

Supplementary information

Protocol and registration

The study protocol was designed prior to the summary of evidence and aimed to be systematic and transparent. The study protocol is not registered on a web platform.

Eligibility criteria

In accordance with the PCC method, the *population* of interest was defined as children younger than 17 years evaluated after a musculoskeletal trauma or blunt head trauma.

The *concept* was defined as non-radiologist-performed POCUS.

The *context* under investigation is any setting where frontline healthcare providers, not specialised in pediatric radiology, use POCUS to diagnose fractures in children.

The review included published studies including original data on non-radiologist-performed POCUS to diagnose pediatric fractures, as well as systematic reviews and meta-analyses.

Case-reports were excluded.

No limitation was set for the area of injury, the sonographer, the reference standard, and the year of publication.

Studies that published data on both children and adults were only considered eligible if the results were reported separately.

Only English and French papers were considered.

Information sources

A search was conducted using the Databases Pubmed and Embase.

The gray literature was sought with Google Scholar and Elicit, from which the first 50 hits were taken into consideration.

Relevant references were retrieved through screening of the citations of articles and identified systematic reviews.

Search strategy

The search strategy was elaborated with the help of a librarian :

Pubmed (last search : 2025.05.19, 115 hits)

((("Adolescent"[Mesh] OR "Child"[Mesh] OR "Infant"[Mesh] OR "Pediatrics"[Mesh] OR "adolescent*"[tiab] OR "babies"[tiab] OR "baby"[tiab] OR "child*"[tiab] OR "infant*"[tiab] OR "newborn*"[tiab] OR "p\$ediatr*"[tiab] OR "teenager*"[tiab] OR "toddler*"[tiab]) AND ("Point-of-Care Systems"[Mesh] OR "point of care ultras*"[tiab]) AND ("Fractures, Bone"[Mesh] OR "ankle fracture*"[tiab] OR "arm fracture*"[tiab] OR "buckle fracture*"[tiab] OR "crani* fracture"[tiab] OR "diaphys* fracture*"[tiab] OR "elbow fracture*"[tiab] OR "epiphys* fracture*"[tiab] OR "femoral fracture*"[tiab] OR "femur fracture*"[tiab] OR "fibula fracture*"[tiab] OR "foot fracture*"[tiab] OR "forearm fracture*"[tiab] OR "greenstick fracture*"[tiab] OR "hand fracture*"[tiab] OR "hip fracture*"[tiab] OR "humerus fracture*"[tiab] OR "knee fracture*"[tiab] OR "limb fracture*"[tiab] OR "metaphys* fracture*"[tiab] OR "physeal fracture*"[tiab] OR "radius fracture*"[tiab] OR "salter-harris"[tiab] OR "shoulder fracture*"[tiab] OR "skull fracture*"[tiab] OR "tibia* fracture*"[tiab] OR "toddler* fracture*"[tiab] OR "torus fracture*"[tiab] OR "ulna fracture*"[tiab] OR "wrist fracture*"[tiab]))

Embase (last search : 2025.05.19, 133 hits)

((('adolescent'/exp OR 'child'/exp OR 'pediatrics'/exp OR 'adolescent*':ab,ti,kw OR 'babies':ab,ti,kw OR 'baby':ab,ti,kw OR 'child*':ab,ti,kw OR 'infant*':ab,ti,kw OR 'newborn*':ab,ti,kw OR 'p\$ediatr*':ab,ti,kw OR 'teenager*':ab,ti,kw OR 'toddler*':ab,ti,kw) AND ('point of care ultrasound'/exp OR 'point of care ultras*':ab,ti,kw) AND ('limb fracture'/exp OR 'skull fracture'/exp OR 'salter-harris':ab,ti,kw OR ((ankle* OR arm* OR buckle OR crani* OR diaphys* OR elbow* OR epiphys* OR femoral* OR femur* OR fibula OR foot OR forearm* OR greenstick OR hand* OR hip* OR humerus OR knee* OR limb* OR metaphys* OR phys* OR radi* OR shoulder* OR skull OR tibia* OR toddler* OR torus OR ulna OR wrist) NEAR/3 fracture*):ti,ab,kw))

Google Scholar (last search : 2025.05.25, 50 first hits)

« POCUS AND fractures AND children »

Elicit (last search: 2025.05.25, 50 first hits)

« How effective is point-of-care ultrasound (POCUS) in detecting fractures across different age groups of children? »

Selection of sources of evidence

The selection of sources of evidence were carried out by 2 authors (C.H., A.D.).

The articles retrieved by the search strategies were transferred into an Excel spreadsheet, with double hits removed manually.

Title and abstracts were screened online and the full-text of eligible articles were reviewed using their uploaded PDFs.

Disagreements regarding the eligibility of an article were solved through discussion.

Potential duplicates were clarified by contacting their authors.

Data charting

A calibrated form using an Excel spreadsheet was developed by the authors. It was prospectively updated and calibrated through an iterative process, as new data items appeared relevant for the analysis of the reviewed papers. Both reviewers (C.H., A.D.) independently charted the data and then discussed the results.

Inconsistencies were resolved through discussion.

Data items

The following data were extracted:

Author

Country of origin

Year of publication

Journal

Objectives of the study (free text)

Primary outcome

Secondary outcomes

Study design

Population:

 Number of patients

 Age

 Site of trauma

 Fracture rate

 For studies on skull fracture after blunt head trauma: rate of traumatic brain injury

 Inclusion criteria

Exclusion criteria

Duration of follow-up

Index test:

POCUS protocol

Definition of fracture with POCUS

Ultrasound device

Transducer

Reference test:

Presence or absence

Modality: radiography or CT

Appropriate reference test: yes or no

Interpretation by a pediatric radiologist

Comparison group:

Presence or absence

Type of control group:

Same population with POCUS + reference test

Same population with reference test alone

Healthy group with POCUS alone (no reference test)

POCUS provider(s):

Number of examiners

Medical or paramedical speciality

Level of training

Credential

Aware of clinical information

The person who performs POCUS also interprets the images

The person who performs POCUS is different from the one who interprets the images

Outcomes other than accuracy

Pain assessment

Method of measurement

Duration of examination

Method of measurement

Waiting time

Method of measurement

Cost comparison between POCUS and reference test

Method of measurement

Radiation exposure

Dose metrics used

Critical appraisal of individual sources of evidence

The included articles were not critically appraised.

However, the robustness of the eligible articles was considered with the following items:

1. Clarity of research question: yes (1) – unclear (2) – not stated (3)
2. Appropriate study design for the research question: yes (1) – limitations (2) – inappropriate (3)
3. Description of participant recruitment: clearly described and random (1) – convenience sampling (2) – not mentioned (3)
4. Use of a control group: yes and appropriate (1) – yes inappropriate (2) – no control (3)
5. Blinding of POCUS examiners to the reference test: yes (1) – no (2) – not mentioned (3)
6. Consideration of confounding factors or biases: identified and appropriately addressed (1) – acknowledged but not addressed (2) – not considered (3)

Synthesis of results

The results were presented with descriptive statistics and with the use of text and tables.

Basic descriptive statistics were performed.