ESSENTIAL APPENDICES FOR ASSESSMENT REPORT
NIHR HTA Programme project number 11/118

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2 Search strategies for clinical effectiveness, cost effectiveness and registries

A. Clinical effectiveness search strategy

Medline (1946 to October Week 4 2012) via OVID interface, searched on 05/11/2012

1	exp Arthroplasty, Replacement, Hip/	15246
2	exp Hip Prosthesis/	18304
3	(tha or thr).tw.	23312
4	exp Hip Joint/	20108
5	exp Hip/	8480
6	hip.tw.	79606
7	("femur head*" or "femoral head*" or acetabul*).tw.	20571
8	exp Femur Head/	7700
9	exp Acetabulum/	8243
10	4 or 5 or 6 or 7 or 8 or 9	97057
11	(arthroplast* or replace* or implant* or prosthes*).tw.	514865
12	exp Joint Prosthesis/	33736
13	exp "Prostheses and Implants"/	355910
14	11 or 12 or 13	716289
15	10 and 14	35876
16	(surf* or resurf*).tw.	629176
17	10 and 16	5573
18	1 or 2 or 3 or 15 or 17	61490
19	exp Arthritis, Rheumatoid/ or exp Arthritis/	190095
20	exp Osteoarthritis, Hip/ or exp Osteoarthritis/	39813
21	(arthrit* or osteoarthrit* or osteoarthrosis or "rheumatoid arthrit*").tw.	141102
22	19 or 20 or 21	221909
23	18 and 22	7739
24	meta analysis.pt.	37222
25	randomized controlled trial.pt.	340101
26	(random* or "controlled trial*" or "clinical trial*" or rct).tw.	718263
27	(metaanalys* or "meta analys*" or "meta-analys*").tw.	42924
28	"systematic review*".tw.	34474
29	24 or 25 or 26 or 27 or 28	846326
30	23 and 29	614
31	limit 30 to (english language and yr="2002 -Current")	443

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Medline In-Process & Other Non-Indexed Citations November 02, 2012 via OVID interface, searched on 05/11/2012

1	(tha or thr).tw.	773
2	(hip* or "femoral head*" or "femur head*" or acetabul*).tw.	9533
3	(arthroplast* or replace* or implant* or prosthes*).tw.	26517
4	(surf* or resurf*).tw.	87833
5	3 or 4	111797
6	2 and 5	1866
7	1 or 6	2325
8	meta analysis.pt.	34
9	randomized controlled trial.pt.	460
10	(random* or "controlled trial*" or "clinical trial*" or rct).tw.	50523
11	"systematic review*".tw.	4605
12	(metaanalys* or "meta analys*" or "meta-analys*").tw.	4148
13	8 or 9 or 10 or 11 or 12	55127
14	7 and 13	192

Embase 1974 to 2012 Week 44 via OVID interface, searched on 05/11/2012

1	exp hip arthroplasty/	37471
2	exp total hip prosthesis/	20316
3	(tha or thr).tw.	25515
4	exp hip/	29775
5	hip*.tw.	257572
6	exp femur head/	9209
7	exp acetabulum/	8120
8	("femoral head*" or "femur head*" or acetabul*).tw.	25366
9	4 or 5 or 6 or 7 or 8	274870
10	(arthroplast* or replace* or implant* or prosthes*).tw.	661628
11	exp joint prosthesis/	43247
12	exp prosthesis/ or exp implant/ or exp "prostheses and orthoses"/	380676
13	10 or 11 or 12	872492
14	9 and 13	48019
15	(surf* or resurf*).tw.	809046
16	9 and 15	10412
17	1 or 2 or 3 or 14 or 16	80859
18	exp arthritis/ or exp chronic arthritis/ or exp rheumatoid arthritis/	310664

19	exp hip osteoarthritis/ or exp osteoarthritis/	72791
20	(arthrit* or osteoarthrit* or osteoarthroses or "rheumatoid arthrit*").tw.	189738
21	18 or 19 or 20	338180
22	17 and 21	10696
23	meta analysis/	66936
24	randomized controlled trial/	334512
25	(metaanalys* or "meta analys*" or "meta-analys*").tw.	60497
26	(random* or "controlled trial*" or "clinical trial*" or rct).tw.	968002
27	"systematic review*".tw.	47500
28	23 or 24 or 25 or 26 or 27	1114673
29	22 and 28	837
30	limit 29 to (english language and yr="2002 -Current")	645

Web of Science (Science Citation Index and Conference Proceedings Citation Index-Science), searched on 09/11/2012

# 11	**691**	#10 AND #9 *Databases=SCI-EXPANDED, CPCI-S* *Timespan=2002-01-01 - 2012-11-09* *Lemmatization=On*
# 10	**778,898**	(TS=(random* or "clinical trial*" or "controlled trial*" or rct or "metaanalys*" or "meta analys*" or "meta-analys*" or "systematic review*")) AND Language=(English) *Databases=SCI-EXPANDED, CPCI-S* *Timespan=2002-01-01 - 2012-11-09* *Lemmatization=On*
# 9	**3,944**	#8 AND #7 *Databases=SCI-EXPANDED, CPCI-S* *Timespan=2002-01-01 - 2012-11-09* *Lemmatization=On*
# 8	**106,592**	(TS=(arthriti* or osteoarthrit* or "rheumatoid arthrit*" or osteoarthrosis)) AND Language=(English) *Databases=SCI-EXPANDED, CPCI-S* *Timespan=2002-01-01 - 2012-11-09* *Lemmatization=On*
# 7	**39,025**	#6 OR #1 *Databases=SCI-EXPANDED, CPCI-S* *Timespan=2002-01-01 - 2012-11-09* *Lemmatization=On*

# 6	**28,795**	#5 AND #2 *Databases=SCI-EXPANDED, CPCI-S* *Timespan=2002-01-01 - 2012-11-09* *Lemmatization=On*
# 5	**1,604,641**	#4 OR #3 *Databases=SCI-EXPANDED, CPCI-S* *Timespan=2002-01-01 - 2012-11-09* *Lemmatization=On*
# 4	**1,273,961**	(TS=(surf* or resurf*)) AND Language=(English) *Databases=SCI-EXPANDED, CPCI-S* *Timespan=2002-01-01 - 2012-11-09* *Lemmatization=On*
# 3	**374,918**	(TS=(arthroplast* or implant* or replace* or prosthes*)) AND Language=(English) *Databases=SCI-EXPANDED, CPCI-S* *Timespan=2002-01-01 - 2012-11-09* *Lemmatization=On*
# 2	**151,640**	(TS=(hip* or "femoral head*" or "femur head*" or acetabul*)) AND Language=(English) *Databases=SCI-EXPANDED, CPCI-S* *Timespan=2002-01-01 - 2012-11-09* *Lemmatization=On*
# 1	**12,821**	(TS=(tha or thr)) AND Language=(English) *Databases=SCI-EXPANDED, CPCI-S* *Timespan=2002-01-01 - 2012-11-09* *Lemmatization=On*

Cochrane Library (including CDSR, CENTRAL, DARE, HTA, NHS EED), searched on 09/11/2012

#1	MeSH descriptor: [Arthroplasty, Replacement, Hip] explode all trees	1296
#2	MeSH descriptor: [Hip Prosthesis] explode all trees	949
#3	tha or thr	664
#4	MeSH descriptor: [Hip Joint] explode all trees	678
#5	MeSH descriptor: [Hip] explode all trees	258
#6	hip* or femoral next head* or femur next head* or acetabul*	10895
#7	MeSH descriptor: [Acetabulum] explode all trees	103
#8	MeSH descriptor: [Femur Head] explode all trees	57
#9	#4 or #5 or #6 or #7 or #8	10895
#10	(arthroplast* or replace* or implant* or prosthes*)	31347
#11	MeSH descriptor: [Joint Prosthesis] explode all trees	1478
#12	MeSH descriptor: [Prostheses and Implants] explode all trees	11766
#13	#10 or #11 or #12	35161
#14	#9 and #13	4051

#15	(surf* or resurf*)	14646
#16	#9 and #15	429
#17	#1 or #2 or #3 or #14 or #16	4422
#18	MeSH descriptor: [Arthritis] explode all trees	7651
#19	MeSH descriptor: [Arthritis, Rheumatoid] explode all trees	3887
#20	MeSH descriptor: [Osteoarthritis] explode all trees	2998
#21	MeSH descriptor: [Osteoarthritis, Hip] explode all trees	490
#22	(arthrit* or osteoarthrit* or osteoarthrosis or rheumatoid next arthritit*)	12010
#23	#18 or #19 or #20 or #21 or #22	12530
#24	#17 and #23	663
#25	#24 from 2002	493

n.b. of the total 493, we did not import 3 from Cochrane Groups database

ClinicalTrials.gov, searched on 09/11/2012

(arthritis OR arthitic OR arthritics OR osteoarthritis OR osteoarthritic OR osteoarthritics OR "rheumatoid arthritis" OR "rheumatoid arthritic" OR "rheumatoid arthritics" OR osteoarthrosis OR osteoarthrotic) [ALL-FIELDS] AND ((tha OR thr) OR ((hip OR hips OR "femoral head" OR "femoral heads" OR "femur head" OR "femur heads" OR acetabulum OR acetabula OR acetabulums OR acetabular) AND (tha OR thr OR arthroplasty OR arthroplasties OR implant OR implants OR replace OR replacement OR replacements OR replaced OR replaces OR implant OR implants OR prosthesis OR prostheses OR surface OR surfacing OR surfaced OR resurface OR resurfacing OR resurfaced))) [ALL-FIELDS]
315

UK Clinical Research Network Study Portfolio (UKCRN Portfolio), searched on 12 December 2012

1. TOPIC: Musculoskeletal
2. SPECIALTY GROUP: All
4. RESEARCH SUMMARY: hip femur femoral acetabula acetabulum [retrieves 36]

Current Controlled Trials, searched on 12 December 2012

(arthrit* OR osteoarthrit* OR osteoarthro*) AND ((THR OR THA) OR ((hip* OR femur* OR femor* OR acetabul*) AND (arthroplast* OR implant* OR replace* OR prosthes* OR surfac* OR resurfac*))) [retrieves 73]

B. Cost effectiveness search strategy

Medline (1946 to November Week 3 2012) via OVID interface, searched on 26/11/2012

	Searches	Results
1	exp Arthroplasty, Replacement, Hip/	15463
2	exp Hip Prosthesis/	18505
3	(tha or thr).tw.	23441
4	exp Hip Joint/	20462
5	exp Hip/	8619
6	hip.tw.	80726
7	("femur head*" or "femoral head*" or acetabul*).tw.	20866
8	exp Femur Head/	7859
9	exp Acetabulum/	8399
10	4 or 5 or 6 or 7 or 8 or 9	98375
11	(arthroplast* or replace* or implant* or prosthes*).tw.	518308
12	exp Joint Prosthesis/	34040
13	exp "Prostheses and Implants"/	360484
14	11 or 12 or 13	722831
15	10 and 14	36336
16	(surf* or resurf*).tw.	632344
17	10 and 16	5616
18	1 or 2 or 3 or 15 or 17	62056
19	exp Arthritis, Rheumatoid/ or exp Arthritis/	190890
20	exp Osteoarthritis, Hip/ or exp Osteoarthritis/	40142
21	(arthrit* or osteoarthrit* or osteoarthrosis or "rheumatoid arthrit*").tw.	141817
22	19 or 20 or 21	222917
23	18 and 22	7861
24	*Economics/ or exp *"economics, hospital"/ or *economics, medical/ or *economics, nursing/	27342
25	exp *"Costs and Cost Analysis"/	42120
26	exp *"Cost of Illness"/	6779
27	exp *"Models, Economic"/	3078
28	(cost* or economic*).ti.	96110
29	exp *"Quality of Life"/	46255
30	exp *"Quality-Adjusted Life Years"/	1297

31	(ICER or qaly* or eq5d* or "eq-5d*" or euroqol or "euro-qol" or "quality of well-being" or "quality of wellbeing" or "short-form 36" or "shortform 36" or "36-item short-form" or "36-item short form" or "sf-36" or sf36 or "short-form 12" or "short form 12" or "12-item short-form" or "12-item short form" or "sf12" or "sf-12").ti.	1823
32	("Stanford Health Assessment Questionnaire" or HAQ or "Western Ontario and McMaster University Osteoarthritis Index" or WOMAC or OAKHQOL or JAQQ or PSAQoL).tw.	3222
33	(markov or "time trade off" or "time-trade-off" or standard gamble or utilit* or qol or hrql or hrqol or disutilit* or "net-benefit analysis").ti.	18006
34	(quality adj2 life).ti.	32969
35	(decision adj2 model).ti.	454
36	("resource use" or "resource utili?ation").ti.	1506
37	exp *Health Status/	45849
38	("health state*" or "health status").ti.	7441
39	24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38	247461
40	23 and 39	500
41	limit 40 to (english language and yr="2002 -Current")	348

Medline In-Process & Other Non-Indexed Citations November 21, 2012 via OVID interface, searched on 26/11/2012

	Searches	**Results**
1	(tha or thr).tw.	816
2	(hip* or "femoral head*" or "femur head*" or acetabul*).tw.	9790
3	(arthroplast* or replace* or implant* or prosthes*).tw.	27240
4	(surf* or resurf*).tw.	88816
5	3 or 4	113450
6	2 and 5	1940
7	1 or 6	2422
8	(cost* or economic*).ti.	5677
9	(ICER or qaly* or eq5d* or "eq-5d*" or euroqol or "euro-qol" or "quality of well-being" or "quality of wellbeing" or "short-form 36" or "shortform 36" or "36-item short-form" or "36-item short form" or "sf-36" or sf36 or "short-form 12" or "short form 12" or "12-item short-form" or "12-item short form" or "sf12" or "sf-12").ti.	60
10	("Stanford Health Assessment Questionnaire" or HAQ or "Western Ontario and McMaster University Osteoarthritis Index" or WOMAC or	230

	OAKHQOL or JAQQ or PSAQoL).tw.	
11	(markov or "time trade off" or "time-trade-off" or standard gamble or utilit* or qol or hrql or hrqol or disutilit* or "net-benefit analysis").ti.	1507
12	(quality adj2 life).ti.	2232
13	(decision adj2 model).ti.	23
14	("resource use" or "resource utili?ation").ti.	82
15	("health state*" or "health status").ti.	289
16	8 or 9 or 10 or 11 or 12 or 13 or 14 or 15	9814
17	7 and 16	82

Embase 1974 to 2012 Week 46 via OVID interface, searched on 26/11/2012
n.b. saved in Ovid as HIPS Embase V5 Cost

	Searches	**Results**
1	exp hip arthroplasty/	37516
2	exp total hip prosthesis/	20340
3	(tha or thr).tw.	25540
4	exp hip/	29872
5	hip*.tw.	258132
6	exp femur head/	9240
7	exp acetabulum/	8131
8	("femoral head*" or "femur head*" or acetabul*).tw.	25429
9	4 or 5 or 6 or 7 or 8	275465
10	(arthroplast* or replace* or implant* or prosthes*).tw.	663172
11	exp joint prosthesis/	43311
12	exp prosthesis/ or exp implant/ or exp "prostheses and orthoses"/	381252
13	10 or 11 or 12	872557
14	9 and 13	48566
15	(surf* or resurf*).tw.	810448
16	9 and 15	10437
17	1 or 2 or 3 or 14 or 16	81422
18	exp arthritis/ or exp chronic arthritis/ or exp rheumatoid arthritis/	310935
19	exp hip osteoarthritis/ or exp osteoarthritis/	72812
20	(arthrit* or osteoarthrit* or osteoarthroses or "rheumatoid arthrit*").tw.	189771
21	18 or 19 or 20	338437
22	17 and 21	10767

23	*health economics/	16427
24	exp *economic evaluation/	30055
25	exp *"health care cost"/	44344
26	exp *"quality of life"/	48125
27	exp *health status/	38138
28	(cost* or economic*).ti.	128093
29	(ICER or qaly* or eq5d* or "eq-5d*" or euroqol or "euro-qol" or "quality of well-being" or "quality of wellbeing" or "short-form 36" or "shortform 36" or "36-item short-form" or "36-item short form" or "sf-36" or sf36 or "short-form 12" or "short form 12" or "12-item short-form" or "12-item short form" or "sf12" or "sf-12").ti.	2376
30	("Stanford Health Assessment Questionnaire" or HAQ or "Western Ontario and McMaster University Osteoarthritis Index" or WOMAC or OAKHQOL or JAQQ or PSAQoL).tw.	5548
31	(markov or "time trade off" or "time-trade-off" or standard gamble or utilit* or qol or hrql or hrqol or disutilit* or "net-benefit analysis").ti.	25983
32	(quality adj2 life).ti.	47695
33	(decision adj2 model).ti.	583
34	("resource use" or "resource utili?ation").ti.	2176
35	("health state*" or "health status").ti.	8766
36	23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35	300476
37	22 and 36	640
38	limit 37 to (english language and yr="2002 -Current")	489

Web of Science (Science Citation Index and Conference Proceedings Citation Index-Science), searched on 30/11/2012

n.b. saved in WoK as HIPS V5 Cost Filter

# 18	**520**	#17 AND #9 *Databases=SCI-EXPANDED, CPCI-S Timespan=2002-01-01 - 2012-11-30* *Lemmatization=On*
# 17	**169,247**	#16 OR #15 OR #14 OR #13 OR #12 OR #11 OR #10 *Databases=SCI-EXPANDED, CPCI-S Timespan=2002-01-01 - 2012-11-30* *Lemmatization=On*
# 16	**3,487**	(TI=("health state*" or "health status")) AND Language=(English) *Databases=SCI-EXPANDED, CPCI-S Timespan=2002-01-01 - 2012-11-30* *Lemmatization=On*
# 15	**2,194**	(TI=("resource use" or "resource utili?ation")) AND Language=(English) *Databases=SCI-EXPANDED, CPCI-S Timespan=2002-01-01 - 2012-11-30* *Lemmatization=On*

# 14	**2,366**	(TI=(decision NEAR/2 model)) AND Language=(English) *Databases=SCI-EXPANDED, CPCI-S Timespan=2002-01-01 - 2012-11-30* *Lemmatization=On*
# 13	**31,919**	(TI=(quality NEAR/2 life)) AND Language=(English) *Databases=SCI-EXPANDED, CPCI-S Timespan=2002-01-01 - 2012-11-30* *Lemmatization=On*
# 12	**31,421**	(TI=(markov or "time trade off" or "time-trade-off" or standard gamble or utilit* or qol or hrql or hrqol or disutilit* or "net-benefit analysis")) AND Language=(English) *Databases=SCI-EXPANDED, CPCI-S Timespan=2002-01-01 - 2012-11-30* *Lemmatization=On*
# 11	**2,797**	(TS=("Stanford Health Assessment Questionnaire" or HAQ or "Western Ontario and McMaster University Osteoarthritis Index" or WOMAC or OAKHQOL or JAQQ or PSAQoL)) AND Language=(English) *Databases=SCI-EXPANDED, CPCI-S Timespan=2002-01-01 - 2012-11-30* *Lemmatization=On*
# 10	**100,820**	(TI=(cost* or economic* or ICER or qaly* or eq5d* or "eq-5d*" or euroqol or "euro-qol" or "quality of well-being" or "quality of wellbeing" or "short-form 36" or "shortform 36" or "36-item short-form" or "36-item short form" or "sf-36" or sf36 or "short-form 12" or "short form 12" or "12-item short-form" or "12-item short form" or "sf12" or "sf-12")) AND Language=(English) *Databases=SCI-EXPANDED, CPCI-S Timespan=2002-01-01 - 2012-11-30* *Lemmatization=On*
# 9	**3,969**	#8 AND #7 *Databases=SCI-EXPANDED, CPCI-S Timespan=2002-01-01 - 2012-11-30* *Lemmatization=On*
# 8	**108,491**	(TS=(arthriti* or osteoarthrit* or "rheumatoid arthrit*" or osteoarthrosis)) AND Language=(English) *Databases=SCI-EXPANDED, CPCI-S Timespan=2002-01-01 - 2012-11-30* *Lemmatization=On*
# 7	**39,281**	#6 OR #1 *Databases=SCI-EXPANDED, CPCI-S Timespan=2002-01-01 - 2012-11-30* *Lemmatization=On*
# 6	**28,995**	#5 AND #2 *Databases=SCI-EXPANDED, CPCI-S Timespan=2002-01-01 - 2012-11-30* *Lemmatization=On*
# 5	**1,617,466**	#4 OR #3 *Databases=SCI-EXPANDED, CPCI-S Timespan=2002-01-01 - 2012-11-30* *Lemmatization=On*
# 4	**1,284,032**	(TS=(surf* or resurf*)) AND Language=(English) *Databases=SCI-EXPANDED, CPCI-S Timespan=2002-01-01 - 2012-11-30* *Lemmatization=On*
# 3	**378,013**	(TS=(arthroplast* or implant* or replace* or prosthes*)) AND Language=(English) *Databases=SCI-EXPANDED, CPCI-S Timespan=2002-01-01 - 2012-*

		11-30 *Lemmatization=On*
# 2	**152,745**	(TS=(hip* or "femoral head*" or "femur head*" or acetabul*)) AND Language=(English) *Databases=SCI-EXPANDED, CPCI-S Timespan=2002-01-01 - 2012-11-30* *Lemmatization=On*
# 1	**12,896**	(TS=(tha or thr)) AND Language=(English) *Databases=SCI-EXPANDED, CPCI-S Timespan=2002-01-01 - 2012-11-30* *Lemmatization=On*

NHS EED, HTA database searched via Cochrane Library on 30/11/2012

n.b. saved in Cochrane Library as HIPS V6 Filter

ID	Search	Hits
#1	MeSH descriptor: [Arthroplasty, Replacement, Hip] explode all trees 1297	
#2	MeSH descriptor: [Hip Prosthesis] explode all trees	949
#3	tha or thr	667
#4	MeSH descriptor: [Hip Joint] explode all trees 679	
#5	MeSH descriptor: [Hip] explode all trees 258	
#6	hip* or femoral next head* or femur next head* or acetabul* 10914	
#7	MeSH descriptor: [Acetabulum] explode all trees	103
#8	MeSH descriptor: [Femur Head] explode all trees	57
#9	#4 or #5 or #6 or #7 or #8	10914
#10	(arthroplast* or replace* or implant* or prosthes*)	31428
#11	MeSH descriptor: [Joint Prosthesis] explode all trees 1478	
#12	MeSH descriptor: [Prostheses and Implants] explode all trees 11775	
#13	#10 or #11 or #12	35244
#14	#9 and #13	4060
#15	(surf* or resurf*)	14670
#16	#9 and #15	432
#17	#1 or #2 or #3 or #14 or #16	4435
#18	MeSH descriptor: [Arthritis] explode all trees 7660	
#19	MeSH descriptor: [Arthritis, Rheumatoid] explode all trees	3891
#20	MeSH descriptor: [Osteoarthritis] explode all trees	3004
#21	MeSH descriptor: [Osteoarthritis, Hip] explode all trees 490	
#22	(arthrit* or osteoarthrit* or osteoarthrosis or rheumatoid next arthritit*)	12032
#23	#18 or #19 or #20 or #21 or #22	12552
#24	#17 and #23	666

#25 #24 from 2002 (Word variations have been searched)
496

n.b. of the total 496, we imported:

NHSEED	30
HTA	8

CDSR, CENTRAL, DARE, searched via Cochrane Library on 30/11/2012
n.b. saved in Cochrane Library as HIPS V5 Cost Filter

ID	Search	Hits
#1	MeSH descriptor: [Arthroplasty, Replacement, Hip] explode all trees	1297
#2	MeSH descriptor: [Hip Prosthesis] explode all trees	949
#3	tha or thr	667
#4	MeSH descriptor: [Hip Joint] explode all trees	679
#5	MeSH descriptor: [Hip] explode all trees	258
#6	hip* or femoral next head* or femur next head* or acetabul*	10914
#7	MeSH descriptor: [Acetabulum] explode all trees	103
#8	MeSH descriptor: [Femur Head] explode all trees	57
#9	#4 or #5 or #6 or #7 or #8	10914
#10	(arthroplast* or replace* or implant* or prosthes*)	31428
#11	MeSH descriptor: [Joint Prosthesis] explode all trees	1478
#12	MeSH descriptor: [Prostheses and Implants] explode all trees	11775
#13	#10 or #11 or #12	35244
#14	#9 and #13	4060
#15	(surf* or resurf*)	14670
#16	#9 and #15	432
#17	#1 or #2 or #3 or #14 or #16	4435
#18	MeSH descriptor: [Arthritis] explode all trees	7660
#19	MeSH descriptor: [Arthritis, Rheumatoid] explode all trees	3891
#20	MeSH descriptor: [Osteoarthritis] explode all trees	3004
#21	MeSH descriptor: [Osteoarthritis, Hip] explode all trees	490
#22	(arthrit* or osteoarthrit* or osteoarthrosis or rheumatoid next arthritit*)	12032
#23	#18 or #19 or #20 or #21 or #22	12552
#24	#17 and #23	666
#25	#24 from 2002 (Word variations have been searched)	496
#26	MeSH descriptor: [Economics] this term only	50

#27	MeSH descriptor: [Economics, Hospital] explode all trees	1385
#28	MeSH descriptor: [Economics, Medical] this term only 33	
#29	MeSH descriptor: [Economics, Nursing] this term only 15	
#30	MeSH descriptor: [Costs and Cost Analysis] explode all trees 18514	
#31	MeSH descriptor: [Models, Economic] explode all trees 1457	
#32	(cost* or economic*):ti,ab	30879
#33	MeSH descriptor: [Quality of Life] explode all trees	12081
#34	MeSH descriptor: [Quality-Adjusted Life Years] explode all trees 2768	
#35	(ICER or qaly* or eq5d* or eq-5d* or euroqol or euro-qol or "quality of well-being" or "quality of wellbeing" or "short-form 36" or "shortform 36" or "36-item short-form" or "36-item short form" or "sf-36" or sf36 or "short-form 12" or "short form 12" or "12-item short-form" or "12-item short form" or "sf12" or "sf-12"):ti,ab	4323
#36	("Stanford Health Assessment Questionnaire" or HAQ or "Western Ontario and McMaster University Osteoarthritis Index" or WOMAC or OAKHQOL or JAQQ or PSAQoL):ti,ab 845	
#37	(markov or "time trade off" or "time-trade-off" or "standard gamble" or utilit* or qol or hrql or hrqol or disutilit* or "net-benefit analysis"):ti,ab 8363	
#38	(quality near/2 life):ti,ab	18690
#39	(decision near/2 model):ti,ab	281
#40	("resource use" or resource next utili?ation):ti,ab	1048
#41	MeSH descriptor: [Health Status] explode all trees	4568
#42	(health next state* or "health status"):ti,ab	2397
#43	#26 or #27 or #28 or #29 or #30 or #31 or #32 or #33 or #34 or #35 or #36 or #37 or #38 or #39 or #40 or #41 or #42	62008
#44	#25 and #43	178

n.b. of the total 178, we imported:

Cochrane Reviews	64
DARE	5
CENTRAL	78

CEA Registry (Articles) searched on 12/12/12

Hip	159
Femoral	18
Acetabula	2
Acetabulum	0

Femur 0
26 references selected across all searches.

ClinicalTrials.gov, searched on 09/11/2012

(arthritis OR arthitic OR arthritics OR osteoarthritis OR osteoarthritic OR osteoarthritics OR "rheumatoid arthritis" OR "rheumatoid arthritic" OR "rheumatoid arthritics" OR osteoarthrosis OR osteoarthrotic) [ALL-FIELDS] AND ((tha OR thr) OR ((hip OR hips OR "femoral head" OR "femoral heads" OR "femur head" OR "femur heads" OR acetabulum OR acetabula OR acetabulums OR acetabular) AND (tha OR thr OR arthroplasty OR arthroplasties OR implant OR implants OR replace OR replacement OR replacements OR replaced OR replaces OR implant OR implants OR prosthesis OR prostheses OR surface OR surfacing OR surfaced OR resurface OR resurfacing OR resurfaced))) [ALL-FIELDS]

315

Saved search: Repeat the search by clicking on the following link:
http://www.clinicaltrials.gov/ct2/results?term=arthritis+OR+arthitic+OR+arthritics+OR+osteoarthritis+OR+osteoarthritic+OR+osteoarthritics+OR+%22rheumatoid+arthritis%22+OR+%22rheumatoid+arthritic%22+OR+%22rheumatoid+arthritics%22+OR+osteoarthrosis+OR+osteoarthrotic&sntx=%28+tha+OR+thr+OR+%28+hip+OR+hips+OR+%22femoral+head%22+OR+%22femoral+heads%22+OR+%22femur+head%22+OR+%22femur+heads%22+OR+acetabulum+OR+acetabula+OR+acetabulums+OR+acetabular+%29+AND+%28+tha+OR+thr+OR+arthroplasty+OR+arthroplasties+OR+implant+OR+implants+OR+replace+OR+replacement+OR+replacements+OR+replaced+OR+replaces+OR+implant+OR+implants+OR+prosthesis+OR+prostheses+OR+surface+OR+surfacing+OR+surfaced+OR+resurface+OR+resurfacing+OR+resurfaced+%29+%29+%5BALL-FIELDS%5D&show_xprt=Y

UK Clinical Research Network Study Portfolio (UKCRN Portfolio), searched on 12 December 2012

1. TOPIC: Musculoskeletal
2. SPECIALTY GROUP: All
4. RESEARCH SUMMARY: hip femur femoral acetabula acetabulum [retrieves 36]

Current Controlled Trials, searched on 12 December 2012

(arthrit* OR osteoarthrit* OR osteoarthro*) AND ((THR OR THA) OR ((hip* OR femur* OR femor* OR acetabul*) AND (arthroplast* OR implant* OR replace* OR prosthes* OR surfac* OR resurfac*))) [retrieves 73]

Saved search: Repeat the search by clicking on the following link:

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http://www.controlled-trials.com/isrctn/search.html?srch=%28arthrit*+OR+osteoarthrit*+OR+osteoarthro*%29+AND+%28%28THR+OR+THA%29+OR+%28%28hip*+OR+femur*+OR+femor*+OR+acetabul*%29+AND+%28arthroplast*+OR+implant*+OR+replace*+OR+prosthes*+OR+surfac*+OR+resurfac*%29%29%29&sort=3&dir=desc&max=10&Submit=SUBMIT

NLM Gateway, searched on 12/12/12.

(hip OR tha OR thr OR femur OR femor* OR acetabul*) 87
HSRProj refs

C. Registries search strategy

Medline (OVID), 1946 to November Week 3, 2012. Searched on 04 Dec 2012.

Results	Search Type	Actions
1	exp Arthroplasty, Replacement, Hip/	15469
2	exp Hip Prosthesis/	18508
3	(tha or thr).tw.	23458
4	exp Hip Joint/	20473
5	exp Hip/	8627
6	hip.tw.	80767
7	("femur head*" or "femoral head*" or acetabul*).tw.	20872
8	exp Femur Head/	7861
9	exp Acetabulum/	8400
10	4 or 5 or 6 or 7 or 8 or 9	98424
11	(arthroplast* or replace* or implant* or prosthes*).tw.	518589
12	exp Joint Prosthesis/	34047
13	exp "Prostheses and Implants"/	360616
14	11 or 12 or 13	723184
15	10 and 14	36345
16	(surf* or resurf*).tw.	632737
17	10 and 16	5621
18	1 or 2 or 3 or 15 or 17	62084
19	exp Arthritis, Rheumatoid/ or exp Arthritis/	190963
20	exp Osteoarthritis, Hip/ or exp Osteoarthritis/	40163
21	(arthrit* or osteoarthrit* or osteoarthrosis or "rheumatoid arthrit*").tw.	141888
22	19 or 20 or 21	223011
23	18 and 22	7863
24	exp Registries/	50293
25	(registry or registries).tw.	48917

26	(register or registers).tw.	34521
27	Databases as Topic/	7953
28	Databases, Factual/	37658
29	24 or 25 or 26 or 27 or 28	145740
30	23 and 29	245
31	limit 30 to (english language and yr="2002 -Current")	208

Embase, 1947 to Dec 03 2012, searched on 04 Dec 2012

Results	Search Type	Actions
1	exp hip arthroplasty/	38263
2	exp total hip prosthesis/	20654
3	(tha or thr).tw.	26605
4	exp hip/	38923
5	hip*.tw.	271815
6	exp femur head/	11130
7	exp acetabulum/	9541
8	("femoral head*" or "femur head*" or acetabul*).tw.	28308
9	4 or 5 or 6 or 7 or 8	291434
10	(arthroplast* or replace* or implant* or prosthes*).tw.	710537
11	exp joint prosthesis/	44090
12	exp prosthesis/ or exp implant/ or exp "prostheses and orthoses"/	399853
13	10 or 11 or 12	926495
14	9 and 13	50948
15	(surf* or resurf*).tw.	856383
16	9 and 15	11107
17	1 or 2 or 3 or 14 or 16	85465
18	exp arthritis/ or exp chronic arthritis/ or exp rheumatoid arthritis/	339336
19	exp hip osteoarthritis/ or exp osteoarthritis/	79262

20	(arthrit* or osteoarthrit* or osteoarthroses or "rheumatoid arthrit*").tw.	205812
21	18 or 19 or 20	367580
22	17 and 21	11575
23	register/	51419
24	(registry or registries).tw.	72626
25	(register or registers).tw.	45675
26	exp factual database/	37382
27	23 or 24 or 25 or 26	164947
28	22 and 27	289
31	limit 28 to (yr="2002 -Current")	263

MEDLINE(R) In-Process & Other Non-Indexed Citations December 06, 2012, via OVID interface, searched on 07/12/2012

	Searches	Results
1	(tha or thr).tw.	869
2	(hip* or "femoral head*" or "femur head*" or acetabul*).tw.	10378
3	(arthroplast* or replace* or implant* or prosthes*).tw.	28722
4	(surf* or resurf*).tw.	91209
5	3 or 4	117173
6	2 and 5	2040
7	1 or 6	2552
8	(registry or registries).tw.	3295
9	(register or registers).tw.	2122
10	8 or 9	5284
11	7 and 10	70

3 Quality assessment of included RCTs and SRs

3.1. Quality assessment of included RCTs: THR 1 vs. THR 2 studies (n=13)

Cochrane Collaboration's tool for assessing risk of bias for a randomized controlled trial (adapted from Higgins et al. 2011[97])

Cup fixation

Name of first reviewer: Paul Sutcliffe
Name of second reviewer: Alexander Tsertsvadze
First author surname year of publication: Angadi 2012[109]

Bias domain	Source of bias		Support for judgment*	Authors' judgment**
Selection bias	Random sequence generation		Randomised using a number generation programme	Low risk of bias
	Allocation concealment		Assignment card in a sealed opaque envelope. This envelope was opened before surgery	Low risk of bias
Performance bias	Blinding of participants and Personnel	Subjective (e.g., patient-reported)	Not described	Unclear risk of bias
		Objective (e.g., mortality, radiography, dislocation)	The awareness of cup fixation unlikely to influence the result	Low risk of bias
Detection bias	Blinding of outcome assessors	Subjective (e.g., patient-reported)	Not described	Unclear risk of bias
		Objective (e.g., mortality, radiography, dislocation)	The awareness of cup fixation unlikely to influence the result	Low risk of bias
Attrition bias	Incomplete outcome data	Subjective outcomes (e.g., patient-reported)	Small attrition rate (<5%)	Low risk of bias
		Objective outcomes (e.g., mortality, radiography, dislocation)	See above	Low risk of bias
Reporting bias	Selective reporting of the outcome, subgroups, or analysis		All specified outcomes in the protocol were reported in the results section –	Low risk of bias

		survival was unclear	
Other bias	Funding source, adequacy of statistical methods used, type of analysis [ITT/PP], baseline imbalance in important characteristics	Not clear the source of funding	Unclear risk of bias
ITT=intention to treat; PP=per protocol; NA=not applicable			

[*] Statement, description or quote supporting the judgment
[**] Low risk of bias, high risk of bias, or unclear risk of bias

Summary assessment of the risk of bias for an outcome within a study across domains

Outcome measure	Summary risk of bias across all domains within a study
Subjective (list of outcomes): Harris Hip Score (HHS)	Unclear risk of bias
Objective (list of outcomes): Aseptic loosening Implant dislocation Implant survival rate Infection Osteolysis Revision rate	Low risk of bias

Name of first reviewer: Alexander Tsertsvadze
Name of second reviewer: Paul Sutcliffe
First author surname year of publication: Bjorgul 2010[107] Bjorgul 2010[108]

Bias domain	Source of bias		Support for judgment*	Authors' judgment**
Selection bias	Random sequence generation		Not described	Unclear risk
	Allocation concealment		Randomization was concealed	Low risk
Performance bias	Blinding of participants and Personnel	Subjective (e.g., patient-reported)	Patients were blinded to the allocated treatment (cup fixation method) until the 2-year follow-up	Unclear risk
		Objective (e.g., mortality, radiography, dislocation)	The knowledge of the allocated treatment less likely to influence these outcomes	Low risk
Detection bias	Blinding of outcome assessors	Subjective (e.g., patient-reported)	Assessor was not directly involved in the study	Low risk
		Objective (e.g., mortality, radiography, dislocation)	See above	Low risk
Attrition bias	Incomplete outcome data	Subjective outcomes (e.g., patient-reported)	30% of the initial sample not analysed	High risk
		Objective outcomes (e.g., mortality, radiography, dislocation)	See above	High risk
Reporting bias	Selective reporting of the outcome, subgroups, or analysis		All specified outcomes reported	Low risk
Other bias	Funding source, adequacy of statistical methods used, type of analysis [ITT/PP], baseline imbalance in important characteristics		Baseline imbalance in Charnley classification, no ITT analysis	High risk
ITT=intention to treat; PP=per protocol; NA=not applicable				

* Statement, description or quote supporting the judgment
** Low risk of bias, high risk of bias, or unclear risk of bias

Summary assessment of the risk of bias for an outcome within a study across domains

Outcome measure	Summary risk of bias across all domains within a study
Subjective (list of outcomes): Harris Hip score	Unclear risk of bias
Objective (list of outcomes): revision, implant survival, cup migration	Low risk of bias

Guide for assessing summary risk of bias for an outcome within a study across domains

Risk of bias across key domains	Interpretation	Summary risk of bias
Low risk of bias for all key domains	Plausible bias unlikely to seriously alter the results	Low risk of bias
Unclear risk of bias for at least two key domains	Plausible bias that raises some doubt about the results	Unclear risk of bias
High risk of bias for at least two key domains	Plausible bias that seriously weakens confidence in the results	High risk of bias

Key (most important) domains: selection bias, performance bias, and detection bias

3.2. Quality assessment of included SRs: THR 1 vs. THR 2 studies (n=5)

Cup fixation

Quality assessment criteria for systematic reviews: The AMSTAR tool for assessing methodological quality of systematic reviews

Name of first reviewer: Alexander Tsertsvadze
Name of second reviewer: Paul Sutcliffe
First author surname year of publication: Voigt 2012[134]

1. Was an 'a priori' design provided?
The research question and inclusion criteria should be established before the conduct of the review.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

2. Was there duplicate study selection and data extraction?
There should be at least two independent data extractors and a consensus procedure for disagreements should be in place.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

3. Was a comprehensive literature search performed?
At least two electronic sources should be searched. The report must include years and databases used (e.g. Central, EMBASE, and MEDLINE). Key words and/or MESH terms must be stated and where feasible the search strategy should be provided. All searches should be supplemented by consulting current contents, reviews, textbooks, specialized registers, or experts in the particular field of study, and by reviewing the references in the studies found.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?
The authors should state that they searched for reports regardless of their publication type. The authors should state whether or not they excluded any reports (from the systematic review), based on their publication status, language etc.

☐ Yes ☐ No ☒ Can't answer ☐ Not applicable

5. Was a list of studies (included and excluded) provided?
A list of included and excluded studies should be provided.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

6. Were the characteristics of the included studies provided?
In an aggregated form such as a table, data from the original studies should be provided on the participants, interventions and outcomes. The ranges of characteristics in all the studies analyzed e.g. age, race, sex, relevant socioeconomic data, disease status, duration, severity, or other diseases should be reported.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

7. Was the scientific quality of the included studies assessed and documented?

ESSENTIAL APPENDICES FOR ASSESSMENT REPORT
NIHR HTA Programme project number 11/118

'A priori' methods of assessment should be provided (e.g., for effectiveness studies if the author(s) chose to include only randomized, double-blind, placebo controlled studies, or allocation concealment as inclusion criteria); for other types of studies alternative items will be relevant.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

8. Was the scientific quality of the included studies used appropriately in formulating conclusions?
The results of the methodological rigor and scientific quality should be considered in the analysis and the conclusions of the review, and explicitly stated in formulating recommendations.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

9. Were the methods used to combine the findings of studies appropriate?
For the pooled results, a test should be done to ensure the studies were combinable, to assess their homogeneity (i.e. Chi-squared test for homogeneity, I^2). If heterogeneity exists a random effects model should be used and/or the clinical appropriateness of combining should be taken into consideration (i.e. is it sensible to combine?).

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

10. Was the likelihood of publication bias assessed?
An assessment of publication bias should include a combination of graphical aids (e.g., funnel plot, other available tests) and/or statistical tests (e.g., Egger regression test).

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

11. Was the conflict of interest stated?
Potential sources of support should be clearly acknowledged in both the systematic review and the included studies.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

OVERALL RATING (tick one box):

☒ **High quality**

☐ **Medium quality**

☐ **Low quality**

Rating (by criteria fulfilled, i.e. 'yes' response): 9 to 11 high quality; 5 to 8 medium quality; 0 to 4 low quality

ESSENTIAL APPENDICES FOR ASSESSMENT REPORT

NIHR HTA Programme project number 11/118

Name of first reviewer: Paul Sutcliffe
Name of second reviewer: Alexander Tsertsvadze
First author surname year of publication: Pakvis 2011[135]

1. Was an 'a priori' design provided?
The research question and inclusion criteria should be established before the conduct of the review.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

2. Was there duplicate study selection and data extraction?
There should be at least two independent data extractors and a consensus procedure for disagreements should be in place.

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

3. Was a comprehensive literature search performed?
At least two electronic sources should be searched. The report must include years and databases used (e.g. Central, EMBASE, and MEDLINE). Key words and/or MESH terms must be stated and where feasible the search strategy should be provided. All searches should be supplemented by consulting current contents, reviews, textbooks, specialized registers, or experts in the particular field of study, and by reviewing the references in the studies found.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?
The authors should state that they searched for reports regardless of their publication type. The authors should state whether or not they excluded any reports (from the systematic review), based on their publication status, language etc.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

5. Was a list of studies (included and excluded) provided?
A list of included and excluded studies should be provided.

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

6. Were the characteristics of the included studies provided?
In an aggregated form such as a table, data from the original studies should be provided on the participants, interventions and outcomes. The ranges of characteristics in all the studies analyzed e.g. age, race, sex, relevant socioeconomic data, disease status, duration, severity, or other diseases should be reported.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

7. Was the scientific quality of the included studies assessed and documented?
'A priori' methods of assessment should be provided (e.g., for effectiveness studies if the author(s) chose to include only randomized, double-blind, placebo controlled studies, or allocation concealment as inclusion criteria); for other types of studies alternative items will be relevant.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

8. Was the scientific quality of the included studies used appropriately in formulating conclusions?
The results of the methodological rigor and scientific quality should be considered in the analysis and the conclusions of the review, and explicitly stated in formulating recommendations.

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

9. Were the methods used to combine the findings of studies appropriate?
For the pooled results, a test should be done to ensure the studies were combinable, to assess their homogeneity (i.e. Chi-squared test for homogeneity, I^2). If heterogeneity exists a random effects model should be used and/or the clinical appropriateness of combining should be taken into consideration (i.e. is it sensible to combine?).

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

10. Was the likelihood of publication bias assessed?
An assessment of publication bias should include a combination of graphical aids (e.g., funnel plot, other available tests) and/or statistical tests (e.g., Egger regression test).

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

11. Was the conflict of interest stated?
Potential sources of support should be clearly acknowledged in both the systematic review and the included studies.

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

OVERALL RATING (tick one box):

☐ **High quality**

☒ **Medium quality**

☐ **Low quality**

Rating (by criteria fulfilled, i.e. 'yes' response): 9 to 11 high quality; 5 to 8 medium quality; 0 to 4 low quality

ESSENTIAL APPENDICES FOR ASSESSMENT REPORT

NIHR HTA Programme project number 11/118

Name of first reviewer: Paul Sutcliffe
Name of second reviewer: Alexander Tsertsvadze
First author surname year of publication: Clement 2012[136]

1. Was an 'a priori' design provided?
The research question and inclusion criteria should be established before the conduct of the review.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

2. Was there duplicate study selection and data extraction?
There should be at least two independent data extractors and a consensus procedure for disagreements should be in place.

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

3. Was a comprehensive literature search performed?
At least two electronic sources should be searched. The report must include years and databases used (e.g. Central, EMBASE, and MEDLINE). Key words and/or MESH terms must be stated and where feasible the search strategy should be provided. All searches should be supplemented by consulting current contents, reviews, textbooks, specialized registers, or experts in the particular field of study, and by reviewing the references in the studies found.

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?
The authors should state that they searched for reports regardless of their publication type. The authors should state whether or not they excluded any reports (from the systematic review), based on their publication status, language etc.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

5. Was a list of studies (included and excluded) provided?
A list of included and excluded studies should be provided.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

6. Were the characteristics of the included studies provided?
In an aggregated form such as a table, data from the original studies should be provided on the participants, interventions and outcomes. The ranges of characteristics in all the studies analyzed e.g. age, race, sex, relevant socioeconomic data, disease status, duration, severity, or other diseases should be reported.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

7. Was the scientific quality of the included studies assessed and documented?
'A priori' methods of assessment should be provided (e.g., for effectiveness studies if the author(s) chose to include only randomized, double-blind, placebo controlled studies, or allocation concealment as inclusion criteria); for other types of studies alternative items will be relevant.

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

8. Was the scientific quality of the included studies used appropriately in formulating conclusions?
The results of the methodological rigor and scientific quality should be considered in the analysis and the conclusions of the review, and explicitly stated in formulating recommendations.

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

9. Were the methods used to combine the findings of studies appropriate?
For the pooled results, a test should be done to ensure the studies were combinable, to assess their homogeneity (i.e. Chi-squared test for homogeneity, I^2). If heterogeneity exists a random effects model should be used and/or the clinical appropriateness of combining should be taken into consideration (i.e. is it sensible to combine?).

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

10. Was the likelihood of publication bias assessed?
An assessment of publication bias should include a combination of graphical aids (e.g., funnel plot, other available tests) and/or statistical tests (e.g., Egger regression test).

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

11. Was the conflict of interest stated?
Potential sources of support should be clearly acknowledged in both the systematic review and the included studies.

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

OVERALL RATING (tick one box):

☐ **High quality**

☐ **Medium quality**

☒ **Low quality**

Rating (by criteria fulfilled, i.e. 'yes' response): 9 to 11 high quality; 5 to 8 medium quality; 0 to 4 low quality

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Femoral head bearing-on-cup liner bearing

Name of first reviewer: Alexander Tsertsvadze
Name of second reviewer: Paul Sutcliffe
First author surname year of publication: Sedrakyan 2011[137]

1. Was an 'a priori' design provided?
The research question and inclusion criteria should be established before the conduct of the review.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

2. Was there duplicate study selection and data extraction?
There should be at least two independent data extractors and a consensus procedure for disagreements should be in place.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

3. Was a comprehensive literature search performed?
At least two electronic sources should be searched. The report must include years and databases used (e.g. Central, EMBASE, and MEDLINE). Key words and/or MESH terms must be stated and where feasible the search strategy should be provided. All searches should be supplemented by consulting current contents, reviews, textbooks, specialized registers, or experts in the particular field of study, and by reviewing the references in the studies found.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?
The authors should state that they searched for reports regardless of their publication type. The authors should state whether or not they excluded any reports (from the systematic review), based on their publication status, language etc.

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

5. Was a list of studies (included and excluded) provided?
A list of included and excluded studies should be provided.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

6. Were the characteristics of the included studies provided?
In an aggregated form such as a table, data from the original studies should be provided on the participants, interventions and outcomes. The ranges of characteristics in all the studies analyzed e.g. age, race, sex, relevant socioeconomic data, disease status, duration, severity, or other diseases should be reported.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

7. Was the scientific quality of the included studies assessed and documented?
'A priori' methods of assessment should be provided (e.g., for effectiveness studies if the author(s) chose to include only randomized, double-blind, placebo controlled studies, or allocation concealment as inclusion criteria); for other types of studies alternative items will be relevant.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

8. Was the scientific quality of the included studies used appropriately in formulating conclusions?

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The results of the methodological rigor and scientific quality should be considered in the analysis and the conclusions of the review, and explicitly stated in formulating recommendations.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

9. Were the methods used to combine the findings of studies appropriate?
For the pooled results, a test should be done to ensure the studies were combinable, to assess their homogeneity (i.e. Chi-squared test for homogeneity, I^2). If heterogeneity exists a random effects model should be used and/or the clinical appropriateness of combining should be taken into consideration (i.e. is it sensible to combine?).

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

10. Was the likelihood of publication bias assessed?
An assessment of publication bias should include a combination of graphical aids (e.g., funnel plot, other available tests) and/or statistical tests (e.g., Egger regression test).

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

11. Was the conflict of interest stated?
Potential sources of support should be clearly acknowledged in both the systematic review and the included studies.

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

OVERALL RATING (tick one box):

☒ **High quality**

☐ **Medium quality**

☐ **Low quality**

Rating (by criteria fulfilled, i.e. 'yes' response): 9 to 11 high quality; 5 to 8 medium quality; 0 to 4 low quality

ESSENTIAL APPENDICES FOR ASSESSMENT REPORT

NIHR HTA Programme project number 11/118

Name of first reviewer: Alexander Tsertsvadze
Name of second reviewer: Paul Sutcliffe
First author surname year of publication: Yoshitomi 2009[138]

1. Was an 'a priori' design provided?
The research question and inclusion criteria should be established before the conduct of the review.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

2. Was there duplicate study selection and data extraction?
There should be at least two independent data extractors and a consensus procedure for disagreements should be in place.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

3. Was a comprehensive literature search performed?
At least two electronic sources should be searched. The report must include years and databases used (e.g. Central, EMBASE, and MEDLINE). Key words and/or MESH terms must be stated and where feasible the search strategy should be provided. All searches should be supplemented by consulting current contents, reviews, textbooks, specialized registers, or experts in the particular field of study, and by reviewing the references in the studies found.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?
The authors should state that they searched for reports regardless of their publication type. The authors should state whether or not they excluded any reports (from the systematic review), based on their publication status, language etc.

☐ Yes ☐ No ☒ Can't answer ☐ Not applicable

5. Was a list of studies (included and excluded) provided?
A list of included and excluded studies should be provided.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

6. Were the characteristics of the included studies provided?
In an aggregated form such as a table, data from the original studies should be provided on the participants, interventions and outcomes. The ranges of characteristics in all the studies analyzed e.g. age, race, sex, relevant socioeconomic data, disease status, duration, severity, or other diseases should be reported.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

7. Was the scientific quality of the included studies assessed and documented?
'A priori' methods of assessment should be provided (e.g., for effectiveness studies if the author(s) chose to include only randomized, double-blind, placebo controlled studies, or allocation concealment as inclusion criteria); for other types of studies alternative items will be relevant.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

8. Was the scientific quality of the included studies used appropriately in formulating conclusions?
The results of the methodological rigor and scientific quality should be considered in the analysis and the conclusions of the review, and explicitly stated in formulating recommendations.

☐ Yes ☐ No ☐ Can't answer ☒ Not applicable

9. Were the methods used to combine the findings of studies appropriate?
For the pooled results, a test should be done to ensure the studies were combinable, to assess their homogeneity (i.e. Chi-squared test for homogeneity, I^2). If heterogeneity exists a random effects model should be used and/or the clinical appropriateness of combining should be taken into consideration (i.e. is it sensible to combine?).

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

10. Was the likelihood of publication bias assessed?
An assessment of publication bias should include a combination of graphical aids (e.g., funnel plot, other available tests) and/or statistical tests (e.g., Egger regression test).

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

11. Was the conflict of interest stated?
Potential sources of support should be clearly acknowledged in both the systematic review and the included studies.

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

OVERALL RATING (tick one box):

☐ **High quality**

☒ **Medium quality**

☐ **Low quality**

Rating (by criteria fulfilled, i.e. 'yes' response): 9 to 11 high quality; 5 to 8 medium quality; 0 to 4 low quality

3.3. Quality assessment of hip resurfacing RCTs: THR vs. Resurfacing studies (n=3)

Cochrane Collaboration's tool for assessing risk of bias for a randomized controlled trial (adapted from Higgins et al. 2011) (BMJ 2011;343:d5928 doi: 10.1136/bmj.d5928)

Name of first reviewer: Paul Sutcliffe
Name of second reviewer: Alexander Tsertsvadze
First author surname year of publication: Costa 2012[127] Achten 2010[104]

Bias domain	Source of bias		Support for judgment*	Authors' judgment**
Selection bias	Random sequence generation		Computer generated random numbers and stratified by the supervising orthopaedic surgeon to balance any potential surgeon effects	Low risk of bias
	Allocation concealment		Investigators blinded to the sequence of allocation	Low risk of bias
Performance bias	Blinding of participants and Personnel	Subjective (e.g., patient-reported)	Patients/personnel were aware of the allocated treatment and likely to influence hip function and quality of life assessments	High risk of bias
		Objective (e.g., mortality, radiography, dislocation)	these outcomes (e.g., dislocation) unlikely to be influenced by the knowledge of the allocation group	Low risk of bias
Detection bias	Blinding of outcome assessors	Subjective (e.g., patient-reported)	Assessors were unaware of the treatment allocation	Low risk of bias
		Objective (e.g., mortality, radiography, dislocation)	Assessors were unaware of the treatment allocation	Low risk of bias
Attrition bias	Incomplete outcome data	Subjective outcomes (e.g., patient-reported)	Small attrition rate (<5%)	Low risk of bias
		Objective outcomes (e.g., mortality, radiography, dislocation)	Small attrition rate (<5%)	Low risk of bias
Reporting bias	Selective reporting of the outcome, subgroups, or analysis		All specified outcomes in the protocol were reported in the results section	Low risk of bias
Other bias	Funding source, adequacy of statistical methods used, type of analysis [ITT/PP], baseline imbalance in important characteristics		Research for Patient Benefit scheme of the National Institute of Health Research; ITT used; no baseline imbalance present	Low risk of bias

ITT=intention to treat; PP=per protocol; NA=not applicable

* Statement, description or quote supporting the judgment
** Low risk of bias, high risk of bias, or unclear risk of bias

Summary assessment of the risk of bias for an outcome within a study across domains

Outcome measure	Summary risk of bias across all domains within a study
Subjective (list of outcomes): Harris Hip score Oxford Hip score Disability Rating Index health related quality of life (EQ-5D score)	Low risk of bias
Objective (list of outcomes): Complications (implant dislocation, infection, deep vein thrombosis)	Low risk of bias

ESSENTIAL APPENDICES FOR ASSESSMENT REPORT
NIHR HTA Programme project number 11/118

Name of first reviewer: Alexander Tsertsvadze
Name of second reviewer: Paul Sutcliffe
First author surname year of publication: Garbuz 2010[128]

Bias domain	Source of bias		Support for judgment*	Authors' judgment**
Selection bias	Random sequence generation		Not described	Unclear risk of bias
	Allocation concealment		The assignments were contained in sealed envelopes and were opened the day before surgery by the study coordinator to allow for proper setup in the operating room	Low risk of bias
Performance bias	Blinding of participants and Personnel	Subjective (e.g., patient-reported)	The patients, nurses, and physiotherapists were blinded to their assignment	Low risk of bias
		Objective (e.g., mortality, radiography, dislocation)	NA	NA
Detection bias	Blinding of outcome assessors	Subjective (e.g., patient-reported)	Not described	Unclear risk of bias
		Objective (e.g., mortality, radiography, dislocation)	NA	NA
Attrition bias	Incomplete outcome data	Subjective outcomes (e.g., patient-reported)	8% of incomplete data	Low risk of bias
		Objective outcomes (e.g., mortality, radiography, dislocation)	NA	NA
Reporting bias	Selective reporting of the outcome, subgroups, or analysis		All pre-specified outcomes reported in the Results section	Low risk of bias
Other bias	Funding source, adequacy of statistical methods used, type of analysis [ITT/PP], baseline imbalance in important characteristics		Industry-funded	High risk of bias
ITT=intention to treat; PP=per protocol; NA=not applicable				

* Statement, description or quote supporting the judgment
** Low risk of bias, high risk of bias, or unclear risk of bias

Summary assessment of the risk of bias for an outcome within a study across domains

Outcome measure	Summary risk of bias across all domains within a study
Subjective (list of outcomes): WOMAC, SF-36, and UCLA activity scores	Unclear risk of bias
Objective (list of outcomes): NR	NA

ESSENTIAL APPENDICES FOR ASSESSMENT REPORT
NIHR HTA Programme project number 11/118

Name of the first reviewer: Alexander Tsertsvadze
Name of the second reviewer: Paul Sutcliffe
First author surname year of publication: Vendittoli 2010[129] Vendittoli 2006[130] Girard 2006[131] Rama 2009[132] Vendittoli 2006[133]

Bias domain	Source of bias		Support for judgment*	Authors' judgment**
Selection bias	Random sequence generation		Computer-generated random number table	Low risk of bias
	Allocation concealment		Both surgeons and patients were kept blinded to the randomisation group until the morning of surgery	Low risk of bias
Performance bias	Blinding of participants and Personnel	Subjective (e.g., patient-reported)	Patients and personnel knew the treatment they were getting	High risk of bias
		Objective (e.g., mortality, radiography, dislocation)	The knowledge would not influence the results of the outcomes	Low risk of bias
Detection bias	Blinding of outcome assessors	Subjective (e.g., patient-reported)	Not described	Unclear risk of bias
		Objective (e.g., mortality, radiography, dislocation)	The knowledge would not influence the results of the outcomes	Low risk of bias
Attrition bias	Incomplete outcome data	Subjective outcomes (e.g., patient-reported)	About 30% of incomplete data	High risk of bias
		Objective outcomes (e.g., mortality, radiography, dislocation)	No incomplete data	Low risk of bias
Reporting bias	Selective reporting of the outcome, subgroups, or analysis		All outcomes pre-specified in the Methods section are reported in Results section	Low risk of bias
Other bias	Funding source, adequacy of statistical methods used, type of analysis [ITT/PP], baseline imbalance in important characteristics		No major concern	Low risk of bias
ITT=intention to treat; PP=per protocol; NA=not applicable				

* Statement, description or quote supporting the judgment
** Low risk of bias, high risk of bias, or unclear risk of bias

Summary assessment of the risk of bias for an outcome within a study across domains

Outcome measure	Summary risk of bias across all domains within a study
Subjective (list of outcomes): WOMAC, UCLA, and Merle d'Aubigne scores	Unclear risk of bias
Objective (list of outcomes): revision, infection, implant dislocation, aseptic loosening, and fracture rates	Low risk of bias

3.4. Quality assessment of hip resurfacing included SRs: THR vs. Resurfacing studies (n=3)

Name of first reviewer: Alexander Tsertsvadze
Name of second reviewer: Paul Sutcliffe
First author surname year of publication: Jiang 2011[139]

1. Was an 'a priori' design provided?
The research question and inclusion criteria should be established before the conduct of the review.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

2. Was there duplicate study selection and data extraction?
There should be at least two independent data extractors and a consensus procedure for disagreements should be in place.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

3. Was a comprehensive literature search performed?
At least two electronic sources should be searched. The report must include years and databases used (e.g. Central, EMBASE, and MEDLINE). Key words and/or MESH terms must be stated and where feasible the search strategy should be provided. All searches should be supplemented by consulting current contents, reviews, textbooks, specialized registers, or experts in the particular field of study, and by reviewing the references in the studies found.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?
The authors should state that they searched for reports regardless of their publication type. The authors should state whether or not they excluded any reports (from the systematic review), based on their publication status, language etc.

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

5. Was a list of studies (included and excluded) provided?
A list of included and excluded studies should be provided.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

6. Were the characteristics of the included studies provided?
In an aggregated form such as a table, data from the original studies should be provided on the participants, interventions and outcomes. The ranges of characteristics in all the studies analyzed e.g. age, race, sex, relevant socioeconomic data, disease status, duration, severity, or other diseases should be reported.

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

7. Was the scientific quality of the included studies assessed and documented?
'A priori' methods of assessment should be provided (e.g., for effectiveness studies if the author(s) chose to include only randomized, double-blind, placebo controlled studies, or allocation concealment as inclusion criteria); for other types of studies alternative items will be relevant.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

8. Was the scientific quality of the included studies used appropriately in formulating conclusions?
The results of the methodological rigor and scientific quality should be considered in the analysis and the conclusions of the review, and explicitly stated in formulating recommendations.

☐ Yes ☐ No ☒ Can't answer ☐ Not applicable

9. Were the methods used to combine the findings of studies appropriate?
For the pooled results, a test should be done to ensure the studies were combinable, to assess their homogeneity (i.e. Chi-squared test for homogeneity, I^2). If heterogeneity exists a random effects model should be used and/or the clinical appropriateness of combining should be taken into consideration (i.e. is it sensible to combine?).

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

10. Was the likelihood of publication bias assessed?
An assessment of publication bias should include a combination of graphical aids (e.g., funnel plot, other available tests) and/or statistical tests (e.g., Egger regression test).

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

11. Was the conflict of interest stated?
Potential sources of support should be clearly acknowledged in both the systematic review and the included studies.

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

OVERALL RATING (tick one box):

☐ **High quality**

☒ **Medium quality**

☐ **Low quality**

Rating (by criteria fulfilled, i.e. 'yes' response): 9 to 11 high quality; 5 to 8 medium quality; 0 to 4 low quality

ESSENTIAL APPENDICES FOR ASSESSMENT REPORT
NIHR HTA Programme project number 11/118

Name of first reviewer: Alexander Tsertsvadze
Name of second reviewer: Paul Sutcliffe
First author surname year of publication: Smith 2010[140]

1. Was an 'a priori' design provided?
The research question and inclusion criteria should be established before the conduct of the review.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

2. Was there duplicate study selection and data extraction?
There should be at least two independent data extractors and a consensus procedure for disagreements should be in place.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

3. Was a comprehensive literature search performed?
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☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?
The authors should state that they searched for reports regardless of their publication type. The authors should state whether or not they excluded any reports (from the systematic review), based on their publication status, language etc.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

5. Was a list of studies (included and excluded) provided?
A list of included and excluded studies should be provided.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

6. Were the characteristics of the included studies provided?
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☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

8. Was the scientific quality of the included studies used appropriately in formulating conclusions?
The results of the methodological rigor and scientific quality should be considered in the analysis and the conclusions of the review, and explicitly stated in formulating recommendations.

☐ Yes ☐ No ☒ Can't answer ☐ Not applicable

9. Were the methods used to combine the findings of studies appropriate?
For the pooled results, a test should be done to ensure the studies were combinable, to assess their homogeneity (i.e. Chi-squared test for homogeneity, I^2). If heterogeneity exists a random effects model should be used and/or the clinical appropriateness of combining should be taken into consideration (i.e. is it sensible to combine?).

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10. Was the likelihood of publication bias assessed?
An assessment of publication bias should include a combination of graphical aids (e.g., funnel plot, other available tests) and/or statistical tests (e.g., Egger regression test).

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

11. Was the conflict of interest stated?
Potential sources of support should be clearly acknowledged in both the systematic review and the included studies.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

OVERALL RATING (tick one box):

☒ **High quality**

☐ **Medium quality**

☐ **Low quality**

Rating (by criteria fulfilled, i.e. 'yes' response): 9 to 11 high quality; 5 to 8 medium quality; 0 to 4 low quality

ESSENTIAL APPENDICES FOR ASSESSMENT REPORT
NIHR HTA Programme project number 11/118

Name of first reviewer: Alexander Tsertsvadze
Name of second reviewer: Paul Sutcliffe
First author surname year of publication: Springer 2009[141]

1. Was an 'a priori' design provided?
The research question and inclusion criteria should be established before the conduct of the review.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

2. Was there duplicate study selection and data extraction?
There should be at least two independent data extractors and a consensus procedure for disagreements should be in place.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

3. Was a comprehensive literature search performed?
At least two electronic sources should be searched. The report must include years and databases used (e.g. Central, EMBASE, and MEDLINE). Key words and/or MESH terms must be stated and where feasible the search strategy should be provided. All searches should be supplemented by consulting current contents, reviews, textbooks, specialized registers, or experts in the particular field of study, and by reviewing the references in the studies found.

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?
The authors should state that they searched for reports regardless of their publication type. The authors should state whether or not they excluded any reports (from the systematic review), based on their publication status, language etc.

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

5. Was a list of studies (included and excluded) provided?
A list of included and excluded studies should be provided.

☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

6. Were the characteristics of the included studies provided?
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☒ Yes ☐ No ☐ Can't answer ☐ Not applicable

7. Was the scientific quality of the included studies assessed and documented?
'A priori' methods of assessment should be provided (e.g., for effectiveness studies if the author(s) chose to include only randomized, double-blind, placebo controlled studies, or allocation concealment as inclusion criteria); for other types of studies alternative items will be relevant.

☐ Yes ☐ No ☒ Can't answer ☐ Not applicable

8. Was the scientific quality of the included studies used appropriately in formulating conclusions?
The results of the methodological rigor and scientific quality should be considered in the analysis and the conclusions of the review, and explicitly stated in formulating recommendations.

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

9. Were the methods used to combine the findings of studies appropriate?
For the pooled results, a test should be done to ensure the studies were combinable, to assess their homogeneity (i.e. Chi-squared test for homogeneity, I^2). If heterogeneity exists a random effects model should be used and/or the clinical appropriateness of combining should be taken into consideration (i.e. is it sensible to combine?).

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

10. Was the likelihood of publication bias assessed?
An assessment of publication bias should include a combination of graphical aids (e.g., funnel plot, other available tests) and/or statistical tests (e.g., Egger regression test).

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

11. Was the conflict of interest stated?
Potential sources of support should be clearly acknowledged in both the systematic review and the included studies.

☐ Yes ☒ No ☐ Can't answer ☐ Not applicable

OVERALL RATING (tick one box):

☐ **High quality**

☐ **Medium quality**

☒ **Low quality**

Rating (by criteria fulfilled, i.e. 'yes' response): 9 to 11 high quality; 5 to 8 medium quality; 0 to 4 low quality

4. Study details and patient characteristics of included RCTs and SRs

4.2.Table A. Study details and patient characteristics of included records: RCTs on THR vs THR arthroplasty

Author year Ref ID Country	Study details	Inclusion/ exclusion criteria	Intervention and prostheses used	Patient characteristics		
					THR 1	THR 2
Angadi 2012[109] UK	***Outcome category:*** Cup fixation ***Aim:*** To compare the clinical and radiological results of a cemented all-polyethylene Ultima acetabular component with those of a cementless porous-coated acetabular component (PFC) following total hip replacement (THR) ***Length of follow up:*** up to 14 years [The mean follow-up was 7.52 years (0.4 to 15.0) for patients in Ultima group and 7.87 years (0.5 to 14.0) for those in PFC group]	***Inclusion criteria:*** Candidates for primary THR with osteoarthritis or rheumatoid arthritis who were independently mobile without cognitive impairment ***Exclusion criteria:*** Patients aged < 55 years of age, and those judged to be unsuitable for cementless fixation at surgery at the discretion of the senior operating surgeon, were excluded. Patients with cognitive impairment were excluded	***THR 1:*** Cemented all-polyethylene Ultima acetabular component. The Ultima acetabular component is an ultra-highmolecular- weight polyethylene (UHMWPE) implant with a minimum thickness of 5 mm. It is hemispherical with a circumferential flange ***THR 2:*** Cementless porous-coated acetabular component with a polyethylene liner. The PFC acetabular component is a cobalt-chromium alloy hemispherical shell without holes, which is a porous-coated surface of cobalt–chromium–molybdenum alloy beads with a mean pore size of 290 µm and an UHMWPE liner	***Patients randomised***	183	104
				Age (years) Mean	71.3 (range 55 – 89)	69.8 (range 56 – 89)
				Sex –female n/N (%)	110 (60)	56 (54)
				Weight (kg) Mean (SD)	73.9 (range 43 – 128)	76.1 (range 49 – 124)
				BMI (kg/m^2) Mean (SD)	26.7 (range 13.3 – 41.4)	27.4 (range 18.8 – 44.1)
				Primary osteoarthritis n/N (%)	172/183 (94)	99/104 (95)
				Bilateral osteoarthritis n/N (%)	55/183 (30)	37/104 (36)
				Harris Hip Score Mean (SD)	35.2 (range 9 – 76)	35.7 (range 10 – 70)
				Oxford Hip Score Mean (SD)	NR	NR
Bjorgul	***Outcome category:*** Cup	***Inclusion criteria:***	***THR 1:*** THR using	***Patients randomised***	107	108

Author year Ref ID Country	Study details	Inclusion/ exclusion criteria	Intervention and prostheses used	Patient characteristics		
					THR 1	THR 2
2010[107] Bjorgul 2010[108] Norway	fixation ***Aim:*** To compare the effects of cemented (Charnley) and uncemented (Duraloc) cups on long term follow up for radiographic and clinical outcomes ***Length of follow up:*** 10-14 years	Patients aged 75 years or younger with osteoarthritis (OA), posttraumatic arthritis, psoriatic arthritis, gout, rheumatoid arthritis (RA), juvenile rheumatoid arthritis, and systemic lupus erythematosus ***Exclusion criteria:*** Previous prosthetic replacement was a contraindication to participation, but not osteotomies and internal fixations	cemented (Charnley) cup Cement containing gentamycin and a Charnley stem (DePuy) with 22.225 mm head diameter ***THR 2:*** THR using uncemented (Duraloc) cup. Duraloc 1200 cup (DePuy); hemispherical modular cup consisting of a titanium shell with a porous-coated surface	***Age (years) Mean***	65 (95% CI 64, 66)	66 (95% CI 65, 67)
				Sex –female n/N (%)	81/107 (76.0)	76/108 (71.0)
				Weight (kg) Mean (SD)	NR	NR
				BMI (kg/m^2) Mean (SD)	27 (95% CI 27, 28)	27 (95% CI 26, 27)
				Primary osteoarthritis n/N (%)	93/107 (87.0)	94/108 (87.0)
				Bilateral osteoarthritis n/N (%)	13/107 (12.1)	12/108 (11.1)
				Harris Hip Score Mean (SD)	47 (95% CI 45, 50)	49 (95% CI 47, 52)
				Oxford Hip Score Mean (SD)	NR	NR
McCalden 2009[238] Canada	***Outcome category:*** Cup liner bearing surface ***Aim:*** To report the clinical and radiographic results, after a minimum of five years of follow-up, of a randomized, blinded, controlled trial comparing a	***Inclusion criteria:*** A patient had to have degenerative arthritis of one hip requiring total hip arthroplasty, a designation of A or B according to the Charnley hip classification, and an age between 40 and 79	***THR 1:*** Highly cross-linked PE acetabular cup liners. The highly cross-linked polyethylene liners, calcium-stearate-free GUR 1050 resin was also utilized to create compression-molded sheets, which were then	***Patients randomised***	50	50
				Age (years) Mean	72.31 (56-79)	72.58 (56-79)
				Sex –female n/N (%)	33 (66%)	36 (72%)
				Weight (kg) Mean (SD)	NR	NR
				BMI (kg/m^2) Mean (SD)	29.7 (22-39)	29.71 (18-48)
				Primary osteoarthritis n/N (%)	NR	NR
				Bilateral osteoarthritis n/N (%)	NR	NR
				Harris Hip Score Mean (SD)	38.96 (11.35)	35.64 (12.97)

Author year Ref ID Country	Study details	Inclusion/ exclusion criteria	Intervention and prostheses used	Patient characteristics		
					THR 1	THR 2
	conventional polyethylene (PE) with a first-generation highly cross-linked PE ***Length of follow up:*** mean of 6.8 years	years ***Exclusion criteria:*** Preexisting bone disease (such as severe osteoporosis or osteomalacia), systemic conditions affecting bone density (such as inflammatory arthritis or renal disease), and a contralateral revision or poorly functioning THR	machined into the final implant geometry ***THR 2:*** Conventional PE acetabular cup liners. Conventional polyethylene liners used in this study were made of calciumstearate- free GUR 1050 resin machined from compressionmolded sheet polyethylene. The final implant was then sterilized with gamma radiation (25 kGy) in an inert nitrogen environment	***Oxford Hip Score Mean (SD)***	NR	NR
Engh 2012[110] Engh 2006[111] US	***Outcome category:*** Cup liner bearing surface ***Aim:*** To compare the clinical outcome of THA patients randomized to either cross-linked or conventional non–cross-linked PE cup liners	***Inclusion criteria:*** NR ***Exclusion criteria:*** NR	***THR 1:*** Cross-linked PE cup liners (Marathon). Patients were implanted a Duraloc 100 (DePuy) cup incorporating a 4-mm lateralized liner, The polyethylene liner was secured in the Duraloc shell by a	***Patients randomised***	111	109
				Age (years) Mean	62.5 (10.6)	62.0 (11.1)
				Sex –female n/N (%)	65/111 (58.0)	57/109 (52.3)
				Weight (kg) Mean (SD)	84.3 (21.3)	81.6 (18.1)
				BMI (kg/m^2) Mean (SD)	28.6 (5.5)	27.9 (5.1)
				Primary osteoarthritis n/N (%)	99/111 (89.1)	90/109 (82.5)
				Bilateral osteoarthritis n/N (%)	NR	NR
				Harris Hip Score Mean (SD)	88.0 (14.0)	86.0 (15.0)

Author year Ref ID Country	Study details	Inclusion/ exclusion criteria	Intervention and prostheses used	Patient characteristics			
					THR 1	THR 2	
	Length of follow up: 10 years		peripheral locking ring that engaged a groove machined into the liner and shell ***THR 2:*** Non-cross linked (conventional) PE cup liners (Enduron)	***Oxford Hip Score Mean (SD)***	NR	NR	
Capello 2008[112] D'Antonio 2005[113] D'Antonio 2003[114] Mesko 2011[115] US	***Outcome category:*** Cup shell design ***Aim:*** To compare clinical and radiography outcomes between patients receiving total hip replacement (THR) with ceramic-on-ceramic bearings vs. metal-on-polyethylene (PE) bearings; to compare the results between two groups of patients receiving THRs with ceramic-on-	***Inclusion criteria:*** patients aged 21-75 years, not morbidly obese, clinically qualified for THA, diagnosis of osteoarthritis, traumatic arthritis, avascular necrosis, slipped capital epiphysis, pelvic fracture, femoral fracture, failed fracture, fixation, or diastrophic variant, absence of active infection in the	***THR 1:*** THR with ceramic-on-ceramic bearings (titanium porous-coated shell) – System I ***THR 1:*** THR with ceramic-on-ceramic bearings (titanium arc-deposited HA-coated shell) – System II ***THR 1:*** THR with metal-on-polyethylene bearings (titanium porous-coated shell) – System III		***THR 1:***	***THR 2:***	***THR 3:***
				Patients randomised	113	109	106
				Age (years) Mean	53 (11.4)	54 (10.7)	55 (10.7)
				Sex –female n/N (%)	41/113 (35.0)	41/109 (37.0)	42/106 (39.0)
				Weight (kg) Mean (SD)	85.0 (17.9)	87.8 (17.3)	85.9 (17.7)
				BMI (kg/m^2) Mean (SD)	NR	NR	NR
				Primary osteoarthritis n/N (%)	95/113 (84.0)	86/109 (79.0)	81/106 (77.0)
				Bilateral osteoarthritis n/N (%)	NR	NR	NR
				Harris Hip Score Mean (SD)	NR	NR	NR

Author year Ref ID Country	Study details	Inclusion/ exclusion criteria	Intervention and prostheses used	Patient characteristics			
					THR 1		THR 2
	ceramic bearings but with different cup design (porous-coated shell vs. arc-deposited HA-coated shell) ***Length of follow up:*** 10 years	affected hip or no previous THA, no psychiatric disorder, senile dementia, Alzheimer's disease, presence of alcohol, or substance abuse, no neuromuscular or neurosensory deficiency, no systemic disorder, was not immunologically suppressed, nor was receiving steroids in excess of physiologic dose requirements; was skeletally mature, was not pregnant; and had no plans to relocate to another geographic area before completion of the study ***Exclusion criteria:*** See above	***THR 4:*** This arm was added later and was not randomised arm; therefore not extracted – System IV	***Oxford Hip Score Mean (SD)***	NR	NR	NR
Corten 2011[116] Laupacis 2002[117] Bourne 2010[118] Corten	***Outcome category:*** Cup/stem fixation and Femoral head bearing-on-cup liner bearing ***Aim:*** To compare the effects of cemented cup/stem (Mallory-	***Inclusion criteria:*** Osteoarthritis of the hip and undergoing a unilateral primary arthroplasty ***Exclusion criteria:*** Patient's age > 75 years,	***THR 1:*** THR using cemented femoral and cemented acetabular components. All patients were operated on by either surgeon with use of an identical	***Patients randomised***	124		126
				Age (years) Mean	64 (8.0)		64 (7.0)
				Sex –female n/N (%)	60/124 (48)		60/126 (46)
				Weight (kg) Mean (SD)	NR		NR
				BMI (kg/m^2) Mean (SD)	NR		NR
				Primary osteoarthritis n/N (%)	NR		NR

Author year Ref ID Country	Study details	Inclusion/ exclusion criteria	Intervention and prostheses used	Patient characteristics		
					THR 1	THR 2
2011[119] Canada	head) and uncemented cup/stem (Mallory-head) prosthesis on long term follow up for mortality, revision, time to revision, health – related quality of life, and radiography signs ***Length of follow up:*** 20 years	severe, symptomatic osteoarthritis of either knee or the contralateral hip, a previous arthroplasty of the ipsilateral hip, arthroplasty on the contralateral side more than five years before the most recent arthroplasty, or had had infectious arthritis	direct lateral approach and within a vertical laminar airflow enclosure in which the surgical team wore bodyexhaust suits ***THR 2:*** THR using uncemented femoral and uncemented acetabular components. The prosthesis (Mallory-Head; Biomet, Warsaw, Indiana), was made from a titanium alloy. The implant was a tapered design with a 3° taper and the proximal one-third was plasma-sprayed	***Bilateral osteoarthritis n/N (%)***	0/124 (0.0)	0/126 (0.0)
				Harris Hip Score Mean (SD)	44 (11.0)	43 (10.0)
				Oxford Hip Score Mean (SD)	NR	NR
Howie 2012[120] Australia	***Outcome category:*** Femoral head size ***Aim:*** To compare the incidence of dislocation at one year after total hip arthroplasty between two groups of patients who had received 36-mm and 28-mm femoral head articulations ***Length of follow up:*** 1	***Inclusion criteria:*** Patients aged 60 years or older with osteoarthritis and rheumatoid arthritis referred for THR ***Exclusion criteria:*** Patients younger than 60 years with diagnoses other than osteoarthritis, rheumatoid arthritis, inflammatory arthritis,	***THR 1:*** 36 mm femoral head. All arthroplasties were performed with use of uncemented acetabular components, which comprised a cluster three-holed acetabular shell (Trilogy) fixed with one or two screws and a 10° elevated 36 or	***Patients randomised***	273	284
				Age (years) Mean	72.3 (95% CI: 71.5, 73.0)	72.3 (95% CI: 71.6, 73.1)
				Sex –female n/N (%)	152/273 (56.0)	175/284 (61.3)
				Weight (kg) Mean (SD)	NR	NR
				BMI (kg/m^2) Mean (SD)	28.0 (95% CI: 27.4, 28.7)	28.4 (95% CI: 27.8, 29.0)
				Primary osteoarthritis n/N (%)	96.3 (95% CI: 94.1, 98.6)	95.4 (95% CI: 93.0, 97.9)
				Bilateral osteoarthritis n/N (%)	0	0
				Harris Hip Score Mean (SD)	NR	NR

Author year Ref ID Country	Study details	Inclusion/ exclusion criteria	Intervention and prostheses used	Patient characteristics		
					THR 1	THR 2
	year	or previous fracture/dislocation/surgery involving the hip, abnormal acetabulum, neuromuscular disorder affecting hip, tumour of the hip, unable to provide consent, unable to complete follow-up	28-mm-inner-diameter highly cross-linked polyethylene liner (Longevity). A cemented femoral stem was used for all arthroplasties (CPT). During the trial, the taper of the CPT femoral stem was changed from a 6° taper to a 12/14 taper by the manufacturer ***THR 2:*** 28 mm femoral head. See above	***Oxford Hip Score Mean (SD)***	NR	NR
Lewis 2008[121] Canada	***Outcome category:*** Femoral head bearing ***Aim:*** To compare clinical outcomes in patients who received total hip replacement (THR) with oxinium vs. Cobalt chrome femoral heads ***Length of follow up:*** 2 years	***Inclusion criteria:*** NR ***Exclusion criteria:*** NR	***THR 1:*** THR with Oxinium femoral heads. 46 patients received an Echelon stem, the remaining 4 received a Synergy stem. The acetabular components were press fit, uncemented	***Patients randomised***	50	50
				Age (years) Mean	51 (10.8)	51 (11.0)
				Sex –female n/N (%)	24/50 (48.0)	24/50 (48.0)
				Weight (kg) Mean (SD)	NR	NR
				BMI (kg/m^2) Mean (SD)	NR	NR
				Primary osteoarthritis n/N (%)	NR	NR
				Bilateral osteoarthritis n/N (%)	NR	NR
				Harris Hip Score Mean (SD)	NR	NR

Author year Ref ID Country	Study details	Inclusion/ exclusion criteria	Intervention and prostheses used	Patient characteristics		
					THR 1	THR 2
			Reflection cups paired with either standard polyethylene (22 cases) or highly crosslinked polyethylene (28 cases) ***THR 2:*** THR with Cobalt chrome femoral heads. Thirty patients received an Echelon stem whereas the remaining 20 patients received a Synergy stem. The acetabular components were press fit. Uncemented Reflection cups paired with eitlicr standard polyethylene (31 eases) or highly cross-linked polyethylene (19 cases)	***Oxford Hip Score Mean (SD)***	NR	NR
Amanatullah 2011[122] USA	***Outcome category:*** Femoral head bearing-on-cup liner bearing ***Aim:*** To compare the clinical performance and evaluate the wear rate of ceramic-on-ceramic vs. ceramic-on-polyethylene (PE) bearing surfaces ***Length of follow up:*** >5	***Inclusion criteria:*** Patients were included if clinically indicated for a THA as a result of osteoarthritis or rheumatoid arthritis and were 21 to 80 years of age with a Harris Hip Score (HHS) <=60, availability for => 2 years of clinical follow-	***THR 1:*** Ceramic-on-ceramic. Each ceramic-ceramic articulation was implanted with a 28- or 32-mm alumina ceramic femoral head and an alumina ceramic acetabular cup liner ***THR 2:*** Ceramic-on-polyethylene. Alumina	***Patients randomised***	166 patients (196 hips)	146 patients (161 hips)
				Age (years) Mean	50.4 (12.8)	54.7 (12.9)
				Sex –female n/N (%)	60 (36.1)	62 (42.5)
				Weight (kg) Mean (SD)	86.9 (20.0)	83.7 (18.5)
				BMI (kg/m^2) Mean (SD)	29.6 (12.4)	28.0 (5.1)
				Primary osteoarthritis n/N (%)	NR	NR
				Bilateral osteoarthritis n/N (%)	NR	NR
				Harris Hip Score Mean (SD)	NR	NR

Author year Ref ID Country	Study details	Inclusion/ exclusion criteria	Intervention and prostheses used	Patient characteristics					
						THR 1		THR 2	
	years	up, ability to meet acceptable preoperative medical clearance, and without the presence or history of treatment for cardiac, pulmonary, hematologic, or any other medical condition that would pose excessive operative risk ***Exclusion criteria:*** NR	ceramic components were also sterilized with ethylene oxide gas. Metal components were sterilized with a minimum of 25 kGy of gamma irradiation	***Oxford Hip Score Mean (SD)***		NR		NR	
Kadar 2011[123] Norway	***Outcome category:*** Femoral head bearing-on-cup liner bearing ***Aim:*** To evaluate wear and migration patterns between cemented highly cross-linked Reflection All-Poly (XLPE) cup and All-Poly cup articulated with either Oxinium or cobalt chrome (CoCr) femoral heads compared to the Charnley Ogee prostheses ***Length of follow up:*** 2 years	***Inclusion criteria:*** Primary or secondary osteoarthritis of the hip ***Exclusion criteria:*** BMI > 35, incompensated cardio-pulmonary disease, malignant disease, dementia, rheumatoid arthritis, or other serious systemic diseases	***THR 1:*** Charnley Ogee prostheses. Charnley monoblock stainless steel femoral stem with a 22.2 mm head articulated with a cemented Charnley Ogee UHMWPE (GUR 1050) acetabular cup that was g-sterilized with 2.5 Mrad in nitrogen ***THR 2:*** Cobalt chrome-on-polyethylene (PE) articulation. Spectron EF femoral stem with a 28 mm CoCr femoral head and	***Patients randomised***	***THR 1: 30***	***THR 2: 30***	***THR 3: 30***	***THR 4: 30***	***THR 5: 30***
				Age (years) Mean	70 (6.1)	69 (5.9)	69 (6.7)	70 (5.3)	70 (5.4)
				Sex –female n/N (%)	20/30 (66.6)	20/30 (66.6)	23/30 (76.6)	20/30 (66.6)	22/30 (73.3)
				Weight (kg) Mean (SD)	76 (14.9)	76 (11.1)	72 (13.9)	80 (14.8)	76 (14.6)
				BMI (kg/m^2) Mean (SD)	NR	NR	NR	NR	NR
				Primary osteoarthritis n/N (%)	28/30 (93.3)	26/30 (86.6)	26/30 (86.6)	22/30 (73.3)	27/30 (90.0)
				Bilateral osteoarthritis n/N (%)	NR	NR	NR	NR	NR

Author year Ref ID Country	Study details	Inclusion/ exclusion criteria	Intervention and prostheses used	Patient characteristics					
						THR 1		THR 2	
			a Reflection All-Poly UHMWPE (GUR 1050) cup that was sterilized	***Harris Hip Score Mean (SD)***	45 (NR)	41 (NR)	47 (NR)	47 (NR)	40 (NR)

Author year Ref ID Country	Study details	Inclusion/ exclusion criteria	Intervention and prostheses used	Patient characteristics					
						THR 1		THR 2	
			by EtO ***THR 3:*** Oxinium-on-polyethylene (PE) articulation. Spectron EF femoral stem with a 28 mm Oxinium femoral head and a Reflection All-Poly UHMWPE (GUR 1050) cup that was sterilized by EtO ***THR 4:*** Cobalt chrome-on-HXLPE articulation. Spectron EF femoral stem with a 28 mm CoCr femoral head and a Reflection All-Poly XLPE (GUR 1050) cup irradiated with 10 Mrad, melted at 1358C, and EtO sterilized ***THR 5:*** Oxinium-on-HXLPE articulation. Spectron EF femoral stem with a 28 mm Oxinium femoral head and a Reflection All-Poly XLPE (GUR 1050) cup irradiated with 10 Mrad, melted at 1358C, and EtO sterilized	***Oxford Hip Score Mean (SD)***	NR	NR	NR	NR	NR

Author year Ref ID Country	Study details	Inclusion/ exclusion criteria	Intervention and prostheses used	Patient characteristics		
					THR 1	**THR 2**
Healy 2009[124] US	***Outcome category:*** Stem composition ***Aim:*** To compare the effects of Cobalt chrome vs. Titanium femoral stems in terms of post-total hip replacement (THP) clinical and radiographic measures ***Length of follow up:*** 4.7 (2.0-8.9) years	***Inclusion criteria:*** NR ***Exclusion criteria:*** NR	***THR 1:*** THR with cobalt chromium femoral stem. Trilock femoral stem made of cobalt-chrome or titanium in 11 sizes is a straight, collarless, modular, cementless, porous-coated femoral implant with a flat, tapered, wedge design of the intraosseous body of the stem ***THR 2:*** THR with titanium femoral stem. See full data extraction sheet for more details	***Patients randomised***	199	191
				Age (years) Mean	66 (range: 25-100)	64 (range: 35-102)
				Sex –female n/N (%)	96/199 (48.2)	92/191 (48.1)
				Weight (kg) Mean (SD)	81.7 (range: 44.9-136.0)	81.7 (range: 36.3-149.6)
				BMI (kg/m^2) Mean (SD)	NR	NR
				Primary osteoarthritis n/N (%)	182/199 (91.4)	168/191 (88.0)
				Bilateral osteoarthritis n/N (%)	33/199 (16.6)	24/191 (12.6)
				Harris Hip Score Mean (SD)	50.3 (range: 16.2-70.7)	50.8 (range: 23.4-75.4)
				Oxford Hip Score Mean (SD)	NR	NR
Kim 2011[125] South Korea	***Outcome category:*** Stem design ***Aim:*** Comparing a short metaphyseal-fitting femoral stem to conventional metaphyseal- and diaphyseal-filling stem with respect to post-operative clinical and	***Inclusion criteria:*** NR ***Exclusion criteria:*** Severe osteoporosis of the proximal femur	***THR 1:*** Short anatomical metaphyseal-fitting cementless stem (Proxima). Cementless Pinnacle acetabular component made of titanium alloy, Proxima stem, and 28-mm-internal-diameter	***Patients randomised***	50	50
				Age (years) Mean	54.3 (12.97)	51.8 (12.3)
				Sex –female n/N (%)	28/50 (56)	26/50 (52)
				Weight (kg) Mean (SD)	66.5 (9.51)	64.8 (10.6)
				BMI (kg/m^2) Mean (SD)	25.6 (2.82)	24.7 (3.6)
				Primary osteoarthritis n/N (%)	24/50 (48)	24/50 (48)
				Bilateral osteoarthritis n/N (%)	5/50 (10)	5/50 (10)
				Harris Hip Score Mean (SD)	44.6 (NR)	48.4 (NR)

Author year Ref ID Country	Study details	Inclusion/ exclusion criteria	Intervention and prostheses used	Patient characteristics		
					THR 1	THR 2
	radiographic parameters ***Length of follow up:*** 3.35 years		Biolox forte ceramic liner were used in all hips ***THR 2:*** Conventional anatomical metaphyseal- and diaphyseal-filling cementless stem (Profile). The cementless Profile femoral component is made of titanium alloy and is an anatomical metaphyseal- and diaphyseal-fitting stem	***Oxford Hip Score Mean (SD)***	NR	NR
Kim 2011[126] South Korea	***Outcome category:*** Stem fixation ***Aim:*** To compare the clinical and radiological results, rates of revision, and the survival of implants after THRs with cemented (hybrid) vs. cementless femoral components performed in patients < 50 years of age at a minimum 16 years' follow-up ***Length of follow up:*** 20	***Inclusion criteria:*** NR ***Exclusion criteria:*** NR	***THR 1:*** THR with cemented femoral stem. The Charnley Elite or Elite-plus stem (Ortron 90) (DePuy, Leeds, United Kingdom) was used in the cemented (hybrid) group and the Profile stem (DePuy) in the cementless group ***THR 2:*** THR with cementless femoral stem. A cementless	***Patients randomised***	83	83
				Age (years) Mean	43.4 (range 21 - 50)	46.8 (range 21 - 49)
				Sex –female n/N (%)	16/78 (21)	21/79 (27)
				Weight (kg) Mean (SD)	59 (range 45 - 82)	60.5 (range 48 - 87)
				BMI (kg/m^2) Mean (SD)	22.2 (range 22.1 - 24.8)	22.2 (range 21.9 - 24.4)
				Primary osteoarthritis n/N (%)	10 (12.8)	12 (15.2)
				Bilateral osteoarthritis n/N (%)	NR	NR
				Harris Hip Score Mean (SD)	44 (range 5 - 66)	48.8 (range 6 - 55)

Author year Ref ID Country	**Study details**	**Inclusion/ exclusion criteria**	**Intervention and prostheses used**	**Patient characteristics**		
					THR 1	**THR 2**
	years		Duraloc 100 or 1200 series acetabular component (DePuy, Warsaw, Indiana) was used in all hips in both groups. Of the 62 Duraloc 1200 acetabular components used in both groups, 28 were fixed with one or two screws and the remaining 34 were press-fitted without using an additional screw	***Oxford Hip Score Mean (SD)***	NR	NR

4.3.Table B. Study details of included records: Systematic reviews on THR vs THR arthroplasty

Author (year) Ref ID Country	Study details	Search strategy	Inclusion criteria	Quality assessment	Methods of synthesis

Author (year) Ref ID Country	Study details	Search strategy	Inclusion criteria	Quality assessment	Methods of synthesis
Voigt 2012[134] US	***Outcome category:*** Cup fixation ***Aim:*** To compare uncemented metal backed acetabular components with polyethylene inserts to cemented all-polyethylene acetabular components (using the same type of femoral component and method of femoral fixation in both arms of trial) in terms of revision rates, function, complications, and costs in patients with osteoarthritis	***Databases searched:*** PubMed-Medline, Cochrane Library ***Last date of search:*** 13 June 2011	***Participants:*** Patients with osteoarthritis or rheumatoid arthritis ***Interventions:*** Primary total hip implant with uncemented metal backed acetabular components with polyethylene inserts ***Comparators:*** Primary total hip implant with cemented all-polyethylene acetabular components ***Outcome measures:*** Revision rate, function (Harris Hip Score, Oxford Hip score), complications (infection or wound, deep vein thrombosis, pulmonary embolism, dislocations, overreaming, fractures, and costs of treatment) ***Types of studies:*** RCTs	***Quality assessment tool used:*** Cochrane risk of bias tool ***Risk of bias assessment criteria:*** Sequence generation, allocation concealment, blinding, incomplete outcome data, selective outcome reporting, and other issues ***Summary of risk of bias of included studies:*** Random sequence generation (low=4/6 trials), allocation concealment (high=3/6 trials; low=2/6 trials), caregiver blinding (high=6/6 trials), patient blinding (unknown=4/6 trials; high=1/6 trials), assessor blinding (high=5/6 trials), incomplete outcome data (low=5/6 trials), selective reporting (low=6/6 trials), other bias (low=3/6 trials; high=2/6 trials)	**Direct comparison** *a) Non-quantitative:* No *b) Quantitative :* Yes **Indirect comparison** *a) Unadjusted:* No *b) Adjusted:* No *c) Mixed treatment comparison :* No **Specific methods of assessment** *a) Heterogeneity:* Yes *b) Publication bias:* Yes *c) Overall quality/strength of evidence (GRADE):* No

Author (year) Ref ID Country	Study details	Search strategy	Inclusion criteria	Quality assessment	Methods of synthesis
Pakvis 2011[135] The Netherlands	***Outcome category:*** Cup fixation ***Aim:*** To identify all relevant RCTs and comparative cohort studies in which cemented and cementless sockets were compared	***Databases searched:*** Medline and Embase (1980 - December 2009) ***Last date of search:*** December 2009	***Participants:*** Indication for performing THA had to be primary or secondary osteoarthritis ***Interventions:*** Cemented acetabular components ***Comparators:*** Cementless acetabular components ***Outcome measures:*** Minimal follow-up had to be 12 months; data presented had to be clinical (complications, Harris hip score and survival) and radiological outcome measurements (wear, migration and osteolysis) ***Types of studies:*** Non-randomised studies; RCTs	***Quality assessment tool used:*** van Tulder checklist (for RCTs); Newcastle-Ottawa quality assessment scale (for non-RCTs) ***Risk of bias assessment criteria:*** van Tulder checklist (randomisation, allocation concealment, prognostic factors, patient blinding, surgeon blinding, outcome assessor blinding, co-interventions, compliance, drop-out, timing of the outcome assessments, intention to treat, and homogeneity); Newcastle-Ottawa quality assessment scale (representativeness of the exposed cohort, selection of the non-exposed cohort, ascertainment of exposure, demonstration that outcome of interest was not present at start of study, comparability of cohorts on the basis of the design or analysis, assessment of outcome, and adequacy of follow-up of cohorts) ***Summary of risk of bias of included studies:*** There were three RCT studies which scored 'yes' on more than 50% of the van Tulder criteria [20, 26, 30]. In orthopaedic surgery, surgeon blinding is not feasible. Therefore when re-evaluating the results of the van Tulder questionnaire we could select seven articles that scored yes on more than 50% of the van Tulder items	**Direct comparison** *a) Non-quantitative:* Yes *b) Quantitative :* No **Indirect comparison** *a) Unadjusted:* No *b) Adjusted:* No *c) Mixed treatment comparison :* No **Specific methods of assessment** *a) Heterogeneity:* No *b) Publication bias:* No *c) Overall quality/strength of evidence (GRADE):* No

Author (year) Ref ID Country	Study details	Search strategy	Inclusion criteria	Quality assessment	Methods of synthesis
Clement 2012[136] France	***Outcome category:*** Cup fixation ***Aim:*** To perform a critical analysis of the current evidence from a systemic literature review of comparative studies, long-term case series, prior literature reviews, meta-analysis, and national arthroplasty registry data for cemented and uncemented acetabular components	***Databases searched:*** Medline ***Last date of search:*** 2011	***Participants:*** Young patients and for patients with dysplastic hip disease ***Interventions:*** Cemented THR ***Comparators:*** Uncemented THR ***Outcome measures:*** Aseptic loosening, radiographic loosening, overall survival, wear rates per year, dislocation, osteolysis, acetabular revision, liner exchange, quality of life ***Types of studies:*** 1) All published review articles and meta-analysis; 2) All studies comparing cemented with uncemented acetabular components with a minimal follow-up of 5 years, quoting survival and wear or complications; 3) All arthroplasty registers reporting a comparison between cemented with uncemented acetabular components; 4) Single centre outcome studies with more than 13 years; 5) Single centre series reporting survivorship of cemented or uncemented cups in young patients and for patients with dysplastic hip disease	***Quality assessment tool used:*** None ***Risk of bias assessment criteria:*** None ***Summary of risk of bias of included studies:*** NA	**Direct comparison** *a) Non-quantitative:* Yes *b) Quantitative :* No **Indirect comparison** *a) Unadjusted:* No *b) Adjusted:* No *c) Mixed treatment comparison :* No **Specific methods of assessment** *a) Heterogeneity:* No *b) Publication bias:* No *c) Overall quality/strength of evidence (GRADE):* No

Author (year) Ref ID Country	Study details	Search strategy	Inclusion criteria	Quality assessment	Methods of synthesis
Sedrakyan 2011[137] US	***Outcome category:*** Femoral head bearing-on-cup liner bearing ***Aim:*** To determine comparative safety and effectiveness of combinations of bearing surfaces of hip implants	***Databases searched:*** Medline, Embase, and the Cochrane Controlled Trials Register from January 1995 ***Last date of search:*** June 2011	***Participants:*** Adults enrolled, reporting any one of the clinical outcomes of interest (any functional outcomes or revisions, or both) ***Interventions:*** Conventional hip replacement ***Comparators:*** Conventional hip replacement ***Outcome measures:*** Any functional outcome (Harris hip score and general quality of life measures such as SF-12) and occurrence of revision ***Types of studies:*** RCTs, controlled clinical trials, observational comparative controlled studies	***Quality assessment tool used:*** Selected validity items (RCTs) and STROBE (observational studies) ***Risk of bias assessment criteria:*** RCTs (methods of random allocation generation, allocation concealment, masking of patients and outcome assessors, and intention to treat analysis) ***Summary of risk of bias of included studies:*** Four studies were classified as moderate to high quality, five studies as moderate quality, and six studies as low quality	**Direct comparison** *a) Non-quantitative:* No *b) Quantitative :* Yes **Indirect comparison** *a) Unadjusted:* No *b) Adjusted:* No *c) Mixed treatment comparison :* No **Specific methods of assessment** *a) Heterogeneity:* Yes *b) Publication bias:* Yes *c) Overall quality/strength of evidence (GRADE):* No

Author (year) Ref ID Country	Study details	Search strategy	Inclusion criteria	Quality assessment	Methods of synthesis
Yoshitomi 2009[138] Japan	***Outcome category:*** Femoral head bearing-on-cup liner bearing ***Aim:*** To compare the survivorship/revision and annual PE wear rates between THRs with zirconia-on-polyethylene (PE) and nonzirconia-on-PE; to explore if manufacturers or fixation method influenced survivorship	***Databases searched:*** PubMed (1966 to July 2007), EMBASE (1974 to July 2007), and the Cochrane Central Register of Controlled Trials (Issue 4, July 2007) ***Last date of search:*** July 2007	***Participants:*** NR ***Interventions:*** THA using zirconia heads with PE cup liner (regardless of femoral head size, method of fixation) ***Comparators:*** THA using nonzirconia heads with PE cup liner (regardless of femoral head size, method of fixation) ***Outcome measures:*** Survivorship/revision, PE wear rates ***Types of studies:*** RCTs, nonrandomized controlled trials, and cohort studies with follow-up more than 5 years	***Quality assessment tool used:*** The Cochrane Back Review Group 11-item criteria ***Risk of bias assessment criteria:*** Generation of random allocation, allocation concealment, blinding, co-interventions, compliance, sample attrition, outcome assessment timing, and type of analysis ***Summary of risk of bias of included studies:*** The mean (range) score for the cohort studies= 4.5 (4–5) for the RCTs= 6.3 (6–7)	**Direct comparison** *a) Non-quantitative:* No *b) Quantitative :* Yes **Indirect comparison** *a) Unadjusted:* No *b) Adjusted:* No *c) Mixed treatment comparison :* No **Specific methods of assessment** *a) Heterogeneity:* Yes *b) Publication bias:* Yes *c) Overall quality/strength of evidence (GRADE):* No

4.4.Table C. Study details and patient characteristics of included records: RCTs on THR vs RS arthroplasty

Author year Ref ID Country	Study details	Inclusion/ exclusion criteria	Intervention and prostheses used	Patient characteristics		
					THR	RS
Costa 2012[127] Achten 2010[104] UK	***Outcome category:*** THR vs. RS ***Aim:*** To compare the clinical effectiveness of total hip replacement (THR) with resurfacing (RS) arthroplasty in patients with severe arthritis of the hip with regards to hip function, quality of life, physical activity, and harms ***Length of follow up:*** 12 months	***Inclusion criteria:*** Older than 18 years of age, medically fit for an operation, and suitable for a resurfacing arthroplasty ***Exclusion criteria:*** If evidence indicated that patient would be unable to adhere to trial procedures or complete questionnaires. If a recruited patient needed a contralateral hip replacement during the trial period, the second hip was not included in the study	***THR:*** NR ***Resurfacing:*** NR	***Patients randomised***	60	66
				Age (years) Mean	56.3 (7.3)	56.6 (6.6)
				Sex –female n/N (%)	22/60 (37.0)	30/66 (45.0)
				Weight (kg) Mean (SD)	NR	NR
				BMI (kg/m^2) Mean (SD)	28.6 (6.3)	28.7 (4.6)
				Primary osteoarthritis n/N (%)	59/60 (98)	61/66 (93)
				Bilateral osteoarthritis n/N (%)	NR	NR
				Harris Hip Score Mean (SD)	48.6 (14.2)	50.1 (13.5)
				Oxford Hip Score Mean (SD)	19.1 (8.0)	19.6 (7.8)
Garbuz 2010 [128] Canada	***Outcome category:*** THR vs. RS ***Aim:*** To compare THR; (metal-on-metal with large diameter head) with surface replacement arthroplasty (SRA; metal-on-metal) in terms of quality of life	***Inclusion criteria:*** Patients aged between 19 and 70 years deemed suitable for hip resurfacing as judged by the treating surgeon. ***Exclusion criteria:*** Previous fracture of the hip requiring internal fixation, previous	***THR:*** Large-head MoM Durom1 acetabular cup. M/L Taper titanium femoral stem. Large Metasul1 head attached via Cr-Co alloy metal sleeve adapter and Morse taper to match 12/14 stem taper ***Resurfacing:*** Durom	***Patients randomised***	56	48
				Age (years) Mean	52.0 (NR)	51.5 (NR)
				Sex –female n/N (%)	6/56 (10.7)	5/48 (10.4)
				Weight (kg) Mean (SD)	NR	NR
				BMI (kg/m^2) Mean (SD)	28.2 (NR)	28.3 (NR)
				Primary osteoarthritis n/N (%)	NR	NR
				Bilateral osteoarthritis n/N (%)	NR	NR
				Harris Hip Score Mean (SD)	NR	NR

Author year Ref ID Country	Study details	Inclusion/ exclusion criteria	Intervention and prostheses used	Patient characteristics		
					THR	**RS**
	measures and metal ion levels in serum ***Length of follow up:*** 2 years	femoral or pelvic osteotomy, dysplasia requiring structural graft, presence of osteopenia or osteoporosis, and hepatic or renal insufficiency	acetabular cup. Durom femoral RS component. Large Metasul head via a Cr-Co alloy metal sleeve adapter and Morse taper to match 12/14 stem taper. Bearing surface in each arm was identical (all Zimmer)	***Oxford Hip Score Mean (SD)***	NR	NR
Vendittoli 2010[129] Vendittoli 2006[130] Girard 2006[131] Rama 2009[132] Vendittoli 2006[133] Canada	***Outcome category:*** THR vs. RS ***Aim:*** To compare total hip replacement (THR; metal-on-metal) to surface replacement arthroplasty (SRA; metal-on-metal) with respect to post-operative clinical, radiographic outcomes, and complications	***Inclusion criteria:*** Patients 18 to 65 years of age with degenerative hip joint disease who were candidates for both metal-metal THA and SRA were recruited for study ***Exclusion criteria:*** Implantation, hip arthrodesis, renal insufficiency, known or	***THR:*** Titanium, cementless CLS SpotornoTM femoral stem. AllofitTM acetabular cup. 28 mm MetasulTM chrome-cobalt insert and femoral head (Zimmer). Implant options included 135° or 145° neck-shaft angle and neck lengths from -4	***Patients randomised***	100	109
				Age (years) Mean	51.0 (8.6)	49.2 (9.0)
				Sex –female n/N (%)	32/100 (32.0)	40/109 (37.0)
				Weight (kg) Mean (SD)	NR	NR
				BMI (kg/m^2) Mean (SD)	30.0 (6.8)	27.0 (5.3)
				Primary osteoarthritis n/N (%)	39/100 (39.0)	34/109 (31.2)
				Bilateral osteoarthritis n/N (%)	NR	NR
				Harris Hip Score Mean (SD)	NR	NR

Author year Ref ID Country	Study details	Inclusion/ exclusion criteria	Intervention and prostheses used	Patient characteristics		
					THR	RS
	Length of follow up: 6 years	suspected metal allergy, osteopenia or osteoporosis of the hip	mm to +8 mm ***Resurfacing:*** Hybrid DuromTM (Zimmer). Cemented femoral component. Cementless acetabular component. Femoral head preparation included drilling of any sclerotic area and routine pulse lavage. Cementing with low-viscosity cement with tobramycin (Simplex, Stryker) at approximately 4 minutes	***Oxford Hip Score Mean (SD)***	NR	NR

4.5.Table D. Study details of included records: Systematic reviews on THR vs RS arthroplasty

Author (year) Ref ID Country	Study details	Search strategy	Inclusion criteria	Quality assessment	Methods of synthesis
Jiang 2011[139] China	***Outcome category:*** THR vs. RS ***Aim:*** To compare the clinical results of metal-on-metal hip resurfacing arthroplasty (MMHRA) to those of standard THR for the treatment of hip disease in active young patients	***Databases searched:*** Cochrane Bone, Joint and Muscle Trauma Group Specialized Register (June 2009), the Cochrane Central Register of Controlled Trials (The Cochrane Library, Issue 2, 2009), PubMed (January 1990 to June 2009), Ovid (January 1990 to June 2009), Science Direct Online (January 1990 to June 2009) ***Last date of search:*** June 2009	***Participants:*** Younger than 65 years, were skeletally mature, had end-stage hip disease, and were followed up for more than 12 months ***Interventions:*** Modern MMHRA ***Comparators:*** THA ***Outcome measures:*** Rate of revision, mortality, femoral neck fracture, component loosening, dislocation, and deep hip joint infection, as well as hip function and range of motion ***Types of studies:*** RCTs and controlled clinical trials	***Quality assessment tool used:*** Cochrane risk of bias assessment tool ***Risk of bias assessment criteria:*** Sequence generation, allocation concealment, blinding, incomplete outcome data, selective outcome reporting, and other issues ***Summary of risk of bias of included studies:*** 3 studies were adequately randomized, and the fourth study was randomized only by the patients' dates of admission. Two studies included patients who were lost before follow-up could be completed, and the allocation concealments of all 4 eligible studies were unclear. None of the studies included adequate blinding procedures	**Direct comparison** *a) Non-quantitative:* No *b) Quantitative :* Yes **Indirect comparison** *a) Unadjusted:* No *b) Adjusted:* No *c) Mixed treatment comparison :* No **Specific methods of assessment** *a) Heterogeneity:* Yes *b) Publication bias:* No *c) Overall quality/strength of evidence (GRADE):* No

Author (year) Ref ID Country	Study details	Search strategy	Inclusion criteria	Quality assessment	Methods of synthesis
Smith 2010[140] UK	***Outcome category:*** THR vs. RS ***Aim:*** To compare total hip replacement (THR) and hip resurfacing arthroplasty (HRA) for clinical and radiological outcomes and complication rates	***Databases searched:*** Medline (1950 to January 2010), CINAHL (1982 to 1950 to January 2010), AMED (1985 to 1950 to January 2010) and EMBASE (1974 to 1950 to January 2010) ***Last date of search:*** January 10, 2010	***Participants:*** Patients with hip pathology ***Interventions:*** RS ***Comparators:*** THR ***Outcome measures:*** Incidence of revision, mortality, dislocation, aseptic loosening, avascular necrosis, infection, and fracture; incision length, last acetabular reamer size, duration of operation, blood loss and frequency of blood transfusion requirement, length of hospital stay, pain, functional and quality of life outcome, and hip range of motion; femoral/acetabular offset, incidence of femoral / acetabular radiolucency, leg length, cup height, and heterotopic ossification; incidence of complications (venous thromboembolic events, acetabular malposition, trochanteric malunion, or nonunion, nerve palsy, and presence of Trendelenburg sign ***Types of studies:*** RCTs and non-randomized controlled trials	***Quality assessment tool used:*** Modified 17-item appraisal tool CASP ***Risk of bias assessment criteria:*** Subject identification, randomization, blinding, and drop-out rates; presentation of results using descriptive and inferential statistics; and external validity to clinical practice ***Summary of risk of bias of included studies:*** CASP score (maximum 17): 0–3 (1 study), 4–7 (16 studies), 8–11 (23 studies), 12–15 (5 studies), 16–17 (no study); 9 RCTs clearly described the method of randomization; for 25 studies, the groups were comparable at baseline; assessor blinding was used in 4 studies; patients were blinded in only 2 studies; in 16 studies, the results were analyzed by intention-to-treat methods; the results were interpreted appropriately in 35 studies	**Direct comparison** *a) Non-quantitative:* No *b) Quantitative :* Yes **Indirect comparison** *a) Unadjusted:* No *b) Adjusted:* No *c) Mixed treatment comparison :* No **Specific methods of assessment** *a) Heterogeneity:* No *b) Publication bias:* Yes *c) Overall quality/strength of evidence (GRADE):* No

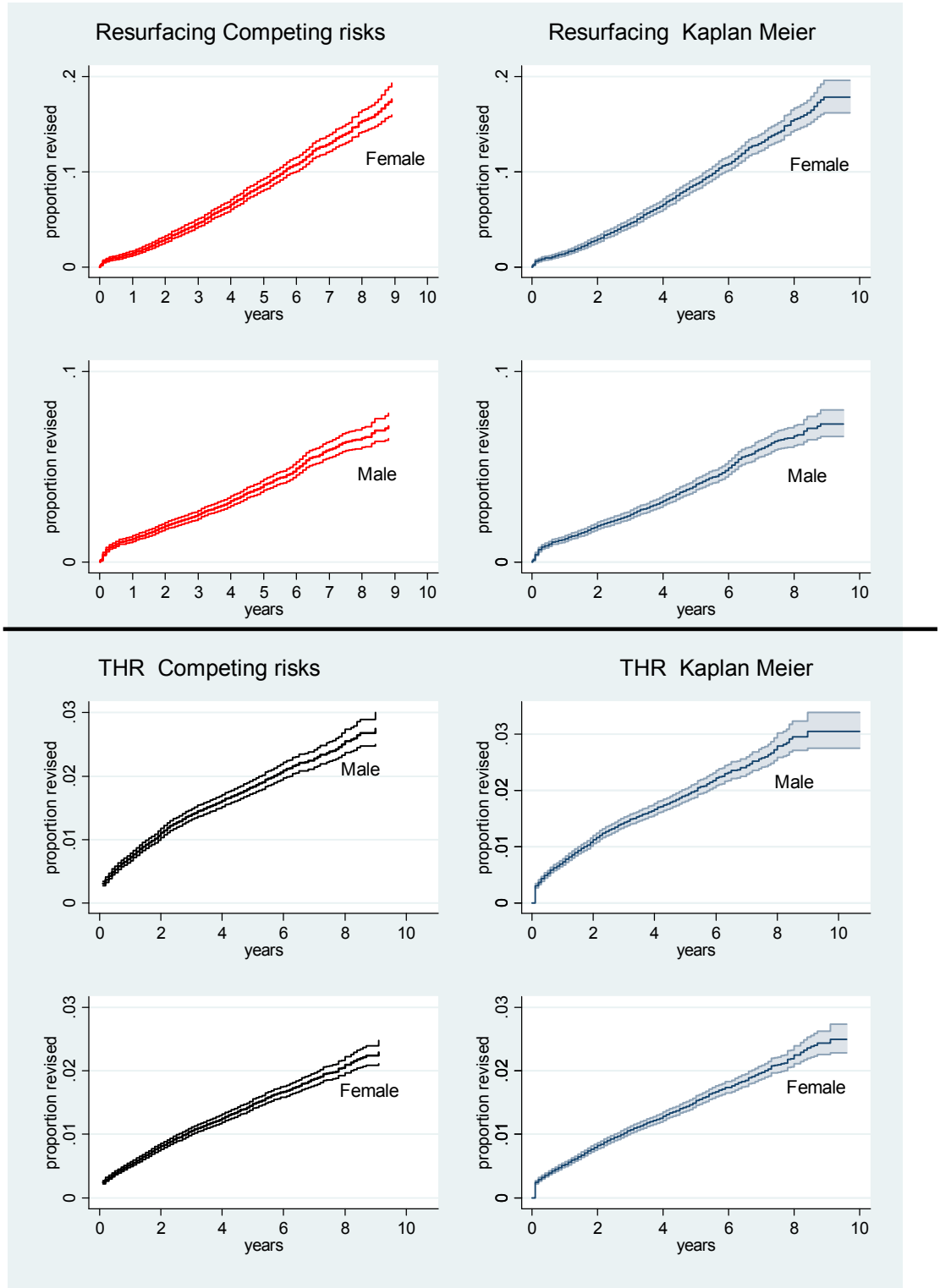
Author (year) Ref ID Country	**Study details**	**Search strategy**	**Inclusion criteria**	**Quality assessment**	**Methods of synthesis**
Springer 2009[141] Canada	***Outcome category:*** THR vs. RS ***Aim:*** To compare the effects of total hip replacement (THR) and hip resurfacing arthroplasty (HRA) on failure rates of cementless femoral components in younger patients	***Databases searched:*** Medline, PubMed, and CINAHL searched from their inception ***Last date of search:*** March 31, 2008	***Participants: Y***oung adults (mean age<55 years) ***Interventions:*** THR with modern cementless components ***Comparators:*** RS ***Outcome measures:*** Femoral failure due to any reason, femoral failure due to revision, and femoral failure due to mechanical reasons ***Types of studies:*** RCT, observational studies including single arm studies (THR or RS only)	***Quality assessment tool used:*** Methodological quality assessment was performed by a single reviewer by assigning nonrandomized studies a Methodological Index for Non-Randomized Studies score ***Risk of bias assessment criteria:*** NR ***Summary of risk of bias of included studies:*** NA	**Direct comparison** *a) Non-quantitative:* No *b) Quantitative :* No **Indirect comparison** *a) Unadjusted:* Yes *b) Adjusted:* No *c) Mixed treatment comparison :* No **Specific methods of assessment** *a) Heterogeneity:* No *b) Publication bias:* No *c) Overall quality/strength of evidence (GRADE):* No

19. Results from competing risks and KM analyses of revision rates for patients receiving THR and RS interventions

The following figure summarises competing risk and Kaplan Meier analyses of revision rates for patients receiving THR or RS; the results are stratified by gender and are presented on reversed scale for ease of comparison with NJR results published by Smith et al. (2012).[15] It is clear that for females, revision rates after RS are much higher than is the case for males. For RS the rates estimated from KM and CR analyses are similar for both genders; this is not surprising because few deaths would be likely to occur for this relatively young population during the relatively short follow up. For THR the Kaplan Meier analysis generates somewhat higher rates of revision than competing risk analysis; again this applies for both genders. For this older group of patients a greater proportion of deaths occur during follow up, relative to younger RS patients.

Competing risk and Kaplan Meier analysis of revision rates after THR or resurfacing (showing 95% CIs)

Upper panel RS, lower panel THR; M = male, F = female



20. Information criteria scores for parametric models

a. RS versus THR

	Intervention gender	Model	Observations	Likelihood model	Parameters	AIC	BIC
	RS FEM	exponential	9321	-3832.57	2	7669.146	7683.426
	RS FEM	weibull	9321	-3822.48	3	7650.955	7672.375
	RS FEM	gompertz	9321	-3810.47	3	7626.936	7648.357
	RS FEM	lognormal	9321	-3871.01	3	7748.02	7769.44
	RS FEM	loglogistic	9321	-3826.6	3	7659.199	7680.619
	RS FEM	bath tub	9321	-3804.81	4	7617.618	7646.178
Matched	THR FEM	exponential	9321	-1175.68	2	2355.366	2369.646
Matched	THR FEM	weibull	9321	-1171.86	3	2349.722	2371.142
Matched	THR FEM	gompertz	9321	-1174.19	3	2354.382	2375.802
Matched	THR FEM	lognormal	9321	-1172.61	3	2351.221	2372.641
Matched	THR FEM	loglogistic	9321	-1171.9	3	2349.793	2371.213
Matched	THR FEM	bath tub	9321	-1171.07	4	2350.132	2378.692
	RS M	exponential	17322	-4156.28	2	8316.549	8332.069
	RS M	weibull	17322	-4136.86	3	8279.725	8303.004
	RS M	gompertz	17322	-4153.83	3	8313.657	8336.936
	RS M	lognormal	17322	-4154.04	3	8314.077	8337.356
	RS M	loglogistic	17322	-4138.8	3	8283.599	8306.879
	RS M	bath tub	17322	-4103.65	4	8215.306	8246.345
Matched	THR M	exponential	17322	-2051.92	2	4107.83	4123.349
Matched	THR M	weibull	17322	-2038.25	3	4082.5	4105.779
Matched	THR M	gompertz	17322	-2046.58	3	4099.169	4122.448
Matched	THR M	lognormal	17322	-2040.2	3	4086.392	4109.671
Matched	THR M	loglogistic	17322	-2038.37	3	4082.738	4106.017
Matched	THR M	bath tub	17322	-2033.94	4	4075.889	4106.928
RS = resurfacing; THR = total hip replacement; FEM = female; M= male							

b. THR categories (A to E); males over 65 years old

THR category	Model	observations	Model likelihood	parameters	AIC	BIC
CeLCoC (C)	exponential	6186	-746.636	2	1497.273	1510.733
CeLCoC (C)	weibull	6186	-729.575	3	1465.15	1485.34
CeLCoC (C)	gompertz	6186	-732.489	3	1470.978	1491.168
CeLCoC (C)	lognormal	6186	-726.414	3	1458.828	1479.018
CeLCoC (C)	loglogistic	6186	-729.471	3	1464.942	1485.132
CeLCoC (C)	bath tub	6186	-723.201	4	1454.401	1481.321
HyPoM (D)	Exponential,	8657	-759.608	2	1523.211	1537.343
HyPoM (D)	weibull	8657	-747.974	3	1501.79	1522.989
HyPoM (D)	gompertz,	8657	-750.925	3	1507.62	1528.818
HyPoM (D)	lognormal	8657	-746.515	3	1498.783	1519.982
HyPoM (D)	loglogistic	8657	-747.947	3	1501.732	1522.93
HyPoM (D)	bath tub	8657	-745.745	4	1499.49	1527.754
CeLPoM (B)	exponential	11878	-1509.99	2	3017.336	3032.101
CeLPoM (B)	weibull	11878	-1457.43	3	2916.575	2938.723
CeLPoM (B)	gompertz	11878	-1466.86	3	2936.071	2958.218
CeLPoM (B)	lognormal	11878	-1451.03	3	2902.553	2924.701
CeLPoM (B)	loglogistic	11878	-1457.23	3	2916.099	2938.247
CeLPoM (B)	bath tub	11878	-1438.98	4	2885.952	2915.482
CePoM (A)	exponential	37018	-3243.77	2	6491.542	6508.58
CePoM (A)	weibull	37018	-3196.01	3	6398.019	6423.577
CePoM (A)	gompertz	37018	-3212.72	3	6431.431	6456.989
CePoM (A)	lognormal	37018	-3190.82	3	6387.648	6413.205
CePoM (A)	loglogistic	37018	-3195.95	3	6397.894	6423.452
CePoM (A)	bath tub	37018	-3182.69	4	6373.389	6407.465
CePoC (E)	exponential	2777	-193.422	2	390.0204	401.8786
CePoC (E)	weibull	2777	-191.253	3	387.7762	405.5636
CePoC (E)	gompertz	2777	-190.6	3	386.5367	404.3241
CePoC (E)	lognormal	2777	-190.787	3	386.8841	404.6715
CePoC (E)	loglogistic	2777	-191.24	3	387.7485	405.5359
CePoC (E)	bathtub	2777	NR			

c. THR categories (A to E); females over 65 years old

THR category	Model	observations	Model likelihood	Para-meters	AIC	BIC
CeLCoC (C)	exponential	7554	-708.1475	2	1420.295	1434.155
CeLCoC (C)	weibull	7554	-685.9571	3	1377.914	1398.704
CeLCoC (C)	gompertz	7554	-692.052	3	1390.104	1410.893
CeLCoC (C)	lognormal	7554	-683.4155	3	1372.831	1393.62
CeLCoC (C)	loglogistic	7554	-685.9026	3	1377.805	1398.595
CeLCoC (C)	bath tub	7554	-678.7391	4	1365.478	1393.197
HyPoM (D)	exponential	15641	-1200.145	2	2404.291	2419.606
HyPoM (D)	weibull	15641	-1167.915	3	2341.831	2364.804
HyPoM (D)	gompertz	15641	-1178.968	3	2363.936	2386.909
HyPoM (D)	lognormal	15641	-1165.254	3	2336.508	2359.481
HyPoM (D)	loglogistic	15641	-1167.881	3	2341.762	2364.735
HyPoM (D)	bath tub	15641	-1158.393	4	2324.787	2355.417
CeLPoM (B)	exponential	18396	-2076.223	2	4156.445	4172.085
CeLPoM (B)	weibull	18396	-1983.403	3	3972.806	3996.265
CeLPoM (B)	gompertz	18396	-2016.981	3	4039.962	4063.421
CeLPoM (B)	lognormal	18396	-1975.002	3	3956.004	3979.464
CeLPoM (B)	loglogistic	18396	-1983.209	3	3972.418	3995.878
CeLPoM (B)	bath tub	18396	-1949.76	4	3907.519	3938.799
CePoM (A)	exponential	75734	-5258.73	2	10521.46	10539.93
CePoM (A)	weibull	75734	-5231.8	3	10469.59	10497.3
CePoM (A)	gompertz	75734	-5243.93	3	10493.85	10521.56
CePoM (A)	lognormal	75734	-5233.88	3	10473.75	10501.46
CePoM (A)	loglogistic	75734	-5231.91	3	10469.82	10497.52
CePoM (A)	bath tub	75734	-5228.99	4	10465.98	10502.92
CePoC (E)	exponential	4655	-231.0568	2	466.1135	479.0049
CePoC (E)	weibull	4655	-230.1712	3	466.3423	485.6794
CePoC (E)	gompertz	4655	-229.2509	3	464.5019	483.839
CePoC (E)	lognormal	4655	-229.665	3	465.3301	484.6672
CePoC (E)	loglogistic	4655	-230.1605	3	466.321	485.6581
CePoC (E)	bath tub	NR				

d. THR categories (A to E); males < 65 years old

THR category	Model	observations	Model likelihood	Para-meters	AIC	BIC
CeLCoC (C)	exponential	9316	-1127.92	2	2259.84	2274.119
CeLCoC (C)	weibull	9316	-1112.134	3	2230.269	2251.687
CeLCoC (C)	gompertz	9316	-1117.294	3	2240.588	2262.007
CeLCoC (C)	lognormal	9316	-1110.068	3	2226.137	2247.555
CeLCoC (C)	loglogistic	9316	-1112.095	3	2230.189	2251.608
CeLCoC (C)	bath tub	9316	-1108.026	4	2224.052	2252.61
HyPoM (D)	exponential	1524	-219.2187	2	442.4374	453.0956
HyPoM (D)	weibull	1524	-215.9177	3	437.8354	453.8226
HyPoM (D)	gompertz	1524	-217.6033	3	441.2066	457.1939
HyPoM (D)	lognormal	1524	-215.6226	3	437.2452	453.2325
HyPoM (D)	loglogistic	1524	-215.9186	3	437.8372	453.8245
HyPoM (D)	bath tub	1524	-214.6095	4	437.2189	458.5353
CeLPoM (B)	exponential	3177	-447.9051	2	899.8102	911.9376
CeLPoM (B)	weibull	3177	-444.5135	3	895.027	913.218
CeLPoM (B)	gompertz	3177	-446.802	3	899.6039	917.795
CeLPoM (B)	lognormal	3177	-445.2237	3	896.4473	914.6384
CeLPoM (B)	loglogistic	3177	-444.5621	3	895.1241	913.3152
CeLPoM (B)	bath tub	3177	-443.3329	4	894.6658	918.9206
CePoM (A)	exponential	4454	-552.23	2	1108.459	1121.262
CePoM (A)	weibull	4454	-550.158	3	1106.316	1125.521
CePoM (A)	gompertz	4454	-551.318	3	1108.635	1127.84
CePoM (A)	lognormal	4454	-550.825	3	1107.65	1126.855
CePoM (A)	loglogistic	4454	-550.198	3	1106.396	1125.601
CePoM (A)	bath tub	4454	-549.76	4	1107.519	1133.125
CePoC (E)	exponential	2200	-121.8768	2	247.7535	259.1459
CePoC (E)	weibull	2200	-121.8192	3	249.6385	266.7271
CePoC (E)	gompertz	2200	-121.5913	3	249.1827	266.2713
CePoC (E)	lognormal	2200	-122.5208	3	251.0416	268.1303
CePoC (E)	loglogistic	2200	-121.8351	3	249.6702	266.7589
CePoC (E)	bath tub	2200	-121.2367	4	250.4733	273.2582

e. THR categories (A to E); females <65 years old

THR category	Model	observations	Model likelihood	Para-meters	AIC	BIC
CeLCoC (C)	exponential	11698	-1366.3	2	2736.599	2751.334
CeLCoC (C)	weibull	11698	-1345.799	3	2697.598	2719.7
CeLCoC (C)	gompertz	11698	-1353.718	3	2713.435	2735.537
CeLCoC (C)	lognormal	11698	-1343.318	3	2692.636	2714.738
CeLCoC (C)	loglogistic	11698	-1345.762	3	2697.523	2719.625
CeLCoC (C)	bath tub	11698	-1339.205	4	2686.41	2715.879
HyPoM (D)	exponential	2649	-240.9111	2	485.8222	497.586
HyPoM (D)	weibull	2649	-240.9111	3	487.8221	505.468
HyPoM (D)	gompertz	2649	-240.7166	3	487.4333	505.0791
HyPoM (D)	lognormal	2649	-241.8498	3	489.6996	507.3454
HyPoM (D)	loglogistic	2649	-240.9405	3	487.8809	505.5267
HyPoM (D)	bath tub	2649	-239.6651	4	487.3302	510.858
CeLPoM (B)	exponential	4423	-495.8744	2	995.7488	1008.538
CeLPoM (B)	weibull	4423	-492.0127	3	990.0253	1009.209
CeLPoM (B)	gompertz	4423	-491.7144	3	989.4287	1008.612
CeLPoM (B)	lognormal	4423	-491.0348	3	988.0695	1007.253
CeLPoM (B)	loglogistic	4423	-491.9636	3	989.9272	1009.111
CeLPoM (B)	bath tub	NR				
CePoM (A)	exponential	8079	-905.022	2	1814.045	1828.039
CePoM (A)	weibull	8079	-902.087	3	1810.173	1831.164
CePoM (A)	gompertz	8079	-904.823	3	1815.647	1836.638
CePoM (A)	lognormal	8079	-903.623	3	1813.246	1834.237
CePoM (A)	loglogistic	8079	-902.157	3	1810.314	1831.305
CePoM (A)	bath tub	8079	-897.288	4	1802.577	1830.565
CePoC (E)	exponential	3073	-209.3335	2	422.6671	434.7279
CePoC (E)	weibull	3073	-208.9521	3	423.9041	441.9954
CePoC (E)	gompertz	3073	-209.3335	3	424.667	442.7582
CePoC (E)	lognormal	3073	-209.5089	3	425.0178	443.1091
CePoC (E)	loglogistic	3073	-208.9722	3	423.9445	442.0357
CePoC (E)	bath tub	3073	-207.8105	4	423.6209	447.7426

21. Plots of KM estimated cumulative hazard versus modelled cumulative hazard

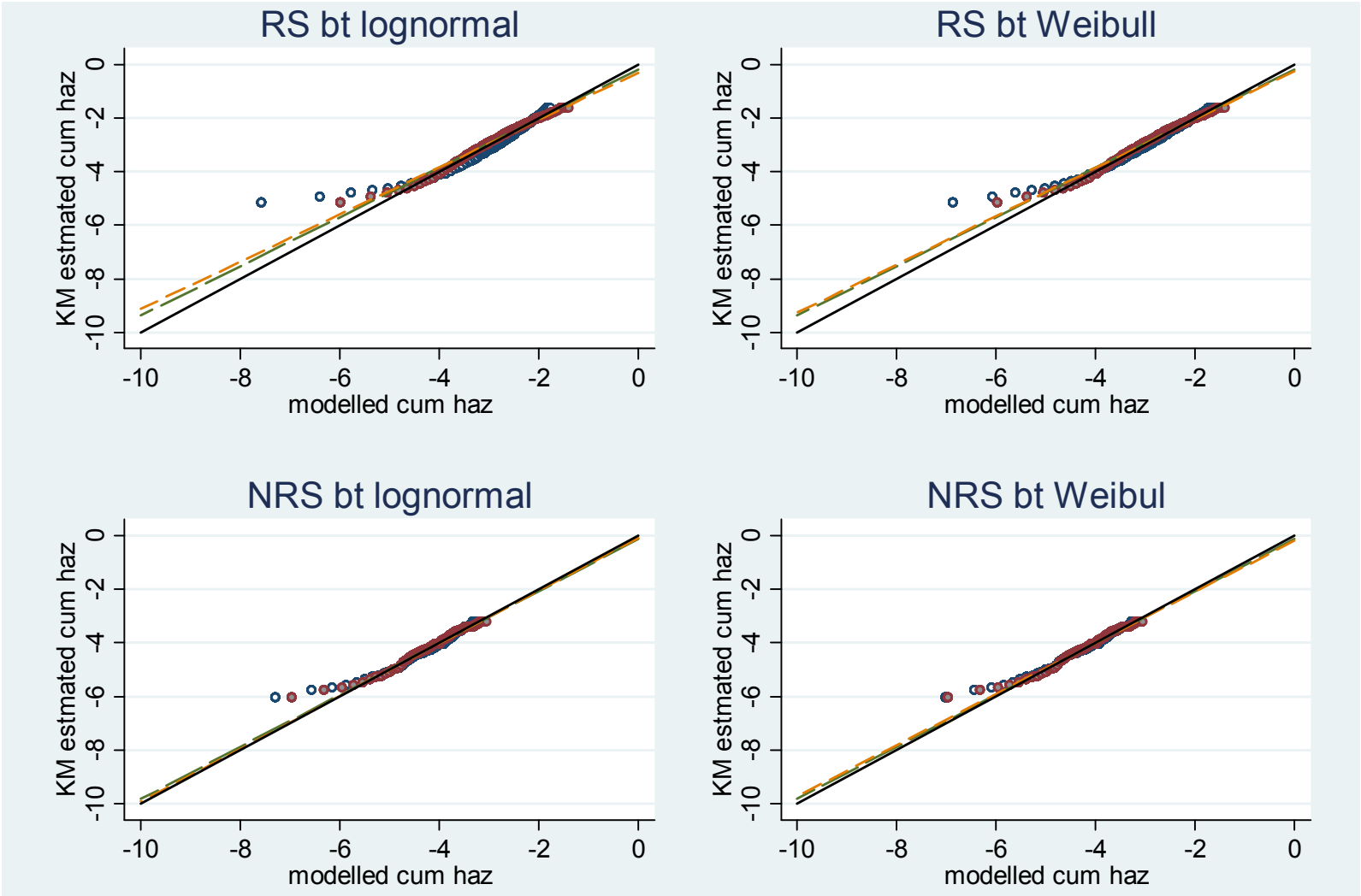


Figure 1. Female RS v NRS (matched THR) cumulative hazard plots. Symbols:open = Weibull or lognormal; solid =bathtub. Lines: solid= K-M; log dash = linear regression for bathtub; short dash= linear regression for Weibull or lognormal

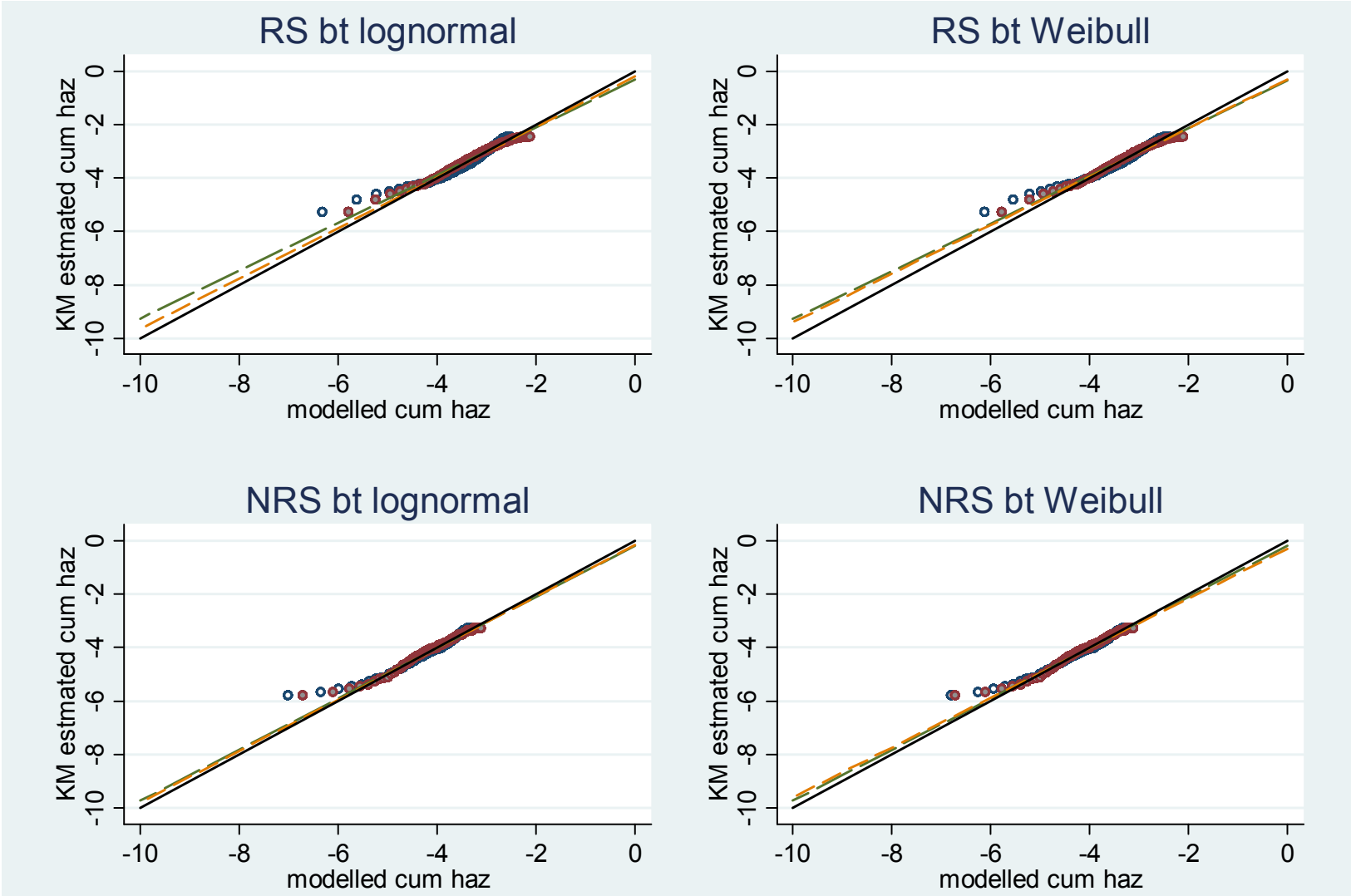
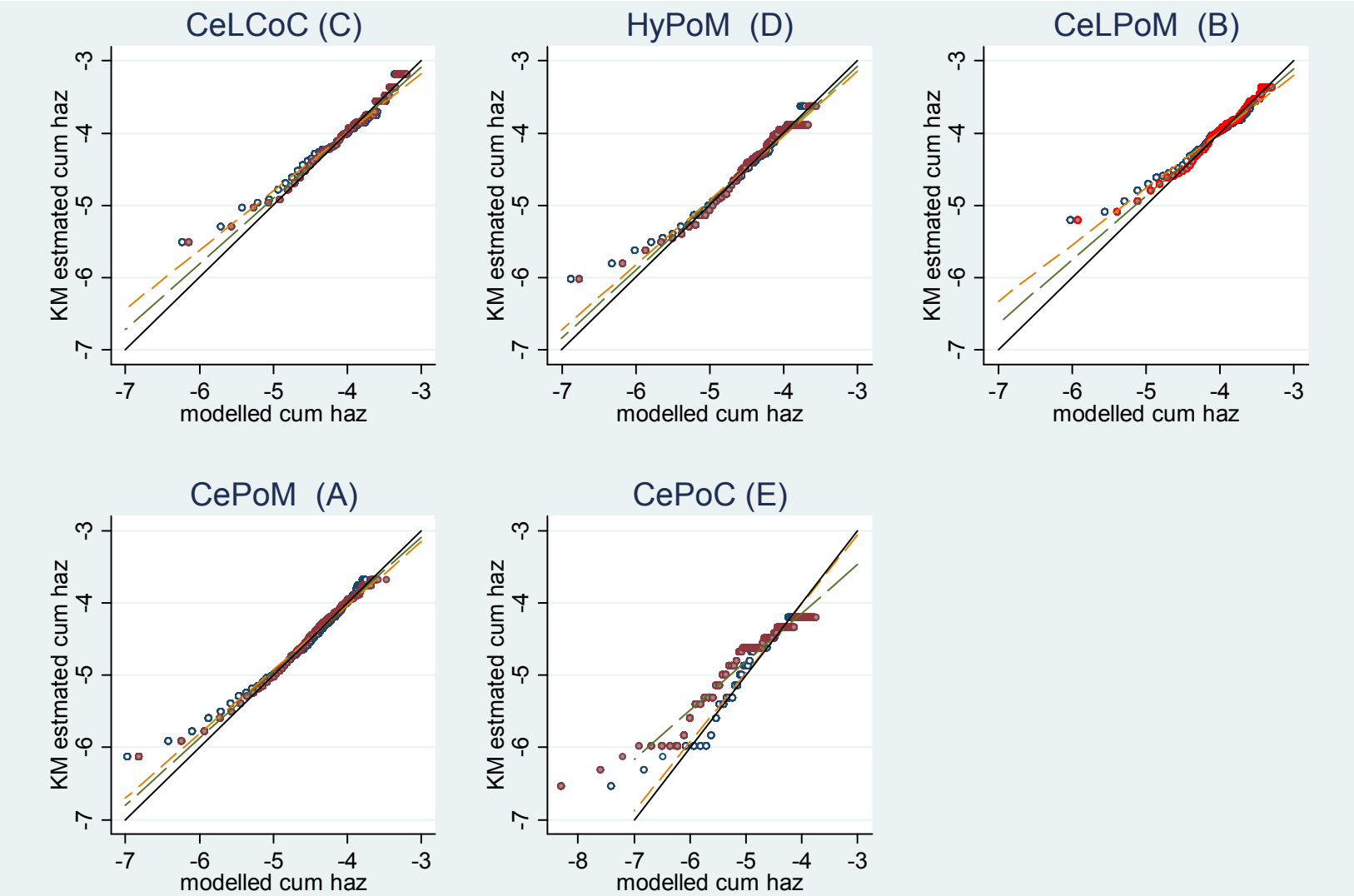
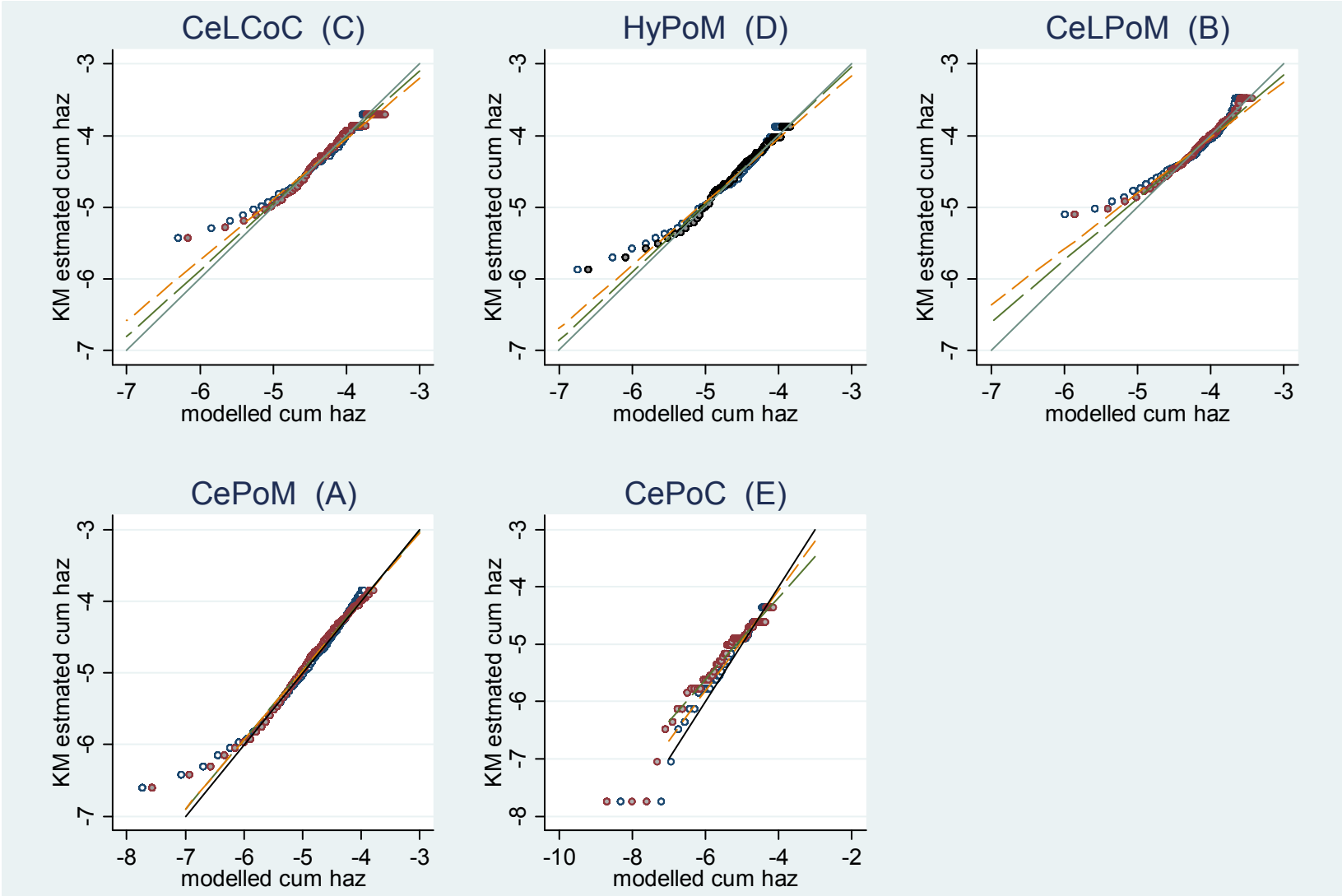


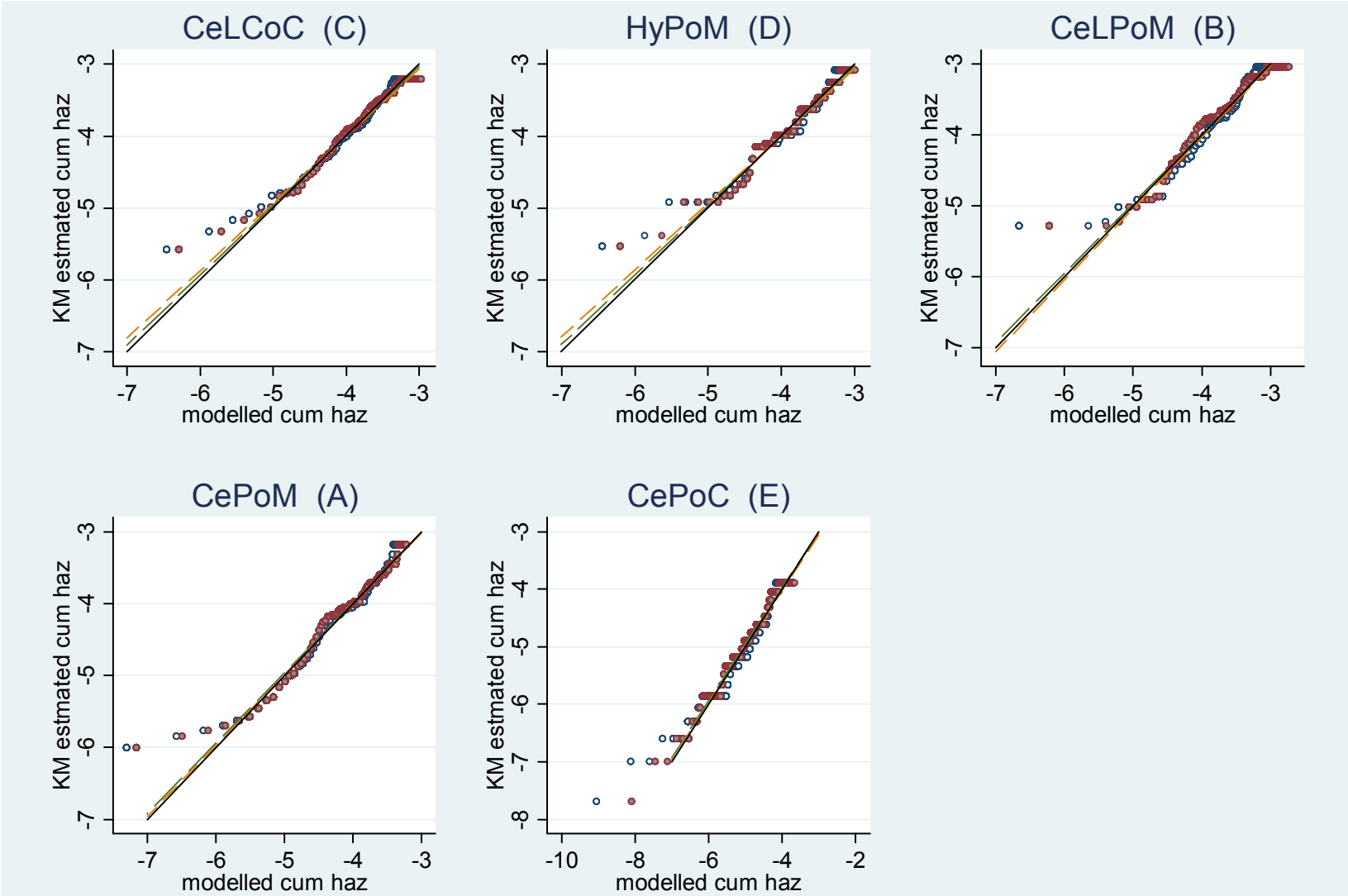
Figure 2. Male RS v NRS (matched THR) cumulative hazard plots. Symbols: open = Weibull or lognormal; solid =bathtub. Lines: solid= K-M; log dash = linear regression for bathtub; short dash= linear regression for Weibull or lognormal



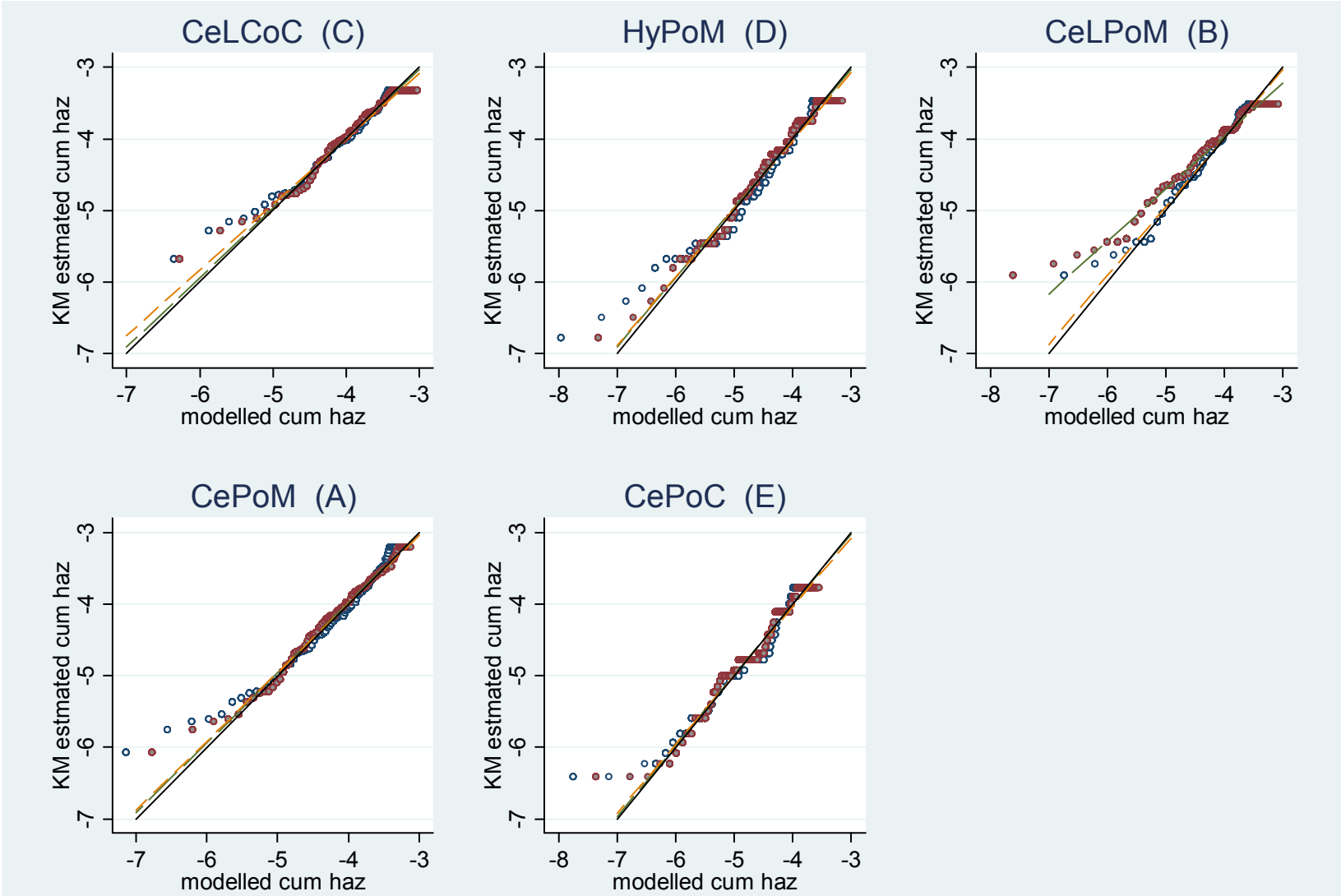
Cumulative hazard plots for males over 65; Symbols: open = Weibull or lognormal; solid =bathtub (C5 exponential). Lines: solid= K-M; log dash = linear regression for bathtub; short dash= linear regression for Weibull or lognormal.



Cumulative hazard plots for females over 65; Symbols:open = Weibull or lognormal; solid =bathtub (C5 exponential). Lines: solid= K-M; log dash = linear regression for bathtub; short dash= linear regression for Weibull or lognormal



Cumulative hazard plots for males under 65; Symbols:open = Weibull or lognormal; solid =bathtub (C5 exponential). Lines: solid= K-M; log dash = linear regression for bathtub; short dash= linear regression for Weibull or lognormal



Cumulative hazard plots for females under 65; Symbols:open = Weibull or lognormal; solid =bathtub (C5 exponential). Lines: solid= K-M; log dash = linear regression for bathtub; short dash= linear regression for Weibull or lognormal