



AMA MEDSTYLE STAT!

By Dr. Abel Scribe PhD - Fall 2007

The American Medical Association (AMA) *Manual of Style* begins with this charming observation:

I never cease to be amazed by the general inability of physicians, other health professionals, and scientists to communicate through the written word. Their scholarly and creative ideas and insightful data interpretation of them seem to get lost in the translation from brain to page.^{1(pv)}

--Catherine D. De Angelis, MD, MPH

No brainer? Those needing connective surgery from brain to page might wish to read “The Science of Scientific Writing,” by G.D. Gopen and J.A. Swan, from the *American Scientist*, 1990. They argue “if the reader is to grasp what the writer means, the writer must understand what the reader needs.” Available at <http://www.americanscientist.org/template/AssetDetail/assetid/23947?fulltext=true&print=yes>

AMA STAT! CONTENTS

AMA-Style Page Format	General & AMA Conventions	Research Documentation
1. Title & Text Page	7. Abbreviations & Acronyms	14. Text Citations
2. Structured Abstract	8. Capitalization & Spacing	15. “Versioning”
3. Page Parameters	9. Compound Words	16. Reference Style Sheet
4. Headings (Cap Rule)	10. Emphasis: Italics/Quotes	• Articles
5. Tables and Figures	11. Numbers & Measurements	• Books & Chapters
6. Bullets & Lists	12. Quotations	• Papers & References Works
	13. Terminology	• Web Sites & CDs

AMA Stat! is a quick reference to using the style of the American Medical Association in research papers—papers drafted for conferences, classes, and seminars. It is based on the most recent 10th edition of the *AMA Manual of Style*, 2007. The latest version and other style resources are available at www.docstyles.com. Freeware Copyright 2007 by Dr. Abel Scribe PhD.

AMERICAN MEDICAL ASSOCIATION STYLE AT 10

The *AMA Manual* remains a heavy tome. The last edition weighed 3.0 pounds (to convert to kilograms multiply by 0.45); the new one comes in at 4.2 pounds!^{1,2} This works out to 1032 pages, more even than the *Chicago Manual of Style*.³ Alas, the rules and instructions for preparing research papers are scattered throughout the volume. *AMA Stat!* seeks to capture the most essential features, neither an easy nor certain task with a text so vast.

Significant changes to the style include the manner of presenting conventional clinical measurements and the “versioning” of references to online sources. Conventional measures now require a conversion factor to SI units (metric system) in the text. The AMA has thoughtfully provided the 18-page table of conversion factors from the *AMA Manual* among the “Instructions for Authors” on their website (AMA spells it *Web site*).⁴ Versioning adds multiple dates to Web references.

Changes readers might notice are the use of 2-letter postal abbreviations for states in references (AMA style had called for old style abbreviations, eg, *Mich.* for Michigan), and the use of lowercase letters in place of symbols in tables (eg, asterisks, daggers, and the like). The old manual allowed numbers other than one to be written out, as in *two-letter* postal abbreviations, but no longer. This simply reflects long-standing practice observed in the pages of *JAMA*, a practice not widely shared by other major journals, such as the *New England Journal of Medicine*.

AMA style merges into minutiae with obscure rules. For example, the abbreviation for *saint* is followed by a period when used in a person’s name, St. James, but not when used with the name of a place, St. Louis.^{1(p334)} This suggests a style too obscure at the margins to usefully master, a product of evolutionary diversity exploding through 10 generations, overseen by committee. *AMA Stat!* focuses on main themes, with recourse to the *New England Journal of Medicine*, International Committee of Medical Journal Editors (ICMJE) “Uniform Requirements,”⁵ and *Chicago Manual of Style*³ as circumstances merit.

AMA STYLE PAGE FORMATS

1.0 Title and Text Page

The **objective** is to present a paper in a format familiar to persons accustomed to reading the medical literature even though no single style exemplifies a normative or generic format. As a result, research papers should reasonably incorporate features that might be expected in a manuscript submitted for review, and should be consistent in the use of whatever stylistic features adopted.

Figure 1. Title page and first text page for a paper with an unstructured abstract.

	<p>Final Manuscripts in AMA Style Abel Scribe, PhD Ganja College of Traditional Medicine April 1, 2008</p> <p>ABSTRACT</p> <p>Reports of original data, reviews and, meta-analyses require a structured abstract of no more than 300 words. Other major manuscripts require as unstructured abstract of no more than 200 words that summarizes the objective, main points, and conclusions of the article. Abstracts are not required for editorials, commentaries, and some special features.¹</p> <p>MAJOR SUBJECT HEADING</p> <p>Final manuscripts differ from <i>copy manuscripts</i> in that they are presented in the format intended for the reader. Use block-paragraph spacing, with extra space before headings. Double-space the text; single-space block quotes and references.</p> <p>Second-Level Heading</p> <p>Copy manuscripts are read by typesetters and editors, who may have only a slight or passing interest in the subject. The first paragraph after a heading is not indented.</p> <p style="padding-left: 40px;">Third-level heading. If there is 1 heading or subheading at any level there must be a second. Henry David Thoreau professed that “[n]o face which we can give to a matter will stead us so well . . . as the truth.”^{1(p217)} However, Thoreau also anticipated evidence-based medicine, noting that</p> <p style="padding-left: 40px;">[a]lert and healthy natures remember that the sun rose clear. It is never too late to give up our prejudices. No way of thinking or doing, however ancient, can be trusted without proof. What everybody echoes, or in silence passes by as true to-day [<i>sic</i>], may turn out to be falsehood to-morrow [<i>sic</i>], mere smoke of opinion.^{1(p10)}</p> <p>A second third-level heading. Write out ordinal numbers <i>first</i> through <i>ninth</i>, as in <i>second third-level heading</i>. Number every page of the paper.</p>	
	1	

2.0 Structured Abstract

An **abstract** is required for most papers, though not all. Journals vary in their requirements; their “Instructions for Authors” typically giving specific requirements. An unstructured abstract is presented in Figure 1. In AMA style this is to be 200 words or less. Figure 2 shows a structured abstract drawn from the ICMJE “Uniform Requirements for Manuscripts Submitted to Biomedical Journals.”⁵

Figure 2. Title page with a structured abstract in classic IMRAD form.

	<p>Title Page With a Structured Abstract Abel Scribe, PhD Ganja College of Traditional Medicine April 1, 2008</p> <p>ABSTRACT</p> <p>Introduction [Context]</p> <p>The text of observational and experimental articles is usually (but not necessarily) divided into sections with the headings Introduction, Methods, Results, and Discussion. This so-called “IMRAD” structure is not simply an arbitrary publication format, but rather a direct reflection of the process of scientific discovery. Long articles may need subheadings within some sections (especially the Results and Discussion sections) to clarify their content. Other types of articles, such as case reports, reviews, and editorials, are likely to need other formats.</p> <p>Method [Design, Setting, and Participants]</p> <p>An abstract (requirements for length and structured format vary by journal) should provide the context or background for the study and should state the study’s purposes, basic procedures (selection of study subjects or laboratory animals, observational and analytical methods), main findings (giving specific effect sizes and their statistical significance, if possible), and principal conclusions. It should emphasize new and important aspects of the study or observations.</p> <p>Results</p> <p>Present your results in logical sequence in the text, tables, and illustrations, giving the main or most important findings first. Do not repeat in the text all the data in the tables or illustrations; emphasize or summarize only important observations. Extra or supplementary materials and technical detail can be placed in an appendix where it will be accessible but will not interrupt the flow of the text; alternatively, it can be published only in the electronic version of the journal.</p> <p>Discussion [Conclusions]</p> <p>Emphasize the new and important aspects of the study and the conclusions that follow from them. Do not repeat in detail data or other material given in the Introduction or the Results section. For experimental studies it is useful to begin the discussion by summarizing briefly the main findings, then explore possible mechanisms or explanations for these findings, compare and contrast the results with other relevant studies, state the limitations of the study, and explore the implications of the findings for future research and for clinical practice.</p>	
	<p>1</p>	

IMRAD stands for *Introduction, Method, Results, [and] Discussion*. The ICMJE “Uniform Requirements” note that “[t]his so-called ‘IMRAD’ structure is not simply an arbitrary publication format, but rather a direct reflection of the process of scientific discovery.” The AMA uses slightly different terms, as shown in brackets in Figure 2. When presenting a structured abstract begin the text on the next page, repeating the title (and author information if you wish). The “Instructions for Authors” for AMA journals explain the headings and organization required for various types of papers (eg, clinical trials, reviews, commentaries, etc).⁴ The ICMJE “Uniform Requirements” note these sources of further information:⁵

Table 1. Reporting Guidelines for Specific Study Designs

Initiative	Type of study	Source
CONSORT	Randomized controlled trials	http://www.consort-statement.org/
STARD	Studies of diagnostic accuracy	http://www.consort-statement.org/stardstatement.htm
QUOROM	Systematic reviews/meta-analyses	http://www.consort-statement.org/Initiatives/MOOSE/moose.pdf
STROBE	Observational epidemiology	http://www.strobe-statement.org/
MOOSE	Meta-analyses in epidemiology	http://www.consort-statement.org/Initiatives/MOOSE/moose.pdf

3.0 Page Parameters

Conference and class papers differ from those submitted for review or publication in that (1) formal disclosure statements and permissions tend to become brief notes added to the end of the text, before the references; (2) the text is consolidated with abstracts, acknowledgments, tables, and figures embedded rather than leading or trailing the text on separate pages; and (3) block paragraph spacing is used for abstracts, tables, notes, quotes, and references.

- *Margins.* One inch margins are required around the text. Leave the right margin unjustified.
- *Line Spacing.* Block paragraph spacing is recommended for final manuscripts. Single space within the abstract, notes, titles and headings, block quotes, tables and figures, and references (everything but the main text), double space before and after each single spaced block.
- *Fonts.* *JAMA* specifies a 12-point or 10-point font. There is no requirement for the typeface. A *serif* typeface is commonly used in publication (eg, Times Roman). A *sans serif* typeface is then used with tables and figures.
- *Indents.* Half-inch indents are standard.
- *Page Numbers.* Every page of a research paper is numbered consecutively starting with the title page. Do not change numbering systems through the text, even with lengthy data sets or appendixes.
- *Headers.* A short title header goes at the top of the page, aligned with the page number or left margin. This takes the place of the “running head” required of copy manuscripts.

4.0 Headings: Style and Capitalization

“**Headings** reflect the progression of logic or the flow of thought in an article and thereby guide the reader. Headings also help break up the copy, making the article more attractive and easier to read.”^{1(p26)} Three levels usually serve (Figs. 1 & 2). Additional levels can be added by following the second and third levels with a heading in the same format in italics. Three styles of capitalization are used with headings

FIRST-LEVEL HEADINGS: ALL CAPS.

Every letter is capitalized. The text follows after a blank line; the paragraph is usually not indented.

Second-Level Headings: Heading-Headline Caps

“Capitalize [major words, and] 2-letter verbs, such as *go, do, am, is, be*. Note: The infinitive “to” is not capitalized. Do not capitalize a coordinating conjunction, article, or preposition of 3 or fewer letters, except when it is the first word of the title.”^{1(p372)} This rule applies to the main title, second-level headings, and the titles of books. Blank lines go before and after the heading.

Third-level headings with sentence capitalization. This form capitalizes the first word, the first word after a colon, and all proper nouns. Third-level headings (also known as *run-in, run-on, paragraph, or sideheads*) follow this form as do titles of articles in references. The heading is indented as a paragraph; need not be a complete sentence; must end with a punctuation mark. The text immediately follows the heading (no blank line).

5.0 Tables and Figures

Tables presented in papers for publication now must be formatted using the table creation feature your word processor. Published styles vary greatly from journal to journal, and yours may too, as long as you are consistent in using the same format throughout the text. The style shown is classic AMA, with features shared with other styles (eg, Chicago, APA). Complex tables require some forethought in their construction; study the *AMA Manual*, chapter 4, "Visual Presentation of Data" for guidance.

Figure 3. Tables and figures in research papers.

	<p>Short Title Header 2</p>																																																																																							
	<p>There is no one consistent format for presenting tables in AMA journals. The format suggested draws on features widely used in other styles, and is consistent with the official requirements of the <i>AMA Manual</i>.</p> <p>Table 2. Exercise and Body Weight by Educational Level: US 2002⁵</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Education level</th> <th colspan="3">Physical Exercise %</th> <th colspan="3">Body Weight %</th> </tr> <tr> <th>Active</th> <th>Some</th> <th>Inactive</th> <th>Healthy</th> <th>Heavy</th> <th>Obese</th> </tr> </thead> <tbody> <tr> <td>Less than 12 years</td> <td>33.8</td> <td>20.5</td> <td>45.7</td> <td>33.6</td> <td>36.7</td> <td>29.7</td> </tr> <tr> <td>High school graduate</td> <td>43.1</td> <td>26.4</td> <td>30.5</td> <td>36.6</td> <td>35.9</td> <td>27.5</td> </tr> <tr> <td>Some college</td> <td>47.5</td> <td>31.5</td> <td>21.0</td> <td>37.8</td> <td>36.4</td> <td>25.4</td> </tr> <tr> <td>College graduate</td> <td>51.9</td> <td>35.0</td> <td>13.1</td> <td>45.3</td> <td>37.3</td> <td>17.4</td> </tr> </tbody> </table> <p><small>^a Active is 20 minutes of vigorous physical activity 3 times a week; Some is less than active but more than Inactive. Healthy body weight is a body mass index (BMI) less than 25; Heavy is 25 or more but less than 30; Overweight is 30 or more. Data from the <i>Statistical Abstract of the United States: 2005</i>.⁶</small></p> <p>Tables and figures are numbered independently and consecutively through the manuscript, appearing close <i>after</i> their first mention in the text. Use a contrasting sans-serif font such as arial or helvetica. Table notes are no longer referenced with symbols, but now require lowercase letters. Figures include graphs, diagrams, and images.</p> <p>Figure 1. Cases of Hantavirus Pulmonary Syndrome⁷ Reported in the Four Corners States (Arizona, Colorado, New Mexico, Utah): 1994-2001</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center; margin-top: 10px;"> <caption>Data for Figure 1: HPS Cases Confirmed by Quarter</caption> <thead> <tr> <th>Year</th> <th>Q1</th> <th>Q2</th> <th>Q3</th> <th>Q4</th> </tr> </thead> <tbody> <tr> <td>1994</td> <td>4</td> <td>5</td> <td>10</td> <td>1</td> </tr> <tr> <td>1995</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> </tr> <tr> <td>1996</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> </tr> <tr> <td>1997</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> </tr> <tr> <td>1998</td> <td>4</td> <td>7</td> <td>1</td> <td>1</td> </tr> <tr> <td>1999</td> <td>3</td> <td>6</td> <td>1</td> <td>3</td> </tr> <tr> <td>2000</td> <td>1</td> <td>11</td> <td>11</td> <td>1</td> </tr> <tr> <td>2001</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> </tr> </tbody> </table> <p>Cases are reported by the calendar quarter of onset of symptoms.</p> <p>All figures require a title and a caption or <i>legend</i>, an explanation of the scale or axes of a graph set below or to the side of the figure. Internal footnotes are not practical for most figures, although circles and arrows can be explained in the legend.</p>	Education level	Physical Exercise %			Body Weight %			Active	Some	Inactive	Healthy	Heavy	Obese	Less than 12 years	33.8	20.5	45.7	33.6	36.7	29.7	High school graduate	43.1	26.4	30.5	36.6	35.9	27.5	Some college	47.5	31.5	21.0	37.8	36.4	25.4	College graduate	51.9	35.0	13.1	45.3	37.3	17.4	Year	Q1	Q2	Q3	Q4	1994	4	5	10	1	1995	1	1	1	1	1996	1	1	1	1	1997	1	1	1	1	1998	4	7	1	1	1999	3	6	1	3	2000	1	11	11	1	2001	1	1	1	1	
Education level	Physical Exercise %			Body Weight %																																																																																				
	Active	Some	Inactive	Healthy	Heavy	Obese																																																																																		
Less than 12 years	33.8	20.5	45.7	33.6	36.7	29.7																																																																																		
High school graduate	43.1	26.4	30.5	36.6	35.9	27.5																																																																																		
Some college	47.5	31.5	21.0	37.8	36.4	25.4																																																																																		
College graduate	51.9	35.0	13.1	45.3	37.3	17.4																																																																																		
Year	Q1	Q2	Q3	Q4																																																																																				
1994	4	5	10	1																																																																																				
1995	1	1	1	1																																																																																				
1996	1	1	1	1																																																																																				
1997	1	1	1	1																																																																																				
1998	4	7	1	1																																																																																				
1999	3	6	1	3																																																																																				
2000	1	11	11	1																																																																																				
2001	1	1	1	1																																																																																				

Tables. “Each table should have a brief, specific, descriptive title, usually written as a phrase rather than as a sentence, that distinguishes the table from other data displays in the article.”^{1(p84)}

Table 3. Title in Bold Heading Caps: The Basic Parts of a Table^a
(Rule)

Stubhead	Column head	Column spanner	
	Age, mean (%), y	Decked head	Decked head
(Rule)			
[Row] Stub	Data.0(50)	Data Cell	Data Cell
[Row] Stub	Data.0(50)	[Table body or field]	
Age, mean (SD), y	Mean.0(SD)		

(Rule)
^aNotes indicated by superscript letters.

“The field or body of the table presents the data. Each data entry point is considered a cell, which is the intersection of a column and a row. Table cells may contain numerals, text, symbols, or a combination of these Similar types of data should be grouped. Numbers that are added or averaged should be placed in the same column. Text in field cells should be capitalized sentence style (ie, the first word is capitalized and all that follow in the cell are lowercased).”^{1(p87)}

Table 4. Reported Cases: Hantavirus Pulmonary Syndrome 1993-2004^a

Characteristic	Cases(%)
Reported Cases	366(100)
Gender	
Male	227(62)
Female	139(38)
Case Fatality	135(37)
Age, mean (range), y	37(10-75)

^aCases reported to the CDC (NCID) from January 1, 1993 to July 6, 2004.

Place tables in the text close after where they are first mentioned. Number tables consecutively. The table number is followed by a label or title in heading caps.

Spacing. Tables should be spaced for clarity. A contrasting font is also suggested, for example a sans-serif typeface (eg, arial, helvetica) in a table with a serif typeface (eg, Palitino or Times Roman) in the text.

Abbreviations may be used in column headings or row studs. Percentages in a column or row must add to 100 or a note of explanation is required.

Units of measure should not change within columns unless the change is noted in the row stub and is congruent with the column data; all numbers should be presented to the same number of decimal places. See the section on numbers for rules on presenting significant digits and rounding in tables.

- “In tables, units of measure, including the variability of the measurement if reported, should follow a comma in the table column heading or stub.”^{1(p95)} In Table 4 the last row stub changes the units in the Cases column to *Age, mean (range), y*. The *y* is the abbreviation for *years*.
- **Missing data** and blank space in the table field (ie, and empty cell) may create ambiguity and should be avoided An ellipsis (. . .) may be used to indicate no data are available [or applicable].^{1(p87)}
- **Significance.** “All *P* values should be reported as exact numbers to 2 digits past the decimal point, regardless of significance, unless they are lower than .01, in which case they should be presented to 3 digits. Express any *P* values lower than .001 as *P*<.001. *P* values can never equal 0 or 1.”⁸

 Footnotes are indicated by superscript lowercase letters; the old symbols are no longer used.

Figures include graphs, charts, photographs, illustrations, diagrams, and images.

Number all figures in the order of their citation in the text followed by a title (a brief phrase, preferably no longer than 10 to 15 words).

Figure 2. *Peromyscus maniculatus* (deer mouse)⁶



- Include a legend (caption) for each photograph, graph, and illustration (maximum length, 40 words). For photomicrographs, include the type of specimen, original magnification or a scale bar, and stain. For gross pathology specimens, label any rulers with units of measure.⁷
- The figure is cited in the text when first mentioned, for example, Figure 2 shows the deer mouse, carrier of the hantavirus Sin Nombre virus (SNV) in the United States.

A citation is required when the figure is adapted from another source.⁶ The image is about half scale.

6.0 Bullets and Lists (Seriation)

Seriation is the itemization or enumeration of the parts to a series or an argument. The Chicago, APA, and AMA styles refer to this as the process of *enumeration*. “Enumerate elements in a series to prevent misreading or to clarify the sequence or relationship between elements, particularly when they are lengthy or complex.”^{6(pp115-116)}

Sentence seriation. A series or list of terms or phrases can be introduced following a colon in AMA style: either (a) marked by lowercased letters in italics with the parentheses in plain text; or (2) marked by numbers, and (3) set in parentheses. Whatever style you adopt, be consistent throughout your text.

Paragraph seriation. If each element in the series requires a separate paragraph, these are set flush with the left margin with each paragraph indented and numbered appropriately. An introductory clause or sentence ending with a colon typically introduces the series:

1 This form of seriation is useful in detailing and summarizing an argument, or perhaps the results of a research study.

2 Each element in the series may contribute to the general topic with extensive commentary.

3 This form of seriation is common in *JAMA*. It is used to present the parts of arguments, and also to summarize the conclusions of a study. It is rare in the *NEJM*.

“**Bullets** without enumeration may be used for emphasis and clarity when the specific order of the item is not important. If the items are complete sentences, begin each item with a capital letter and end it with a period.”^{1(p829)} If the items do not form a sentence do not use a period; uppercase or lowercase the first word to your preference; short lists are usually lowercased.

GENERAL AND AMA TEXT CONVENTIONS

7.0. Abbreviations

“**The editors** of the AMA’s scientific publications discourage the use of abbreviations, acronyms, and initialisms in their journals, with the exception of internationally approved and accepted units of measure and some well-recognized clinical, technical, and general terms and symbols.”^{1(p442)} Note, *acronyms* are sounded as words, like NASA, while *initialisms* are sounded character by character, like CDC or FBI.


“Authors . . . should use good judgment, flexibility, and common sense when considering the use of abbreviations. Abbreviations that some consider universally known may be obscure to others. Author-invented abbreviations should be avoided.”^{1(p442)}

- *Expanded at first use.* Acronyms/initialisms should be expanded at first use (written out in full) followed by the abbreviation in parentheses. Subsequently only the abbreviation is used. “Note: The expanded form . . . is given in lowercase letters, unless the expansion contains a proper noun, is a formal name, or begins a sentence (capitalize the first word only).”^{1(p444)}
- *Familiar acronyms.* Some groups are better known by their acronym than their full name, for example, WHO (World Health Organization) or CDC (Centers for Disease Control). But, “to avoid confusion, the names of all organizations should be expanded at the first mention in the text . . . with the abbreviation following immediately in parentheses.”^{1(p458)}
- *Lower cased.* “The expanded form of an abbreviation is given in lowercase letters, unless the expansion contains a proper noun, is a formal name, or begins a sentence (capitalize first word only).”
- *Beginning a sentence.* “Avoid using abbreviations at the beginning of a sentence unless the expansion is cumbersome.”^{1(p501)} That is, write “AIDS research has demonstrated . . .” in preference to “Acquired immune deficiency syndrome research has demonstrated . . .”
- *Headings, subheadings.* “Do not use an abbreviation as the sole term in a subheading. Also avoid introducing an abbreviation in a subheading.”^{1(p501)} Instead, write the term out and repeat it in the following text to introduce the acronym.
- *Plurals.* Write the plural form of an acronym without an apostrophe. For example, write “the Master of Business Administration (MBA) program is popular because MBAs command high starting salaries.”
- *Possessives.* If the full term is possessive, the acronym in parentheses should also be possessive. For example: “The American Medical Association’s (AMA’s) style manual has a mass of 1.9 kg.”
- *Places, States, and Addresses.* “Names of US states, territories, and possessions should be spelled out in full when they stand alone.”^{1(p451)} “At first mention in the text the names of the appropriate

country should follow the name of a city whenever clarification of location is thought to be important for the reader.”^{1(p453)}

- *States (Addresses & References)*. “Use 2-letter abbreviations for US state and Canadian province names in addresses (with US ZIP Codes and Canadian postal codes) and in *references* . . . but not in the text [emphasis added].”^{1(p451)}
- *Scholarly and Latin Abbreviations*. Latin abbreviations such as *etc*, *eg*, and *ie* may be used only in parenthetical notes or references, otherwise spell out the equivalent term. *For example*, “Authorities support this rule (*eg*, the *Chicago Manual of Style*).” Do not use periods in these abbreviations.

 **AMA “style for abbreviations rarely calls for the use of periods.”**^{1(p442)} Punctuation is not used with any AMA abbreviations other than initials in names, or when quoted from another source!

 **Medical journals.** “Abbreviate and italicize names of journals. Use capital letters. Abbreviate according to the listing in the PubMed Journals database.”^{1(p48)} This is the *List of Journals Indexed by Medline*, formerly the *Index Medicus*, published by the National Library of Medicine. It is available (free) at their website in PDF format. The volume is also listed on the AMA style page at www.docstyles.com with a link to the document. There is a separate volume for online journals.

8.0 Capitalization & Spacing

“Words are capitalized sparingly but conventionally in the scientific publications of the AMA.”^{2(p231)} The common rule is to capitalize terms when they refer proper nouns or to specific things: the East Coast, the Congressional Budget Office, the Beck Depression Inventory. But when these terms are generalized, they are lowercased: the coast, the budget office, a depression inventory.

Words following a colon. If a formal statement follows a colon, capitalize the first word. But, “in the case of a question, capitalization of the first word can be left to the author’s personal style.”^{2(p241)} In *book titles* the first word after a colon is capitalized. But, “for journal articles the subtitle begins with a lowercase letter.”^{2(p34)} For example, Krause RM. The origin of plagues: old and new. *Science*. 1992;257:1073-1078.

Special words. “Do not capitalize the following words, even when used as specific designations unless they are used as part of a heading or title.”^{1(p379)}

axis	control	fraction	level	paragraph	section	type
case	day	grade	method	part	series	volume
chapter	edition	grant	month	patient	stage	wave
chromosome	experiment	group	notes	phase	step	week
column	factor	lead	page	schedule	stub	

Heading caps. “Capitalize [in the text] major words in titles, subtitles, and headings of publications, parts of publications, musical compositions, plays (stage and screen), radio and television programs, movies, paintings and other works of art, software programs, Web sites, electronic systems, trademarks and names of ships, airplanes, spacecraft, awards, corporations, and monuments.”^{1(p372)} Titles of some publications are formatted differently in references (see sec 16).

- “Do not capitalize a coordinating conjunction, article, or preposition of 3 letters or less, except when it is the first or last word in a title or subtitle.”
- But, “in titles and headings, capitalize 2-letter verbs, for example, *go*, *do*, *am*, *is*, *be*.”

Sentence caps capitalize just the first letter of the first word, the first word after a colon, and proper nouns in a title, label, or phrase. For example, *Breaking ground, breaking through: The strategic plan for mood disorders research of the National Institute of Mental Health*. AMA style does not capitalize the first word after a colon in article titles in references.

Compound Words? “In titles, subtitles, table heads, centerheads, sideheads, and line art, do not capitalize the second part of a hyphenated compound in the following instances.”^{1(p373)}

- Do not capitalize “if either part is a hyphenated prefix of suffix.” For example, Anti-infective Drugs.
- Do not capitalize “if both parts together constitute a single word.” For example, X-ray films (check a dictionary to determine if the compound is recognized as a single word).

Capitalize both parts in all other circumstances. For example, “Client-Centered Therapy,”

Geographical Names. Capitalize geographic names when they refer to specific places.

- “Capitalize names of cities, towns, counties, states, countries, continents, islands, airports, peninsulas, bodies of water, mountains and mountain ranges, streets, parks, forests, canyons, dams, and regions.”^{1(p374)}
- Do not capitalize generic nouns used in the plural. For example, write “the Suez Canal” in the singular, but write “the Suez and Panama *canals* . . .” in the generalized plural.
- “Compass directions are not capitalized unless they are generally accepted terms for regions.”^{1(p375)} For example, “although he lives in the *West*, and has adopted the mannerisms of a *westerner* right down to his cowboy boots, he grew up *east* of Rochester, New York.”

Names with Prefixes. “Surnames that contain certain prefixes or particles (eg, von, de, La, van) are spelled and capitalized according to the preference of the persons named.”^{1(p45)}

Seasons and Holidays. “Do not capitalize the names of the seasons. . . . Capitalize the recognized holidays and calendar events.”^{1(p377)} For example, the last day of *fall* ends with the *winter* solstice closely followed by *Christmas*.

Sociocultural Designations. “Capitalize the names of languages, nationalities, ethnicities, political parties, religions, and religious denominations. Do not capitalize political doctrines (conservative, progressive). Do not capitalize white or black as a designation of race.”^{1(p375)} Do not hyphenate compound terms, either as nouns or adjectives, for example, Anglo American, Hispanic American, Serbo Croatia, and so forth.

Tests. The word *test* is not usually capitalized except when it is part of the official name of the test. Always verify exact names of any tests with the author or with reference sources.”^{1(p377)} Specific forms are capitalized, eg, the *Beck Depression Inventory*; generic terms are not capitalized when the generalized form is used: the *Beck inventory*. Statistical tests are not capitalized except for proper nouns: a goodness-of-fit test, the Fischer exact probability test.

9.0 Compound Words


Compound words are two or more words that work together in a specified order. This order cannot be reversed or rearranged without destroying the compound word’s meaning. Many compounds are hyphenated when used as adjectives, but not as nouns. A dictionary is the best guide to spelling and usage. If it is not in the dictionary it is not likely a hyphenated compound.


Full-time compound words are hyphenated whatever their role in a sentence--as an adjective or a noun. These are called *orthographic* compounds. “The court-martial hearing is set for 1000 hours. The hearing will determine whether a court-martial is warranted.” *Court-martial* is a full-time compound word (as is *full-time*). Consult a dictionary.

Conditional compounds are hyphenated as **adjectives**, but not when used as nouns.

1. *Adjectival compound.* “The counselor suggested a *role-playing* technique to reduce the stress of encounters, but cautioned that *role playing* alone would not solve the problem.” *Role playing* is a compound adjective, but not a compound noun. He was reading at the *ninth-grade* level in the *sixth* grade.
2. *Add a hyphen* to any prefix attached to a proper noun, capitalized abbreviation, or number. For example, the *post-Freudian* era, the *pre-1960s* civil rights movement, the *pro-HMO* lobby.^{1(p347)}
3. *Fractions.* “Common fractions are expressed with hyphenated words, whether the fraction is used as an adjective or a noun. Mixed fractions [ie, common fractions greater than 1, such as 3½] are typical expressed in numerals.”^{1(p824)}
4. *Made-up compound.* A *made-up-for-the-occasion* compound is hyphenated as a modifier, but not when used in the predicate. The compound word was *made up for the occasion*. But when the term is “commonplace and familiar in everyday usage” [the hyphens are retained whatever the position of the term in the sentences].^{1(p345)} For example, “the drug index was *up-to-date*.”
5. *Numbers.* “Hyphenate compound numbers from 21 to 99 and compound cardinal and ordinal numbers when written out, as at the beginning of a sentence.”^{1(p347)} Twenty-seven nurses were recognized for outstanding service.
6. *Serial compounds.* When two or more compound modifiers have a common base, this base is sometimes omitted in all but the last modifier, but the hyphens are retained. Long- and short-term

memory, 2-, 3-, and 10-min trials. When not used as modifiers the hyphen is dropped, for example, trials of 2, 3, and 10 minutes.^{1(p347)}

 **AMA Exception.** A prefix may not stand alone before a contrasting unhyphenated prefix, eg, *pre- and postoperative* care. Write *preoperative and postoperative* care.^{1(p347)}

 **Use sparingly.** “When not otherwise specified, hyphens should be used only as an aid to the reader’s understanding, primarily to avoid ambiguity.”^{1(p344)}

Prefixes. Through long usage most common prefixes do not require a hyphen: *aftereffect, antifreeze, cofounder, Internet, microwave, oversight, preempt, reexamine, supermarket, unbiased, underground*. There are many exceptions. When in doubt check a dictionary. Note the following exceptions:

1. *Ambiguous terms.* Add a hyphen if the unhyphenated word or phrase would have a different meaning. For example, does a “small bowel obstruction” refer to a small obstruction of the bowel, or an obstruction of the small bowel? If the latter it is a *small-bowel* obstruction. Words easily confused include re-creation, re-treat, un-ionized.
2. *Same two letters.* If the prefix puts the same two letters together, a hyphen is sometimes inserted. For example, write: anti-industrial, co-op, non-native, post-trial. But also write: cooperative, coordinate, nonnegotiable, overrate, overreach, overrule, reelect, unnamed.
3. *Superlatives-diminutives.* Some prefixes, *best-, better-, ill-, lesser-, little-, well-*, are hyphenated when they precede the noun they modify, but are not hyphenated when preceded by a modifier, or when used as a predicate adjective. The *ill-advised* attack failed, the strategy was *ill advised*.

The following prefixes *always* require a hyphen:


Prefix	Example	Prefix	Example	Prefix	Example
all-	all-powerful leader	great-	great-grandfather	self-	self-reliant person
ever-	ever-faithful friend	half-	half-baked plan	still-	still-active volcano
ex-	ex-president	much-	much-loved pastor		

The following common prefixes are not joined by hyphens except when they precede a proper noun, a capitalized word, or an abbreviation:^{1(p349)}

Prefix	Example	Prefix	Example	Prefix	Example
ante	antedated check	intra	intracranial	re	readminister
anti	antibiotic	micro	microvascular	semi	semicomatose
bi	bisexual	mid	midterm	sub	subcutaneous
co	copayment	non	noninflammatory	super	superciliary
contra	contraindicated	over	overweight	supra	supraorbital
counter	countersuit	pre	prenatal	trans	transnational
de	detoxify	post	postoperative	tri	tricycle
extra	extraorbital	pro	proactive	ultra	ultramicrotome
infra	inframaxillary	pseudo	psuedomorphic	un	untreated
inter	interscapular			under	underrepresented

10.0 Emphasis: Italics & Quotes

Add Emphasis with Italics. Emphasize a keyword or phrase in your text by placing it in italics. The next time an emphasized term or phrase is used it should be in plain text. Emphasis may be added to a word or phrase in a quotation by placing it in italics. When this is done the note [italics added] must be inserted in brackets next to or near the word or phrase emphasized.

 Use this technique sparingly. It is generally not appropriate to place an entire sentence in italics nor to follow a sentence with an exclamation point. There are few, if any, instances in research writing where such extensive emphasis is appropriate.


Quotation Marks. “Do not use quotation marks when emphasizing a word, when using a non-English word, when mentioning a term [word] as a term, or when defining a term. In these instances, italics are preferred.”^{1(p360)}

- *No Quotes.* “Quotation marks used around words to give special effect or to indicate irony are usually unnecessary.”^{1(p360)}

- *But if you must.* . . . “Coined words, slang, nicknames, and words or phrases used ironically or facetiously may be enclosed in quotation marks at first mention. Thereafter omit quotation marks.”^{1(p360)} For example, “versioning” is the practice of noting several dates in references to online sources in AMA style.
- *Common words used in a special sense.* “Enclose in quotation marks a common word used in a special technical sense when the context does not make the meaning clear.”^{1(p361)} For example, a “ragged-right” margin is preferred in manuscripts.
- *Foreign words.* Use quotation marks for the literal translation or definition of non-English words. The non-English term itself is placed in italics the first time it is used. For example, the name of the capital of Ethiopia, *Addis Ababa*, literally translated means “new flower.”
- *Titles.* “In the text, use quotation marks to enclose titles of short poems, essays, lectures, radio and television programs, songs, the name of an electronic file, parts of published works (chapters, articles in a periodical), papers read at meetings, dissertations, theses, and parts of the same article (eg, the “Results” section).”^{1(p361)}

11. Numbers & Measurements

“**Numerals** should be used to express numbers in most circumstances. Exceptions are numbers that begin a sentence, title, subtitle, or heading; common fractions, accepted usage such as idiomatic expressions, numbers used as pronouns, and other uses of the number “one” in running text; ordinals *first* through *ninth*; and numbers spelled out in quotations or published titles.”^{1(p823)}

 **Note.** The AMA penchant for using numerals for all numbers under 10 is not followed by other major journals, such as the *New England Journal of Medicine*.

- “*The word one* should be spelled out when used as a pronoun or noun.”^{1(p824)}
- *Ordinal numbers.* “The numerical expression of commonly used ordinals (1st, 2nd, 3rd, 4th, etc) may appear jarring and interrupt the flow of text. For this reason ordinals *first* through *ninth* are spelled out.”^{1(p825)}
- *Beginning a sentence.* Write out numbers that begin a sentence, heading, title, or column heading in a table. If possible, rewrite the sentence or heading to avoid this problem.
- *Consecutive numbers.* When two numbers must be presented together write one with words or rewrite the sentence. For example write: “There were twelve 16-year-olds in the clinical trial.” Do not write “There were 12 16-year-olds. . . .”
- *Measures & units must agree.* When writing out numbers, accompanying units of measure must also be written out (and vice versa). For example, write: “Twenty degrees centigrade was the maximum temperature at which the vaccine could be stored.” Or write: “The maximum temperature at which the vaccine could be stored was 20 °C.” Do not write twenty °C, or 20 degrees centigrade.
- *Decimal fractions.* Numbers less than 1.0 must have a leading 0 before the decimal point, as with 0.6 kg (not .6 kg). An exception is made when a number cannot be greater than 1 or less than zero, as in the probability $P < .001$.
- *Full dates* when written in the text or in references are written in US format--month, day, year; “August 21, 2001.” Other date formats follow the general rules for numbers. For example, write “applications were accepted from the 3rd to 23rd of August” or, “from the third to sixth of April.”
- *Rounded large numbers.* Large rounded numbers usually combine numerals and words. “About 8 million people were affected by the drought.”
- *Compound numbers.* Hyphenate compound written numbers from twenty-one to ninety-nine, and compounds with a number as the first element. For example, “We tested twenty-five 50 g samples.” (Note, a hyphen is *never* used in SI units, “50 g samples,” even when the number is an adjective.)
- “*Common fractions* are expressed with hyphenated words, whether the fraction is used as an adjective or a noun. Mixed fractions [ie, common fractions greater than 1, such as 3½] are typically expressed in numerals.”^{1(p824)}
- *Plurals.* Form the plurals of numbers by adding *s* or *es*, without an apostrophe, to words or figures. “The gambler rolled several sixes in a row.” “The 1960s taught a generation about war first hand.”


Clinical Measurements (New!). “Most physicians and other health care professionals [in the US] use conventional units for many common clinical measurements (eg, blood pressure), and many clinical laboratories report most laboratory values by means of conventional units. Accordingly, some biomedical publications, including *JAMA* and the *Archives Journals*, have adapted an approach for reporting units of measure that includes a combination of SI units and conventional units.”^{1(p794)}

“Laboratory values are expressed using conventional units of measure, with relevant Système International (SI) conversion factors expressed secondarily (in parentheses) only at first mention. . . . In tables and figures, a conversion factor to SI should be presented in the footnote or legend.”^{1(p795)} For example, the *AMA Manual* weight 4.2 pounds (to convert to kilograms multiply by 0.45). An exhaustive table of conversion factors is available in the “Instructions for Authors” at the *JAMA* website and at www.docstyles.com.

Significant Digits. Implicit in any number is that it is accurate to the degree of precision shown. “When numbers are expressed in scientific and biomedical articles, they should reflect the degree of accuracy of the original measurement. Numbers obtained from mathematical calculations should be rounded to reflect the original degree of precision.”^{1(p851)} For example, “for a scale accurate to 0.1 kg a weight [*sic*] should be expressed as 75.2 kg not 75.23 kg.”

AMA Rounding Rule. AMA style likes even numbers. “If the digit to the right of the last significant digit is less than 5, the last digit is not changed. If the last digit is greater than 5, the last significant digit is rounded up. . . . If the digit immediately to the right of the last significant digit is 5, with either no digits or all zeros after the 5, the last significant digit is rounded up if it is odd and not changed if it is even. . . . 47.7500 becomes 47.8; 47.65 becomes 47.6.”^{1(p851)}

Inclusive Numbers. When expressing an inclusive range of numbers in your text do not use a dash or hyphen, write *to* or *through* instead, unless the use of the hyphen is absolutely clear. Write: “The IQ range of the first group was 86 to 112.” In measurements, a hyphen can be mistaken for a minus sign.

 “Digits should not be omitted when indicating a span of years or page numbers in the text.”^{1(p827)} For example, some journals drop digits from the second number in a range: 1134-39. AMA writes 1134-1139.

Le Système International d’Unitiés (SI) is the governing international standard for measurement in the sciences. The National Institute of Standards and Technology (NIST) publishes their *Guide for the Use of the International System of Units (SI)*, available online at: <http://physics.nist.gov/Document/sp811.pdf>. The current link is also available at www.docstyles.com.



SI numbers have three parts: the numerical value, the prefix or multiplier, and the unit symbol or abbreviation (e.g., 25.3 kg). Numbers are *always* formatted in plain text (no italics), there is *always* a space after the value (*never* a hyphen), there is *never* a period after the units (except at the end of a sentence).

Numerical values are presented without commas in SI notation. For example, the distance between Chicago and Denver is 1600 km (not 1,600 km). The *km* stands for kilo-meters. The prefix *kilo* indicates the units are multiplied by 1000. There are about 1.6 kilometers to a mile. If it is important for clarity you can note the conventional US measure in parentheses after the SI number: 1600 km (1,000 miles).

- There is *always* a space after the numerical value, and *only* a space (eg, the temperature was 25 °C, or about 77 °F today).
- SI numbers are not subject grammatical conventions other than those of the SI. Only a space may follow a numerical value, no hyphens, no exceptions! Do not hyphenate a measure used as an adjective, as for example, “a 5-mg dose” is incorrect (see Taylor, 1995, sec. 7.2b).
- Units of measure are always abbreviated when presented with numerical values, but written out when noted in the text *without* a numerical value. For example, a **liter** is about a quart; “It took 22 **L** to top off the gas tank.”
- Numerical values less than one are preceded by a zero. For example, one yard is 0.91 m, or about three inches short of a meter. An exception is made for statistical values that by definition cannot be greater than one, for example a probability statistic such as $p < .05$.

12. Quotations

Quotations must be placed within quotation marks or indented as a block quote. All quotations must include a citation referring the reader to the source document. Quotations should be integrated into the flow of your text, and may be edited to do so. Quotations must be exact replicas of the original subject to the editing options noted below. Citations in the original should be reproduced in the quote but are not included in the list of references.

Run-On Quotes. Shorter quotes, less than four lines of text, continue with the text inside quotation marks. These are referred to as *run-on* quotations in AMA style.

- *Commas, colons.* Put closing quotation marks outside commas and periods, but *inside* colons and semicolons.
- *Terminal punctuation.* Put question marks, dashes, and exclamation points inside quotation marks when they are part of the quote.

Block Quotes. “If material quoted from text or speeches is longer than 4 line of text, the material should be set off in a block, ie, in reduced type and without quotation marks. Paragraph indents are generally not used unless the quoted material is known to begin a paragraph. Space [blank lines] is often added both above and below these longer quotations.”^{1(p365)}

- *Quotation marks.* Quotations marks are not used around block quotes, but the block is usually set off from the text by additional spacing above and below the block.
- *Block Indent.* Block quotes are typically set 1/2 inch from the left margin in manuscripts, or the same distance as a paragraph indent. An additional paragraph indent is used on the first line only if it is found in the original.
- *Spacing.* Block quotes may be single spaced in research papers (double spaced before and after the quote). This block paragraph spacing may also be applied to references.

Edit Quotations. While obvious typical errors in a quotation are usually corrected without making a special notation, strict adherence to the AMA manual requires even these aberrations to be noted. An unusual word choice, concept, term, or spelling is quoted faithfully followed by the Latin term *sic* (thus), in italics and in brackets, immediately following. This example was actually found in the last (9th) edition of the AMA manual: “Each reference should be cited in the text, tables, or figures in consecutive numerical order by means of superscript arabic numerals [*sic*].”^{2(p30)}

- *Brackets* are required to indicate material or emphasis added to a quote. For example, write “They [the Irish Republican Army] initiated a cease fire” or “[The Irish Republican Army] initiated a cease fire.”
- A change in capitalization to merge a quotation into the flow of your text must be indicated with brackets.^{1(p365)} “[M]erge a quotation into the flow of your text.”
- “The first word after the end punctuation mark and the ellipsis [within a quotation] should use original capitalization”^{1(p365)}
- Italics may be used to add emphasis to words or phrases within a quotation, or to the entire quotation. When this is done a note is added to the quote in brackets at the *end of the sentence* [italics added].

Delete Text from a Quotation. Ellipsis points are used to indicate text omitted from a quotation. But unless clarity demands it, do not use ellipsis points to begin or end a quotation.

- *Within a sentence.* Three ellipsis points (periods with a single space before, between, and after each period) indicate material has been omitted within a sentence. For example, “The creature . . . walks like a duck, and swims like a duck.”
- *Between sentences.* A period and three ellipsis points are used to indicate material omitted between two sentences, or at the end of a sentence when the quote continues to a following sentence. “If a creature flies like a duck, quacks like a duck, walks like a duck. . . . It is, therefore, likely to be a duck.”
- *Beginning a sentence?* In run-on quotes, the leading portions of a sentence opening a quotation, or the trailing portions of a sentence ending a quotation, may be excluded from a quotation without indicating an omission. “When a quoted phrase is an incomplete sentence, readers understand that something precedes and follows; therefore ellipses are not used.”^{1(p365)}

- *Beginning a sentence?* In block quotes, “If the initial word(s) of the first sentence or [a] paragraph being quoted is omitted, begin that paragraph with a paragraph indentation and ellipses to indicate that this is not the beginning of that paragraph.”^{1(p365)}

13. Terminology

“Authors should avoid words and phrases that are unnecessarily elaborate, trendy, tautologic, or euphemistic.”^{1(p381)} Conciseness is a virtue in medical writing. Many journals restrict the length of manuscripts; papers are evaluated for their brevity and clarity.

Age. The *AMA Manual* provides these definitions: *Neonates* or *newborns* are persons from birth to 1 month of age; *infants* are *children* from 1 month to 1 year; *children* are persons from 1 year to 12 years; adolescents from 13 to 17 years; and adults are persons over 18.^{1(p410)}

Designation of Persons. Language in its careless use can dehumanize people. “The careful writer avoids generalizations and stereotypes and is specific when choosing words to describe people.”^{2(p265)}

- *Aged/Elderly.* “Because the term elderly connotes a stereotype, avoid using it as a noun.”^{1(p416)} Refer to *older persons, elderly patients, the elderly population* not *the old* or *the elderly*.
- *Case/Patient/Subject.* “A *case* is evaluated, documented, [managed], and reported. A *patient* is examined, undergoes testing, [is cared for], and is treated. A *research subject* is recruited, selected, sometimes subjected to experimental conditions, and observed.”^{1(p389)}
- *Disabilities.* “Avoid labeling (and thus equating) people with their disabilities or diseases (eg, the blind, schizophrenics, epileptics). Instead, put the person first.”^{1(p416)} Instead of referring to diabetics, refer to persons with diabetes; the disabled as persons with disabilities; the crippled, lame, or deformed are the physically disabled or persons with physical disabilities.

Drugs. “Use nonproprietary names of drugs, devices, and other products, unless the specific trade name of a drug is essential to the discussion.”^{1(pp567-569)} “[O]nly 1 drug name, the nonproprietary name, is regulated internationally to ensure consistent usage and no duplication with other drugs. Once a drug has been assigned a nonproprietary name, the nonproprietary name should always be used to refer to the drug.”^{1(p565)}

Microorganisms. A distinction is made between taxonomic classification and nomenclature. This is especially relevant in medicine where many microorganisms use taxonomic nomenclature that does not reflect the phylogenetic relationships or evolutionary descent of a taxonomic system.

“Stylistic hallmarks of biological nomenclature differentiate scientific names from vernacular names. These hallmarks are latinization, italics, and a 2-word term for species; the binomial, also called binary or binominal, eg, *Homo sapiens*.

According to the international codes, initial capitals are used for all taxa, except for the second portion of the binomial. (That portion is called the specific name in the zoological code and the specific epithet in the botanical and bacteriological codes.) Italics are always used for the genus and species components of the binomial. Diacritical marks (accents) and ligatures (eg, *æ*) are not used.

“All codes capitalize scientific names of taxa but differ in italicizing higher taxa. The bacterial code recommends italicizing all scientific names but recognizes that journals may wish to style all organism names similarly. In *JAMA* and the *Archives Journals*, taxa above genus are not italicized. The following examples . . . illustrate the style in *JAMA* and the *Archives Journals*.”^{1(p742)}

Table 5. Taxonomic Classification Systems

Animal		Bacteria		Fungi	
Rank	Taxon	Rank	Taxon	Rank	Taxon
kingdom	Animalia	kingdom	Prokaryotae	kingdom	Fungi (Mycota)
phylum	Chordata	division	Firmicutes	phylum	Ascomycota
class	Mammalia	class	Firmibacteria	class	Ascomycetes
order	Primate	order	(not applicable)	order	Onygenales
family	Hominidae	family	Bacillaceae	family	Onygenaceae
genus	<i>Homo</i>	genus	<i>Staphylococcus</i>	genus	<i>Ajellomyces</i>
species	<i>Homo sapiens</i>	species	<i>Staphylococcus aureus</i>	species	<i>Ajellomyces capsulatus</i>

The binomial is usually all that is noted in a text; the higher levels of the taxonomic classification are generally inferred unless describing a new species, new classification, or the phylogenetic relationship between two or more species.

- “After first mention of the binomial species name, abbreviate the genus portion of the name. (*JAMA* and the *Archives Journals* do not use a period.) Do not abbreviate the specific name. Do not begin a sentence with an abbreviated genus name [or any abbreviation unless unavoidable]; either expand or reword.”^{1(p743)}
- When the genus is shared with a second organism do not abbreviate the genus until it is mentioned in full with both species. For example, “*Staphylococcus aureus* and *Staphylococcus epidermidis* may be components . . . in clinically significant infections, although *S aureus* is the more serious pathogen of the two.”^{1(p743)}

Do not abbreviate the specific name [eg, *aureus* and *epidermidis* in the example above], and do not abbreviate the genus name when used alone.”¹⁽⁷⁴³⁾ For example, “*Staphylococcus* bacteria are a common source of hospital-acquired infections.”

Viruses. “Although the viral nomenclature code recommends italicizing all scientific virus names (ie, species through order) codes for other organisms differ on using italics for names of higher taxa. For reasons of internal consistency, *JAMA* and the *Archives Journals* do not italicize names of viral taxa above genus. . . . [though the journals] do italicize formal viral genus and species names”^{1(p757)} Vernacular names are never italicized.

“Binomial Proposal. Formal virus species names do not currently [2007] follow the binomial style of other organisms, . . . which include the genus and specific epithet. Confusion exists between terms for abstract virus species and actual virus entities, which are often distinguished only typographically. Virologists have indicated a preference for a binomial style.”^{1(p759)}

World Wide Web & Internet Terminology. There are differences of opinion on what to capitalize and what to hyphenate. The *British Medical Journal* truncates or closes just about everything. American conventions tend to be conservative (linked to the publication cycle of style guides!).

- **e-mail.** The hyphenated form is found in the AMA, APA, and CMS manuals. The *e* is never uppercased except at the beginning of a sentence.
- **home page [homepage].** This is spelled open in the *Chicago Manual*.
- **Internet [Net].** Internet is a proper noun.
- **Web** This is a proper noun. When Web is used in an open compound term (or with a hyphen when used as an adjective), as in Web page design, *Web* is uppercased. When the compound term is closed, *Web* is usually spelled lowercased, as in webmaster.
- **Web page, Web site.** These terms are still spelled open in AMA style.
- **webmaster, web. . .** Most other Web terms (except Web ring) are spelled lowercased and closed (without a hyphen)--webcam, webcast, webhead, webmail, webzine, webmaster, etc.

RESEARCH DOCUMENTATION

14. Text Citations

“Each reference should be cited in the text, tables, or figures in consecutive numerical order [as presented in the text] by means of superscript arabic numerals.”^{1(p42)} “Authors should always consult the primary source and should never cite a reference that they themselves have not read.”^{1(p40)}

1. **Placement.** In the text, a superscript citation number should appear after a comma or period, but before a colon or semicolon. While citations may be placed within a sentence, it is preferable to place them at the end of a sentence unless accuracy and clarity demands otherwise.
2. **Multiple citations.** Multiple references can be cited by listing each in order in the superscript citation, separated by a comma. An inclusive range of references can be cited by separating the range with a hyphen. For example, “Profuse bleeding is generally indicative of an injury.”^{1,2-5,8,12}
3. **Page numbers.** Specific page numbers within a source can be cited by placing the page reference in parentheses after the citation number. Several sources may be cited in a single superscript.^{1(p44), 2(p9)}
4. **Table & figures.** References in table and figures are cited in sequence with those in the text. The numbering shifts to the table or figure after it is first mentioned in the text. All references in the table or figure are cited in sequence. The numbering of citations then returns to the text and continues for subsequent citations.

5. *Numbers & measures.* “Avoid placing a superscript reference citation immediately after a number [numeral] or an abbreviated unit of measure to avoid any confusion between the superscript reference citation and an exponent.”^{1(p43)}
6. *Authors noted.* When mentioned in the text, only surnames of authors are used. For a 2-author reference list both surnames; for references with more than 2 authors or authors and a group, include the first author’s surname followed by “et al,” “and associates,” “and coworkers,” or “and colleagues.” For example: Smith⁷ observed, Smith and Jones⁸ reported, Jones et al¹⁰ determined.
7. *Titles noted.* When titles are presented in the text they are placed in heading caps (sec. 8), titles of books and similar publications are placed in italics; titles of articles are placed in quotation marks.

Parenthetical Citations. Unretrievable sources and news articles are cited in the text in parentheses. These sources are not included in the reference list. For example: “Newspapers reported HMOs were routinely denying basic care (eg, *New York News*, September 31, 2003:12; *Washington Star*, February 29, 2003:G1), and the *Chicago Times* (December 1, 2003;§2:2)” “Robert Smith, MD, found the paperwork requirements of his HMO exasperating (personal communication, April 2007).”

15. “Versioning” Online Sources


AMA style now makes provision for referencing online sources that may change over the course of their posting on the Internet. The *AMA Manual* calls this “versioning” [the quotes are in the original, p. 64]. The *Manual* offers this block format for references:^{1(p64)}

Author(s). Title. Journal Name [using National Library of Medicine abbreviations--see 14.10, Abbreviations, Names of Journals]. Year;volume(issue No.):inclusive pages.
 URL [provide the URL in this field; no need to use "URL:" preceding it].
Published [date]. Updated [date]. Accessed [date].

The last line is particularly interesting. It is what the *AMA Manual* calls “versioning” [the quotes are in the original, p. 64]. They are three distinct elements or dates, used as available and appropriate. Since the access date is always known it is always a part of the reference. The other two dates are included when relevant and/or available, as in this example:

International Committee of Medical Journal Editors. Uniform requirements for manuscripts submitted to biomedical journals: sample references. Bethesda, MD: United States National Library of Medicine Web site. http://www.nlm.nih.gov/bsd/uniform_requirements.html.
Published July 9, 2003. Updated April 25, 2007. Accessed September 5, 2007.

The problem with this reference is that we have no idea what has changed. Without documentation of the change (as is required in print journals) you have no way of assessing the importance of the revision. If the original reported the correct dose was “10 g” and latter corrected it to “10 mg” the consequences may be grave. But if the correction was for a minor spelling error the effect would be insignificant.

 A paper that relies on ephemeral sources becomes a fleeting conjecture grounded in undocumented and changing content. This is too vague to be credible in scientific publication.

16. Reference List

“Reference to information that is retrievable is appropriately made in the reference list. This includes but is not limited to (1) articles published or accepted for publication in scholarly or mass circulation print or electronic journals, magazines, or newspapers, (2) books that have been published or accepted for publication, (3) papers presented at professional meetings, (4) abstracts, (5) theses, (6) CD-ROMs, films, videotapes and audiofiles, (7) package inserts or a manufacturer’s documentation, (8) monographs, (9) official reports, (10) databases and Web sites, (11) legal cases, (12) patents, and news releases.”^{1(p41), 9(p29)}

- *Authors & Editors.* List up to six authors or editors. If there are more, list the first three, plus et al. Invert all names—authors, editors, translators, compilers—first & middle initials trailing without periods. If the author(s) represent a group, add the group name after the authors (follow the rule for using *et al.*).
- *Article Titles.* Titles of articles, chapters, Web pages, and entries in reference works are set in sentence caps; in plain text without quotation marks or italics. Note, “for journal articles the subtitle begins with a lowercase letter.”^{1(p47)}
- *Book Titles.* Titles of books, volumes, reference works, reports & bulletins, theses & dissertations are formatted in heading caps and set in italics.

- *Journal Names.* The names of journals are set in italics and abbreviated according to the *List of Journals Indexed for Medline* (formerly *Index Medicus*) published by the National Library of Medicine.^{1(p19)} A link is available at www.docstyles.com.
- *City: State.* Include the 2-letter abbreviation for the state with all US cities and Canadian provinces, eg, New York, NY; Toronto, ON. Add the country with all other cities, eg, Paris, France; London, England. Do not list the state if it is part of the publisher's name.^{1(p35)}
- *Page Numbers.* Do not omit digits from inclusive page numbers.^{1(p48),2(p35)}
- *Uniform Resource Locators (URLs).* "Use the URL that will take the reader most directly to the article, not a long search string and not a short, more general URL (one to the publisher's home page, for example)" if a URL is provided, as close as possible to publication verify that the link still works"^{1(p64)}


Articles in Periodicals

One to Six Authors (Commentary, Online)

Krause RM. The origin of plagues: old and new. *Science*. 1992;257:1073-1078.

Barry JM. The site of origin of the 1918 influenza pandemic and its public health implications [Commentary]. *J Translational Med*. January 20, 2004;2(3):1-4. <http://www.translational-medicine.com/content/2/1/3>. Accessed November 18, 2005.

Mokdad AH, Bowman BA, Ford ES, Vinicor F, Marks JS, Koplan JP. The continuing epidemics of obesity and diabetes in the US. *JAMA*. 2001;286:1195-1200.

 According to the *AMA Manual*, "When citing an electronic document that also exists in print form, you should cite the version you consulted."^{2(p44)} There are no examples of references to pdf facsimiles of print articles in the *AMA Manual* or in recent issues of *JAMA*. Cite as print?

More than Six Authors

McGlynn EA, M. Asch S, Adams J, et al. The quality of health care delivered to adults in the United States. *N Engl J Med*. June 26, 2003;348(26):2635-2645.

Authors Representing a Group

Moher D, Schulz KF, Altman D; for the CONSORT Group. The CONSORT statement: revised recommendations for improving the quality of reports of parallel-group randomized trials. *JAMA*. 2001;285:1987-1991.

Group/Corporate Author

Centers for Disease Control and Prevention. Plan and operation of the Third National Health and Nutrition Examination Survey, 1988-94. *Vital Health Stat*. 1994;1:1-307.

Hypericum Depression Trial Study Group. Effect of *Hypericum perforatum* (St. John's Wort) in major depressive disorder: a randomized controlled trial. *JAMA*. 2002;287:1807-1814.

Jr. & III (Editorial)

Pope HG Jr, Ionescu-Pioggia M, Pope KW. Drug use and life style among college undergraduates: a 30-year longitudinal study. *Am J Psychiatry*. 2001;158:1519-1521.

Chambers HF III, Winston LG. Mupirocin prophylaxis misses by a nose [editorial]. *Ann Intern Med*. 2004;140(6):484-486.

No Author

Annual smoking attributable mortality, years of potential life lost and economic costs: United States 1995-1999. *MMWR Morb Mortal Wkly Rep*. 2002;51:300-303.

Abstract / Department / Letter

Alexander, GC, Werner, RM, Ubel, PA. The costs of denying scarcity [commentary]. *Arch Intern Med*. 2004;164:593-596.

Coyle JT. Use it or lose it--do effortful mental activities protect against dementia? [Perspective]. *N Engl J Med*. 2003;348:2489-2490.

Lofwall MR, Strain EC, Brooner RK, Kindbom KA, Bigelow GE. Characteristics of older methadone maintenance (MM) patients [abstract]. *Drug Alcohol Depend.* 2002;66(suppl 1):S105.

Tor M, Turker H. International approaches to the prescription of long-term oxygen therapy [letter]. *Eur Respir J.* 2002;20(1):242.

Annual Reviews

Visscher TL, Seidell JC. The public health impact of obesity. *Annu Rev Public Health.* 2001;22:355-375.

Book Reviews

Yager J, reviewer. *Am J Psychiatry.* 2004;161:1137. Review of: Crawshaw R. *Compassion's Way: A Doctor's Quest into the Soul of Medicine.*

Erratum / Corrections

Curfman GD, Morrissey S, Drazen JM. Notice of duplicate publication of [Park S-J, Shin WH, Ho DS, et al. A paclitaxel-eluting stent for the prevention of coronary restenosis. *N Engl J Med.* 2003;348:1537-1545]. *N Engl J Med.* 2003;348:2254.

Hyman DJ, Pavlik VN. Characteristics of patients with uncontrolled hypertension in the United States [erratum, *N Engl J Med.* 2002;346:544]. *N Engl J Med.* 2001;345:479-486.

Mansharamani M, Chilton BS. The reproductive importance of P-type ATPases [published correction appears in *Mol Cell Endocrinol.* 2002;188(1-2): 22-5]. *Mol Cell Endocrinol.* 2001;183(1-2):123-126.

Newspapers & Magazines

Gottlieb M. A free-for-all in swapping Medicaid for managed care. *New York Times.* October 2, 1995:A1, A4.

Markoff J. Voluntary rules proposed to help insure privacy for Internet users. *New York Times.* June 5, 1996. <http://www.nytimes.com/library/cyber/week/yo5dat.html>. Accessed April 1, 1998.


Relman AS, Angell M. America's other drug problem. *The New Republic.* December 16, 2002:27-41.

Undisclosed settlement reached out of court in Michigan Biodyne civil suit. *Psychiatric Times.* March 1, 1992:16.

Paged by Issue

Banit DM, Kaufer H, Hartford JM. Intraoperative frozen section analysis in revision total joint arthroplasty. *Clin Orthop.* 2002;(401):230-238.

McGlynn EA, Brook RH. Keeping quality on the policy agenda. *Health Aff (Millwood).* 2001;20(3):82-90.

 Most journals are paged continuously through a volume. When they are not the number of the issue is cited in parentheses.

Parts & Supplements

Bodenheimer T. The Oregon Health Plan--lessons for the nation: first of two parts. *N Engl J Med.* 1997;337:651-655.

Bodenheimer T. The Oregon Health Plan--lessons for the nation. *N Engl J Med.* 1997;337(pt 2):720-723.

Flanagin A, Winker MA, eds. Global health. *JAMA.* 2004;291(21, theme issue):2511-2664.

Ward P, Small I, Smith J, Suter P, Dutkowski R. Oseltamivir (Tamiflu) and its potential for use in the event of an influenza pandemic. *J Antimicrob Chemother.* 2005;55(suppl 1):i5S-i21S.

Books & Chapters

Goldstein H. *Multilevel Statistical Models.* 2nd ed. New York, NY: Wiley; 1995.

Congressional Budget Office. *Changes in the Living Arrangements of the Elderly: 1960-2030.* Washington, DC: US Government Printing Office; 1988.

Iverson C, Flanagin A, Fontanarosa PB, et al. *American Medical Association Manual of Style: A Guide for Authors and Editors.* 9th ed. Baltimore, MD: Lippincott Williams & Wilkins; 1997.

Kuhn, Thomas S. *The Structure of Scientific Revolutions*. 2nd ed. Chicago, IL: University of Chicago Press; 1970.

Edited Book (Editors as Authors/Online)

Beers MH, Berkow R, eds. *The Merck Manual of Diagnosis and Therapy*. 17th ed. 1999. <http://www.merck.com/pubs/mmanual/>. Accessed January 17, 2003.

Breedlove GK, Schorfheide AM. *Adolescent Pregnancy*. 2nd ed. Wieczorek RR, ed. White Plains, NY: March of Dimes Education Services; 2001.

Wassenaar JD, Thran SL, eds. *Physician Socioeconomic Statistics*. 2000-2002 ed. Chicago, IL: American Medical Association; 2001.

Chapters in Edited Books (Volume & Edition)

Davey Smith G, Egger M. Going beyond the grand mean: subgroup analysis in meta-analysis of randomised trials. In: Altman DG, ed. *Systematic Reviews in Health Care: Meta-analysis in Context*. 2nd ed. London, England: BMJ Publishing; 2001:143-156.

Mills S. Herbal medicine. In: Lewith G, Jonas WB, Walach H, eds. *Clinical Research in Complementary Therapies*. Edinburgh, Scotland: Churchill Livingstone; 2002:211-227.

Reynolds RC, Stone J. On doctoring: the making of an anthology of literature and medicine. In: Isaacs SL, Knickman JR, eds. *To Improve Health and Health Care*. San Francisco, CA: Jossey-Bass Publishers; 2002:chap 8. *The Robert Wood Johnson Foundation Anthology*; vol 5. <http://www.rwjf.org/publications/publicationPdfs/anthology2002/chap8.html>. Accessed June 26, 2003.

Stephan WG. Intergroup relations. In: Lindzey G, Aronson E, eds. *The Handbook of Social Psychology*. Vol. 2. 3rd ed. New York, NY: Random House; 1985:599-658.

Monographs, Proceedings, & References

Conferences (Papers Published & Unpublished)

Braveman P, Cubbin C, Marchi KS, Egerter S. An approach to policy-oriented monitoring of equity in health. Paper presented at: The 130th Annual Meeting of the American Public Health Association; November 9-13, 2002; Philadelphia, PA.

Harnden P, Joffe JK, Jones WG, eds. *Germ Cell Tumours V*. Proceedings of the 5th Germ Cell Tumour Conference; September 13-15, 2001; Leeds, UK. New York, NY: Springer; 2002.

Giesecker KE, Miller LA, Bryan R, et al. Occupational exposure to hantavirus: knowledge, risk, behavior: a four-state review [abstract 33]. In: *Program and Abstracts of the 4th International Conference on HFRS and Hantaviruses*. Atlanta, GA: Centers for Disease Control; 1998:72.

Dissertations

Borkowski MM. *Infant Sleep and Feeding: A Telephone Survey of Hispanic Americans* [dissertation]. Mount Pleasant, MI: Central Michigan University; 2002.

Package Insert

Tamiflu (oseltamivir phosphate) Capsules and for Oral Suspension [package insert]. Basel, Switzerland: F Hoffmann-La Roche Ltd; 1999.

Reference Works

Bureau of the Census. Higher education price indexes: 1965–1991. In: *Statistical Abstract of the United States: 1993*. 113th ed. Table 277. Washington, DC: US GPO; 1993.

Filamin. In: *Dorland's Illustrated Medical Dictionary*. 29th ed. Philadelphia, PA: W. B. Saunders; 2000:675.

Johnson K. Hantaviruses. In: Evans AS, ed. *Viral Infections of Humans: Epidemiology and Control*. 3rd ed. New York, NY: Plenum Press, 1989:341-350.

Merriam-Webster Collegiate Dictionary. 10th ed. Springfield, MA: Merriam-Webster; 1993.

Scientific or Technical Reports

Taylor BN. *Guide for the Use of the International System of Units (SI)*. 1995 ed. Gaithersburg, MD: National Institute of Standards and Technology; April 1995. NIST Special Publication 811. <http://physics.nist.gov/Document/sp811.pdf>. Accessed June 25, 2003.

Web Pages & Electronic Resources

CD-ROMs

Anderson SC, Poulsen KB. *Anderson's Electronic Atlas of Hematology* [CD-ROM]. Philadelphia, PA: Lippincott Williams & Wilkins; 2002.

Organisation for Economic Co-operation and Development. *OECD Health Data 2004* [CD-ROM]. Paris, France: Organization for Economic Cooperation and Development; 2004.

Database Online

Meta-analysis. In: MeSH Browser [database online]. Bethesda, MD: National Library of Medicine; 2002. <http://www.nlm.nih.gov/mesh/MBrowser.html>. Accessed June 10, 2003.

Who's Certified [database online]. Evanston, IL: The American Board of Medical Specialists, 2000. <http://www.abms.org/newsearch.asp>. Accessed March 8, 2001.

Document Online

Homeland Security Council. *National Strategy for Pandemic Influenza*. Washington, DC: The Whitehouse; November 1, 2005. <http://www.whitehouse.gov/homeland/pandemic-influenza.html>. Accessed November 2, 2005.

Monograph Online

Foley KM, Gelband H, eds. *Improving palliative care for cancer* [monograph online]. Washington, DC: National Academy Press; 2001. <http://www.nap.edu/books/0309074029/html/>. Accessed July 9, 2002.

Serial Online

Morse SS. Factors in the emergence of infectious diseases. *Emerg Infect Dis* [serial online]. January-March 1995;1(1):7-15. <http://www.cdc.gov/ncidod/EID/eid.htm>. Accessed April 15, 2003.

Software & Manuals

Adobe Systems. *Adobe Acrobat 5.0 User Guide for Windows and Macintosh*. San Jose, CA: Adobe Systems Inc; 2000. <http://www.adobe.com/products/readstep/>. Accessed April 1, 2002.

Epi Info [computer program]. Version 3.3.2. Atlanta, GA: Centers for Disease Control and Prevention; February 9, 2005. <http://www.cdc.gov/epiinfo.html>. Accessed November 20, 2005.

World Wide Web Pages

Association of Cancer Online Resources, Inc. *Cancer-Pain* [homepage]. New York, NY: The Association, 2001. <http://www.cancer-pain.org/>. Accessed July 9, 2002.

National Center for Complementary and Alternative Medicine. *St. John's Wort and the treatment of depression* [Web page]. National Institutes of Health Web site. <http://nccam.nih.gov/health/stjohnswort/>. Accessed January 19, 2003.

World Health Organization. *Confirmed human cases of avian influenza A(H5N1) since 28 January 2004* [on the Internet]. January 26, 2005. http://www.who.int/csr/disease/avian_influenza/country/cases_table_2005_01_26/en/JE. Accessed November 16, 2005.

REFERENCES CITED IN AMA STAT!

1. Iverson C, Christiansen S, Flanagan A, et al. *American Medical Association Manual of Style*. 10th ed. New York, NY: Oxford University Press, 2007.
2. Iverson C, Flanagan A, Fontanarosa PB, et al, for the American Medical Association. *American Medical Association Manual of Style: A Guide for Authors and Editors*. 9th ed. Baltimore, MD: Lippincott Williams & Wilkins; 1997.
3. *The Chicago Manual of Style*. 15th ed. Chicago, IL: University of Chicago Press; 2003.
4. JAMA instructions for authors. JAMA Web site. August 7, 2007. <http://jama.ama-assn.org/misc/ifora.dtl>. Accessed September 7, 2007.
5. International Committee of Medical Journal Editors. Uniform requirement for manuscripts submitted to biomedical journals: writing and editing for biomedical publication. Updated February 2006. <http://www.icmje.org/>. Accessed September 15, 2007.
6. American Psychological Association. *Publication Manual of the American Psychological Association*. 5th ed. Washington, DC: American Psychological Association; 2001.

STATE & PROVINCIAL POSTAL CODES

AL Alabama	HI Hawaii	MO Missouri	PR Puerto Rico
AK Alaska	ID Idaho	MT Montana	RI Rhode Island
AS American Samoa	IL Illinois	NE Nebraska	SC South Carolina
AZ Arizona	IN Indiana	NV Nevada	SD South Dakota
AR Arkansas	IA Iowa	NH New Hampshire	TN Tennessee
CA California	KS Kansas	NJ New Jersey	TX Texas
CO Colorado	KY Kentucky	NM New Mexico	UT Utah
CT Connecticut	LA Louisiana	NY New York	VT Vermont
DE Delaware	ME Maine	NC North Carolina	VA Virginia
DC District of Columbia	MD Maryland	ND North Dakota	VI Virgin Islands
FL Florida	MA Massachusetts	OH Ohio	WA Washington
GA Georgia	MI Michigan	OK Oklahoma	WV West Virginia
GU Guam	MN Minnesota	OR Oregon	WI Wisconsin
	MS Mississippi	PA Pennsylvania	WY Wyoming
AB Alberta	NB New Brunswick		
BC British Columbia	NS Nova Scotia	ON Ontario	SK Saskatchewan
MB Manitoba	NT Northwest Terr.	QB Québec (PQ)	YT Yukon Territory