

METRICS Tool v1.0

Please fill out all conditions first for relevant sections and then all active items to calculate METRICS score.

Please note that default option is "No".

- ☐ ?
- Stands for explanation of items and conditions.
- ☐ C
- Stands for conditional items or sections.

Items/Conditions	Definitions	Weights	Options
Study Design			
Item#1	<div><input type="checkbox"/> ?</div> Adherence to radiomics and/or machine learning-specific checklists or guidelines	0.0368	<div><input checked="" type="radio"/> Yes</div> <div><input type="radio"/> No</div>
Item#2	<div><input type="checkbox"/> ?</div> Eligibility criteria that describe a representative study population	0.0735	<div><input checked="" type="radio"/> Yes</div> <div><input type="radio"/> No</div>
Item#3	<div><input type="checkbox"/> ?</div> High-quality reference standard with a clear definition	0.0919	<div><input checked="" type="radio"/> Yes</div> <div><input type="radio"/> No</div>
Imaging Data			
Item#4	<div><input type="checkbox"/> ?</div> Multi-center	0.0438	<div><input checked="" type="radio"/> Yes</div> <div><input type="radio"/> No</div>
Item#5	<div><input type="checkbox"/> ?</div> Clinical translatability of the imaging data source for radiomics analysis	0.0292	<div><input type="radio"/> Yes</div> <div><input checked="" type="radio"/> No</div>
Item#6	<div><input type="checkbox"/> ?</div> Imaging protocol with acquisition parameters	0.0438	<div><input type="radio"/> Yes</div> <div><input checked="" type="radio"/> No</div>
Item#7	<div><input type="checkbox"/> ?</div> The interval between imaging used and reference standard	0.0292	<div><input checked="" type="radio"/> Yes</div> <div><input type="radio"/> No</div>
Segmentation <div><input type="checkbox"/> C</div>			
Condition#1	<div><input type="checkbox"/> ?</div> Does the study include segmentation?		<div><input checked="" type="radio"/> Yes</div> <div><input type="radio"/> No</div>
Condition#2	<div><input type="checkbox"/> ?</div> Does the study include fully automated segmentation?		<div><input type="radio"/> Yes</div> <div><input checked="" type="radio"/> No</div>
			<div><input checked="" type="radio"/> Yes</div>

Item#8	<input type="checkbox"/> Transparent description of segmentation methodology	0.0337	<input type="radio"/> No
Item#9	<input type="checkbox"/> Formal evaluation of fully automated segmentation <input type="checkbox"/> C	0.0225	<input type="radio"/> Yes <input type="radio"/> No
Item#10	<input type="checkbox"/> Test set segmentation masks produced by a single reader or automated tool	0.0112	<input checked="" type="radio"/> Yes <input type="radio"/> No

Image Processing and Feature Extraction

Condition#3	<input type="checkbox"/> Does the study include hand-crafted feature extraction?		<input checked="" type="radio"/> Yes <input type="radio"/> No
Item#11	<input type="checkbox"/> Appropriate use of image preprocessing techniques with transparent description	0.0622	<input checked="" type="radio"/> Yes <input type="radio"/> No
Item#12	<input type="checkbox"/> Use of standardized feature extraction software <input type="checkbox"/> C	0.0311	<input checked="" type="radio"/> Yes <input type="radio"/> No
Item#13	<input type="checkbox"/> Transparent reporting of feature extraction parameters, otherwise providing a default configuration statement	0.0415	<input type="radio"/> Yes <input checked="" type="radio"/> No

Feature Processing

Condition#4	<input type="checkbox"/> Does the study include tabular data?		<input checked="" type="radio"/> Yes <input type="radio"/> No
Condition#5	<input type="checkbox"/> Does the study include end-to-end deep learning?		<input checked="" type="radio"/> Yes <input type="radio"/> No
Item#14	<input type="checkbox"/> Removal of non-robust features <input type="checkbox"/> C	0.0200	<input type="radio"/> Yes <input checked="" type="radio"/> No
Item#15	<input type="checkbox"/> Removal of redundant features <input type="checkbox"/> C	0.0200	<input type="radio"/> Yes <input checked="" type="radio"/> No
Item#16	<input type="checkbox"/> Appropriateness of dimensionality compared to data size <input type="checkbox"/> C	0.0300	<input type="radio"/> Yes <input checked="" type="radio"/> No
Item#17	<input type="checkbox"/> Robustness assessment of end-to-end deep learning pipelines <input type="checkbox"/> C	0.0200	<input type="radio"/> Yes <input checked="" type="radio"/> No

Preparation for Modeling

Item#18	<input type="checkbox"/> Proper data partitioning process	0.0599	<input checked="" type="radio"/> Yes <input type="radio"/> No
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Item#19	<div><div>?</div>Handling of confounding factors</div>	0.0300	<div><div></div>Yes</div> <div><div></div>No</div>
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Metrics and Comparison

Item#20	<div><div>?</div>Use of appropriate performance evaluation metrics for task</div>	0.0352	<div><div></div>Yes</div> <div><div></div>No</div>
Item#21	<div><div>?</div>Consideration of uncertainty</div>	0.0234	<div><div></div>Yes</div> <div><div></div>No</div>
Item#22	<div><div>?</div>Calibration assessment</div>	0.0176	<div><div></div>Yes</div> <div><div></div>No</div>
Item#23	<div><div>?</div>Use of uni-parametric imaging or proof of its inferiority</div>	0.0117	<div><div></div>Yes</div> <div><div></div>No</div>
Item#24	<div><div>?</div>Comparison with a non-radiomic approach or proof of added clinical value</div>	0.0293	<div><div></div>Yes</div> <div><div></div>No</div>
Item#25	<div><div>?</div>Comparison with simple or classical statistical models</div>	0.0176	<div><div></div>Yes</div> <div><div></div>No</div>

Testing

Item#26	<div><div>?</div>Internal testing</div>	0.0375	<div><div></div>Yes</div> <div><div></div>No</div>
Item#27	<div><div>?</div>External testing</div>	0.0749	<div><div></div>Yes</div> <div><div></div>No</div>

Open Science

Item#28	<div><div>?</div>Data availability</div>	0.0075	<div><div></div>Yes</div> <div><div></div>No</div>
Item#29	<div><div>?</div>Code availability</div>	0.0075	<div><div></div>Yes</div> <div><div></div>No</div>
Item#30	<div><div>?</div>Model availability</div>	0.0075	<div><div></div>Yes</div> <div><div></div>No</div>

Total METRICS score: 61.7%

?

 Quality category: Good

?

 Publication ID:

If you publish any work which uses this tool, please cite the following publication:

Kocak B, Akinci D'Antonoli T, Mercaldo N, et al. METHodological RadiomICs Score (METRICS): a quality scoring tool for radiomics research endorsed by EuSoMII. Insights Imaging. 2024;15(1):8. Published 2024 Jan 17. doi:10.1186/s13244-023-01572-w