

Intramedullary Nails in Comparison With Sliding Hip Screws for Intertrochanteric Hip Fractures: A Rapid Review

M Nikitovic

April 2013

Suggested Citation

This report should be cited as follows:

Nikitovic M. Intramedullary nails in comparison with sliding hip screws for intertrochanteric fractures: a rapid review; 2013. 18p. Available from: <http://www.hqontario.ca/evidence/publications-and-ohtac-recommendations/rapid-reviews>.

Conflict of Interest Statement

All reports prepared by the Division of Evidence Development and Standards at Health Quality Ontario are impartial. There are no competing interests or conflicts of interest to declare.

Rapid Review Methodology

Clinical questions are developed by the Division of Evidence Development and Standards at Health Quality Ontario in consultation with experts, end-users, and/or applicants in the topic area. A systematic literature search is then conducted to identify relevant systematic reviews, health technology assessments (HTAs), and meta-analyses; if none are located, the search is expanded to include randomized controlled trials (RCTs), and guidelines. Systematic reviews are evaluated using a rating scale developed for this purpose. If the systematic review has evaluated the included primary studies using the GRADE Working Group criteria (<http://www.gradeworkinggroup.org/index.htm>), the results are reported and the rapid review process is complete. If the systematic review has not evaluated the primary studies using GRADE, the primary studies included in the systematic review are retrieved and a maximum of two outcomes are graded. If no well-conducted systematic reviews are available, RCTs and/or guidelines are evaluated. Because rapid reviews are completed in very short timeframes, other publication types are not included. All rapid reviews are developed and finalized in consultation with experts.

Disclaimer

This rapid review is the work of the Division of Evidence Development and Standards at Health Quality Ontario, and is developed from analysis, interpretation, and comparison of published scientific research. It also incorporates, when available, Ontario data and information provided by experts. As this is a rapid review, it may not reflect all the available scientific research and is not intended as an exhaustive analysis. Health Quality Ontario assumes no responsibility for omissions or incomplete analysis resulting from its rapid reviews. In addition, it is possible that other relevant scientific findings may have been reported since completion of the review. This report is current to the date of the literature search specified in the Research Methods section, as appropriate. This rapid review may be superseded by an updated publication on the same topic. Please check the Health Quality Ontario website for a list of all publications: <http://www.hqontario.ca/evidence/publications-and-ohtac-recommendations>.

About Health Quality Ontario

Health Quality Ontario is an arms-length agency of the Ontario government. It is a partner and leader in transforming Ontario's health care system so that it can deliver a better experience of care, better outcomes for Ontarians, and better value for money.

Health Quality Ontario strives to promote health care that is supported by the best available scientific evidence. Health Quality Ontario works with clinical experts, scientific collaborators, and field evaluation partners to develop and publish research that evaluates the effectiveness and cost-effectiveness of health technology and services in Ontario.

On the basis of the research conducted by Health Quality Ontario and its partners, the Ontario Health Technology Advisory Committee—a standing advisory subcommittee of the Health Quality Ontario Board—makes recommendations about the uptake, diffusion, distribution, or removal of health interventions to Ontario's Ministry of Health and Long-Term Care, clinicians, health system leaders, and policymakers.

Rapid reviews, evidence-based analyses and their corresponding Ontario Health Technology Advisory Committee recommendations, and other associated reports are published on the Health Quality Ontario website. Visit <http://www.hqontario.ca> for more information.

About Health Quality Ontario Publications

To conduct its rapid reviews, Health Quality Ontario or its research partners reviews the available scientific literature, making every effort to consider all relevant national and international research; collaborates with partners across relevant government branches; consults with clinical and other external experts and developers of new health technology; and solicits any necessary supplemental information.

In addition, Health Quality Ontario collects and analyzes information about how a health intervention fits within current practice and existing treatment alternatives. Details about the diffusion of the intervention into current health care practices in Ontario can add an important dimension to the review. Information concerning the health benefits; economic and human resources; and ethical, regulatory, social, and legal issues relating to the intervention could be included to assist in making timely and relevant decisions to optimize patient outcomes.

Permission Requests

All inquiries regarding permission to reproduce any content in Health Quality Ontario reports should be directed to: EvidenceInfo@hqontario.ca.

How to Obtain Rapid Reviews from Health Quality Ontario

All rapid reviews are freely available in PDF format at the following URL:
<http://www.hqontario.ca/evidence/publications-and-ohtac-recommendations/rapid-reviews>.

Table of Contents

Table of Contents	4
List of Abbreviations	5
Background	6
Objective of Analysis	6
Clinical Need and Target Population.....	6
Technology/Technique	6
Rapid Review	7
Research Question	7
Research Methods.....	7
<i>Literature Search</i>	7
<i>Inclusion Criteria</i>	7
<i>Exclusion Criteria</i>	7
<i>Outcomes of Interest</i>	7
<i>Expert Panel</i>	7
Quality of Evidence	8
Results of Literature Search.....	8
Results for Outcomes of Interest	9
<i>Reoperations</i>	9
<i>Functional Status</i>	10
Conclusions	11
Acknowledgements	12
Appendices	14
Appendix 1: Literature Search Strategies	14
Appendix 2: Quality Assessment Tables	16
References	17

List of Abbreviations

AMSTAR	Assessment of Multiple Systematic Reviews
CI	Confidence interval
HTA	Health Technology Assessment
NCGC	National Clinical Guideline Centre
NICE	National Institute for Clinical Excellence
RCT	Randomized controlled trial
RR	Relative risk

Background

Objective of Analysis

This analysis aimed to evaluate the effectiveness of intramedullary nails versus extramedullary sliding hip screws for treatment of intertrochanteric hip fractures.

Clinical Need and Target Population

Intertrochanteric hip fractures are extracapsular fractures that occur between the greater and lesser trochanters. These fractures can further be subdivided into stable and unstable fractures. In stable intertrochanteric hip fractures, the lesser trochanter is not displaced, whereas unstable fractures are defined by displacement of the lesser trochanter. (1)

Technology/Technique

Intertrochanteric fractures are most frequently treated with internal fixation; the two major forms are intramedullary or extramedullary implants. Intramedullary implants, or intramedullary nails, are inserted down the middle of the femoral shaft, either from distal to proximal or from proximal to distal, and are held in place with screws. (2;3) Alternatively, extramedullary implants attach externally along the side of the femur. The most common extramedullary implants are the sliding hip screw, also called a compression hip screw or dynamic hip screw. (1) The sliding hip screw consists of a lag screw passed up the femoral neck through the femoral head, and attached to a plate on the side of the femur affixed with multiple screws that cross the upper femur. (1-3)

As legislated in Ontario's *Excellent Care for All Act*, Health Quality Ontario's mandate includes the provision of objective, evidence-informed advice about health care funding mechanisms, incentives, and opportunities to improve quality and efficiency in the health care system. As part of its Quality-Based Funding (QBF) initiative, Health Quality Ontario works with multidisciplinary expert panels (composed of leading clinicians, scientists, and administrators) to develop evidence-based practice recommendations and define episodes of care for selected disease areas or procedures. Health Quality Ontario's recommendations are intended to inform the Ministry of Health and Long-Term Care's Health System Funding Strategy.

For more information on Health Quality Ontario's Quality-Based Funding initiative, visit www.hqontario.ca.

Rapid Review

Research Question

What is the effectiveness of intramedullary nails in comparison with extramedullary sliding hip screws for the treatment of intertrochanteric hip fractures?

Research Methods

Literature Search

A literature search was performed on January 14, 2013, using Ovid MEDLINE, Ovid MEDLINE In-Process and Other Non-Indexed Citations, Ovid Embase, the Wiley Cochrane Library, and the Centre for Reviews and Dissemination database, for studies published from January 1, 2008, until January 11, 2013. Abstracts were reviewed by a single reviewer, and full-text articles were obtained for any studies meeting the eligibility criteria. Reference lists were also examined for any additional relevant studies not identified through the search.

Inclusion Criteria

- English-language full reports
- published between January 1, 2008, and January 11, 2013
- HTAs, systematic reviews, and meta-analyses
- intertrochanteric hip fracture population
- studies comparing intramedullary fixation (i.e., intramedullary nails) to extramedullary fixation (i.e., sliding hip screws)

Exclusion Criteria

- individual RCTs, observational studies, case reports, editorials
- studies where outcomes of interest cannot be abstracted
- studies combining intertrochanteric and subtrochanteric hip fractures

Outcomes of Interest

- reoperations
- functional status

Expert Panel

In December 2012, an Expert Advisory Panel on Episodes of Care for Hip Fractures was struck. Members of the panel included physicians, personnel from the Ministry of Health and Long-Term Care, and representatives from the community.

The role of the Advisory Panel was to place the evidence produced by Health Quality Ontario in context and to provide advice on the appropriate clinical pathway for a hip fracture in the Ontario health care

setting. However, the statements, conclusions, and views expressed in this report do not necessarily represent the views of Advisory Panel members.

Quality of Evidence

The Assessment of Multiple Systematic Reviews (AMSTAR) measurement tool is used to assess the methodological quality of systematic reviews. (4)

The quality of the body of evidence for each outcome is examined according to the GRADE Working Group criteria. (5) The overall quality is determined to be very low, low, moderate or high using a step-wise, structural methodology.

Study design is the first consideration; the starting assumption is that RCTs are high quality, whereas observational studies are low quality. (5) Five additional factors—risk of bias, inconsistency, indirectness, imprecision, and publication bias—are then taken into account. Limitations or serious limitations in these areas result in downgrading the quality of evidence. Finally, 3 factors that could raise the quality of evidence were considered: large magnitude of effect, dose-response gradient, and accounting for all residual factors. For more detailed information, please refer to the latest series of GRADE articles. (5)

As stated by the GRADE Working Group (5), the final quality score can be interpreted using the following definitions:

High	Very confident that the true effect lies close to that of the estimate of the effect;
Moderate	Moderately confident in the effect estimate—the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different;
Low	Confidence in the effect estimate is limited—the true effect could be substantially different from the estimate of the effect;
Very Low	Very little confidence in the effect estimate—the true effect is likely to be substantially different from the estimate of effect.

Results of Literature Search

The database search yielded 117 citations published between January 1, 2008, and January 11, 2013 (with duplicates removed). Articles were excluded on the basis of information in the title and abstract. The full texts of potentially relevant articles were obtained for further assessment.

Eight systematic reviews were identified that evaluated the effectiveness of intramedullary nails versus extramedullary implants for extracapsular hip fractures. Hand-searching of HTA websites identified 1 additional review, for a total of 9 reviews. Among these, 7 did not meet the inclusion and exclusion criteria of the current review; 1 focused solely on subtrochanteric hip fractures (6); 2 combined results for subtrochanteric and intertrochanteric fractures (1;7); 3 did not evaluate the specific outcomes of interest (2;8;9); and 1 did not provide adequate information to assess the primary studies included in the meta-analyses. (10)

Of the remaining 2 reviews, the meta-analysis by Liu et al had an AMSTAR score of 6 of a possible 11, and the review by the National Clinical Guideline Centre (NCGC)/National Institute for Clinical

Evaluation (NICE) had a score of 8. (3;11) (see **Appendix 2** for AMSTAR ratings). Because of the higher methodologic quality as assessed by AMSTAR, and because it is the most recent and comprehensive review, the systematic review and meta-analysis by NCGC/NICE was included in the current review.

Details of the review by the NCGC/NICE are summarized in **Table 1**. Trochanteric hip fractures were defined as intertrochanteric and reverse oblique fractures and were stratified into stable, unstable, and reverse oblique fractures. No studies included in the review evaluated reverse oblique fractures. All studies of subtrochanteric hip fractures were excluded, as well as studies where outcomes specifically for trochanteric hip fractures could not be extracted.

Table 1. Summary of National Clinical Guideline Centre Systematic Review

Author, Year	Review Type	Search Dates	Inclusion Criteria	No. of RCTs	AMSTAR Score
NCGS/NICE, 2011 (3)	HTA, MA	To August 2010	<ul style="list-style-type: none"> • RCTs • Patients > 18 years • Trochanteric extracapsular hip fracture (defined as intertrochanteric or reverse oblique fractures) • Extramedullary sliding hip screws vs intramedullary nails • Excluded people with fractures caused by specific pathologies other than osteoporosis or osteopenia 	21	8

Abbreviations: AMSTAR, Assessment of Multiple Systematic Reviews; HTA, health technology assessment; MA, meta analysis; NCGS, National Clinical Guideline Centre; NICE, National Institute for Clinical Excellence; No., number; RCTs, randomized controlled trials

Results for Outcomes of Interest

Reoperations

The review by the NCGC/NICE evaluated reoperations within the follow-up period of the study, which included reoperations as a result of operative or postoperative fractures of the femur, cut-out or non-union. Sixteen RCTs were identified for meta-analysis; study follow-up ranged between 12 weeks and 27 months. The pooled results are summarized in **Table 2**.

Overall, there was no statistically significant difference in the rate of reoperations between patients receiving intramedullary nails and those receiving extramedullary sliding hip screws (relative risk [RR] 1.39; 95% confidence interval [CI] 0.87–2.23). The GRADE quality for the body of evidence was assessed as high. The authors noted that the definition of reoperation varied between studies to include both minor and major revisions, but did not downgrade the level of evidence for indirectness.

Subgroup analysis among studies that specified type of intertrochanteric fracture identified no significant difference in reoperations between intramedullary nails and sliding hip screws among patients with stable fractures (RR 7.42; 95% CI 0.93–59.01) or unstable fractures (RR 1.41; 95% CI 0.32–6.14). Additionally, in an attempt to account for potential improvements with newer implant designs, an analysis was conducted among the 9 RCTs published since 2000. This analysis similarly found no significant difference in reoperation rates (RR 1.10; 95% CI 0.52–2.34) between groups, but found greater statistical heterogeneity.

Table 2. Results from Meta-Analysis of Reoperations with Intramedullary Versus Extramedullary Implants for Intertrochanteric Hip Fractures

Subgroup of Reoperations	No. of RCTs	No. Of Participants	RR of Reoperation (95% CI) ^a	I ²	GRADE Quality of Evidence
All	16	2573	1.39 (0.87–2.23)	25%	High ^{bc}
Stable Fractures	1	173	7.42 (0.93–59.01)	NA	NR
Unstable Fractures	5	783	1.41 (0.32–6.14)	65%	NR
Studies since 2000	9	1471	1.10 (0.52–2.34)	39%	NR

Abbreviations: CI, confidence interval; NA, not applicable; NCGC, National Clinical Guideline Centre; NICE, National Institute for Clinical Excellence; No., number; NR, not reported; RCTs, randomized controlled trials; RR, relative risk

^a Using a Mantel-Haenzel statistical method with a random effects analysis

^b GRADE assessed directly by review authors (3)

^c Authors did not downgrade for indirectness, but noted that definition of reoperation varies between studies to include minor or major revisions

Source: NCGC/NICE, 2011 (3)

Functional Status

Functional status and quality of life were evaluated as primary outcomes of interest in the NCGC/NICE systematic review; however, only results for mean mobility were identified from the RCTs.

The review by the NCGC/NICE identified 4 RCTs reporting on mean mobility at 1-year follow-up, measured using the Parker-Palmer score. The Parker-Palmer score assesses 4 components of a person's mobility with total scores ranging from 0 to 9 (higher scores representing greater mobility). Meta-analysis of the studies identified no significant difference in the mean mobility score between patients receiving intramedullary nails and those receiving sliding hip screws (**Table 3**). Review authors assessed the GRADE quality of the body of evidence as high. Evaluation of only those studies published since the year 2000 (n = 3 RCTs) similarly found no significant difference in mean mobility between groups.

Table 3. Results from Meta-Analysis of Mean Mobility with Intramedullary Versus Extramedullary Implants for Intertrochanteric Hip Fractures

Subgroup of Mean Mobility Using Parker-Palmer Score	No. of RCTs	Total Sample Size	Mean Difference in Score (95% CI) ^a	I ²	GRADE Quality of Evidence
Overall	4	555	0.17 (-0.17 to 0.51)	0%	High ^b
Studies since 2000	3	455	0.20 (-0.56 to 0.96)	0%	NR

Abbreviations: CI, confidence interval; NCGS, National Clinical Guideline Centre; NICE, National Institute for Clinical Excellence; No., Number; NR, not reported; RCTs, randomized controlled trials

^a Assessed using Mantel-Haenzel statistical method with a fixed effects analysis

^b GRADE assessed directly by review authors (3)

Source: NCGC/NICE, 2011 (3)

Conclusions

One high-quality systematic review was identified that evaluated the effectiveness of intramedullary nails in comparison with extramedullary sliding hip screws for treatment of intertrochanteric hip fractures. (3) The following conclusions were reached:

- Based on high quality of evidence, there was no significant difference in reoperations among patients receiving intramedullary nails versus those receiving sliding hip screws.
- Based on high quality of evidence, there was no significant difference in mean mobility scores measured using the Parker-Palmer score between patients receiving intramedullary nails and those receiving sliding hip screws.

Acknowledgements

Editorial Staff

Elizabeth Jean Betsch, ELS

Medical Information Services

Corinne Holubowich, BEd, MLIS

Kellee Kaulback, BA(H), MISt

Expert Panel for Health Quality Ontario: Episode of Care for Hip Fracture

Name	Role	Organization
Chair		
Dr. James Waddell	Orthopedic surgeon	St. Michael's Hospital, Toronto
Orthopedic Surgery		
Dr. John P. Harrington	Orthopedic surgeon	William Osler Health System, Toronto
Dr. Mark Harrison	Orthopedic surgeon	Queen's University, Kingston
Dr. Hans J. Kreder	Professor	Division of Orthopaedics, Department of Surgery, University of Toronto
Dr. Allan Liew	Orthopedic surgeon	Department of Surgery, University of Ottawa
Dr. Mark MacLeod	Orthopedic surgeon	London Health Sciences Centre
Dr. Aaron Nauth	Orthopedic surgeon	St. Michael's Hospital/University of Toronto
Dr. David Sanders	Orthopedic surgeon	London Health Sciences Centre
Dr. Andrew Van Houwelingen	Orthopedic surgeon	St. Thomas Elgin General Hospital
Anesthesiology		
Dr. Nick Lo	Staff anesthesiologist	St. Michael's Hospital, Toronto
Emergency Medicine		
Dr. Michael O'Connor	Emergency medicine	Kingston General Hospital
Dr. Lisa Shepherd	Emergency medicine	South West Local Health Integration Network (LHIN), London
Family Medicine		
Dr. Christopher Jyu	Physician lead, primary care	Central East LHIN, Ajax
Geriatrics		
Dr. Anna Byszewski	Geriatrician	The Ottawa Hospital
Dr. Maria Zorzitto	Chief of geriatric medicine	St. Michael's Hospital, Toronto
Physiotherapy		
Ruth Vallis	Physiotherapist	University Health Network, Toronto
Rehabilitation		
Charissa Levy	Executive director	GTA Rehab Network
Dr. Peter Nord	Vice president, chief medical officer and chief of staff	Providence Healthcare, Toronto

Name	Role	Organization
Research		
Dr. Susan Jaglal	Chair	Toronto Rehabilitation Institute, University of Toronto
Dr. Valerie Palda	Associate professor	Department of Medicine and Institute of Health Policy, Management and Evaluation, University of Toronto
Administration		
Jane de Lacy	Executive director, patient services	William Osler Health System, Toronto
Brenda Flaherty	Executive vice president and chief operating officer	Hamilton Health Sciences
Jo-anne Marr	Executive vice president and chief operating officer	Mackenzie Health, Richmond Hill
Malcolm Moffat	Executive vice president, programs	Sunnybrook Health Sciences Centre, Toronto
Kathy Sabo	Senior vice president, clinical programs/operations	University Health Network, Toronto
Community Care Access Centres		
Patricia (Tricia) Khan	Senior director, client services	Erie St. Clair Community Care Access Centre, Chatham
Janet McMullan	Project director, consultant	Bone and Joint Canada
Professional Organizations		
Ravi Jain	Director, Ontario osteoporosis strategy	Osteoporosis Canada
Rhona McGlasson	Executive director	Bone and Joint Canada

Appendices

Appendix 1: Literature Search Strategies

Database: Ovid MEDLINE(R) <1946 to November Week 3 2012>, Ovid MEDLINE(R) In-Process and Other Non-Indexed Citations <December 6, 2012>, Embase <1980 to 2012 Week 49>
Search Strategy:

#	Searches	Results
1	exp Hip Fractures/ use mesz	16801
2	exp Hip Fracture/ use emez	26238
3	((hip* or femur* or femoral* or trochant* or petrochant* or intertrochant* or subtrochant* or intracapsular* or extracapsular*) adj4 fracture*).ti,ab.	56278
4	((hip* or ((femur* or femoral*) adj3 (head or neck or proximal))) adj4 fracture*).ti,ab.	38861
5	or/1-4	69802
6	exp Arthroplasty, Replacement, Hip/ use mesz	15469
7	exp arthroplasty/	101540
8	exp total hip prosthesis/ use emez	19181
9	exp hip arthroplasty/ use emez	35979
10	exp hip hemiarthroplasty/ use emez	152
11	(Arthroplasty* or Arthroplasty14sty* or hemi-arthroplast* or prosthes* or implant* or bipolar* or bi-polar*).ti,ab.	760520
12	(total hip adj2 (replace* or arthroplasty*)).ti,ab.	34545
13	((bipolar or bi-polar) adj2 arthroplast*).ti,ab.	242
14	or/6-13	796729
15	5 and 14	14229
16	Meta Analysis.pt.	37949
17	Meta Analysis/ use emez	67610
18	Systematic Review/ use emez	55424
19	exp Technology Assessment, Biomedical/ use mesz	8944
20	Biomedical Technology Assessment/ use emez	11419
21	(meta analy* or metaanaly* or pooled analysis or (systematic* adj2 review*) or published studies or published literature or medline or embase or data synthesis or data extraction or 14rthrop).ti,ab.	300528
22	((health technolog* or biomedical technolog*) adj2 assess*).ti,ab.	3997
23	or/16-22	361006
24	15 and 23	396
25	limit 24 to 14rthrop language	372
26	limit 25 to yr="2008 -Current"	194
27	remove duplicates from 26	122

Cochrane Library

ID	Search	Hits
#1	MeSH descriptor: [Hip Fractures] explode all trees	955
#2	((hip* or femur* or femoral* or trochant* or petrochant* or intertrochant* or subtrochant* or intracapsular* or extracapsular*) near/4 fracture*).ti (Word variations have been searched)	1407
#3	((hip* or ((femur* or femoral*) adj3 (head or neck or proximal))) near/4 fracture*).ti (Word variations have been searched)	792
#4	#1 or #2 or #3	1699
#5	MeSH descriptor: [Arthroplasty, Replacement, Hip] explode all trees	1297
#6	MeSH descriptor: [Arthroplasty] explode all trees	2627
#7	(arthroplasty* or arthroplasty14sty* or hemi-arthroplast* or prosthes* or implant* or bipolar* or bi-polar*).ti (Word variations have been searched)	8357

#8	(total hip near/2 (replace* or arthroplasty*)):ti (Word variations have been searched)	1255
#9	((bipolar or bi-polar) near/2 arthroplast*):ti (Word variations have been searched)	6
#10	#5 or #6 or #7 or #8 or #9	9959
#11	#4 and #10 from 2008 to 2012, in Cochrane Reviews (Reviews and Protocols), Other Reviews, Methods Studies, Technology Assessments, Economic Evaluations and Cochrane Groups	34

Centre for Reviews and Dissemination

Line	Search	Hits
1	MeSH DESCRIPTOR hip fractures EXPLODE ALL TREES	161
2	((hip* or femur* or femoral* or trochant* or petrochant* or intertrochant* or subtrochant* or intracapsular* or extracapsular*) adj4 fracture*):TI	117
3	((hip* or ((femur* or femoral*) adj3 (head or neck or proximal))) adj4 fracture*):TI	97
4	#1 OR #2 OR #3	197
5	MeSH DESCRIPTOR Arthroplasty, Replacement, Hip EXPLODE ALL TREES	281
6	MeSH DESCRIPTOR Arthroplasty EXPLODE ALL TREES	508
7	((arthroplasty* or arthroplast* or hemi-arthroplast* or prosthes* or implant* or bipolar* or bi-polar*)):TI	1033
8	((total hip adj2 (replace* or arthroplasty*)):TI	103
9	((bipolar or bi-polar) adj2 arthroplast*)	2
10	#5 OR #6 OR #7 OR #8 OR #9	1251
11	#4 AND #10	50
12	(#11) FROM 2008 TO 2012	31

Appendix 2: Quality Assessment Tables

Table A1: AMSTAR Scores of Included Systematic Reviews

Author, Year	AMSTAR score ^a	1) Provided Study Design	2) Duplicate Study Selection	3) Broad Literature Search	4) Considered Status of Publication	5) Listed Excluded Studies	6) Provided Characteristics of Studies	7) Assessed Scientific Quality	8) Considered Quality in Report	9) Methods to Combine Appropriate	10) Assessed Publication Bias	11) Stated Conflict of Interest
NCGC/NICE 2011 (3)	8	✓		✓		✓	✓	✓	✓	✓		✓
Lui et al, 2010 (11)	6	✓					✓	✓	✓	✓		✓

Abbreviations: AMSTAR, Assessment of Multiple Systematic Reviews; NCGC, National Clinical Guideline Centre; NICE, National Institute for Clinical Excellence

^aMaximum possible score is 11. Details of AMSTAR score are described in Shea et al (4)

References

- (1) Parker MJ, Handoll HHG. Gamma and other cephalocondylic intramedullary nails versus extramedullary implants for extracapsular hip fractures in adults. *Cochrane Database Syst Rev*. 2008;CD000093(3):1-175.
- (2) Butler M, Forte M, Kane RL, Joglekar S, Duval SJ, Swiontkowski M, et al. Treatment of common hip fractures. *Evidence Rep Technol Assess (Full Rep)*. 2009;(184):1-85.
- (3) National Clinical Guideline Centre. The management of hip fracture in adults: methods, evidence & guidance [Internet]. London, UK: National Clinical Guideline Centre; 2011. [cited 2013 Feb]. 658p. Available from: www.ncgc.ac.uk.
- (4) Shea BJ, Grimshaw JM, Wells GA, Boers M, Andersson N, Hamel C, et al. Development of AMSTAR: a measurement tool to assess the methodological quality of systematic reviews. *BMC Med Res Methodol*. 2007;7(10):1-7.
- (5) GRADE Working Group. Grading quality of evidence and strength of recommendations. *BMJ*. 2006;328(7454):1490-4.
- (6) Kuzyk PRT, Bhandari M, McKee MD, Russell TA, Schemitsch EH. Intramedullary versus extramedullary fixation for subtrochanteric femur fractures. *J Orthop Trauma*. 2009;23(6):465-70.
- (7) Oliver D, Griffiths R, Roche J, Sahota O. Hip fracture. *Clin Evid*. 2010;5:p1110.
- (8) Bhandari M, Schemitsch E, Jonsson A, Zlowodzki M, Haidukewych GJ. Gamma nails revisited: Gamma nails versus compression hip screws in the management of intertrochanteric fractures of the hip: A meta-analysis. *J Orthop Trauma*. 2009;23(6):460-4.
- (9) Norris R, Bhattacharjee D, Parker MJ. Occurrence of secondary fracture around intramedullary nails used for trochanteric hip fractures: A systematic review of 13,568 patients. *Injury*. 2012;43(6):706-11.
- (10) Jiang S-D, Jiang L-S, Zhao C-Q, Dai L-Y. No advantages of Gamma nail over sliding hip screw in the management of peritrochanteric hip fractures: A meta-analysis of randomized controlled trials. *Disabil Rehabil*. 2008;30(7):493-7.
- (11) Liu M, Yang Z, Pei F, Huang F, Chen S, Xiang Z. A meta-analysis of the Gamma nail and dynamic hip screw in treating peritrochanteric fractures. *Int Orthop*. 2010;34(3):323-8.

Health Quality Ontario
130 Bloor Street West, 10th Floor
Toronto, Ontario
M5S 1N5
Tel: 416-323-6868
Toll Free: 1-866-623-6868
Fax: 416-323-9261
Email: EvidenceInfo@hqontario.ca
www.hqontario.ca

ISSN 1915-7398 (online)

© Queen's Printer for Ontario, 2013