

Style Matters

Uniform requirements for manuscripts submitted to biomedical journals

International Committee of Medical Journal Editors

In January 1978 a group of editors from some major biomedical journals published in English met in Vancouver, British Columbia, and decided on uniform technical requirements for manuscripts to be submitted to their journals. These requirements, including formats for bibliographic references, were published in three of the journals early in 1979. The Vancouver group evolved into the International Committee of Medical Journal Editors. At the October 1981 meeting of the committee the requirements were revised slightly and are presented as the main part of this document.

Over 150 journals have now agreed to receive manuscripts prepared in accordance with these requirements. It is important to emphasise what these requirements imply and what they do not.

Firstly, if authors prepare their manuscripts in the style specified in these requirements, editors will not return manuscripts for changes in details of style. Even so, manuscripts may be altered by journals to conform with details of their own publication styles.

Thus, secondly, the requirements are instructions to authors on how to prepare manuscripts, not to editors on publication style.

Thirdly, authors sending manuscripts to a participating journal should not try to prepare them in accordance with the individual publication style of that journal but should follow the "Uniform requirements for manuscripts submitted to biomedical journals."

Nevertheless, authors *must also* follow the instructions to authors in the journal as to what topics are suitable for that journal and the types of papers that may be submitted—for example, original articles, reviews, case reports. In addition, the journal's instructions are likely to contain other requirements unique to that journal, such as number of copies of manuscripts, acceptable languages, length of articles, and approved abbreviations besides those listed in this document.

The co-operating journals are expected to state in their instructions to authors that their requirements are in accordance with "Uniform requirements for manuscripts submitted to biomedical journals."

This document will be revised at intervals. Inquiries and comments from Central and North America about these requirements should be sent to Edward J Huth, MD, *Annals of Internal Medicine*, 4200 Pine Street, Philadelphia, PA 19104,

USA; those from other regions should be sent to Stephen Lock, FRCP, *British Medical Journal*, British Medical Association, Tavistock Square, London WC1H 9JR, United Kingdom.

Editors of journals which have agreed to accept manuscripts that conform to the uniform requirements may reprint this article, and single reprints will be available to editors free of charge if they send a stamped addressed envelope and to authors at a cost of 70p (including postage).

Summary of requirements

Type the manuscript double spaced, including title page, abstract, text, acknowledgments, references, tables, and legends.

Each manuscript component should begin on a new page, in this sequence: title page; abstract and key words; text; acknowledgments; references; tables: each table, complete with title and footnotes, on a separate page; legends for illustrations.

Illustrations must be good quality, unmounted glossy prints usually 127 × 173 mm (5 × 7 in) but no larger than 203 × 254 mm (8 × 10 in).

Submit the required number of copies of manuscript and figures (see journal's instructions) in a heavy-paper envelope. The submitted manuscript should be accompanied by a covering letter, as described under "Submission of manuscripts," and permissions to reproduce previously published materials or to use illustrations that may identify human subjects.

Follow the journal's instructions for transfer of copyright. Authors should keep copies of everything submitted.

Prior and duplicate publication

Most journals do not wish to consider for publication a paper on work that has already been reported in a published paper or is described in a paper submitted or accepted for publication elsewhere. This policy does not usually preclude consideration of a manuscript that has been rejected by another journal or of a complete report that follows publication of a preliminary report, usually in the form of an abstract. When submitting a manuscript an author should always make a full statement to the editor about all submissions and prior reports that might be regarded as prior or duplicate publication of the same or very similar work. Copies of such material should be included with the submitted manuscript to help the editor decide how to deal with the matter.

Preparation of manuscript

Type the manuscript on white bond paper, 216 × 279 mm (8½ × 11 in) or ISO A4 (212 × 297 mm), with margins of at least 25 mm (1 in). Type only on one side of the paper. Use double spacing

Members of the Committee are: Ole Harlem (*Norwegian Medical Journal*), Edward J Huth (*Annals of Internal Medicine*), Stephen Lock (*British Medical Journal*), Ian Munro (*Lancet*), Arnold Relman (*New England Journal of Medicine*), Povl Riis (*Danish Medical Bulletin*), Richard Robinson (*New Zealand Medical Journal*), Andrew Sherrington (*Canadian Medical Association Journal*), Therese Southgate (*Journal of the American Medical Association*), Ilkka Vartiavaara (*Finnish Medical Journal*).

throughout, including title page, abstract, text, acknowledgments, references, tables, and legends for illustrations. Begin each of the following sections on separate pages: title page, abstract and key words, text, acknowledgments, references, individual tables, and legends. Number pages consecutively, beginning with the title page. Type the page number in the upper righthand corner of each page.

TITLE PAGE

The title page should carry (1) the title of the article, which should be concise but informative; (2) a short running head or footline of no more than 40 characters (count letters and spaces) placed at the foot of the title page and identified; (3) first name, middle initial, and last name of each author, with highest academic degree(s); (4) name of department(s) and institution(s) to which the work should be attributed; (5) disclaimers, if any; (6) name and address of author responsible for correspondence about the manuscript; (7) name and address of author to whom requests for reprints should be addressed, or statement that reprints will not be available from the author; (8) the source(s) of support in the form of grants, equipment, drugs, or all of these.

ABSTRACT AND KEY WORDS

The second page should carry an abstract of no more than 150 words. The abstract should state the purposes of the study or investigation, basic procedures (study subjects or experimental animals; observational and analytical methods), main findings (give specific data and their statistical significance, if possible), and the principal conclusions. Emphasise new and important aspects of the study or observations. Use only approved abbreviations (see Commonly used approved abbreviations elsewhere in this document).

Below the abstract, provide, and identify as such, three to 10 key words or short phrases that will assist indexers in crossindexing your article and that may be published with the abstract. Use terms from the medical subject headings list from *Index Medicus* when possible.

TEXT

The text of observational and experimental articles is usually—but not necessarily—divided into sections with the headings Introduction, Methods, Results, and Discussion. Long articles may need sub-headings within some sections to clarify their content, especially the Results and Discussion sections. Other types of articles such as case reports, reviews, and editorials are likely to need other formats, and authors should consult individual journals for further guidance.

Introduction—Clearly state the purpose of the article. Summarise the rationale for the study or observation. Give only strictly pertinent references, and do not review the subject extensively.

Methods—Describe your selection of the observational or experimental subjects (patients or experimental animals, including controls) clearly. Identify the methods, apparatus (manufacturer's name and address in parentheses), and procedures in sufficient detail to allow other workers to reproduce the results. Give references to established methods, including statistical methods; provide references and brief descriptions for methods that have been published but are not well known; describe new or substantially modified methods, give reasons for using them, and evaluate their limitations.

When reporting experiments on human subjects, indicate whether the procedures followed were in accordance with the ethical standards of the committee on human experimentation of the institution in which the experiments were done or in accordance with the Helsinki Declaration of 1975. When reporting experiments on animals, indicate whether the institution's or the national research council's guide for the care and use of laboratory animals was followed. Identify precisely all drugs and chemicals used, including generic name(s), dosage(s), and route(s) of administration. Do not use patients' names, initials, or hospital numbers.

Include numbers of observations and the statistical significance of the findings when appropriate. Detailed statistical analyses, mathematical derivations, and the like may sometimes be suitably presented in the form of one or more appendixes.

Results—Present your results in logical sequence in the text, tables, and illustrations. Do not repeat in the text all the data in the tables, illustrations, or both: emphasise or summarise only important observations.

Discussion—Emphasise the new and important aspects of the study and conclusions that follow from them. Do not repeat in detail data given in the Results section. Include in the Discussion the implications of the findings and their limitations and relate the observations to other relevant studies. Link the conclusions with the goals of the study but avoid unqualified statements and conclusions not completely supported by your data. Avoid claiming priority and alluding to work that has not been completed. State new hypotheses when warranted, but clearly label them as such. Recommendations, when appropriate, may be included.

ACKNOWLEDGMENTS

Acknowledge only persons who have made substantive contributions to the study. Authors are responsible for obtaining written permission from everyone acknowledged by name because readers may infer their endorsement of the data and conclusions.

REFERENCES

Number references consecutively in the order in which they are first mentioned in the text. Identify references in text, tables, and legends by arabic numerals (in parentheses). References cited *only* in tables or in legends to figures should be numbered in accordance with a sequence established by the first identification in the text of the particular table or illustration.

Use the style of the examples below, which are based on the formats used by the US National Library of Medicine in *Index Medicus*.

The titles of journals should be abbreviated according to the style used in *Index Medicus*. A list of abbreviated names of frequently cited journals is given near the end of this document; for others, consult the "List of the Journals Indexed," printed annually in the January issue of *Index Medicus*.

Try to avoid using abstracts as references; "unpublished observations" and "personal communications" may not be used as references, although references to written, not verbal, communications may be inserted (in parentheses) in the text. Include among the references manuscripts accepted but not yet published; designate the journal followed by "in press" (in parentheses). Information from manuscripts submitted but not yet accepted should be cited in the text as "unpublished observations" (in parentheses).

The references must be verified by the author(s) against the original documents.

Examples of correct forms of references are given below.

Journals

- (1) *Standard journal article*—(List all authors when six or less; when seven or more, list only first three and add *et al.*)

You CH, Lee KY, Chey WY, Menguy R. Electrogastrographic study of patients with unexplained nausea, bloating and vomiting. *Gastroenterology* 1980;79:311-4.

- (2) *Corporate author*

The Royal Marsden Hospital Bone-Marrow Transplantation Team. Failure of syngeneic bone-marrow graft without preconditioning in post-hepatitis marrow aplasia. *Lancet* 1977;2:242-4.

- (3) *No author given*

Anonymous. Coffee drinking and cancer of the pancreas [Editorial]. *Br Med J* 1981;283:628.

- (4) *Journal supplement*

Mastri AR. Neuropathy of diabetic neurogenic bladder. *Ann Intern Med* 1980;92(2 Pt 2):316-8.
Frumin AM, Nussbaum J, Esposito M. Functional asplenia: demonstration of splenic activity by bone marrow scan [Abstract]. *Blood* 1979;54(suppl 1):26a.

- (5) *Journal paginated by issue*

Seaman WB. The case of the pancreatic pseudocyst. *Hosp Pract* 1981;16(Sep):24-5.

Books and other monographs(6) *Personal author(s)*

Eisen HN. Immunology: an introduction to molecular and cellular principles of the immune response. 5th ed. New York: Harper and Row, 1974:406.

(7) *Editor, compiler, chairman as author*

Dausset J, Colombani J, eds. Histocompatibility testing 1972. Copenhagen: Munksgaard, 1973:12-8.

(8) *Chapter in a book*

Weinstein L, Swartz MN. Pathogenic properties of invading microorganisms. In: Sodeman WA Jr, Sodeman WA, eds. Pathologic physiology: mechanisms of disease. Philadelphia: W B Saunders, 1974:457-72.

(9) *Published proceedings paper*

DuPont B. Bone marrow transplantation in severe combined immunodeficiency with an unrelated MLC compatible donor. In: White HJ, Smith R, eds. Proceedings of the third annual meeting of the International Society for Experimental Hematology. Houston: International Society for Experimental Hematology, 1974:44-6.

(10) *Monograph in a series*

Hunninghake GW, Gadek JE, Szapiel SV, et al. The human alveolar macrophage. In: Harris CC ed. Cultured human cells and tissues in biomedical research. New York: Academic Press, 1980:54-6. (Stoner GD, ed. Methods and perspectives in cell biology; vol 1).

(11) *Agency publication*

Ranofsky AL. Surgical operations in short-stay hospitals: United States—1975. Hyattsville, Maryland: National Centre for Health Statistics, 1978; DHEW publication no. (PHS)78-1785. (Vital and health statistics; series 13; no 34).

(12) *Dissertation or thesis*

Cairns RB. Infrared spectroscopic studies of solid oxygen. Berkeley, California: University of California, 1965. 156 pp. Dissertation.

Other articles(13) *Newspaper article*

Shaffer RA. Advances in chemistry are starting to unlock mysteries of the brain: discoveries could help cure alcoholism and insomnia, explain mental illness. How the messengers work. Wall Street Journal 1977 Aug 12:1(col 1), 10(col 1).

(14) *Magazine article*

Roueché B. Annals of medicine: the Santa Claus culture. The New Yorker 1971 Sep 4:66-81.

TABLES

Type each table on a separate sheet; remember to double space. Do not submit tables as photographs. Number tables consecutively and supply a brief title for each. Give each column a short or abbreviated heading. Place explanatory matter in footnotes, not in the heading. Explain in footnotes all non-standard abbreviations that are used in each table. For footnotes, use the following symbols, in this sequence: *, †, ‡, §, ||, ¶, **, ††. . . .

Identify statistical measures of variations such as SD and SEM.

Do not use internal horizontal and vertical rules.

Cite each table in the text in consecutive order.

If you use data from another published or unpublished source, obtain permission and acknowledge fully.

The use of too many tables in relation to the length of the text may produce difficulties in the layout of pages. Examine issues of the journal to which you plan to submit your manuscript to estimate how many tables can be used per 1000 words of text.

The editor on accepting a manuscript may recommend that additional tables containing important backup data too extensive to publish be deposited with the National Auxiliary Publications Service

or made available by the author(s). In that event, an appropriate statement will be added to the text. Submit such tables for consideration with the manuscript.

ILLUSTRATIONS

Submit the required number of complete sets of figures. Figures should be professionally drawn and photographed; freehand or typewritten lettering is unacceptable. Instead of *original* drawings, roentgenograms, and other material, send sharp, glossy black-and-white photographic prints, usually 127 × 173 mm (5 × 7 in) but no larger than 203 × 254 mm (8 × 10 in). Letters, numbers, and symbols should be clear and even throughout, and of sufficient size that when reduced for publication each item will still be legible. Titles and detailed explanations belong in the legends for illustrations, not on the illustrations themselves.

Each figure should have a label pasted on its back indicating the number of the figure, the names of the authors, and the top of the figure. Do not write on the back of the figures, mount them on cardboard, or scratch or mar them using paper clips. Do not bend figures.

Photomicrographs must have internal scale markers. Symbols, arrows, or letters used in the photomicrographs should contrast with the background.

If photographs of persons are used, either the subjects must not be identifiable or their pictures must be accompanied by written permission to use the photograph.

Cite each figure in the text in consecutive order. If a figure has been published, acknowledge the original source and submit written permission from the copyright holder to reproduce the material. Permission is required, regardless of authorship or publisher, except for documents in the public domain.

For illustrations in colour, supply colour negatives or positive transparencies and, when necessary, accompanying drawings marked to indicate the region to be reproduced; in addition, send two positive colour prints to assist editors in making recommendations. Some journals publish illustrations in colour only if the author pays for the extra cost.

LEGENDS FOR ILLUSTRATIONS

Type legends for illustrations double spaced, starting on a separate page, with arabic numerals corresponding to the illustrations. When symbols, arrows, numbers, or letters are used to identify parts of the illustrations, identify and explain each one clearly in the legend. Explain internal scale and identify method of staining in photomicrographs.

Units of measurement

Measurements of length, height, weight, and volume should be reported in metric units (metre, kilogram, litre) or their decimal multiples.

Temperatures should be given in degrees Celsius. Blood pressures should be given in millimetres of mercury. Other measurements should be reported in the units in which they were made.

In most countries the International System of Units (SI) is standard or is becoming so. Journals may use these units or convert them to other units according to their editorial policies. Editors may request that alternative units (SI or non-SI units) be added by the author before publication of the paper.

Abbreviations and symbols

Use only standard abbreviations (see below for lists of commonly used abbreviations). Consult the following sources for additional abbreviations: (1) CBE Style Manual Committee. *Council of Biology Editors Style Manual: a Guide for Authors, Editors, and Publishers in the Biological Sciences*. 4th ed. Arlington, Virginia: Council of Biology Editors, 1978; and (2) O'Connor M, Woodford FP. *Writing Scientific Papers in English: an ELSE-Ciba Foundation Guide for Authors*. Amsterdam: Elsevier-Excerpta Medica, 1975. Avoid abbreviations in the title. The full term for which an abbreviation stands should precede its first use in the text unless it is a standard unit of measurement.

Commonly used approved abbreviations

Standard units of measurement, combining prefixes and statistical terms

Term	Abbreviation or symbol	Term	Abbreviation or symbol
<i>Standard units of measurement</i>			
ampere	A	international unit	IU
ångström	Å	joule	J
barn	b	kelvin	K
candela	cd	kilogram	kg
coulomb	C	liter, litre	l or L
counts per minute	cpm	meter, metre	m
counts per second	cps	minute	min
curie	Ci	molar	M
degree Celsius	°C	mole	mol
disintegration per minute	dpm	newton	N
disintegration per second	dps	normal (concentration)	N
electron Volt equivalent	eV	ohm	Ω
farad	F	osmol	osmol
gauss	G	pascal	Pa
gram	g	revolutions per minute	rpm
henry	H	second	s
hertz	Hz	square centimeter	cm ²
hour	h	volt	V
		watt	W
		week	wk
		year	yr
<i>Combining prefixes</i>			
tera- (10 ¹²)	T	centi- (10 ⁻²)	c
giga- (10 ⁹)	G	milli- (10 ⁻³)	m
mega- (10 ⁶)	M	micro- (10 ⁻⁶)	μ
kilo- (10 ³)	k	nano- (10 ⁻⁹)	n
hecto- (10 ²)	h	pico- (10 ⁻¹²)	p
deca- (10 ¹)	da	femto- (10 ⁻¹⁵)	f
deci- (10 ⁻¹)	d	atto- (10 ⁻¹⁸)	a
<i>Statistical terms</i>			
correlation coefficient	r	standard deviation	SD
degrees of freedom	df	standard error of the mean	SEM
mean	\bar{x}	"Student's" t test	t test
not significant	NS	variance ratio	F
number of observations	n		
probability	p		

Other common abbreviations

Term	Abbreviation or symbol
adenosinediphosphatase	ADPase
adenosine 5'-diphosphate (adenosinediphosphate)	ADP
adenosine 5'-monophosphate (adenosine monophosphate, adenylic acid)	AMP
adenosine triphosphatase	ATPase
adenosine 5'-triphosphate(adenosine triphosphate)	ATP
adrenocorticotrophic hormone (adrenocorticotropin)	ACTH
bacille Calmette-Guérin	BCG
basal metabolic rate	BMR
body temperature, pressure, and saturated	BTPS
central nervous system	CNS
coenzyme A	coA
deoxyribonucleic acid (deoxyribonucleate)	DNA
dihydroxyphenethylamine	dopamine
electrocardiogram	ECG
electroencephalogram	EEG
enteric cytopathogenic human orphan (virus)	ECHO
ethyl	Et
ethylenediaminetetra-acetate	EDTA
gas-liquid chromatography	GLC
guanosine 5'-monophosphate (guanosine monophosphate, guanylic acid)	GMP
haemoglobin	Hb
logarithm (to base 10; common logarithm)	log
logarithm, natural	ln
methyl	Me
Michaelis constant	K _m
negative logarithm of hydrogen ion activity	pH
partial pressure of CO ₂	Pco ₂
partial pressure of O ₂	Po ₂
per	/
percent	%
radiation (ionising, absorbed dose)	rad
respiratory quotient	RQ
specific gravity	sp gr
standard atmosphere	atm
standard temperature and pressure	STP
ultraviolet	uv
volume	vol
volume ratio (volume per volume)	vol/vol
weight	wt
weight per volume	wt/vol
weight ratio (weight per weight)	wt/wt

Submission of manuscripts

Mail the required number of manuscript copies in a heavy-paper envelope, enclosing the manuscript copies and figures in cardboard, if necessary, to prevent bending of photographs during mail handling. Place photographs and transparencies in a separate heavy-paper envelope.

Manuscripts should be accompanied by a covering letter from the author who will be responsible for correspondence regarding the manuscript. The covering letter should contain a statement that the manuscript has been seen and approved by all authors. The letter should give any additional information that may be helpful to the editor, such as the type of article the manuscript represents in the particular journal, information on prior or duplicate publication or submission of any part of the work, and whether the author(s) will be willing to meet the cost of reproducing colour illustrations. Include copies of any permissions needed to reproduce published material or to use illustrations of identifiable subjects.

Abbreviations of names of frequently cited journals and participating journals

The journals listed below by abbreviated title are those covered by *Abridged Index Medicus* and additional journals participating in the Uniform Requirements agreement. Participating journals are marked by an asterisk.

Acta Paediatr Scand*	Bangladesh Paediatr*
Activox*	Bibl Laeger*
AJR*	Blood
Am Fam Physician*	Bol Med Hosp Infant Mex*
Am Heart J	Bordeaux Med*
Am J Cardiol*	Brain
Am J Clin Nutr*	Brain Develop*
Am J Clin Pathol	Br Dent J*
Am J Dis Child*	Br Heart J*
Am J Epidemiol*	Br Homeopath J*
Am J Hosp Pharm*	Br J Ind Med*
Am J Hum Genet*	Br J Obstet Gynaecol
Am J Med*	Br J Ophthalmol*
Am J Med Sci	Br J Pain*
Am J Nurs	Br J Radiol
Am J Obstet Gynecol	Br J Surg*
Am J Ophthalmol	Br J Vener Dis*
Am J Pathol*	Br Med J*
Am J Phys Med	Bull Med Libr Assoc*
Am J Psychiatry*	Bull WHO*
Am J Public Health*	CA
Am J Surg*	Cancer
Am J Trop Med Hyg	Can J Public Health*
Am Rev Respir Dis*	Can J Surg*
Am Surg*	Can Med Assoc J*
Anaesthesia*	Cardiovasc Res*
Anaesth Intensive Care*	Cephalalgia*
Anesth Analg (Cleve)*	Chest*
Anesthesiology	Chron Dis Can*
Ann Clin Biochem*	Circulation*
Ann Clin Lab Sci*	Clin Chem Acta*
Ann Intern Med*	Clin Invest Med*
Ann Otol Rhinol Laryngol*	Clin Orthop
Ann R Coll Phys Surg Can*	Clin Pediatr (Phila)*
Ann R Coll Surg Engl*	Clin Pharmacol Ther
Ann Rheum Dis*	Clin Prevent Dent*
Ann Surg*	Clin Toxicol
Ann Thorac Surg*	Community Med*
Ann Trop Paediatr*	Crit Care Med
Arch Dermatol*	Cuad Hosp Clin*
Arch Dis Child*	Curr Concepts Hyperten
Arch Environ Health	Cardiovasc Dis*
Arch Gen Psychiatry*	Curr Probl Surg
Arch Intern Med*	Dan Med Bull*
Arch Invest Med (Mex)*	Diabetes
Arch Neurol*	Dig Dis Sci
Arch Ophthalmol*	DM
Arch Otolaryngol*	Drug Intell Clin Pharm*
Arch Pathol Lab Med*	Endocrinology
Arch Phys Med Rehabil	Eur Heart J*
Arch Surg*	Eur J Cancer*
Ariz Med*	Eur J Clin Invest*
Arteriosclerosis*	Eur J Resp Dis*
Arthritis Rheum	Eur J Rheum Inflamm*
Aust Fam Physician*	Fam Med Teacher*
Aust J Derm*	Fin Med J*
Aust J Hosp Pharm*	Gastroenterology*
Aust J Ophthalmol*	Gastrointest Endosc*
Aust NZ J Med*	Geriatrics*
Aust NZ J Surg*	Gut*
Aust Paediatr J*	

This archived document is no longer current. The current document is available at www.icmje.org.

Hawaii Med J*	J Natl Cancer Inst*	Ned Tijdschr Geneesk*	Public Health Pap*
Heart Lung Hospitals	J Nephrol*	N Engl J Med*	Public Health Rep
Hosp Pharm*	J Nerv Ment Dis	Neurology (NY)*	Quart J Med*
Hosp Pract	J Neurol Neurosurg Psychiatry*	Newfoundland Med Assoc J*	Radiol Clin North Am
Iatriki*	J Neurosurg	Niger Med J*	Radiology*
Indian J Dermatol Venereol Leprol*	J Nucl Med Technol*	Nord Med*	Rev Esp Rheumatol*
Int J Epidemiol*	J Nurs Adm	No To Hattatsu*	Rev Med Chil*
Int J Pediatr Nephrol*	J Oral Surg	Nurs Clin North Am	Rev Med IMSS*
Int Rehab Med*	J Pediatr	Nurs Outlook	Rheumatol Rehabil
J Allergy Clin Immunol*	J Psychosom Res*	Nurs Res	S Afr Med J*
JAMA*	J R Army Med Corps*	NZ Fam Physician*	Scand J Respir Dis*
J Am Diet Assoc	J R Coll Physicians Lond*	NZ Med J*	Sex Transm Dis*
J Bone Joint Surg (Am)	J R Col Surg Edinb*	NZ J Med Lab Technol*	South Med J*
J Bone Joint Surg (Br)	J R Nav Med Ser*	Obstet Gynecol	Sri Lankan Fam Physician*
J Cardiovasc Surg*	J Thorac Cardiovasc Surg	Ophthalmology*	Surg Clin North Am
J Chronic Dis*	J Trauma	Orthop Clin North Am	Surgery
J Clin Endocrinol Metab	J Urol	Orthopt J Aust*	Surg Gynecol Obstet
J Clin Gastroenterol*	J Vivekananda Inst Med Sci*	Otolaryngol Head Neck Surg*	Swed Med J*
J Clin Invest	Lakartidningen*	Papua New Guinea Med J*	Thorax*
J Clin Pathol*	Lancet*	Pathology*	Thromb Haemost*
J Epidemiol Community Health*	Lepr Rev*	Pediatr Clin North Am	Tidsskr Nor Laegeforen*
J Fac Med (Baghdad)*	Malay J Pathol*	Pediatrics	Transfusio*
J Fam Pract	Matern Child Health*	Periton Dialys Bull*	Trop Gastroenterol*
J Gerontol	Mayo Clin Proc	Pharmacotherapy*	Ugeskr Laeger*
J Hong Kong Med Technol Assoc*	Med Care*	Physician Sports Med*	Ulster Med J*
J Immunol	Med Clin (Barc)*	Phys Ther	Undersea Biomed Res*
J Irish Coll Physicians Surg*	Med Clin North Am	Plast Reconstr Surg	Urol Clin North Am
J Infect Dis	Medicine (Baltimore)	PM*	Vet Radiol*
J Lab Clin Med*	Medicine (Oxford)*	Postgrad Doct-Africa*	WHO Chron*
J Laryngol Otol	Med J Aust*	Postgrad Doct-Asia*	WHO Monogr Ser*
J Manipul Physiol Therap*	Med Lab Sci*	Postgrad Doct-Middle East*	WHO Tech Rep Ser*
J Matern Child Health*	Med Lett Drugs Ther	Postgrad Med*	World Health Stat Q*
J Med Ethics*	Med Pediatr Oncol*	Postgrad Med J*	World Med J*
J Med Educ	Mt Sinai J Med*	Prog Cardiovasc Dis	Yale J Biol Med*
J Med Genet*	N Carolina Med J*	Public Health*	
	N Doct*		

What is the safest tranquilliser, and should tranquillisers be taken at sea?

Tranquillisers may be categorised as major and minor tranquillisers. The former are the neuroleptic drugs that have an antipsychotic action and are widely used to treat the symptoms of behavioural disturbances of psychotic illnesses. The choice of drug depends on the patient's symptoms and the diagnosis. I presume, however, that this question refers to minor tranquillisers used for their anxiolytic effect. It is clearly preferable for the patient to cope without drugs, and tranquillisers, when prescribed, should be a part (and not the whole) of the treatment programme, which may include support, counselling, psychotherapy, etc. If symptoms of anxiety are sufficiently serious to warrant treatment benzodiazepines are the drugs of choice. They reduce the subjective feelings and anxiety and tension and also the accompanying palpitations, sweating, tremor, etc. They are very safe, and their most frequent side effect is sedation, which gradually wears off as tolerance develops. Although it has been suggested that tolerance to the anxiolytic effect develops less swiftly, the long-term (more than two months) clinical effectiveness of benzodiazepines in treating anxiety is doubtful. Death from an overdose of benzodiazepine alone rarely occurs—an important safety consideration given the frequency of self-poisoning with psychotropic drugs. Psychological and physical dependence, similar to that caused by barbiturates and alcohol, can occur, and this is another reason for prescribing benzodiazepines only when absolutely necessary. Despite what the advertisements say, there is little to choose in terms of efficacy or safety between the benzodiazepines now in clinical use; though they may differ in their metabolism or elimination, their pharmacological effects are similar, as is the risk of dependence on them. So far as their use at sea is concerned, those working with the machinery of the ship should exercise the caution appropriate to the use of any sedative drug, which may impair fine sensory-motor co-ordination. Passengers should avoid the simultaneous use of other depressants of the central nervous system as they potentiate the effect of benzodiazepines; in this context alcohol and the use of antihistamines to prevent sea sickness should be specifically prohibited.—A H GHODSE, consultant psychiatrist, London.

An apparently normal, healthy 9-year-old boy with normal eating habits and regular bowel action passes considerable amounts of offensive flatus, especially soon after rising in the morning. Examination results are negative. What advice should be given?

Human intestinal gas contains nitrogen, oxygen, carbon dioxide, hydrogen, and methane¹; however, only about 40% of individuals produce methane. Production of methane in normal subjects depends on their ethnic origin and intake of substrate.² Methane is probably produced in 75-80% of Nigerians³ but in only 24% of Orientals.² Hydrogen is produced by fermentation of non-absorbed carbohydrate, commonly referred to as dietary fibre, by bacteria normally present in the colon. Non-absorbable carbohydrate is found predominantly in vegetables, particularly legumes. The hydrogen produced is rapidly converted to methane by direct reduction of carbon dioxide by methanogenic bacteria. An increased intake of fibre or bran supplements, particularly when first introduced, will cause an increase in the production of flatus. Methane may also be produced directly from several other substrates, including products of lactose and sucrose fermentation that would be increased by malabsorption of sugar. This is found in children who have a deficiency of hydrolases, usually lactase and less often sucrase, in the gut. Intolerance to lactose is a common condition in subjects from many parts of the world, particularly Africa, Asia, and the Americas.⁴ In these people lactase activity declines after the weaning period. Gastrointestinal symptoms of intolerance to lactose include abdominal distension, borborygmi, flatus, and abdominal pain. Growth of these subjects is usually normal. A 9-year-old boy who has a normal growth velocity is unlikely to have disease. A stagnant loop, because of increased numbers of bacteria, can give rise to increased quantities of offensive flatus, but he would have other symptoms and signs. Intolerance to lactose should be excluded, particularly if he is from an ethnic group in whom lactase activity declines. Provided that he does not have an intolerance to disaccharide, the production of offensive flatus may be decreased by reducing his intake of dietary fibre or stopping bran supplements.—C A HUGHES, senior lecturer in paediatrics, Birmingham.

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² Pitt P, De Bruijn KM, Beeching MF, Goldberg E, Blendis LM. Studies on breath methane: the effect of ethnic origins and Lactulose. *Gut* 1980;21:951-9.

³ Cummings JH. Short chain fatty acids in the human colon. *Gut* 1981;22:763-79.

⁴ Mitchell KJ, Bayless TM, Paige DM, Goodgame RW, Huang S. Intolerance of eight ounces of milk in healthy lactose-intolerant teenagers. *Pediatrics* 1975; 56:718-21.