PRISMA 2020 Checklist

AI-Driven CT Analysis for Aortic Disease: A Task-Based Systematic Review of Segmentation, Measurement, and Detection Applications (Tomography, manuscript 4643861). Locations refer to sections, tables and figures of the revised manuscript and Supplementary Materials.

Section and topic	Item	#	Checklist item	Location where item is reported
TITLE	Title	1	Identify the report as a systematic review.	Title ("A Task-Based Systematic Review…")
ABSTRACT	Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Abstract (structured); see second table
INTRODUCTION	Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Section 1, paragraphs 1–4
	Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Section 1, last paragraph
METHODS	Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Section 2.2
	Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Section 2.3 (PubMed/MEDLINE and Europe PMC, 5 September 2026; backward and forward citation searching); Table S1
	Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Section 2.3; Table S1 (full strings, limits)
	Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Section 2.4 (two reviewers jointly, in consensus; structured re-examination; no automation tools for screening)
	Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or	Section 2.5 (one reviewer with AI-assisted extraction, Elicit; verification of every value by a second reviewer); Section 2.7, Use of generative AI statement

			confirming data from study investigators, and if applicable, details of automation tools used in the process.	
	Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought, and if not, the methods used to decide which results to collect.	Section 2.5, paragraphs 3–4 (task-specific performance metrics; primary structure and main measurand conventions); Tables S3–S5
		10b	List and define all other variables for which data were sought. Describe any assumptions made about any missing or unclear information.	Section 2.5, paragraph 2 (common backbone); Section 2.5, paragraph 4 (conventions)
	Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Section 2.6 (QUADAS-2/QUADAS-AI for detection; CLAIM-informed descriptive appraisal with explicit decision rules for segmentation and measurement; two reviewers in consensus); Table S10
	Effect measures	12	Specify for each outcome the effect measure(s) used in the synthesis or presentation of results.	Section 2.7 (DSC, bias and limits of agreement, MAE, sensitivity, specificity, AUC, summarised as unweighted median and range)
	Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis.	Section 2.7, paragraph 2 (summaries within comparable compartments, measurands and units; exclusions from aggregate distributions stated in the summary lines of Tables 1–3)
		13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Section 2.5, paragraph 4 and Section 2.7 (metrics recorded as reported, not converted; multi-class means described separately)
		13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Section 2.7 (Tables 1–3, grouped by pathology and operative status; Figure 3)
		13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify	Section 2.7, paragraph 1 (no meta-analysis because of heterogeneity in targets, metrics and reference standards; synthesis without meta-analysis following SWiM)

			the presence and extent of statistical heterogeneity, and software package(s) used.	
		13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Section 2.7, paragraph 2 (descriptive subgroup summaries by sample size, validation design and CT technique); Table S9
		13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Not performed (descriptive synthesis without meta-analysis); stated in Section 2.7
	Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Not formally assessed; incomplete reporting of metrics addressed in Sections 3.3 (distance metrics) and 3.6, and in the CLAIM-informed reporting area (Section 2.6, Table S10)
	Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Not formally assessed (no GRADE); limitations of the evidence base discussed in Sections 4.5 and 4.6
RESULTS	Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Section 3.1, paragraph 1; Figure 1
		16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Table S2 (68 reports excluded at full text, with reasons)
	Study characteristics	17	Cite each included study and present its characteristics.	Tables 1–3; Section 3.1; Tables S3–S5
	Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Section 3.7; Figure 2; Tables S6–S8
	Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Tables 1–3 (one primary metric per study, external value where available); Tables S3–S5 (full extraction)
	Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Sections 3.3–3.5 (summary lines under Tables 1–3 state the number and identity of contributing studies); Section 3.7
		20b	Present results of all statistical	Sections 3.3–3.5 (unweighted

			syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	medians and ranges with number of studies); Figure 3
		20c	Present results of all investigations of possible causes of heterogeneity among study results.	Section 3.6, last paragraph; Table S9
		20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	Not applicable (no sensitivity analyses)
	Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Not formally assessed; see item 14
	Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Not formally assessed; see item 15
DISCUSSION	Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Section 4.1
		23b	Discuss any limitations of the evidence included in the review.	Sections 4.2–4.5 (compartment dependence, individual error, enriched samples, validation hierarchy, three levels of evidence)
		23c	Discuss any limitations of the review processes used.	Section 4.6, paragraph 2
		23d	Discuss implications of the results for practice, policy, and future research.	Section 4.5, last paragraph; Section 5
OTHER INFORMATION	Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Section 2.1 and Abstract: the review was not registered prospectively; the protocol was registered retrospectively on INPLASY, registration number INPLASY2026110004 (1 November 2026)
		24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Section 2.1: INPLASY record, doi:10.37766/inplasy2026.11.0004 (https://inplasy.com/inplasy-2026-11-0004/)
		24c	Describe and explain any	Section 2.1: the registration is

			amendments to information provided at registration or in the protocol.	retrospective and records the methods as conducted; post hoc descriptive elements are declared in the record; no amendments
	Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Funding statement (no external funding)
	Competing interests	26	Declare any competing interests of review authors.	Conflicts of Interest statement
	Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Data Availability Statement; Supplementary Tables S1–S10 (search strategies, excluded reports, extraction tables, appraisal tables, subgroup summaries, decision rules)

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TITLE	Title	1	Identify the report as a systematic review.	Title
BACKGROUND	Objectives	2	Provide an explicit statement of the main objective(s) or question(s) the review addresses.	Abstract, Background/Objectives
METHODS	Eligibility criteria	3	Specify the inclusion and exclusion criteria for the review.	Abstract, Background/Objectives and Methods (AI applications to CT/CTA of the thoracic and abdominal aorta by primary task)
	Information sources	4	Specify the information sources (e.g. databases, registers) used to identify studies and the date when each was last searched.	Abstract, Methods (PubMed/MEDLINE and Europe PMC, 2015 to September 2026)
	Risk of bias	5	Specify the methods used to assess risk of bias in the included studies.	Abstract, Methods (CLAIM; QUADAS-2/QUADAS-AI)
	Synthesis of results	6	Specify the methods used to present and synthesise results.	Abstract, Methods (synthesis without meta-analysis)
RESULTS	Included studies	7	Give the total number of included studies and participants and summarise relevant characteristics of studies.	Abstract, Results (118 studies: 42, 38, 38)
	Synthesis of results	8	Present results for main outcomes, preferably indicating the number of included studies and participants for each. If meta-analysis was	Abstract, Results (median DSC, bias and limits of agreement, AUC)

			done, report the summary estimate and confidence/credible interval. If comparing groups, indicate the direction of the effect (i.e. which group is favoured).	
DISCUSSION	Limitations of evidence	9	Provide a brief summary of the limitations of the evidence included in the review (e.g. study risk of bias, inconsistency and imprecision).	Abstract, Results (external validation rates; 33 of 38 at high risk of bias; two prospective evaluations)
	Interpretation	10	Provide a general interpretation of the results and important implications.	Abstract, Conclusions
OTHER	Funding	11	Specify the primary source of funding for the review.	Not stated in the Abstract (no external funding; Funding statement)
	Registration	12	Provide the register name and registration number.	Abstract, Methods (“the protocol was registered retrospectively (INPLASY2026110004)”)

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71. For more information, visit: http://www.prisma-statement.org/