for Exclusion
Qu, Y.; Jiang, T.; Zhao, H.; Gao, Y.; Zheng, C.; Xu, J.	Mid-term results of metal-on-metal hip resurfacing for treatment of osteoarthritis secondary to developmental dysplasia of the hip: a minimum of 8-years of follow-up	2014	Patient population
Sakellariou, V.I.; Christodoulou, M.; Sasalos, G.; Babis, G.C.	Reconstruction of the Acetabulum in Developmental Dysplasia of the Hip in total hip replacement	2014	review
Ramani, N.; Patil, M.S.; Mahna, M.	Outcome of surgical management of developmental dysplasia of hip in children between 18 and 24 months	2014	less than 10 patients in groups
Imai, H.; Kamada, T.; Takeba, J.; Shiraishi, Y.; Mashima, N.; Miura, H.	Anterior coverage after eccentric rotational acetabular osteotomy for the treatment of developmental dysplasia of the hip	2014	Unclear of population-Tonnis Grade not mention
Hashimoto, S.; Fujishiro, T.; Hayashi, S.; Kanzaki, N.; Nishiyama, T.; Kurosaka, M.	Clinical importance of impingement deformities for hip osteoarthritis progression in a Japanese population	2014	Not relevant to recommendation
Albers, C.E.; Steppacher, S.D.; Ganz, R.; Tannast, M.; Siebenrock, K.A.	Impingement adversely affects 10-year survivorship after periacetabular osteotomy for DDH	2013	Patient population, Tonnis 2 and 3 used
van Stralen, R.A.; van Hellemond, G.G.; Ramrattan, N.N.; de, Visser E.; de, Kleuver M.	Can a triple pelvic osteotomy for adult symptomatic hip dysplasia provide relief of symptoms for 25 years?	2013	retrospective case series
Hartig-Andreasen, C.; Troelsen, A.; Thillemann, T.M.; Soballe, K.	What factors predict failure 4 to 12 years after periacetabular osteotomy?	2012	Retrospective case series
Nishiyama, T.; Saegusa, Y.; Fujishiro, T.; Hayashi, S.; Kanzaki, N.; Hashimoto, S.; Kurosaka, M.	Long-term results of intertrochanteric varus osteotomy for the dysplastic hip	2012	retrospective case series
Kemp, J.L.; Collins, N.J.; Makdissi, M.; Schache, A.G.; Machotka, Z.; Crossley, K.	Hip arthroscopy for intra-articular pathology: a systematic review of outcomes with and without femoral osteoplasty	2012	Systematic Review

Authors	Article Title	Year	Reason for Exclusion
Hunt,D.; Prather,H.; Harris,Hayes M.; Clohisy,J.C.	Clinical outcomes analysis of conservative and surgical treatment of patients with clinical indications of prearthritic, intra-articular hip disorders	2012	less than 10 patients in groups
Hirose,S.; Otsuka,H.; Morishima,T.; Sato,K.	Long-term outcomes of shelf acetabuloplasty for developmental dysplasia of the hip in adults: a minimum 20-year follow- up study	2011	retrospective case series
Chang,C.F.; Wang,T.M.; Wang,J.H.; Huang,S.C.; Lu,T.W.	Adolescents after Pemberton's osteotomy for developmental dysplasia of the hip displayed greater joint loading than healthy controls in affected and unaffected limbs during gait	2011	Not relevant, does not answer pico question
Barnes,J.R.; Thomas,S.R.; Wedge,J.	Acetabular coverage after innominate osteotomy	2011	Not relevant, does not answer pico question
van der Grinten,M.; Reijman,M.; van Biezen,F.C.; Verhaar,J.A.	Trochanteric osteotomy versus posterolateral approach: function the first year post surgery. A pilot study	2011	Patient population -receiving THA
Ito,H.; Tanino,H.; Yamanaka,Y.; Nakamura,T.; Minami,A.; Matsuno,T.	The Chiari pelvic osteotomy for patients with dysplastic hips and poor joint congruency: long-term follow-up	2011	retrospective comparative
Kain,M.S.; Novais,E.N.; Vallim,C.; Millis,M.B.; Kim,Y.J.	Periacetabular osteotomy after failed hip arthroscopy for labral tears in patients with acetabular dysplasia	2011	Not relevant to recommendation
Teratani,T.; Naito,M.; Kiyama,T.; Maeyama,A.	Periacetabular osteotomy in patients fifty years of age or older: surgical technique	2011	Method section/not completed study
Tsuboi,M.; Hasegawa,Y.; Fujita,K.; Kawabe,K.	Pubic/ischial stress fractures after eccentric rotational acetabular osteotomy	2011	for displasia and fai, preoperative diagnosis unclear. inclusion criteria adequately described, to determine if article meets inclusion criteria
Bolland,B.J.; Wahed,A.; Al-Hallao,S.; Culliford,D.J.; Clarke,N.M.	Late reduction in congenital dislocation of the hip and the need for secondary surgery: radiologic predictors and confounding variables	2010	Not relevant to recommendation

Authors	Article Title	Year	Reason for Exclusion
Matheney,T.; Kim,Y.J.; Zurakowski,D.; Matero,C.; Millis,M.	Intermediate to long-term results following the bernese periacetabular osteotomy and predictors of clinical outcome: surgical technique	2010	Method section/not completed study
Yamaguchi,J.; Hasegawa,Y.; Kanoh,T.; Seki,T.; Kawabe,K.	Similar survival of eccentric rotational acetabular osteotomy in patients younger and older than 50 years	2009	retrospective case series
Matheney,T.; Kim,Y.J.; Zurakowski,D.; Matero,C.; Millis,M.	Intermediate to long-term results following the Bernese periacetabular osteotomy and predictors of clinical outcome	2009	Not enough low quality studies met the inclusion criteria to make an evidence-based limited recommendation for dysplasia treatment. The work group opted for a consensus recommendation.
Hsieh,P.H.; Huang,K.C.; Lee,P.C.; Chang,Y.H.	Comparison of periacetabular osteotomy and total hip replacement in the same patient: a two-to ten-year follow-up study	2009	Retrospective case series
Johnsen,K.; Goll,R.; Reikeras,O.	Acetabular dysplasia as an aetiological factor in development of hip osteoarthritis	2009	retrospective case series
Armiger,R.S.; Armand,M.; Tallroth,K.; Lepisto,J.; Mears,S.C.	Three-dimensional mechanical evaluation of joint contact pressure in 12 periacetabular osteotomy patients with 10-year follow-up	2009	retrospective case series
Troelsen,A.	Surgical advances in periacetabular osteotomy for treatment of hip dysplasia in adults	2009	Systematic Review
Okano,K.; Enomoto,H.; Osaki,M.; Shindo,H.	Rotational acetabular osteotomy with excision of the capital drop for advanced osteoarthritis secondary to developmental dysplasia of the hip	2008	
Garbuz,D.S.; Awwad,M.A.; Duncan,C.P.	Periacetabular osteotomy and total hip arthroplasty in patients older than 40 years	2008	Not relevant, does not answer pico question
Steppacher,S.D.; Tannast,M.; Ganz,R.; Siebenrock,K.A.	Mean 20-year followup of Bernese periacetabular osteotomy	2008	Retrospective case series
Ansari,A.; Jones,S.; Hashemi-Nejad,A.; Catterall,A.	Varus proximal femoral osteotomy for hip dysplasia in adults	2008	Retrospective case series

Authors	Article Title	Year	Reason for Exclusion
Nakano,S.; Nishisyo,T.; Hamada,D.; Kosaka,H.; Yukata,K.; Oba,K.; Kawasaki,Y.; Miyoshi,H.; Egawa,H.; Kinoshita,I.; Yasui,N.	Treatment of dysplastic osteoarthritis with labral tear by Chiari pelvic osteotomy: outcomes after more than 10 years follow-up	2008	Not relevant to recommendation
Haverkamp,D.; Marti,R.K.	Bilateral varus osteotomies in hip deformities: are early interventions superior? A long-term follow-up	2007	Retrospective case series
Koulouvaris,P.; Stafylas,K.; Aznaoutoglou,C.; Zacharis,K.; Xenakis,T.	Isolated varus intertrochanteric osteotomy for hip dysplasia in 52 patients: long-term results	2007	Not relevant, outcome
Clohisy,J.C.; Barrett,S.E.; Gordon,J.E.; Delgado,E.D.; Schoenecker,P.L.	Periacetabular osteotomy in the treatment of severe acetabular dysplasia. Surgical technique	2006	Narrative review
Kralj,M.; Mavcic,B.; Antolic,V.; Igljic,A.; Kralj-Igljic,V.	The Bernese periacetabular osteotomy: clinical, radiographic and mechanical 7-15-year follow-up of 26 hips	2005	Not relevant, tonnis grade, less then 10 patients per group
Hailer,N.P.; Soykaner,L.; Ackermann,H.; Rittmeister,M.	Triple osteotomy of the pelvis for acetabular dysplasia: age at operation and the incidence of nonunions and other complications influence outcome	2005	Retrospective case series
Hisatome,T.; Yasunaga,Y.; Tanaka,R.; Yamasaki,T.; Ishida,O.; Ochi,M.	Natural course of the minimally symptomatic nonoperated hip in patients with bilateral hip dysplasia treated with contralateral rotational acetabular osteotomy	2005	Not relevant, does not answer pico question
Yanagimoto,S.; Hotta,H.; Izumida,R.; Sakamaki,T.	Long-term results of Chiari pelvic osteotomy in patients with developmental dysplasia of the hip: indications for Chiari pelvic osteotomy according to disease stage and femoral head shape	2005	Not relevant to recommendation
Fawzy,E.; Mandellos,G.; de,Steiger R.; McLardy-Smith,P.; Benson,M.K.; Murray,D.	Is there a place for shelf acetabuloplasty in the management of adult acetabular dysplasia? A survivorship study	2005	Not relevant to recommendation

Authors	Article Title	Year	Reason for Exclusion
Yasunaga,Y.; Hisatome,T.; Tanaka,R.; Yamasaki,T.; Ochi,M.	Curved varus femoral osteotomy for minimal dysplastic hip in patients older than 45 years of age: comparison with rotational acetabular osteotomy	2005	Not relevant to recommendation
Ito,H.; Matsuno,T.; Minami,A.	Intertrochanteric varus osteotomy for osteoarthritis in patients with hip dysplasia: 6 to 28 years followup	2005	Retrospective case series
Nozawa,M.; Enomoto,F.; Shitoto,K.; Matsuda,K.; Maezawa,K.; Kurosawa,H.	Rotational acetabular osteotomy for osteonecrosis with collapse of the femoral head in young patients	2005	Retrospective case series
Pogliacomini,F.; Stark,A.; Wallensten,R.	Periacetabular osteotomy. Good pain relief in symptomatic hip dysplasia, 32 patients followed for 4 years	2005	retrospective case series
Clohisy,J.C.; Barrett,S.E.; Gordon,J.E.; Delgado,E.D.; Schoenecker,P.L.	Periacetabular osteotomy for the treatment of severe acetabular dysplasia	2005	retrospective case series
Sibinski,M.; Synder,M.	The value of selected factors in predicting hip joint development after overhead traction for developmental dyplasia	2004	not in English
Yasunaga,Y.; Ochi,M.; Shimogaki,K.; Yamamoto,S.; Iwamori,H.	Rotational acetabular osteotomy for hip dysplasia: 61 hips followed for 8-15 years	2004	retrospective case series
Schramm,M.; Hohmann,D.; Radespiel- Troger,M.; Pitto,R.P.	Treatment of the dysplastic acetabulum with Wagner spherical osteotomy. A study of patients followed for a minimum of twenty years	2003	Retrospective case series
Sen,C.; Sener,N.; Tozun,I.R.; Boynuk,B.	Polygonal triple (Kotz) osteotomy in the treatment of acetabular dysplasia: 17 patients (19 hips) with 4-9 years of follow-up	2003	Retrospective case series
Ito,H.; Matsuno,T.; Minami,A.	Comparison of the surgical approaches for a Chiari pelvic osteotomy	2003	Not relevant to recommendation

Authors	Article Title	Year	Reason for Exclusion
Yasunaga,Y.; Takahashi,K.; Ochi,M.; Ikuta,Y.; Hisatome,T.; Nakashiro,J.; Yamamoto,S.	Rotational acetabular osteotomy in patients forty-six years of age or older: comparison with younger patients	2003	Not relevant, does not answer pico question
Rozkydal,Z.; Kovanda,M.	Chiari pelvic osteotomy in the management of developmental hip dysplasia: a long term follow-up	2003	Retrospective case series
Sen,C.; Asik,M.; Tozun,I.R.; Sener,N.; Cinar,M.	Kotz and Ganz osteotomies in the treatment of adult acetabular dysplasia	2003	Not relevant to recommendation
Endo,H.; Mitani,S.; Senda,M.; Kawai,A.; McCown,C.; Umeda,M.; Miyakawa,T.; Inoue,H.	Three-dimensional gait analysis of adults with hip dysplasia after rotational acetabular osteotomy	2003	Not relevant to recommendation
Murphy,S.; Deshmukh,R.	Periacetabular osteotomy: preoperative radiographic predictors of outcome	2002	Not relevant, does not answer pico question
Hasegawa,Y.; Iwase,T.; Kitamura,S.; Yamauchi,Ki K.; Sakano,S.; Iwata,H.	Eccentric rotational acetabular osteotomy for acetabular dysplasia: follow-up of one hundred and thirty-two hips for five to ten years	2002	Osteoarthritis already present
Nakamura,S.; Ninomiya,S.; Morimoto,S.; Moro,T.; Takatori,Y.	Combined intertrochanteric valgus and rotational acetabular osteotomy	2001	less than 10 patients in groups
Yasunaga,Y.; Ikuta,Y.; Shigenobu,T.; Nakamura,S.; Yamamoto,S.; Nakashiro,J.	Rotational acetabular osteotomy for hip dysplasia: spontaneous medial enlargement of the acetabulum	2001	retrospective case series
Lane,N.E.; Lin,P.; Christiansen,L.; Gore,L.R.; Williams,E.N.; Hochberg,M.C.; Nevitt,M.C.	Association of mild acetabular dysplasia with an increased risk of incident hip osteoarthritis in elderly white women: the study of osteoporotic fractures	2000	Not relevant, does not answer pico question
Schramm,M.; Pitto,R.P.; Bar,K.; Meyer,M.; Rohm,E.; Hohmann,D.	Prophylaxis of secondary osteoarthrosis with spherical osteotomy in residual acetabular dysplasia. Analysis of predictive factors of success	1999	Not relevant, does not answer pico question

Authors	Article Title	Year	Reason for Exclusion
Bohm,P.; Klinger,H.M.; Kusswetter,W.	The Salter innominate osteotomy for the treatment of developmental dysplasia of the hip in young adults	1999	retrospective case series
McGrory,B.J.; Estok,D.M.; Harris,W.H.	Follow-up of intertrochanteric osteotomy of the hip during a 25-year period	1998	Not relevant, does not answer pico question
Spruit,M.; Van Goethem,C.J.; Kooijman,M.A.; Pavlov,P.W.	Diagnostic infiltration of the hip joint with bupivacain in adult acetabular dysplasia	1997	Not relevant, does not answer pico question
Shindo,H.; Igarashi,H.; Taneda,H.; Azuma,H.	Rotational acetabular osteotomy for severe dysplasia of the hip with a false acetabulum	1996	Not relevant, does not answer pico question
Nakamura,N.; Sugano,N.; Masuhara,K.; Ohzono,K.; Takaoka,K.	Bone scintigraphy as an indicator for dome osteotomy of the pelvis: comparison between scintigraphy, radiography and outcome in 57 hips	1996	Not relevant, does not answer pico question
Takatori,Y.; Ninomiya,S.; Nakamura,S.; Morimoto,S.; Sasaki,T.	Long-term follow-up results of rotational acetabular osteotomy in painful dysplastic hips: efficacy in delaying the onset of osteoarthritis	1996	Not relevant, does not answer pico question
Pitto,R.P.; Klaue,K.; Ganz,R.; Ceppatelli,S.	Acetabular rim pathology secondary to congenital hip dysplasia in the adult. A radiographic study	1995	Not relevant to recommendation
Murphy,S.B.; Ganz,R.; Muller,M.E.	The prognosis in untreated dysplasia of the hip. A study of radiographic factors that predict the outcome	1995	Not relevant to recommendation
Trousdale,R.T.; Ekkernkamp,A.; Ganz,R.; Wallrichs,S.L.	Periacetabular and intertrochanteric osteotomy for the treatment of osteoarthritis in dysplastic hips	1995	Not relevant, does not answer pico question
Matsuno,T.; Ichioka,Y.; Kaneda,K.	Modified Chiari pelvic osteotomy: a long-term follow-up study	1992	Case report
Hasegawa,Y.; Iwata,H.; Mizuno,M.; Genda,E.; Sato,S.; Miura,T.	The natural course of osteoarthritis of the hip due to subluxation or acetabular dysplasia	1992	Not relevant to recommendation

Authors	Article Title	Year	Reason for Exclusion
Scher,M.A.; Jakim,I.	Combined intertrochanteric and Chiari pelvic osteotomies for hip dysplasia	1991	Not relevant, does not answer pico question
Croft,P.; Cooper,C.; Wickham,C.; Coggon,D.	Osteoarthritis of the hip and acetabular dysplasia	1991	Not relevant to recommendation
Lack,W.; Windhager,R.; Kutschera,H.P.; Engel,A.	Chiari pelvic osteotomy for osteoarthritis secondary to hip dysplasia. Indications and long-term results	1991	retrospective case series
Treble,N.J.; Jensen,F.O.; Bankier,A.; Rogers,J.G.; Cole,W.G.	Development of the hip in multiple epiphyseal dysplasia. Natural history and susceptibility to premature osteoarthritis	1990	Not relevant to recommendation
Yano,H.; Sano,S.; Nagata,Y.; Tabuchi,K.; Okinaga,S.; Seki,H.; Suyama,T.	Modified rotational acetabular osteotomy (RAO) for advanced osteoarthritis of the hip joint in the middle-aged person. First report	1990	Not relevant, does not answer pico question
Clohisy,J.C.; St John,L.C.; Nunley,R.M.; Schutz,A.L.; Schoenecker,P.L.	Combined periacetabular and femoral osteotomies for severe hip deformities	2009	Retrospective case series
Sankar,W.N.; Spiegel,D.A.; Gregg,J.R.; Sennett,B.J.	Long-term follow-up after one-stage reconstruction of dislocated hips in patients with cerebral palsy	2006	retrospective case series
Jacobsen,S.; Sonne-Holm,S.; Soballe,K.; Gebuhr,P.; Lund,B.	Joint space width in dysplasia of the hip	2005	Not relevant to recommendation
Albinana,J.; Dolan,L.A.; Spratt,K.F.; Morcuende,J.; Meyer,M.D.; Weinstein,S.L.	Acetabular dysplasia after treatment for developmental dysplasia of the hip. Implications for secondary procedures	2004	Not relevant, does not answer pico question
Schramm,M.; Hohmann,D.; Radespiel-Troger,M.; Pitto,R.P.	The Wagner Spherical Osteotomy of the Acetabulum	2004	Narrative review
Nozawa,M.; Shitoto,K.; Matsuda,K.; Maezawa,K.; Kurosawa,H.	Rotational acetabular osteotomy for acetabular dysplasia	2002	Not relevant, does not answer pico question
McCarthy,J.C.; Busconi,B.	The role of hip arthroscopy in the diagnosis and treatment of hip disease	1995	Abstract

Authors	Article Title	Year	Reason for Exclusion
Kobayashi,D.; Satsuma,S.; Kinugasa,M.; Kuroda,R.; Kurosaka,M.	Does Salter Innominate Osteotomy Predispose the Patient to Acetabular Retroversion in Adulthood?	2014	retrospective case series
Kemp,J.L.; MacDonald,D.; Collins,N.J.; Hatton,A.L.; Crossley,K.M.	Hip Arthroscopy in the Setting of Hip Osteoarthritis: Systematic Review of Outcomes and Progression to Hip Arthroplasty	2014	Systematic Review
Pogliacomì,F.; Stark,A.; Wallensten,R.	Periacetabular osteotomy	2005	Not relevant, does not answer pico question
Takakuwa,M.; Matsuno,T.; Gotoh,E.; Ando,M.; Funakoshi,M.	Long-term results of triple osteotomy of the pelvis	2004	Retrospective case series
Zaragoza,E.J.; Beaule,P.E.	Imaging of the painful non-arthritic hip: A practical approach to surgical relevancy	2004	Retrospective case series
De,Roeck N.; Hashemi- Nejad,A.	The modified Tonnis triple pelvic osteotomy in the young adult - Early results	2003	retrospective case series
Stark,A.; Wallensten,R.	Periacetabular osteotomy using the ilioinguinal incision for treatment of hip dysplasia	2003	Narrative review
Weber,M.; Ganz,R.	The Bernese periacetabular osteotomy	2002	Narrative review
Nozawa,M.; Kurosawa,H.; Shitoto,K.; Kajihara,H.; Hirose,T.; Matsuda,K.	Radiographic study of osteoarthritis of the hip joints treated conservatively for more than ten years	1997	Not relevant, does not answer pico question
Clohisy,J.C.; Nepple,J.J.; Ross,J.R.; Pashos,G.; Schoenecker,P.L.	Does surgical hip dislocation and periacetabular osteotomy improve pain in patients with Perthes-like deformities and acetabular dysplasia?	2015	Retrospective case series
Birch,S.; Liljensoe,A.; Hartig-Andreasen,C.; Soballe,K.; Mechlenburg,I.	No correlations between radiological angles and self-assessed quality of life in patients with hip dysplasia at 2-13 years of follow-up after periacetabular osteotomy	2015	Patient population -all patient who had PAO

Authors	Article Title	Year	Reason for Exclusion
Beaule,P.E.; Dowding,C.; Parker,G.; Ryu,J.J.	What factors predict improvements in outcomes scores and reoperations after the Bernese periacetabular osteotomy?	2015	retrospective case series
Malviya,A.; Dandachli,W.; Beech,Z.; Bankes,M.J.; Witt,J.D.	The incidence of stress fracture following peri-acetabular osteotomy: an under-reported complication	2015	Not relevant, does not answer pico question
Mazloumi,M.; Omid-Kashani,F.; Ebrahimzadeh,M.H.; Makhmalbaf,H.; Hoseinayee,M.M.	Combined Femoral and Acetabular Osteotomy in Children of Walking Age for Treatment of DDH; A Five Years Follow-Up Report	2015	less than 10 patients in groups
Novais,E.N.; Potter,G.D.; Sierra,R.J.; Kim,Y.J.; Clohisy,J.C.; Schoenecker,P.L.; Trousdale,R.T.; Carry,P.M.; Millis,M.B.	Surgical Treatment of Adolescent Acetabular Dysplasia With a Periacetabular Osteotomy: Does Obesity Increase the Risk of Complications?	2014	Not relevant, does not answer pico question
Zhao,X.; Yan,Y.B.; Cao,P.C.; Ma,Y.S.; Wu,Z.X.; Zhang,Y.; Zang,Y.; Jie,Q.; Lei,W.	Surgical results of developmental dysplasia of the hip in older children based on using three-dimensional computed tomography	2014	Not relevant to recommendation
Agus,H.; Bozoglan,M.; Kalenderer,O.; Kazimoglu,C.; Onvural,B.; Akan,I.	How are outcomes affected by performing a one-stage combined procedure simultaneously in bilateral developmental hip dysplasia?	2014	Not relevant, does not answer pico question
Tarassoli,P.; Gargan,M.F.; Atherton,W.G.; Thomas,S.R.	The medial approach for the treatment of children with developmental dysplasia of the hip	2014	Not relevant to recommendation
Akiyama,M.; Nakashima,Y.; Oishi,M.; Sato,T.; Hirata,M.; Hara,D.; Iwamoto,Y.	Risk factors for acetabular retroversion in developmental dysplasia of the hip: does the Pemberton osteotomy contribute?	2014	Retrospective case series
Bulut,M.; Gurger,M.; Belhan,O.; Batur,O.C.; Celik,S.; Karakurt,L.	Management of developmental dysplasia of the hip in less than 24 months old children	2013	Not relevant to recommendation

Authors	Article Title	Year	Reason for Exclusion
Bulut,M.; Karakurt,L.; Azboy,I.; Demirtas,A.; Ersoz,G.; Belhan,O.	Comparison of soft-tissue and bone surgeries in the treatment of developmental dysplasia of the hip in 18-24-month-old patients	2013	Patient population, includes tonnis 2, 3 and 4
Erturk,C.; Altay,M.A.; Isikan,U.E.	A radiological comparison of Salter and Pemberton osteotomies to improve acetabular deformations in developmental dysplasia of the hip	2013	Not relevant, outcome
Roposch,A.; Ridout,D.; Protopapa,E.; Nicolaou,N.; Gelfer,Y.	Osteonecrosis complicating developmental dysplasia of the hip compromises subsequent acetabular remodeling	2013	Not relevant to recommendation
Wang,T.M.; Wu,K.W.; Shih,S.F.; Huang,S.C.; Kuo,K.N.	Outcomes of open reduction for developmental dysplasia of the hip: does bilateral dysplasia have a poorer outcome?	2013	Not relevant, does not answer pico question
Gulati,V.; Eseonu,K.; Sayani,J.; Ismail,N.; Uzoigwe,C.; Choudhury,M.Z.; Gulati,P.; Aqil,A.; Tibrewal,S.	Developmental dysplasia of the hip in the newborn: A systematic review	2013	Systematic Review
Nassif,N.A.; Schoenecker,P.L.; Thorsness,R.; Clohisy,J.C.	Periacetabular osteotomy and combined femoral head-neck junction osteochondroplasty: a minimum two-year follow-up cohort study	2012	Not relevant, does not answer pico question
Gunel,U.; Daglar,B.; Tasbas,B.A.; Delialioglu,O.; Bayrakci,K.	Results of Tonnis-type acetabuloplasty in patients with developmental hip dysplasia	2012	Not relevant, does not answer pico question
De La Rocha,A.; Sucato,D.J.; Tulchin,K.; Podeszwa,D.A.	Treatment of adolescents with a periacetabular osteotomy after previous pelvic surgery	2012	Not relevant to recommendation
Polkowski,G.G.; Novais,E.N.; Kim,Y.J.; Millis,M.B.; Schoenecker,P.L.; Clohisy,J.C.	Does previous reconstructive surgery influence functional improvement and deformity correction after periacetabular osteotomy?	2012	retrospective case series

Authors	Article Title	Year	Reason for Exclusion
Ezirmik,N.; Yildiz,K.	Advantages of single-stage surgical treatment with salter innominate osteotomy and Pemberton pericapsular osteotomy for developmental dysplasia of both hips	2012	Not relevant to recommendation
Vukasinovic,Z.; Spasovski,D.; Slavkovic,N.; Bascarevic,Z.; Zivkovic,Z.; Starcevic,B.	Chiari pelvic osteotomy in the treatment of adolescent hip disorders: possibilities, limitations and complications	2011	Patient population dysplasia and avascular necrosis
Zheng,P.; Tang,K.; Lee,R.; Ji,C.; Lin,G.; Pan,X.; Zhang,Z.; Lou,Y.	Surgical treatment of developmental dysplasia of the hip presenting in children above 10 years	2011	Not relevant to recommendation
Ganz,R.; Horowitz,K.; Leunig,M.	Algorithm for femoral and periacetabular osteotomies in complex hip deformities	2010	Retrospective case series
Wu,K.W.; Wang,T.M.; Huang,S.C.; Kuo,K.N.; Chen,C.W.	Analysis of osteonecrosis following Pemberton acetabuloplasty in developmental dysplasia of the hip: long-term results	2010	retrospective case series
Xu,R.J.; Li,W.C.; Ma,C.X.	Slotted acetabular augmentation with concurrent open reduction for developmental dysplasia of the hip in older children	2010	Not relevant, does not answer pico question
Spence,G.; Hocking,R.; Wedge,J.H.; Roposch,A.	Effect of innominate and femoral varus derotation osteotomy on acetabular development in developmental dysplasia of the hip	2009	outcome measure
Al-Ghadir,M.; Masquijo,J.J.; Guerra,L.A.; Willis,B.	Combined femoral and pelvic osteotomies versus femoral osteotomy alone in the treatment of hip dysplasia in children with cerebral palsy	2009	Not relevant, does not answer pico question
Rebello,G.; Zilkens,C.; Dudda,M.; Matheney,T.; Kim,Y.J.	Triple pelvic osteotomy in complex hip dysplasia seen in neuromuscular and teratologic conditions	2009	Not relevant to recommendation
Akman,B.; Ozkan,K.; Cift,H.; Akan,K.; Eceviz,E.; Eren,A.	Treatment of Tonnis type II hip dysplasia with or without open reduction in children older than 18 months: a preliminary report	2009	Patient population, tonnis 2

Authors	Article Title	Year	Reason for Exclusion
Vukasinovic,Z.; Spasovski,D.; Zivkovic,Z.; Slavkovic,N.; Cerovic,S.	Triple pelvic osteotomy in the treatment of hip dysplasia	2009	Not relevant, does not answer pico question
Lopez-Carreno,E.; Carillo,H.; Gutierrez,M.	Dega versus Salter osteotomy for the treatment of developmental dysplasia of the hip	2008	Not relevant to recommendation
Piontek,T.; Szulc,A.; Glowacki,M.; Strzyzewski,W.	Distant outcomes of the Chiari osteotomy 30 years follow up evaluation	2006	not in English
Macnicol,M.F.; Bertol,P.	The Salter innominate osteotomy: should it be combined with concurrent open reduction?	2005	Retrospective case series
Hasegawa,Y.; Sakano,S.; Kawabe,K.	Ectopic bone formation around the poly-L-lactide screw head in rotational acetabular osteotomy for hip dysplasia	2004	Not relevant, does not answer pico question
Bicimoglu,A.; Agus,H.; Omeroglu,H.; Tumer,Y.	Six years of experience with a new surgical algorithm in developmental dysplasia of the hip in children under 18 months of age	2003	Not relevant, does not answer pico question
Grudziak,J.S.; Ward,W.T.	Dega osteotomy for the treatment of congenital dysplasia of the hip	2001	Not relevant to recommendation
Rejholec,M.; el-Sisi,H.	Conservative treatment of developmental dysplasia of the hip in Kuwait	2001	Not relevant to recommendation
Fong,H.C.; Lu,W.; Li,Y.H.; Leong,J.C.	Chiari osteotomy and shelf augmentation in the treatment of hip dysplasia	2000	Retrospective case series
Zadeh,H.G.; Catterall,A.; Hashemi-Nejad,A.; Perry,R.E.	Test of stability as an aid to decide the need for osteotomy in association with open reduction in developmental dysplasia of the hip	2000	Retrospective case series
Matta,J.M.; Stover,M.D.; Siebenrock,K.	Periacetabular osteotomy through the Smith-Petersen approach	1999	Narrative review
Hattori,T.; Ono,Y.; Kitakoji,T.; Takashi,S.; Iwata,H.	Soft-tissue interposition after closed reduction in developmental dysplasia of the hip. The long-term effect on acetabular development and avascular necrosis	1999	Not relevant, tonnis grade not mentioned

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Vedantam,R.; Capelli,A.M.; Schoenecker,P.L.	Pemberton osteotomy for the treatment of developmental dysplasia of the hip in older children	1998	Retrospective case series
Morin,C.; Rabay,G.; Morel,G.	Retrospective review at skeletal maturity of the factors affecting the efficacy of Salter's innominate osteotomy in congenital dislocated, subluxed, and dysplastic hips	1998	retrospective case series
Olney,B.; Latz,K.; Asher,M.	Treatment of hip dysplasia in older children with a combined one-stage procedure	1998	Retrospective case series
McCarthy,J.J.; Fox,J.S.; Gurd,A.R.	Innominate osteotomy in adolescents and adults who have acetabular dysplasia	1996	Not relevant, does not answer pico question
Szepesi,K.; Rigo,J.; Biro,B.; Fazekas,K.; Poti,L.	Pemberton's pericapsular osteotomy for the treatment of acetabular dysplasia	1996	Not relevant, does not answer pico question
Borges,J.L.; Kumar,S.J.; Guille,J.T.	Congenital dislocation of the hip in boys	1995	Not relevant, does not answer pico question
Saleh,J.M.; O'Sullivan,M.E.; O'Brien,T.M.	Pelvic remodeling after Salter osteotomy	1995	Not relevant to recommendation
Hintermann,B.; Morscher,E.W.	Total hip replacement with solid autologous femoral head graft for hip dysplasia	1995	retrospective case series
Stringa,G.; Pitto,R.P.; Di Muria,G.V.; Marcucci,M.	Total hip replacement with bone grafting using the removed femoral head in severe acetabular dysplasia	1995	Not relevant to recommendation
Inao,S.; Gotoh,E.; Ando,M.	Total hip replacement using femoral neck bone to graft the dysplastic acetabulum. Follow-up study of 18 patients with old congenital dislocation of the hip	1994	Not relevant to recommendation
Gulman,B.; Tuncay,I.C.; Dabak,N.; Karaismailoglu,N.	Salter's innominate osteotomy in the treatment of congenital hip dislocation: a long-term review	1994	Not relevant to recommendation

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Guille,J.T.; Forlin,E.; Kumar,S.J.; MacEwen,G.D.	Triple osteotomy of the innominate bone in treatment of developmental dysplasia of the hip	1992	retrospective case series
Staheli,L.T.; Chew,D.E.	Slotted acetabular augmentation in childhood and adolescence	1992	Not relevant to recommendation
Synder,M.; Forlin,E.; Xin,S.; Bowen,J.R.	Results of the Kalamchi modification of salter osteotomy in the treatment of developmental dysplasia of the hip	1992	Not relevant to recommendation
Rejholec,M.; Stryhal,F.	Behavior of the proximal femur during the treatment of congenital dysplasia of the hip: a clinical long-term study	1991	Not relevant, does not answer pico question
Sutherland,D.H.; Moore,M.	Clinical and radiographic outcome of patients treated with double innominate osteotomy for congenital hip dysplasia	1991	Retrospective case series
Chu,Y.M.; Zhou,Y.X.; Han,N.; Yang,D.J.	Two Different Total Hip Arthroplasties for Hartofilakidis Type C1 Developmental Dysplasia of Hip in Adults	2016	not joint preserving surgery. patients had osteotomy with THA
Wenger,D.; Siverson,C.; Dahlberg,L.E.; Tiderius,C.J.	Residual hip dysplasia at 1 year after treatment for neonatal hip instability is not related to degenerative joint disease in young adulthood: a 21-year follow-up study including dGEMRIC	2016	Not relevant, does not answer pico question
Kowalczuk,M.; Yeung,M.; Simunovic,N.; Ayeni,O.R.	Does Femoroacetabular Impingement Contribute to the Development of Hip Osteoarthritis? A Systematic Review	2015	
Castaneda,P.; Vidal-Ruiz,C.; Mendez,A.; Salazar,D.P.; Torres,A.	How Often Does Femoroacetabular Impingement Occur After an Innominate Osteotomy for Acetabular Dysplasia?	2016	Retrospective case series

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Carsi,M.B.; Clarke,N.M.	Acetabuloplasties at Open Reduction Prevent Acetabular Dysplasia in Intentionally Delayed Developmental Dysplasia of the Hip: A Case-control Study	2015	Retrospective case series
Carroll,K.L.; Schiffen,A.N.; Murray,K.A.; Stevenson,D.A.; Viskochil,D.H.; Toydemir,R.; MacWilliams,B.A.; Roach,J.W.	The occurrence of occult acetabular dysplasia in relatives of individuals with developmental dysplasia of the hip	2016	Not relevant, does not answer pico question
Morbi,A.H.M.; Carsi,B.; Gorianinov,V.; Clarke,N.M.P.	Adverse outcomes in infantile bilateral developmental dysplasia of the hip	2015	Retrospective case series
HÄ?Ä¶lmich,P.; Thorborg,K.; Nyvold,P.; Klit,J.; Nielsen,M.B.; Troelsen,A.	Does bony hip morphology affect the outcome of treatment for patients with adductor-related groin pain? Outcome 10 years after baseline assessment	2014	Not relevant, does not answer pico question
Chandrasekaran,S.; Gui,C.; Darwish,N.; Lodhia,P.; Suarez-Ahedo,C.; Domb,B.G.	Outcomes of Hip Arthroscopic Surgery in Patients With Tonnis Grade 1 Osteoarthritis With a Minimum 2-Year Follow-up: Evaluation Using a Matched-Pair Analysis With a Control Group With Tonnis Grade 0	2016	Not relevant, does not answer pico question