# *European Radiology* Manuscript requirements for submissions

**Edition 2 (June 2024)**

Dear authors:

The Editors of *European Radiology* have put together the following requirements and recommendations for your submission to the journal. The aim is to help you improve your work by enhancing scientific soundness and style.

Note that manuscripts that fail to comply with instructions marked as Must have will be sent back to authors upon submission for correction.

## Summary of changes from edition 1

- Added "technique" to suggested Article title elements.
- Added "General remarks" section with new requirements.
- Re-structured **Key points** and **Clinical relevance statement**:
  - 2 Key points (25-30 words each) + Relevance statement (max 40 words)
- Demographics summary no longer advised for Table 1, it can be any Table.
- Instruction on long tables and tables in landscape format moved to Tips instead of being directly discouraged.

European Radiology

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## Article title

Article titles are the first point of contact with the reader. They should be as short and catchy as possible but include as many details as needed to grasp the essence of your work.

**Must have:**

State which body part, disease, technique, and/or problem is being investigated. Be as concise as possible.

No use of abbreviations is allowed (exceptions: *CT, MR, MRI, PET, US, BI-RADS, LI-RADS, PI-RADS, other very common, non-subspecialty, abbreviations).*

**Highly recommended:**

No more than 15 words.

If space allows, indicate study type (e.g., randomised clinical trial) and clinical trial or cohort name (e.g., DETERMINE, MESA).

**Tips**

ⓘ Avoid "pilot study" or "preliminary study" when your study does not qualify as such. See L Thabane et al. (doi: 10.1186/1471-2288-10-1) and Halligan et al. (doi: 10.1007/s00330-021-07971-1).

ⓘ If you have a nuclear medicine paper, stick to the EANM nomenclature.

## General remarks for all manuscript parts

- Be consistent with *either* British English or American English spellings.
- When using commas in a list, we suggest using a comma after the penultimate item in the list and before the "and" that indicates the last item in the list, i.e., use the Oxford comma.
- Abbreviations that are generally understood by all radiologists (e.g., MRI, PET/CT, PI-RADS, etc.) do not need defining. Any subspecialty abbreviations or study specific abbreviations (e.g., iodinated contrast media might be ICM in one study and CM in another) should be defined in the abstract and again in the introduction or the first time they're introduced in the main text.
- *p*-values should be included as a small italicized '*p*' followed by one space, the relational operator, one space, and the value.
    - E.g., "$p < 0.05$"
    - All *p*-values should include a zero before the decimal point (unless the value is equal to 1) and two digits after the decimal point except when very small or near the significance level (e.g., very small $p < 0.01$ or $p = 0.049$).
- In general, things that were done for the study or previously reported results should be referred to in the past tense while things that are being reported to the reader should be in the present tense.
    - E.g., The results were evaluated with Spearman Rank Correlation Coefficients and the results are presented in Table 2.
- Figures and Tables should be numbered in order of appearance in the article.
- Additional material (supplementary figures, tables, or videos) should be submitted as Electronic Supplementary Material.

# Abstract

**Must have:**

Word limit of 250 for the abstract.

**Highly recommended**

Use the following structure and provide details on:

| | |
|---|---|
| Objectives | • Main objective (the problem which should be solved) of the study. Provide context for the objective if space allows. |
| Materials & Methods | |
| *Study design* | • Identification as a study of diagnostic accuracy using at least one measure of accuracy.<br>• Description of the index test and reference standard.<br>• Summary of statistical tests performed.<br>• Describe compared groups, cohort size, intervention, and control group. |
| *Modalities/ Interventions* | • State/list the modalities and procedures performed. |
| *Data collection* | • Retrieval method, prospective/retrospective, period of enrolment. |
| *Participations* | • Main eligibility criteria for participants. Single or multicentre. |
| Results | • In the first sentence, indicate the number, sex, and mean age ± standard deviation of the patients/participants enrolled. *Example: for 100 patients of 60 men and 40 women, write 100 patients (mean age, 47 years +/- 10 [standard deviation], 60 men) were evaluated.*<br>• Numerical data, *p*-values for all comparisons. *Example: (group A, 25 ± 4, group B 50 ± 5, p = 0.01)*<br>• Include confidence intervals, if appropriate. *Example: (AUC, 0.70; 95% CI: 0.64, 0.77; p < 0.001).* |
| Conclusion | • Must address the problem noted as the objective and be derived from the results.<br>• Do not elaborate on the importance of the study or other implications. |

**Tips**

ⓘ According to the type of the study, you are advised to consult the following abstract checklists: STARD, STROBE, PRISMA-DTA, PRISMA, TRIPOD, CONSORT.

ⓘ Study design considerations: In a prospective study, data collection was planned with an idea of prospective results, and optimally with the size of the cohort, i.e., before the index test and reference standard were performed. Enrolment of participants with consent, data analysis, and outcomes were specified prior to initiating the study. When data of prospective study is reworked, it is no longer considered a prospective study. Methodology must be decided beforehand. Optimally, a calculation should exist based on the size of cohort.
If the main prospective study did not include your study purpose in the original design, classify as a retrospective study/retrospective analysis of prospective cohort, specialised approval should be obtained.
A retrospective study looks backwards and examines already acquired data.

## Key points and Clinical Relevance Statement

The role of the key points is to invite the reader to read the study. They should be short and catchy.

**Must have:**

1. **Question** (20–25 words) – Explain the unmet need/clinical problem your study addresses

2. **Findings** (20–25 words) – Objectively summarize your main result

3. **Clinical Relevance Statement** (maximum 40 words) – summarize the benefit for the patient and/or clinical relevance of the study

*Example:*

***Question*** *Localizing sites of bile leakage following abdominal trauma is important for determining the method of treatment, but it is not identified by first-line radiological studies.*

***Findings*** *Gadolinium ethoxybenzyl-enhanced MRCP (Gd-EOB-DTPA-MRCP) identified and localized all cases of bile leaks, including in cases of impaired liver function, in iatrogenic and non-iatrogenic trauma.*

***Clinical Relevance*** *Gd-EOB-DTPA-MRCP is a reliable diagnostic tool for exactly localizing iatrogenic and post-traumatic biliary leakage. Its precise localization helps tailor local therapies for different injury patterns, resulting in comparable clinical outcomes despite varying treatments.*

No use of abbreviations that are not fully spelled out is allowed (exceptions: *CT, MR, MRI, PET, US, BI-RADS, LI-RADS, PI-RADS, or other very common, non-subspecialty, abbreviations).*

**Highly recommended:**

Avoid hypotheticals and vague language (*e.g.,* 'could', 'might', 'can in future', etc.).

Avoid opinions or extrapolations that are not proven by the study.

Do not copy sentences already used in the main text or abstract.

**Examples**

Example of **ineffective** Key Points:

- Breast cancer is a leading cause of death in Europe (**Too general, no added value**).
- PBO of IIA, CIA, and IAA is effective in placenta accreta (**Overuse of specialised abbreviations that are not explained**).

- Diaphragmatic curvature showed a significant deterioration after 1 year in Pompe patients compared to healthy controls, but the curvature seems to remain stable over this period in patients who were treated with enzyme replacement therapy for less than 3 years, possibly indicating a positive effect of ERT (**Too long**).

## Keywords

Keywords help your article to be more visible in future online searches.

**Must have:**

3 to 5 terms representative of your study.

**Highly recommended:**

Choose those Keywords that best fit your article topic and include:

- body part of interest
- disease
- imaging modalities (tomography, computed; magnetic resonance imaging; single photon emission computed tomography; no abbreviations)
- problem being studied

## Introduction

**Highly recommended**

Not exceeding 400 words.

Include short paragraphs (2–3 sentences each) on the following:

- Specific position of the question (no general statements on the disease): include a summary of the open scientific questions.
- Purpose of the investigation: what is the specific problem or gap in knowledge being addressed, to what extent the literature tried to solve it, and what is its relevance in the current clinical context?
- How do you plan to solve this problem?

**Tips**

ⓘ Keep in mind:

- For prospective studies only: include your hypothesis.
- For reviews or meta-analyses: explain why a systematic review on this topic was needed and what it aimed to contribute to the field.
- For retrospective studies: state the aim of your research.
- Avoid sentences without specific added value for your study.

## Materials and methods

This section should be given in sufficient detail to permit repetition of the experimental work. Adherence to applicable reporting guidelines (see EQUATOR network or CLAIM for artificial intelligence papers) is strongly recommended.

**Must have:**

- The first sentence should address institutional review board (IRB) approval and patient informed consent, including the reference to human and animal rights declarations and regulations.

- A clear statement of whether the study is retrospective or prospective.

- Date ranges of the study, patient enrolment, and retrieval method.

- Inclusion and exclusion criteria, consecutive or random selection.

- Description of the index test and reference standard (optionally in a dedicated table).

- Explanation of how the evaluation was performed.

- Mention of any utilised instruments or drugs (including contrast) with trade names, manufacturer's name in parentheses (*do not* include the country of origin).

- Statistical methods used to analyse the data.

**Nice to have:**

- Initials of all authors executing tests or readings/evaluations- Clear and well-explained reading strategy.

- It is advised to have a statistical guarantor, ideally one of the authors, who will be responsible for sincerity and transparency of all statistical analyses and answer any pre- or post-publication queries.

- If applicable, report the sample size calculation.

**Tips**

ⓘ Note that exclusion criteria should *not* be the opposite of the inclusion criteria, but a well-defined and explained reason not to include participants.

ⓘ Statistical consultation should be set before planning a study to ensure appropriate sample size and data analysis.

## Results

The results section should describe the outcome of the study. Data should be presented as concisely as possible.

**Do:**

- Use the first sentence to describe the final cohort after application of inclusion/exclusion criteria described in the methods.
- Use **Figure 1** to represent the **flowchart** of the study, from initial retrieval to final study cohort.
- Summarise the **demographics** of your study sample, ideally, presented in a **Table:**
    - indicate number of patients/participants
    - mean age ± standard deviation or median age and interquartile range
    - number of men vs women
- Use tables and figures to illustrate your findings.
- Follow the same structure in the Results as in the Material and Methods (i.e., keep the same subheadings), if applicable.
- Make efforts to improve legibility of the results, exposing them in a simple and logical manner.
- Report all collected statistical analyses, not only the positive findings.
- Try to cite all figures and tables in the Results section.

**Don't:**

- Avoid elaborating on "trends" or any non-significant results.
- Do not include any statistical results based on tests that were not included in the corresponding section of Material and Methods.
- Do not include interpretation or opinions in the result section.

**Tips**

ⓘ *p* values should be generally expressed to 2 digits to the right of the decimal point. Exceptions are $p < 0.01$ and close to 0.05. Three digits to the right of the decimal point are allowed.
ⓘ Tip: ask a "naïve" colleague, not involved in the study, to read the Results section and collect his/her opinion on the clarity.

## Discussion

The discussion should be an interpretation of the results and their significance with reference to work by other authors. It should be written in clear and concise language using the following structure.

**Do:**

- 1st paragraph: Summarise and interpret the results in a simple manner.
- 2nd paragraph: Compare your findings with the existing literature, background, and any useful comments.
- 3rd paragraph: Outline biases and limitations, explaining in detail what the limitations are and how these were mitigated or can be addressed in the potential future studies.
- 4th paragraph: Include a short and straightforward conclusion, including a statement on the clinical implications/relevance of your study. Support your conclusion with the main results of your study.

**Don't:**

- Don't repeat information that is already stated in the Introduction.
- Don't start the discussion with general considerations about the question/disease.
- Don't introduce any new results. The discussion should be based only on the results stated in the previous section.
- Don't make a hypothetical conclusion based on opinions or desired outcomes.

**Tips**

ⓘ Be aware that many readers (especially those who are non-specialised and want to simply improve their knowledge without getting into the details) will read the Introduction and the Discussion, *not* the Material and Methods or the Results. For those readers, the authors should consider that the Discussion is the natural continuation of the Introduction.

# References

**Must have:**

All references must already be published or accepted for publication (a DOI must already be available).

Citations in the text should be in Arabic numerals typed in square brackets, e.g., [2, 5, 12]. References must be listed in the order in which they appear in the text.

Adhere to the reference style included below.

### Reference style

References should follow the following journal format:

- *Ward J, Robinson PJ (2002) How to detect hepatocellular carcinoma in cirrhosis. Eur Radiol 12:2258-2272*

  **or**

- *Ward J, Robinson PJ (2002) How to detect hepatocellular carcinoma in cirrhosis. Eur Radiol. DOI:10.1007/s00330-002-1450-y*

If there are 6 authors or fewer, the names of **all** authors should be provided (i.e., 'et al.' should not be used).

- *Lunkiewicz M, Forte S, Freiwald B, Singer G, Leo C, Kubik-Huch RA (2020) Interobserver variability and likelihood of malignancyfor fifth edition BI-RADS MRI descriptors in non-mass breast le-sions. Eur Radiol 30:77–86*

  **or**

- *Lunkiewicz M, Forte S, Freiwald B, Singer G, Leo C, Kubik-Huch RA (2020) Interobserver variability and likelihood of malignancyfor fifth edition BI-RADS MRI descriptors in non-mass breast le-sions. Eur Radiol DOI: 10.1007/s00330-019-06312-7*

If there are 7 authors or more, only the names of the first 3 authors in the list should be given followed by 'et al.'.

- *Thomassin-Naggara I, Trop I, Chopier J et al (2011) Nonmasslike enhancement at breast MR imaging: the added value of mammography and US for lesion categorization. Radiology 261:69–79*

  **or**

- *Thomassin-Naggara I, Trop I, Chopier J et al (2011) Nonmasslike enhancement at breast MR imaging: the added value of mammography and US for lesion categorization. Radiology DOI: 10.1148/radiol.11110190*

All online resources should contain the date of last access.

- *Foundational Model of Anatomy, NCBO BioPortal (2022) Available via https://bioportal.bioontology.org/ontologies/FMA. Accessed 11 Apr 2022*

## Figure captions

Figure captions should be understandable even when not reading the full paper. They must be brief and provide clear, concise explanations of the illustrations.

**Do:**

- Explain all images comprising the figure.
- Address and explain any symbols/visual aids used in the figure (arrows, arrowheads, asterisks, lines, colour shades), and make sure that any symbols/visual aids are clearly visible and of appropriate size. Unless explicitly needed, these should be black or white.
- Define all abbreviations appearing in the images and include all units.
- Explain the entire figure in the caption and specify only the characteristics/differences in the individual panels.
- Any uncommon abbreviations used in the caption must be written in full when first mentioned.
- Multiple images (panels) within one figure should be indicated in in-text references with a lowercase letter (e.g., *Figure 1a, Figure 2b*) for each of the panels. These should be addressed in the Figure captions using the same lowercase letters bolded (e.g., Figure 1 **(a)** 1.5-T MRI of ROI and **(b)** 3-T MRI of ROI).
- Figure numbers and captions should be included only in the caption (and not embedded in the figure file).

**Don't:**

- Don't describe images in detail.
- Don't provide analysis of the images; image interpretation should be a part of main text.
- Don't repeat information that is already included in the main text.

**Example 1 (good / bad):**

- Dual-energy CT angiographic (DECT) examination obtained in a 73-year-old female patient (BMI 34.6 kg/m$^2$) with Chronic Thromboembolic Pulmonary Hypertension. DECT perfusion images (2-mm thick) obtained at the level of the carina **(a)**, right bronchus intermedius **(b),** and lower lung zones **(c)** illustrating the adequate depiction of numerous perfusion defects (arrows) despite image graininess in this obese patient
- Dual-energy CT angiographic examination obtained in a 73-year-old female patient (BMI 34.6 kg/m$^2$) with CTEPH. DECT perfusion images (transverse CT sections; 2-mm thick) obtained at the level of the carina (**a**). DECT perfusion images (transverse CT sections; 2-mm thick) obtained at the level of the right bronchus intermedius (**b**). DECT perfusion images (transverse CT sections; 2-mm thick) obtained at the level of the lower lung zones (**c**) illustrating the adequate depiction of numerous perfusion defects (arrows) despite image graininess in this obese patient **(repetitive information)**

**Example 2 (good / bad):**

- Longitudinal plane of B-mode US features in the first metatarsophalangeal joint: **a** Echogenic foci (arrows). **b** Double-contour sign (arrows). **c** Cortical bone erosions (arrows). **d** Joint cavity effusion (arrows). **e** Tophus (arrows)

- Longitudinal plane of B-mode US features in the first metatarsophalangeal joint: **a** Echogenic foci. **b** Double-contour sign. **c** Cortical bone erosions. **d** Joint cavity effusion. **e** Tophus **(symbols in the figure, not addressed)**

## Tables

Tables help the reader to understand larger data by summarising it concisely.
They must be numbered in Arabic numbers and should include a title.

**Do:**

- All abbreviations in the table must be explained.
- Footnotes in tables are denoted by superscript lower-case letters (or asterisks for significance values and other statistical data).
- Cite each table in numerical order in the main text.
- Provide information on statistical variability when applicable (standard deviations for mean values or confidence intervals).
- Make tables understandable by themselves without reference to the results section.
- Indicate sub-sections of the first column by indenting the items within a section.
- Make sure that each column follows the same heading all the way down.
- Make sure that each row follows the same heading all the way across.
- Contain each item of data within its own cell.
- Define all abbreviations used in tables in the footnotes of each table.
- Indicate significance of any special characters/symbols or font typeface (**bold**, *italic*) in the footnote.

**Don't:**

- Don't use special typeface or symbols if there is no special significance to it.
- Don't use visual aids to distinguish results (*no* coloured letters, highlighted cells, images, or emoticons; the typesetting does not allow for these in the tables).

**Tips**

ⓘ It is advisable that your tables (including legends) take up no more than one typed page. Tables exceeding one full page, or tables in landscape format, can be moved to the Electronic Supplementary Material.
ⓘ Present the same data consistently (e.g., to the same number of significant digits) throughout the abstract, text, tables, figures, and supplements.