GLOSSARY

Term	Definition
Absolute difference	The absolute difference in rates of good or harmful outcomes between experimental groups (experimental event rate, or EER) and control groups (control event rate, or CER), calculated as the event rate in the experimental group minus the event rate in the control group (EER – CER). For instance, if the rate of adverse events is 20% in the control group and 10% in the treatment group, the absolute difference is 20% – 10% = 10%.
Absolute risk	The risk of an event (eg, if 10 of 100 patients have an event, the absolute risk is 10% expressed as a percentage, or 0.10 expressed as a proportion).
Absolute risk increase	The absolute arithmetic difference in rates of harmful outcomes between experimental groups (experimental event rate, or EER) and control groups (control event rate, or CER), calculated as rate of harmful outcome in experimental group minus rate of harmful outcome in control group (EER – CER). Typically used to describe a harmful exposure or intervention (eg, if the rate of adverse outcomes is 20% in treatment and 10% in control, the absolute risk increase would be 10% expressed as a percentage and 0.10 expressed as a proportion). See also Absolute risk reduction; Number needed to harm.
Absolute risk reduction	The absolute difference (risk difference) in rates of harmful outcomes between experimental groups (experimental event rate, or EER) and control groups (control event rate, or CER), calculated as the rate of harmful outcome in the control group minus the rate of harmful outcome in the experimental group (CER – EER). Typically used to describe a beneficial exposure or intervention (eg, if 20% of patients in the control group have an adverse event, as do 10% among treated patients, the ARR or risk difference would be 10% expressed as a percentage or 0.10 expressed as a proportion).

Term	Definition
Academic detailing	A strategy for changing clinician behavior. Use of a trained person who meets with professionals in their practice settings to provide information with the intent of changing their practice. The pharmaceutical industry frequently uses this strategy, to which the term detailing is applied. Academic detailing is such an interaction initiated by an academic group or institution rather than the pharmaceutical industry.
Active alternatives	The set of diagnoses that can plausibly explain a patient's presentation. See also Differential diagnosis.
Additive	Describes any trait that increases proportionately in expression when comparing those with no copy, 1 copy, or 2 copies of that allele, ie, those with 1 copy of the allele show more of the trait than those without, and in turn, those with 2 copies show more of the trait than those with 1 copy.
Adherence	Extent to which patients carry out health care recommendations, or the extent to which health care providers carry out the diagnostic tests, monitoring equipment, interventional requirements, and other technical specifications that define optimal patient management.
Adjusted analysis	An adjusted analysis takes into account differences in prognostic factors (or baseline characteristics) between groups that may influence the outcome. For instance, when comparing an experimental and control intervention, if the experimental group is on average older, and thus at higher risk of an adverse outcome than the control group, the analysis adjusted for age will show a larger treatment effect than the unadjusted analysis. See also Cox regression model.
Alerting systems	A strategy for changing clinician behavior. A type of computer decision support system that alerts the clinician to a circumstance that might require clinical action (eg, a system that highlights out-of-range laboratory values). See also Reminder systems.
Algorithm	An explicit description of an ordered sequence of steps with branching logic that can be applied under specific clinical circumstances. The logic of an algorithm is as follows: if a, then do x; if b, then do y; etc.
Allele	One of several variants of a gene, usually referring to a specific site within the gene.
Alpha level	The probability of erroneously concluding there is a difference between comparison groups when there is in fact no difference (type I error). Typically, investigators decide on the chance of a false-positive result they are willing to accept when they plan the sample size for a study (eg, investigators often set alpha level at 0.05).

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Term	Definition
Alvarado model	The Alvarado model is a clinical decision rule for diagnosing appendicitis. This model uses the MANTRELS mnemonic to examine 8 findings from the medical history or the examination, and the resulting score provides guidance on whether to operate in the setting of suspected appendicitis. Of 10 potential points, patients with a score of 7 or higher are considered "positive" and are more likely to have appendicitis. The various components are **M**igration (1 point), **A**norexia-acetone (1), **N**ausea-vomiting (1), **T**enderness in RLQ (2), **R**ebound pain (1), **E**levation of temperature (1), **L**eukocytosis (2), and **S**hift to the left of normal WBC count (1). See Table 5-5 in *The Rational Clinical Examination*.
Amoss sign	In patients with severe meningeal irritation, the patient may spontaneously assume the tripod position (also called Amoss sign or Hoyne sign), sitting on the edge of the bed with the knees and hips flexed, the back arched lordotically, the neck extended, and the arms brought back to support the thorax.
Anchor	An independent standard that is itself interpretable and at least moderately correlated with the instrument being explored. The anchor is usually designed to establish a minimum important difference (MID) in change.
Arthralgia	Joint pain.
Atelectasis	Loss of air in all or part of the lung (collapse).
Autocorrelation	Occurs when the likelihood of an observation is not independent of its relationship with other observations. For example, autocorrelation occurs when a good day for a patient with chronic disease is more likely to follow a "good day" than a "bad day."
Background questions	These clinical questions are about physiology, pathology, epidemiology, and general management and are often asked by clinicians in training. The answers to background questions are often best found in textbooks or narrative review articles.
Barrel chest sign	The anterior-posterior dimension of the chest increases in relation to the lateral dimensions, giving the shape of a barrel. This occurs in conditions that result in hyperinflation of the lung.
Base case	In an economic evaluation, the base case is the best estimates of each of the key variables that bear on the costs and effects of the alternative management strategies.
Baseline characteristics	Factors that describe study participants at the beginning of the study (eg, age, sex, disease severity); in comparison studies, it is important that these characteristics be initially similar between groups; if not balanced or if the imbalance is not statistically adjusted, these characteristics can cause confounding and can bias study results.

Term	Definition
Baseline risk	The proportion or percentage of study participants in the control group in whom an adverse outcome is observed. See also Absolute risk.
Bayesian analysis	An analysis that starts with a particular probability of an event (the prior probability) and incorporates new information to generate a revised probability (a posterior probability). The approach to diagnosis assumes that diagnosticians are intuitive Bayesian thinkers and move from pretest to posttest probabilities as information accumulates.
Before-after design	Study in which the investigators compare the status of a group of study participants before and after the introduction of an intervention. See also Crossover study.
Bias	A systematic error in the design, conduct, or interpretation of a study that may cause a systematic deviation from the underlying truth (eg, overestimation of a treatment effect because of failure to randomize).
Blind	Patients, clinicians, data collectors, outcome adjudicators, or data analysts unaware of which patients have been assigned to the experimental or control group. In the case of diagnostic tests, those interpreting the test results are unaware of the result of the reference standard or vice versa. See also Concealment.
Boas sign	Originally, this sign referred to point tenderness in the region to the right of the 10th to 12th thoracic vertebrae, but contemporary sources describe hyperesthesia to light touch in the right upper quadrant or infrascapular area.
Boolean operators	Words used when searching electronic databases. These operators are AND, OR, and NOT and are used to combine terms (AND/OR) or exclude terms (NOT) from the search strategy.
Bootstrap technique	A statistical technique for estimating parameters such as standard errors and confidence intervals based on resampling from an observed data set with replacement from the original sample.
Bronchiolitis	Inflammation of the bronchioles.
Brudzinski sign	Meningeal inflammation and irritation that elicits a protective reflex to prevent stretching of the inflamed and hypersensitive nerve roots, which is detectable clinically as neck stiffness or Kernig or Brudzinski signs. A Brudzinski sign (also known as the "nape of the neck" sign) is present when passive neck flexion in a supine patient results in flexion of the knees and hips.
Candidate gene study	A study that evaluates association of specific genetic variants with outcomes or traits of interest, selecting the variants to be tested according to explicit considerations (known or postulated biology or function, previous studies, etc).

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Term	Definition
Case reports	Descriptions of individual patients.
Case series	A report of a study of a collection of patients treated in a similar manner, without a control group. For example, a clinician might describe the characteristics of an outcome for 25 consecutive patients with diabetes who received education for prevention of foot ulcers.
Case study	In qualitative research, an exploration of a case defined by some boundaries or contemporary phenomena usually within a real-life context.
Case-control study	A study designed to determine the association between an exposure and outcome in which patients are sampled by outcome. Those with the outcome (cases) are compared to those without the outcome (controls) with respect to exposure to the suspected harmful agent.
Castell sign	A sign that indicates splenomegaly. The patient is placed in the supine position. Percussion is carried out in the lowest intercostal space in the left anterior axillary line in both expiration and full inspiration. In a normal expiration result, the percussion note remains resonant throughout this maneuver. Splenomegaly is diagnosed when the percussion note is dull or becomes dull on full inspiration.
Categorical variable	A categorical variable may be nominal or ordinal. Categorical variables can be defined according to attributes without any associated order (eg, medical admission, elective surgery, or emergency surgery); these are called nominal variables. A categorical variable can also be defined according to attributes that are ordered (eg, height such as high, medium, or low); these are called ordinal variables.
CDSS intervention	A clinical decision support system (CDSS) intervention is used with individual patients to guide diagnosis and therapy, plus provide feedback on performance and tips on patient management.
Chadwick sign	When the mucous membranes of the vulva, vagina, and cervix become congested and take on a bluish-violet hue.
Chance-corrected agreement	The proportion of possible agreement achieved beyond what one would expect by chance alone, often measured by the kappa statistic.
Chance-independent agreement	The proportion of possible agreement achieved that is independent of chance and unaffected by the distribution of ratings, as measured by the ϕ statistic.
Channeling bias	Tendency of clinicians to prescribe treatment based on a patient's prognosis. As a result of the behavior, in observational studies, treated patients are more or less likely to be high-risk patients than untreated patients, leading to biased estimate of treatment effect. See also Bias.

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Term	Definition
Checklist effect	1. The effect on clinicians' behavior of having them record information, or their orders, using a structured data collection form. 2. The improvement seen in medical decision making because of more complete and structured data collection (eg, clinicians fill out a detailed form, so their decisions improve).
Chi-square test	A nonparametric test of statistical significance used to compare the distribution of categorical outcomes in two or more groups, the null hypothesis of which is that the underlying distributions are identical.
Chromosome	Self-replicating structures in the nucleus of a cell that carry the genetic information.
Circumcision	The cutting off of the foreskin of males as a sanitary measure in modern surgery or as a religious rite.
Cirrhosis	Widespread disruption of normal liver structure by fibrosis and the formation of regenerative nodules that is caused by various chronic progressive conditions affecting the liver (such as long-term alcohol abuse or hepatitis).
Clinical decision support system	A strategy for changing clinician behavior. An information system used to integrate clinical and patient information and provide support for decision-making in patient care. See also Computer decision support system.
Clinical gestalt	The physician's overall intuitive sense of the likelihood of disease established after the clinical evaluation of the patient. The clinical evaluation may include risk factors, history, symptoms, signs, and basic laboratory or radiological studies.
Clinical practice guidelines	A strategy for changing clinician behavior. Systematically developed statements or recommendations to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances. They present indications for performing a test, procedure, or intervention, or the proper management for specific clinical problems. Guidelines may be developed by government agencies, institutions, organizations such as professional societies or governing boards, or by convening expert panels.
Clinical prediction rules	A guide for practice that is generated by initially examining, and ultimately combining, a number of variables to predict the likelihood of a current diagnosis or a future event. Sometimes, if the likelihood is sufficiently high or low, the rule generates a suggested course of action.
Closed fist sign	Paresthesias in the distribution of the median nerve when the patient actively flexes the fingers into a closed fist for 60 seconds.

Term	Definition
Cluster analysis	A statistical procedure in which the unit of analysis matches the unit of randomization, which is something other than the patient or participant (eg, school, clinic).
Cluster assignment	The assignment of groups (eg, schools, clinics) rather than individuals to intervention and control groups. This approach is often used when assignment by individuals is likely to result in contamination (eg, if adolescents within a school are assigned to receive or not receive a new sex education program, it is likely that they will share the information they learn with one another; instead, if the unit of assignment is schools, entire schools are assigned to receive or not receive the new sex education program). Cluster assignment is typically randomized, but it is possible (though not advisable) to assign clusters to treatment or control by other methods.
Cochrane Q	A common test for heterogeneity that assumes the null hypothesis that all the apparent variability between individual study results is due to chance. Cochrane Q generates a probability, presented as a P value, based on a χ^2 distribution, that between-study differences in results equal to or greater than those observed are likely to occur simply by chance.
Cohort	A group of persons with a common characteristic or set of characteristics. Typically, the group is followed for a specified period of time to determine the incidence of a disorder or complications of an established disorder (prognosis). See also Cohort study.
Cohort study	When used to study potential causes of a disorder, it is a prospective investigation in which a cohort of individuals who do not have evidence of an outcome of interest but who are exposed to the putative cause are compared with a concurrent cohort who are also free of the outcome but not exposed to the putative cause. Both cohorts are then followed forward in time to compare the incidence of the outcome of interest. When used to study the effectiveness of an intervention, it is a prospective investigation in which a cohort of individuals who receive the intervention are compared with a concurrent cohort who do not receive the intervention. Both cohorts are then followed forward in time to compare the incidence of the outcome of interest. Cohort studies can be conducted retrospectively in the sense that someone other than the investigator has followed patients, and the investigator obtains the data base and then examines the association between exposure and outcome. See also Inception cohort.
Cointerventions	Intervention other than intervention under study that affect the outcome of interest and that may be differentially applied to intervention and control groups and, thus, potentially bias the results of a study.

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Term	Definition
Comorbidity	Disease(s) or conditions that coexist(s) in study partici- pants in addition to the index condition that is the sub- ject of the study.
Complete follow-up	The investigators are aware of the outcome in every patient who participated in a study.
Composite endpoint	When investigators measure the effect of treatment on an aggregate of endpoints of various importance. Inferences from composite endpoints are strongest in the rare situations in which (1) the component end- points are of similar patient-importance, (2) the end- points that are more important occur with at least similar frequency to those that are less important, and (3) strong biologic rationale supports results that, across component endpoints, show similar relative risks with sufficiently narrow confidence intervals.
Computer decision support system	A strategy for changing clinician behavior. Computer- based information systems used to integrate clinical and patient information and provide support for deci- sion making in patient care. In clinical decision support systems (CDSSs) that are computer based, detailed individual patient data are entered into a computer program and are sorted and matched to programs or algorithms in a computerized database, resulting in the generation of patient-specific assessments or recom- mendations. CDSSs can have the following purposes: alerting, reminding, critiquing, interpreting, predicting, diagnosing, and suggesting. See also Clinical decision support system.
Concealment	Randomization is concealed if the person who is making the decision about enrolling a patient is unaware of whether the next patient enrolled will be entered in the intervention or control group (using techniques such as central randomization or sequen- tially numbered opaque, sealed envelopes). If ran- domization is not concealed, patients with better prognoses may tend to be preferentially enrolled in the active intervention arm, resulting in exaggeration of the apparent benefit of intervention (or even falsely concluding that the intervention is effica- cious). See also Blind.
Concepts	The basic building blocks of theory.
Conceptual framework	An organization of interrelated ideas or concepts that provides a system of relationships between those ideas or concepts.
Conditional probabilities	The probability of a particular state, given another state (i.e., the probability of A, given B).
Confidence interval	Range between two values within which it is proba- ble that the true value lies for the whole population of patients from which the study patients were selected.

Term	Definition
Conflict of interest	A conflict of interest exists when investigators, authors, institutions, reviewers, and/or editors have financial or nonfinancial relationships with other persons or organizations (eg, study sponsors) or personal investments in research projects or the outcomes of projects that may inappropriately influence their interpretation or actions. Conflicts of interest can lead to biased design, conduct, analysis, and interpretation of study results.
Confounder	1. A factor that distorts the true relationship of the study variable of interest by virtue of also being related to the outcome of interest. Confounders are often unequally distributed among the groups being compared. Randomized studies are less likely to have their results distorted by confounders than are observational studies. 2. A factor that is associated with the outcome of interest and is differentially distributed in patients exposed and unexposed to the outcome of interest.
Consecutive sample	A sample in which all potentially eligible patients seen over a period of time are enrolled. See also Case series.
Construct validity	A construct is a theoretically derived notion of the domain(s) we wish to measure. An understanding of the construct will lead to expectations about how an instrument should behave if it is valid. Construct validity therefore involves comparisons between measures and examination of the logical relationships, which should exist between a measure and characteristics of patients and patient groups.
Contamination	Occurs when participants in either the experimental or control group receive the intervention intended for the other arm of the study.
Continuous variable	A variable that can theoretically take any value and in practice can take a large number of values with small differences between them (eg, height). Continuous variables are also sometimes called interval data.
Control group	A group that does not receive the experimental intervention. In many studies, the control group receives either usual care or a placebo.
Convenience sample	Individuals or groups selected at the convenience of the investigator or primarily because they were available at a convenient time or place.
Corollary orders	Orders that are needed to detect or ameliorate adverse reactions.
Correlation	The magnitude of the relationship between two different variables or phenomena.
Correlation coefficient	A numerical expression of the magnitude and direction of the relationship between two variables, which can take values from −1.0 (perfect negative relationship) to 0 (no relationship) to 1.0 (perfect positive relationship).

Term	Definition
Cost analysis	An economic analysis in which only costs of various alternatives are compared. This comparison informs only the resource-use half of the decision (the other half being the expected outcomes).
Cost-benefit analysis	An economic analysis in which both the costs and the consequences (including increases in the length and quality of life) are expressed in monetary terms.
Cost-effectiveness acceptability curve	The cost-effectiveness acceptability is plotted on a graph that relates the maximum one is willing to pay for a particular treatment alternative (eg, how many dollars one is willing to pay to gain 1 life-year) on the x-axis to the probability that a treatment alternative is cost-effective compared with all other treatment alternatives on the y-axis. The curves are generated from uncertainty around the point estimates of costs and effects in trial-based economic evaluations or uncertainty around values for variables used in decision analytic models. As one is willing to pay more for health outcomes, treatment alternatives that initially might be considered unattractive (eg, a high cost per life-year saved) will have a higher probability of becoming more cost-effective. Cost-effectiveness acceptability curves are a convenient method of presenting the effect of uncertainty on economic evaluation results on a single figure instead of through the use of numerous tables and figures of sensitivity analyses.
Cost-effectiveness analysis	An economic analysis in which the consequences are expressed in natural units. Examples include cost per life saved or cost per unit of blood pressure lowered.
Cost-effectiveness efficiency frontier	The cost and effectiveness results of each treatment alternative from an economic evaluation can be graphed on a figure known as the cost-effectiveness plane. The cost-effectiveness plane plots cost on the vertical axis (i.e., positive infinity at the top and negative infinity and the bottom) and effects such as life-years on the horizontal axis (i.e., negative infinity at the far left and positive infinity at the far right). One treatment alternative such as usual care is plotted at the origin (i.e., 0, 0), and all other treatment alternatives are plotted relative to the treatment at the origin. Treatment alternatives are considered dominated if they have both higher costs and lower effectiveness relative to any other. Line segments can be drawn connecting the nondominated treatment alternatives and the combination of line segments that join these nondominated treatment alternatives is referred to as the cost-effectiveness efficiency frontier. Constructed in this way, any treatment alternative that lies above the cost-effectiveness efficiency frontier is considered to be inefficient (dominated) by a treatment alternative or combination of alternatives on the efficiency frontier.
Cost-minimization analysis	An economic analysis conducted in situations in which the consequences of the alternatives are identical, and the only issue is their relative costs.

Term	Definition
Cost-to-charge ratio	Where there is a systematic deviation between costs and charges, an economic analysis may adjust charges using a cost-to-charge ratio to approximate real costs.
Cost-utility analysis	A type of economic analysis in which the consequences are expressed in terms of life-years adjusted by people's preferences. Typically, one considers the incremental cost per incremental gain in quality-adjusted life years (QALYs). See also Quality-adjusted life-year.
Courvoisier sign	A palpable, nontender gallbladder in a patient with jaundice.
Cox regression model	A regression technique that allows adjustment for known differences in baseline characteristics between intervention and control groups applied to survival data. See also Adjusted analysis.
Credibility	In qualitative research, a term used instead of validity to reflect whether the investigators engaged thoroughly and sensitively with the material and whether the investigators' interpretations are credible. Signs of credibility can be found not only in the procedural descriptions of methodology but also through an assessment of the coherence and depth of the findings reported.
Critical theory	A qualitative research tradition focused on understanding the nature of power relationships and related constructs, often with the intention of helping to remedy systemic injustices in society.
Critiquing	A strategy for changing clinician behavior. A decision support approach in which the computer evaluates a clinician's decision and generates an appropriateness rating or an alternative suggestion.
Cronbach α coefficient	Cronbach α is an index of reliability homogeneity or internal consistency of items on a measurement instrument. The Cronbach α rises with the magnitude of the interitem correlation and with the number of items.
Cross-product ratio	A ratio of the odds of an event in an exposed group to the odds of the same event in a group that is not exposed.
Crossover study	A study design in which all patients are switched, in a specified or random order, to the alternate intervention after a specified period of time. See also Before-after design.
Cross-sectional study	The observation of a defined population at a single point in time or during a specific time interval. Exposure and outcome are determined simultaneously.
Curtain sign	Also known as "enhanced ptosis" or "paradoxic ptosis", the curtain sign is usually observed in patients with some initial ptosis. The patient looks straight ahead and refrains from blinking. The examiner holds one eye open, which results in the other lid starting to droop more (like a curtain falling).

Term	Definition
Data completeness bias	Using a computer decision support system (CDSS) to log episodes in the intervention group and using a manual system in the non-CDSS control group can create variation in the completeness of data. See also Bias.
Data-dredging	Searching a data set for differences between groups on particular outcomes, or in subgroups of patients, without explicit *a priori* hypotheses.
de Musset head-bobbing sign	A peripheral hemodynamic sign traditionally associated with aortic regurgitation. The de Musset head-bobbing sign consists of a forward shaking of the head with every heartbeat. It is best observed in patients who are sitting.
Decision aid	A tool that endeavors to present patients with the benefits and harms of alternative courses of action in a manner that is quantitative, comprehensive, and understandable.
Decision analysis	A systematic approach to decision making under conditions of uncertainty. It involves identifying all available alternatives and estimating the probabilities of potential outcomes associated with each alternative, valuing each outcome, and, on the basis of the probabilities and values, arriving at a quantitative estimate of the relative merit of the alternatives.
Decision tree	Most clinical decision analyses are built as decision trees, and the articles usually will include one or more diagrams showing the structure of the decision tree used for the analysis.
Degrees of freedom	A technical term in a statistical analysis that has to do with the power of the analysis. The more degrees of freedom, the more powerful the analysis. The degrees of freedom typically refers to the number of observations in a sample less the number of unknown parameters estimated for the model. It reflects a sort of adjusted sample size, with the adjustment based on the number of unknowns that need to be estimated in a model. For example, in a 2-sample t test, the degrees of freedom is $n1 + n2 - 1 - 1$, because there are $n1 + n2$ subjects altogether and 1 mean estimated in one group and 1 mean in another, giving $n1 + n2 - 2$.
Deontological	A deontological approach to distributive justice holds that the clinician's only responsibility should be to best meet the needs of the individual under his or her care. An alternative to the consequentialist or utilitarian view.
Detection bias	The tendency to look more carefully for an outcome in one of the comparison groups. Also known as surveillance bias. See also Bias.
Determinants of outcome	The causal factors that most strongly determine whether or not a target event will occur.

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Term	Definition
Dichotomous outcome	A categorical variable that can take one of two discrete values rather than an incremental value on a continuum (eg, pregnant or not pregnant, dead or alive).
Dichotomous variable	A variable that can take one of two discrete values rather than values incrementally placed along a continuum (eg, male or female, pregnant or not pregnant, dead or alive).
Differential diagnosis	The set of diagnoses that can plausibly explain a patient's presentation. See also Active alternatives.
Differential verification bias	When test results influence the choice of the reference standard (eg, test-positive patients undergo an invasive test to establish the diagnosis, whereas test-negative patients undergo long-term follow-up without application of the invasive test), the assessment of test properties may be biased. See also Bias; Verification bias.
Dipstick urinalysis	A chemical analysis of urine performed by using urine dipsticks, in which the test results can be read as color changes.
Disability-adjusted life-years	The number of years of life after downward adjustment for disabilities that patients experience. See also Quality-adjusted life-year.
Discriminant analysis	A statistical technique, similar to logistic regression analysis, that identifies variables that are associated with the presence or absence of a particular categorical (nominal) outcome.
Disease-specific health-related quality of life	Disease-specific HRQL measures evaluate the full range of patients' problems and experiences relevant to a specific condition or disease. See also Health-related quality of life.
Document analysis	In qualitative research, this is one of 3 basic data collection methods. It involves the interpretive review of written material.
Dominant	Describes any trait that is expressed in a heterozygote, ie, one copy of that allele is sufficient to manifest its effect.
Dominate	In economic evaluation, if the intervention of interest is both more effective and less costly than the control strategy, it is said to dominate the alternative.
Dose-response gradient	Exists when the risk of an outcome changes in the anticipated direction as the quantity or the duration of exposure to the putative harmful or beneficial agent increases.
Downstream costs	Costs due to resources consumed in the future and associated with clinical events in the future that are attributable to the intervention.
Drug class effects	Similar effects produced by most or all members of a class of drugs (eg, beta blockers, calcium antagonists, or angiotensin converting enzyme inhibitors).

Term	Definition
Dysuria	Painful urination.
Ecological study	Ecologic studies examine relationships between groups of individuals with exposure to a putative risk factor and an outcome. Exposures are measured at the population, community, or group level rather than at the individual level. Ecologic studies can provide information about an association; however, they are prone to bias: the ecologic fallacy. The ecologic fallacy holds that relationships observed for groups necessarily hold for individuals (eg, if countries with more dietary fat have higher rates of breast cancer, then women who eat fatty foods must be more likely to get breast cancer). These inferences may be correct but are only weakly supported by the aggregate data.
Economic analysis	1. A set of formal, quantitative methods used to compare two or more treatments, programs, or strategies with respect to their resource use and their expected outcomes. 2. Comparative analysis of alternative courses of action in terms of both their costs and consequences.
Educational meetings	A strategy for changing clinician behavior. Participation of professionals in workshops that include interaction and discussion.
Educational outreach visits	See Academic detailing.
Effect size	The difference in outcomes between the intervention and control groups divided by some measure of variability, typically the standard deviation.
Efficiency	Technical efficiency is the relationship between inputs (costs) and outputs (in health, quality-adjusted life-years [QALYs]). Interventions that provide more QALYs for the same or fewer resources are more efficient. Technical efficiency is assessed using cost minimization, cost-effectiveness, and cost-utility analysis. Allocative efficiency recognizes that health is not the only goal that society wishes to pursue, so competing goals must be weighted and then related to costs. This is typically done through cost-benefit analysis.
Efficiency frontier	When the cost and effectiveness results of an economic evaluation are graphed on a cost-effectiveness plane along with incremental cost-effectiveness ratios, the resultant line segments are referred to as the efficiency frontier. Any strategy that has a base-case cost-effectiveness that is above the efficiency frontier would be considered dominated.
Endpoint	Health event or outcome that leads to completion or termination of follow-up of an individual in a trial or cohort study (eg, death or major morbidity). See also Treatment target.

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Term	Definition
Equivalence studies	Trials that estimate treatment effects that exclude any patient-important superiority of interventions under evaluation. Equivalence trials require *a priori* definition of the smallest difference in outcomes between these interventions that patients would consider large enough to justify a preference for the superior intervention (given the intervention's harms and burdens). The confidence interval for the estimated treatment effect at the end of the trial should exclude that difference for the authors to claim equivalence (i.e., the confidence limits should be closer to zero than the minimal patient-important difference). This level of precision often requires investigators to enroll large numbers of patients with large numbers of events. Equivalence trials are helpful when investigators want to see whether a cheaper, safer, simpler (or increasingly often, better method to generate income for the sponsor) intervention is neither better nor worse (in terms of efficacy) than a current intervention. Claims of equivalence are frequent when results are not significant, but one must be alert to whether the confidence intervals exclude differences between the interventions that are as large as or larger than those patients would consider important. If they do not, the trial is indeterminate rather than yielding equivalence.
Erythema migrans	A red rash that expands over time and that occurs at the site of a tick bite. The rash may have an area of central clearing. Lyme disease is the most common cause of erythema migrans.
Ethnography	In qualitative research, an approach to inquiry that focuses on the culture or subculture of a group of people to try to understand the world view of those under study.
Event rate	Proportion or percentage of study participants in a group in which an event is observed. Control event rate (CER) and experimental event rate (EER) are used to refer to event rates in control groups and experimental groups of study participants, respectively. See also Treatment effect; Baseline risk.
Evidence	A broad definition of evidence is any empirical observation, whether systematically collected or not. The unsystematic observations of the individual clinician constitute one source of evidence. Physiologic experiments constitute another source. Clinical research evidence refers to systematic observation of clinical events.
Evidence-based experts	Clinicians who can, in a sophisticated manner, independently find, appraise, and judiciously apply the best evidence to patient care.

Term	Definition
Evidence-based medicine	1. The conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. Evidence-based clinical practice requires integration of individual clinical expertise and patient preferences with the best available external clinical evidence from systematic research, and consideration of available resources. 2. Evidence-based medicine (EBM) can be considered a subcategory of evidence-based health care, which also includes other branches of health care practice such as evidence-based nursing or evidence-based physiotherapy. EBM subcategories include evidence-based surgery and evidence-based cardiology. See also Evidence-based practice.
Evidence-based policy making	Policy making is evidence based when practice policies (eg, use of resources by clinicians), service policies (eg, resource allocation, pattern of services), and governance policies (eg, organizational and financial structures) are based on research evidence of benefit or cost-benefit.
Evidence-based practice	The conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. Evidence-based clinical practice (or evidence-based health care) requires integration of individual clinical expertise and patient preferences with the best available external clinical evidence from systematic research, and consideration of available resources.
Evidence-based practitioners	Clinicians who can differentiate evidence-based summaries and recommendations from those that are not evidence-based and understand results sufficiently well to apply them judiciously in clinical care, ensuring decisions are consistent with patients' values and preferences.
Exclusion criteria	The characteristics that render potential subjects ineligible to participate in a particular study or that render studies ineligible for inclusion in a systematic review.
Experimental event rate	Proportion or percentage of study participants in the experimental or intervention group in whom an event is observed.
Experimental studies	In contrast with Observational studies, studies in which the investigators control which patients are exposed to health care interventions and which are not exposed or are exposed to alternate (control) interventions.
Experimental therapy	A therapeutic alternative to standard or control therapy, which is often a new intervention or different dose of a standard drug.
Explode	When searching MEDLINE, the "explode" command identifies all articles that have been indexed using a given MeSH term as well as articles indexed using more specific terms.

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Term	Definition
Exposure	A condition to which patients are exposed (either a potentially harmful agent or a potentially beneficial one) that may have an impact on their health.
Face validity	The extent to which a measurement instrument appears to measure what it is intended to measure.
Fail-safe N	The minimum number of undetected studies with negative results that would be needed to change the conclusions of a meta-analysis. A small fail-safe N suggests that the conclusion of the meta-analysis may be susceptible to publication bias.
False negative	Those who have the target disorder but the test incorrectly identifies them as not having it.
False positive	Those who do not have the target disorder, but the test incorrectly identifies them as having it.
Feedback effect	1. The impact of performance evaluations on clinicians' behavior. 2. The improvement seen in medical decision because of performance evaluation and feedback.
Feeling thermometer	A feeling thermometer is a visual analogue scale presented as a thermometer, typically with markings from 0 to 100, with 0 representing death and 100 full health. Respondents use the thermometer to indicate their utility rating of their health state or of a hypothetical health state.
Fixed-effects models	A model to generate a summary estimate of the magnitude of effect in a meta-analysis that restricts inferences to the set of studies included in the metaanalysis and assumes that a single true value underlies all of the primary study results. The assumption is that if all studies were infinitely large, they would yield identical estimates of effect; thus, observed estimates of effect differ from one another only because of random error. This model takes only within-study variation into account and not between-study variation.
Flick sign	When asking the patient, "What do you actually do with your hand(s) when the symptoms are at their worst?" the patient demonstrates a flicking movement of the wrist and hand, similar to that used in shaking down a thermometer.
Focus group	A small group of individuals (typically gatherings of four to eight people with similar background or experience) who meet together and are asked questions by a moderator about a given topic.
Follow-up	The extent to which investigators are aware of the outcome in every patient who participated in a study.
Follow-up (complete)	The investigators are aware of the outcome in every patient who participated in a study.

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Term	Definition
Foreground questions	These clinical questions are more commonly asked by seasoned clinicians. They are questions asked when browsing the literature (eg, what important new information should I know to optimally treat my patients?) or when problem solving (eg, defining specific questions raised in caring for patients, and then consulting the literature to resolve these problems).
Funnel plot	A graphic technique for assessing the possibility of publication bias in a systematic review. The effect measure is typically plotted on the horizontal axis and a measure of the random error associated with each study on the vertical axis. In the absence of publication bias, because of sampling variability, the graph should have the shape of a funnel. If there is bias against the publication of null results or results showing an adverse effect of the intervention, one quadrant of the funnel plot will be partially or completely missing.
Generalizability	The degree to which the results of a study can be generalized to settings or samples other than the ones studied.
Generic health-related quality of life	Generic health-related quality of life (HRQL) measures contain items covering all relevant areas of HRQL. They are designed for administration to people with any kind of underlying health problem (or no problem at all). Generic HRQL measures allow comparisons across diseases or conditions. See also Health-related quality of life.
Genetic heterogeneity	A situation in which a particular phenotype may result from more than one genetic variant.
Genetic marker	A specific genetic variant known to be associated with a recognizable trait.
Genome	The entire collection of genetic information (or genes) that an organism possesses.
Genome-wide association (GWA) study	A study that evaluates association of genetic variation with outcomes or traits of interest by using 100 000 to 1 000 000 or more markers across the genome.
Genotype	The genetic constitution of an individual, either overall or at a specific gene.
Gold standard	A method having established or widely accepted accuracy for determining a diagnosis that provides a standard to which a new screening or diagnostic test can be compared. The method need not be a single or simple procedure but could include follow-up of patients to observe the evolution of their conditions or the consensus of an expert panel of clinicians.
Goodell sign	Softening of the cervix on bimanual examination. May be detected by 8 weeks' gestational age. The progressive edema that develops during pregnancy softens the consistency of the cervix tip to approximate that of the lips (Goodell sign).

Term	Definition
Guarding, involuntary	A reflexive spasm of the abdominal musculature in the setting of peritoneal irritation, such as with appendicitis, which cannot be overcome by distraction (also referred to as rigidity).
Guarding, voluntary	Contraction of the abdominal musculature, often due to fear of pain rather than actual pain, but which can usually be partially or fully overcome by using relaxation and distraction techniques.
Haplotype	Alleles that tend to occur together on the same chromosome due to single-nucleotide polymorphisms (SNPs) being in proximity and therefore inherited together.
Hardy-Weinberg equilibrium (HWE)	A situation in which a defined population displays constant genotype frequencies from generation to generation, and those genotype frequencies can be calculated from the allele frequencies based on the HWE formula.
Harm	1. Adverse consequences of exposure to a stimulus. 2. Adverse consequences of exposure to an intervention.
Hawthorne effect	The tendency for human performance to improve when participants are aware that their behavior is being observed.
Hazard ratio	The weighted relative risk of an outcome (eg, death) over the entire study period; often reported in the context of survival analysis.
Health	A state of optimal physical, mental, and social well-being; not merely the absence of disease and infirmity (World Health Organization definition).
Health care personnel	Such persons include Physicians (Internists-UK), Medical Doctors (specific non-internists-UK), Nurses (including Nurse Practitioners and Physician Assistants) and other allied health personnel. See also Health professionals.
Health condition	A broad term for a health state that may include diseases, disorders, syndromes, and symptoms. See also Health state.
Health costs	Health care resources that are consumed. These reflect the inability to use the same resources for other worthwhile purposes (opportunity costs).
Health outcomes	All possible changes in health status that may occur for a defined population or that may be associated with exposure to an intervention. These include changes in the length and quality of life, major morbid events, and mortality.
Health professionals	All persons with health-based certification: physicians, nurses, medical doctors, physiotherapists, pharmacists, occupational therapists, respiratory technicians, and counselors. See also Health care personnel.

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Term	Definition
Health profile	A type of data collection tool, intended for use in the entire population (including the healthy, the very sick, and patients with any sort of health problem) that attempts to measure all important aspects of health-related quality of life (HRQL). See also Health-related quality of life.
Health state	The health condition of an individual or group over a specified interval of time (commonly assessed at a particular point in time).
Health-related quality of life	Measurements of how people are feeling, or the value they place on their health state. Such measurements can be disease specific or generic. See also Health profile.
Hegar sign	A palpable softening of the lowermost portion of the corpus occurring at about 6 weeks' gestational age. To elicit this sign, when the uterus is anteverted, the examiner places two fingers in the anterior vaginal fornix (or the posterior fornix in the presence of a ret-roverted uterus) and the compresses behind the fun-dus at the lower uterine segment with the other hand, using suprapubic pressure.
Heterogeneity	Differences among individual studies included in a sys-tematic review, typically referring to study results; the terms can also be applied to other study characteristics.
Heterozygous	An individual is heterozygous at a gene location if he or she has 2 different alleles (one on the maternal chromosome and one on the paternal) at that location.
Hierarchical regression	Hierarchical regression examines the relation between independent variables or predictor variables (eg, age, sex, disease severity) and a dependent variable (or outcome variable; eg, death, exercise capacity). Hier-archical regression differs from standard regression in that one predictor is a subcategory of another predic-tor. The lower-level predictor is nested within the higher-level predictor. For instance, in a regression predicting likelihood of withdrawal of life support in intensive care units (ICUs) participating in an interna-tional study, city is nested within country and ICU is nested within city.
Hierarchy of evidence	A system of classifying and organizing types of evi-dence, typically for questions of treatment and preven-tion. Clinicians should look for the evidence from the highest position in the hierarchy.
Historical cohort design	Cohort studies can be conducted retrospectively (his-torically) in the sense that someone other than the investigator has followed patients, and the investigator obtains the data base and then examines the associa-tion between exposure and outcome.
Historiography	A qualitative research methodology concerned with understanding both historical events and approaches to the writing of historical narratives.

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Term	Definition
Homans sign	The development of pain in the calf or popliteal region on forceful and abrupt dorsiflexion of the ankle while the knee is flexed.
Homozygous	An individual is homozygous at a gene location if he or she has 2 identical alleles at that location.
Hoyne sign	In patients with severe meningeal irritation, the patient may spontaneously assume the tripod position (also called Amoss sign or Hoyne sign), sitting on the edge of the bed with the knees and hips flexed, the back arched lordotically, the neck extended, and the arms brought back to support the thorax.
Hypoxemia	Deficient oxygenation of the blood.
I^2 statistic	The I^2 statistic is a test of heterogeneity. I^2 can be calculated from Cochrane Q (the most commonly used heterogeneity statistic) according to the formula: $I^2 = 100\% \times$ (Cochrane Q − degrees of freedom) / Cochrane Q. Any negative values of I^2 are considered equal to 0, so that the range of I^2 values is between 0% and 100%.
Inception cohort	A designated group of persons assembled at a common time early in the development of a specific clinical disorder (for example, at the time of first exposure to the putative cause or the time of initial diagnosis) and who are followed thereafter. See also Cohort study.
Incidence	Number of new cases of disease occurring during a specified period of time; expressed as a percentage of the number of people at risk during that time.
Inclusion criteria	The characteristics that define the population eligible for a study or that define the studies that will be eligible for inclusion in a systematic review.
Incorporation bias	Occurs when investigators study a diagnostic test that incorporates features of the target outcome. The result is a bias toward making the test appear more powerful in differentiating target positive from target negative than it actually is. See also Bias.
Independent association	When a variable is associated with an outcome after adjusting for multiple other potential prognostic factors (often after regression analysis), the association is an independent association.
Independent variable	The variable that is believed to cause, influence, or at least be associated with the dependent variable; in experimental research, the manipulated (intervention) variable.
Index date	The date of an important event that marks the beginning of monitoring patients for the occurrence of the outcome of interest.
Indirect costs and benefits	The impact of alternative patient management strategies on the productivity of the patient and others involved in the patient's care.

Term	Definition
Individual patient data meta-analysis	A meta-analysis in which individual patient data from each primary study are used to create pooled estimates. Such an approach can facilitate more accurate intention-to-treat analyses and informed subgroup analyses.
Informational redundancy	In qualitative research, the point in the analysis at which new data fail to generate new themes and new information. This is considered an appropriate stopping point for data collection in most methods and an appropriate stopping point for analysis in some methods. See also Theoretical saturation.
Informed consent	A participant's expression (verbal or written) of willingness, after full disclosure of the risks, benefits, and other implications, to participate in a study
Intention to treat analysis	Analyzing participant outcomes according to the group to which they were randomized, even if participants in that group did not receive the planned intervention. This principle preserves the power of randomization, thus ensuring that important known and unknown factors that influence outcomes are likely to be equally distributed across comparison groups. We do not use the term intention-to-treat analysis because of ambiguity created by patients lost to follow-up, which can cause exactly the same sort of bias as failure to adhere to the intention-to-treat principle.
Internal validity	Whether a study provides valid results depends on whether it was designed and conducted well enough that the study findings accurately represent the direction and magnitude of the underlying true effect (ie, studies that have higher internal validity have a lower likelihood of bias/systematic error).
Interobserver agreement	The degree to which a single evaluator agrees with her/his assessment at different points in time.
Interrater reliability	The extent to which a rater is able to consistently differentiate participants with higher and lower values of an underlying trait on repeated ratings over time (typically measured with an intraclass correlation).
Interview	In qualitative research, this is one of 3 basic data collection methods. It involves an interviewer asking questions to engage participants in dialogue to allow interpretation of experiences and events in the participants' own terms. The 2 most common interviews are semistructured, detailed interviews of individuals or discussion-based interviews of several people, called focus groups. In quantitative research, a method of collecting data in which an interviewer obtains information from a participant through conversation.
Interviewer bias	Greater probing by an interviewer in one of the groups being compared, contingent on particular features of the participants. See also Bias.

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Term	Definition
Intraclass correlation coefficient	This is a measure of reproducibility that compares variance between patients to the total variance, including both between- and within-patient variance.
Intraobserver agreement	Agreement among 2 or more evaluators (observers). See also Interrater reliability.
Intussusception	The enfolding of one segment of the intestine within another.
Inverse rule of 3s	A rough rule of thumb, called the inverse rule of 3s, tells us the following: If an event occurs, on average, once every x days, we need to observe 3x days to be 95% confident of observing at least one event.
Investigator triangulation	Investigator triangulation requires more than one investigator to collect and analyze the raw data, such that the findings emerge through consensus among a team of investigators. See also Triangulation.
Isoform	Variant in the amino acid sequence of a protein.
Kappa statistic (κ)	A measure of the extent to which observers achieve agreement beyond the level expected to occur by chance alone. Kappa can take values from 0 (poor agreement) to 1.0 (perfect agreement).
Kernig signs	Meningeal inflammation and irritation that elicits a protective reflex to prevent stretching of the inflamed and hypersensitive nerve roots, which is detectable clinically as neck stiffness or Kernig or Brudzinski signs. Originally, the Kernig signs were present when patients sat on the edge of a bed with their legs dangling and an attempt to extend the knee joint more than 135 degrees, or in severe cases more than 90 degrees, elicited spasm of the extremity that disappeared when the patients lay supine or stood up. Today, the maneuver is most commonly performed with the patient lying supine and the hip flexed at 90 degrees. A positive sign is present when extension of the knee from this position elicits resistance or pain in the lower back or posterior thigh.
Kruis model	A logistic model that contains signs and symptoms useful for diagnosing irritable bowel syndrome. See Table 55-6 in *The Rational Clinical Examination*.
Kussmaul sign	The paradoxic increase in the height of jugular venous pressure that occurs during inspiration. This sign is most commonly caused by severe right-sided heart failure, regardless of etiology.
Law of multiplicative probabilities	The law of multiplicative probabilities for independent events (in which one event in no way influences the other) tells us that the probability of 10 consecutive heads in 10 coin flips can be found by multiplying the probability of a single head (1/2) 10 times over; that is, $1/2 \times 1/2 \times 1/2$, and so on.

Term	Definition
Lead time bias	Occurs when outcomes such as survival, as measured from the time of diagnosis, may be increased not because patients live longer, but because screening lengthens the time that they know they have disease. See also Bias.
Leading hypothesis	The clinician's single best explanation for the patient's clinical problem(s).
Length time bias	Occurs when patients whose disease is discovered by screening also may appear to do better, or live longer, than people whose disease presents clinically with symptoms. Screening tends to detect disease that is destined to progress slowly and, therefore, has a good prognosis. See also Bias.
Levels of evidence	A hierarchy of research evidence to inform practice, usually ranging from strongest to weakest.
Likelihood functions	Functions constructed from a statistical model and a set of observed data that give the probability of that data for various values of the unknown model parameters. Those parameter values that maximize the probability are the maximum likelihood estimates of the parameters. See also Likelihood ratio.
Likelihood ratio	For a screening or diagnostic test (including clinical signs or symptoms), the likelihood ratio (LR) expresses the relative likelihood that a given test would be expected in a patient with, as opposed to one without, a disorder of interest. An LR of 1 means that the posttest probability is identical to the pretest probability. As LRs increase above 1, the posttest probability progressively increases in relation to the pretest probability. As LRs decrease below 1, the posttest probability progressively decreases in relation to the pretest probability. An LR is calculated as the proportion of target positive with a particular test result (which, with a single cut point, would be either a positive or negative result) divided by the proportion of target negative with same test result.
Likert scales	Scales, typically with three to nine possible values, that include extremes of attitudes or feelings (eg, from totally disagree to totally agree) that respondents mark to indicate their rating. See also Visual analogue scale.
Linear regression	The term used for a regression analysis when the dependent or target variable is a continuous variable, and the relationship between the dependent and independent variables is thought to be linear.
Linkage	The tendency of genes or other DNA sequences at specific loci to be inherited together as a consequence of their physical proximity on a single chromosome.
Linkage disequilibrium	A measure of association between alleles at different loci.

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Term	Definition
Local consensus process	A strategy for changing clinician behavior. Inclusion of participating clinicians in discussions to create agreement with a suggested approach to change provider practice.
Local opinion leaders	A strategy for changing clinician behavior. These persons are clinician peers who are recognized by their colleagues as model caregivers or who are viewed as having particular content expertise.
Locus/loci	The site(s) on a chromosome at which the gene for a particular trait is located or on a gene at which a particular SNP is located.
Logistic regression	1. A multivariate regression analysis that analyzes relationships between multiple independent variables and categorical dependent variables. 2. A regression analysis in which the dependent variable is binary.
Lost to follow-up	Patients whose status on the outcome or endpoint of interest is unknown.
Malrotation	Improper rotation of a body part (eg, the intestines).
Manning criteria	Combinations of findings used to diagnose irritable bowel syndrome. See Table 55-2 in *The Rational Clinical Examination*.
MANTRELS	The MANTRELS mnemonic is a helpful tool used to diagnose appendicitis. This mnemonic is a part of the Alvarado clinical decision rule and examines 8 findings from the medical history or the examination. The various components are **M**igration, **A**norexia-acetone, **N**ausea-vomiting, **T**enderness in RLQ, **R**ebound pain, **E**levation of temperature, **L**eukocytosis, and **S**hift to the left of normal WBC count. See Table 5-5 in *The Rational Clinical Examination*.
Marginal utility	The change in a person's utility (preference or relative value) for an outcome as the outcome increases in magnitude.
Markov model	Markov models are tools used in decision analyses. Named after a 19th-century Russian mathematician, Markov models are the basis of software programs that model what might happen to a cohort of patients during a series of cycles (eg, periods of 1 year). The model allows for the possibility that patients might move from one health state to another. For instance, one patient may have a mild stroke in one 3-month cycle, continue with minimal functional limitation for a number of cycles, have a gastrointestinal bleeding episode in a subsequent cycle, and finally experience a major stroke. Ideally, data from randomized trials will determine the probability of moving from one state to another during any cycle under competing management options.

Term	Definition
Matching	A deliberate process to make the study group and comparison group comparable with respect to factors (or confounders) that are extraneous to the purpose of the investigation but that might interfere with the interpretation of the study's findings. For example, in case control studies, individual cases may be matched with controls on the basis of comparable age, gender, and/or other clinical features.
Median survival	Length of time that one-half of the study population survives.
Medical subject headings	The U.S. National Library of Medicine's controlled vocabulary used for indexing articles for MEDLINE/PubMed. MeSH terminology provides a consistent way to retrieve information that may use different terminologies for the same concepts.
Member checking	In qualitative research, this involves sharing draft study findings with the participants to inquire whether their viewpoints were faithfully interpreted and to ascertain whether the account makes sense to participants with different perspectives.
Messenger RNA	A ribonucleic acid–containing single-strand copy of a gene that migrates out of the cell nucleus to the ribosome, where it is translated into a protein.
Meta-analysis	A statistical technique for quantitatively combining the results of multiple studies that measure the same outcome into a single pooled or summary estimate.
Meta-regression analysis	When summarizing patient or design characteristics at the individual trial level, meta-analysts risk failing to detect genuine relationships between these characteristics and the size of treatment effect. Furthermore, the risk of obtaining a spurious explanation for variable treatment effects is high when the number of trials is small and many patient and design characteristics differ. Meta-regression techniques can be used to explore whether patient characteristics (eg, younger or older patients) or design characteristics (eg, studies of low or high quality) are related to the size of the treatment effect.
Meta-synthesis	A procedure for combining qualitative research on a specific topic in which researchers compare and analyze the texts of individual studies and develop new interpretations.
Minimal important difference	The smallest difference in a patient-important outcome that patients perceive as beneficial and that would mandate, in the absence of troublesome adverse effects and excessive cost, a change in the patient's health care management.

Term	Definition
Mixed-methods study	A study that combines data collection approaches, sometimes both qualitative and quantitative, into the study methodology and is commonly used in the study of service delivery and organization. Some mixed-methods studies combine study designs (eg, investigators may embed qualitative or quantitative process evaluations alongside quantitative evaluative designs to increase understanding of factors influencing a phenomenon). Some mixed-methods studies include a single overarching research design but use mixed-methods for data collection (eg, surveys, interviews, observation, and analysis of documentary material).
Model	Often used to describe statistical regression analyses involving more than one independent variable and one dependent variable. This is a multivariable or multiple regression (or multivariate) analysis.
Mortality	Measure of rate of death.
Multiple regression	A type of regression that provides a mathematical model that explains or predicts the dependent or target variable by simultaneously considering all of the independent or predictor variables. See also Multivariate regression analysis.
Multivariate regression analysis	A type of regression that provides a mathematical model that attempts to explain or predict the dependent variable (or outcome variable or target variable) by simultaneously considering 2 or more independent variables (or predictor variables). See also Multiple regression.
Murphy sign	Pain and arrested inspiration occurring when the patient inspires deeply while the examiner's fingers are hooked underneath the right costal margin.
Mutation	A rare variant in a gene, occurring in <1% of a population. See also Polymorphism.
Myalgia	Muscle discomfort.
Myerson sign	Persistent blinking during the Glabella tap test used to diagnose Parkinson disease.
Narrative review	A review article (eg, a typical book chapter) that is not conducted using methods to minimize bias (in contrast to a systematic review).
Natural history	As distinct from prognosis, natural history refers to the possible consequences and outcomes of a disease or condition and the frequency with which they can be expected to occur when the disease condition is untreated.
Negative effect	As clinical studies accumulate, it is more common for effects to shrink than to increase. Negative effects are smaller or less dramatic than effects from previous studies.

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Term	Definition
Negative predictive value	See Predictive value.
Negative studies	Studies in which the authors have concluded that the comparison groups do not differ statistically in the variables of interest. Research results that fail to support the researchers' hypotheses.
Neural network	The application of nonlinear statistics to pattern-recognition problems. Neural networks can be used to develop clinical prediction rules. The technique identifies those predictors most strongly associated with the outcome of interest that belong in a clinical prediction rule and those that can be omitted from the rule without loss of predictive power.
N-of-1 randomized controlled trial	An experiment designed to determine the effect of an intervention or exposure on a single study participant. In one N-of-1 design, the patient undergoes pairs of treatment periods organized so that 1 period involves the use of the experimental treatment and 1 period involves the use of an alternate treatment or placebo. The patient and clinician are blinded, if possible, and outcomes are monitored. Treatment periods are replicated until the clinician and patient are convinced that the treatments are definitely different or definitely not different.
Nominal variable	A variable that can be classified into a category (eg, male or female sex); often called categorical varaible. A categorical variable may be nominal or ordinal. Categorical variables can be defined according to attributes without any associated order (eg, medical admission, elective surgery, or emergency surgery); these are called nominal variables. A categorical variable can also be defined according to attributes that are ordered (eg, height such as high, medium, or low); these are called ordinal variables.
Nomogram	Graphic scale facilitating calculation of a probability. The most-used nomogram in the evidence-based medicine world is one developed by Fagan to move from a pretest probability, through a likelihood ratio, to a posttest probability.
Nonadherent	Patients are nonadherent if they are not exposed to the full course of a study intervention (eg, most commonly, they do not take the prescribed dose or duration of a drug or they do not participate fully in the study program).
Nonrandomized controlled trial	In an nonrandomized controlled trial, it is difficult or impossible to assign participants to different study arms (interventions) by chance. These types of trials are subject to bias because of the inability to control for factors between groups that could affect outcomes.
Null hypothesis	In the hypothesis-testing framework, this is the starting hypothesis that the statistical test is designed to consider and possibly reject, which contends that there is no relationship between the variables under study.

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Term	Definition
Null result	A nonsignificant result; no statistically significant difference between groups.
Number needed to harm	The number of patients who, if they received the experimental intervention, would lead to one additional patient being harmed over a specific period of time. It is the inverse of the absolute risk increase (ARI), expressed as a percentage (100/ARI). See also Absolute risk increase.
Number needed to screen	The number of patients who would need to be screened to prevent one adverse event.
Number needed to treat	The number of patients who need to be treated over a specific period of time to achieve one additional good outcome. When discussing NNT, it is important to specify the intervention, its duration, and the desirable outcome. It is the inverse of the absolute risk reduction (ARR), expressed as a percentage (100/ARR). See also Absolute risk reduction.
1-sided significance tests	Test of statistical significance in which deviations from the null hypothesis in only 1 direction are considered. Most commonly used for the t test.
Observational studies	An observational study can be used to describe many designs that are not randomized trials (eg, cohort studies or case-control studies that have a goal of establishing causation, studies of prognosis, studies of diagnostic tests, and qualitative studies). The term is most often used in the context of cohort studies and case-control studies in which patient or caregiver preference, or happenstance, determines whether a person is exposed to an intervention or putative harmful agent or behavior (in contrast to the exposure's being under the control of the investigator, as in a randomized trial).
Observer bias	Occurs when an observer's observations differ systematically according to participant characteristics (eg, making systematically different observations in treatment and control groups). See also Bias.
Odds	The ratio of events to non-events; the ratio of the number of study participants experiencing the outcome of interest to the number of study participants not experiencing the outcome of interest.
Odds ratio	A ratio of the odds of an event in an exposed group to the odds of the same event in a group that is not exposed.
Odds reduction	The odds reduction expresses, for odds, what relative risk reduction expresses for risks. Just as the relative risk reduction is 1 – relative risk, the odds reduction is 1 – relative odds (the relative odds and odds ratio being synonymous). Thus, if a treatment results in an odds ratio of 0.6 for a particular outcome, the treatment reduces the odds for that outcome by 0.4.

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Term	Definition
Open-ended questions	Questions that offer no specific structure for the respondent's answers and allow the respondents to answer in their own words.
Opinion leaders	See Local opinion leaders.
Opportunistic sampling	See Convenience sample.
Opportunity costs	The value of (health or other) benefits forgone in alternative uses when a resource is used.
Osler sign	While feeling the radial pulse, occlude the brachial artery by cuff inflation or by direct pressure using the other thumb. If the radial artery remains palpable as a firm "tube," the Osler sign is positive. The test's usefulness for detecting pseudohypertension is debatable.
Osteomyelitis	Inflammation of the bone that is almost always due to infection (bacterial or mycobacteria) and frequently associated with overlying soft tissue infections such as diabetic foot ulcers.
Outcome variable	The target variable of interest. The variable that is hypothesized to depend on or be caused by another variable, the independent variable. See also Treatment target; Endpoint.
Overview	A type of review in which primary research relevant to a question is examined and summarized, and an effort is made to identify all available literature (published or unpublished) that pertains to that question.
P value	The probability that results as extreme as or more extreme than those observed would occur if the null hypothesis were true and the experiment were repeated over and over. A *P* value <0.05 means that there is a less than 1 in 20 probability that, on repeated performance of the experiment, the results as extreme as or more extreme than those observed would occur if the null hypothesis were true. See also Probability.
Palliate	Palliative care or treatment is a set of actions taken for patients in whom cure is unlikely. Stedman's defines palliative as mitigating or reducing the severity of symptoms without reducing the underlying disease. These actions are often multiple and can include family members and significant others.
Paracentesis	A surgical puncture of a bodily cavity with a trocar, aspirator, or other instrument usually to draw off an abnormal effusion for diagnostic or therapeutic purposes. Paracentesis can also be done as a therapeutic procedure when large volumes of fluid are removed to provide the patient relief from symptoms.
Parenchyma	The essential tissue of an organ or an abnormal growth as distinguished from its supportive framework.

Term	Definition
Partial verification bias	Occurs when only a selected sample of patients who underwent the index test is verified by the reference standard, and that sample is dependent on the results of the test. For example, patients with suspected coronary artery disease whose exercise test results are positive may be more likely to undergo coronary angiography (the reference standard) than those whose exercise test results are negative. See also Bias.
Pastia sign	A scarlatiniform ("scarlet fever") rash in the antecubital fossae is one of the signs for streptococcal pharyngitis.
Patient expected event rate	The probability of the occurrence of the endpoint or outcome of interest in the patient group of which the individual under consideration is representative.
Patient preferences	The relative value that patients place on various health states. Preferences are determined by values, beliefs, and attitudes that patients bring to bear in considering what they will gain—or lose—as a result of a management decision. Explicit enumeration and balancing of benefits and risks that is central to evidence-based clinical practice brings the underlying value judgments involved in making management decisions into bold relief.
Patient-important outcomes	Outcomes that patients value directly. This is in contrast to surrogate, substitute, or physiologic outcomes that clinicians may consider important. One way of thinking about a patient-important outcome is that, were it to be the only thing that changed, patients would be willing to undergo a treatment with associated risk, cost, or inconvenience. This would be true of treatments that ameliorated symptoms or prevented morbidity or mortality. It would not be true of treatments that lowered blood pressure, improved cardiac output, improved bone density, or the like, without improving the quality or increasing the length of life.
Patient-mediated interventions	A strategy for changing clinician behavior. Any intervention aimed at changing the performance of health care professionals through interactions with, or information provided by or to, patients.
Pedigree	A diagram depicting heritable traits across 2 or more generations of a family.
Peek sign	A sign for myasthenia gravis elicited by having the patient close their eyelids to hold them in apposition. Despite effort to keep them closed, the lids gradually separate and the examiner will be able to see the sclera in a positive sign.
Periumbilical	Adjacent to the navel.

Term	Definition
Performance criteria	Concerns how interventions are performed without regard to whether they should be performed. An example would be the acceptable range of results reported for reference cholesterol samples sent to clinical laboratories.
Per-protocol analysis	An analysis restricted to patients who adhered to their assigned treatment in a randomized trial (omitting patients who dropped out of the study or for other reasons did not actually receive the planned intervention). This analysis can provide a misleading estimate of effect because all patients randomized are no longer included, raising concerns about whether important unknown factors that influence outcome are equally distributed across comparison groups.
Phalen sign	Paresthesias in the distribution of the median nerve when the patient flexes both wrists 90 degrees for 60 seconds.
Phase I studies	Studies often conducted in normal volunteers that investigate a drug's physiologic effect and evaluate whether it manifests unacceptable early toxicity. See also Studies or study design.
Phase II studies	Initial studies on patients that provide preliminary evidence of possible drug effectiveness. See also Studies or study design.
Phase III studies	Randomized controlled trials designed to test the magnitude of benefit and harm of a drug. See also Studies or study design.
Phase IV studies	Studies conducted after the effectiveness of a drug has been established and the drug marketed, typically to establish the frequency of uncommon or unanticipated toxic effects. See also Studies or study design.
Phenomenology	In qualitative research, an approach to inquiry that emphasizes the complexity of human experience and the need to understand the experience holistically as it is actually lived.
Phenotype	The observable characteristics of a cell or organism, usually being the result of the product coded by a gene (genotype).
Phi statistic (ϕ)	A measure of chance-independent agreement calculated by the following formula: [square root of (OR − 1)]/[square root of (OR + 1)].
PICO	A method for answering clinical questions.
Placebo	A biologically inert substance (typically a pill or capsule) that is as similar as possible to the active intervention. Placebos are sometimes given to participants in the control arm of a drug trial to help ensure that the study is blinded.

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Term	Definition
Placebo effect	The impact of an intervention independent of its biological effect.
Point estimate	The single value that best represents the value of the population parameter.
Polymorphism	The existence of 2 or more variants of a gene, occurring in a population, with at least 1% frequency of the less common variant. See also Mutation.
Pooled estimate	Estimate based on combining data from 2 or more samples.
Population stratification	Describes the situation in which a population may be composed of multiple sub-groups of different ethnicity; case and control group differences in the mix can confound the comparison and lead to spurious genetic associations.
Positive predictive value	See Predictive value.
Positive study	1. A study with results that are consistent with the researchers' hypotheses. 2. A study with results that show a difference that investigators interpret as beyond the play of chance.
Posttest odds	The odds of the target condition being present after the results of a diagnostic test are available.
Posttest probability	The probability of the target condition being present after the results of a diagnostic test are available.
Power	The ability of a study to reject a null hypothesis when it is false (and should be rejected). It is linked to the adequacy of the sample size: if a sample size is too small, the study will have insufficient power to detect differences between groups, if differences exist.
Predictive value	Two categories: Positive predictive value—the proportion of people with a positive test result who have the disease; negative predictive value—the proportion of people with a negative test result and who are free of disease.
Pre-processed	A process whereby someone has reviewed the literature and chosen only the methodologically strongest studies.
Pretest odds	The odds of the target condition being present before the results of a diagnostic test are available.
Pretest probability	The probability of the target condition being present before the results of a diagnostic test are available.
Prevalence	Proportion of persons affected with a particular disease at a specified time. Prevalence rates obtained from high-quality studies can inform pretest probabilities.

Term	Definition
Prevent	A preventive maneuver is an action that decreases the risk of a future event or the threatened onset of disease. Primary prevention is designed to stop a condition from developing. Secondary prevention is designed to stop or slow progression of a disease or disorder when patients have a disease and are at risk for developing something related to their current disease. Often, secondary prevention is indistinguishable from treatment. An example of primary prevention is vaccination for pertussis. An example of secondary prevention is administration of an anti-osteoporosis intervention to women with low bone density and evidence of a vertebral fracture to prevent subsequent fractures. An example of tertiary prevention is a rehabilitation program for patients experiencing the adverse effects associated with a myocardial infarction.
Primary care	Medical care provided by the clinician of first contact for the patient. Typically, the primary care physician is a general practitioner, family practitioner, primary care internist, or primary care pediatrician. Primary care may also be administered by health professionals other than physicians, notably specially trained nurses (nurse practitioners) and paramedics. Usually, a general practitioner, family practitioner, nurse practitioner, or paramedic provides only primary care services, but an individual with specialty qualifications may provide primary care, alone or in combination with referral services. Thus, it is the nature of the contact (first vs. referred) that determines the care designation rather than the qualifications of the practitioner. See also Referred care.
Primary care setting	Medical care facility that offers first contact health care only. Patients requiring specialized medical care are referred elsewhere. Some primary care centers provide a mixture of primary and referred care. Thus, it is the nature of the service provided (first contact) rather than the setting per se that distinguishes primary from more advanced levels of care. See also Primary care; Referred care; Tertiary care center.
Primary studies	Studies that collect original data. Primary studies are differentiated from synopses that summarize the results of individual primary studies and they are different from systematic reviews that summarize the results of a number of primary studies.
Probability	Quantitative estimate of the likelihood of a condition existing (as in diagnosis) or of subsequent events (such as in an intervention study). See also *P* value.
Prognosis	The possible consequences and outcomes of a disease and the frequency with which they can be expected to occur.
Prognostic factors	Patient or study participant characteristics that confer increased or decreased risk of a positive or adverse outcome.

Term	Definition
Prognostic study	A study that enrolls patients at a point in time and follows them forward to determine the frequency and timing of subsequent events.
Provider adherence	Extent that health care providers carry out the host of diagnostic tests, monitoring equipment, interventional requirements, and other technical specifications that define optimal patient management.
Publication bias	Occurs when the publication of research depends on the direction of the study results and whether they are statistically significant. See also Bias.
Puddle sign	A maneuver to detect ascites that is not currently recommended. To elicit the finding, the patient must prop themselves up on their hands and knees, while the examiner reaches underneath the abdomen to percuss.
Pulmonary edema	Abnormal accumulation of fluid in the lungs.
Purposeful sampling	In qualitative research, a type of nonprobability sampling in which theory or personal judgment guide the selection of study participants who will be most representative of the population. Depending on the topic, examples include (1) maximum variation sampling, to document range or diversity; (2) extreme or deviant case sampling, in which one selects cases that are opposite in some way; (3) typical or representative case sampling, to describe and illustrate what is typical and common in terms of the phenomenon of interest; (4) critical sampling, to make a point dramatically; and (5) criterion sampling, in which all cases that meet some predetermined criteria of importance are studied.
Pyelonephritis	Bacterial or fungal invasion of the kidney causing tubular cell necrosis and inflammation of both the parenchyma and the lining of its renal pelvis. Chronic pyelonephritis involves pelvicaliceal inflammation, fibrosis, and deformity of the kidney.
Pyrexia	Abnormal elevation of body temperature, fever.
Pyuria	The presence of pus in urine.
Qualitative research	Qualitative research focuses on social and interpreted, rather than quantifiable, phenomena and aims to discover, interpret, and describe rather than to test and evaluate. Qualitative research makes inductive, descriptive inferences to theory concerning social experiences or settings, whereas quantitative research makes causal or correlational inferences to populations. Qualitative research is not a single method but a family of analytic approaches that rely on the description and interpretation of qualitative data. Specific methods include, for example, grounded theory, ethnography, phenomenology, case study, critical theory, and historiography.

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Term	Definition
Quality assurance	Any procedure, method, or philosophy for collecting, processing, or analyzing data that is aimed at maintaining or improving the appropriateness of health care services.
Quality improvement	An approach to defining, measuring, improving, and controlling practices to maintain or improve the appropriateness of health care services.
Quality of care	The extent to which health care meets technical and humanistic standards of optimal care.
Quality-adjusted life expectancy	The number of years of expected life corrected for the quality of life that patients are expected to experience in those years.
Quality-adjusted life-year	A unit of measure for survival that accounts for the effects of suboptimal health status and the resulting limitations in quality of life. For example, if a patient lives for 10 years and his or her quality of life is decreased by 50% because of chronic lung disease, survival would be equivalent to 5 quality-adjusted life-years. See also Cost-utility analysis.
Quantitative research	The investigation of phenomena that lend themselves to test well-specified hypotheses through precise measurement and quantification of predetermined variables that yield numbers suitable for statistical analysis.
Random	Governed by a formal chance process in which the occurrence of previous events is of no value in predicting future events. For example, the probability of assigning a participant to one of two specified groups is 50%. See also Randomization; Random error.
Random error	We can never know with certainty the true value of an intervention effect because of random error. It is inherent in all measurement. The observations that are made in a study are only a sample of all possible observations that could be made from the population of relevant patients. Thus, the average value of any sample of observations is subject to some variation from the true value for that entire population. When the level of random error associated with a measurement is high, the measurement is less precise, and we are less certain about the value of that measurement. See also Random sample.
Random sample	A sample derived by selecting sampling units (eg, individual patients) such that each unit has an independent and fixed (generally equal) chance of selection. Whether a given unit is selected is determined by chance; for example, by a table of randomly ordered numbers. See also Random error.

Term	Definition
Random-effects model	A model used to give a summary estimate of the magnitude of effect in a meta-analysis that assumes that the studies included are a random sample of a population of studies addressing the question posed in the meta-analysis. Each study estimates a different underlying true effect, and the distribution of these effects is assumed to be normal around a mean value. Because a random-effects model takes into account both within-study and between-study variability, the confidence interval around the point estimate is, when there is appreciable variability in results across studies, wider than it could be if a fixed-effects model were used.
Randomization	Allocation of individuals to groups by chance, usually done with the aid of a table of random numbers. Not to be confused with systematic allocation or quasi-randomization (eg, on even and odd days of the month) or allocation at the convenience or discretion of the investigator. See also Random sample; Random error.
Randomized controlled trial	Experiment in which individuals are randomly allocated to receive or not receive an experimental diagnostic, preventive, therapeutic, or palliative procedure and then followed to determine the effect of the intervention. See also Nonrandomized controlled trial.
Recall bias	Occurs when patients who experience an adverse outcome have a different likelihood of recalling an exposure than patients who do not experience the adverse outcome, independent of the true extent of exposure. See also Bias.
Recessive	Describes any trait that is expressed in a homozygote but not a heterozygote, ie, 2 copies of that allele are necessary to manifest its effect.
Recursive partitioning analysis	A technique for determining the optimal way of using a set of predictor variables to estimate the likelihood of an individual experiencing a particular outcome. The technique repeatedly divides the population (eg, old vs young; among young and old, the men and the women; and so on) according to their status on variables that discriminate between those who will have the outcome of interest and those who will not.
Referral bias	Occurs when characteristics of patients differ between one setting (eg, primary care) and another setting that includes only referred patients (eg, secondary or tertiary care). See also Bias.
Referred care	Medical care provided to a patient when referred by one health professional to another with more specialized qualifications or interests. There are two levels of referred care: secondary and tertiary. Secondary care is usually provided by a broadly skilled specialist such as a general surgeon, general internist, or obstetrician. See also Primary care.

Term	Definition
Reflexivity	In qualitative research using field observation, whichever of the three approaches used, the observer will always have some effect on what is being observed, small or large. This interaction of the observer with what is observed is called reflexivity. Whether it plays a positive or negative role in accessing social truths, the researcher must acknowledge and investigate reflexivity and account for it in data interpretation.
Regression	A technique that uses predictor or independent variables to build a statistical model that predicts an individual patient's status with respect to a dependent or target variable.
Rehabilitation	A set of actions designed to restore, following disease or injury, the ability to function in a normal or near-normal manner.
Relative benefit increase	The proportional increase in rates of good outcomes between experimental and control participants. It is calculated by dividing the rate of good outcome in the experimental group (experimental event rate, or EER) minus the rate of good outcome in the control group by the rate of good outcome in the control group.
Relative diagnostic odds ratio	The diagnostic odds ratio is a single value that provides one way of representing the power of the diagnostic test. It is applicable when we have a single cut point for a test and classify tests results as positive and negative. The diagnostic odds ratio is calculated as the product of the true positive and true negative divided by the product of the false positives and false negatives. The relative diagnostic odds ratio is the ratio of one diagnostic odds ratio to another.
Relative difference	The absolute difference (risk difference) in rates of harmful outcomes between experimental groups (experimental event rate, or EER) and control groups (control event rate, or CER), calculated as the rate of harmful outcome in the control group minus the rate of harmful outcome in the experimental group (CER – EER). Typically used to describe a beneficial exposure or intervention (eg, if 20% of patients in the control group have an adverse event, as do 10% among treated patients, the ARR or risk difference would be 10% expressed as a percentage or 0.10 expressed as a proportion).
Relative risk	Ratio of the risk of an event among an exposed population to the risk among the unexposed. See also Relative risk reduction.

Term	Definition
Relative risk increase	The proportional increase in rates of harmful outcomes between experimental and control participants. It is calculated by dividing the rate of harmful outcome in the experimental group (experimental event rate, or EER) minus the rate of harmful outcome in the control group (control event rate, or CER) by the rate of harmful outcome in the control group ([EER − CER]/CER). Typically used with a harmful exposure.
Relative risk reduction	The proportional reduction in rates of harmful outcomes between experimental and control participants. It is calculated by dividing the rate of harmful outcome in the control group (control event rate, or CER) minus the rate of harmful outcome in the experimental group (experimental event rate, or EER) by the rate of harmful outcome in the control group ([CER − EER]/CER). Used with a beneficial exposure or intervention. See also Relative risk; Risk; Treatment effect.
Reliability	Reliability is used as a technical statistical term that refers to a measurement instrument's ability to differentiate between subjects, patients, or participants in some underlying trait. Reliability increases as the variability between subjects increases and decreases as the variability within subjects (over time, or over raters) increases. Reliability is typically expressed as an intraclass correlation coefficient with between-subject variability in the numerator and total variability (between-subject and within-subject) in the denominator.
Reminder systems	A strategy for changing clinician behavior. Manual or computerized reminders to prompt behavior change. See also Alerting systems.
Reporting bias	The inclination of authors to differentially report research results according to the magnitude, direction, or statistical significance of the results. See also Bias.
Residual confounding	Unknown, unmeasured, or suboptimally measured prognostic factors that remain unbalanced between groups after full covariable adjustment by statistical techniques. The remaining imbalance will lead to a biased assessment of the effect of any putatively causal exposure.
Review	A general term for all attempts to obtain and synthesize the results and conclusions of two or more publications on a given topic.
Ribosome	The protein synthesis machinery of a cell where messenger RNA translation occurs.
Risk	A measure of the association between exposure and outcome (including incidence, adverse effects, or toxicity). See also Absolute risk reduction; Relative risk reduction.

Term	Definition
Risk aversion	People are said to be risk averse if they would accept a fixed outcome with certainty rather than a lottery with a higher expected value. For example, they would choose $10 for sure rather than a 50/50 chance of $0 or $30.
Risk factors	Risk factors are patient characteristics associated with the development of a disease in the first place. Prognostic factors are patient characteristics that confer increased or decreased risk of a positive or adverse outcome from a given disease.
ROC curve	A figure depicting the power of a diagnostic test. The ROC curve presents the test's true-positive rate (i.e., sensitivity) on the horizontal axis and the false-positive rate (i.e., 1 – specificity) on the vertical axis for different cut-points dividing a positive from a negative test. An ROC curve for a perfect test has an area under the curve = 1.0, while a test that performs no better than chance has an area under the curve of only 0.5.
Rome criteria	A series of proposed combinations of findings used to diagnose irritable bowel syndrome. The Rome III criteria is the most recently proposed set of findings. See Table 55-2 in *The Rational Clinical Examination*.
Rovsing sign	A sign related to the rebound tenderness test for appendicitis. Press deeply and evenly in the left lower quadrant and then release pressure suddenly. The presence of tenderness in the right lower quadrant during palpation or referred rebound tenderness in the right lower quadrant during release is considered a positive Rovsing sign.
Sampling error	Error introduced by chance differences between the estimate obtained from the sample and the true value in the population from which the sample was drawn. Sampling error is inherent in the use of sampling methods and is measured by the standard error.
Schamroth sign	Normal fingers create a diamond-shaped window when the dorsal surfaces of the terminal phalanges of similar fingers are opposed. In the clubbed finger, the diamond becomes obliterated because of the loss of the profile angle and the increase in the soft tissue at the cuticle (Schamroth sign).
Screening	Services designed to detect people at high risk of experiencing a condition associated with a modifiable adverse outcome, offered to persons who have neither symptoms of nor risk factors for a target condition.

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Term	Definition
Secondary care	Medical care provided to a patient when referred by one health professional to another with more specialized qualifications or interests. There are two levels of referred care: secondary and tertiary. Secondary care is usually provided by a broadly skilled specialist such as a general surgeon, general internist or obstetrician. See also Referred care.
Secular trends	Changes in the probability of events with time, independent of known predictors of outcome.
Selective screening	Services to be offered to asymptomatic persons with one or more risk factors for a target condition, such as family history of the disease, certain personal behaviors, or membership in a population with increased prevalence of the disease. See also Screening.
Sensitivity	The proportion of people who truly have a designated disorder who are so identified by the test. The test may consist of, or include, clinical observations. See also Sensitivity analysis; Specificity; SnNout.
Sensitivity analysis	Any test of the stability of the conclusions of a health care evaluation over a range of probability estimates, value judgments, and assumptions about the structure of the decisions to be made. This may involve the repeated evaluation of a decision model in which one or more of the parameters of interest are varied.
Sentinel effect	The tendency for human performance to improve when participants are aware that their behavior is being evaluated; in contrast to the Hawthorne effect, which refers to behavior change as a result of being observed but not evaluated.
Sequential sample	A sample in which all potentially eligible patients seen over a period of time are enrolled. See also Case series.
Sequential tests	Tests conducted in sequence, rather than simultaneously.
Sign	Any abnormality indicative of disease, discoverable by the clinician at an examination of the patient. It is an objective aspect of a disease.
Sign test	A nonparametric test for comparing two paired groups based on the relative ranking of values between the pairs.
Silo effect	One of the main reasons for considering narrower viewpoints in conducting an economic analysis is to assess the impact of change on the main budget holders because budgets may need to be adjusted before a new intervention can be adopted (the silo effect).
Simple regression	Regression when there is only one independent variable under evaluation with respect to a dependent variable. See also Regression.

Term	Definition
SnNout	When a test with a high **Sen**sitivity is **N**egative, it effectively rules **out** the diagnosis of disease. See also Sensitivity.
Snowball sampling	Study participants nominate or refer other potential study participants who meet the study inclusion criteria.
SNP	Abbreviation for single-nucleotide polymorphism, a single base pair change in the DNA sequence at a particular point compared with the "common" or "wild-type" sequence.
Specificity	The proportion of people who are truly free of a designated disorder who are so identified by the test. The test may consist of, or include, clinical observations. See also Sensitivity; SpPin.
Spectrum bias	Ideally, diagnostic test properties will be assessed in a population in which the spectrum of disease in the target-positive patients includes all those in whom clinicians might be uncertain about the diagnosis, and the target-negative patients include all those with conditions easily confused with the target condition. Spectrum bias may occur when the accuracy of a diagnostic test is assessed in a population that differs from this ideal. Examples of spectrum bias include a situation in which a substantial proportion of the target-positive population have advanced disease, and target-negative participants are normal or asymptomatic. Such situations typically occur in diagnostic case-control studies (eg, comparing those with advanced disease to normal individuals). Such studies are liable to yield an overly sanguine estimate of the usefulness of the test. See also Bias.
SpPin	When a test is highly **Sp**ecific, a **P**ositive result can rule **in** the diagnosis. See also Specificity.
Square wrist sign	The anteroposterior dimension of the wrist divided by the mediolateral dimension equals a ratio of greater than 0.70, when measured with calipers at the distal wrist crease.
Standard error	The standard deviation of an estimate of a population parameter. The standard error of the mean is the standard deviation of the estimate of the population mean value.
Standard gamble	A direct preference or utility measure that effectively asks respondents to rate their quality of life on a scale from 0 to 1.0, where 0 is death and 1.0 is full health. Respondents choose between a specified time x in their current health state and a gamble in which they have probability P (anywhere from 0 to 0.99) of full health for time x, and a probability $1 - P$ of immediate death.

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Term	Definition
Standards	Authoritative statements of minimal levels of acceptable performance or results, excellent levels of performance or results, or the range of acceptable performance or results.
STARI	Southern tick-associated rash illness (Masters disease).
Statistical inference	Statistical methodologies to make deductions about underlying truth. There are two principle functions: (1) To predict or estimate a population parameter from a sample statistic, and (2) to test statistically based hypotheses.
Statistical significance	A term indicating that the results obtained in an analysis of study data are unlikely to have occurred by chance, and the null hypothesis is rejected. When statistically significant, the probability of the observed results, given the null hypothesis, falls below a specified level of probability (most often $P < 0.05$).
Stopped early trials	Truncated randomized controlled trials (RCTs) are trials stopped early because of apparent harm because the investigators have concluded that they will not be able to demonstrate a treatment effect (futility), or because of apparent benefit. Believing the treatment from RCTs stopped early for benefit will be misleading if the decision to stop the trial resulted from catching the apparent benefit of treatment at a random high.
Stopping rules	These are methodological and statistical guides that inform decisions to stop trials early. They can incorporate issues such as the planned sample size, planned and conducted interim analyses, presence and type of data monitoring including independent research oversight, statistical boundaries, and statistical adjustments for interim analyses and stopping.
Structured abstracts	These abstracts often include critical information about research conduct omitted from the original reports. They do not include the introduction or the discussion sections of the original report or the conclusions of the original study.
Studies or study design	The way a drug study is organized or constructed.
Subgroup analysis	The separate analysis of data for subgroups of patients, such as those at different stages of their illness, those with different comorbid conditions, or those of different ages.
Surrogate outcomes or endpoints	Outcomes that are not in themselves important to patients but are associated with outcomes that are important to patients (eg, bone density for fracture, cholesterol for myocardial infarction, and blood pressure for stroke). These outcomes would not influence patient behavior if they were the only outcomes that would change with an intervention.

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Term	Definition
Survey	Observational study that focuses on obtaining information about activities, beliefs, preferences, knowledge, or attitudes from respondents through interviewer-administered or self-administered methods.
Survival analysis	A statistical procedure used to compare the proportion of patients in each group who experience an outcome or endpoint at various time intervals over the duration of the study (eg, death).
Survival curve	A curve that starts at 100% of the study population and shows the percentage of the population still surviving (or free of disease or some other outcome) at successive times for as long as information is available.
Symptom	Any phenomenon or departure from the normal in function, appearance, or sensation reported by the patient and suggestive or indicative of disease. Symptoms are considered subjective.
Syndrome	A collection of signs and/or symptoms and/or physiological abnormalities.
Syndrome diagnosis	When no reference standards exist, investigators' degree of diagnostic certainty is much lower. In these situations, known sometimes as syndrome diagnosis, diagnostic criteria usually rely on a list of clinical features required for the diagnosis. See also Syndrome.
Synonymous SNP	A SNP that does not lead to a change in the amino acid sequence compared with the common or wild-type sequence. Compare to *nonsynonymous*, in which there is a change in the amino acid sequence as a result of the SNP.
Systematic review	1. The consolidation of research evidence that incorporates a critical assessment and evaluation of the research (not simply a summary) and addresses a focused clinical question using methods designed to reduce the likelihood of bias. 2. The identification, selection, appraisal, and summary of primary studies addressing a focused clinical question using methods to reduce the likelihood of bias.
Target condition	In diagnostic test studies, the condition the investigators or clinicians are particularly interested in identifying (eg, tuberculosis, lung cancer, or iron-deficiency anemia).
Target endpoints	In intervention studies, the condition the investigators or clinicians are particularly interested in identifying and in which it is anticipated the intervention will decrease (eg, myocardial infarction, stroke, or death) or increase (eg, ulcer healing). See also Cohort study.
Target-negative	In diagnostic test studies, patients who do not have the target condition.

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Term	Definition
Target-positive	In diagnostic test studies, patients who do have the target condition.
Tertiary care	Medical care provided to a patient when referred by one health professional to another with more specialized qualifications or interests. There are two levels of referred care: secondary and tertiary. Secondary care is usually provided by a broadly skilled specialist such as a general surgeon, general internist, or obstetrician. Synonymous with Referred care.
Tertiary care center	A medical facility that receives referrals from both primary and secondary care levels and usually offers tests, treatments, and procedures that are not available elsewhere. Most tertiary care centers offer a mixture of primary, secondary, and tertiary care services so that it is the specific level of service rendered rather than the facility that determines the designation of care in a given study. See also Referred care; Primary care.
Test threshold	The probability below which the clinician decides a diagnosis warrants no further consideration. See also Treatment threshold.
Theoretical saturation	The point at which iterations among data collection, analysis, and theory development yield a well-developed concept, and further observations yield minimal or no new information to further challenge or elaborate the concept. See also Informational redundancy.
Theory	Theory consists of concepts and their relationships.
Theory triangulation	Theory triangulation is a process whereby emergent findings are corroborated with existing social science theories. See also Triangulation.
Threshold NNT	Maximum number needed to treat (NNT) or number needed to harm (NNH) accepted as justifying the benefits and harms of therapy. See also Test threshold.
Time-series design	In this study design, data are collected at several times both before and after the intervention; data collected before the intervention allow the underlying trend and cyclical (seasonal) effects to be estimated. Data collected after the intervention allow the intervention effect to be estimated while accounting for underlying secular trends. The time-series design monitors the occurrence of outcomes or endpoints over a number of cycles and determines whether the pattern changes coincident with the intervention.
Tinel sign	Paresthesias in the distribution of the median nerve when the clinician taps on the distal wrist crease over the median nerve.

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Term	Definition
Treatment effect	The results of comparative clinical studies can be expressed using various intervention effect measures. Examples are absolute risk reduction (ARR), relative risk reduction (RRR), odds ratio (OR), number needed to treat (NNT), and effect size. The appropriateness of using these to express an intervention effect and whether probabilities, means, or medians are used to calculate them depend on the type of outcome variable used to measure health outcomes. For example, ARR, RRR, and NNT are used for dichotomous variables, and effect sizes are normally used for continuous variables. See also Absolute risk reduction; Relative risk reduction; Odds ratio; Number needed to treat.
Treatment target	The manifestation of illness (a symptom, sign, or physiological abnormality) toward which a treatment is directed. See also Endpoint.
Treatment threshold	Probability above which a clinician would consider a diagnosis confirmed and would stop testing and initiate treatment. See also Test threshold.
Trial of therapy	In a trial of therapy, the physician offers the patient an intervention, reviews the impact of the intervention on that patient at some subsequent time, and, depending on the impact, recommends either continuation or discontinuation of the intervention.
Triangulation	1. More than one investigator collects and analyzes the raw data, such that the findings emerge through consensus among investigators. 2. In qualitative research, an analytic approach in which key findings are corroborated using multiple sources of information.
Trigger orders	Orders in response to which the computer decision support system (CDSS) would initiate action.
Trim-and-fill method	When publication bias is suspected in a systematic review, investigators may attempt to estimate the true intervention effect by removing, or trimming, small positive-result studies that do not have a negative-result study counterpart and then calculating a supposed true effect from the resulting symmetric funnel plot. The investigators then replace the positive-result studies they have removed and add hypothetical studies that mirror these positive-result studies to create a symmetric funnel plot that retains the new pooled effect estimate. This method allows the calculation of an adjusted confidence interval and an estimate of the number of missing trials.
True negative	Those whom the test correctly identifies as not having the target disorder.
True positive	Those whom the test correctly identifies as having the target disorder.

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Term	Definition
T-test	A parametric statistical test that examines the difference between the means of 2 groups of values.
Type I error	An error created by rejecting the null hypothesis when it is true (ie, investigators conclude that a relationship exists between variables when it does not).
Type II error	An error created by accepting the null hypothesis when it is false (ie, investigators conclude that no relationship exists between variables when, in fact, a relationship does exist).
Unblinded	Patients, clinicians, those monitoring outcomes, judicial assessors of outcomes, data analysts, and manuscript authors are aware of whether patients have been assigned to the experimental or control group.
Unit of analysis error	When investigators use any sort of cluster randomization (randomize by physician instead of patient, practice instead of physician or patient, or village instead of participant) and analyze as if they have randomized according to patient or participant, they have made a unit of analysis error. The appropriate analysis acknowledges the cluster randomization and takes into account the extent to which outcomes differ between clusters independent of treatment effect.
Up-front costs	Costs incurred to "produce" the treatment such as the physician's time, nurse's time, and materials.
Utilitarian	A consequentialist or utilitarian view of distributive justice would contend that even in individual decision making, the clinician should take a broad social view in which the action that would provide the greatest good to the greatest number is favored. In this broader view, the effect on others of allocating resources to a particular patient's care would bear on the decision. An alternative to the deontological view.
Utility	Patient preferences that are measured with techniques consistent with modern utility theory. Patient preferences refer to the degrees of subjective satisfaction, distress, or desirability that patients or potential patients associate with a particular health outcome. Utility theory is based on specific axioms that describe how a rational decision maker ought to make a decision when the outcomes of that decision are uncertain. Commonly used measures of utility include the "standard gamble" or "time trade-off" techniques.
Utility measures	Measures that provide a single number that summarizes all of health-related quality of life (HRQL) and are preference- or value-weighted; these have the preferences or values anchored to death and full health and are called utility measures. See also Health-related quality of life.

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Term	Definition
Utilization review	An organized procedure carried out through committees to review admissions, duration of stay, and professional services provided, and to evaluate the necessity of those services and promote their most efficient use.
Validity	In health status measurement terms, validity is the extent to which an instrument measures what it is intended to measure. In critical appraisal terms, validity reflects the extent to which the study results are likely to be subject to systematic error and thus be more or less likely to reflect the truth. See also Credibility.
Values	When used generically, as in "values and preferences," we refer to the collection of goals, expectations, predispositions, and beliefs that individuals have for certain decisions and their potential outcomes. The incorporation of patient values and preferences in decision making is central to evidence-based medicine. These terms also carry specific meaning in other settings. Measurement tools that require a choice under conditions of uncertainty to indirectly measure preference for an outcome in health economics (eg, the standard gamble) quantify preferences. Measurement tools that evaluate the outcome on a scale with defined favorable and unfavorable ends (eg, visual analog scales, feeling thermometers) quantify values.
Variance	The technical term for the statistical estimate of the variability in results.
Variant allele	The allele at a particular SNP that is the least frequent in a population.
Verification bias	Results of a diagnostic test influence whether patients are assigned to an intervention group. See also Differential verification bias.
Visual analogue scale	A scaling procedure consisting of a straight line anchored on each end with words or phrases that represent the extremes of some phenomenon (eg, "worst pain I have ever had" to "absolutely no pain"). Respondents are asked to make a mark on the line at the point that corresponds to their experience of the phenomenon.
Washout period	In a crossover or N-of-1 trial, the period required for the treatment to cease to act once it has been discontinued.
Weighted kappa	A measure of the extent to which observers achieve agreement beyond the level expected to occur by chance alone. Kappa can take values from 0 (poor agreement) to 1.0 (perfect agreement).
Wild-type allele	The allele at a particular SNP that is most frequent in a population, also called "common" allele.
χ^2 test	A nonparametric test of statistical significance used to compare the distribution of categorical outcomes in two or more groups, the null hypothesis of which is that the underlying distributions are identical.