

Supplementary Material 1

Search strategies as executed, and a PRESS 2015 self-assessment

Review — Definitions and Assessment of Residual Distal Radioulnar Joint Instability After Operative Fixation of Distal Radius Fractures: A Methodological Systematic Review

Prepared 5 August 2026; revised 6 August 2026. Reported in accordance with PRISMA-S.

How to read this appendix. Part C identifies three findings and labels them **F1**, **F2** and **F3**. Every later mention refers to them by label and does not restate them.

Part A · Strategies as executed

Two databases were searched. No language, species, publication-type or study-design filter was applied; the only limit was publication year. The structure is **A AND (B OR C)**, where A is the population block, B the DRUJ stability block and C the TFCC and ulnar styloid block.

A.1 MEDLINE via PubMed

Executed 3 August 2026. 466 records.

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("Radius Fractures"[Mesh] OR "distal radius fracture*" [tiab]
OR "distal radial fracture*" [tiab] OR "distal radius fracture" [tiab:~3]
OR Colles [tiab]) ← block A
AND
((DRUJ [tiab] OR "distal radioulnar" [tiab] OR "distal radio-ulnar" [tiab]
OR "radioulnar instability" [tiab:~3] OR "radioulnar stability" [tiab:~3]
OR "radioulnar stable" [tiab:~3] OR "radioulnar unstable" [tiab:~3]
OR "radioulnar subluxation" [tiab:~3] OR "radioulnar laxity" [tiab:~3]
OR ballottement [tiab] OR shuck [tiab] OR "piano key" [tiab]
OR "piano-key" [tiab]) ← block B
OR
("Triangular Fibrocartilage" [Mesh] OR "triangular fibrocartilage" [tiab] OR TFCC [tiab]
OR foveal [tiab] OR "ulnar styloid" [tiab]) ← block C
AND ("2015/01/01" [Date - Publication] : "3000" [Date - Publication])
```

A.2 Embase (Embase.com, Advanced search)

Executed 3 August 2026. 574 records.

Set	Query	Records
#1	'distal radius fracture'/exp OR 'distal radius fracture' OR 'colles fracture'/exp OR 'colles fracture' OR 'smith fracture'/exp OR 'smith fracture'	8,242
#2	((('distal radius' OR 'distal radial' OR 'distal end radius' OR 'distal end of radius') NEAR/3 fracture*):ti,ab,kw) OR colles:ti,ab,kw	10,499
#3	#1 OR #2 — block A	11,902
#4	'distal radioulnar joint'/exp OR druj:ti,ab,kw OR 'distal radioulnar':ti,ab,kw OR 'distal radio-ulnar':ti,ab,kw OR (((radioulnar OR 'radio ulnar') NEAR/4 (instabilit* OR stabilit* OR unstable OR stable OR subluxat* OR laxit*)):ti,ab,kw) OR ballottement:ti,ab,kw OR shuck:ti,ab,kw OR 'piano key':ti,ab,kw OR 'piano-key':ti,ab,kw — block B	3,233
#5	'triangular fibrocartilage'/exp OR tfcc:ti,ab,kw OR 'triangular fibrocartilage':ti,ab,kw OR foveal:ti,ab,kw OR 'ulnar styloid':ti,ab,kw — block C	21,035
#6	#3 AND (#4 OR #5) AND [2015-2026]/py	574

Set numbering, and one documented difference

The registered protocol reports the Embase strategy with the set numbers of the development session (#5, #48, #49, #8, #10, #50); the re-execution session assigned #1–#6. The queries are identical and map in order: #5→#1, #48→#2, #49→#3, #8→#4, #10→#5, #50→#6.

One wording difference exists. The executed set #1 contains six terms; the registered set #5 contains three (the /exp forms without their bare-phrase counterparts). The development execution of 28 July 2026 also used the six-term form, and the 571 records reported in the registered protocol are the product of that six-term execution. The two forms were tested against each other in the same session:

Set	Definition	Records
#7	Registered three-term form	5,992
#1	Executed six-term form	8,242
#9	(#7 OR #2) AND (#4 OR #5) AND [2015-2026]/py	574
#6	(#1 OR #2) AND (#4 OR #5) AND [2015-2026]/py	574

Since $\#7 \subseteq \#1$, it follows that $\#9 \subseteq \#6$; the two are of equal size, so $\#9 = \#6$. **The registered wording reproduces the search of record exactly.** No amendment was required, and none was made.

Part B · Execution and verification

Step	Record
Development search	28 July 2026 — PubMed 465, Embase 571
Search of record	3 August 2026 — PubMed 466, Embase 574
Final update search	None. The search of record of 3 August 2026 falls within 30 days of submission, as the protocol requires
Records identified	1,040
Duplicates removed	343 (330 by exact normalized DOI; 13 by title and year after manual confirmation)
Records screened	697

Every one of the 695 records from the development search was retrieved again; none was lost, and two were new. The deduplication is reproducible from the two raw export files by the script deposited with the review.

Known-item verification

Six reports that the strategy must retrieve were specified during development and checked in the executed search. **All six were retrieved.** These reports test retrieval, not eligibility; three of the six were subsequently excluded.

Report	What it tests
Lee SK 2016, <i>Ann Plast Surg</i> (PMID 27525497)	Block B — "DRUJ instability" in the title
Kim KW 2023, <i>Arch Orthop Trauma Surg</i> (PMID 34618191)	The proximity operator — the title carries <i>stability</i> , not <i>instability</i>
Moradi 2021, <i>Arch Bone</i>	Block B — "stable DRUJ"

Report	What it tests
<i>Joint Surg</i> (PMID 34026936)	
Sawada 2016, <i>J Orthop Sci</i> (PMID 27511887)	Block C only — ulnar styloid
Velmurugesan 2023, <i>Injury</i> (PMID 37210301)	Block C only
Afifi 2023, <i>J Hand Surg Eur</i>	Block C only

Block C earns its place empirically: during protocol development, five reports whose eligibility changed from excluded to included on reading the full text had all been retrieved through block C rather than block B. This is a development-stage observation and is distinct from the post-registration re-check of title-and-abstract exclusions, in which no decision was reversed.

Part C · PRESS 2015 self-assessment

How this assessment was conducted, and its limits

No information specialist or librarian took part in developing, executing or reviewing the searches. After the searches were complete, the strategies were assessed by the review team against the six elements of the **PRESS 2015 Evidence-Based Checklist**.

Three limitations of this assessment must be stated plainly. It was **conducted after execution**, so no finding could be acted on by revising the strategy. The strategy is **registered**, and the review team took the position that a registered search should not be silently altered after the data were locked, so every finding is reported rather than remedied. And it was **conducted by an author**, not by an independent peer; self-assessment against a checklist is weaker evidence than peer review by a specialist and is not a substitute for it. The assessment is offered as a structured, disclosed check of a search that was not peer reviewed — not as a claim that the search was peer reviewed.

The three findings

	Finding	Element	Could it have cost an eligible report?
F1	Neither strategy uses a subject heading for joint instability ("Joint Instability"[Mesh], 'joint instability'/exp)	1, 3	Possibly — tested in Part D
F2	The hyphenated form <i>radio-ulnar</i> is absent from the PubMed proximity terms; Embase searches both forms	2	Possibly — tested in Part D
F3	The proximity distance differs between databases: ~3 in PubMed, NEAR/4 in Embase	2	No — the Embase form is the more inclusive of the two, so the difference cannot have cost a record the narrower form would have found

No other deficiency was identified. **No change was made to the registered strategy**; F1 and F2 were instead tested directly, as reported in Part D.

Element 1 · Translation of the research question

Adequate, with two deliberate omissions. The question decomposes into a population (operatively fixed distal radius fracture) and a target condition (residual DRUJ instability, or its structural correlate); blocks A, B and C map onto this as A AND (B OR C).

- **Operative fixation is deliberately absent from the strategy.** Adding it would have raised precision and lowered recall, because many reports do not name the fixation in the title or abstract. Operative status was instead verified at screening. The decision was made before registration and is recorded in the protocol.
- **Terms for definition and assessment are deliberately absent**, for the same reason: a review whose object is what reports fail to state cannot filter on the presence of such statements.
- **F1** arises here and is developed under Element 3.

Element 2 · Boolean and proximity operators

Correct in structure; F2 and F3 identified. The A AND (B OR C) structure is applied identically in both databases, nesting is explicit throughout, and no unparenthesised OR sits inside an AND. Proximity is used where word order varies — *radioulnar joint instability* versus *instability of the radioulnar joint*.

- **F2.** PubMed does not equate a hyphenated phrase with its unhyphenated form. A PubMed record using *radio-ulnar instability* and never *distal radio-ulnar*, *radioulnar*, *DRUJ*, *TFCC* or *ulnar styloid* would be missed. The standalone term "distal radio-ulnar"[tiab] covers the commonest such phrasing but does not close the gap entirely.
- **F3.** The difference in proximity distance is not justified by anything in the strategy and was not intended.
- PubMed's proximity operator is incompatible with truncation; no truncated term appears inside any proximity expression, so this constraint is not triggered.

Element 3 · Subject headings

Used where they exist and are specific; F1 identified.

- PubMed: "Radius Fractures"[Mesh] (which explodes to include *Colles' Fracture*) and "Triangular Fibrocartilage"[Mesh]. Embase: 'distal radius fracture'/exp, 'colles fracture'/exp, 'smith fracture'/exp, 'distal radioulnar joint'/exp, 'triangular fibrocartilage'/exp, all exploded.
- "Radius Fractures"[Mesh] is not restricted to the distal radius. This broadens rather than narrows retrieval and is offset by the free-text terms in the same block; it is not a defect.
- Neither database has a subject heading specific to distal radioulnar instability, so block B necessarily relies on free text in PubMed. Embase's 'distal radioulnar joint'/exp partly compensates.
- **F1.** Combined with the population block, the joint-instability heading would have added records indexed for instability whose abstracts describe it only as *wrist instability* or *forearm instability*.

Element 4 · Text word searching

Comprehensive for the core concepts. No deficiency identified.

- Spelling and compounding variants are covered: *radioulnar*, *radio-ulnar*, *radio ulnar* (Embase), *distal radial* and *distal radius*, *piano key* and *piano-key*.
- Named clinical tests appear as free text — *ballottement*, *shuck*, *piano key* — which is what allows retrieval of reports that describe a maneuver without naming the joint's instability.
- Truncation is used in Embase (fracture*, instabilit*, stabilit*, subluxat*, laxit*) and in the non-proximity PubMed phrases. Fields are set explicitly: [tiab] in PubMed, :ti,ab,kw in Embase; the asymmetry favours Embase and reduces retrieval in neither.
- **Terms considered and not included:** *sigmoid notch*, *ulnocarpal*, *fovea sign*, *Galeazzi*. A report using only these and none of the block B or C terms is possible but was not observed in the 69 reports assessed at full text. *Galeazzi* denotes a diaphyseal rather than a distal radius fracture and lies outside the population.

Element 5 · Spelling, syntax and line numbers

Correct. No deficiency identified. No spelling errors were found in either strategy; field tags, quotation and truncation are syntactically valid in both interfaces. Straight quotation marks were used throughout, because typographic quotation marks silently alter the meaning of a PubMed query, and the strategies were copied from a plain-text source for that reason. The Embase set-number discrepancy is documented in Part A.2 and was shown

there to be immaterial. Record counts at every set are logged, which allows any reader to reproduce the strategy set by set.

Element 6 · Limits and filters

Appropriate. No filter that could bias retrieval was applied.

- The only limit is publication year, from 1 January 2015, applied as [Date - Publication] in PubMed — publication date rather than entry date, so that older articles indexed recently are still retrieved — and as [2015-2026]/py in Embase. The open upper bound in PubMed ("3000"[Date - Publication]) is intentional so that the strategy can be re-executed unchanged.
- **No language filter.** Four of the 30 included reports are not published in English — three in Czech and one in Chinese. All four were read with machine-assisted translation; confirmation by a fluent speaker was not sought.
- **No species, publication-type or study-design filter**, and no methodological search filter of any kind. For a review whose object is reporting practice, a design filter would have removed precisely the case series in which the omissions are most common; ten of the 30 included reports are case series.

Part D · Testing findings F1 and F2

Rationale and query

A registered search should not be altered silently, but neither should an identified weakness be left unexamined. Rather than amend the strategy — which would have made the search of record a mixture of the registered and a revised form — the review team measured whether the gap contains anything. The registered figures are unaffected by this test.

The diagnostic query was executed in PubMed on **5 August 2026**. It combines the registered population block with the two elements named in F1 and F2 and excludes everything the registered strategy already retrieves, so that its output is exactly the set of records the registered search could not have found.

```
("Radius Fractures"[Mesh] OR "distal radius fracture*"[tiab]
OR "distal radial fracture*"[tiab] OR "distal radius fracture"[tiab:~3]
OR Colles[tiab])
AND ("Joint Instability"[Mesh] OR "radio-ulnar"[tiab])
AND ("2015/01/01"[Date - Publication] : "3000"[Date - Publication])
NOT (DRUJ[tiab] OR "distal radioulnar"[tiab] OR "distal radio-ulnar"[tiab]
OR "radioulnar instability"[tiab:~3] OR "radioulnar stability"[tiab:~3]
OR "radioulnar stable"[tiab:~3] OR "radioulnar unstable"[tiab:~3]
OR "radioulnar subluxation"[tiab:~3] OR "radioulnar laxity"[tiab:~3]
OR ballottement[tiab] OR shuck[tiab] OR "piano key"[tiab] OR "piano-key"[tiab]
OR "Triangular Fibrocartilage"[Mesh] OR "triangular fibrocartilage"[tiab]
OR TFCC[tiab] OR foveal[tiab] OR "ulnar styloid"[tiab])
```

Result — 98 records, none eligible

Content of the retrieved set	n
Elbow, proximal radius or longitudinal forearm injury — radial head fracture and arthroplasty, terrible triad, coronoid, Monteggia, olecranon, Essex-Lopresti, interosseous membrane	61
Distal radius fracture in which <i>instability</i> denotes fracture instability — predictors of an unstable fracture, fixation series for unstable fractures	14

Content of the retrieved set	n
Carpal, scapholunate or midcarpal instability after distal radius fracture	11
Pediatric forearm or distal radius	5
Cadaveric or biomechanical	3
Editorial, commentary or introduction	2
Non-human	1
Galeazzi fracture-dislocation — excluded by the registered eligibility criteria, not by the search	1
Meeting the eligibility criteria on title and abstract	0

One of the 98 was already in the screening master. DRUJ0616 (Logli and Pulos, *Hand Clinics* 2020, a historical review) had been retrieved through **Embase**, whose stability block includes the Emtree term 'distal radioulnar joint'/exp and searches author keywords; it was excluded at title and abstract as a review. This is the PubMed gap operating in practice, and it shows the two-database design compensating for it.

Why the gap is empty, and what the test does not show

"Radius Fractures"[Mesh] is not restricted to the distal radius, and "Joint Instability"[Mesh] attaches predominantly to the elbow and the carpus. Their intersection is therefore dominated by elbow literature (61 of 98) and by carpal instability (11 of 98) — the adjacent constructs that the review's prespecified construct boundary was written to exclude. The subject heading adds recall where the review has no interest, and none where it does.

The test shows that **no report retrievable through F1 or F2, and not already retrieved by the registered strategy, meets the eligibility criteria on title and abstract**. It does not exclude a report that assesses residual DRUJ instability after fixation and never says so in its title or abstract. That class was bounded separately: 127 records excluded at title and abstract for apparent absence of a post-fixation assessment were selected for a full-text re-check, 118 full texts were obtained and re-examined, and **no decision was reversed**.

The registered strategy was therefore not amended, and this test is reported in place of an amendment.

Part E · Limitations of the search

1. **The search was not peer reviewed by an information specialist.** The structured self-assessment in Part C was conducted after execution and is not equivalent to independent peer review.
2. **Three weaknesses were identified and the strategy was not amended** (F1, F2, F3 in Part C). F1 and F2 were tested directly and the gap was found to contain no eligible report (Part D); F3 cannot have cost a record.
3. **Chinese-language databases were not searched** (CNKI, Wanfang, and the Chinese Medical Journal Network). One report identified by citation searching, Liu 2018 in the *Chinese Journal of Hand Surgery*, is not indexed in MEDLINE and its full text could not be obtained. The one Chinese-language report in the included set was retrieved through Embase; a direct search of Chinese databases might have found more.
4. **Grey literature and trial registries were not searched.** The object of the review is the reporting practice of published reports, which makes the restriction defensible, but it is a restriction.
5. **Citation searching is reported separately** in the flow diagram, under identification of studies by other methods.