

Supplement to the Clinical Practice Guideline for Management of Hip Fractures in Older Adults

e-Appendix 1

- Search Strategy
- AAOS Approval Bodies
- Review Organizations
- Letters of Endorsement from External Organizations

Table of Contents

Literature Search Strategy	3
AAOS Approval Bodies	12
Review Organizations	12
Letters of Endorsement from External Organizations	13

Literature Search Strategy

Database: MEDLINE via Ovid
 Ovid MEDLINE® and Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Daily and
Interface: Versions ® 1946 to March 4, 2020
Date: 3/5/2020
Search Management of Hip Fractures in the Elderly

Line	Search Strategy
1	exp Hip Fractures/ OR (exp Hip Joint/ OR exp Hip Injuries/ OR exp Hip/ AND fracture*.ti,ab.) OR ((hip OR hips) AND fracture*).ti,ab. OR (Joint Capsule/in AND (hip OR hips).ti,ab.)
2	(fracture* AND (femoral neck OR neck of femur OR proximal femoral OR proximal femur OR low energy OR basicervical OR midcervical OR subcapital OR trochanter* OR subtrochanter* OR peritrochanter* OR pertrochanter* OR intertrochanter* OR intracapsular OR extracapsular)).ti,ab.
3	exp Aged/ OR (elderly OR geriatric? OR (older adj (adult? OR people OR person? OR women OR men OR patient?))).ti,ab. OR (age? adj5 (6# or 7# or 8# or 9#)).ti,ab. OR ((6# or 7# or 8# or 9#) adj years).ti,ab.
4	*Fractures, Spontaneous/ OR *Periprosthetic Fractures/ OR ((*Spinal Fractures/ or (vertebra* or spine or spinal).ti.) not (exp *Hip Fractures/ or exp *Hip Joint/ or exp *Hip Injuries/ or exp *Hip/ or *Femur Neck/ or (hip or femur or femoral).ti.)) OR exp *Femur Head Necrosis/ OR (necrosis OR osteonecrosis).ti.
5	(exp "Animals"/ NOT Humans/) OR exp "Cadaver"/ OR (animal? OR dog OR dogs OR canine OR horse OR horses OR equine OR mouse OR mice OR rat OR rats OR rabbit OR rabbits OR sheep OR p?ediatric? OR porcine OR pig OR pigs OR rodent? OR monkey?).ti. OR (cadaver* OR in vitro).ti,ab. OR ((comment OR editorial OR letter OR historical article) NOT clinical trial).pt. OR address.pt. OR news.pt. OR newspaper article.pt. OR pmcbook.af. OR case reports.pt. OR (case report? OR abstracts OR editorial OR reply OR commentary OR letter).ti.
6	(1 OR 2) AND 3
7	6 NOT (4 OR 5)
8	7 and English.lg.
9	Delivery of Health Care, Integrated/ or Health Services for the Aged/ or exp Patient Care Team/ or (comanag* or co manag* or interdisciplinary or multidisciplinary or multi disciplinary or ((care or clinical or treatment or rehabilitation) adj pathway?) or coordinat* or orthogeriatric* or ortho geriatric* or (comprehensive adj3 (assessment? or care or treatment))).ti,ab.
10	Venous Thrombosis/ OR Venous Thromboembolism/ OR (dvt OR vte OR thrombos* OR thrombotic OR thromboembol*).ti,ab. OR exp Pulmonary embolism/ OR ((pulmonary OR lung?) AND (infarct* OR embol* OR clot*)).ti,ab.

11	exp Anticoagulants/ OR (anticoagul* OR anti coagul*).ti,ab. OR exp Fibrinolytic Agents/ OR exp Thrombolytic Therapy/ OR exp Chemoprevention/ OR (antithromb* OR thrombolytic* OR thromboprophyla* OR chemoprophyla*).ti,ab. OR exp Platelet Aggregation Inhibitors/ OR (antiplatelet* OR anti platelet*).ti,ab. OR exp Heparin/ OR (heparin* OR dalteparin OR Fragmin OR tinzaparin OR Innohep OR enoxaparin OR Lovenox).ti,ab. OR Clopidogrel/ OR (Plavix OR clopidogrel).ti,ab. OR Warfarin/ OR (Coumadin OR Jantoven OR warfarin*).ti,ab. OR exp Antithrombins/ OR Fondaparinux/ OR Dabigatran/ OR (Arixtra OR factor Xa inhibitor* OR rivaroxaban OR Xarelto OR apixaban OR Eliquis OR edoxaban OR Savaysa OR betrixaban OR Bevyxxa OR bivalirudin OR Angiomax OR lepirudin OR Refludan OR dabigatran OR Pradaxa OR desirudin OR Iprivask).ti,ab. OR exp Aspirin/ OR aspirin.ti,ab.
12	Stockings, Compression/ OR (compression adj (stocking? OR device?)).ti,ab. OR Intermittent Pneumatic Compression Devices/ OR (foot AND pump?).ti,ab. OR ((pneumatic OR leg OR calf) adj compression).ti,ab. OR (mechanical adj3 prophyla*).ti,ab.
13	10 OR 11 OR 12
14	Anesthesia/ OR exp Anesthesia, Conduction/ OR exp Anesthesia, General/ OR exp Anesthetics/ OR (an?esthesia OR an?esthetic? OR analgesi*).ti,ab. OR ((nerve OR spinal OR neuraxial OR subarachnoid OR plexus OR quadratus lumborum OR compartment OR fascia iliaca) adj block*).ti,ab. OR ((nerve OR perineural OR spinal) adj4 catheter?).ti,ab. OR (lidocaine OR ropivacaine OR bupivacaine).ti,ab.
15	Pain Management/ OR ((multimodal OR multi modal) and pain).ti,ab.
16	Acetaminophen/ OR (acetaminophen OR paracetamol OR Tylenol OR propacetamol).ti,ab.
17	exp Narcotics/ OR Tramadol/ OR (narcotic* OR opioid* OR opiate* OR papaver* OR oxycodone OR Oxycontin OR Oxy-ER OR Oxy-CRF OR OxyIR OR Oxy-IR OR Percodan OR Percocet OR Roxicet OR hydrocodone OR dihydrocodeinone OR Vicodin OR Vicoprofen OR Norco OR Lortab OR Lorcet OR oxymorphone OR Opana OR morphine OR Kadian OR Avinza OR MS Contin OR Duramorph OR Roxanol OR codeine OR fentanyl OR Duragesic OR Actiq OR Sublimaze OR hydromorphone OR Dilaudid OR meperidine OR Demerol OR tramadol OR Ultram OR buprenorphine OR propoxyphene OR Darvocet OR Omnopon OR methadone OR Dolophine OR Methadose OR suboxone OR nalbuphine OR propoxyphene OR pentazocine).ti,ab.
18	Pregabalin/ OR Gabapentin/ OR (gabapentin OR gabapentinoid* OR Neurontin OR Gralise OR Horizant OR pregabalin OR Lyrica).ti,ab.
19	exp Anti-Inflammatory Agents, Non-Steroidal/ OR (non-steroidal anti-inflammatory agent? OR nonsteroidal anti-inflammatory agent? OR meloxicam OR Mobic OR naproxen OR Aleve OR ibuprofen OR Advil OR flurbiprofen OR ketorolac OR Toradol OR COX-2 inhibitor? OR COX2 inhibitor? OR celecoxib OR Celebrex OR diclofenac OR misoprostol OR sulindac OR ketoprofen OR tolmetin OR etodolac OR fenoprofen OR piroxicam OR indomethacin OR nabumetone OR aspirin).ti,ab.
20	exp Adrenal Cortex Hormones/ OR (adrenal cortex hormones OR corticosteroid* OR cortico steroid OR corticoid* OR cortisone OR prednisone OR prednisolone OR methylprednisolone OR triamcinolone OR dexamethasone OR glucocorticoid* OR cortisone OR hydrocortisone OR betamethasone OR budesonide OR mineralocorticoid*).ti,ab.
21	14 OR 15 OR 16 OR 17 OR 18 OR 19 OR 20

22	exp Orthopedic Procedures/ OR exp Internal Fixators/ OR (arthroplast* OR hemiarthroplast* OR fixat* OR ((hip? OR joint) adj3 replacement?) OR surgery OR surgical* OR nail* OR screw* OR cephalomedullary OR THA).ti,ab.
23	9 OR 13 OR 21 OR 22
24	exp Time Factors/ OR exp Time-to-Treatment/ OR (timing-death OR wait* time? OR ((time OR timing or delay* OR early OR same day) adj5 (surgery OR surgical))).ti,ab.
25	exp Hemoglobins/ OR (h?emoglobin OR hgb OR hb OR hba1c).ti,ab. OR exp Anemia/ OR an?emia.ti,ab.
26	Traction/ OR traction.ti,ab.
27	24 OR 25 OR 26
28	Antifibrinolytic Agents/ OR anti?fibrinoly*.ti,ab. OR Tranexamic Acid/ OR (tranexamic OR TXA OR Cyklokapron OR Lysteda).ti,ab. OR Aminocaproic Acid/ OR (aminocaproic OR Amicar).ti,ab.
29	Early Ambulation/ OR ((early OR accelerated OR immediate) adj4 (ambulat* OR walking OR mobilization OR mobilisation OR motion OR weightbearing OR weight bearing OR rehabilitation)).ti,ab.
30	28 OR 29
31	randomized controlled trial.pt. OR exp Randomized Controlled Trials as Topic/ OR random allocation/ OR random*.ti,ab.
32	(MEDLINE OR (systematic* AND review*) OR meta analys*).ti,ab. OR (meta analysis OR systematic review).pt.
33	8 and 23
34	(8 and 27) and (31 or 32)
35	8 and 30
36	limit 33 to yr="2013-Current"
37	limit 34 to yr="2013-Current"
38	limit 35 to yr="1995-Current"
39	36 OR 37 OR 38
40	limit 39 to ez=20200305-20210108
41	
42	limit 39 to ez=20210108-20210228
43	

Database: Embase
Interface: Elsevier (<https://embase.com>)
Date: 5/20/2020
Search Management of Hip Fractures in the Elderly

Line	Search Strategy
1	hip fracture'/exp OR (('hip injury'/exp OR hip/exp) AND fracture*:ti,ab) OR ((hip OR hips) AND fracture*):ti,ab
2	femoral neck fracture'/de OR (fracture*:ti,ab AND ('femoral neck'/de OR ('femoral neck' OR 'neck of femur' OR 'proximal femoral' OR 'proximal femur' OR 'low energy' OR basicervical OR midcervical OR subcapital OR trochanter* OR subtrochanter* OR peritrochanter* OR petrochanter* OR intertrochanter* OR intracapsular OR extracapsular):ti,ab))
3	aged/exp OR (elderly OR geriatric\$ OR (older NEXT/1 (adult\$ OR people OR person\$ OR women OR men OR patient\$))):ti,ab OR (age\$ NEXT/5 (6? or 7? or 8? or 9?):ti,ab OR ((6? or 7? or 8? or 9?) NEXT/1 years):ti,ab
4	pathologic fracture'/mj OR 'periprosthetic fracture'/mj OR (('spine fracture'/exp/mj OR (vertebra* OR spine OR spinal):ti) NOT ('hip fracture'/exp/mj OR 'hip Injury'/exp/mj OR hip/exp/mj OR 'femoral neck'/mj OR 'femoral neck fracture'/mj OR (hip or femur or femoral):ti)) OR 'femur head necrosis'/mj OR (necrosis OR osteonecrosis):ti
5	abstract report'/de OR abstracts:ti OR 'book'/de OR 'editorial'/de OR 'editorial':it OR editorial:ti OR 'note'/de OR 'note':it OR 'letter'/de OR reply:ti OR commentary:ti OR 'letter':it OR letter:ti OR 'case study'/de OR 'case report'/de OR 'chapter':it OR 'conference paper'/exp OR 'conference paper':it OR 'conference abstract':it OR 'conference review':it OR 'cadaver'/de OR 'in vitro study'/exp OR (cadaver* OR 'in vitro'):ti,ab OR 'animal experiment'/exp OR (animal\$ OR dog OR dogs OR canine OR horse OR horses OR equine OR mouse OR mice OR rat OR rats OR rabbit OR rabbits OR sheep OR p\$ediatric\$ OR porcine OR pig OR pigs OR rodent\$ OR monkey\$):ti
6	(#1 OR #2) AND #3
7	#6 NOT (#4 OR #5)
8	#7 AND [english]/lim
9	geriatric care'/exp OR (comanag* OR 'co manag*' OR interdisciplinary OR multidisciplinary OR 'multi disciplinary' OR ((care OR clinical OR treatment OR rehabilitation) NEXT/1 pathway\$) OR coordinat* OR orthogeriatric* OR 'ortho geriatric*' OR (comprehensive NEXT/3 (assessment\$ or care or treatment))):ti,ab
10	vein thrombosis'/de OR thrombophlebitis/de OR 'venous thromboembolism'/exp OR (dvt OR vte OR thrombos* OR thrombotic OR thromboembol*):ti,ab OR ((pulmonary OR lung\$) AND (infarct* OR embol* OR clot*)):ti,ab
11	anticoagulant agent'/exp OR (anticoagul* OR 'anti coagul*'):ti,ab OR 'fibrinolytic agent'/exp OR 'fibrinolytic therapy'/exp OR chemoprophylaxis/de OR 'blood clotting inhibitor'/exp OR 'antithrombotic agent'/exp OR 'thrombocyte aggregation inhibition'/de OR (antithromb* OR thrombolytic* OR thromboprophyla* OR chemoprophyla*):ti,ab OR (antiplatelet* OR anti platelet*):ti,ab OR heparin/exp OR 'heparin derivative'/exp OR (heparin* OR dalteparin OR Fragmin OR tinzaparin OR Innohep OR enoxaparin OR Lovenox):ti,ab OR clopidogrel/exp OR (Plavix OR clopidogrel):ti,ab OR warfarin/exp OR (Coumadin OR Jantoven OR warfarin*):ti,ab OR 'dabigatran etexilate'/exp OR (Arixtra OR fondaparinux OR factor Xa inhibitor* OR rivaroxaban OR Xarelto OR apixaban OR Eliquis OR edoxaban OR Savaysa OR betrixaban OR Bevyxxa OR bivalirudin OR Angiomax OR lepirudin OR Refludan OR dabigatran OR Pradaxa OR desirudin OR desulfatohirudin OR Iprivask OR argatroban OR aspirin):ti,ab

12	compression garment'/exp OR (compression NEXT/1 (stocking\$ OR device\$)):ti,ab OR 'intermittent pneumatic compression device'/de OR (foot AND pump\$):ti,ab OR ((pneumatic OR leg OR calf NEXT/1 compression):ti,ab OR (mechanical NEXT/3 prophyla*):ti,ab
13	#10 OR #11 OR #12
14	anesthesia/de OR 'general anesthesia'/exp OR 'spinal anesthesia'/de OR 'epidural anesthesia'/exp OR 'regional anesthesia'/exp OR 'intravenous anesthesia'/exp OR 'local anesthesia'/exp OR 'anesthetic agent'/exp OR (anesthesia OR anesthetic\$):ti,ab OR ((nerve OR spinal OR neuraxial OR subarachnoid OR plexus OR 'quadratus lumborum' OR compartment OR 'fascia iliaca') NEXT/1 block*):ti,ab OR 'anesthetic catheter'/exp OR ((nerve OR perineural OR spinal) NEAR/4 catheter\$):ti,ab OR 'local anesthetic agent'/exp OR (lidocaine OR ropivacaine OR bupivacaine):ti,ab
15	analgesia/exp OR analgesi*:ti,ab OR (multimodal AND pain):ti,ab
16	paracetamol'/exp OR 'propacetamol'/exp OR acetaminophen:ti,ab OR paracetamol:ti,ab OR propacetamol:ti,ab OR tylenol:ti,ab
17	narcotic agent'/exp OR 'narcotic analgesic agent'/exp OR narcotic*:ti,ab OR opioid*:ti,ab OR opiate*:ti,ab OR papaver*:ti,ab OR oxycodone:ti,ab OR Oxycontin:ti,ab OR 'Oxy-ER':ti,ab OR 'Oxy-CRF':ti,ab OR 'OxyLR':ti,ab OR 'Oxy-IR':ti,ab OR Percodan:ti,ab OR Percocet:ti,ab OR Roxicet:ti,ab OR hydrocodone:ti,ab OR dihydrocodeinone:ti,ab OR Vicodin:ti,ab OR Vicoprofen:ti,ab OR Norco:ti,ab OR Lortab:ti,ab OR Lorcet:ti,ab OR oxymorphone:ti,ab OR Opana:ti,ab OR morphine:ti,ab OR Kadian:ti,ab OR Avinza:ti,ab OR 'MS Contin':ti,ab OR Duramorph:ti,ab OR Roxanol:ti,ab OR codeine:ti,ab OR fentanyl:ti,ab OR Duragesic:ti,ab OR Actiq:ti,ab OR Sublimaze:ti,ab OR hydromorphone:ti,ab OR Dilaudid:ti,ab OR meperidine:ti,ab OR Demerol:ti,ab OR tramadol:ti,ab OR Ultram:ti,ab OR buprenorphine:ti,ab OR propoxyphene:ti,ab OR Darvocet:ti,ab OR Omnopon:ti,ab OR methadone:ti,ab OR Dolophine:ti,ab OR Methadose:ti,ab OR suboxone:ti,ab OR nalbuphine:ti,ab OR propoxyphene:ti,ab OR pentazocine:ti,ab
18	pregabalin'/exp OR 'gabapentinoid'/exp OR 'gabapentin'/exp OR pregabalin:ti,ab OR gabapentinoid*:ti,ab OR gabapentin:ti,ab OR Lyrica:ti,ab OR Neurontin:ti,ab OR Gralise:ti,ab OR Horizant:ti,ab
19	nonsteroid antiinflammatory agent'/exp OR 'cyclooxygenase 2 inhibitor'/exp OR 'non-steroidal anti-inflammatory agent':ti,ab OR 'nonsteroidal anti-inflammatory agents':ti,ab OR meloxicam:ti,ab OR mobic:ti,ab OR naproxen:ti,ab OR aleve:ti,ab OR ibuprofen:ti,ab OR advil:ti,ab OR flurbiprofen:ti,ab OR ketorolac:ti,ab OR toradol:ti,ab OR 'cox-2 inhibitor\$':ti,ab OR 'cox2 inhibitor\$':ti,ab OR celecoxib:ti,ab OR celebrex:ti,ab OR diclofenac:ti,ab OR misoprostol:ti,ab OR sulindac:ti,ab OR ketoprofen:ti,ab OR tolmetin:ti,ab OR fenoprofen:ti,ab OR piroxicam:ti,ab OR etodolac:ti,ab OR indomethacin:ti,ab OR nabumetone:ti,ab OR aspirin:ti,ab
20	corticosteroid'/exp OR corticosteroid*:ti,ab OR corticoid*:ti,ab OR 'adrenal cortex hormone\$':ti,ab OR prednisone:ti,ab OR methylprednisolone:ti,ab OR triamcinolone:ti,ab OR glucocorticoid*:ti,ab OR cortisone:ti,ab OR hydrocortisone:ti,ab OR dexamethasone:ti,ab OR prednisolone:ti,ab OR betamethasone:ti,ab OR budesonide:ti,ab OR mineralocorticoid*:ti,ab
21	#14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20
22	orthopedic surgery'/exp OR 'orthopedic fixation device'/exp OR (arthroplast* OR hemiarthroplast* OR 'hemi arthroplast*' OR fixat* OR ((hip OR joint) NEAR/3 replacement\$) OR surgery OR surgical* OR nail* OR screw* OR cephalomedullary OR THA):ti,ab
23	#9 OR #13 OR #21 OR #22

24	time factor'/exp OR 'time to treatment'/exp OR ('timing death' OR 'wait* time\$' OR ((time OR timing or delay* OR early OR 'same day') NEAR/5 (surgery OR surgical))):ti,ab
25	hemoglobin/exp OR (h?emoglobin OR hgb OR hb OR hba1c):ti,ab OR anemia/exp OR an?emia:ti,ab
26	traction therapy'/exp OR traction:ti,ab
27	#24 OR #25 OR #26
28	antifibrinolytic agent'/exp OR anti\$fibrinoly*:ti,ab OR (tranexamic OR TXA OR Cyklokapron OR Lysteda OR aminocaproic OR Amicar):ti,ab
29	mobilization/de OR ((early OR accelerated OR immediate) NEAR/4 (ambulat* OR walking OR mobilization OR mobilisation OR motion OR weightbearing OR 'weight bearing' OR rehabilitation)):ti,ab
30	#28 OR #29
31	randomized controlled trial'/exp OR 'randomized controlled trial (topic)'/exp OR 'randomization'/de OR random*:ti,ab,kw
32	systematic review'/exp OR 'meta analysis'/exp OR ((systematic* NEAR/2 review*):ti,ab,kw) OR 'meta analys*':ti,ab,kw
33	#8 and #23
34	(#8 and #27) and (#31 or #32)
35	#8 and #30
36	(#33 OR #34) AND [2013-3000]/py
37	#35 AND [1995-3000]/py
38	#36 OR #37
39	(#36 OR #37) AND [20-5-2020]/sd NOT [9-1-2021]/sd
40	(#36 OR #37) AND [8-1-2021]/sd NOT [1-3-2021]/sd

Database: Cochrane Central Register of Controlled Trials (CENTRAL)

Interface: Wiley (<https://www.cochranelibrary.com/central>)

Date: 5/20/2020

Search Management of Hip Fractures in the Elderly

Line	Search Strategy
1	((hip OR hips) AND fracture*):ti,ab
2	fracture*:ti,ab AND ("femoral neck" OR "neck of femur" OR "proximal femoral" OR "proximal femur" OR "low energy" OR basicervical OR midcervical OR subcapital OR trochanter* OR subtrochanter* OR peritrochanter* OR pertrochanter* OR intertrochanter* OR intracapsular OR extracapsular):ti,ab
3	(elderly OR geriatric? OR (older NEXT/1 (adult? OR people OR person? OR women OR men OR patient?))):ti,ab OR (age? NEXT/5 (6? or 7? or 8? or 9?)):ti,ab OR ((6? or 7? or 8? or 9?) NEXT/1 years):ti,ab
4	[mh ^"Fractures, Spontaneous"] OR [mh ^"Periprosthetic fractures"] OR (([mh ^"Spinal Fractures"] OR (vertebra* OR spine OR spinal):ti) NOT ([mh ^"Hip Fractures"] OR [mh ^"Hip Joint"] OR [mh ^"Hip Injuries"] OR [mh ^Hip] OR [mh ^"Femure Neck"] OR (hip or femur or femoral):ti)) OR [mh ^"Femur Head Necrosis"] OR (necrosis OR osteonecrosis):ti
5	"conference abstract":pt OR abstracts:ti OR editorial:ti OR reply:ti OR commentary:ti OR letter:ti OR cadaver*:ti,ab OR "in vitro":ti,ab OR animal*:ti OR dog:ti OR dogs:ti OR canine:ti OR horse:ti OR horses:ti OR equine:ti OR mouse:ti OR mice:ti OR rat:ti OR rats:ti OR rabbit:ti OR rabbits:ti OR sheep:ti OR porcine:ti OR pig:ti OR pigs:ti OR rodent?:ti OR monkey?:ti
6	(#1 OR #2) AND #3
7	#6 NOT (#4 OR #5)
8	(comanag* OR (co NEXT/1 manag*) OR interdisciplinary OR multidisciplinary OR "multi disciplinary" OR ((care OR clinical OR treatment OR rehabilitation) NEXT/1 pathway?) OR coordinat* OR orthogeriatric* OR (ortho NEXT/1 geriatric*) OR (comprehensive NEXT/3 (assessment? or care or treatment))):ti,ab
9	(dvt OR vte OR thrombos* OR thrombotic OR thromboembol*):ti,ab OR ((pulmonary OR lung?) AND (infarct* OR embol* OR clot*)):ti,ab
10	(anticoagul* OR "anti coagul*"):ti,ab OR (antithromb* OR thrombolytic* OR thromboprophyla* OR chemoprophyla*):ti,ab OR (antiplatelet* OR (anti NEXT/1 platelet*)):ti,ab OR (heparin* OR dalteparin OR Fragmin OR tinzaparin OR Innohep OR enoxaparin OR Lovenox):ti,ab OR (Plavix OR clopidogrel):ti,ab OR (Coumadin OR Jantoven OR warfarin*):ti,ab OR (Arixtra OR fondaparinux OR (factor NEXT/1 Xa NEXT/1 inhibitor*) OR rivaroxaban OR Xarelto OR apixaban OR Eliquis OR edoxaban OR Savaysa OR betrixaban OR Bevyxxa OR bivalirudin OR Angiomax OR lepirudin OR Refludan OR dabigatran OR Pradaxa OR desirudin OR desulfatohirudin OR lprivask OR argatroban OR aspirin):ti,ab
11	(compression NEXT/1 (stocking? OR device?)):ti,ab OR (foot AND pump?):ti,ab OR ((pneumatic OR leg OR calf) NEXT/1 compression):ti,ab OR (mechanical NEXT/3 prophyla*):ti,ab
12	#9 OR #10 OR #11

13	(anesthesia OR anesthetic):ti,ab OR ((nerve OR spinal OR neuraxial OR subarachnoid OR plexus OR "quadratus lumborum" OR compartment OR "fascia iliaca") NEXT/1 block):ti,ab OR ((nerve OR perineural OR spinal) NEAR/4 catheter):ti,ab OR (lidocaine OR ropivacaine OR bupivacaine):ti,ab
14	analgesia:ti,ab OR (multimodal AND pain):ti,ab
15	acetaminophen:ti,ab OR paracetamol:ti,ab OR propacetamol:ti,ab OR tylenol:ti,ab
16	(narcotic* OR opioid* OR opiate* OR papaver* OR oxycodone OR Oxycontin OR "Oxy-ER" OR "Oxy-CRF" OR "OxyIR" OR "Oxy-IR" OR Percodan OR Percocet OR Roxicet OR hydrocodone OR dihydrocodeinone OR Vicodin OR Vicoprofen OR Norco OR Lortab OR Lorcet OR oxymorphone OR Opana OR morphine OR Kadian OR Avinza OR "MS Contin" OR Duramorph OR Roxanol OR codeine OR fentanyl OR Duragesic OR Actiq OR Sublimaze OR hydromorphone OR Dilaudid OR meperidine OR Demerol OR tramadol OR Ultram OR buprenorphine OR propoxyphene OR Darvocet OR Omnipon OR methadone OR Dolophine OR Methadose OR suboxone OR nalbuphine OR propoxyphene OR pentazocine):ti,ab
17	(pregabalin OR gabapentinoid* OR gabapentin OR Lyrica OR Neurontin OR Gralise OR Horizant):ti,ab
18	("non-steroidal anti-inflammatory agents" OR "nonsteroidal anti-inflammatory agents" OR meloxicam OR Mobic OR naproxen OR Aleve OR ibuprofen OR Advil OR flurbiprofen OR ketorolac OR Toradol OR "COX-2 inhibitor" OR "COX-2 inhibitors" OR "COX2 inhibitor" OR "COX2 inhibitors" OR celecoxib OR Celebrex OR diclofenac OR misoprostol OR sulindac OR ketoprofen OR tolmetin OR etodolac OR fenoprofen OR piroxicam OR indomethacin OR nabumetone OR aspirin):ti,ab
19	("adrenal cortex hormones" OR corticosteroid* OR corticoid* OR prednisone OR methylprednisolone OR triamcinolone OR dexamethasone OR glucocorticoid* OR cortisone OR hydrocortisone OR prednisolone OR betamethasone OR budesonide OR mineralocorticoid*):ti,ab
20	#13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19
21	(arthroplast* OR hemiarthroplast* OR "hemi arthroplast*" OR fixat* OR ((hip OR joint) NEAR/3 replacement?) OR surgery OR surgical* OR nail* OR screw* OR cephalomedullary OR THA):ti,ab
22	#8 OR #12 OR #20 OR #21
23	("timing death" OR (wait* NEXT/1 time?) OR ((time OR timing or delay* OR early OR "same day") NEAR/5 (surgery OR surgical))):ti,ab
24	(hemoglobin OR hgb OR hb OR hba1c):ti,ab OR anemia:ti,ab
25	traction:ti,ab
26	#23 OR #24 OR #25
27	antifibrinolytic:ti,ab OR (tranexamic OR TXA OR Cyklokapron OR Lysteda OR aminocaproic OR Amicar):ti,ab

28	((early OR accelerated OR immediate) NEAR/4 (ambulat* OR walking OR mobilization OR mobilisation OR motion OR weightbearing OR "weight bearing" OR rehabilitation)):ti,ab
29	#27 OR #28
30	#7 and #22
31	(#7 and #26)
32	#7 and #29 with Publication Year from 1995 to 2020, in Trials
33	(#30 OR #31) with Publication Year from 2013 to 2020, in Trials
35	#32 OR #33
36	(#32 OR #33) with Cochrane Library publication date from May 2020 to Jan 2021
37	
38	(#32 OR #33) with Cochrane Library publication date from Jan 2021 to Feb 2021
39	

AAOS Approval Bodies

Committee on Evidence Based Quality and Value

The committee on Evidence Based Quality and Value (EBQV) consists of twenty-three AAOS members who implement evidence-based quality initiatives such as clinical practice guidelines (CPGs), systematic literature reviews (SRs) and appropriate use criteria (AUCs). They also oversee the dissemination of related educational materials and promote the utilization of orthopaedic value products by the Academy's leadership and its members.

Council on Research and Quality

The Council on Research and Quality promotes ethically and scientifically sound clinical and translational research to sustain patient care in musculoskeletal disorders. The Council also serves as the primary resource for educating its members, the public, and public policy makers regarding evidenced-based medical practice, orthopaedic devices and biologics, regulatory pathways and standards development, patient safety, and other related important research and quality areas. The Council is comprised of the chairs of the committees on Devices, Biologics, and Technology, Patient Safety, Research Development, U.S. and chair and section leaders of the Evidence Based Quality and Value committee. Also, on the Council are the second vice-president, three members at large, and representatives of the Diversity Advisory Board, Women's Health Issues Advisory Board, Board of Specialty Societies (BOS), Board of Councilors (BOC), Communications Cabinet, Orthopaedic Research Society (ORS), Orthopedic Research and Education Foundation (OREF).

Board of Directors

The 17-member Board of Directors manage the affairs of the AAOS, set policy, and oversee the Strategic Plan

Review Organizations

Review of the clinical practice guideline is completed by interested external organizations. The AAOS solicits reviewers for each clinical practice guideline. They consist of experts in the topic area and represent professional societies other than AAOS. Review organizations are nominated by the clinical practice guideline development group at the introductory meeting. Review responses are available on www.aaos.org/quality.

Participation in the AAOS systematic literature review peer review process does not constitute an endorsement, nor does it imply that the reviewer supports this document.

Letters of Endorsement from External Organizations

January 3, 2022

Kaitlyn S. Sevarino
Director, Department of Clinical Quality and Value
sevarino@aaos.org

RE: AAHKS Endorsement of the AAOS Clinical Practice Guideline for the Management of Hip Fractures in Older Adults

Dear Ms. Sevarino:

The American Association of Hip and Knee Surgeons (AAHKS) has voted to endorse the AAOS Clinical Practice Guideline for the Management of Hip Fractures in Older Adults. This endorsement implies permission for the AAOS to officially list our organization as an endorser of this clinical practice guideline and reprint our logo in the introductory section of the clinical practice guideline review document.

Please note that while AAHKS representative participated in the guideline review at the AAOS, AAHKS feels that it would be able to provide the most value to the AAOS if allowed to share feedback during the open comment period.

Sincerely,



Richard Iorio, MD

AAHKS President

CC: Matthew S. Austin, MD, Evidence Based Medicine Committee Chair
Michael J. Zarski, JD, Executive Director
Josh Kerr, Deputy Executive Director



Orthopaedic Trauma Association

Education ■ Research ■ Advocacy

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March 14, 2022

Kaitlyn S. Sevarino, MBA, CAE
Director
Department of Clinical Quality and Value

Dear Ms. Sevarino,

The OTA Board of Directors has voted to endorse the AAOS Clinical Practice Guideline for the Management of Hip Fractures in Older Adults. This endorsement implies permission for the AAOS to officially list our organization as an endorser of this clinical practice guideline and reprint our logo in the introductory section of the clinical practice Guideline review document.

Sincerely,

Michael Archdeacon, MD
OTA President



March 17, 2022

Dear Ms. Sevarino,

The APTA Executive Committee of the Board of Directors has voted to endorse the AAOS Clinical Practice Guideline for the Management of Osteoarthritis of the Knee (Non-Arthroplasty) 3rd Edition and the AAOS Clinical Practice Guideline for the Management of Hip Fractures in Older Adults. This endorsement implies permission for the AAOS to officially list our organization as an endorser of this clinical practice guideline and reprint our logo in the introductory section of the clinical practice guideline review document.

Sincerely,

A handwritten signature in black ink that reads "Roger Herr". The signature is written in a cursive style with a long horizontal line extending to the right.

Roger Herr, PT
President, APTA



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March 22, 2022

Barb Krause
Quality Improvement Specialist
American Academy of Orthopaedic Surgeons
American Association of Orthopaedic Surgeons
9400 W. Higgins Road, Rosemont, IL 60018
Submitted Via Email: krause@aaos.org

RE: AAOS Clinical Practice Guideline for the Management of Hip Fractures in Older Adults

Dear Barb Krause,

The American Academy of Physical Medicine and Rehabilitation (AAPM&R) appreciates the opportunity to have participated in the development of the American Academy of Orthopaedic Surgeons (AAOS) Clinical Practice Guideline (CPG) for the Management of Hip Fractures in Older Adults. We also appreciate the opportunity to review the CPG for endorsement consideration. AAPM&R is the national medical specialty organization representing more than 9,000 physicians who are specialists in physical medicine and rehabilitation (PM&R). PM&R physicians, also known as physiatrists, treat a wide variety of medical conditions affecting the brain, spinal cord, nerves, bones, joints, ligaments, muscles, and tendons. PM&R physicians evaluate and treat injuries, illnesses, and disability, and are experts in designing comprehensive, patient-centered treatment plans. Physiatrists utilize cutting-edge as well as time-tested treatments to maximize function and quality of life.

We are pleased to inform you that the AAPM&R Clinical Practice Guideline (CPG) Committee has voted to **endorse** the AAOS CPG for the Management of Hip Fractures in Older Adults. The Committee evaluated this guideline using the Appraisal of Guidelines for Research & Evaluation (AGREE) II Tool. Overall, the Committee agreed that the guideline is well done and provides pertinent recommendations for managing hip fractures. However, the Committee did express concern with certain aspects regarding the methodology and development of the guideline.

There was concern that the CPG states that the GRADE framework was used to evaluate the evidence and formulate recommendations; however, the minimal criteria required to state GRADE was used (per the GRADE working group) were seemingly not met. GRADE methods are standardized, and it is not recommended that any modifications to them be made to them. There were no evidence profiles or summary of findings tables indicating how the overall quality of the evidence ratings were determined using GRADE methods. In addition, there is no documentation showing the GRADE EtD methods were followed for formulating recommendations and the recommendations themselves made are not in any of the standard formats recommended by GRADE. The Committee also highlighted that the guideline does not



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discuss patient representation or engagement, or how conflicts of interests were managed. Attached you will find an AGREE II analysis from the AAPM&R CPG Committee with domain scores and additional feedback.

Ultimately, the Committee believes this guideline is highly valuable and supports endorsement of the guideline. This endorsement implies permission for the AAOS to officially list our organization as an endorser of this clinical practice guideline and reprint our logo in the introductory section of the clinical practice guideline review document. AAPM&R would also like your permission to post the most updated version of the guideline on our website or, if you prefer, to provide a link to the guideline on your website.

Thank you, again, for the opportunity to review the AAOS CPG for the Management of Hip Fractures in Older Adults. If you have any additional questions or concerns, please contact Brit Johnson, Health Policy and State Legislative Affairs Manager, Department of Health Policy and Practice Services, at bjohnson@aapmr.org or (847) 737-6004.

Sincerely,

A handwritten signature in black ink, appearing to be 'D Lee'.

David W. Lee, MD
Clinical Practice Guidelines Committee, Chair

Tally for AAOS Management of Hip Fractures in the Elderly CPG													
			(Note - 1 is lowest and 7 is highest)	Rev 1	Rev 2	Rev 3	Rev 4	Rev 5	Rev 6	Tally	Max Score	Min Score	Domain Score
	Question		Reviewer/ Score 1-7										
Domain 1	1	The overall objective(s) of the guideline is (are) specifically described.		7	7	6	7	7	7	41			
	2	The health question(s) covered by the guideline is (are) specifically described.		7	7	7	7	7	7	42			
	3	The population (patients, public, etc.) to whom the guideline is meant to apply is specifically described.		7	7	7	7	7	7	42			
										125	126	18	99.00%
Domain 2	4	The guideline development group includes individuals from all relevant professional groups.		7	7	5	6	7	7	39			
	5	The views and preferences of the target population (patients, public, etc.) have been sought.		1	7	1	2		1	12			
	6	The target users of the guideline are clearly defined.		7	7	6	7	7	7	41			
										92	126	18	69.00%
Domain 3	7	Systematic methods were used to search for evidence.		7	7	1	7	6	7	35			
	8	The criteria for selecting the evidence are clearly described.		6	7	5	5	6	7	36			
	9	The strength and limitations of the body of evidence are clearly described.		6	6	2	5	6	5	30			
	10	The methods for formulating the recommendations are clearly described.		6	7	3	6	7	7	36			
	11	The health benefits, side effects, and risks have been considered in formulating the recommendations.		6	5	5	6	7	6	35			
	12	There is an explicit link between the recommendations and the supporting evidence.		7	7	1	6	7	7	35			
	13	The guideline has been externally reviewed by experts prior to its publication.		7	7	4	7	7	7	39			
	14	A procedure for updating the guideline is provided.		7	7	7	7	6	7	41			
										287	336	48	83.00%
Domain 4	15	The recommendations are specific and unambiguous.		7	7	3	7	7	7	38			
	16	The different options for management of the condition or health issue are clearly presented.		6	7	5	5	7	5	35			
	17	Key recommendations are easily identifiable.		7	7	6	7	7	7	41			
										114	126	18	89.00%
Domain 5	18	The guideline describes facilitators and barriers to its application.		6	7	4	6	6	5	34			
	19	The guideline provides advice and/or tools on how the recommendations can be put into practice.		6	6	1	6	6	6	31			
	20	The potential resource implications of applying the recommendations have been considered.		6	7	3	5	6	6	33			
	21	The guideline presents monitoring and/or auditing criteria.		6	4	1	5	7	3	26			
										124	168	24	62.00%
Domain 6	22	The views of the funding body have not influenced the content of the guideline.		7	1	4	7	7	1	27			
	23	Competing interests of guideline development group members have been recorded and addressed.		7	3	2	7	7	4	30			
										57	84	12	63.00%
	Overall:												
	1	Rate the overall quality of this guideline.		7	6	2	6	6	6	33	42	6	75%
	2	Overall Assessment: Endorsement / Affirmation / Rejection		Endorse	Endorse	Reject	Endorse	Endorse	Endorse				

Comments:

Domain 1: Scope and Purpose

Domain 2: Stakeholder Involvement

Q5. No attempt whatsoever to engage target population in selecting or prioritizing outcomes and no mention of any qualitative studies that document views and preferences. - R3

Q5. Did not see it in the CPG - R6

Domain 3: Rigor of Development

Q7. Can't really tell if this is true. No details provided about methods used for study selection (ie, how many independent reviewers, involved and processes for resolving discrepancies) search included .

Therefore cannot be confident that comprehensive search was performed or that no bias was introduced in the study selection process. - R3

Q9. They only describe strength/limitations based on numbers of studies of certain designs. GRADE methods for evaluation of the overall certainty of a body of literature make this determination based not only

on study design but by other factors such as including risk of bias, imprecision, indirectness, inconsistency, and publication bias. RCTs and NRSIs are given starting level of RoB as high and low, respectively. Based on these other factors, the overall quality of a body of evidence is upgraded or downgraded. This results in a rating of high, moderate, low, and very low overall quality or certainty. Judgments for each of these should be transparently reported on evidence summary tables. This document does not describe that methodology. In fact, they do not explain how the RoB results listed in Appendix are used to come up with "quality" rating. Confuses - R3

Q10. They say they used GRADE EtD framework but they really did not use it the way GRADE intends to be used; moreover, GRADE specifically advises against any modifications or adaptations of its methodology. In GRADE, quality of evidence is not up or downgraded on the basis of factors used to develop recommendations (eg, resources, patient preferences, harms vs benefits etc) - R3

Q11. Discuss harms vs benefits specifically, but it is unclear what the overall quality of evidence is for harms as opposed to effectiveness. - R3

Q12. It is impossible to judge this. They do not describe what methods were used to evaluate the "quality" of individual included studies, and exactly how this was used to then inform the "overall" evidence quality rating on a topic. For example, they provide "quality appraisal" tables but do not identify what tool is being applied. It appears (by the categories of the assessment listed) that the Cochrane RoB tool was used for "randomized" studies but yet the tables refer to quality not RoB (and they are not the same thing!). Do not recognize the tool they use for "observational" studies but does not appear to matter as all of these are rated "low certainty" so not sure why they did this. Their quality ratings may very well be correct but I cannot have any confidence they are because they don't transparently present that information. - R3

Q13. Appears it was only reviewed only by clinical experts but not any methodology or GRADE experts. - R3

Domain 4: Clarity of Presentation

Q15. The recommendations are specific in terms of the clinical scenarios; however they are very confusing because do not present EtD framework as recommended by GRADE. In GRADE, recommendations are either for vs against and conditional vs strong. The whole point of using GRADE is to the use of a common language for recommendations in actionable terms. Their creation of an "options" category that is also "GRADE-d" further muddles things. - R3

Domain 5: Applicability

Q18. Some description of acceptability issues for patients and physicians. was included - R3

Q19. - No information provided. - R3

Q20. Some mention of feasibility issues, but not investigated specifically with any data from economic or other studies. - R3

Q21. No information provided. - R3

Q21. Did not find info on the procedure and personnel involved to address monitoring or auditing. - R6

Domain 6: Editorial Independence

Q22. AAOS is the funding source for this documentation - R2

Q22. Assume not, but not explicitly addressed. - R3

Q22. Not explicitly described. - R6

Q23. They did record and provide the disclosure information. However, at least half of the guideline development group disclose financial COIs of high or moderate levels of seriousness. No information provided about how this was managed or justified. - R3

Q23. Not found in the CPG - R6

Overall:

I enjoyed reading and learning this CPG. I particularly liked the summary of the recommendations for quick review. - R2

Cannot recommend because of significant methodological concerns:

- 1) Lack of confidence in the evaluation of the certainty of evidence. Significant confusion about individual study "quality" vs overall "quality" ratings; in addition, RoB appears to be assessed in the "Quality appraisal" tables but is not mentioned at all in the document.
- 2) Did not apply GRADE methods for determining the overall quality of a body of evidence even though they indicate they followed some aspects of that process (eg, rating all observational studies (actually should be all NRSIs) low quality based on study design).
- 3) Did not apply GRADE methods for formulating recommendations which is not done by upgrading and downgrading. They did use some of the GRADE criteria for consideration in the Evidence to Decision framework (eg, feasibility, resources, etc) but did not actually follow GRADE methods for this.
- 4) They did not even acknowledge the fact that they used some variation of GRADE methodology (which is well described and has distinct components) let alone describe any justification for deviating from it (which GRADE advises against).

Important guideline related concerns as well:

- 1) No patient representation or involvement, direct or indirect
 - 2) COI concerns
 - 3) Did not address implementation issues
- R3

This CPG is well defined and described the pertinent aspects of Hip fractures. It is clearly one of the best CPGs I have reviewed. - R6