11.0 Correct and Preferred Usage

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> *Style, not least, adds beauty to the world. To a literate reader, a crisp sentence, an arresting metaphor, a witty aside, an elegant turn of phrase are among life's greatest pleasures. . . . [T]his thoroughly impractical virtue of good writing is where the practical effort of mastering good writing must begin.*
> Steven Pinker[1]

11.1 Correct and Preferred Usage of Common Words and Phrases.

UPDATE: In chapter 11.1, Correct and Preferred Usage, the term mutations was edited to sequence variations in the entry for "classic, classical" to be consistent with style policy as explained in chapter 14.6.1.1.1. This change was made *May 28, 2020*.

Following simple rules for correct and preferred usage of common words and phrases is important in scientific communication because it increases clarity, provides consistency, and helps avoid miscommunication.

Note: All terms (and pairs of terms) are in alphabetical (not preferential) order.

ability, capability, capacity—These near-synonyms have slightly different meanings. *Ability* means an actual (as opposed to potential) skill, either mental or

physical; it may be native or acquired. *Capability* is a unique fitness for a defined end; the word is sometimes used in place of *ability*, but its use in place of *capacity* is rarely correct. *Capacity* is the potential to exercise or develop a skill, usually mental; it is native as opposed to acquired.

> The ability to select candidates who will thrive and successfully complete a residency is especially critical for general surgery programs.
>
> The capacity of the patient to make medical decisions should be evaluated within the context of specific medical conditions.
>
> In this study of the association between walking and future risk of dementia, findings are based on a sample of physically capable elderly men.

abnormal, normal; negative, positive—Examinations and laboratory tests and studies are not in themselves abnormal, normal, negative, or positive. These adjectives apply to observations, results, or findings (see 19.0, Study Design and Statistics). Avoid the use of *normal* and *abnormal* to describe persons' health status. Results of cultures and tests for specific reactions or microorganisms may be negative or positive. Other tests display a pattern of activity rather than a single feature, and in these a range of normal and abnormal results is possible. These tests include electroencephalograms and electrocardiograms and modes of imaging, such as isotopic scans, radiographic studies, and tomograms.

Incorrect:	The physical examination was normal.
Correct:	Findings from the physical examination were normal.
Incorrect:	The throat culture was negative.
Correct:	The throat culture was negative for β-hemolytic streptococci.
Incorrect:	The electroencephalogram was positive.
Correct:	The electroencephalogram showed abnormalities in the temporal regions.
Incorrect:	Serologic tests for *Treponema pallidum* hemagglutination, which were previously negative, are now positive.
Correct:	Serologic test results for *Treponema pallidum* hemagglutination, which were previously negative, are now positive.
Also correct:	Serologic tests for *Treponema pallidum* hemagglutination, the results of which were previously negative, showed a titer of 1:80.

See 11.10, Laboratory Values.

Exceptions:	HIV-positive men
	seronegative women
	node-negative lung tumors
	gram-negative sepsis
	receptor-positive breast cancer

abort, terminate—*Abort* means to stop a process prematurely. In pregnancy, *abortion* means the premature expulsion—spontaneous or induced—from the uterus of the products of conception. A pregnancy, not a fetus or a woman, may be aborted. The synonym *terminate*—to bring to an ending or a halt—may also be used.

about, approximately, around—Although each of these words is used to refer to a value that is estimated and therefore imprecise, whether it is acceptable to use them interchangeably depends in part on context and the level of accuracy being implied. When referring to an inexact value in casual conversation, *around, about*, and *approximately* are all acceptable. When referring to an inexact value in medical or other technical writing, *about* may very occasionally be used if one carefully assesses the context; *approximately* is nearly always the best choice. Also, *an estimated* may be better.

accident, injury—According to the National Center for Injury Prevention and Control of the US Centers for Disease Control and Prevention,[2] *accident* should not be used to refer to injuries from any cause. Although *accident* implies a random act that is unpredictable and unavoidable, epidemiologic studies and injury control programs indicate that injuries may be predictable and therefore preventable. The preferred terms refer either to the external cause (eg, injury from falls, injury from motor vehicle crashes, gunshot injury) or to the intentionality (*unintentional injury* for injuries resulting from acts that were not intended to cause harm and *violence* for any act in which harm was intended).[2]

Accident (and *accidental*) is considered by the public health community to be imprecise and should therefore be avoided. The injury-causing event can be described as noted above or with other terms, such as *motorcycle crash, shooting, drowning, collision, poisoning, suffocation, fall from stairs, burning, paintball injury*.

Note: Do not change *accident* if it is integral to the terminology being used, for example, an established injury classification system or as established terminology within a specific discipline (eg, Fatality Analysis Reporting System of the US National Highway Traffic Safety Administration, the World Health Organization's *International Classification of Diseases*, cerebrovascular accident).

acute, chronic—These terms should be used to describe symptoms, conditions, or diseases; they refer to duration, not severity. Avoid the use of *acute* and *chronic* to describe patients, parts of the body, treatment, or medication.

Avoid:	chronic dialysis
	chronic heroin users
	acute administration of epinephrine
	chronic diagnosis
	chronic care
Preferred:	long-term dialysis (also maintenance dialysis)
	long-term heroin users
	immediate administration of epinephrine
	long-standing diagnosis of a chronic disease

long-term care (see note below)
chronic obstructive pulmonary disease
acute kidney failure
chronic kidney disease
chronic arthritis

Also: acute, severe cystitis
acute, mild pruritus

Exception: Acute abdomen is a specific serious intra-abdominal condition—for example, appendicitis—with pain, tenderness, and muscular rigidity and for which emergency surgery may be indicated.

A note on short- and long-term patient care: According to Kane and Kane,[3] "*acute care hospital* is preferred to *short-term care hospital*. *Long-term care* has come to include both an acute component (sometimes called *subacute care* or *postacute care*), which effectively provides the care formerly offered in hospitals, and the more traditional chronic component, which includes both medical and social services. As the name implies, subacute care has a shorter time frame and serves patients who are expected to recuperate or die, while the more chronic form provides more sustained supportive services."

adapt, adopt—To *adapt* means to modify or adjust to fit a particular circumstance or requirement. To *adopt* means to take by choice into a relationship.

> Despite health being vulnerable to the vagaries of climate, humans have adjusted their behavioral patterns and technologies to adapt to a diverse range of climates.

> Purchasers, plans, practitioners, and organizations that certify or license clinicians or accredit training programs should adopt systems for measuring, monitoring, and improving quality for psychosocial interventions.

adherence, compliance—Although these terms are often used as synonyms, there are differences. *Adherence* can be defined as the extent to which a patient's behavior (in terms of, for example, taking medication, following a diet, modifying habits, or attending clinics) coincides with medical or health advice. Use of the term *adherence* is intended to be nonjudgmental, a statement of fact rather than of blame of the prescriber, patient, or treatment.[4] *Noncompliance* has a negative connotation that may indicate a stigmatizing image of rule, enforcement, and control; dominance and submission; and deviance from expected social roles. Whether a patient chooses to adhere to a therapeutic regimen may depend on many aspects of his or her experience with the disease and the medical encounter itself.[5]

> Continued interaction with patients may provide an opportunity to identify barriers to medication adherence as well as a chance to suggest potential strategies to overcome them (eg, use of a pill box or cueing the taking of medications with a routine activity, such as toothbrushing).

Possible exception: A patient with a mental illness may be required to *comply* with court-ordered therapy.

adverse effect, adverse event, adverse reaction, side effect—*Side effect* is the secondary consequence of implementing an agent (usually a drug). The term is often used incorrectly when *adverse effect, adverse event*, or *adverse reaction* is intended. Because a side effect can be either beneficial or harmful, a specific term should be used.

> A recent study examined the incidence of serious and fatal adverse drug reactions in hospitalized patients.
>
> The beneficial side effects of aspirin include preventing myocardial infarctions and reducing the severity and damage from thrombotic strokes.

affect, effect—*Affect*, as a verb, means to have an influence on. *Effect*, as a verb, means to bring about or to cause. The 2 words cannot be used interchangeably.

> Ingesting massive doses of ascorbic acid may affect his recovery [influence the recovery in some way].
>
> Ingesting massive doses of ascorbic acid may effect his recovery [produce the recovery].

Affect, as a noun, refers to immediate expressions of emotion (in contrast to *mood*, which refers to sustained emotional states). *Effect*, as a noun, means result. *Affect* is often used as part of psychiatric diagnostic terminology.

> The patient's general lack of affect was considered an effect of recent trauma.

Note: In reports of research, use of the word *effect* should be limited to studies with designs that permit assessment of causal findings (eg, randomized trials, controlled laboratory experiments) and should not be used in reports of observational studies (eg, cohort, cross-sectional, case-control, case series, and meta-analysis) unless related to a statistical measurement such as effect size. See also ***association, relationship*** and 19.0, Study Design and Statistics.

age, aged, school-age, school-aged, teenage, teenaged—The adjectival form *aged*, not the noun *age*, should be used to designate a person's age. Similarly, *school-aged* and *teenaged* are preferred to *school-age* and *teenage*. However, a precise age or age range should be given whenever possible (see 11.7, Age and Sex Referents).

> The patient, aged 75 years, had symptoms of mild cognitive impairment.
>
> *Alternative:* The 75-year-old patient had symptoms of mild cognitive impairment.
>
> The US Preventive Services Task Force recommends chlamydia and gonorrhea screening for all sexually active women younger than 25 years (including teenaged girls), even if they are not engaging in high-risk sexual behaviors.

Note: In some expressions regarding age, it is redundant to add *of age* after the number of months or years because it is implied in the adjectives *younger* and *older*.

> Influenza vaccination is not recommended for infants younger than 6 months.

See 11.2.1, Redundant Words.

aggravate, irritate—When an existing condition is made worse, more serious, or more severe, it is *aggravated* (also *exacerbated*), not *irritated*. *Irritated* indicates reaction, often excessive (eg, inflammation) to a stimulus.

> Symptoms of gastroesophageal reflux disease can be aggravated by certain foods, such as chocolate, citrus fruits, spicy and tomato-based foods, caffeine, and alcohol, or by eating just before going to bed.
>
> Wool, chemicals, soaps, and other substances can irritate the skin and cause itching.

alternate, alternative—*Alternate* is an adjective, adverb, or verb and *alternative* is usually a noun. *Alternate* means "occurring in turn" and *alternative* means "another possibility."

> Medications that interfere with testing should be stopped only if safe alternatives can be substituted.
>
> The drugs should be taken on alternate days.

although, though—*Although* and *though* may be considered interchangeable. However, *although* is preferable as a complete conjunction because *though* in this construction is an "abbreviation" and thus may be less appropriate for formal prose. *Though* in the adverbial construction, meaning "however" or "nevertheless," is correct.

> Although the analysis was performed correctly, the terms of the investigation were too narrow to be interesting.
>
> Squamous cell skin cancer, though common, remains largely unreported and unstudied.

ambiguous, equivocal—The 2 words are close in meaning but distinct in usage. *Ambiguous* means able to be understood in more than one way, having more than one possible meaning, or not expressed or clearly understood. *Equivocal* is defined as having 2 or more possible interpretations or not easily explained or understood.

> The student was faulted for her ambiguous answer to a crucial question.
>
> Further assessment for the presence of human papillomavirus can clarify an equivocal result from Papanicolaou testing.

among, between—*Among* usually pertains to general collective relations and always in a group of more than 2. *Between* pertains to the relation or association of 1 item and 1 other item. For instance, a treaty may be made *between* 4 countries because each is defining a relationship with each of the others, but peace may exist *among* them.

> The patients shared the library books among themselves.
>
> Between the two of us, we are certain to find the common factor among the patients we have examined.

analog, analogue—Use *analog* when referring to items related to computers or electronic equipment. Use *analogue* when "something similar to something else"

is meant or when referring to chemical compounds. Use *visual analog scale* (not *visual analogue scale*).

apt, liable, likely—*Apt* connotes a volition or habitual tendency and should not be used in regard to an inanimate object. *Apt* also means suited to a purpose. *Liable* connotes the possibility of risk or disadvantage. *Likely* merely implies probability and thus is more inclusive than *apt*.

> A child is apt to cry when frustrated.
>
> Patients receiving immunosuppressant drugs are liable to acquire fungal infections.
>
> The computer system is likely to crash if it is overloaded.

article, manuscript, paper—An unpublished study, report, or essay—that is, the document itself—may be referred to as a *manuscript* or *paper*. When published, it is an *article*.

> The authors thank Frank J. Kobler, PhD, for statistical review of the manuscript.
>
> Nancy MacClean, ELS(D), assisted with manuscript preparation.
>
> The content of this article does not necessarily reflect the views or policies of the US Department of Health and Human Services.
>
> The article by Carrozza and Sillke addresses the therapeutic options for a 69-year-old woman with disease of the left main coronary artery.

as, because, since—*As, because*, and *since* can all be used when "for the reason that" is meant. However, in this construction, *as* should be avoided when it could be construed to mean *while*.

Ambiguous:	She could not answer her page as she was examining a critically ill patient.
Better:	She could not answer her page, as she was examining a critically ill patient [comma used].
Preferred:	She could not answer her page because she was examining a critically ill patient.

Similarly, *since* should be avoided when it could be construed to mean "from the time of" or "from the time that."

Ambiguous:	She had not been able to answer her page since she was in the clinic.
Preferred:	She had not been able to answer her page because she was in the clinic.

association, relationship—*Association* occurs between 2 or more variables in which the independent variable does not necessarily cause the other dependent variable(s). *Relationship* implies cause and effect, and in reports of research, the term should only be used for studies with designs that can demonstrate causality

(eg, randomized clinical trials and controlled laboratory experiments) (see 19.5, Glossary of Statistical Terms).

> To our knowledge, this is the first cohort study to analyze the association between a patient's expected prognosis and do-not-resuscitate decision-making.
>
> There was an inverse relationship between cholesterol levels and coronary artery disease in the intervention group in this randomized clinical trial.

assure, ensure, insure—*Assure* means to provide positive information to a person or persons and implies the removal of doubt and suspense (*assure* the study's participants that their test results will be held in complete confidence). *Ensure* means to make sure or certain (ensure the statistical power of the study). *Insure* means to take precaution beforehand (insure his life).

> The insurance company assured the families of workers the provision of adequate funds for a proper burial.
>
> The journal editors can assure readers that research was conducted ethically by mandating that every relevant paper include a statement that an institutional review board reviewed the study protocol.

because of, caused by, due to, owing to—*Due to* and *caused by* are adjectival phrases, *owing to* and *because of* adverbial phrases. The use of *due to* in both situations can sometimes alter the meaning of a sentence.

> One mechanism is the increase in macular inflammation due to retinal amyloid-β deposition.
>
> *Meaning:* One mechanism is the increase in macular inflammation caused by retinal amyloid-β deposition

Caused by could be substituted for *due to*, and the meaning would be retained. *That is* could be inserted before *due to* without changing the meaning of the sentence.

> Percentages have been rounded owing to missing data.
>
> *Meaning:* Percentages have been rounded because of missing data.

Because of could be substituted for *owing to*, and the meaning would be retained. However, if *that are* is inserted before *owing to*, the meaning of the sentence changes.

Clue to usage: The phrase "coughs due to colds" is a good example of correct usage of *due to*. If "because of" sounds right, use it or "owing to." If "caused by" is intended, use it or "due to" (or possibly "attributable to").

biopsy—*Biopsy* refers to the removal and examination (usually microscopically) of tissue or cells from the living body. Use of *biopsy* as a verb was previously considered to be incorrect. However, such use has become common and acceptable.

> *Acceptable:* The lung mass was biopsied.
> A biopsy of the lung mass was performed.
> Lesions believed to be malignant were biopsied.

Observations are made of the biopsy specimen, not on the biopsy itself.

Incorrect: Biopsy was normal.

Correct: The results of the biopsy were normal.

The utility of standard biopsy in addition to targeted biopsy for prostate cancer was found to be limited.

Millions of breast biopsies are performed annually.

blinding, masking—The statistical term *blinding* (or *blinded review* or *assessment*) is the evaluation or categorization of an outcome in which the person assessing the outcome is unaware of the treatment assignment; blinding is used to avoid bias. The term is also used to refer to peer review, for example, single-blind review, where the reviewer can see the author's name and affiliation on the paper but the reviewer's identity is concealed, or double-blind review, where both reviewer and author identities are concealed. The equivalent term *masking* (or *masked review* or *assessment*) is preferred by some investigators and journals, particularly those in ophthalmology (see 5.7.1, Confidentiality During Editorial Evaluation and Peer Review and After Publication, and 19.5, Glossary of Statistical Terms).

breastfeed, nurse—When referring to human lactation, use *breastfeeding* (*breastfeed, breastfed*). This term is more specific than *nursing* and prevents any confusion with the profession of nursing.

cadaver, donor—When describing the source of human organs and tissues used for transplant, avoid *cadaver* (or *dead body*). Correct usage is *deceased donor* (or *recovered from deceased organ and tissue donors*). When referring to a deceased person whose body is to be used for anatomical dissection, *cadaver* is correct (*cadaveric* as an adjective).

can, may, will—Bernstein,[6] in his classic *The Careful Writer*, perhaps said it best: "Whatever the interchangeability of these words in spoken or informal English, the writer who is attentive to the proprieties will preserve the traditional distinction: *can* for ability or power to do something, *may* for permission to do it." When summing up findings, *will* is used to express futurity or inevitability; *may* suggests the possibility to do something.

Use of the most common antibiotics in early life may increase the risk of autoimmunity in children at increased genetic risk.

Use of the most common antibiotics in early life will increase the risk of autoimmunity in children at increased genetic risk.

Improved air quality can promote molecular longevity from birth onward.

Improved air quality will promote molecular longevity from birth onward.

case, client, consumer, participant, patient, subject—In biological research, a *case* is a particular instance of a disease. A *patient* is a particular person under medical care. A research *participant* (preferred to *subject*; see below) is a person with a particular characteristic or behavior or a person who undergoes an intervention as part of a scientific investigation. A control *participant* is a person who

does not have at least some of the characteristics under study or does not receive the intervention but provides a basis of comparison with the case patient (see 19.0, Study Design and Statistics). In case-control studies, it is appropriate to refer to *cases, patients in the case group*, or *case patients* and *controls, participants in the control group*, or *control patients*.

Some consider *subject* (as in *study subject*) to be impersonal, even derogatory, as if the person in the study were in a subservient role. Similarly, the use of *case* is dehumanizing when referring to a specific person. For example,

Avoid: A 63-year-old case with type 2 diabetes . . .

Preferred: A 63-year-old patient with type 2 diabetes . . .

Note: Make the distinction between *person* and *patient*:

> Many persons in the United States have type 2 diabetes [persons with type 2 diabetes regardless of care].
>
> Many patients in the United States have type 2 diabetes [only persons under medical care].

A *case* is evaluated, documented, and reported. A *patient* is examined, undergoes testing, and is treated. A *research participant* is recruited, selected, sometimes exposed to experimental conditions, and observed. See also ***diagnose, evaluate, examine, identify*** and ***follow, follow up, follow-up, observe***.

Note: In general, patients should not be referred to as *clients* or *consumers*. However, persons enrolled in substance use treatment programs, for example, or persons undergoing treatment at a dialysis center are sometimes referred to as *clients*. *Client* may also be used by social workers or psychologists and in some research settings where *patient* or *participant* is inappropriate. *Consumer*—one who consumes goods or services—has worked its way into the medical lexicon and may be appropriate in certain discussions. For instance, in the following example, *patient* would not fit the context:

> The internet has become an important mass medium for consumers seeking health information and health care services online.

case-fatality rate, fatality; morbidity, morbidity rate; mortality, mortality rate—*Fatality* is the occurrence of death and *case-fatality rate* is the probability of death among people diagnosed as having a disease. The rate is calculated as the number of deaths during a specific period divided by the number of persons with the disease at the beginning of the period.[7] *Morbidity* is a diseased state, and *morbidity rate* is the frequency with which a disease appears in a population. *Mortality* is the number of deaths in a given time or place, and *mortality rate* is the death rate described by the following equation: [(Number of Deaths During Period) × (Period of Observation)]/(Number of Individuals Observed)[7] (see 19.5, Glossary of Statistical Terms).

catatonic, hysterical, manic, psychotic, schizophrenic—Do not use these terms when referring to patients. It is dehumanizing to refer to a patient as "a schizophrenic." Use "a patient with schizophrenia" (see 11.12.6, Terms for Persons With Diseases, Disorders, or Disabilities).

cerebrovascular accident, stroke, stroke syndrome—*Cerebrovascular accident* (abbreviated CVA) is an older but acceptable generic term synonymous with *stroke* and *stroke syndrome*. However, when using any of these terms, an author should also specify, if possible, the subtype(s) under discussion (eg, ischemic stroke, hemorrhagic stroke, and/or transient ischemic attack).

cesarean delivery, cesarean section—According to the American College of Obstetricians and Gynecologists Publications Department, the preferred terms are *cesarean delivery* or *cesarean birth*. Most etymologists believe that *cesarean* and *section* originated from the Latin verbs that both mean "to cut"; therefore, *cesarean section* is redundant.[8] Do not capitalize *cesarean*.

chief complaint, chief concern—*Chief complaint* has been traditionally used by physicians when taking a patient's medical history. However, *chief concern* may be a better description because *complaint* may be construed as pejorative and confrontational. Also, patients report symptoms and concerns. Avoid "patient complaint."

classic, classical—In most scientific writing, the adjective *classic* generally means authentic, authoritative, or typical (the *classic* symptoms of myocardial infarction include angina, dyspnea, nausea, and diaphoresis). In contrast, *classical* refers to the humanities or the fine or historical arts (the elements of *classical* architecture can be applied in radically different architectural contexts than those for which they were developed).

> Primary liquid dysphagia is a classic symptom suggestive of achalasia.
>
> Darkening of the iris pigmentation and eyelash hypertrichosis are classic findings associated with the use of a prostaglandin analogue agent.
>
> The figure represents the aesthetic of the age: clear, beautiful, simple, and clean design, with a background of twirling leaves reminiscent of classical themes.

However, some disciplines (eg, genetics, immunology) use *classical* for specific terms:

> Classical lissencephaly may be caused by sequence variations of genes in chromosome bands 17p13.3 and Xq22.3-q23.
>
> The classical and alternative pathways of complement components are described in 14.8.3, Nomenclature, Complement.
>
> The authors suggest how to present results of data analysis under each of 3 statistical paradigms: classical frequentist, information-theoretic, and bayesian.

clinician, practitioner—Depending on context, these terms can be used to describe persons in the clinical practice of the health fields of medicine, nursing, psychology, dentistry, optometry, and podiatry, as distinguished from those specializing in laboratory science, research, policy, or theory, for example. When referring to a particular type of clinician or practitioner, it is preferable to use the more descriptive term (eg, physician, nurse, dentist, optometrist, podiatrist). The plural forms *clinicians* and *practitioners* may be appropriate to refer to a group of such

professionals from different fields. Avoid use of the nonspecific term *provider.* See also ***provider***.

compare to, compare with—One thing or person is usually compared *with* another when the aim is to examine similarities or differences in detail. An entity is compared *to* another when a single striking similarity (or dissimilarity) is observed or when a thing of one class is likened to one of another class, without analysis (ie, one entity is comparable to another).

> Patients in both active treatment groups had greater improvements from baseline in psychosocial functioning compared with patients receiving only routine medical care.
>
> Few medical discoveries can compare to the discovery of penicillin.

compose, comprise—*Comprise* means to be composed of or to include; it takes the active voice, whereas *compose* takes the passive voice. The whole is composed of its parts and comprises its parts.

> The chemotherapeutic regimen is composed of several toxic ingredients.
>
> The chemotherapeutic regimen comprises several toxic ingredients.

Clue to usage: Never use *of* with *comprise*.

A good alternative for *comprise* is to use "consist of" or "include."

condition, disease, disorder—Although these terms are frequently used interchangeably, differences between them exist and can assist in using them in more specific senses. *Condition* is perhaps the least specific, often denoting states of health considered normal or healthy but nevertheless posing implications for health care (eg, pregnancy). The term might also be used to indicate grades of health (eg, a patient might be described as in stable, serious, or critical condition). *Condition* indicates a state of health, whether well or ill. A condition conferring illness might further be classified as a disease or disorder; however, *condition* might be used in place of *disease* or *disorder* when a non–disease-specific term is indicated.

Disease is often used in a general sense when referring to conditions that affect a physical system (eg, cardiovascular disease) or a part of the body (eg, diseases of the eye). The term also may be used in specific senses; for example, a writer might refer in general terms to neurologic disease or cognitive impairment or in more specific terms to Alzheimer disease or dementia with Lewy bodies.

Disorder, in contrast, denotes a condition characterized by functional impairment without structural change. Although certain disorders or categories of disorders might be accompanied by specific signs and symptoms, their presence is not required for a condition to be termed a *disorder*.

continual, continuous—*Continual* means to recur at regular and frequent intervals. *Continuous* means to go on without pause or interruption.

> The patient with emphysema coughed continually.
>
> His labored breathing was eased by a continuous flow of oxygen through a nasal cannula.

contrast, contrast agent, contrast material, contrast medium—Distinguish between *contrast* (ie, blackness and whiteness on an image) and *contrast material*

(or *contrast agent, contrast medium*) (ie, a compound administered to enhance portions of the anatomy on an image).

criterion standard, gold standard—*Criterion standard* is a test considered to be the diagnostic standard for a particular disease or condition, used as a basis of comparison for other (usually noninvasive) tests. A commonly used synonym, *gold standard*, is considered jargon by some in the methodological literature but not in the medical literature[9] (see 19.5, Glossary of Statistical Terms).

diabetes—The types of diabetes currently recognized by the American Diabetes Association are as follows:

Older Terms	*Preferred Terms*
juvenile diabetes, juvenile-onset diabetes, or insulin-dependent diabetes	type 1 diabetes
maturity-onset diabetes, adult-onset diabetes, or non–insulin-dependent diabetes	type 2 diabetes

Prediabetes refers to blood glucose levels that are higher than normal but not yet high enough to be diagnosed as diabetes. The term *prediabetes* is sometimes referred to as impaired glucose tolerance or impaired fasting glucose, depending on what test was used when it was detected.[10]

"Mellitus" need not be specified when referring to diabetes, even at first mention; the term *mellitus* has etymologic significance (and there are other, rarer, types of diabetes, such as insipidus), but mellitus need not be added.

Avoid: chemical diabetes, borderline diabetes, or latent diabetes

Preferred: impaired glucose tolerance (nondiagnostic fasting blood glucose level, glucose tolerance abnormal) gestational diabetes

For other specific types of diabetes, consult *Diabetes Care*.[11]

diagnose, evaluate, examine, identify—*Diagnose, evaluate*, and *identify* apply to conditions, syndromes, and diseases. Patients are *examined*. Patients may be *evaluated* for the possibility of a condition (eg, The patient was evaluated for possible cardiac disease). Although *diagnose* was formerly avoided when referring to a patient, it is now acceptable to say a patient "was diagnosed." See also ***case, client, consumer, participant, patient, subject*** and ***management, treatment***.

The patient was diagnosed as having schizophrenia.

The patient was diagnosed with schizophrenia.

die from, die of—Persons die *of*, not *from*, specific diseases or disorders.

The patient died of complications of disseminated intravascular coagulation.

dilate, dilation, dilatation—According to the American College of Obstetricians and Gynecologists, *dilate* is a verb meaning to expand or open. *Dilation* means the act of dilating. *Dilatation* means the condition of being stretched or expanded.[8]

The patient's cervix dilated during a period of 12 hours.

The patient was treated with dilation and curettage.

After 4 hours of labor, cervical dilatation was 3 cm.

disc, disk—For ophthalmologic terms, use *disc* (eg, optic disc); for other anatomical terms, use *disk* (eg, lumbar disk).

discomfit, discomfort, disconcert—These words are commonly confused, perhaps because they begin with the same 5 letters and sound similar.

Discomfit, although occasionally still used in the sense of "to frustrate or thwart," is currently most often used to indicate mental, rather than physical, states, specifically in the sense of one's being perplexed or embarrassed (ie, *disconcerted*). *Discomfort* is most often used to indicate one's feeling physically or emotionally uncomfortable, resulting from the efforts of others, from personal excess, or from a condition or disease state. *Disconcert*, indicating perplexity or disturbed composure, is still occasionally used as a verb but currently is used much more frequently as an adjective.

The medical student felt discomfited by her palpable grief at the loss of a patient.

The excitement produced by the first meal since bariatric surgery may be followed by a feeling of abdominal discomfort.

I found the discussion to be premature and very disconcerting.

discreet, discrete—*Discreet* is defined as careful and circumspect in one's speech or actions, especially to avoid causing offense or to gain an advantage (ie, intentionally unobtrusive). *Discrete* means individually separate and distinct.

Working with sensitive patient information, physicians and other medical staff must be discreet.

Although the lesions are usually discrete, they can appear grouped and only rarely do they coalesce.

disinterested, uninterested—Although these 2 words are increasingly treated as synonyms in written and spoken language, their differences in meaning are sufficiently useful to be worth preserving. To be *disinterested* is to be unbiased or impartial and free from selfish motives; to be *uninterested* is to be unconcerned, indifferent, inattentive, or unbiased. A disinterested judge is admirable; an uninterested judge is not. As with many "word pairs," context is key:

She was uninterested in a career in basic research.

He was a disinterested observer of the complex procedure.

doctor, physician—*Doctor* is a more general term than *physician* because it includes persons who hold such degrees as PhD, DDS, EdD, DVM, and PharmD. Thus, the term *physician* should be used when referring specifically to a doctor of medicine, such as a person with an MD, MBBS, or a DO or equivalent degree. See also ***clinician, practitioner*** and ***provider***, and 11.5, Jargon.

dosage, dose—A *dose* is the quantity to be administered at one time or the total quantity administered during a specified period. *Dosage* implies a regimen; it is the regulated administration of individual doses and is usually expressed as a quantity per unit of time.

> The usual initial dosage of furosemide for adult hypertension is 80 mg/d, typically divided into doses of 40 mg twice a day. Dosage should then be adjusted according to the patient's response.

effective, effectiveness; efficacious, efficacy—*Efficacy* and *efficacious*, used especially in pharmacology and decision analysis, have to do with the ability of a medication or intervention (procedure, regimen, service) to produce the desired or intended effect under *ideal* conditions of use. The determination of efficacy is generally based on the results of a randomized clinical trial.

Effective and *effectiveness*, however, describe a measure of the extent to which an intervention produces the effect in *average* or *routine* conditions of use; a measure of the extent to which an intervention fulfills its objectives.

> Few safe, effective weight-management drugs are currently available.
>
> The researchers investigated the safety and efficacy of liraglutide vs placebo for weight management in adults with overweight or obesity and type 2 diabetes.

Cost-effectiveness analysis is the comparison of strategies to determine which provides the most clinical value for the cost.[12] *Comparative effectiveness research* is the conduct and synthesis of systematic research comparing different interventions and strategies to prevent, diagnose, treat, and monitor health conditions. The purpose of this research is to inform patients, health care professionals, and decision makers about which interventions are most effective for which patients under specific circumstances[13] (see 19.5, Glossary of Statistical Terms).

eg, ie—*eg* comes from the Latin *exempli gratia*: "for example" and *ie* comes from *id est*: "that is." Both should be followed by a comma.

> In this study, the general module of messages included information generally provided by secondary prevention programs, eg, on chest pain action plans, guidelines and risk factor targets, and medications and adherence.
>
> With 95% power and a 2-sided significance level of 5%, the study had statistical power to detect a significant odds ratio of 0.76 (ie, a 24% reduced risk) for individuals in the highest quartile of intake.

elicit, illicit, solicit—These words have distinctly different denotations, yet they are often confused or misused. In medical and scientific contexts, it is especially important to preserve the distinctions between them.

Illicit, denoting simply not permitted or unlawful (and sometimes used colloquially to indicate naughty, unseemly, or immoral), has limited use in medical writing. For example, written materials might convey the risks associated with the use of illicit drugs, discuss illicit relationships between researchers and industry, or report on the illicit trade in human body parts. Beyond such instances, the word is not often used in medical literature.

Elicit, however, means to call forth or draw out (as information or a response) or to draw forth or bring out (something latent or potential). The word occurs frequently in medical contexts. It might be used in both senses regarding a patient-physician encounter. For example, a physician evaluating a patient's pain will ask questions to elicit information about the characteristics of the pain (eg, location, nature, duration, exacerbating factors, severity). Having thus elicited information about a patient's pain, the physician then tries to elicit the real concern. In materials that cover the basic sciences and their clinical applications, *elicit* is perhaps most frequently used in the second sense. A writer might report that a new vaccine elicits a given immune response, describe pathological mechanisms that elicit organ damage, or present a theory of how a treatment might elicit changes in gene expression.

Illicit and *elicit* are easily distinguished from each other; *illicit* is always an adjective, whereas *elicit*—in current usage—is always a verb. It also can help to remember that *illicit* denotes illegal.

Solicit is most frequently used in medical contexts in the sense of to approach with a request or a plea. It is often used interchangeably with *elicit*. However, such use obscures an important distinction. The *Oxford Dictionary of American Usage and Style* states, "To solicit a response is to request it. To elicit a response is to get it."[14] Thus, the physician solicits information regarding the patient's pain and then performs a physical examination to elicit and evaluate actual pain. In medical contexts, the distinction has obvious implications for reports of survey studies and possibly for discussion of power calculations in reports of clinical trials.

endemic, epidemic, hyperendemic, pandemic—*Endemic* conditions or diseases are prevalent in a particular place or among a particular group. *Epidemic* conditions occur abruptly in a defined area and are (usually) temporary. A *hyperendemic* condition is one that has a high prevalence. A *pandemic* condition occurs abruptly throughout a wide geographic area, even worldwide, and is (usually) temporary.

> Cowpox is an orthopoxvirus infection endemic in European wild rodents but with a wide host range, including human beings.
>
> The Ebola epidemic sparked a much-needed course correction that favored strong health infrastructure.
>
> The researchers used remote sensing and geographic information system technology to identify individual high-risk residences in Westchester County, New York, where Lyme disease has been hyperendemic since 1982.
>
> Internationally, between 50 million and 100 million people died in the 1918-1919 influenza pandemic.

erectile dysfunction, impotence—*Erectile dysfunction* is the inability to develop and maintain an erection for satisfactory sexual intercourse or activity (in the absence of an ejaculatory disorder). *Erectile dysfunction* is the preferred term rather than the more commonly used term *impotence*.

etc—Use *etc* (or *and so on* or *and the like*) with discretion. Such terms are often superfluous and are used simply to extend a list of examples. When, in other instances, omission would be detrimental, substitute more specific phrasing, such as *and other methods* or *and other factors*. *Etc* may be used in a noninclusive listing when a complete list would be unwieldy *and* its content is obvious to the reader. The term is best avoided in scientific reports.

Etc is not followed by a period except when it is at the end of a sentence.

Gelatin is made from animal ligaments, tendons, bones, etc, that have been boiled in water. Gelatin is often used in confectionery, ice cream, and other dairy products.

fasted, fasting—These terms are derivative forms (adjective and participle) of the noun and verb *fast* that are often used in the scientific literature.

in the fasted and fed states	related to age, sex, oxygen deficiency, and short-term fasting
in the fasting and feeding conditions	effects of fasting and sex
in fasted rats	tests were performed with the patient in the fasting state
in the fasting mouse	patients had been fasting overnight

fellow, intern, internist, resident—*Fellows* have completed their residency and can elect to complete further training in a specialty. *Interns* have graduated medical school and are in the first year of post–medical school training. Interns can only practice medicine within their training program. *Internists* are physicians specializing in internal medicine. *Residents* have completed their intern year and are still in training.

fever, temperature—*Fever* is a condition in which body temperature rises above that defined as normal. It is incorrect to say a person has a temperature if "fever" is intended. Everyone has a temperature, either normal or abnormal.

Incorrect:	The patient has a fever of 39.5 °C.
Correct:	The patient has a fever (temperature, 39.5 °C).
Correct:	The patient is febrile (temperature, 39.5 °C).
Correct:	The patient has an elevated temperature (39.5 °C).

fewer, less—*Fewer* and *less* are not interchangeable. Use *fewer* for number (individual persons or things that are countable) and *less* for volume, mass, and percentage/proportion (indicating degree or value).

Fewer interventions may not always mean less care.

The report suggests that fewer women are receiving screening mammograms.

Note: We spent less than $1000 (*not:* We spent fewer than $1000).

There was less than 30% difference in outcomes.

The outcome of interest occurred in less than 30% of the patients.

They reported fewer data (*not:* They reported less data).

follow, follow up, follow-up, observe—Cases are *followed*. Patients are not *followed* but *observed*. However, either cases or patients may be *followed up* (eg, the maintenance of contact with or reexamination of a person or patient, especially after treatment). Their clinical course may be *followed*.

In a study, case or control participants may be *lost to follow-up* (eg, the investigators were unable to locate them to complete documentation on participants in the initial study groups) or *unavailable for follow-up* (eg, they could not be contacted or the investigators were unable to persuade them to complete the study).

Patients with retained intracranial fragments have been followed up, and the sequelae of such fragments were analyzed. To date, 9 patients have been lost to follow-up.

foreign-born—This term may be considered derogatory and should not be used. It is preferable to say that a person was born outside the country of interest. For example, use non–US born or non–Canadian born.

> The best approach to testing among non–US-born residents is uncertain.
>
> We estimated the cost-effectiveness of testing and treatment for latent tuberculosis infection in residents born outside Canada.

gender, sex—*Sex* is defined as the classification of living things as male or female and is a "biological component, defined via the genetic complement of chromosomes, including cellular and molecular differences."[15]

Gender comprises "social, environmental, cultural, and behavioral factors and choices that influence a person's self-identity and health."[9] The term *gender* "includes gender identity (how individuals and groups perceive and present themselves), gender norms (unspoken rules in the family, workplace, institutional, or global culture that influence individual attitudes and behaviors), and gender relations (the relations between individuals of different gender identities)."[15]

The terms should not be used interchangeably. In reports of research, if demographic information about human participants is included, the term used should be indicated and defined and the method used to assess sex or gender should be described (eg, self-report, investigator observed, metadata in a database). In many instances, authors of articles in biomedical publications use the term *gender* when they intend the word *sex*. As noted by Clayton and Tannenbaum, "[W]hen sex is based on self-report, it will be incorrect in a very small percentage of individuals because some individuals will not be 46XX or 46XY. However, in most research studies, it is not possible to conduct detailed genetic evaluation to determine the genetic make-up of all participants."[15]

> A sex ratio of 1.06:1, the ratio of male to female births, has declined in the past decades.
>
> Many studies indicate that women are less likely than men to undergo cardiac procedures after an acute myocardial infarction, raising concerns of sexual bias in clinical care. However, no data exist about the relationship among patient sex, physician sex, and use of cardiac procedures.
>
> Responses to pain and pain therapies differ between men and women. Whether this difference is related to sex-based factors (physiological), gender-based factors (psychosocial), or both has not been determined.
>
> The survey of bias in the workplace asked women and men to self-report their gender.

Transgender means of, relating to, or being a person whose gender identity differs from the sex the person had or was identified as having at birth. *Cisgender* means of, relating to, or being a person whose gender identity corresponds with the sex the person had or was identified as having at birth.
Avoid using any *trans* term as a noun; the adjectival form is preferred (not *transman* or *transwoman* but *transgender man* and *transgender woman*).

> Surgeons are seeing an increase in consultations for surgical therapy to help transgender and gender-nonconforming individuals.

> The study examined the health status of gender minorities in the United States compared with cisgender peers.

See 11.7, Age and Sex Referents, the GLAAD Media Reference Guide-Transgender Issues website,[16] and the Gender Equity Resource Center website.[17]

global, international—*Global* relates to or involves the entire world; an equivalent term is *worldwide* (a global system of communication, global climate change, global health security).

> Spread of infection with Zika virus among pregnant women has become a global public health concern.

International affects 2 or more nations (international trade, international movement, international consortium).

> Researchers conducted an international survey, with respondents selected from Australia, China, France, the United Kingdom, and the United States.

But: global amnesia, global aphasia, global ischemia, global cognitive function, global pain relief, Global Assessment of Functioning Scale

health care—Express this term as 2 words. It is not necessary to hyphenate *health care* in its adjectival form (see 8.3, Punctuation, Hyphens and Dashes).

health care professionals	health care organizations
health care system	health care reform
health care policy	health care insurance

historic, historical—Although their meanings overlap and they are often used interchangeably, *historic* and *historical* have different usages. *Historic* means important or influential in history (a *historic* discovery). *Historical* is concerned with the events in history (a *historical* novel).

> This historical novel has had a historic impact.

> This article considers the historical effect of Medicare and Medicaid on mental health services and discusses this history as a basis for appraising the legislation now before the US Congress.

Note: The aspirant "h" in both *historic* and *historical* is not silent (see 7.3.2, Indefinite Articles, and 11.11, Articles).

-ic, -ical—*Merriam-Webster's Collegiate, Stedman's, Dorland's*, and *American Heritage* dictionaries are resources for determining the appropriate suffix for

adjectives. In some cases, the "-ical" form is more remote from the word root and may have a meaning beyond that of the "-ic" form. Although, for example, "anatomic" may be used in the same sense as "anatomical," the latter is preferred as the adjectival form. The important guideline is that the use of terms must be consistent throughout an article or chapter, and preferably throughout the entire publication. Usually the "-al" may be omitted unless its absence changes the meaning of the word. Examples of such differences in meaning include

biologic	biological
classic	classical
economic	economical
empiric	empirical
historic	historical
pathologic	pathological
periodic	periodical
physiologic	physiological.

immunize, inoculate, vaccinate—*Immunize* means to induce or provide immunity by giving a vaccine, toxoids, or preformed antibodies. *Inoculate* means to introduce a serum, a vaccine, or an antigenic substance. *Vaccinate* refers to the act of administering a vaccine.

> To immunize the newborn of an HBsAg-positive woman against hepatitis B, the patient should be inoculated with both hepatitis B immunoglobulin and vaccine.
>
> All participants were inoculated intranasally with influenza A/Texas/36/91(H1N1) virus.
>
> Ten vaccinia-naive participants were vaccinated with undiluted smallpox vaccine.
>
> The World Health Organization is partnering with the United Nations Children's Fund to conduct a massive vaccination campaign in 7 countries to inoculate more than 20 million children against polio and other diseases.

impaired, intoxicated—These related terms are used in the United States to define impairment in driving performance attributable to the use of alcohol or drugs. For instance, in some jurisdictions, a blood or breath alcohol (ethanol) concentration of 0.08 g/dL is considered legal evidence of impairment for driving. By extension, some injury prevention researchers have considered this concentration of alcohol to be scientific evidence of impairment in other potentially hazardous activities. However, cognitive and other functions may be impaired at even lower concentrations of alcohol, particularly if other psychoactive drugs, including prescription drugs, have been taken. No specific blood or breath concentration of alcohol may be considered to be scientific evidence of intoxication or impairment for all persons in all settings and activities. Authors should explain, justify, and define the use of these terms, preferably in the Methods section of the manuscript.

imply, infer—To *imply* is to suggest or to indicate or express indirectly. To *infer* is to conclude or to draw conclusions from facts, statements, or indications.

> These results, though cross-sectional, imply that physical fitness is related to fewer coronary risk factors.
>
> Our study relied on cross-sectional data, restricting our ability to infer the causal directions underlying the observed associations.

Note: Inference is the process of passing from observations to generalizations, usually with calculated degrees of uncertainty.

> In the presence of missing data, mixed models can provide valid inferences under an assumption that data are missing at random.

See 19.5, Glossary of Statistical Terms (***inference***).

incidence, prevalence—*Incidence* refers to the number of new cases of disease among persons at risk that occur over time,[7] as contrasted with *prevalence*, which is the total number of persons with the disease at any given time.

See 19.5, Glossary of Statistical Terms.

injecting, injection drug user; intravenous—The terms *injecting drug user* and *injection drug user* are not necessarily the same as *intravenous drug user*. Injecting or injection drug users can inject drugs intravenously, intramuscularly, or subcutaneously. Do not substitute one term for the other. If *intravenous* is used, ascertain that the route of administration is through a vein. If *injecting* or *injection drug user* is used, specify the type of injection (eg, intravenous, intradermal) at first mention, unless all types are meant. If uncertain, query the author.

in order to—*In order* can often be removed from the phrase *in order to* without changing its meaning (see 11.2.1, Redundant Words). However, in some cases such a deletion may be awkward or change the meaning.

> *Avoid*: In order to meet the study sample size, participants were recruited from 3 centers.
>
> *Better*: To meet the study sample size, participants were recruited from 3 centers.
>
> Our students must have the learning opportunities that they need in order to acquire true understanding. [If "in order to" is removed, the syntax is disrupted ("need to acquire" would seem to apply to "opportunities"). The sentence might be reworded as "to be able to acquire" instead of "in order to acquire."]

irregardless, regardless—*Irregardless*—most likely a blend of *irrespective* and *regardless*—is incorrect regardless of usage.

life expectancy, life span—*Life expectancy* is the average period that a person may expect to live. *Life span* is the length of time a person lives.

limited-income, low-income, resource-limited, resource-poor, transitional—These adjectives are used to describe a nation, region, or group in which most of the population lives on far less money—with far fewer basic public services—than the population in wealthy countries. For the purposes of financing, debt relief, technical assistance and advisory services, and special initiatives, the World Bank

also categorizes countries as *heavily indebted poor countries, middle-income countries, low-income countries under stress*, and *small states*. There is no universal, agreed-on criterion for describing a country in terms of its economic or human "development" and which countries fit these different categories, although there are different reference points, such as a nation's gross domestic product per capita or the limited nation's Human Development Index (HDI) compared with that of other nations.

Choice of an appropriate term will depend on context, and writers should choose respectful terms that reflect a specific country's economic and social situations.

Use of the terms *first world/third world* and *developed/developing* are not recommended as descriptors when comparing countries or regions. The term *third world* is pejorative and archaic. The term *developing* may seem like an acceptable alternative, but it too can be considered pejorative and insensitive to the many complexities of metrics used to measure economic, political, resource, and social factors. Best practice is to avoid such general terms and use specific terms that reflect what is being compared, such as low-income or high-income for an article comparing countries based on measures such as gross national product per capita.

malignancy, malignant neoplasm, malignant tumor—When referring to a specific tumor, use *malignant neoplasm* or *malignant tumor* rather than *malignancy. Malignancy* refers to the quality of being malignant.

Avoid: Pancreatic cancer is a type of malignancy that eludes early detection.

Preferred: Pancreatic cancer is a type of malignant neoplasm that eludes early detection.

Relatives of patients with carcinoma of unknown primary (CUP) are at increased risk of CUP and several other malignant neoplasms, including lung, pancreatic, and colon cancer.

management, treatment—To avoid dehumanizing usage, it is generally preferable to say that cases are *managed* and that patients are *cared for* or *treated*. However, constructions such as "the clinical management of the seriously ill patient" and "the management of patients with HIV infection" are acceptable when used to refer to a general treatment protocol. *Management* is especially applicable when the care of the patient does not involve specific interventions but may include, for example, watchful waiting (eg, for prostate cancer or mitral regurgitation). *Management* may also be used to refer to the monitoring or periodic evaluations of the patient.

militate, mitigate—These 2 words are not synonymous. *Militate* means to have weight or effect and is usually used with *against*. *Mitigate* means to moderate, abate, or alleviate.

The constraints of nationalism militate against state conformance with global health norms.

An increasing body of evidence presents the possibility of developing drugs to mitigate cognitive decline.

This review considered evidence related to mitigation of risk in the use of opioids for chronic pain.

multivariable, multivariate; univariable, univariate—*Multivariable* means many variables and refers to any statistical test that deals with 1 dependent variable and at least 2 independent variables. It may include nominal or continuous variables, but ordinal data must be converted to a nominal scale for analysis. *Multivariate analysis* is similar to multivariable analysis except that there is more than 1 dependent variable. The term *multivariate* is frequently incorrectly used in the scientific literature when multivariable analysis is meant. *Univariable analysis* refers to statistical tests involving only 1 dependent variable and no independent variables or may also apply to an analysis in which there are no independent variables. For *univariate*, the suffix "-ate" means to act on. Because no variable is acted on in a univariable analysis, *univariable* is a more appropriate term than *univariate* when there is only a single variable involved.

See 19.0, Study Design and Statistics.

nauseous, nauseated—These terms are often used interchangeably to mean feeling unwell, but they have distinctly different meanings. *Nauseous* refers to causing an illness or disgust, and *nauseated* refers to feeling ill or disgust.

> The nauseous smell sickened several people in its vicinity.
>
> The patient was nauseated after taking aspirin.

-ology—This suffix, derived from the Greek *logos*, meaning "word," "idea," or "thought," denotes *science of* or *study of*. Many terms with this suffix, like *morphology, histology, etiology*, and *symptomatology*, are general and abstract nouns and should not be used to describe individual and particular items. *Pathology* is an exception and can be used.

Avoid:	Tumor registry data were supplemented by hospital record and histology in men aged 55 to 74 years with clinically localized prostate cancer.
Preferred:	Tumor registry data were supplemented by hospital record and histologic examination findings in men aged 55 to 74 years with clinically localized prostate cancer.
Avoid:	The buildup of infectious debris behind the tympanic membrane, along with inflammatory mediators, produces the symptomatology and signs of acute otitis media.
Preferred:	The buildup of infectious debris behind the tympanic membrane, along with inflammatory mediators, produces the symptoms and signs of acute otitis media.

on, upon—In scientific articles, *upon* often simply means *on*, which is the preferred term.

operate, operate on—Surgeons *operate on* a patient or *perform an operation on* a patient. Similarly, patients are not *operated* but are *operated on*.

Incorrect:	The operated group recovered quickly.
Correct:	The surgical group recovered quickly.
Also correct:	The group that underwent surgery recovered quickly.

operation, surgical procedure, surgeries, surgery—*Surgery* can mean surgical care, surgical treatment, or surgical therapy (ie, the care provided by a surgeon with the help of nurses and other personnel from the first consultation and examination, through the hospital stay, operation, and postoperative care, until the last follow-up visit is complete).

An *operation* is performed on a living body to repair damage or a defect or restore health; it is the *surgical procedure*.

Surgery is what a surgeon practices or a particular medical specialty. An *operation* is what a surgeon performs. In this context, there is no such word as *surgeries*. In the United Kingdom, *surgeries* are treatment rooms.[18]

ophthalmologist, optician, optometrist—*Ophthalmologists* are specialists in medical and surgical eye disease. *Opticians* are technical practitioners who design, fit, and dispense corrective lenses. *Optometrists* are health care professionals who provide primary vision care that ranges from sight testing and correction to the diagnosis, treatment, and management of vision changes.

over, under—Correct usage of these words depends on context.

Time:	*Over* may mean either *more than* or *for* (*a period of*). In cases in which ambiguity might arise, *over* should be avoided and *more than* used.
Ambiguous:	The cases were followed up over 4 years.
Preferred:	The cases were followed up for more than 4 years.
Also:	The cases were followed up for 4 years.
Age:	When referring to age groups, *over* and *under* should be replaced by the more precise *older than* and *younger than* (see also ***age, aged, school-age, school-aged, teenage, teenaged***).
Avoid:	All participants in the study were over 65 years old.
Preferred:	All participants in the study were older than 65 years.

Note: It is unnecessary and redundant to add *of age* after the number of years. When the terms *older* and *younger* are used, age is implied (see 11.2.1, Redundant Words).

percent, percentage, percentage point, percentile—See 18.7.2, Numbers and Percentages, Forms of Numbers, Percentages.

persons, people—Both terms are acceptable.

place on, put on—The phrase "to put [or to place] a patient on a drug" is jargon and should be avoided. Medications are *prescribed* or patients are *given* medications; therapy or therapeutic agents are started, administered, maintained, stopped, or discontinued.

Incorrect:	If opioids are necessary, patients should be put on the lowest effective dose.
Correct:	If opioid therapy is necessary, patients should be prescribed the lowest effective dose.

Correct: The patient with chronic pain was given the lowest possible dose of hydrocodone.

Correct: A combination therapeutic regimen of hydrocodone bitartrate (5 mg) and acetaminophen (325 mg) was begun.

Incorrect: The patient with newly diagnosed celiac disease was put on a gluten-free diet.

Correct: The patient with newly diagnosed celiac disease was prescribed a gluten-free diet.

preventative, preventive—As adjectives, *preventive* and its derivative *preventative* are equal in meaning. The shorter *preventive* is preferred.

principal, principle—These words sound the same but have very different meanings. *Principal* can be a noun or an adjective and has several definitions, including a loan amount that requires repayment, someone who has an important role, or something that is primary or pivotal. *Principle* is always a noun and only refers to a law or rule.

The patient was hospitalized with a principal diagnosis of chest pain.

The principal investigator observed the first 2 interventions.

The physician studied the principles of ethics of the American Medical Association.

prostitute, sex worker—Epidemiologic studies use the term *sex worker* (or *commercial sex worker*) to describe these persons of any gender, rather than the more derogatory *prostitute*.

provider—The term *provider* can mean a health care professional, a medical institution or organization, or a third-party payer. If the usage refers to 1 specific provider (eg, physician, hospital), use the specific name for that provider (eg, pediatrician, tertiary care hospital, managed care organization), rather than the general term *provider*. If the term connotes several providers, it can be used to avoid repeating lists of persons or institutions; however, the term(s) should always be defined at first mention.

To protect the public health and safety during recovery operations after a hurricane, the Centers for Disease Control and Prevention has created guidelines of interest to health care providers (trauma surgeons, nurses, and psychologists), relief workers, and shelter operators.

The phrase *nonphysician provider* should be avoided because it is similarly imprecise and can refer to numerous health professionals licensed to provide a health care service. It is better to specify the type of professional (eg, nurse, pharmacist, dentist) or to use *health care professional* or *clinician*. If a phrase is needed to describe repeatedly and succinctly the many health care professionals who are not physicians, then *physician and other health care professionals* may be acceptable as long as the phrase is defined at first mention. This also applies to other professions (eg, avoid use of nonnurses, nonpharmacists, nondentists).

psychiatrist, psychologist—*Psychiatrists* are trained physicians who can prescribe medications and focus on medication management as a course of treatment. *Psychologists* cannot write prescriptions and focus on psychotherapy and treating patients with behavioral intervention.

race, ethnicity—For definitions and guidance on appropriate usage, see 11.12.3, Race and Ethnicity.

regime, regimen—A *regime* is a form of government, a social system, or a period of rule (eg, a military regime). A *regimen* is a systematic schedule (involving, for example, diet, exercise, way of living, physical therapy, or medication) designed to improve or maintain the health of a patient.

> Resistant hypertension is the failure to reach goal blood pressure while adhering to full doses of an appropriate 3-drug regimen that includes a diuretic.
>
> A retrospective study compared mild-, moderate-, and high-intensity exercise regimens in patients with detectable hepatic fat.

repeat, repeated—*Repeat* is a noun or a verb and should not be used in place of the adjective *repeated*. *Repeated* implies repetition. For precision and clarity, the exact number should be given.

Incorrect:	A repeat electrocardiogram was obtained.
Possible but misleading:	A repeated electrocardiogram was obtained.
Preferred:	A second electrocardiogram was obtained.
	The electrocardiogram was repeated.
	Two successive electrocardiograms showed no abnormalities.

respective, respectively—These words indicate a one-to-one correspondence that may not otherwise be obvious between members of 2 series. When only 1 series, or none at all, is listed, the distinction is meaningless and should not be used.

Incorrect:	The 2 patients are 12 and 14 years old, respectively.
Correct:	Kate and Jake are 12 and 14 years old, respectively.
Incorrect:	The 2 patients' respective ages are 12 and 14 years.
Correct:	The 2 patients are 12 and 14 years old.

> Low back pain, other muscular disorders, and neck pain rank first, third, and fourth, respectively, among the 30 leading diseases that contribute to years lived with disability in the United States.

safe injection site, safer injection sites, supervised injection facility or site—Use *supervised injection facility* or *site*.

section, slice—Use *section* to refer to a radiologic image; use *slice* to refer to a slice of tissue (eg, for histologic examination).

> *But:* frozen-section biopsy

See also ***cesarean delivery, cesarean section***.

side effect—See *adverse effect, adverse event, adverse reaction, side effect*.

signs, symptoms—*Signs* can be seen and read by other people. *Symptoms* can only be described by the person feeling them.

substance abuse, substance use—Never use the term *substance abuse*. Many consider it to be pejorative, but it is a clarity and accuracy issue as well. If what is meant is "use" ("The patient used heroin"), then "use" is sufficient. There is no difference between heroin "use" and heroin "abuse," so "abuse" adds no information. If what is meant is "The patient had depression and substance use disorder" (eg, both are medical illnesses), then saying "The patient had substance abuse" would be unclear and inaccurate (unless specifically referring to meeting the *DSM-IV* substance abuse definition). Use "substance use disorder" to mean uncontrolled use of a substance with recurrent consequences. Use "substance use" to mean the action of taking a substance without any conclusions about whether it has harmed the person or whether they have control over its use ("The patient used marijuana last night"). See 11.12.6, Terms for Persons With Diseases, Disorders, or Disabilities.

suffer from, suffer with— See 11.12.6, Terms for Persons With Diseases, Disorders, or Disabilities, for a discussion of usage.

suggestive of, suspicious of—To be *suggestive of* is to give a suggestion or to evoke. To be *suspicious of* is to distrust.

Incorrect:	The chest film was suspicious for tuberculosis.
Correct:	The chest film was suggestive of tuberculosis.
Also correct:	The chest film showed abnormalities suggestive of tuberculosis.

supine, prone—These terms are antonyms. *Supine* means lying on the back or with the face up. *Prone* means lying on the front of the body facing downward.

> The patient was placed in supine position for thoracic surgery.
>
> The patient was placed in a prone position for the spinal surgery.

survivor, victim, victimization—In scientific publications, avoid the use of the word *victim* when describing persons who experienced physical, domestic, sexual, or psychological violence, bullying, or a natural disaster. Similarly, avoid labeling (and thus equating) people with a disability or disease as victims (eg, AIDS victim, stroke victim; see 11.12.6, Terms for Persons With Diseases, Disorders, or Disabilities). The term *victimization* should likewise be avoided; instead, a term or phrase that describes the specific exposure should be used (eg, exposure to violence, experienced trauma, bullying, being bullied).

Victim may imply a state of helplessness.[19] Characterizing a person who has experienced abuse or other violence as a victim perpetuates the stereotype of a passive person who cannot recover from the experience or trauma. In such cases, *survivor* may be more appropriate (eg, rape survivor, tsunami survivor, survivor of torture).

> Survivors of sexual assault often choose not to speak publicly about their experiences.
>
> Refugees who reported experiencing violence had higher rates of anxiety than those who did not report such experience.

Children who were bullied and participated in the group counseling sessions reported lower scores for symptoms of depression compared with those who did not participate in the group counseling.

If a person who experienced such trauma has died, referring to them as a *victim* may be appropriate (victim of a landmine explosion or gunshot wound). *Victim* may also be used in the vernacular (victim of his own success).

titrate, titration—In therapeutics, *titrate* and *titration* refer to dosing schedules that start with a small dose and gradually are increased to the recommended or therapeutic dose. Patients are not titrated.

toxic, toxicity—*Toxic* means pertaining to or caused by a poison or toxin. Toxicity is the quality, state, or degree of being poisonous. A patient is not toxic. A patient does not have toxicity.

Dactinomycin is a toxic antineoplastic drug of the actinomycin group.

The drug had a toxic effect on the patient.

The patient had a toxic reaction to the drug.

The patient had a toxic appearance.

The toxicity of the drug must be considered.

But: toxic shock syndrome, toxic neuropathy, toxic epidermal necrolysis, toxic megacolon

transplant, transplantation—*Transplant* is both a noun (typically meaning the surgical operation itself but also increasingly referring to the overall field) and a transitive verb. Use *graft* (or *allograft, autograft, xenograft*, and so on, depending on the level of precision needed) as the general noun for the organ or tissue that is transplanted, or specify which organ or tissue (eg, liver, skin), rather than use the noun *transplant* in this context. *Transplantation* is traditionally the noun used to describe the overall field. Never use the plural *transplantations*.

Incorrect:

The patient was transplanted.

The surgeon transplanted the patient.

The patient underwent a transplantation.

Fifteen transplantations were performed.

Correct:

The patient underwent a transplant.

The patient received a kidney allograft.

The transplanted intestine functioned well.

The surgeon transplanted the donor heart into a 4-year-old girl.

Fifteen transplants were performed.

Dr Jones performed the first successful heart-lung transplant at our center.

Cyclosporine has been used as monotherapy in pediatric liver transplantation [also, *transplant*].

Islet transplantation [also, *transplant*] is now a clinical reality at our institution.

The researchers collected transplantation data.

For the adjectival form, use *transplant*, as well as *pretransplant* and *posttransplant* (not *pretransplantation* and *posttransplantation*).

Avoid: The transplantation coordinator described the pretransplantation and posttransplantation data from her transplantation program.

Preferred: The transplant coordinator described the pretransplant and posttransplant data from her transplant program.

ultrasonography, ultrasound—These terms are not interchangeable. When referring to the imaging procedure, use *ultrasonography. Ultrasound* refers to the actual sound waves that penetrate the body during ultrasonography.

use, usage, utility, utilize—*Use* is almost always preferable to *utilize*, which has the specific meaning "to find a profitable or practical use for," suggesting the discovery of a new use for something. However, even where this meaning is intended, *use* would be acceptable.

We used correlation and hierarchical linear regression analyses.

Vitamin C helps the body use the iron present in the diet.

Some urban survivors utilized plastic garbage cans as "lifeboats" to escape flooding in the aftermath of Hurricane Katrina.

Exception: Utilization review and *utilization rate* are acceptable terms.

Usage refers to an acceptable, customary, or habitual practice or procedure, often linguistic in nature. For the broader sense in which there is no reference to a standard of practice, *use* is the correct noun form.

The correct usage of *compose* vs *comprise* was discussed earlier.

The style manual determines what the correct usage should be.

Some authors use the pretentious *usage* where *use* would be appropriate. As a rule of thumb, avoid *utilize* and be wary of *usage*. Use *use*.

Note: *Utility*—meaning fitness for some purpose, or usefulness—should never be changed to the noun *use*. Nor should the verb *employ* be routinely changed to *use*. Use *employ* to mean hire.

vision, visual acuity—*Vision* is a general term that describes the overall ability of the eye and brain to perceive the environment. *Visual acuity* is a specific measurement of one aspect of the sensation of vision assessed by an examiner.

A patient describing symptoms of his or her visual sensation would be describing the overall visual performance of the eye(s) and would use the term *vision*: "My vision is improved [or worse]."

A practitioner reporting the examination findings at one specific time would describe *visual acuity* (20/30, 20/15, etc). However, the practitioner might also refer to the general visual function as *vision*: "As the vitreous hemorrhage cleared, the vision improved and visual acuity returned to 20/20." It is possible to have normal visual acuity despite marked vision impairment (eg, when the peripheral visual field is abnormal).

11.2 Redundant, Expendable, and Incomparable Words and Phrases.

> *This parrot is no more. It has ceased to be. It's expired and gone to meet its maker. This is a late parrot. It's a stiff. Bereft of life, it rests in peace. If you hadn't nailed it to the perch, it would be pushing up the daisies. It's rung down the curtain and joined the choir invisible. This is an ex-parrot.*
> **John Cleese, "Monty Python's Flying Circus"**[20]

11.2.1 Redundant Words. A redundancy is a term or phrase that unnecessarily repeats words or meanings. Below are some common redundancies that can usually be avoided (redundant words are *italicized*):

actual fact	combine *together*
adequate *enough*	*completely* full [empty]
added bonus	consensus *of opinion*
advance planning	contemporaneous *in age*
aggregate *together*	continue *on*
blatantly obvious	could *potentially*
blend *together*	count [divide] *up*
brief *in duration*	covered *over*
browse *through*	*current* status quo
close *proximity* to	distinguishing *the difference*
collaborate *together*	each *individual* person
eliminate *altogether*	*old* adage
empty *out*	orbit *around*
end *result*	*outward* appearances
enter *into* (*exception:* enter into a contract)	*out* of [eg, 2 *out* of 12, *but:* out of bounds, out of place, out of the question, out of the jurisdiction, out of the woods]
equally as well as	
estimated at *about*	outside *of*
favorably disposed	oval [square, round, lenticular] *in shape*
fellow colleagues	own *personal* view
fewer *in number*	*past* history (experience)
filled *to capacity*	period *of time*, *time* period, *point in* time
final destination	*personal* friend
final outcome	pervade *throughout*

first discovered	plan *ahead*
first and foremost	plan *in advance*
first initiated	precedes *in time*
free gift	predict *in advance*
fuse *together*	*prior* experience
future plans	reassessed *again*
general rule	red *in color*
herein we describe	revert *back*
historic milestone	rough [smooth] *in texture*
interact *with each other*	*skin* rash
interval *of time*	software *programs*
join *together*	soft [firm] *in consistency*
joint cooperation	sour [sweet, bitter] *tasting*
large [small, bulky] *in size*	split *up*
lift *up*	similar results were obtained *also* by
major breakthrough	*still* continues
merge (mix) *together*	sum *total*
moment *in time*	tender *to the touch*
near *to*	*true* fact
2 halves	*12* noon [midnight]
whether *or not* [unless the intent is to give equal emphasis to the alternative]	*uniformly* consistent
	younger [older] than 50 years *of age*

11.2.2 **Expendable Words and Circumlocution.** Some words and phrases can usually be omitted without affecting meaning, and omitting them often improves the readability of a sentence:

as already stated	it was demonstrated that
in order to	it was found that
in other words	needless to say
it goes without saying	take steps to
it is important [interesting] to note	the fact that
it may be said that	the field of
it stands to reason that	to be sure

Quite, very, and *rather* are often overused and misused and can be deleted in many instances (see 11.1, Correct and Preferred Usage, Correct and Preferred Usage of Common Words and Phrases).
Avoid roundabout and wordy expressions:

Avoid	*Better*
an appreciable number of	many, several
an increased [decreased] number of	more [fewer]
as the result of	because
at this [that] point in time	now [then]
carry out	perform, conduct
commented to the effect that	said, stated
concerning the matter of	about
despite the fact that	although
draws to a close	ends
due to the fact that	because, due to
during the time that	while
fall off	decline, decrease
file a lawsuit against	sue
has the opportunity to	can
have an effect [impact] on	affect
in a situation in which	if
in close proximity to	near
in light of the fact that	because
in regard to, with regard to	about, regarding
in terms of	in, of, for
in the event that	if
in the vicinity of	near
in those areas where	where
look after	watch, care for
the majority of	most
produce an inhibitory effect that	inhibit
with the exception of	except

11.2.3 **Incomparable Words.** Some words are regarded as "absolute" adjectives, those not possessing a comparative or superlative form (eg, young, younger, youngest or loud, louder, loudest). Words considered incomparable that need no superlative or comparative modifier are listed below:

absolute	omnipotent
ambiguous	original
complete [*but:* almost or nearly complete]	preeminent
comprehensive	perfect [*but:* almost or nearly perfect]
entire	preferable
equal	pregnant
eternal	supreme
expert	total
fatal [*but:* almost or nearly fatal]	ultimate
final	unique
full [*but:* half full, nearly full]	unanimous [*but:* almost or nearly unanimous]
infinite	

Note: In general, superlatives should be avoided in scientific writing.

11.3 **Spelling and Spacing Variations.** ante mortem/antemortem—Both forms are used depending on placement before or after the noun. *Ante mortem* means occurring before death and is used after the noun. *Antemortem* means before death and precedes a noun.

The antemortem injuries were not the cause of death.

The injuries were discovered ante mortem.

bloodstream/blood stream—*Bloodstream* is preferred.

brainstem/brain stem—*Brainstem* is preferred.

caregiver/care giver—*Caregiver* is preferred.

caseload/case load—*Caseload* is preferred.

dataset/data set—*Data set* is preferred.

email/e-mail—*Email (email)* is preferred.

end point/endpoint—*End point* is preferred

fiberoptic(s)/fiber optic(s)—*Fiberoptic(s)* is preferred.

flowchart/flow chart—*Flowchart* is preferred but use *flow diagram* over *flowdiagram*.

gallbladder/gall bladder—*Gallbladder* is preferred.

healthcare/health care—*Health care* is preferred.

heartbeat/heart beat—*Heartbeat* is preferred.

needlestick/needle stick—*Needlestick* is preferred.

postmortem/post mortem—Both forms are used depending on placement before or after the noun. *Postmortem* means after death and precedes a noun. *Post mortem* means occurring or performed after death or pertaining to the period after death and is used after a noun.

A postmortem clot formed in the heart.

The clot formed in the heart post mortem.

postpartum/post partum—Both forms are used depending on placement before or after the noun. *Postpartum* means after childbirth and precedes a noun. *Post partum* means occurring after childbirth with reference to the mother and is used after a noun.

The new mother experienced postpartum depression.

The new mother's depression began post partum.

radiofrequency/radio frequency—*Radiofrequency* is preferred.

radioguided/radio guided—*Radioguided* is preferred.

skinfold/skin fold—*Skinfold* is preferred.

slitlamp/slit lamp—*Slitlamp* is preferred.

waveform/wave form—*Waveform* is preferred.

website/Web site—*web* (lowercase "w") and *website* (1 word, lowercase "w") are preferred, but retain initial caps on the full name the World Wide Web.

11.4 Back-formations.

The transformation of a noun into a verb is a back-formation, often seen in technical as well as informal writing. *Diagnose*, for example, is a mid–19th-century back-formation, from *diagnosis*. Back-formations in use include *dialyze* (from *dialysis*) and *anesthetize* (from anesthesia). A back-formation that is not widely accepted is *diurese* (from *diuresis*). Any use of back-formations should be checked in a dictionary.

Back-formation:	The patient was diuresed.
Preferred:	The patient was given diuretics [or underwent diuresis].
Back-formation	The individuals were cohortized.
Preferred:	The individuals were studied as a cohort.
Also correct:	The researchers used a cohort design.
Back-formation:	The patient was hysterectomized.
Preferred:	The patient had [or underwent] a hysterectomy.

11.5 Jargon.

> *Many words have found their way into medical vocabularies with unusual meanings that are not recognized even by medical dictionaries. Such writings may be characterized as medical jargon or medical slang. When these words appear in medical manuscripts or in medical conversation, they are unintelligible to other scientists.*
> **Morris Fishbein, MD**[21]

> *Jargon is . . . a language exquisitely precise, using terms in a highly specific sense. It is highly rational, addressed to the intellect and not the emotions; a technical language, intended for a particular group engaged in a particular activity. . . . Jargon has a specificity and precision of meaning, intelligible to a limited group but more or less baffling to other groups.*
> **Lester S. King, MD**[22]

Words and phrases that can be understood in conversation but are vague, confusing, or depersonalizing are generally inappropriate in formal scientific writing (see 7.7, Diction; 11.1, Correct and Preferred Usage of Common Words and Phrases; and 19.5, Glossary of Statistical Terms).

Jargon	*Preferred form*
4+ albuminuria	proteinuria (4+)
blood sugar	blood glucose
chart	medical record
chief complaint	chief concern
cocktail	mixture
congenital heart	congenital heart disease; congenital cardiac anomaly
emergency room	emergency department
exam	examination
flu	influenza
gastrointestinal infection	gastrointestinal tract infection or infection of the gastrointestinal tract
genitourinary infection	genitourinary tract infection or infection of the genitourinary tract
heart attack	myocardial infarction
hyperglycemia of 250 mg/dL	hyperglycemia (blood glucose level of 250 mg/dL)

Jargon	*Preferred form*
jugular ligation	jugular vein ligation or ligation of the jugular vein
lab	laboratory
left heart failure	left ventricular failure [preferred, but query author]; left-sided heart failure
normal range	reference range
Pap smear	Papanicolaou test
the patient failed treatment	treatment failed
preemie	premature infant
preop/postop	preoperative/postoperative
prepped	prepared
psychiatric floor	psychiatric department, service, unit, ward
randomized patients	randomly assigned patients
respiratory infection	respiratory tract infection or infection of the respiratory tract
surgeries	operations or surgical procedures
symptomatology	symptoms [query author]
therapy of [a disease or condition]	therapy for
treatment for [a disease or condition]	treatment of
urinary infection	urinary tract infection or infection of the urinary tract

The following terms and euphemisms should be changed to preferred forms:

Avoid	*Use*
expired, passed, passed away, succumbed	died
sacrificed	killed; humanely killed; euthanized

Avoid trivializing or dehumanizing disciplines or specialties. For example:

Osteopathic physician and *osteopathic medicine*, not *osteopath* and *osteopathy*

Cardiologic consultant or *cardiology consultation*, not *cardiology* [for the person]

Orthopedic surgeon, not *orthopod*

Colloquialisms, idioms, and vulgarisms should be avoided in formal scientific writing. Exceptions may be made in editorials and informal articles.

11.6 **Administration of Drugs.** When describing the administration of drugs, *buccal, cutaneous, dermal, inhalational, intra-articular, intracardiac, intramuscular, intrathecal, intravenous, intraventricular, intravitreal, nasal, ocular, oral, otic, parenteral, rectal, subconjunctival, subcutaneous, sublingual, topical, transdermal,* and *vaginal* are acceptable terms when these are the usual or intended routes of administration. Except for systemic chemotherapy, however, drugs are usually neither systemic nor local but are given for systemic or local effect.

Some topical corticosteroid ointments produce systemic effects.

Oral penicillin is often preferred to parenteral penicillin.

Intravenously injected heroin may be contaminated.

Exceptions: Local anesthetics are a class of drug. Techniques for delivering anesthesia are general, local, and regional.

11.7 **Age and Sex Referents.** Use specific terms to refer to a person's age.

Neonates or *newborns* are persons from birth to 1 month of age.

Infants are children aged 1 month to 1 year (12 months).

Children are persons aged 1 to 12 years. Sometimes, *children* may be used more broadly to encompass persons from birth to 12 years of age. They may also be referred to as *boys* or *girls*.

Adolescents are persons aged 13 through 17 years. They may also be referred to as *teenagers* or as *adolescent boys* or *adolescent girls*, depending on context.

Adults are persons 18 years or older and should be referred to as *men* or *women*. Persons 18 to 24 years of age may also be referred to as *young adults*.

Note: If the age of an individual patient is given, it may be expressed as a mixed fraction (eg, 6½ years) or as "6 years 6 months." However, when age is presented as a mean, use the decimal form: 6.5 years (see 19.4.1, Study Design and Statistics, Significant Digits and Rounding Numbers, Significant Digits).

Whenever possible, a patient should be referred to as a man, woman, boy, girl, or infant. Occasionally, however, a study group may comprise children and adults of both sexes. Then, the use of *male* and *female* as nouns is appropriate. *Male* and *female* are also appropriate adjectives.

See 11.12.4, Inclusive Language, Age.

11.8 **Anatomy.** Authors often err in referring to anatomical regions or structures as the "right heart," "left chest," "left neck," and "right brain." Generally, these terms can be corrected by inserting a phrase such as "part of the" or "side of the."

right side of the heart, right atrium, right ventricle

left side of the chest, left hemithorax

left aspect of the neck

right hemisphere

ascending [not right] and descending [not left] colon

Where appropriate, use specific anatomical descriptors:

proximal jejunum, distal esophagus, distal radius, distal ureter, femoral neck

The *upper extremity* comprises the arm (extending from the shoulder to the elbow), the forearm (from the elbow to the wrist), and the hand. The *lower extremity* comprises the thigh (extending from the hip to the knee), the leg (from the knee to the ankle), and the foot. Therefore, references to upper and lower arm and upper and lower leg are often redundant or ambiguous. When such references appear in a manuscript, the author should be queried.

11.9 **Clock Referents.** Occasionally, reference to a locus of insertion, position, or attitude is given in terms of a clock-face orientation, as seen by the viewer (see 18.1.4, Numbers and Percentages, Use of Numerals, Measures of Time).

Ambiguous:	The foreign body was observed in the patient's left eye at 9 o'clock.
Use:	The foreign body was observed in the patient's left eye at the 9-o'clock position.

Note: The terms *clockwise* and *counterclockwise* can also be confusing. The point of reference (eg, that of observer vs subject) should be specified if the usage is ambiguous.

11.10 **Laboratory Values.** Usually, in reports of clinical or laboratory data, the substance per se is not reported; rather, a value is given that was obtained by measuring a substance or some function or constituent of it. For example, one does not report hemoglobin but hemoglobin level. Some other correct forms are as follows:

agglutination *titer*

antinuclear antibody *titer*

creatinine *level*

creatinine *clearance*

differential white blood cell *count*

erythrocyte sedimentation *rate*

hemagglutination inhibition *titer*

high-density lipoprotein *fraction*

increase in antibody *level*

increase in bilirubin *level*

mean corpuscular *volume*

platelet *count*

prothrombin *time*

pulse *rate*

serum phosphorus *concentration*

total serum cholesterol *value* or *level* or *concentration*

24-hour urine *output* or *volume*

urinary placental growth factor *concentration*

urinary protein *excretion*

In reports of findings from clinical examinations or laboratory values, data may be enumerated without repeating *value, level*, etc, in accordance with the following example:

> Laboratory values were as follows: white blood cells, 19.5×10^3/μL; hemoglobin, 12.9 g/dL; hematocrit, 38.5%; platelets, 203×10^3/μL; and international normalized ratio, 1.1.

11.11 Articles. The article *a* is used before the aspirate *h* (eg, *a* historic occasion) and nonvocalic *y* (eg, *a* ubiquitous organism). Abbreviations and acronyms are preceded by *a* or *an* according to the *sound* following (eg, a UN resolution, an HMO plan) (see 13.8, Agencies, Organizations, Foundations, Funding Bodies, and Others and 7.0, Grammar).

a hypothesis [*h* sound]	an ultraviolet source [*u* sound]
a WMA report [*d* sound]	a UV source [*y* sound]
a hematocrit [*h* sound]	an honorarium [*o* sound]
an MD degree [*e* sound]	an NIH grant [*e* sound]
a historic operation [*h* sound]	a historical reenactment [*h* sound]

11.12 Inclusive Language.

> *Any classification according to a singular identity polarizes people in a particular way, but if we take note of the fact that we have many different identities . . . we can see that the polarization of one can be resisted by a fuller picture. So knowledge and understanding are extremely important to fight against singular polarization.*
> **Amartya Sen**[23]

Avoid the use of language that imparts bias against persons or groups on the basis of gender or sex, race or ethnicity, age, physical or mental disability, or sexual orientation. Avoid generalizations (such as *minorities*) and stereotypes and be specific when choosing words to describe people.

Note: Avoid using "non-" (eg, "White and non-White participants"), which is a nonspecific "convenience" grouping and label. Such a category may be oversimplified and misleading, even incorrect. Occasionally, however, these are categorizations used for comparison in data analysis. In such cases, the author should be queried. *Multiracial* and *people of color* are sometimes used in part to address the heterogeneous ethnic background of many people.

11.12.1 Sex/Gender. *Sex* refers to the biological characteristics of males and females. *Gender* includes more than sex and serves as a cultural indicator of a person's personal and social identity. An important consideration when referring to sex is

the level of specificity required: specify sex when it is relevant. In research articles, sex/gender should be reported and defined, and how sex/gender was assessed should be described.[15] In nonresearch reports, choose sex-neutral terms that avoid bias, suit the material under discussion, and do not intrude on the reader's attention (see 11.7, Age and Sex Referents).

Avoid	*Preferred*
chairman, chairwoman	chair, chairperson [but: see note]
corpsman	medical aide, corps member (corpsman is used by the US Marine Corps and Texas A&M University Corps of Cadets, and it may refer to either a man or a woman)
fireman	firefighter
layman	layperson
mailman	letter carrier, mail carrier, postal worker
man, mankind	people, humans, humanity, humankind, human species [but: see note]
manmade	artificial, handmade, synthetic
manpower	employees, human resources, personnel, staffing, workforce, workers
mothering	parenting, nurturing, caregiving
policeman, policewoman	police officer
spokesman, spokeswoman	spokesperson
steward, stewardess	flight attendant

Note: Use *man* or *men* when referring to a specific man or group of men and *woman* or *women* when referring to a specific woman or a group of women. Similarly, *chairman* or *spokesman* might be used if the person under discussion is a man and *chairwoman* or *spokeswoman* if the person is a woman. Any of these might be used in an official title, for example, Michele Smith, alderman of the 43rd Ward, City of Chicago.

Do not attempt to change all words with *man* to *person* (eg, *manhole*). If possible, choose a sex-neutral equivalent such as *sewer hole* or *utility access hole*.

Terms such as *physician, nurse*, and *scientist* are sex-neutral and do not require modification (eg, female physician, male nurse) unless the sex of the person or persons described is relevant to the discussion (eg, a study of only female physicians or male nurses).

> After completing internship, the physician specialized in emergency medicine and worked at several hospitals in California. She was selected as an astronaut candidate by NASA in 2007.

11.12.1.1 **Presenting Data in Tables.** When reporting the sex of participants in a table, include both sexes, as defined in the study, regardless of ratio. Do not use "White" and "male" as the default. When reporting on racial and ethnic differences, be as specific as possible (even if these comprise a small percentage of participants). Define the participants who are in the "other" category (see 4.1.2, Organizing Information in Tables).

11.12.2 **Personal Pronouns.** Avoid sex-specific pronouns in cases in which sex specificity is irrelevant. Do not use common-gender "pronouns" (eg, "s/he," "shem," "shim"). Reword the sentence to use a singular or plural non–sex-specific pronoun, neutral noun equivalent, or change of voice; or use "he or she" ("him or her," "his or her[s]," "they or their[s]"). The use of the "singular they" construction is permitted when rewriting would be awkward or unclear (see 7.2.3.2, Pronoun-Pronoun Agreement).

Avoid	*Preferred*
The physician and his office staff can do much to alleviate a patient's nervousness.	Physicians and their office staff can do a lot to alleviate a patient's nervousness. [plural] The physician and the office staff can do a lot to alleviate a patient's nervousness. [neutral noun equivalent]

11.12.3 **Race and Ethnicity.** This section addresses race and ethnicity. Other subchapters address sex and gender, sexual orientation, personal pronouns, age, socioeconomic status, and terms for persons with diseases, disabilities, and disorders.

Race and ethnicity are social constructs, without scientific or biological meaning. The indistinct construct of racial and ethnic categories has been increasingly acknowledged, and concerns about use of these terms in medical and health research, education, and practice have been progressively recognized. Accordingly, for content published in medical and science journals, language and terminology must be accurate, clear, and precise and must reflect fairness, equity, and consistency in use and reporting of race and ethnicity. (Note: historically, although inappropriately, race may have been considered a biological construct; thus, older content may characterize race as having biological significance.)

One of the goals of this guidance is to encourage the use of language to reduce unintentional bias in medical and science literature. The reporting of race and ethnicity should not be considered in isolation but should be accompanied by reporting of other sociodemographic factors and social determinants, including concerns about racism, disparities, and inequities, and the intersectionality of race and ethnicity with these other factors.

When reporting the results of research that includes racial and ethnic disparities and inequities, authors are encouraged to provide a balanced, evidence-based discussion of the implications of the findings for addressing institutional racism and structural racism as these affect the study population, disease or disorder studied, and the relevant health care systems. For example, Introduction and Discussion sections of manuscripts could include implications of historical injustices when describing the differences observed by race and ethnicity. Such discussion of

implications can use specific words, such as *racism*, *structural racism*, *racial equity*, or *racial inequity*, when appropriate.

11.12.3.1 Definitions. The definitions provided herein focus on reporting race and ethnicity. Definitions of broader terms (eg, disparity, inequity, intersectionality, and others) will be included in the overarching Inclusive Language section that contains this subsection.

"Race and ethnicity are dynamic, shaped by geographic, cultural, and sociopolitical forces."[24] Race and ethnicity are social constructs and with limited utility in understanding medical research, practice, and policy. However, the terms may be useful as a lens through which to study and view racism and disparities and inequities in health, health care, and medical practice, education, and research.[24,25,26] Terms and categories used to define and describe race and ethnicity have changed with time based on sociocultural shifts and greater awareness of the role of racism in society. This guidance is presented with that understanding, and updates have been and will continue to be provided as needed.

The terms *race* (first usage dating back to the 1500s) and *ethnicity* (first usage dating back to the late 1700s)[27] have changed and continue to evolve semantically. The *Oxford English Dictionary* currently defines *race* as "a group of people connected by common descent or origin" or "any of the (putative) major groupings of mankind, usually defined in terms of distinct physical features or shared ethnicity" and *ethnicity* as "membership of a group regarded as ultimately of common descent, or having a common national or cultural tradition."[28] For example, in the US, ethnicity has referred to Hispanic or Latino, Latina, or Latinx people. Outside of the US, other terms of ethnicity may apply within specific nations or ancestry groups. As noted in a lexicographer's post on the *Conscious Style Guide*, race and ethnicity are difficult to untangle.[27] In general, *ethnicity* has historically referred to a person's cultural identity (eg, language, customs, religion) and *race* to broad categories of people that are divided arbitrarily but based on ancestral origin and physical characteristics.[27] Definitions that rely on external determinations of physical characteristics are problematic and may perpetuate racism. In addition, there is concern about whether these and other definitions are appropriate or out-of-date[29] and whether separation of subcategories of race from subcategories of ethnicity could be discriminatory, especially when used by governmental agencies and institutions to guide policy, funding allocations, budgets, and data-driven business and research decisions.[30] Thus, proposals have been made that these terms be unified into an aggregate, mutually exclusive set of categories as in "race and ethnicity."[31] (See Additional Guidance for Use of Racial and Ethnic Collective Terms.)

The term *ancestry* refers to a person's country or region of origin or an individual's lineage of descent. Another important characteristic of many populations is *genetic admixture*, which refers to genetic exchange among people from different ancestries and may correlate with an individual's risk for certain genetic diseases.[24] Ancestry and genetic admixture may provide more useful information about health, population health, and genetic variants and risk for disease or disorders than do racial and ethnic categories.[24]

Although race and ethnicity have no biological meaning, the terms have important, albeit contested, social meanings. Neglecting to report race and ethnicity in health and medical research disregards the reality of social stratification, injustices, and inequities and implications for population health,[24,25] and removing race and

ethnicity from research may conceal health disparities. Thus, inclusion of race and ethnicity in reports of medical research to address and further elucidate health disparities and inequities remains important at this time.

According to the "Health Equity Style Guide for the COVID-19 Response: Principles and Preferred Terms for Non-Stigmatizing, Bias-Free Language" of the Centers for Disease Control and Prevention (CDC), *racism* is defined as a "system of structuring opportunity and assigning value based on the social interpretation of how one looks...("race"), that unfairly disadvantages some individuals and communities, unfairly advantages other individuals and communities, and undermines realization of the full potential of our whole society through the waste of human resources." Note that racism and prejudice can occur without phenotypic discrimination.

Jones[32] and the CDC style guide[33] have defined 3 levels of racism:

Systemic, institutionalized, and structural racism: "Structures, policies, practices, and norms resulting in differential access to the goods, services, and opportunities of society by 'race' (eg, how major systems—the economy, politics, education, criminal justice, health, etc—perpetuate unfair advantage)."[33] The Associated Press (AP) Stylebook advises to not shorten these terms to "racism," to avoid confusion with the other definitions.[34]

Interpersonal and personally mediated racism: "Prejudice and discrimination, where prejudice is differential assumptions about the abilities, motives, and intents of others by 'race,' and discrimination is differential actions towards others by 'race.' These can be either intentional or unintentional."[33]

Internalized racism: "Acceptance by members of the stigmatized 'races' of negative messages about their own abilities and intrinsic worth."[33]

11.12.3.2 Concerns, Sensitivities, and Controversies in Health Care and Research. There are many examples of reported associations between race and ethnicity and health outcomes, but these outcomes may also be intertwined with ancestry and heritage, social determinants of health, as well as socioeconomic, structural, institutional, cultural, demographic, or other factors.[24,25,35] Thus, discerning the roles of these factors is difficult. For example, a person's ancestral heritage may convey certain health-related predispositions (eg, cystic fibrosis in persons of Northern European descent and sickle cell disease reported among people whose ancestors were from sub-Saharan Africa, India, Saudi Arabia, and Mediterranean countries); however, such perceptions have resulted in underdiagnosis of these conditions in other populations.[36]

Also, certain groups may bear a disproportionate burden of disease compared with other groups, but this may reflect individual and systemic disparities and inequities in health care and social determinants of health. For example, according to the US National Cancer Institute, the rates of cervical cancer are higher among Hispanic/Latina women and Black/African American women than among women of other racial or ethnic groups, with Black/African American women having the highest rates of death from the disease, but social determinants of health and inequities are also associated with a high prevalence of cervical cancer among these women.[37] The American Heart Association summarizes similar disparities in cardiovascular disease among Black individuals in the US compared with those from other racial and ethnic groups.[38]

Identifying the race or ethnicity of a person or group of participants, along with other sociodemographic variables, may provide information about participants included in a study and the potential generalizability of the results of a study and may identify important disparities and inequities. Researchers should aim for inclusivity by providing comprehensive categories and subcategories where applicable. Many people may identify with more than 1 race and ethnicity; therefore, categories should not be considered absolute or viewed in isolation.

However, there is concern about the use of race in clinical algorithms and some health-based risk scores and databases because of inapplicability to some groups and the potential for discrimination and inappropriate clinical decisions. For example, the use of race to estimate glomerular filtration rates among Black adults has become controversial for several reasons.[39,40,41,42] Oversimplification of racial dichotomies can be harmful, such as in calculating kidney function, especially with racial inequities in kidney care. In this context, health inequities among populations should be addressed rather than focusing solely on differences in racial categories (eg, Black vs White adults with kidney disease).[42] Another example is the Framingham Risk Score, which was originally developed from a cohort of White, middle-class participants in the US included in the Framingham Heart Study and may not accurately estimate risk in other racial and ethnic populations. Similar concerns have been raised about genetic risk studies based on specific populations or that do not include participants from other groups (eg, a genome-wide association study that reports a genetic association with a specific disease or disorder based solely on a population of European descent).[43] Use caution in interpreting or generalizing findings from studies of risk based on populations of individuals representing specific or limited racial and ethnic categories.

11.12.3.3 Guidance for Reporting Race and Ethnicity in Research Articles. The JAMA Network journals include the following guidance for reporting race and ethnicity and other demographic information in research articles in the Instructions for Authors.[44]

Demographic Information: Aggregate, deidentified demographic information (eg, age, sex, race and ethnicity, and socioeconomic indicators) should be reported for research reports along with all prespecified outcomes. Demographic variables collected for a specific study should be indicated in the Methods section. Demographic information assessed should be reported in the Results section, either in the main article or in an online supplement or both. If any demographic characteristics that were collected are not reported, the reason should be stated. Summary demographic information (eg, baseline characteristics of study participants) should be reported in the first line of the Results section of the Abstract.

With regard to the collection and reporting of demographic data on race and ethnicity:

- The Methods section should include an explanation of who identified participant race and ethnicity and the source of the classifications used (eg, self-report or selection, investigator observed, database, electronic health record, survey instrument).
- If race and ethnicity categories were collected for a study, the reasons that these were assessed also should be described in the Methods section. If collection of data on race and ethnicity was required by the funding agency, that should be noted.
- Specific racial and ethnic categories are preferred over collective terms, when possible. Authors should report the specific categories used in their studies and

recognize that these categories will differ based on the databases or surveys used, the requirements of funders, and the geographic location of data collection or study participants. Categories included in groups labeled as "other" should be defined.

- Categories should be listed in alphabetical order in text and tables (see Table 4.1-14, Reporting Race and Ethnicity, in 4.1.10, Guidelines for Preparing and Submitting Tables).
- Race and ethnicity categories of the study population should be reported in the Results section.

Examples

> Reporting race and ethnicity in this study was mandated by the US National Institutes of Health (NIH), consistent with the Inclusion of Women, Minorities, and Children policy. Individuals participating in the poststudy survey were categorized as American Indian or Alaska Native, Asian, Black or African American, Hispanic or Latino, Native Hawaiian or Other Pacific Islander, or White based on the NIH Policy on Reporting Race and Ethnicity Data. Children's race and ethnicity were based on the parents' report.
>
> Race was self-reported by study participants, and race categories (Black and White) were defined by investigators based on the US Office of Management and Budget's Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity. Given that racial residential segregation is distinctively experienced by Black individuals in the US, the analytical sample was restricted to participants who self-identified as Black.
>
> In this genome-wide association study, participants were from 8 African countries (ie, Kenya, Mozambique, Namibia, Nigeria, South Africa, Sudan, Uganda, and Zambia). Any Black African group from any of the 8 African countries (mostly of Bantu descent) was included in the Black African cohort. The South African group composed primarily of multiple racial categories, comprising any admixture combination of individuals of European, Southeast Asian, South Asian, Bantu-speaking African, and/or indigenous Southern African hunter-gatherer ancestries (Khoikhoi, San, or Bushmen), was renamed admixed African individuals. The race and ethnicity of an individual was self-reported.
>
> Data for this study included US adults who self-reported as non-Hispanic Black (hereafter, Black), Hispanic or Latino, and non-Hispanic White (hereafter, White) individuals. We excluded individuals who self-reported being Asian or of other race and ethnicity (which included those who were American Indian or Alaska Native and Native Hawaiian or Other Pacific Islander) because of small sample sizes.

11.12.3.4 Additional Guidance for Use of Racial and Ethnic Collective Terms. Specific racial and ethnic terms are preferred over collective terms, when possible. Authors should report the specific categories used in their studies and recognize that these categories will differ based on the databases or surveys used, the requirements of funders, and the geographic location of data collection or study participants.

When collective terms are used, merging of race and ethnicity with a virgule as "race/ethnicity" is no longer recommended. Instead, "race and ethnicity" is preferred, with the understanding that there are numerous subcategories within race and ethnicity. Given that a virgule often means "and/or," which can be confusing, do not use the virgule construction in this context (see also 8.4, Forward Slash [Virgule, Solidus]).

The general term *minorities* should not be used when describing groups or populations because it is overly vague and implies a hierarchy among groups. Instead, include a modifier when using the word "minority" and do not use the term as a stand-alone noun, for example, *racial and ethnic minority groups* and *racial and ethnic minority individuals*.[33,45] However, even this umbrella term may not be appropriate in some settings. Other terms such as *underserved populations* (eg, when referring to health disparities among groups) or *underrepresented populations* (eg, when referring to a disproportionately low number of individuals in a workforce or educational program) may be used provided the categories of individuals included are defined at first mention.[46] The term *minoritized* may be acceptable as an adjective provided that the noun(s) that it is modifying is included (eg, "racial and ethnic minoritized group"). *Groups that have been historically marginalized* could be suitable in certain contexts if the rationale for this designation is provided and the categories of those included are defined or described at first mention.[33]

The nonspecific group label "other" for categorizing race and ethnicity is uninformative and may be considered pejorative. However, the term is sometimes used for comparison in data analysis when the numbers of those in some subgroups are too small for meaningful analyses. The term should not be used as a "convenience" grouping or label unless it was a prespecified formal category in a database or research instrument. In such cases, the categories included in "other" groups should be defined and reported. Authors are advised to be as specific as possible when reporting on racial and ethnic categories (even if these categories contain small numbers). If the numbers in some categories are so small as to potentially identify study participants, the specific numbers and percentages do not need to be reported provided this is noted. For cases in which the group "other" is used but not defined, the author should be queried for further explanation.

The terms *multiracial* and *multiethnic* are acceptable in reports of studies if the specific categories these terms comprise are defined or if the terms were predefined in a study or database to which participants self-selected. If the criteria for data quality and confidentiality are met, at a minimum, the number of individuals identifying with more than 1 race should be reported. Authors are encouraged to provide greater detail about the distribution of multiple racial and ethnic categories if known. In general, the term *mixed race* may carry negative connotations[34] and should be avoided, unless it was specifically used in data collection; in this case, the term should be defined, if possible. To the extent possible, the specific type of multiracial and multiethnic groups should be delineated.

Example

> In this study, 140 participants (25%) self-reported as multiracial, which included 100 (18%) identifying as Asian and White and 40 (7%) as Black and White.

Other terms may enter the lexicon as descriptors or modifiers for racial and ethnic categories of people. For example, the term *people of color* was introduced to mean all racial and ethnic groups that are not considered White or of European ancestry and as an indication of antiracist, multiracial solidarity. However, there is concern that the term may be "too inclusive," to the point that it erases differences among specific groups.[34,47,48,49] There are similar concerns about use of the collective and abbreviated terms for *Black, Indigenous, and people of color* (*BIPOC*) and Black, Asian, and minority ethnic (*BAME*) (commonly used in the UK). Criticism of these terms has noted that they disregard individuals' identities, do not include all underrepresented groups, eliminate differences among groups, and imply a hierarchy among them.[34,47,48,49] Although these terms may be used colloquially (eg, within an opinion article), preference is to describe or define the specific racial or ethnic categories included or intended to be addressed. These terms should not be used in reports of research, unless the terms are included in a database on which a study is based or specified in a research data collection instrument (eg, survey questionnaire).

In agreement with other guides,[34,45] other terms related to colors, such as *brown* and *yellow*, should not be used to describe individuals or groups. These terms may be less inclusive than intended or considered pejorative or a racial slur.

In addition, avoid collective reference to racial and ethnic minority groups as "non-White." If comparing racial and ethnic groups, indicate the specific groups. Researchers should avoid study designs and statistical comparisons of White groups vs "non-White" groups and should specify racial and ethnic groups included and conduct analyses comparing the specific groups. If such a comparison is justified, authors should explain the rationale and specify what categories are included in the "non-White" group.

11.12.3.5 **Capitalization.** The names of races, ethnicities, and tribes should be capitalized, such as African American, Alaska Native, American Indian, Asian, Black, Cherokee Nation, Hispanic, Kamba, Kikuyu, Latino, and White. There may be sociopolitical instances in which context may merit exception to this guidance, for example, in an opinion piece for which capitalization could be perceived as inflammatory or inappropriate (eg, "white supremacy").

11.12.3.6 **Adjectival Usage for Specific Categories.** Racial and ethnic terms should not be used in noun form (eg, avoid *Asians*, *Blacks*, *Hispanics*, or *Whites*); the adjectival form is preferred (eg, *Asian women, Black patients*, *Hispanic children*, or *White participants*) because this follows AMA style regarding person-first language. The adjectival form may be used as a predicate adjective to modify the subject of a phrase (eg, "the patients self-identified as Asian, Black, Hispanic, or White").[33]

Most combinations of proper adjectives derived from geographic entities are not hyphenated when used as racial or ethnic descriptors. Therefore, do not hyphenate terms such as *Asian American*, *African American*, and *Mexican American,* and similar combinations, and in compound modifiers (eg, *African American patient*).

11.12.3.7 **Geographic Origin and Regionalization Considerations.** Awareness of the relevance of geographic origin and regionalization associated with racial and ethnic

designations is important. In addition, preferred usage may change about the most appropriate designation. For example, the term *Caucasian* had historically been used to indicate the term *White*, but it is technically specific to people from the Caucasus region in Eurasia and thus should not be used except when referring to people from this region.

The terms *African American* or *Black* may be used to describe participants in studies involving populations in the US, following how such information was recorded or collected for the study. However, the 2 terms should not be used interchangeably in reports of research unless both terms were formally used in the study, and the terms should be used consistently within a specific article. For example, among Black people residing in the US, those from the Caribbean may identify as Black but not as African American, whereas Black people whose families have been in the US for several generations may identify as Black and African American. When a study includes individuals of African ancestry in the diaspora, the term *Black* may be appropriate because it does not obscure cultural and linguistic nuances and national origins, such as Dominican, Haitian, and those of African sovereign states (eg, Kenyan, Nigerian, Sudanese), provided that the term was used in the study.

The term *Asian* is a broad category that can include numerous countries of origin (eg, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, Vietnam, and others) and regions (eg, East Asia, South Asia, Southeast Asia).[44] The term may be combined with those from the Pacific Islands as in *Asian or Pacific Islander*. The term *Asian American* is acceptable when describing those who identify with Asian descent among the US population. However, reporting of individuals' self-identified countries of origin is preferred when known. As with other categories, the formal terms used in research collection should be used in reports of studies.

In reference to persons indigenous to North America (and their descendants), *American Indian* or *Alaska Native* is generally preferred to the broader term *Native American*. However, the term *Indigenous* is also acceptable. There are also other specific designations for people from other locations, such as *Native Hawaiian* and *Pacific Islander*.[50,51] If appropriate, specify the nation or peoples (eg, *Inuit*, *Iroquois*, *Mayan, Navajo*, *Nez Perce*, *Samoan*). Many countries have specific categories for Indigenous peoples (eg, *First Nations* in Canada and *Aboriginal* in Australia). Capitalize the first word and use lowercase for *people* when describing persons who are Indigenous or Aboriginal (eg, *Indigenous people, Indigenous peoples of Canada*, *Aboriginal people*). Lowercase *indigenous* when referring to objects, such as *indigenous plants*.

Hispanic, *Latino* or *Latina*, *Latinx*, and *Latine* are terms that have been used for people living in the US of Spanish-speaking or Latin American descent or heritage, but as with other terms, they can include people from other geographic locations.[50,51] *Hispanic* historically has been associated with people from Spain or other Spanish-speaking countries in the Western hemisphere (eg, Cuba, Central and South America, Mexico, Puerto Rico); however, individuals and some government agencies may prefer to specify country of origin.[50,51,52] *Latino* or *Latina* are broad terms that have been used for people of origin or descent from Cuba, Mexico, Puerto Rico, and some countries in Central America, South America, and the Caribbean, but again, individuals may prefer to specify their country of origin.[50,51,52] When possible, a more specific term (eg, *Cuban*, *Cuban American*, *Guatemalan, Latin American*, *Mexican*, *Mexican American*, *Puerto Rican*) should be used. However, as with other categories, the formal terms used in research

collection should be used for reports of studies. For example, some US agencies also include *Spanish origin* when listing Hispanic and Latino. The terms *Latinx* and *Latine* are acceptable as gender-inclusive or nonbinary terms for people of Latin American cultural or ethnic identity in the US. However, editors should avoid reflexively changing *Latino* and *Latina* to *Latinx* or vice versa and should follow author preference. Authors of research reports, in turn, should use the terms that were prespecified in their study (eg, via participant self-report or selection, investigator observed, database, electronic health record, survey instrument).

Description of people as being of a regional descent (eg, of African, Asian, European, or Middle Eastern or North African descent) is acceptable if those terms were used in formal research. However, it is preferable to identify a specific country or region of origin when known and pertinent to the study.

Example

> For the GWAS discovery stage, study participants of African ancestry were recruited from Ghana, Nigeria, South Africa, and the US, where the same phenotype definition was applied to diagnose primary open-angle glaucoma. The second validation meta-analysis included individuals with primary open-angle glaucoma and matched control individuals from Mali, Cameroon, Nigeria (Lagos, Kaduna, and Enugu), Brazil, Saudi Arabia, the Democratic Republic of the Congo, Morocco, and Peru.

For example, it is generally preferable to describe persons of Asian ancestry according to their country or regional area of origin (eg, *Cambodian*, *Chinese*, *Indian*, *Japanese*, *Korean*, *Sri Lankan*, *East Asian*, *Southeast Asian*). Similarly, study participants from the Middle Eastern and North African region should be described using their nation of origin (eg, *Egyptian*, *Iranian*, *Iraqi*, *Israeli*, *Lebanese*) when possible. Individuals of Middle Eastern and North African descent who identify with Arab ancestry and reside in the US may be referred to as *Arab American*. In such cases, researchers should report how categories were determined (eg, self-reported or selected by study participants or from demographic data in databases or other sources).

Note that *Arab* and *Arab American, Asian* and *Asian American, Chinese* and *Chinese American*, *Mexican* and *Mexican American*, and so on are not equivalent or interchangeable.

For studies that use national databases or include participants in a single country, a term for country of origin can be included if the term was provided at data collection (eg, *Chinese American* and *Korean American* for a study performed in the US, or *Han Chinese* and *Zhuang Chinese* for a study conducted in China). Again, how these designations were determined (eg, self-reported or selected or by other means) should be reported.

11.12.3.8 **Abbreviations.** Generally, abbreviations of categories for race and ethnicity should be avoided unless necessary because of space constraints (eg, in tables and figures) or to avoid long, repetitive strings of descriptors. If used, any abbreviations should be clearly explained parenthetically in text or in table and figure footnotes or legends.

11.12.3.9 **Guidance for Journals and Publishers That Collect Data on Editors, Authors, and Peer Reviewers.** Journals and publishers that collect race and ethnicity data on

editors, editorial board members, authors, and peer reviewers should follow principles of confidentiality, privacy, and inclusivity and should permit individuals to self-identify or opt out of such identification. The Joint Commitment on Action for Inclusion and Diversity in Publishing is developing an international list of terms for journals and publishers that collect information on race and ethnicity.[53]

Journals that collect information on race and ethnicity should not permit editorial decisions to be influenced by the demographic characteristics of authors, peer reviewers, editorial board members, or editors. In addition, the collection and use of such data should respect privacy regulations and be secured to prevent disclosure of personally identifiable information. Individual personally identifiable information of authors and peer reviewers should not be accessible to anyone involved in editorial decisions. Such data may be used in aggregate to benchmark and monitor strategies to promote and improve the diversity of journals.

11.12.4 **Age.** Discrimination based on age (young or old) is ageism. Because terms like *seniors, elderly, the aged, aging dependents, old-old, young-old*, and similar "other-ing" terms connote a stereotype, avoid using them. Terms such as *older persons, older people, older adults, older patients, older individuals, persons 65 years and older*, or *the older population* are preferred. Use *older* adults, a term less likely to connote discrimination and negative stereotypes, when describing individuals 65 years old and older.

Note: In studies that involve human beings, age should always be given specifically (eg, "older people aged 75 to 84 years" or "children younger than 12 years") (see 11.7, Age and Sex Referents).

Adultism is a form of ageism in which children and adolescents are discounted.[54,55]

11.12.5 **Socioeconomic Status.** Avoid labeling people with their socioeconomic status, such as *the poor* or *the unemployed*. Instead, terms such as *low income* and *no income* are preferred. See also ***limited-income, low-income, resource-limited, resource poor, transitional***.

11.12.6 **Terms for Persons With Diseases, Disorders, or Disabilities.** Avoid labeling (and thus equating) people with their disabilities or diseases (eg, the blind, schizophrenics, epileptics). Instead, put the person first. Avoid describing persons as *victims* or with other emotional terms that suggest helplessness (*afflicted with, suffering from, stricken with, maimed*). Avoid euphemistic descriptors, such as *physically challenged, special*, or *special needs*.

Avoid	*Preferred*
AIDS victim, stroke victim	person with AIDS, person who has had a stroke
alcoholic, addict, user, abuser	she was addicted, people with opiate addiction, he misused drugs and alcohol
asthmatics	patient with asthma, asthma group
the blind, the visually impaired	blind people, those with visual impairment

Avoid	*Preferred*
confined (bound) to a wheelchair	uses a wheelchair
crippled, lame, deformed	physically disabled
the deaf	deaf persons, deaf adults, deaf culture or community
diabetics	persons with diabetes, study participants in the diabetes group
the disabled, the handicapped	persons with disability
disabled child, mentally ill person, retarded adult	child with a disability, person with mental illness, adult with intellectual disability
epileptic	person affected by epilepsy, patient with epilepsy
the infirm	patients with long-term illness

Avoid metaphors that may be inappropriate or insensitive and do not translate well (blind to the truth, deaf to the request). For similar reasons, some publications avoid the term *double-blind* when referring to a study's methods.

Note: Some manuscripts use certain phrases many times, and changing, for example, "AIDS patients" to "persons with AIDS" at every occurrence may result in awkward and stilted text. In such cases, the adjectival form may be used, although this is not preferred.

11.12.7 Sexual Orientation. Sexual orientation should be indicated in a manuscript only when scientifically relevant. The term *sexual preference* should be avoided because it implies a voluntary choice of sexual orientation not supported by the scientific literature. In some contexts, reference to specific sexual behaviors (eg, *men who have sex with men*) may be more relevant than *sexual orientation*.

The nouns *lesbians* and *gay men* are preferred to the broader term *homosexuals* when referring to specific groups. Avoid using *gay* or *gays* as a noun. *Heterosexual, homosexual, bisexual, asexual*, and *intersex* may be used as adjectives (eg, *heterosexual men*).

A member of a heterosexual or homosexual couple may be referred to as *spouse, companion, partner*, or *life partner. Same-sex couple* and *same-sex marriage* are appropriate terms.

See also *LGBTQAI* in 13.11 Clinical, Technical, and Other Common Terms, the GLAAD Reference Guide-Transgender Issues website,[16] and the Gender Equity Resource Center website.[17]

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