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Appendix 1 Search strategies

Phase one (identifying: (1) common comparators between exercise with oral non-steroidal anti-inflammatory drugs [NSAIDs] and paracetamol; (2) first part of direct evidence between exercise versus oral NSAIDs and paracetamol, i.e., randomised controlled trials [RCTs] comparing exercise with oral NSAIDs and paracetamol; and (3) first part of indirect evidence between exercise versus oral NSAIDs and paracetamol, i.e., RCTs comparing exercise with potential common comparators [e.g., usual care/no treatment/waiting list control, glucosamine sulphate/chondroitin sulphate, intra-articular hyaluronic acid, topical NSAIDs, acupuncture] that can connect exercise with oral NSAIDs and paracetamol):

MEDLINE (PubMed)
1. (exercise) OR (physical conditioning, human)
2. (Circuit-Based Exercise)
3. (exercise therapy) OR (motion therapy, continuous passive) OR (muscle stretching exercises) OR (plyometric exercise) OR (resistance training) OR (hydrotherapy) OR (rehabilitation) OR (activities of daily living) OR (dance therapy)
4. (muscle strength) OR (physical endurance) OR (anaerobic threshold) OR (exercise tolerance) OR (physical fitness) OR (postural balance) OR (posture) OR (psychomotor performance) OR (range of motion, articular)
5. (Pliability)
6. (movement) OR (motor activity) OR (exercise)
7. (Physical Exertion)
8. (Mind-Body Therapies)
9. (running) OR (jogging) OR (swimming) OR (walking)
10. (Isometric Contraction)
11. (exercise movement techniques) OR (breathing exercises) OR (qigong) OR (tai ji) OR (yoga) OR (pilates)
12. Propriocepti*[title/abstract]
13. Balanc*[title/abstract]
14. Aquat*[title/abstract]
15. Cycl*[title/abstract]
16. Aerobic*[title/abstract]
17. Strength*[title/abstract]
18. (((((tai-ji[Title/Abstract]) OR taiji[Title/Abstract]) OR tajiquan[Title/Abstract]) OR tai ji quan[Title/Abstract]) OR taichi[Title/Abstract]) OR t'ai chi[Title/Abstract]) OR tai chi chuan[Title/Abstract]
20. Therap*[title/abstract]
21. Physiotherapy*[title/abstract]
22. Train*[title/abstract]
23. neuromuscular training*[title/abstract]
24. treadmill[title/abstract]
25. OR/1-24
26. osteoarthritis*[tiab] OR osteoarthritis*[mh]
28. (knee*[tiab] OR hip*[tiab] OR joint*[tiab]) AND (pain*[tiab] OR discomfort*[tiab])
29. (knee*[tiab] OR hip*[tiab] OR joint*[tiab]) AND stiff*[tiab]
30. OR/26-29
31. random*[tiab] OR placebo*[tiab] OR controlled*[tiab] OR trial*[tiab]
32. (singl*[tiab] OR doubl*[tiab] OR tripl*[tiab]) and (mask*[tiab] OR blind*[tiab])
33. compar*[tiab]
34. OR/31-33
35. 25 AND 30 AND 34
Embase
1. ‘exercise’/exp
2. (exercise) OR (physical conditioning, human)
3. (Circuit-Based Exercise)
4. (exercise therapy) OR (motion therapy, continuous passive) OR (muscle stretching exercises) OR (plyometric exercise) OR (resistance training) OR (hydrotherapy) OR (rehabilitation) OR (activities of daily living) OR (dance therapy)
5. (muscle strength) OR (physical endurance) OR (anaerobic threshold) OR (exercise tolerance) OR (physical fitness) OR (postural balance) OR (posture) OR (psychomotor performance) OR (range of motion, articular)
6. (Pliability)
7. (movement) OR (motor activity) OR (exercise)
8. (Physical Exertion)
9. (Mind-Body Therapies)
10. (running) OR (jogging) OR (swimming) OR (walking)
11. (Isometric Contraction)
12. (exercise movement techniques) OR (breathing exercises) OR (qigong) OR (tai ji) OR (yoga) OR (pilates)
13. Propriocepti*:ti,ab
14. Balanc*:ti,ab
15. Aquat*:ti,ab
16. Cycl*:ti,ab
17. Aerobic*:ti,ab
18. Strength*:ti,ab
19. (tai-ji OR taiji OR taijiquan OR tai ji quan OR tai chi OR taichi OR tai chi chuan):ti,ab
20. (qigong OR qi gong OR chi kung OR chikung OR chi kung):ti,ab
21. Therap*:ti,ab
22. Physiotherapy*:ti,ab
23. Train*:ti,ab
24. neuromuscular training:ti,ab
25. treadmill:ti,ab
26. OR/1-25
27. ‘osteoarthritis’/exp
28. (osteoarthritis* OR ostearthro* OR gonarthriti* OR gonarthro* OR gonartho* OR coxarthriti* OR coxarthro* OR arthros* OR arthrot*):ti,ab
29. ((knee* OR hip* OR joint*) near/3 (pain* OR ach* OR discomfort*)):ti,ab
30. ((knee* OR hip* OR joint*) near/3 stiff*):ti,ab
31. OR/27-30
32. (random* or controlled or trial* or placebo):ti,ab
33. ((singl* or doubl*or tripl*) and (mask* or blind*)):ti,ab
34. (compar*):ti,ab
35. OR/32-34
36. 26 AND 31 AND 35
Web of science

1. TITLE: ((exercise OR physical conditioning, human OR Circuit-Based Exercise OR exercise therapy OR motion therapy, continuous passive OR muscle stretching exercises OR plyometric exercise OR resistance training OR hydrotherapy OR rehabilitation OR activities of daily living OR dance therapy OR muscle strength OR physical endurance OR anaerobic threshold OR exercise tolerance OR physical fitness OR postural balance OR posture OR psychomotor performance OR range of motion, articular OR Pliability OR movement OR motor activity OR Physical Exertion OR Mind-Body Therapies OR running OR jogging OR swimming OR walking OR Isometric Contraction OR exercise movement techniques OR breathing exercises OR qigong OR tai ji OR yoga OR pilates OR Propriocepti* OR Balanc* OR Aquat* OR Cycl* OR Aerobic OR Strength* OR tai-ji OR taiji OR taijiquan OR tai ji quan OR tai chi OR taichi OR tai chi chuan OR qigong OR qi gong OR chikung OR chi kung OR Therap* OR Physiotherapy* OR Train* OR neuromuscular training OR treadmill))

2. TITLE: (osteoarthriti* OR osteoarthro* OR gonarthriti* OR gonarthro* OR coxarthriti* OR coxarthro* OR coxarth* OR arthros* OR arthrot*)

3. TITLE: (random* OR control* OR placebo)

4. TITLE: ((singl* OR doubl* OR tripl*) and (mask* OR blind*))

5. TITLE: (compar*)

6. OR/3-5

7. 1 AND 2 AND 6
Cochrane Library

1. MeSH descriptor Osteoarthritis explode all trees
2. (osteoarthritis* OR osteoarthro* OR gonarthriti* OR gonarthro* OR coxarthriti* OR coxarthro* OR arthros* OR arthrot*):ti,ab,kw
3. 1 OR 2
4. MESH descriptor exercise explode all trees
5. (exercise) OR (physical conditioning, human)
6. (Circuit-Based Exercise)
7. (exercise therapy) OR (motion therapy, continuous passive) OR (muscle stretching exercises) OR (plyometric exercise) OR (resistance training) OR (hydrotherapy) OR (rehabilitation) OR (activities of daily living) OR (dance therapy)
8. (muscle strength) OR (physical endurance) OR (anaerobic threshold) OR (exercise tolerance) OR (physical fitness) OR (postural balance) OR (posture) OR (psychomotor performance) OR (range of motion, articular)
9. (ibility)
10. (movement) OR (motor activity) OR (exercise)
11. (Physical Exertion)
12. (Mind-Body Therapies)
13. (running) OR (jogging) OR (swimming) OR (walking)
14. (Isometric Contraction)
15. (exercise movement techniques) OR (breathing exercises) OR (qigong) OR (tai ji) OR (yoga) OR (pilates)
16. Propriocepti*:ab,ti
17. Balance*:ab,ti
18. Aquat*:ab,ti
19. Cycl*:ab,ti
20. Aerobic:ab,ti
21. Strength*:ab,ti
22. (tai-ji OR taiji OR taijiquan OR tai ji quan OR tai chi OR taichi OR tai chi chuan):ab,ti
23. (qigong OR qi gong OR chi kung OR chikung OR ch i kung):ab,ti
24. Therap*:ab,ti
25. Physiotherapy*:ab,ti
26. Train*:ab,ti
27. neuromuscular training:ab,ti
28. treadmill:ab,ti
29. OR/4-28
30. 3 AND 29
Scopus
1. TITLE-ABS(exercise)
2. TITLE-ABS(“exercise therapy”) OR (“motion therapy”) OR (“muscle stretching exercises”) OR (“plyometric exercise”) OR (“resistance training”) OR (“hydrotherapy”) OR (“rehabilitation”) OR (“activities of daily living”) OR (“dance therapy”) OR (“Mind-Body Therapies”) OR (“neuromuscular training”) OR ((running) OR (jogging) OR (swimming) OR (walking)))
3. TITLE-ABS(Propriocepti*)
4. TITLE-ABS(Balanc*)
5. TITLE-ABS(Aquat*)
6. TITLE-ABS(Cycl*)
7. TITLE-ABS(Aerobic)
8. TITLE-ABS(Strength*)
9. OR/1-8
10. TITLE-ABS(osteoarthriti*)
11. TITLE-ABS(osteoarthro* OR gonarthriti* OR gonarthro* OR coxarthriti* OR coxarthro* OR osteo?arthritis)
12. OR/10-11
13. TITLE-ABS(random* OR placebo OR controlled OR trial*)
14. TITLE-ABS(singl* OR doubl* OR tripl*) and TITLE-ABS(mask* OR blind*)
15. TITLE-ABS(compar*)
16. OR/13-15
17. 9 AND 12 AND 16
**Phase two** (identifying: (1) second part of direct evidence between exercise versus oral NSAIDs and paracetamol; and (2) second part of indirect evidence between exercise versus oral NSAIDs and paracetamol, i.e., RCTs comparing exercise or oral NSAIDs and paracetamol with potential common comparators [e.g., usual care/no treatment/waiting list control, glucosamine sulphate/chondroitin sulphate, intra-articular hyaluronic acid, topical NSAIDs, acupuncture] that can connect exercise with oral NSAIDs and paracetamol):

**MEDLINE (PubMed)**
1.1 Search strategies for oral NSAIDs and paracetamol vs. all interventions


5. (Acetaminophen OR Paracetamol OR Tylenol OR ibuprofen OR ketoprofen OR fenoprofen OR oxaprozin OR sulindac OR flurbiprofen OR diclofenac OR naproxen OR tenoxicam OR piroxicam OR droxicam OR indometacin OR indohecin OR feprazone OR phenylbutazone OR isoxicam OR meclofenamate OR ketorolac OR lornoxicam OR nabumetone OR meloxicam OR aceclofenac OR alelofenac OR dexibuprofen OR dexketoprofen OR metaboliz OR phenazone OR propyphenazone OR Prenazon OR ximoprofen OR Apazone OR Bexufexamac OR Clonixin OR Curcumix OR Dextubuprofen OR Dipyrrone OR Epirizole OR Fenbufen OR Fenclonin OR Lederer OR “Niflumic Acid” OR Oxyphenbutazone OR pirazolac OR piprofen OR Ponstan OR Suprofen OR “Tiaprofenic acid” OR “tolfenamic acid” OR Tolmetin OR “meclofenamic acid” OR “mefenamic acid”)[tiab]

6. (coxib* OR apric Coxib OR celecoxib OR cimicoxib OR darbufelone OR deracoxib OR etoricoxib OR firocoxib OR flusulide OR lumiracoxib OR mavacoxib OR methanesulfonamide OR nimesulide OR parecoxib OR robencoxib OR roxecoxib OR valdecoxib OR vedaprofen OR etodolac OR rofenoxib OR vioxox OR Celebrex OR bextra OR prexige OR arcbox OR floctafenine OR meclofenam* OR Mesalamine OR Ceoxx OR Ceeoxx OR Cimalgex OR Deramaxx OR Onsior OR “JTE-522” OR movalis OR mobec OR Mobic OR movicox OR mobic Ox OR paroxic OR uticox OR Daypro OR Dayrun OR Duraprox OR meclomen OR Ponstan OR Xeef OR Seractil OR Antipyrene OR Metherazone OR Loxonin OR indoprofen OR Diflunisal
OR Carprofen OR “Flufenamic acid” OR Flunixin OR Ramifenazone)
7. OR/1-6
8. osteoarthriti*[tiab] OR osteoarthriti*[mhi]
10. 8 OR 9
11. random*[tiab] OR placebo*[tiab] OR controlled*[tiab] OR trial*[tiab]
12. (singl*[tiab] OR doubl*[tiab] OR tripl*[tiab]) and (mask*[tiab] OR blind*[tiab])
13. compar*[tiab]
14. OR/11-13
15. 7 AND 10 AND 14

1.2 Search strategies for exercise vs. all interventions
1. (exercise) OR (physical conditioning, human)
2. (Circuit-Based Exercise)
3. (exercise therapy) OR (motion therapy, continuous passive) OR (muscle stretching exercises) OR (plyometric exercise) OR (resistance training) OR (hydrotherapy) OR (rehabilitation) OR (activities of daily living) OR (dance therapy)
4. (muscle strength) OR (physical endurance) OR (anaerobic threshold) OR (exercise tolerance) OR (physical fitness) OR (postural balance) OR (posture) OR (psychomotor performance) OR (range of motion, articular)
5. (Pliability)
6. (movement) OR (motor activity) OR (exercise)
7. (Physical Exertion)
8. (Mind-Body Therapies)
9. (running) OR (jogging) OR (swimming) OR (walking)
10. (Isometric Contraction)
11. (exercise movement techniques) OR (breathing exercises) OR (qigong) OR (tai ji) OR (yoga) OR (pilates)
12. Propriocepti*[title/abstract]
13. Balanc*[title/abstract]
14. Aquat*[title/abstract]
15. Cycl*[title/abstract]
16. Aerobic*[title/abstract]
17. Strength*[title/abstract]
18. ((((((tai-ji[Title/Abstract]) OR taiji[Title/Abstract]) OR taijiquan[Title/Abstract]) OR tai ji quan[Title/Abstract]) OR tai chi[Title/Abstract]) OR taichi[Title/Abstract]) OR t ai chi[Title/Abstract]) OR t'ai chi[Title/Abstract]) OR tai chi chuan[Title/Abstract]
20. Therap*[title/abstract]
21. Physiotherapy*[title/abstract]
22. Train*[title/abstract]
23. neuromuscular training*[title/abstract]
24. treadmill[title/abstract]
25. OR/1-24
26. osteoarthriti*[tiab] OR osteoarthriti*[mh]
28. (knee*[tiab] OR hip*[tiab] OR joint*[tiab]) AND (pain*[tiab] OR discomfort*[tiab])
29. (knee*[tiab] OR hip*[tiab] OR joint*[tiab]) AND stiff*[tiab]
30. OR/26-29
31. random*[tiab] OR placebo*[tiab] OR controlled*[tiab] OR trial*[tiab]
32. (singl*[tiab] OR doubl*[tiab] OR tripl*[tiab]) and (mask*[tiab] OR blind*[tiab])
33. compar*[tiab]
34. OR/31-33
35. 25 AND 30 AND 34
Search strategies for oral NSAIDs and paracetamol vs. all interventions

1. ((nonsteroid antiinflammatory agent*) OR (non-steroidal anti-inflammatory agent*) OR NSAIDs):ti,ab
2. ((Cyclooxygenase 2 Inhibitor*) OR (cyclooxygenase-2 inhibitor*) OR (cyclooxygenase-II inhibitor*) OR (cyclo-oxygenase-2 inhibitor*) OR (COX2 inhibitor*) OR (COX-2 inhibitor*) OR (COX-II inhibitor*) OR (COXII inhibitor*)):ti,ab
3. (Acetaminophen OR Paracetamol OR Tylenol OR ibuprofen OR ketoprofen OR fenoprofen OR oxaprozin OR sulindac OR flurbiprofen OR diclofenac OR naproxen OR tenoxicam OR piroxicam OR droticin OR indometacin OR indomethacin OR fenprocine OR phenylbutazone OR isoxicam OR meflofenamate OR ketorolac OR lornoxicam OR nabumetone OR meloxicam OR aceclofenac OR alclofenac OR dexibuprofen OR dexketoprofen OR metamizol OR phenozone OR propyphenazone OR Prenazone OR ximoprofen OR Apazone OR Bufexamac OR Clonixin OR Curcumin OR Dixibuprofen OR Dipyrone OR Epirizole OR Fenbufen OR Fenclofenac OR Lederfen OR “Niflumic Acid” OR Oxyphenbutazone OR pirazolac OR nirprofen OR Lonprofen OR Suprofen OR “Tiaprofenic acid” OR “tolfenamic acid” OR Tolmetin OR “mefenamic acid” OR “mefenamic acid”:ti,ab
4. (coxib* OR apricoxib OR celecoxib OR cimicoxib OR darbufelone OR deroxib OR etoricoxib OR firocoxib OR Ifosulide OR lumiracoix OR mavacoxib OR methanesulfonamide OR nimesulide OR parecoxib OR robencoxib OR tiracoxib OR valdecoxib OR vedaprofen OR etodolac OR rofécoxib OR vioxx OR Celebrex OR bextra OR prestige OR arcocia OR fleofthenine OR meclofenam* OR Mesalamine OR Ceoxx OR Ceeoxx OR Cimalgex OR Deramaxx OR Onsior OR “JTE-522” OR movalis OR Mobec OR Mobic OR movicix OR mobicox OR paromin OR uticox OR Daypro OR Dayrun OR Duraprox OR melenem OR Ponstan OR Xefo OR Seractil OR Antipyrine OR Metherazone OR Loxonin OR indoprofen OR Difunisal OR Caprofen OR “Flufenamic Acid” OR Flunixin OR Ramifenaenzo):ti,ab
5. OR/1-4
6. (osteoarthriti* OR osteoarthro* OR gonarthriti* OR gonarthro* OR coxarthriti* OR coxarthro* OR arthros* OR arthrot*):ti,ab
7. (random* OR controlled OR trial* OR placebo):ti,ab
8. (singl* OR doubl*OR tripl*) and (mask* OR blind*)):ti,ab
9. (compar*):ti,ab
10. OR/7-9
11. 5 AND 6 AND 10

Search strategies for exercise vs. all interventions

1. ‘exercise’:exp
2. (exercise) OR (physical conditioning, human)
3. (Circuit-Based Exercise)
4. (exercise therapy) OR (motion therapy, continuous passive) OR (muscle stretching exercises) OR (plyometric exercise) OR (resistance training) OR (hydrotherapy) OR (rehabilitation) OR (activities of daily living) OR (dance therapy)
5. (muscle strength) OR (physical endurance) OR (anaerobic threshold) OR (exercise tolerance) OR (physical fitness) OR (postural balance) OR (posture) OR (psychomotor performance) OR (range
of motion, articular)
6 (Pliability)
7 (movement) OR (motor activity) OR (exercise)
8 (Physical Exertion)
9 (Mind-Body Therapies)
10 (running) OR (jogging) OR (swimming) OR (walking)
11 (Isometric Contraction)
12 (exercise movement techniques) OR (breathing exercises) OR (qigong) OR (tai ji) OR (yoga) OR (pilates)
13 Propriocepti*,ti,ab
14 Balanc*,ti,ab
15 Aquat*,ti,ab
16 Cycl*,ti,ab
17 Aerobic*,ti,ab
18 Strength*,ti,ab
19 (tai-ji OR taiji OR taijiquan OR tai ji quan OR tai chi OR tai chi chuan):ti,ab
20 (qigong OR qi gong OR chi kung OR chikung OR chi kung):ti,ab
21 Therap*,ti,ab
22 Physiotherapy*,ti,ab
23 Train*,ti,ab
24 neuromuscular training:ti,ab
25 treadmill:ti,ab
26 OR/1-25
27 ‘osteoarthritis’/exp
28 (osteoarthriti* OR osteoarthro* OR gonarthritis* OR gonarthro* OR gonarthro* OR coxarthriti*
   OR coxarthro* OR arthros* OR arthrot*):ti,ab
29 ((knee* OR hip* OR joint*) near/3 (pain* OR ach* OR discomfort*)):ti,ab
30 ((knee* OR hip* OR joint*) near/3 stiff*):ti,ab
31 OR/27-30
32 (random* or controlled or trial* or placebo):ti,ab
33 ((singl* or doubl*or tripl*) and (mask* or blind*)):ti,ab
34 (compar*):ti,ab
35 OR/32-34
36 26 AND 31 AND 35
Web of science

3.1 Search strategies for oral NSAIDs and paracetamol vs. all interventions

1. TITLE: (“non-steroidal anti-inflammatory agents” OR “anti-inflammatory agents, non-steroidal” OR “antiinflammatory agents, non-steroidal” OR “Anti-Inflammatory Agents, Non-Steroidal” OR “NSAID*” OR “nonsteroidal antiinflammatory” OR “non-steroidal anti-inflammatory”)

2. TITLE: ((Cyclooxygenase 2 Inhibitor*) OR (cyclooxygenase-2 inhibitor*) OR (cyclooxygenase-II inhibitor*) OR (cyclo-oxygenase-2 inhibitor*) OR (cyclo-oxygenase-II inhibitor*) OR (COX2 inhibitor*) OR (COX-2 inhibitor*) OR (COX-II inhibitor*) OR (COXII inhibitor*))

3. TITLE: (Acetaminophen OR Paracetamol OR Tylenol OR ibuprofen OR ketoprofen OR fenoprofen OR oxaprozin OR sulindac OR flurbiprofen OR diclofenac OR naproxen OR tenoxicam OR piroxicam OR d Roxicam OR Indometacin OR Indomethacin OR Feprazone OR phenylbutazone OR isoxicam OR meclofenamate OR ketorolac OR Iornoxicam OR nabumetone OR meloxicam OR aceclofenac OR aleofencan OR dexibuprofen OR dexketoprofen OR metamizol OR phenazone OR propyphenazone OR Prenazone OR ximoprofen OR Apazone OR Bufexamac OR Clonixin OR Curcumin OR Dextruprofen OR Dipyrone OR Epiprolide OR Fenbufen OR Fenclu fenac OR Lederfen OR “Niflumic Acid” OR Oxyphenbutazone OR pirazolac OR piroprofen OR Ponstan OR Suprofen OR Suprofen OR “Tiaprofenic acid” OR Tolmetin OR “meclofenamic acid” OR “mefenamic acid” OR coxib* OR apricobix OR celecoxib OR cimicoxib OR darfucelone OR deroxacin OR etricoxib OR firocoxib OR flusulide OR lumiracoxib OR mavacoxyb OR methanesulfonamide OR nimesulide OR parecoxib OR robenacoxib OR tiraioxuc OR valdcoxib OR vedaproxen OR etodolac OR rofinoxib OR vioxx OR Celebrex OR Bextra OR prexige OR arcoxia OR floctafenine OR meclofenam* OR Mesalamine OR Ceeox OR Ceeox OR Cimalgex OR Deramaxx OR Onsior OR “JTE-522” OR movalis OR mobec OR Mobic OR molicox OR mobicino OR parocin OR uticox OR Daypro OR Dayrun OR Duraprox OR meclomen OR Ponstan OR Xefo OR Seractil OR Antipyrine OR Metherazone OR Loxonin OR indoprofen OR Diflunisal OR Carprofen OR “Flufenamic acid” OR Flu nimix OR Ramifenazone)

4. OR/1-3

5. TITLE: (osteoarthirit* OR osteoarthro* OR gonarthriti* OR gonarthro* OR coxarthriti* OR coxarthro* OR arthros* OR arthrot*)

6. TITLE: (random* OR control* OR placebo)

7. TITLE: ((singl* OR doubl* OR tripl*) and (mask* OR blind*))

8. TITLE: (compar*)

9. OR/6-8

10. 4 AND 5 AND 9

3.2 Search strategies for exercise vs. all interventions

1. TITLE: ((exercise OR physical conditioning, human OR Circuit-Based Exercise OR exercise therapy OR motion therapy, continuous passive OR muscle stretching exercises OR plyometric exercise OR resistance training OR hydrotherapy OR rehabilitation OR activities of daily living OR dance therapy OR muscle strength OR physical endurance OR anaerobic threshold OR exercise tolerance OR physical fitness OR postural balance OR posture OR psychomotor performance OR range of motion, articular OR Pliability OR movement OR motor activity OR Physical Exertion OR Mind-Body Therapies OR running OR jogging OR swimming OR walking

13
OR Isometric Contraction OR exercise movement techniques OR breathing exercises OR qigong OR tai ji OR yoga OR pilates OR Propriocepti* OR Balanc* OR Aquat* OR Cycl* OR Aerobic OR Strength* OR tai-ji OR taiji OR tajiquan OR tai ji quan OR tai chi OR taichi OR tai chi chuan OR qigong OR qi gong OR chikung OR chi kung OR Therap* OR Physiotherapy* OR Train* OR neuromuscular training OR treadmill))

2. TITLE: (osteoarthritis* OR osteoarthro* OR gonarthriti* OR gonarthro* OR coxarthriti* OR coxarthro* OR arthros* OR arthrop*)

3. TITLE: (random* OR control* OR placebo)

4. TITLE: ((singl* OR doubl* OR tripl*) and (mask* OR blind*))

5. TITLE: (compar*)

6. OR/3-5

7. 1 AND 2 AND 6
Cochrane Library

4.1 Search strategies for oral NSAIDs and paracetamol vs. all interventions
1. MeSH descriptor Osteoarthritis explode all trees
2. (osteoarthritis* OR osteoarthro* OR gonarthriti* OR gonarthro* OR coxarthriti* OR coxarthro* OR arthros* OR arthrot*):ti,ab,kw
3. 1 OR 2
4. MESH descriptor “anti-inflammatory agents, non-steroidal” explode all trees
5. MESH descriptor “cyclooxygenase 2 inhibitor” explode all trees
6. (Acetaminophen OR Paracetamol OR Tylenol OR ibuprofen OR ketoprofen OR fenoprofen OR oxaprozin OR sulindac OR flurbiprofen OR diclofenac OR naproxen OR tenoxicam OR piroxicam OR d Roxicam OR indometacin OR indomethacin OR feprazone OR phenylbutazone OR isoxicam OR Meclofenamate OR ketorolac OR Iromoxicam OR nabumetone OR meloxicam OR aceclofenac OR alclofenac OR dexibuprofen OR dexketoprofen OR metamizol OR phenazone OR propyphenazone OR Prenazone OR ximoprofen OR Apazone OR Bucexamace OR Clonixin OR Curcumin OR Dexibuprofen OR Dipyrone OR Epriazole OR Fenbufen OR Fenclofenac OR Lederfen OR “Niflumic Acid” OR Oxyphenbutazone OR pirazolac OR piroprofen OR Ponzan OR Suprofen OR “Tiaprofenic acid” OR “tofenamic acid” OR Tolmetin OR “meclofenamic acid” OR “mefenamic acid”):ti,ab,kw
7. (coxib* OR apricoxib OR celecoxib OR cimicloxib OR darbufelone OR deroxxib OR etoricoxib OR firocoxib OR flosulide OR limaracoxib OR mavacoxib OR methanesulfonamide OR nimesulide OR parecoxib OR robenacoxib OR iraconoxib OR valdecoxib OR vedaprofen OR etodolac OR rofecoxib OR vioxx OR Celebrex OR bextra OR prexige OR arcoxia OR floctafenine OR moflofenam* OR Mesalamine OR Ceox OR Ceeox OR Cimalgex OR Deramaxx OR Onsior OR “JTE-522” OR movalis OR mobec OR Mobic OR movicox OR mobicox OR parocin OR uticox OR Daypro OR Dayrun OR Duraprox OR meclomen OR Ponzan OR Xefo OR Seractil OR Antipyrine OR Metherazon OR Loxoxin OR indoprofen OR Diflunisal OR Carprofen OR “Flunefamic acid” OR Flunixin OR Ramifenazone):ti,ab,kw
8. OR/4-7
9. 3 AND 8

4.2 Search strategies for exercise vs. all interventions
1. MeSH descriptor Osteoarthritis explode all trees
2. (osteoarthritis* OR osteoarthro* OR gonarthriti* OR gonarthro* OR coxarthriti* OR coxarthro* OR arthros* OR arthrot*):ti,ab,kw
3. 1 OR 2
4. MESH descriptor exercise explode all trees
5. (exercise) OR (physical conditioning, human)
6. (Circuit-Based Exercise)
7. (exercise therapy) OR (motion therapy, continuous passive) OR (muscle stretching exercises) OR (plyometric exercise) OR (resistance training) OR (hydrotherapy) OR (rehabilitation) OR (activities of daily living) OR (dance therapy)
8. (muscle strength) OR (physical endurance) OR (anaerobic threshold) OR (exercise tolerance) OR (physical fitness) OR (postural balance) OR (posture) OR (psychomotor performance) OR (range of motion, articular)
9. (Pliability)
10. (movement) OR (motor activity) OR (exercise)
11. (Physical Exertion)
12. (Mind-Body Therapies)
13. (running) OR (jogging) OR (swimming) OR (walking)
14. (Isometric Contraction)
15. (exercise movement techniques) OR (breathing exercises) OR (qigong) OR (tai ji) OR (yoga) OR (pilates)
16. Propriocepti*:ab,ti
17. Balane*:ab,ti
18. Aquat*:ab,ti
19. Cycl*:ab,ti
20. Aerobic:ab,ti
21. Strength*:ab,ti
22. (tai-ji OR taiji OR taijiquan OR tai ji quan OR tai chi OR taichi OR tai chi quan):ab,ti
23. (qigong OR qi gong OR chi kung OR chikung OR ch i kung):ab,ti
24. Therap*:ab,ti
25. Physiotherapy*:ab,ti
26. Train*:ab,ti
27. neuromuscular training:ab,ti
28. treadmill:ab,ti
29. OR/4-28
30. 3 AND 29
Scopus:

5.1 Search strategies for oral NSAIDs and paracetamol vs. all interventions


2. (“Cyclooxygenase 2 Inhibitors”) OR TITLE-ABS(cyclooxygenase-2 and inhibitor*) OR TITLE-ABS(cyclooxygenase-II and inhibitor*) OR TITLE-ABS(cyclo-oxygenase-2 and inhibitor*) OR TITLE-ABS(cyclo-oxygenase-II and inhibitor*) OR TITLE-ABS(COX2 and inhibitor*) OR TITLE-ABS(COX-II and inhibitor*) OR TITLE-ABS(COX/II and inhibitor*)

3. TITLE-ABS(cyclooxygenase-2 and antagonist*) OR TITLE-ABS(cyclooxygenase-II and antagonist*) OR TITLE-ABS(cyclo-oxygenase-2 and antagonist*) OR TITLE-ABS(cyclo-oxygenase-II and antagonist*) OR TITLE-ABS(COX2 and antagonist*) OR TITLE-ABS(COX-II and antagonist*) OR TITLE-ABS(COXII and antagonist*)

4. TITLE-ABS(prostaglandin and synthase and inhibitor) OR TITLE-ABS(prostaglandin and synthase and inhibitor*) OR TITLE-ABS(prostaglandin and synthase and antagonist) OR TITLE-ABS(prostaglandin and synthase and antagonist*)

5. TITLE-ABS(Acetaminophen) OR (Paracetamol) OR (Tylenol) OR (ibuprofen) OR (ketoprofen) OR (fenoprofen) OR (oxaprozin) OR (sulindac) OR (flurbiprofen) OR (diclofenac) OR (naproxen) OR (tenoxicam) OR (piroxicam) OR (droticam) OR (indomethacin) OR (indomethacin) OR (feprazone) OR (phenylbutazone) OR (isoxicam) OR (melcufenamate) OR (ketorolac) OR (lornoxicam) OR (nabumetone) OR (meloxicam) OR (aceclofenac) OR (alclofenac) OR (dextibuprofen) OR (dextekotrofen) OR (metamizole) OR (phenazone) OR (propyphenazone) OR (Prenazone) OR (ximoprofen) OR (Apazone) OR (B Rufexamac) OR (Clonixin) OR (Curcumin) OR (Dexibuprofen) OR (Dipyrene) OR (Epirizole) OR (Fenbufen) OR (Fenclofenac) OR (Lederfen) OR (“Niflumic Acid”) OR (Oxyphenbutazone) OR (pirazolac) OR (pirprofen) OR (Ponstan) OR (Suprofen) OR (“Tiaprofenic acid”) OR (“tofenamic acid”) OR (Tolmetin) OR (“meclofenamic acid”) OR (“mefenamic acid”)

6. TITLE-ABS(coxib*) OR (apricoxib) OR (celecoxib) OR (cimicoxib) OR (darbufelone) OR (deracoxib) OR (etoricoxib) OR (firocoxib) OR (flosulide) OR (lumiracoixib) OR (mavacoixib) OR (methanesulfonamide) OR (nimesulide) OR (parecoxib) OR (robencoxib) OR (irmacoxib) OR (valdecoxib) OR (vedaprofen) OR (etodolac) OR (rofecoxib) OR (vioxox) OR (Celebex) OR (bextra) OR (prexige) OR (arcxia) OR (floceline) OR (meclofenam*) OR (Mesalamine) OR (Ceox) OR (Ceeox) OR (Cimalgex) OR (Deramaxx) OR (Onsiar) OR (“JTE-522”) OR (novalis) OR (mobeo) OR (Mobic) OR (movicox) OR (mobicox) OR (parolin) OR (uticox) OR (Daypro) OR (Dayrun) OR (Duprox) OR (meclomen) OR (Ponstan) OR (Xefo) OR (Seraclit) OR (Antipyrie) OR (Metherazon) OR (Loxonin) OR (indoprofen) OR (Diflunisal) OR (Carprofen) OR (“Flufenamic acid”) OR (Flunixin) OR (Ramifenzane)

7. OR/1-6

8. TITLE-ABS(osteoarthriti*)

9. TITLE-ABS((osteoarthro*) OR (gonarthriti*) OR (gonarthro*) OR (coxarthriti*) OR (coxarthro*)

17
OR (osteo?arthritis))
10. 8 OR 9
11. TITLE-ABS(random* OR placebo OR controlled OR trial*)
12. TITLE-ABS((singl* OR doubl* OR tripl*) and (mask* OR blind*))
13. TITLE-ABS(compar*)
14. OR/11-13
15. 7 AND 10 AND 14

5.2 Search strategies for exercise vs. all interventions
1. TITLE-ABS(exercise)
2. TITLE-ABS(“exercise therapy”) OR (“motion therapy”) OR (“muscle stretching exercises”) OR (“plyometric exercise”) OR (“resistance training”) OR (“hydrotherapy”) OR (“rehabilitation”) OR (“activities of daily living”) OR (“dance therapy”) OR (“Mind-Body Therapies”) OR (“neuromuscular training”) OR ((running) OR (jogging) OR (swimming) OR (walking))
3. TITLE-ABS(Propriocepti*)
4. TITLE-ABS(Balanc*)
5. TITLE-ABS(Aquat*)
6. TITLE-ABS(Cycl*)
7. TITLE-ABS(Aerobic)
8. TITLE-ABS(Strength*)
9. OR/1-8
10. TITLE-ABS(osteoarthriti*)
11. TITLE-ABS(osteoarthro* OR gonarthriti* OR gonarthro* OR coxarthriti* OR coxarthro* OR osteo?arthritis)
12. OR/10-11
13. TITLE-ABS(random* OR placebo OR controlled OR trial*)
14. TITLE-ABS((singl* OR doubl* OR tripl*) and (mask* OR blind*))
15. TITLE-ABS(compar*)
16. OR/13-15
17. 9 AND 12 AND 16
Appendix 2 NMA-SoF table for comparison between exercise and oral NSAIDs and paracetamol

**Bayesian NMA-SoF table**

**Comparative efficacy of exercise therapy and oral non-steroidal anti-inflammatory drugs and paracetamol for knee or hip osteoarthritis: a network meta-analysis of randomised controlled trials**

**Patient or population:** Patients with knee or hip osteoarthritis  
**Interventions:** Exercise  
**Comparator (reference):** Oral NSAIDs and paracetamol  
**Outcome:** Pain and function at or nearest to four weeks, at eight weeks and at 24 weeks  
**Setting:** Outpatient or community

<table>
<thead>
<tr>
<th>Outcomes***</th>
<th>Total studies:</th>
<th>Comparative efficacy* and ranks**</th>
<th>Certainty of evidence</th>
<th>Interpretation of Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total participants:</td>
<td>Exercise</td>
<td>Oral NSAIDs and paracetamol</td>
<td></td>
</tr>
</tbody>
</table>
| At or nearest to four weeks | 47 RCTs 4,377 participants | SMD: -0.12 (-1.74, 1.50)  
Ranks: 3.2 | SMD: reference  
Ranks: 3.0 | ⬤⬤⬤⬤  
Low Due to Risk of bias and Inconsistency | - |
| Function | 40 RCTs 2,968 participants | SMD: 0.09 (-1.69, 1.85)  
Ranks: 2.8 | SMD: reference  
Ranks: 3.1 | ⬤⬤⬤⬤  
Low Due to Risk of bias and Inconsistency | - |
| At eight weeks | 2 RCTs 210 participants | SMD: 0.22 (-0.05, 0.49)  
Ranks: 1.3 | SMD: reference  
Ranks: 1.7 | ⬤⬤⬤⬤  
High | - |
| Function | 2 RCTs 214 participants | SMD: 0.06 (-0.20, 0.33)  
Ranks: 1.4 | SMD: reference  
Ranks: 1.6 | ⬤⬤⬤⬤  
High | - |
| At 24 weeks | 9 RCTs 2,141 participants | SMD: 0.17 (-0.77, 1.12)  
Ranks: 2.3 | SMD: reference  
Ranks: 2.9 | ⬤⬤⬤⬤  
Moderate Due to Risk of bias | - |
| Function | 9 RCTs 2,141 participants | SMD: 0.05 (-1.15, 1.24)  
Ranks: 2.6 | SMD: reference  
Ranks: 2.7 | ⬤⬤⬤⬤  
Moderate Due to Risk of bias | - |

**NMA-SoF table definitions**  
* Estimates are reported as mean difference and credible interval (CrI). Results are expressed in credible intervals as opposed to the confidence intervals since a Bayesian analysis has been conducted.  
** Ranking and confidence intervals for efficacy outcome are presented. Rank statistics is defined as the probabilities that a treatment out of n treatments in a network meta-analysis is the best, the second, the third and so on until the least effective treatment.  
*** Studies without a common comparator (such as usual care or acupuncture arm) that provides connections through a network of different regimens were excluded from the analysis.

**GRADE Working Group grades of evidence (or certainty in the evidence)**  
High quality: We are very confident that the true effect lies close to that of the estimate of the effect  
Moderate quality: We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different  
Low quality: Our confidence in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect  
Very low quality: We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect
Appendix 3 Funnel plots

Figure 3.1. Funnel plot for assessment of publication bias on pain reduction in the overall network and individual comparisons at or nearest to four weeks.
A= exercise; B= oral NSAIDs and paracetamol; C= acupuncture; D= intra-articular hyaluronic acid; E= topical NSAIDs; F= usual care.

Figure 3.2. Funnel plot for assessment of publication bias on functional improvement in the overall network and individual comparisons at or nearest to four weeks.
A= exercise; B= oral NSAIDs and paracetamol; C= acupuncture; D= intra-articular hyaluronic acid; E= usual care.
Figure 3.3. Funnel plot for assessment of publication bias on pain reduction in the overall network and individual comparisons at 24 weeks.
A= exercise; B= oral NSAIDs and paracetamol; C= intra-articular hyaluronic acid; D= glucosamine sulphate/chondroitin sulphate.

Figure 3.4. Funnel plot for assessment of publication bias on functional improvement in the overall network and individual comparisons at 24 weeks.
A= exercise; B= oral NSAIDs and paracetamol; C= intra-articular hyaluronic acid; D= glucosamine sulphate/chondroitin sulphate.
Appendix 4 Results of SUCRA

Figure 4.1. Rankings for effects on pain relief at or nearest to four weeks. Graph displays distribution of probabilities for each treatment. X-axis represents the possible rank of each treatment (from the best to worst according to the outcomes), Y-axis represents the cumulative probability for each treatment to be the best option, among the best two options, among the best three options, and so on.

The SUCRA values were as followed:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>SUCRA (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acupuncture</td>
<td>77.7</td>
</tr>
<tr>
<td>IAHA</td>
<td>60.8</td>
</tr>
<tr>
<td>Oral NSAIDs and paracetamol</td>
<td>59.8</td>
</tr>
<tr>
<td>Exercise</td>
<td>56.8</td>
</tr>
<tr>
<td>Topical NSAIDs</td>
<td>36.8</td>
</tr>
<tr>
<td>Usual care</td>
<td>8.1</td>
</tr>
</tbody>
</table>

NSAIDs, non-steroidal anti-inflammatory drugs; IAHA, intra-articular hyaluronic acid.
Figure 4.2. Rankings for effects on functional improvement at or nearest to four weeks.

Graph displays distribution of probabilities for each treatment. X-axis represents the possible rank of each treatment (from the best to worst according to the outcomes), Y-axis represents the cumulative probability for each treatment to be the best option, among the best two options, among the best three options, and so on.

The SUCRA values were as followed:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>SUCRA (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acupuncture</td>
<td>83.7</td>
</tr>
<tr>
<td>Exercise</td>
<td>55.8</td>
</tr>
<tr>
<td>IAHA</td>
<td>53.2</td>
</tr>
<tr>
<td>Oral NSAIDs and paracetamol</td>
<td>46.9</td>
</tr>
<tr>
<td>Usual care</td>
<td>10.3</td>
</tr>
</tbody>
</table>

NSAIDs, non-steroidal anti-inflammatory drugs; IAHA, intra-articular hyaluronic acid.
**Figure 4.3. Rankings for effects on pain relief at 24 weeks.** Graph displays distribution of probabilities for each treatment. X-axis represents the possible rank of each treatment (from the best to worst according to the outcomes), Y-axis represents the cumulative probability for each treatment to be the best option, among the best two options, among the best three options, and so on.

The SUCRA values were as followed:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>SUCRA (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IAHA</td>
<td>76.5</td>
</tr>
<tr>
<td>Exercise</td>
<td>56.5</td>
</tr>
<tr>
<td>Oral NSAIDs and paracetamol</td>
<td>37.5</td>
</tr>
<tr>
<td>GS/CS</td>
<td>29.5</td>
</tr>
</tbody>
</table>

NSAIDs, non-steroidal anti-inflammatory drugs; IAHA, intra-articular hyaluronic acid; GS/CS, glucosamine sulphate/chondroitin sulphate.
Figure 4.4. Rankings for effects on functional improvement at 24 weeks. Graph displays distribution of probabilities for each treatment. X-axis represents the possible rank of each treatment (from the best to worst according to the outcomes), Y-axis represents the cumulative probability for each treatment to be the best option, among the best two options, among the best three options, and so on.

The SUCRA values were as followed:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>SUCRA (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IAHA</td>
<td>80.6</td>
</tr>
<tr>
<td>Exercise</td>
<td>46.3</td>
</tr>
<tr>
<td>Oral NSAIDs and paracetamol</td>
<td>44.8</td>
</tr>
<tr>
<td>GS/CS</td>
<td>28.2</td>
</tr>
</tbody>
</table>

NSAIDs, non-steroidal anti-inflammatory drugs; IAHA, intra-articular hyaluronic acid; GS/CS, glucosamine sulphate/chondroitin sulphate.
Appendix 5 Networks plots for each outcome

The size of the circle in each network is proportional to the number of participants randomly assigned to the treatment comparison. The width of each line is proportional to the number of trials comparing the two connected treatments. When a line is absent, this indicates that there were no head-to-head trials of the corresponding treatments reporting the outcome of interest. Numbers (n/n) near the line indicate ‘number of studies/number of participants’ of the related comparisons.

![Network plot for each outcome](image)

**Figure 5.1. Structure of network formed by interventions for pain relief at eight weeks.**

NSAIDs, non-steroidal anti-inflammatory drugs.

![Network plot for pain relief](image)

**Figure 5.2. Structure of network formed by interventions for functional improvement at eight weeks.**

NSAIDs, non-steroidal anti-inflammatory drugs.
Figure 5.3. Structure of network formed by interventions for pain relief at 24 weeks.

NSAIDs, non-steroidal anti-inflammatory drugs; IAHA, intra-articular hyaluronic acid; GS/CS, glucosamine sulphate/chondroitin sulphate.

Figure 5.4. Structure of network formed by interventions for functional improvement at 24 weeks. NSAIDs, non-steroidal anti-inflammatory drugs; IAHA, intra-articular hyaluronic acid; GS/CS, glucosamine sulphate/chondroitin sulphate.
Appendix 6 Assessment of transitivity

Before conducting the statistical analysis, we estimated whether the studies included in the NMA were on average similar in terms of characteristics that might modify the treatment effect (so that the transitivity assumption is plausible). Indirect comparisons, in contrast to direct comparisons, are not protected by randomisation and may be confounded by differences between the trials. In our analysis we deemed the following parameters as possible confounders: publication year, percentage female, mean age, baseline pain and function score.

The plausibility of the transitivity assumption was assessed by comparing the distribution of these potential effect modifiers across trials grouped by comparison.
6.1 Publication year

We examined the distribution of publication year over each intervention. The overall range was between 1996 and 2021 with a median of 2013 at or nearest to four weeks; the overall range was between 2006 and 2018 with a median of 2015 at 24 weeks. Obviously, treatment recommendations for OA may differ considerably with regards to publication year. We examined publication year as a potential effect modifier, because it can be a proxy parameter for a number of factors that may have changed over the years (e.g., changes in trial design, monitoring, etc), that could have possibly influenced the effect size. We found no significant difference in publication year between the all interventions at or nearest to four weeks or 24 weeks ($P > 0.05$).

![Figure 1.A. Boxplot for distribution of publication year across comparisons at or nearest to four weeks](image1.png)

![Figure 1.B. Boxplot for distribution of publication year across comparisons at 24 weeks](image2.png)

NSAIDs, non-steroidal anti-inflammatory drugs; IAHA, intra-articular hyaluronic acid; CS/GS, glucosamine sulphate/chondroitin sulphate.
6.2 Mean age

We examined the distribution of mean age over each intervention. The overall range was between 44.5 and 86.1 with a median of 61.2 at or nearest to four weeks; the overall range was between 55.5 and 71.2 with a median of 61.4 at 24 weeks. Age is a major risk factor for OA; thus, we inspected the effects of mean age as a potential effect modifier. We found no significant difference in mean age between the all interventions at or nearest to four weeks or 24 weeks ($P > 0.05$).

![Figure 2A. Boxplot for distribution of mean age across comparisons at or nearest to four weeks](image)

![Figure 2B. Boxplot for distribution of mean age across comparisons at 24 weeks](image)

NSAIDs, non-steroidal anti-inflammatory drugs; IAHA, intra-articular hyaluronic acid; CS/GS, glucosamine sulphate/chondroitin sulphate.
6.3 Percentage female

We examined the distribution of percentage female over each intervention. The overall range was between 26.9 and 100 with a median of 69.5 at or nearest to four weeks; the overall range was between 51.5 and 100 with a median of 74.7 at 24 weeks. Some studies had only male or only female participants. Female gender is a risk factor for OA; thus, we inspected the effects of percentage female a potential effect modifier. We found no significant difference in percentage female between the all interventions at or nearest to four weeks or 24 weeks ($P > 0.05$).

![Figure 3.A. Boxplot for distribution of percentage female across comparisons at or nearest to four weeks](image)

![Figure 3.B. Boxplot for distribution of percentage female across comparisons at 24 weeks](image)

NSAIDs, non-steroidal anti-inflammatory drugs; IAHA, intra-articular hyaluronic acid; CS/GS, glucosamine sulphate/chondroitin sulphate.
### 6.4 Baseline pain score

We examined the distribution of baseline pain score over each intervention. The overall range was between 1.2 and 9.1 with a median of 5.41 at or nearest to four weeks; the overall range was between 3.9 and 7.7 with a median of 5.84 at 24 weeks. Our results may be susceptible to selection bias due to severity of disease at presentation; thus, we inspected the effects of baseline pain score as a potential effect modifier. We found no significant difference in baseline pain score between the all interventions at or nearest to four weeks or 24 weeks ($P > 0.05$).

![Figure 4.A. Boxplot for distribution of baseline pain score across comparisons at or nearest to four weeks](image1)

![Figure 4.B. Boxplot for distribution of baseline pain score across comparisons at 24 weeks](image2)

NSAIDs, non-steroidal anti-inflammatory drugs; IAHA, intra-articular hyaluronic acid; CS/GS, glucosamine sulphate/chondroitin sulphate.
6.5 Baseline function score

We examined the distribution of baseline function score over each intervention. The overall range was between 28 and 78.7 with a median of 50.0 at or nearest to four weeks; the overall range was between 38.8 and 60.0 with a median of 48.0 at 24 weeks. Our results may be susceptible to selection bias due to severity of disease at presentation; thus, we inspected the effects of baseline function score as a potential effect modifier. We found no significant difference in baseline function score between the all interventions at or nearest to four weeks or 24 weeks ($P > 0.05$).

Figure 5.A. Boxplot for distribution of baseline function score across comparisons at or nearest to four weeks

Figure 5.B. Boxplot for distribution of baseline function score across comparisons at 24 week

NSAIDs, non-steroidal anti-inflammatory drugs; IAHA, intra-articular hyaluronic acid; CS/GS, glucosamine sulphate/chondroitin sulphate.
### Appendix 7 Basic characteristics of included randomised controlled trials (n=152 studies)

<table>
<thead>
<tr>
<th>Studies</th>
<th>Location of OA</th>
<th>Groups</th>
<th>Sample Size (female, %)</th>
<th>Mean Age (years)</th>
<th>Treatment Duration</th>
<th>Follow-up Time Point</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral NSAIDs and paracetamol vs. Exercise</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Doi 2008¹         | Knee           | G1: Oral NSAIDs (one of loxoprofen tablet, diclofenac tablet or zaltoprofen)  
|                  |                | G2: Exercise (strength exercise)                                      | G1: 70 (75.7)  
|                  |                |                                                                  G2: 72 (76.4)  
|                  |                |                                                                   G1: 68.9  
|                  |                |                                                                   G2: 66.8  
|                  |                | 8 weeks  
|                  |                |                                                                   4, 8 weeks  
|                  |                | G1: Pain, function, QoL  
|                  |                | G2: Pain, function, QoL  
| Zhang 2015²       | Knee           | G1: Oral NSAIDs (celecoxib)                                            | G1: 48 (77.1)  
|                  |                | G2: Exercise (strength exercise)                                      | G2: 46 (73.9)  
|                  |                | G1: 64.5  
|                  |                | G2: 63.5  
|                  |                | 4 weeks  
|                  |                | G1: Pain, function  
|                  |                | G2: Pain  
| Holsgaard-Larsen 2018³ | Knee | G1: Paracetamol                                                       | G1: 46 (54.3)  
|                  |                | G2: Exercise (neuromotor exercise)                                    | G2: 47 (61.7)  
|                  |                | G1: 58.3  
|                  |                | G2: 57.9  
|                  |                | 8 weeks  
|                  |                | G1: Pain, function, QoL  
|                  |                | G2: Pain, function, QoL  
| Jing 2020⁴       | Knee           | G1: Oral NSAIDs (one of naproxen, diclofenac or celecoxib)             | G1: 74 (73.5)  
|                  |                | G2: Exercise (mixed exercise)                                         | G2: 92 (71.6)  
|                  |                | G1: 55.8  
|                  |                | G2: 56.7  
|                  |                | 5 weeks  
|                  |                | G1: Function, QoL  
|                  |                | G2: Function, QoL  
| Acupuncture vs. Oral NSAIDs and paracetamol | | | | | | | |
| Gang 2016⁵       | Knee           | G1: Acupuncture (electroacupuncture)                                   | G1: 45 (53.3)  
|                  |                | G2: Oral NSAIDs (meloxicam)                                           | G2: 45 (51.1)  
|                  |                | G1: 54.0  
|                  |                | G2: 54.0  
|                  |                | 6 weeks  
|                  |                | G1: Pain, function  
|                  |                | G2: Pain, function  
| Li 2015⁶         | Knee           | G1: Acupuncture (electroacupuncture)                                   | G1: 38 (NA)  
|                  |                | G2: Oral NSAIDs (celecoxib)                                           | G2: 38 (NA)  
|                  |                | NA  
|                  |                | 3 weeks  
|                  |                | G1: Pain, function  
|                  |                | G2: Pain, function  
| Liu 2013⁷        | Knee           | G1: Acupuncture (long-needle)                                          | G1: 97 (NA)  
|                  |                | G2: Oral NSAIDs (ibuprofen)                                           | G2: 95 (NA)  
|                  |                | NA  
|                  |                | 3 months  
|                  |                | G1: Data not available  
|                  |                | G2: Data not available  
| Nie 2015⁸        | Knee           | G1: Acupuncture                                                        | G1: 60 (61.7)  
|                  |                | G2: Oral NSAIDs (ibuprofen)                                           | G2: 30 (66.7)  
|                  |                | G1: 61.7  
|                  |                | G2: 62.0  
|                  |                | 2 weeks  
|                  |                | G1: Pain  
|                  |                | G2: Pain  
| Hou 2019⁹        | Knee           | G1: Acupuncture (fan-needle)                                           | G1: 50 (70.0)  
|                  |                | G2: Oral NSAIDs (celecoxib)                                           | G2: 50 (66.0)  
|                  |                | G1: 64.0  
|                  |                | G2: 63.0  
|                  |                | 4 weeks  
|                  |                | G1: Pain, function  
|                  |                | G2: Pain, function  
| Sangdee 2002¹⁰   | Knee           | G1: Acupuncture (electroacupuncture)                                   | G1: 48 (79.2)  
|                  |                | G2: Oral NSAIDs (diclofenac)                                           | G2: 49 (77.6)  
|                  |                | G1: 65.1  
|                  |                | G2: 62.1  
|                  |                | 4 weeks  
|                  |                | G1: Pain, function  
|                  |                | G2: Pain, function  
| Sheng 2010¹¹     | Hip            | G1: Acupuncture (electroacupuncture)                                   | G1: 30 (60.0)  
|                  |                | G2: Oral NSAIDs (diclofenac)                                           | G2: 30 (63.3)  
|                  |                | G1: 63.2  
|                  |                | G2: 61.1  
|                  |                | 4 weeks  
|                  |                | G1: Pain, function  
|                  |                | G2: Pain, function  
| Wu 2008¹²        | Knee           | G1: Acupuncture (electroacupuncture)                                   | G1: 20 (60.0)  
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<td>Espejo 2012&lt;sup&gt;90&lt;/sup&gt;</td>
<td>Knee</td>
<td>G1: 14 (NA)</td>
<td>G2: 17 (NA)</td>
<td>4 weeks</td>
<td>4 weeks</td>
<td>Pain, function, QoL</td>
</tr>
<tr>
<td>Evgeniadis 2008&lt;sup&gt;91&lt;/sup&gt;</td>
<td>Knee</td>
<td>G1: 20 (70.0)</td>
<td>G2: 18 (83.3)</td>
<td>4 weeks</td>
<td>4 weeks</td>
<td>Pain, function, QoL</td>
</tr>
<tr>
<td>Ghouzi 2008&lt;sup&gt;92&lt;/sup&gt;</td>
<td>Knee</td>
<td>G1: 14 (NA)</td>
<td>G2: 13 (NA)</td>
<td>8 weeks</td>
<td>8 weeks</td>
<td>Pain, function</td>
</tr>
<tr>
<td>Gstoettner 2011&lt;sup&gt;93&lt;/sup&gt;</td>
<td>Knee</td>
<td>G1: 20 (70.0)</td>
<td>G2: 18 (88.9)</td>
<td>6 weeks</td>
<td>6 weeks</td>
<td>Data not available</td>
</tr>
<tr>
<td>Huang 2017&lt;sup&gt;94&lt;/sup&gt;</td>
<td>Knee</td>
<td>G1: 122 (80.3)</td>
<td>G2: 128 (78.9)</td>
<td>12 weeks</td>
<td>4, 12 weeks</td>
<td>Pain, function</td>
</tr>
<tr>
<td>Kuptniratsaikul 2002&lt;sup&gt;95&lt;/sup&gt;</td>
<td>Knee</td>
<td>G1: 193 (76.7)</td>
<td>G2: 199 (79.4)</td>
<td>2 months</td>
<td>2 months</td>
<td>Pain, function</td>
</tr>
<tr>
<td>Lund 2008&lt;sup&gt;96&lt;/sup&gt;</td>
<td>Knee</td>
<td>G1: 27 (66.7)</td>
<td>G2: 52 (84.6)</td>
<td>8 weeks</td>
<td>8 weeks</td>
<td>Pain, function</td>
</tr>
<tr>
<td>Messier 2004&lt;sup&gt;97&lt;/sup&gt;</td>
<td>Knee</td>
<td>G1: 78 (68.0)</td>
<td>G2: 80 (74.0)</td>
<td>18 months</td>
<td>6, 18 months</td>
<td>Pain, function</td>
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<tr>
<td>Song 2003&lt;sup&gt;98&lt;/sup&gt;</td>
<td>Knee</td>
<td>G1: 21 (100.0)</td>
<td>G2: 22 (100.0)</td>
<td>12 weeks</td>
<td>12 weeks</td>
<td>Pain, function</td>
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<tr>
<td>Study</td>
<td>Condition</td>
<td>G1: Usual care</td>
<td>G2: Exercise (mixed exercise)</td>
<td>G1: 8 (NA)</td>
<td>G2: 16 (NA)</td>
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</tr>
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<tr>
<td>D’Lima 1996&lt;sup&gt;96&lt;/sup&gt;</td>
<td>Knee</td>
<td>G1: Usual care</td>
<td>G2: Exercise (mixed exercise)</td>
<td>G1: 9 (0)</td>
<td>G2: 9 (0)</td>
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<tr>
<td>Moghadam 2017&lt;sup&gt;100&lt;/sup&gt;</td>
<td>Knee</td>
<td>G1: Usual care</td>
<td>G2: Exercise (aerobic exercise)</td>
<td>G1: 44 (88.6)</td>
<td>G2: 44 (84.1)</td>
<td>NA</td>
</tr>
<tr>
<td>Oida 2008&lt;sup&gt;101&lt;/sup&gt;</td>
<td>Knee</td>
<td>G1: Usual care</td>
<td>G2: Exercise (mixed exercise)</td>
<td>G1: 15 (66.7)</td>
<td>G2: 15 (93.3)</td>
<td>NA</td>
</tr>
<tr>
<td>Oosting 2012&lt;sup&gt;102&lt;/sup&gt;</td>
<td>Hip</td>
<td>G1: Usual care</td>
<td>G2: Exercise (mixed exercise)</td>
<td>G1: 65 (92)</td>
<td>G2: 59 (71.2)</td>
<td>NA</td>
</tr>
<tr>
<td>Pelouquin 1999&lt;sup&gt;103&lt;/sup&gt;</td>
<td>Knee</td>
<td>G1: Usual care</td>
<td>G2: Exercise (mixed exercise)</td>
<td>G1: 68.8</td>
<td>G2: 64.7</td>
<td>5 weeks</td>
</tr>
<tr>
<td>Rapp 2009&lt;sup&gt;104&lt;/sup&gt;</td>
<td>Knee</td>
<td>G1: Usual care</td>
<td>G2: Exercise (strength exercise)</td>
<td>G1: 9 (66.7)</td>
<td>G2: 15 (66.7)</td>
<td>NA</td>
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<tr>
<td>Pisters 2010&lt;sup&gt;105&lt;/sup&gt;</td>
<td>Knee or hip</td>
<td>G1: Usual care</td>
<td>G2: Exercise (mixed exercise)</td>
<td>G1: 103 (78.6)</td>
<td>G2: 97 (75.3)</td>
<td>NA</td>
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<tr>
<td>Ravaud 2004&lt;sup&gt;106&lt;/sup&gt;</td>
<td>Knee or hip</td>
<td>G1: Usual care</td>
<td>G2: Exercise (mixed exercise)</td>
<td>G1: 67.3</td>
<td>G2: 65.1</td>
<td>24 weeks</td>
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<td>Salli 2006&lt;sup&gt;107&lt;/sup&gt;</td>
<td>Knee</td>
<td>G1: Usual care</td>
<td>G2: Exercise (strength exercise)</td>
<td>G1: 20 (NA)</td>
<td>G2: 58 (NA)</td>
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<td>Skoffer 2016&lt;sup&gt;108&lt;/sup&gt;</td>
<td>Knee</td>
<td>G1: Usual care</td>
<td>G2: Exercise (strength exercise)</td>
<td>G1: 29 (58.6)</td>
<td>G2: 30 (63.3)</td>
<td>NA</td>
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<tr>
<td>Teirlinck 2016&lt;sup&gt;109&lt;/sup&gt;</td>
<td>Hip</td>
<td>G1: Usual care</td>
<td>G2: Exercise (mixed exercise + usual care)</td>
<td>G1: 102 (54.9)</td>
<td>G2: 101 (62.4)</td>
<td>NA</td>
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<td>Topp 2009&lt;sup&gt;110&lt;/sup&gt;</td>
<td>Knee</td>
<td>G1: Usual care</td>
<td>G2: Exercise (mixed exercise)</td>
<td>G1: 28 (35.7)</td>
<td>G2: 26 (26.9)</td>
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<tr>
<td>Villadsen 2014&lt;sup&gt;111&lt;/sup&gt;</td>
<td>Knee or hip</td>
<td>G1: Usual care</td>
<td>G2: Exercise (neuromotor exercise)</td>
<td>G1: 81 (55.6)</td>
<td>G2: 84 (56.0)</td>
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<td>Wallis 2017&lt;sup&gt;112&lt;/sup&gt;</td>
<td>Knee</td>
<td>G1: Usual care</td>
<td>G2: Exercise (aerobic exercise)</td>
<td>G1: 23 (47.8)</td>
<td>G2: 23 (39.1)</td>
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<tr>
<td>Weidhielm 1993&lt;sup&gt;113&lt;/sup&gt;</td>
<td>Knee</td>
<td>G1: Usual care</td>
<td>G2: Exercise (mixed exercise)</td>
<td>G1: 20 (45.0)</td>
<td>G2: 19 (57.9)</td>
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<tr>
<td>Young Moo 2000&lt;sup&gt;114&lt;/sup&gt;</td>
<td>Knee</td>
<td>G1: Usual care</td>
<td>G2: Exercise (strength exercise)</td>
<td>G1: 40 (85.0)</td>
<td>G2: 40 (90.0)</td>
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<td>Author</td>
<td>Year</td>
<td>Group 1</td>
<td>Group 2</td>
<td>Duration</td>
<td>Target Goal</td>
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<tr>
<td>Van Baar 2001</td>
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<td>Exercise (mixed exercise)</td>
<td>12 weeks</td>
<td>G1: 102 (79.4)</td>
<td>Function, QoL</td>
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<td>Mazloum 2018</td>
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<td>Exercise (mixed exercise)</td>
<td>8 weeks</td>
<td>G1: 13 (NA)</td>
<td>Function</td>
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<tr>
<td>DeVita 2018</td>
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<td>Exercise (strength exercise)</td>
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<td>Pain, function</td>
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<td>Isaramalai 2018</td>
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<td>G1: 25 (80.0)</td>
<td>Pain, function</td>
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<td>Jahic 2018</td>
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<td>Usual care</td>
<td>Exercise (mixed exercise)</td>
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<td>G1: 10 (70.0)</td>
<td>Function</td>
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<td>Pazit 2018</td>
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<td>Usual care</td>
<td>Exercise (mixed exercise)</td>
<td>8 weeks</td>
<td>G1: 9 (56.0)</td>
<td>Pain, function, QoL</td>
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<tr>
<td>De Matos 2019</td>
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<td>Exercise (mixed exercise)</td>
<td>8 weeks</td>
<td>G1: 15 (80.0)</td>
<td>Pain, function</td>
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<tr>
<td>Doiron-Cadrin 2020</td>
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<td>Exercise (strength exercise)</td>
<td>12 weeks</td>
<td>G1: 11 (72.7)</td>
<td>Pain, function, QoL</td>
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<tr>
<td>Rewald 2020</td>
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<td>Usual care</td>
<td>Exercise (aerobic exercise)</td>
<td>12 weeks</td>
<td>G1: 47 (51.1)</td>
<td>Pain, function, QoL</td>
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<tr>
<td>Rezasoltani 2020</td>
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<td>Exercise (aerobic exercise)</td>
<td>4 weeks</td>
<td>G1: 15 (NA)</td>
<td>Pain, function</td>
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<td>Kim 2020</td>
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<td>12 weeks</td>
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<td>Function, QoL</td>
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<tr>
<td>Duarte 2020</td>
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<td>G1: 8 (87.5)</td>
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<td>Ye 2020</td>
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<td>Karimi 2021</td>
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<td>Moharrami, M R</td>
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<td>Xiao 2021</td>
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<td>Exercise (mixed exercise)</td>
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<td>G1: 134 (NA)</td>
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<td>Study</td>
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<td>Group 1</td>
<td>Group 2</td>
<td>Follow-Up</td>
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<tr>
<td>Azizi 2020</td>
<td>Knee</td>
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<td>Exercise (mixed exercise)</td>
<td>G1: 16 (NA) G2: 15 (NA)</td>
<td>G1: 65.5 G2: 63.5</td>
<td>8 weeks 8 weeks</td>
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<tr>
<td>Cheung 2014</td>
<td>Knee</td>
<td>Wait list</td>
<td>Exercise (mind-body exercise)</td>
<td>G1: 18 (100.0) G2: 18 (100.0)</td>
<td>G1: 71.9 G2: 71.9</td>
<td>8 weeks 4, 8 weeks</td>
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<tr>
<td>Chopp Hurley 2017</td>
<td>Knee</td>
<td>Wait list</td>
<td>Exercise (strength exercise)</td>
<td>G1: 12 (75.0) G2: 12 (83.3)</td>
<td>G1: 54.9 G2: 52.8</td>
<td>12 weeks 12 weeks</td>
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<tr>
<td>Ferrara 2008</td>
<td>Hip</td>
<td>Wait list</td>
<td>Exercise (mixed exercise)</td>
<td>G1: 12 (58.3) G2: 11 (63.6)</td>
<td>G1: 63.1 G2: 63.8</td>
<td>4 weeks 4 weeks</td>
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<td>Fransen 2001</td>
<td>Knee</td>
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<td>Exercise (mixed exercise)</td>
<td>G1: 43 (67.0) G2: 40 (78.0)</td>
<td>G1: 66.1 G2: 65.3</td>
<td>8 weeks 8 weeks</td>
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<td>Fransen 2007</td>
<td>Knee or Hip</td>
<td>Wait list</td>
<td>Exercise (mixed exercise)</td>
<td>G1: 41 (82.9) G2: 111 (70.3)</td>
<td>G1: 69.6 G2: 70.4</td>
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<td>French 2013</td>
<td>Hip</td>
<td>Wait list</td>
<td>Exercise (mixed exercise)</td>
<td>G1: 43 (53.5) G2: 45 (75.6)</td>
<td>G1: 60.8 G2: 61.8</td>
<td>8 weeks 8 weeks</td>
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<td>Hinman 2007</td>
<td>Knee or Hip</td>
<td>Wait list</td>
<td>Exercise (mixed exercise)</td>
<td>G1: 35 (68.6) G2: 36 (66.7)</td>
<td>G1: 61.5 G2: 63.3</td>
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<tr>
<td>Jan 2009</td>
<td>Knee</td>
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<td>Exercise (strength exercise)</td>
<td>G1: 35 (68.6) G2: 71 (69.0)</td>
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<td>Jorge 2014</td>
<td>Knee</td>
<td>Wait list</td>
<td>Exercise (strength exercise)</td>
<td>G1: 31 (100.0) G2: 29 (100.0)</td>
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<td>12 weeks 6, 12 weeks</td>
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<td>Lee 2009</td>
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<td>Exercise (mind-body exercise)</td>
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<td>Rogind 1998</td>
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<td>Exercise (mixed exercise)</td>
<td>G1: 12 (91.7) G2: 11 (90.9)</td>
<td>G1: 73.0 G2: 69.3</td>
<td>3 months 3 months</td>
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<td>Rooij 2017</td>
<td>Knee</td>
<td>Wait list</td>
<td>Exercise (mixed exercise)</td>
<td>G1: 63 (73.0) G2: 63 (77.8)</td>
<td>G1: 63.9 G2: 63.2</td>
<td>20 weeks 10, 20 weeks</td>
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<td>Rosedale 2014</td>
<td>Knee</td>
<td>Wait list</td>
<td>Exercise (mixed exercise)</td>
<td>G1: 59 (57.6) G2: 99 (55.6)</td>
<td>G1: 64.0 G2: 66.0</td>
<td>2 weeks 2 weeks</td>
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<td>Thompson 2019</td>
<td>Hip</td>
<td>Wait list</td>
<td>Exercise (mixed exercise)</td>
<td>G1: 10 (70.0) G2: 21 (42.9)</td>
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<td>12 weeks 12 weeks</td>
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<td>Vincent 2019</td>
<td>Knee</td>
<td>Wait list</td>
<td>Exercise (strength exercise)</td>
<td>G1: 32 (66.0) G2: 58 (68.6)</td>
<td>G1: 68.6 G2: 68.1</td>
<td>4 months 4 months</td>
</tr>
<tr>
<td>Shellington 2019</td>
<td>Knee</td>
<td>Wait list</td>
<td>Exercise (mixed exercise)</td>
<td>G1: 12 (75.0) G2: 10 (60.6)</td>
<td>G1: 69.3 G2: 69.7</td>
<td>24 weeks 12, 24 weeks</td>
</tr>
<tr>
<td>Study</td>
<td>Group 1</td>
<td>Group 2</td>
<td>Time</td>
<td>Outcome</td>
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<tr>
<td>Domínguez-Navarro 2020</td>
<td>Wait list (mixed exercise)</td>
<td>Exercise (mixed exercise)</td>
<td>1 month</td>
<td>Pain, function, QoL</td>
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<td>Song 2020</td>
<td>Wait list (neuromotor exercise)</td>
<td>Exercise (neuromotor exercise)</td>
<td>12 weeks</td>
<td>Pain</td>
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<td>Allen 2018</td>
<td>Wait list (mixed exercise)</td>
<td>Exercise (mixed exercise)</td>
<td>4 months</td>
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<td>Li 2018</td>
<td>Wait list (mixed exercise)</td>
<td>Exercise (mixed exercise)</td>
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</tbody>
</table>

G, group; NA, not available; NSAIDs, non-steroidal anti-inflammatory drugs; QoL, quality of life.
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## Appendix 8 Methodological quality of the included studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Random sequence generation (selection bias)</th>
<th>Allocation concealment (selection bias)</th>
<th>Blinding of participants and personnel (performance bias)</th>
<th>Blinding of outcome assessment (detection bias)</th>
<th>Incomplete outcome data (attrition bias)</th>
<th>Selective reporting (reporting bias)</th>
<th>Other bias</th>
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<table>
<thead>
<tr>
<th>Study</th>
<th>Random sequence generation (selection bias)</th>
<th>Allocation concealment (selection bias)</th>
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<th>Blinding of outcome assessment (detection bias)</th>
<th>Incomplete outcome data (attrition bias)</th>
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<tbody>
<tr>
<td>Study 1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Study 2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Study 3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**Note:** The table above represents the risk of bias assessment for different studies. Each column indicates the presence or absence of bias in various categories.
### Appendix 9 League table

Network league tables for all the interventions in regard to the pain reduction and functional improvement at or nearest to four week and at 24 weeks. Results of the functional improvement are presented in the left lower half and results of pain reduction in the upper right half. Comparisons between treatments should be read from left to right and the estimate is in the cell in common between the column-defining treatment and the row-defining treatment. Estimates are presented as mean standard mean difference (SMD) with 95% confidence interval in parentheses. SMD above 0 favour the column intervention and SMD below 0 favour the row intervention. Interventions in bold are significantly different since the 95% credible interval does not include 0.

#### Pain reduction and functional improvement at or nearest to four weeks

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Pain reduction</th>
<th>Functional improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-0.12 (-1.74, 1.50)</td>
<td>-0.53 (-2.39, 1.34)</td>
</tr>
<tr>
<td>Oral NSAIDs and paracetamol</td>
<td>-0.41 (-1.59, 0.77)</td>
<td>-0.04 (-2.42, 2.35)</td>
</tr>
<tr>
<td>Acupuncture</td>
<td>0.37 (-2.22, 2.96)</td>
<td>1.03 (-1.14, 3.22)</td>
</tr>
<tr>
<td>IAHA</td>
<td>0.66 (-2.21, 3.56)</td>
<td>1.48 (-0.81, 3.76)</td>
</tr>
<tr>
<td>Topical NSAIDs</td>
<td>0.99 (-0.82, 2.82)</td>
<td>1.91 (-0.24, 4.04)</td>
</tr>
<tr>
<td>Usual care</td>
<td>1.13 (-1.94, 4.19)</td>
<td>-</td>
</tr>
</tbody>
</table>

#### Pain reduction and functional improvement at 24 weeks

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Pain reduction</th>
<th>Functional improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.17 (-0.77, 1.12)</td>
<td>-0.17 (-1.07, 0.72)</td>
</tr>
<tr>
<td>Oral NSAIDs and paracetamol</td>
<td>-0.34 (-1.26, 0.56)</td>
<td>0.04 (-0.38, 0.45)</td>
</tr>
<tr>
<td>IAHA</td>
<td>0.38 (-0.55, 1.33)</td>
<td>-</td>
</tr>
<tr>
<td>CS/GS</td>
<td>0.53 (-0.68, 1.72)</td>
<td>-</td>
</tr>
</tbody>
</table>

NSAIDs, non-steroidal anti-inflammatory drugs; CS/GS, glucosamine sulphate/chondroitin sulphate; IAHA, intra-articular hyaluronic acid.
Appendix 10 Results of global inconsistency test for the primary analyses

<table>
<thead>
<tr>
<th>Time-point</th>
<th>Pain relief</th>
<th>Functional improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>At or nearest to four weeks</td>
<td>$\chi^2=8.12$, $P=0.087$</td>
<td>$\chi^2=1.91$, $P=0.592$</td>
</tr>
</tbody>
</table>

The results was assessed by the design-by-treatment inconsistenc model and estimates in bold denote significance at $P < 0.05$. 
### Appendix 11 Sensitivity analysis

<table>
<thead>
<tr>
<th></th>
<th>Primary analysis</th>
<th>SMD (95% CrI) *</th>
<th>Sensitivity analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Non-outlier ES &lt; 5</td>
<td>Allocation concealment-low risk</td>
</tr>
<tr>
<td><strong>Pain</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At or nearest to four weeks</td>
<td>47 trials (n=4,377)</td>
<td>46 trials (n=4,347)</td>
<td>16 trials (n=1,367)</td>
</tr>
<tr>
<td></td>
<td>-0.12 (-1.74, 1.50)</td>
<td>-0.25 (-1.25, 0.75)</td>
<td>-1.04 (-2.18, 0.06)</td>
</tr>
<tr>
<td>At 24 weeks</td>
<td>9 trials (n=2,141)</td>
<td>9 trials (n=2,141)</td>
<td>7 trials (n=1,760)</td>
</tr>
<tr>
<td></td>
<td>0.17 (-0.77, 1.12)</td>
<td>0.17 (-0.77, 1.12)</td>
<td>0.15 (-1.28, 1.58)</td>
</tr>
<tr>
<td><strong>Function</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At or nearest to four weeks</td>
<td>40 trials (n=2,968)</td>
<td>38 trials (n=2,906)</td>
<td>16 trials (n=1,367)</td>
</tr>
<tr>
<td></td>
<td>0.09 (-1.69, 1.85)</td>
<td>-0.10 (-1.31, 1.10)</td>
<td>-0.02 (-0.52, 0.49)</td>
</tr>
<tr>
<td>At 24 weeks</td>
<td>9 trials (n=2,141)</td>
<td>9 trials (n=2,141)</td>
<td>7 trials (n=1,760)</td>
</tr>
<tr>
<td></td>
<td>0.05 (-1.15, 1.24)</td>
<td>0.05 (-1.15, 1.24)</td>
<td>-0.02 (-1.76, 1.68)</td>
</tr>
</tbody>
</table>

CrI, credible interval; ES, effect size; SMD, standard mean difference.

*For SMD, negative value favours oral NSAIDs and paracetamol; whereas the positive value favours exercise.

Sensitivity analyses performed to show if some underlying assumptions (i.e., sample size < 30/arm, high or unclear risk of allocation concealment, intervention prescribing paracetamol and also studies that included outliers or had an effect size > 5) which would significantly alter the conclusion of primary analysis.