

## B.1 Clinical search literature search strategy

Searches were constructed using a PICO framework where population (P) terms were combined with Intervention (I) and in some cases Comparison (C) terms. Outcomes (O) are rarely used in search strategies as these concepts may not be indexed or described in the title or abstract and are therefore difficult to retrieve. Search filters were applied to the search where appropriate.

**Table 8: Database parameters, filters and limits applied**

Database	Dates searched	Search filter used
Medline (OVID)	01 January 2018 – 08 January 2023	Randomised controlled trials Systematic review studies  Exclusions (animal studies, letters, comments, editorials, case studies/reports)  English language
Embase (OVID)	01 January 2018 – 08 January 2023	Randomised controlled trials Systematic review studies  Exclusions (animal studies, letters, comments, editorials, case studies/reports, conference abstracts)  English language
The Cochrane Library (Wiley)	Cochrane Reviews 2018 to 2023 Issue 1 of 12 CENTRAL 2018 to 2023 Issue 1 of 12	Exclusions (clinical trials, conference abstracts)
Epistemonikos (The Epistemonikos Foundation)	01 January 2018 – 08 January 2023	Exclusions (Cochrane reviews)  English language
AMED, Allied and Complementary Medicine (OVID)	01 January 2018 – 08 January 2023	Exclusions (animal studies, letters, comments, case reports)  English language
Current Nursing and Allied Health Literature - CINAHL (EBSCO)	01 January 2018 – 08 January 2023	Human  Exclusions (Medline records)  English Language

**Medline (Ovid) search terms**

1.	exp Stroke/
2.	Stroke Rehabilitation/
3.	exp Cerebral Hemorrhage/
4.	(stroke or strokes or cva or poststroke* or apoplexy or "cerebrovascular accident").ti,ab,kf.
5.	((cerebro* or brain or brainstem or cerebral*) adj3 (infarct* or accident*)).ti,ab,kf.
6.	"brain attack*".ti,ab,kf.
7.	or/1-6
8.	exp upper extremity/
9.	(upper limb* or upper extremit* or upper body or arm or arms or shoulder or shoulders or hand or hands or axilla* or elbow* or forearm* or finger* or wrist*).ti,ab,kf.
10.	8 or 9
11.	7 and 10
12.	letter/
13.	editorial/
14.	news/
15.	exp historical article/
16.	Anecdotes as Topic/
17.	comment/
18.	case report/
19.	(letter or comment*).ti.
20.	or/12-19
21.	randomized controlled trial/ or random*.ti,ab.
22.	20 not 21
23.	animals/ not humans/
24.	exp Animals, Laboratory/
25.	exp Animal Experimentation/
26.	exp Models, Animal/
27.	exp Rodentia/
28.	(rat or rats or mouse or mice or rodent*).ti.
29.	or/22-28
30.	11 not 29
31.	limit 30 to English language
32.	robotics/ or automation/ or orthotic devices/ or Exoskeleton Device/ or Rehabilitation/is [Instrumentation]
33.	"equipment and supplies"/ or self-help devices/
34.	physical therapy modalities/ or occupational therapy/
35.	therapy, computer-assisted/ or man-machine systems/
36.	exercise movement techniques/ or exercise/ or exercise therapy/ or muscle stretching techniques/ or motion therapy, continuous passive/
37.	(robot* or orthos* or orthotic* or automat* or computer aided or computer assisted or device*).ti,ab,kf.
38.	(electromechanical or mechanical or mechanised or mechanized or driven).ti,ab,kf.

39.	((continuous passive or cpm) adj3 therap*).ti,ab,kf.
40.	(MIT-Manus or ARM guide or Bi-Manu-Track or ARMtrainer or MIME or Mirror Image Motion Enabler or InMOTION or REHAROB or NeReBot or "GEN-TLE/S" or ARMin).ti,ab,kf.
41.	(assist* adj5 (train* or aid* or rehabilitat* or re-educat*)).ti,ab,kf.
42.	or/32-41
43.	31 and 42
44.	randomized controlled trial.pt.
45.	controlled clinical trial.pt.
46.	randomi#ed.ti,ab.
47.	placebo.ab.
48.	randomly.ti,ab.
49.	Clinical Trials as topic.sh.
50.	trial.ti.
51.	or/44-50
52.	Meta-Analysis/
53.	exp Meta-Analysis as Topic/
54.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
55.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
56.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
57.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
58.	(search* adj4 literature).ab.
59.	(medline or pubmed or cochrane or embase or psychlit or psyclit or psychinfo or psycinfo or cinahl or science citation index or bids or cancerlit).ab.
60.	cochrane.jw.
61.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
62.	or/52-61
63.	43 and (51 or 62)

### Embase (Ovid) search terms

1.	exp Cerebrovascular accident/
2.	exp Brain infarction/
3.	Stroke Rehabilitation/
4.	(stroke or strokes or cva or poststroke* or apoplexy or "cerebrovascular accident").ti,ab,kf.
5.	((cerebro* or brain or brainstem or cerebral*) adj3 (infarct* or accident*)).ti,ab,kf.
6.	"brain attack*".ti,ab,kf.
7.	Intracerebral hemorrhage/
8.	or/1-7
9.	exp arm/ or arm weakness/ or arm exercise/ or arm movement/
10.	(upper limb* or upper extremit* or upper body or arm or arms or shoulder or shoulders or hand or hands or axilla* or elbow* or forearm* or finger* or wrist*).ti,ab,kf.
11.	or/9-10
12.	8 and 11
13.	letter.pt. or letter/

14.	note.pt.
15.	editorial.pt.
16.	case report/ or case study/
17.	(letter or comment*).ti.
18.	(conference abstract or conference paper).pt.
19.	or/13-18
20.	randomized controlled trial/ or random*.ti,ab.
21.	19 not 20
22.	animal/ not human/
23.	nonhuman/
24.	exp Animal Experiment/
25.	exp Experimental Animal/
26.	animal model/
27.	exp Rodent/
28.	(rat or rats or mouse or mice or rodent*).ti.
29.	or/21-28
30.	12 not 29
31.	limit 30 to English language
32.	robotics/ or automation/ or orthotics/ or "exoskeleton (rehabilitation)"/
33.	man machine interaction/ or biomedical engineering/ or device/ or machine/ or assistive technology/ or assistive technology device/ or computer assisted therapy/
34.	passive movement/ or movement therapy/ or kinesiotherapy/ or exp exercise/ or muscle stretching/ or muscle training/
35.	(robot* or orthos* or orthotic* or automat* or computer aided or computer assisted or device*).ti,ab,kf.
36.	(electromechanical or mechanical or mechanised or mechanized or driven).ti,ab,kf.
37.	((continuous passive or cpm) adj3 therap*).ti,ab,kf.
38.	(MIT-Manus or ARM guide or Bi-Manu-Track or ARMtrainer or MIME or Mirror Image Motion Enabler or InMOTION or REHAROB or NeReBot or "GEN-TLE/S" or ARMin).ti,ab,kf.
39.	(assist* adj5 (train* or aid* or rehabilitat* or re-educat*)).ti,ab,kf.
40.	or/32-39
41.	31 and 40
42.	random*.ti,ab.
43.	factorial*.ti,ab.
44.	(crossover* or cross over*).ti,ab.
45.	((doubl* or singl*) adj blind*).ti,ab.
46.	(assign* or allocat* or volunteer* or placebo*).ti,ab.
47.	crossover procedure/
48.	single blind procedure/
49.	randomized controlled trial/
50.	double blind procedure/
51.	or/42-50
52.	systematic review/
53.	meta-analysis/

54.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
55.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
56.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
57.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
58.	(search* adj4 literature).ab.
59.	(medline or pubmed or cochrane or embase or psychlit or psychlit or psychinfo or psycinfo or cinahl or science citation index or bids or cancerlit).ab.
60.	cochrane.jw.
61.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
62.	Or/52-61
63.	41 and (51 or 62)

### Cochrane Library (Wiley) search terms

#1.	MeSH descriptor: [Stroke] explode all trees
#2.	MeSH descriptor: [Stroke Rehabilitation] explode all trees
#3.	MeSH descriptor: [Cerebral Hemorrhage] explode all trees
#4.	(stroke or strokes or cva or poststroke* or apoplexy or "cerebrovascular accident"):ti,ab
#5.	((cerebro* or brain or brainstem or cerebral*) near/3 (infarct* or accident*)):ti,ab
#6.	brain attack*:ti,ab
#7.	(or #1-#6)
#8.	conference:pt or (clinicaltrials or trialsearch):so
#9.	#7 not #8
#10.	MeSH descriptor: [Robotics] explode all trees
#11.	MeSH descriptor: [Automation] explode all trees
#12.	MeSH descriptor: [Orthotic Devices] explode all trees
#13.	MeSH descriptor: [Exoskeleton Device] explode all trees
#14.	MeSH descriptor: [Equipment and Supplies] this term only
#15.	MeSH descriptor: [Self-Help Devices] explode all trees
#16.	MeSH descriptor: [Physical Therapy Modalities] explode all trees
#17.	MeSH descriptor: [Occupational Therapy] explode all trees
#18.	MeSH descriptor: [Therapy, Computer-Assisted] explode all trees
#19.	MeSH descriptor: [Man-Machine Systems] explode all trees
#20.	MeSH descriptor: [Exercise Movement Techniques] explode all trees
#21.	MeSH descriptor: [Exercise] explode all trees
#22.	MeSH descriptor: [Exercise Therapy] explode all trees
#23.	MeSH descriptor: [Muscle Stretching Exercises] explode all trees
#24.	MeSH descriptor: [Motion Therapy, Continuous Passive] explode all trees
#25.	(robot* or orthos* or orthotic* or automat* or computer aided or computer assisted or device*):ti,ab
#26.	(electromechanical or mechanical or mechanised or mechanized or driven):ti,ab
#27.	((continuous passive or cpm) near/3 therap*):ti,ab
#28.	(MIT-Manus or ARM guide or Bi-Manu-Track or ARMtrainer or MIME or Mirror Image Motion Enabler or InMOTION or REHAROB or NeReBot or "GEN-TLE/S" or ARMin):ti,ab

#29.	(assist* near/5 (train* or aid* or rehabilitat* or re-educat*)):ti,ab
#30.	(or #10-#29)
#31.	#9 and #30
#32.	MeSH descriptor: [Upper Extremity] explode all trees
#33.	(upper limb* or upper extremit* or upper body or arm or arms or shoulder or shoulders or hand or hands or axilla* or elbow* or forearm* or finger* or wrist*):ti,ab
#34.	(or #32-#33)
#35.	#31 and #34

**AMED search terms**

1.	exp Stroke/
2.	exp Cerebral Hemorrhage/
3.	(stroke or strokes or cva or poststroke* or apoplexy or "cerebrovascular accident").ti,ab.
4.	((cerebro* or brain or brainstem or cerebral*) adj3 (infarct* or accident*)):ti,ab.
5.	"brain attack*".ti,ab.
6.	or/1-5
7.	case report/
8.	(letter or comment*).ti.
9.	or/7-8
10.	randomized controlled trials/ or random*.ti,ab.
11.	9 not 10
12.	animals/ not humans/
13.	(rat or rats or mouse or mice or rodent*).ti.
14.	or/11-13
15.	6 not 14
16.	exp arm/
17.	(upper limb* or upper extremit* or upper body or arm or arms or shoulder or shoulders or hand or hands or axilla* or elbow* or forearm* or finger* or wrist*):ti,ab.
18.	16 or 17
19.	15 and 18
20.	limit 19 to English language
21.	robotics/
22.	orthotic devices/
23.	physical therapy modalities/
24.	Exercise movement techniques/
25.	Exercise/
26.	Exercise therapy/
27.	continuous passive motion/
28.	(robot* or orthos* or orthotic* or automat* or computer aided or computer assisted or device*).ti,ab.
29.	(electromechanical or mechanical or mechanised or mechanized or driven).ti,ab.
30.	((continuous passive or cpm) adj3 therap*).ti,ab.
31.	(MIT-Manus or ARM guide or Bi-Manu-Track or ARMtrainer or MIME or Mirror Image Motion Enabler or InMOTION or REHAROB or NeReBot or "GEN-TLE/S" or ARMin).ti,ab.

32.	(assist* adj5 (train* or aid* or rehabilitat* or re-educat*)).ti,ab.
33.	or/21-32
34.	20 and 33

**CINAHL search terms**

S1.	MW Stroke or MH Cerebral Hemorrhage
S2.	stroke* or cva or poststroke* or apoplexy or "cerebrovascular accident"
S3.	(cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)
S4.	"brain attack"
S5.	S1 or S2 or S3 or S4
S6.	MH upper extremity
S7.	upper limb* or upper extremit* or upper body or arm or arms or shoulder or shoulders or hand or hands or axilla* or elbow* or forearm* or finger* or wrist*
S8.	S6 or S7
S9.	S5 and S8
S10.	MH robotics
S11.	MH automation
S12.	MH occupational therapy
S13.	MH exercise
S14.	robot* or orthos* or orthotic* or automat* or computer aided or computer assisted or device*
S15.	electromechanical or mechanical or mechanised or mechanized or driven
S16.	continuous passive or cpm
S17.	MIT-Manus or ARM guide or Bi-Manu-Track or ARMtrainer or MIME or Mirror Image Motion Enabler or InMOTION or REHAROB or NeReBot or "GEN-TLE/S" or ARMin
S18.	S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17
S19.	S9 AND S18

**Epistemonikos search terms**

1.	(title:(title:(title:(rehab* AND (hospital* OR patient* OR program* OR therap* OR assistant*))) OR abstract:(rehab* AND (hospital* OR patient* OR program* OR therap* OR assistant*))) OR (title:(intens* OR frequen* OR duration* OR period* OR time* OR timing OR hour* OR week* OR day*) AND (rehab* OR intervention*)) OR abstract:(intens* OR frequen* OR duration* OR period* OR time* OR timing OR hour* OR week* OR day*) AND (rehab* OR intervention*))) OR abstract:(title:(rehab* AND (hospital* OR patient* OR program* OR therap* OR assistant*))) OR abstract:(rehab* AND (hospital* OR patient* OR program* OR therap* OR assistant*))) OR (title:(intens* OR frequen* OR duration* OR period* OR time* OR timing OR hour* OR week* OR day*) AND (rehab* OR intervention*)) OR abstract:(intens* OR frequen* OR duration* OR period* OR time* OR timing OR hour* OR week* OR day*) AND (rehab* OR intervention*))) AND (title:(title:(stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*))) OR abstract:(stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)))) OR abstract:(title:(stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*))) OR abstract:(stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)))))) OR abstract:(title:(title:(rehab* AND (hospital* OR patient* OR program* OR therap* OR assistant*))) OR abstract:(rehab*
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	<p>AND (hospital* OR patient* OR program* OR therap* OR assistant*))) OR (title:(((intens* OR frequen* OR duration* OR period* OR time* OR timing OR hour* OR week* OR day*) AND (rehab* OR intervention*))) OR abstract:(((intens* OR frequen* OR duration* OR period* OR time* OR timing OR hour* OR week* OR day*) AND (rehab* OR intervention*)))))) OR abstract:(title:(rehab* AND (hospital* OR patient* OR program* OR therap* OR assistant*))) OR abstract:(rehab* AND (hospital* OR patient* OR program* OR therap* OR assistant*))) OR (title:(((intens* OR frequen* OR duration* OR period* OR time* OR timing OR hour* OR week* OR day*) AND (rehab* OR intervention*))) OR abstract:(((intens* OR frequen* OR duration* OR period* OR time* OR timing OR hour* OR week* OR day*) AND (rehab* OR intervention*)))))) AND (title:(title:(stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack*" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*))) OR abstract:(stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack*" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)))))) OR abstract:(title:(stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack*" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*))) OR abstract:(stroke OR strokes OR cva OR poststroke* OR apoplexy OR "cerebrovascular accident" OR "brain attack*" OR ((cerebro* OR brain OR brainstem OR cerebral*) AND (infarct* OR accident*)))))) AND (title:(upper limb* OR upper extremit* OR upper body OR arm OR arms OR shoulder OR shoulders OR hand OR hands OR axilla* OR elbow* OR forearm* OR finger* OR wrist*) OR abstract:(upper limb* OR upper extremit* OR upper body OR arm OR arms OR shoulder OR shoulders OR hand OR hands OR axilla* OR elbow* OR forearm* OR finger* OR wrist*)) AND (title:(robot* OR orthos* OR orthotic* OR automat* OR computer aided OR computer assisted OR device*) OR abstract:(robot* OR orthos* OR orthotic* OR automat* OR computer aided OR computer assisted OR device*))</p>
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