Responsible Use of Artificial Intelligence in Health Research

Scientific integrity, research governance, and human accountability in the AI era

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Why this matters

AI is now used across the research lifecycle: literature review, coding, analysis, writing, image generation, and dissemination.

It may **increase speed and scale**—but can also introduce errors, bias, privacy breaches, and untraceable decisions.

The ethical question is not only "**Can AI do this?" but "Should it,** under what safeguards, and who is accountable?"

Learning objectives

Distinguish common AI applications in biomedical and clinical research.

Evaluate AI use for scientific validity, privacy, fairness, and reproducibility.

Identify responsibilities of researchers, principal investigators, institutions, ethics committees, and journals.

Design appropriate verification, documentation, disclosure, and oversight.

Apply a practical governance framework to real research scenarios.

AI across the research lifecycle

Research phase	Possible AI application	Governance question
Concept development	Research-question generation	Is the question relevant, original, and justified?
Literature review	Searching, screening, summarizing	Were primary sources independently verified?
Protocol development	Methodological suggestions	Has a qualified researcher reviewed the design?
Data management	Cleaning, coding, linkage	Are privacy and reproducibility protected?
Analysis	Code generation or model selection	Can the team explain and reproduce the analysis?
Interpretation	Pattern recognition and drafting	Are conclusions supported by the data?
Publication	Writing, figures, peer review	Was AI use disclosed and confidentiality protected?

Scientific integrity under automation

AI-assisted work is not automatically unethical.
Uncritical, undisclosed, or unverifiable AI-assisted work is ethically problematic.

Honesty: no fabricated data, references, quotations, or images.

Accuracy: claims, calculations, code, and interpretations must be checked.

Transparency: document what tool was used, where, and for what purpose.

Reproducibility: preserve relevant prompts, versions, inputs, outputs, and verification steps.

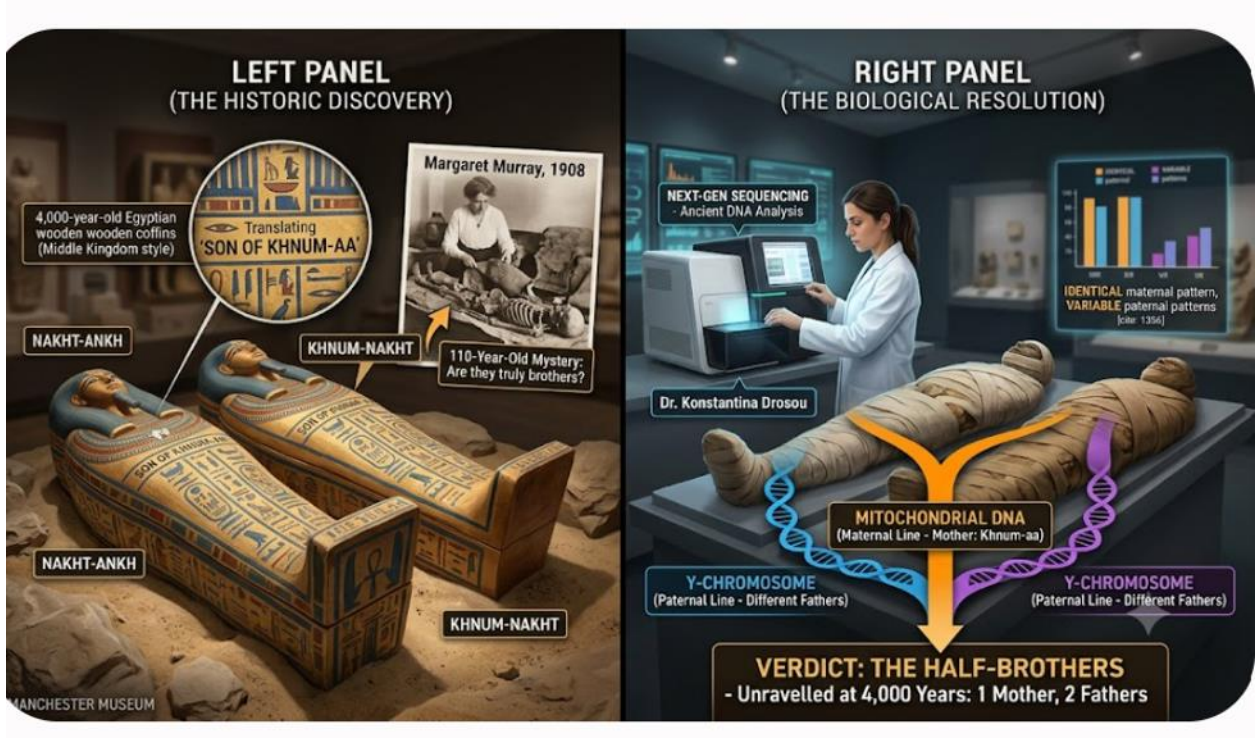
Accountability: named human researchers remain responsible for the final work.

Major ethical risks

Risk	How it appears in research	Control
Hallucination	Invented references, quotations, or results	Verify against primary sources
Automation bias	Uncritical acceptance of confident outputs	Independent expert review
Bias	Unequal performance across populations	Validate in the target population
Privacy breach	Uploading identifiable or sensitive data	Approved secure systems and minimum data
Opacity	Unclear model, prompt, or processing history	Document and audit the workflow
Intellectual property	Unlicensed or unattributed material	Check ownership, permissions, and attribution
Deskilling	Researchers cannot explain the method	Require competence and human sign-off

The use of generative AI and AI-assisted tools in figures, images and artwork

The use of AI tools for the creation of figures, images and artwork is only permitted in specific circumstances.





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Dear Professor Maha,

Thank you for your email. I attach a better version of the image. You have the Museum's permission to use this image, with the credit line 'Courtesy of Manchester Museum, The University of Manchester', please.

Best wishes,

Campbell

Dr Campbell Price (he/him)
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Privacy, confidentiality, and consent

- **Do not assume that "de-identified**" means "risk-free." Linkage across datasets may permit re-identification.
- Before uploading data, **assess authorization, consent,** retention, processing location, training use, and institutional policy.
- **Apply data minimization:** provide only the information necessary for the approved task.
- **Use institutionally approved**, secure systems for sensitive research data.
- **Escalate uncertainty to the principal investigator**, data-protection officer, or **research ethics committee.**

Can I upload it? ≠ Am I authorized to upload it?

Bias and external validity

- AI systems may reproduce **bias from training data**, labels, historical practice, or under-representation.
- **Performance may differ** by age, sex, ethnicity, language, socioeconomic status, disease severity, or care setting.
- **A model trained in one health system** should not automatically be generalized to another population.
- **Assess subgroup performance, missingness**, calibration, false-positive and false-negative rates, and clinical relevance.
- **Document limitations rather than presenting AI output** as objective or universally applicable.

AI and statistical analysis

- AI-generated **code is a draft—not evidence** that the analysis is correct.
- The researcher must understand variable definitions, assumptions, model specification, missing-data handling, and sensitivity analyses.
- **Review code line by line**; test it on known examples; compare results with an independent method where feasible.
- Preserve the final code, software environment, data-processing steps, and analysis decisions.
- A researcher cannot defend an analysis that they cannot explain.

If you cannot explain the analysis, you cannot responsibly publish the result.

AI, authorship, and publication ethics

- AI tools **cannot be authors** because they cannot accept **responsibility**, approve the final manuscript, declare conflicts, or respond to allegations.
- **Human authors remain accountable** for accuracy, originality, plagiarism, copyright, and integrity.
- **Disclose AI use** according to the target journal, institution, funder, and study requirements.
- **Use of AI in methods**, data analysis, image generation, or substantive drafting may require explicit reporting in the manuscript.

Human researcher = accountable author
AI system = tool or assistant

What should be disclosed?

Document	Examples of relevant information
Protocol / governance record	Purpose of AI use, tool, data, risks, safeguards, oversight
Methods section	AI-assisted data processing, classification, analysis, or image generation
Acknowledgment / disclosure	Language editing, brainstorming, formatting, or drafting assistance
Submission forms	Whether AI-assisted technologies were used and how
Laboratory or team record	Prompts, versions, outputs, modifications, validation, final decisions

Documentation and audit trail

Tool name and version, if available.

Date and stage of research.

Purpose and task assigned to AI.

General description of inputs—without exposing confidential data.

Prompts or settings when relevant to reproducibility.

Outputs retained and human modifications made.

Verification procedures and final responsible researcher.

The JUSTIFY–VERIFY–GOVERN–DISCLOSE framework

JUSTIFY

Is AI necessary, proportionate, and scientifically appropriate?

VERIFY

How will accuracy, bias, and reproducibility be assessed?

GOVERN

Are privacy, consent, security, IP, and oversight addressed?

DISCLOSE

What was used, where, how, and with what human review?

Case discussion 1: clinical data

A researcher uploads de-identified patient records to a public chatbot to obtain a statistical-analysis plan.

Is the data truly anonymous?

Was uploading authorized?

Does participant consent cover this use?

Where may the data be stored or processed?

What safer, institutionally approved alternative is available?

Case discussion 2: AI-generated analysis

AI recommends a Cox regression model and produces a significant result. The researcher cannot explain proportional-hazards assumptions or missing-data handling.

Can the result be reported?

What competency and supervision are required?

What validation and sensitivity analyses are needed?

What should be documented in the methods?

Case discussion 3: peer-review confidentiality

A reviewer uploads a submitted manuscript to an external AI platform to help prepare peer-review comments.

Does this breach confidentiality?

Who owns the manuscript and its unpublished ideas?

Is the reviewer authorized to share it?

What do the journal and institutional policies require?

Who is responsible?

Actor	Core responsibility
Individual researcher	Verify outputs, protect data, document use, disclose appropriately
Principal investigator	Approve the use case and ensure supervision and quality control
Research team	Maintain records and review AI-assisted decisions
Ethics committee	Assess privacy, consent, risk, fairness, and secondary use
Institution	Provide policy, approved tools, training, and secure infrastructure
Author group	Review and accept responsibility for the complete manuscript
Journal / editor	Set disclosure requirements and protect confidential submissions

Responsible AI workflow

AI assists

Researcher evaluates

Researcher verifies

Researcher revises

Use documented and disclosed

Human researcher remains accountable

Human oversight must be active—not merely a final signature.

The level of scrutiny should increase with potential harm and scientific consequence.

Practical disclosure examples

Language editing: “A generative AI tool was used for language editing. The authors reviewed and revised all output.”

Statistical code: “AI was used to assist with code development. The code was reviewed, tested, corrected, and independently validated.”

Classification: “AI-assisted classification was evaluated against an independently reviewed reference sample; disagreements were adjudicated by qualified researchers.”

Key take-home messages

Use AI as an assistant, not as an authority.

Protect participants, patients, confidential information, and intellectual property.

Verify every important claim, reference, calculation, model, image, and conclusion.

Assess bias, limitations, and generalizability.

Maintain an auditable record of AI-assisted work.

Disclose AI use when required.

AI cannot be an author. Human researchers remain accountable.

The ethical question is not only "Can AI do this?" but "Should it, under what safeguards, and who will be accountable?"

Selected References

World Health Organization. Ethics and governance of artificial intelligence for health. 2021; updated guidance on large multimodal models, 2025.

International Committee of Medical Journal Editors. Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals. AI guidance updated January 2026.

Committee on Publication Ethics. Authorship and AI tools: position statement and related publication-ethics guidance.

Always check the current policy of the target journal, institution, funder, and research ethics committee before using AI in a project.