



SUPPLEMENTARY APPENDIX

Standalone commercial artificial intelligence software for pulmonary nodule detection on chest radiographs: a systematic review

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This Supplementary Appendix accompanies the main manuscript. It contains the complete electronic search strategies applied across four bibliographic databases (PubMed, PubMed Central, Scopus, and Web of Science) and a supplementary figure: a risk-of-bias summary for the six included studies assessed using an adapted QUADAS-2 framework.

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S1 Search Strategies

The following electronic search strategies were applied across four bibliographic databases. All searches were restricted to English-language publications from January 2017 onwards. Database-specific field tags and syntax were used throughout. The total number of records retrieved from each database is indicated below each strategy.

S1.1 PubMed

```
(
  "chest radiograph*" [Title/Abstract] OR "chest radiography" [Title/Abstract] OR
  "chest x-ray" [Title/Abstract] OR "chest x ray" [Title/Abstract] OR
  CXR [Title/Abstract]
)
AND
(
  "pulmonary nodule*" [Title/Abstract] OR "lung nodule*" [Title/Abstract] OR
  "solitary pulmonary nodule*" [Title/Abstract] OR
  "lung cancer detection" [Title/Abstract]
)
AND
(
  "artificial intelligence" [Title/Abstract] OR "machine learning" [Title/Abstract] OR
  "deep learning" [Title/Abstract] OR "computer-aided detection" [Title/Abstract] OR
  "computer assisted detection" [Title/Abstract] OR
  "computer-aided diagnosis" [Title/Abstract] OR CAD [Title/Abstract] OR
  algorithm* [Title/Abstract]
)
AND
(
  "2017/01/01" [Date - Publication] : "3000" [Date - Publication]
)
```

PUBMED TOTAL: 183

S1.2 PubMed Central

```
(
  "chest radiograph*" [Title/Abstract] OR "chest radiography" [Title/Abstract] OR
  "chest x-ray" [Title/Abstract] OR "chest x ray" [Title/Abstract] OR
  CXR [Title/Abstract]
)
AND
(
  "pulmonary nodule*" [Title/Abstract] OR "lung nodule*" [Title/Abstract] OR
  "solitary pulmonary nodule*" [Title/Abstract] OR
  "lung cancer detection" [Title/Abstract]
)
AND
(
  Lunit [Title/Abstract] OR qXR [Title/Abstract] OR Qure [Title/Abstract] OR
  Samsung [Title/Abstract] OR InferRead [Title/Abstract] OR ChestEye [Title/Abstract] OR
  ChestView [Title/Abstract] OR "AI-Rad Companion" [Title/Abstract] OR
  "CXR-AID" [Title/Abstract] OR Annalise [Title/Abstract] OR
  ClearRead [Title/Abstract] OR "Red Dot" [Title/Abstract] OR
  Milvue [Title/Abstract] OR SenseCare [Title/Abstract] OR VUNO [Title/Abstract] OR
  Gleamer [Title/Abstract] OR Veolity [Title/Abstract]
)
AND
(
  "2017/01/01" [Date - Publication] : "3000" [Date - Publication]
)
```

PUBMED CENTRAL TOTAL: 11



BRIDGE GenAI Lab

BIDMC–DFCI Radiology & Imaging Generative AI Hub
Beth Israel Deaconess Medical Center-Harvard Medical School

S1.3 Scopus

```
TITLE-ABS-KEY
(
  ("chest radiograph*" OR "chest radiography" OR "chest x-ray" OR "chest x ray" OR CXR)
  AND
  ("pulmonary nodule*" OR "lung nodule*" OR "solitary pulmonary nodule*" OR "lung cancer
  detection")
  AND
  (
    Lunit OR qXR OR Qure OR Samsung OR InferRead OR ChestEye OR ChestView OR
    "AI-Rad Companion" OR "CXR-AID" OR Annalise OR ClearRead OR "Red Dot" OR
    Milvue OR SenseCare OR VUNO OR Gleamer OR Veolity
  )
)
AND PUBYEAR > 2016
```

SCOPUS TOTAL: 30

S1.4 Web of Science

```
("chest radiograph*" OR "chest radiography" OR "chest x-ray" OR "chest x ray" OR CXR)
AND
("pulmonary nodule*" OR "lung nodule*" OR "solitary pulmonary nodule*" OR "lung cancer
detection")
AND
(Lunit OR qXR OR Qure OR Samsung OR InferRead OR ChestEye OR ChestView OR
"AI-Rad Companion" OR "CXR-AID" OR Annalise OR ClearRead OR "Red Dot" OR
Milvue OR SenseCare OR VUNO OR Gleamer OR Veolity)
```

WEB OF SCIENCE TOTAL: 18

Database	Date restriction	Records retrieved
PubMed	January 2017–present	183
PubMed Central	January 2017–present	11
Scopus	January 2017–present	30
Web of Science	January 2017–present	18
Total		242

Table S1. Summary of database search yields. All searches restricted to English-language publications from January 2017 onwards. Duplicates were removed prior to title and abstract screening.



S2 Supplementary Figures

Two supplementary figures are provided. Figure S1 shows the risk-of-bias assessment of all six included studies across the four QUADAS-2 domains. Figure S2 presents standalone commercial AI AUC values compared with radiologist AUC, grouped by study context and software product.

	Risk of bias domains				
	D1	D2	D3	D4	Overall
Study	van Leeuwen et al. (2024)	-	+	+	-
	Kim et al. (2025)	×	-	+	×
	Farouk et al. (2023)	×	-	+	×
	Sim et al. (2020)	×	+	+	×
	Koo et al. (2021)	-	-	+	-
	Toda et al. (2023)	-	×	-	×

Domains:
D1: Patient selection.
D2: Index test.
D3: Reference standard.
D4: Flow & timing.

Judgement
× High
- Some concerns
+ Low

Figure S1. Risk-of-bias assessment of the six included studies using an adapted QUADAS-2 framework. Four domains were evaluated: D1, patient selection; D2, index test; D3, reference standard; D4, flow and timing. Judgements are classified as low risk (green, +), some concerns (yellow, -), or high risk (red, ×). Overall risk of bias was determined by the highest-concern domain for each study. Three studies (Kim et al., Farouk et al., Sim et al.) were rated high overall risk, driven primarily by patient selection concerns. The remaining three studies (van Leeuwen et al., Koo et al., Toda et al.) were rated as having some concerns overall. No study was rated low overall risk.