



Writing Medicine at University

GUIDES FOR WRITING IN SPECIFIC DISCIPLINES

1 What is Medicine?

Medicine is the discipline concerned with preserving and improving human health. Although the diagnosis and treatment of human illness are the final goals of medicine, studying morphology and how the human body functions as a living organism have become essential to the training of medical practitioners and the development of medical activity.

The field of medicine lies at the intersection of three disciplines – physics, chemistry and biology – that provide the foundation for medical studies. At the same time, it is closely related to such different disciplines as psychology and anthropology; biochemistry, genetics, microbiology and animal physiology; nutrition and pharmacology; and engineering, communication and computer science.

With the very rapid progress made in medicine in recent decades, the number and diversity of medical specialisations have grown considerably. As a result, spectacular progress has been made by applying scientific knowledge to improve human health and increase life expectancy.

2 General features of writing in Medicine

Communication is a basic and crucial part of the work of doctors, who need to be able to communicate their thoughts, knowledge, opinions and analyses in both speech and writing. Effective communication allows doctors to develop appropriate relationships with patients and their families, as well as with other health professionals. For this reason, doctors should be able to discuss health and healthcare in ways that are accessible and informative to people without any medical background. Deficiencies in written (and verbal) communication, on the other hand, can lead to otherwise avoidable patient-related errors within their healthcare teams.

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The importance of skilled academic writing among doctors cannot be overemphasised. Like writing in other disciplines, good writing in the medical field aims to express concepts simply, clearly and unambiguously. The foundations of good writing include organisation and development as well as sentence structure, grammar and punctuation.

In terms of specific skills, medical professionals should be able to summarise, paraphrase and follow documentation conventions.

Professional writing in medicine reflects the same general ideas as professional writing in the sciences. Readers in both fields expect and value:

- current references and sources,
- processes and measurements explained clearly enough to be reproduced by other professionals who aim to achieve similar results using the same methods,
- proof of conclusions, or writing that clearly examines thinking processes and demonstrates how the authors have arrived at their conclusions, and
- practical application, i.e. how this information is applied to medical practice.

Doctors, like other scientists, must be able to present their work to an audience of professional peers. Unlike many scientists, however, they routinely express sophisticated knowledge in terms that make it accessible to patients and serve to educate the general public. They must know how to extract important and relevant information from medical research and communicate it to a diversity of readers. Writing in different ways for different audiences, doctors need to be aware of and sensitive to people of different cultures, classes and educational backgrounds. They should know how to modify their texts (vocabulary, style, tone, format, logical structure, the use of visuals or rhetorical techniques) when communicating with decision-makers, experts, educated general readers or patients whose reading ability is limited or impaired.

What is more, professional writing in medicine is based on the standards of authority and reliability governing written texts in health and medicine (case studies, research articles, patient instructions, editorials and feature articles).

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Unlike professional writing in the sciences, medical texts often report on people who suffer and are in pain. These texts are therefore subject to legal restrictions and professional ethics. The four principles of biomedical ethics described by Tom L. Beauchamp and James F. Childress (1985) provide a common framework with which to analyse medical ethics: non-maleficence (*do no harm*), beneficence (*act in the best interest of the patient*), respect for patient autonomy (*obtain informed patient consent*) and justice (*treat fairly and equally*).

In addition to the features described above, and to any particular guidelines for publication established by specialised medical journals, writing in medicine is characterised by:

- Great attention to meaning. Because medical research has such great social significance, information should not be repeated in the same text or between texts published within the medical community. In addition, authors should avoid exhaustive presentations of results in the discussion section. Rather, they should only highlight the main conclusions before interpreting them.
- A variety of text registers, due to the diversity and the nature of readers, ranging from confidentiality and communicative empathy (with patients) and reasoned argumentation (with health administrators and other health policy decision-makers) to expository and terminological rigour (with professional colleagues in specialised journals).
- Adequate use of medical terminology of Greek and Latin origins and mastery of the formation of neologisms based on prefixes and suffixes (e.g., *angiogram* from the Greek words *angeion*, meaning *vessel*, and *gramma*, meaning *picture* or *record*; or *bursitis* from the Latin words *bursa*, meaning *purse*, and *itis*, meaning *inflammation*).
- Adaptation to a text structure – widely accepted in the various scientific disciplines – that includes the following sections:
 1. Title: concise description of the contents in words closely linked to it.
 2. Authorship: the professionals who have written the text and the institutions or organisms in which they carry out their medical activity.
 3. Key words: most relevant terms presented in a brief hierarchical list used in electronic searches.
 4. Abstract: summary of the objectives, the development and the most relevant conclusions.
 5. Introduction: to establish the research context and propose the hypotheses of the study).
 6. Materials and methods: description of the protocols followed.
 7. Results and analysis: evaluation of qualitative and quantitative data.
 8. Discussion and conclusions: interpretation of results in light of the hypotheses established and presentation of conclusions within the context of previously known knowledge, focusing on new findings and usually proposing additional research.

Finally, as many medical texts describe experiments with human beings or other animals, authors must respect the legal guidelines related to these practices and recommended by the competent administrations and international bodies.

3 Texts typically written by students of Medicine

Medical activity generates a great variety of written texts that students must be familiar with and know how to elaborate. The *New England Journal of Medicine* identifies several types of medical texts, including research articles, reviews, perspective articles (topics of current social interest in healthcare and medicine), clinical case studies and commentaries (including editorials).

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Among the first medical acts performed by new doctors, and therefore an important part of student training, are clinical interviews. As tools for diagnosis and treatment support, they are used to diagnose and to inform patients about their situations, the risks they face and their prognoses. They are meant to encourage patients to collaborate in their own treatments and promote good relations between doctors and patients and the patients' families and friends. In other words, they create an appropriate climate for the delivery of quality care.

Of critical importance are interview techniques themselves and the proper respect for ethical and legal aspects when interviewing and completing clinical histories. Students should be trained to synthesise medical history information into written admission notes. These records of initial encounters with patients (also referred to as consultation notes) require students to perform complex, multifaceted tasks in which a wealth of information from patient interactions is collected, organised and synthesised. This fundamental skill is required across all disciplines in medicine and is therefore a necessary component of medical training.

Medical texts can be classified into three types, based on their analytical aim and destination. One type is the *clinical history*, an evolutionary record of a patient's state of health written for patients, fellow professionals or health administrators. The other two are *epidemiological studies* (either experimental or observational) and *clinical case studies* (assessment and monitoring of a specific treatment on a specific patient), both of which

are written for the research community, pharmaceutical companies and health administrators.

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Clinical histories

Clinical histories are clear, precise, detailed and chronological accounts of all the epidemiological, psychosomatic and anthropological information about an individual (and his or her family). This information serves to evaluate the patient's current state of health (diagnosis) and analyse their progress (documentary source).

It summarises patients' family histories and individual habits, as well as their physiological and psychological health, environmental factors and, if necessary, the causes and development of the various illnesses they have or have had. More than a list of data or a clinical description of each illness, it contains specific details about the case and the opinions of health professionals, giving it legal significance and making it a confidential document.

New technologies are transforming clinical histories in terms of access (online digital documents) and authorship (the patients themselves can enter information, especially if they are treating themselves at home). Ironically, some electronic health records provide prepared text options to expedite the completion of medical notes when, in fact, they may reduce the ability of medical practitioners to communicate their thoughts independently.

Epidemiological studies

Epidemiology is the medical discipline that studies the distribution of illnesses in human populations and their causes, with the aim of improving health. Epidemiological studies have several phases. They first describe a population's state of health, then identify the factors related to the onset and progression of illness (i.e. risk factors, some of which are particular to individuals while others are specific to the environment), and finally contribute to preventing new cases by reducing exposure to these factors and treating existing cases.

Epidemiological studies can be divided into two large groups: experimental studies, in which researchers manipulate or intervene in the factors of exposure (for example, laboratory or clinical assays), and observational studies, in which there is neither manipulation nor intervention of these factors (purely descriptive studies that contribute

to knowledge about the illness and analytical studies that attempt to prove a hypothesis is related with its causes).

Depending on how the facts are presented in time, they can also be classified into longitudinal studies, which may be retrospective (past events) or prospective (future events), and cross-sectional studies (present events).

Clinical case studies

Clinical case studies present detailed descriptions of the symptoms, medical evidence, diagnosis, treatment and monitoring of a patient's illness. In addition, they often include demographic profiles of patients and information about their sociocultural situations.

Clinical cases allow medical professionals to pass on their experiences in a systematic way, for the benefit of the entire healthcare community and bringing medical theory and practice closer together.

Similarly to clinical histories (of which they are a part), clinical cases present events chronologically, from the description of symptoms to the analysis of the treatment and of the therapeutic objectives achieved. They aim to understand, in a holistic way, the environmental and behavioural causes of illnesses and the medical effects of their treatment.

In addition to being familiar with these three types of texts, medical students should be trained to write grant proposals and business plans. When well written, they can help doctors take the lead in healthcare as members of a team.

4 Writing conventions in Medicine

The International Committee of Medical Journal Editors (ICMJE) has produced recommendations, or guidelines, to standardise the ethics, preparation and formatting of articles submitted for publication in biomedical journals. Most leading biomedical journals require compliance with the ICMJE Recommendations.

In 1978, the ICMJE introduced the Vancouver reference style (also known as the Vancouver system), which presents guidelines and writing conventions for medical texts. The main ones are highlighted below:

- The length of the title should be as brief as possible; it is recommended that it not be much longer than 40 characters.
- Mention must be made of the study's funding sources and any conflicts of interest; they should be listed separately, after the abstract, to make them easily visible and easily indexed for searches in the Medline medical bibliographic database.

- It must be mentioned, in the materials and methods section, that the research complies with the principles of the Declaration of Helsinki of the World Medical Association (WMA) on human research requirements.
- It is recommended to present results in order of importance, specifying their statistical significance.
- Distinctions must be drawn between clinical and statistical significance in the discussion and conclusions section, while also avoiding any declarations about economic benefits and costs (if the text doesn't already contain appropriate economic data and analysis).
- All bibliographic references must be verified with the PubMed application, available for free on Medline; at the same time, they must be adapted to the citation models of the journal in which the text will be published.
- It is recommended to use ordinary abbreviations and international units of measurement (unless the journal of publication imposes its own uses).

5 Selected works and websites about writing in Medicine

1. *International Committee of Medical Journal Editors (ICMJE)*. [<https://www.icmje.org/recommendations/>]
International organisation of medical writing standards.
2. *The New England Journal of Medicine*. [<https://www.nejm.org/medical-article-index>]
Internationally renowned medical journal.
3. BEAUCHAMP, TOM L. and CHILDRESS, JAMES F. *Principles of Biomedical Ethics*, Oxford University Press.
The classic work that helped define the field of biomedical ethics, fully updated to include cutting-edge approaches and research.
4. *PubMed*. US National Library for Medicine. [<https://pubmed.ncbi.nlm.nih.gov/>]
Free search engine accessing primarily the MEDLINE database of references and abstracts on life sciences and biomedical topics and maintained by the United States National Library of Medicine (NLM) at the National Institutes of Health.
5. SIMONSON, JEAN A. *Why We Must Teach Written and Verbal Communication Skills to Medical Students and Residents*.

[https://journals.lww.com/academicmedicine/Fulltext/2013/04000/Why_We_Must_Think_of_Written_and_Verbal_Communication.5.aspx]

Article from the journal *Academic Medicine*, published by the Association of American Medical Colleges.

6. [WMA Declaration of Helsinki](https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/). [<https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/>]

Ethical principles for medical research involving human subjects.

7. [Writing in the Medical Sciences: The Basics](https://libguides.lib.msu.edu/medwriting). Michigan State University. [<https://libguides.lib.msu.edu/medwriting>]

This guide contains resources for writing in the medical field.

8. [Research Advice & Resources](https://rcem.ac.uk/research-advice-and-resources/). Royal College of Emergency Medicine. [<https://rcem.ac.uk/research-advice-and-resources/>]

A guide for those with little research experience to help get your thoughts together and point out some common pitfalls for you to avoid.

This document is based in part on the Catalan version of this guide (*Escriure Medicina a la Universitat*).

9. [Medicine, Nursing and Health Sciences](https://www.monash.edu/learnhq/excel-at-writing/annotated-assessment-samples/medicine-nursing-and-health-sciences). Monash University. [<https://www.monash.edu/learnhq/excel-at-writing/annotated-assessment-samples/medicine-nursing-and-health-sciences>]

Resources to help develop skills to improve writing in medicine.

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