

Benefits and harms

From: [Key Concepts for assessing claims about treatment effects and making well-informed treatment choices \(Version 2022\)](#)

3.2a Weigh the benefits and savings against the harms and costs of acting or not.

Explanation

Individuals, clinicians, and policymakers deciding about whether to use a treatment should consider the potential benefits and the potential harms, costs and other advantages and disadvantages of the treatment. When a decision affects many people, it is important to consider the distribution of the advantages and disadvantages, i.e., who will benefit, who will be harmed, who will achieve savings, and who will bear the costs.

When the advantages of a treatment clearly outweigh the disadvantages, deciding what to do is relatively easy. For example, for patients who have had a heart attack, stroke or transient ischemic attack, the advantages of low-dose aspirin compared to not taking aspirin (reduced deaths, heart attacks, and strokes) are substantially more than the disadvantages (increased serious gastrointestinal bleeds, and minimal inconvenience and cost) [[Vandvik 2012](#)]. Most people in this situation would choose to take aspirin. On the other hand, when the advantages and disadvantages are closely balanced, deciding what to do can be difficult. For example, for someone 50 years or older without symptomatic cardiovascular disease, aspirin only slightly reduces deaths if taken over 10 years, and a reduction in heart attacks is closely balanced with an increase in serious gastrointestinal bleeds. Some people in this situation would choose to take aspirin, and some would not.

Basis for this concept

Treatments have both advantages and disadvantages. Often, people tend to exaggerate the advantages of treatments and ignore or downplay their disadvantages (see Concept 1.1a). For some treatments, the advantages clearly outweigh the disadvantages. However, the advantages and disadvantages are often closely balanced, and need to be carefully weighed. UpToDate is a widely used electronic medical textbook that includes thousands of recommendations based on the best available evidence. Strong recommendations are ones for which the authors were confident that the desirable consequences clearly outweigh the undesirable consequences [[Andrews 2013a](#), [Andrews 2013b](#), [Guyatt 2008a](#)]. Weak or conditional recommendations are ones for which the balance of desirable and undesirable consequences between alternatives is close or uncertain. A review of more than 9,400 recommendations in UpToDate found that less than one-third (31%) of the recommendations were strong [[Agoritsas 2017 \(RS\)](#)]. Most (69%) of the recommendations were weak or conditional. A review of 456 recommendations in 43 guidelines found a higher proportion of strong recommendations (63%) [[Alexander 2014 \(RS\)](#)]. However, more than half (56%) of the strong recommendations were based on evidence warranting very low confidence in the effect estimates and another 23% on evidence warranting low confidence. A critical review of those recommendations determined that 46% warranted a conditional, rather than a strong recommendation [[Alexander 2016 \(RS\)](#)], suggesting that 17% of the recommendations were strong.

Cost-effectiveness analyses can help to inform judgements about whether the net benefits of a treatment (the difference between the benefits and the harms) is worth the cost. Cost-effectiveness

analyses are especially helpful for health insurance schemes when deciding which treatments should be paid for. Because these analyses use models and depend on assumptions, the results are often uncertain (see [Concept 2.2d](#)). Nonetheless, sensitivity analyses can help to reveal important uncertainties and the models can help to inform decisions. However, most published analyses report cost-effectiveness ratios below thresholds commonly used to decide whether a treatment is “cost-effective”, and industry funded analyses are more likely to report ratios below those thresholds than other analyses [[Bell 2006 \(SR\)](#)]. In addition, there is no evidence of an agreed public threshold [[Harris 2008 \(RS\)](#)]. Willingness to pay for a treatment is related to the severity of the condition being treated, the importance of the treatment effect, confidence in the evidence, and total cost to the government or other payer, as well as the estimated cost-effectiveness. Equity, acceptability, and feasibility may also influence decisions [[Alonso-Coello 2016](#)].

Implications

Always consider the balance between advantages and disadvantages of treatments.

References

Systematic reviews

Bell CM, Urbach DR, Ray JG, Bayoumi A, Rosen AB, Greenberg D, et al. Bias in published cost effectiveness studies: systematic review. *BMJ*. 2006;332(7543):699-703. <https://doi.org/10.1136/bmj.38737.607558.80>

Research studies

Agoritsas T, Merglen A, Heen AF, Kristiansen A, Neumann I, Brito JP, et al. UpToDate adherence to GRADE criteria for strong recommendations: an analytical survey. *BMJ Open*. 2017;7(11):e018593. <https://doi.org/10.1136/bmjopen-2017-018593>

Alexander PE, Bero L, Montori VM, Brito JP, Stoltzfus R, Djulbegovic B, et al. World Health Organization recommendations are often strong based on low confidence in effect estimates. *J Clin Epidemiol*. 2014;67(6):629-34. <https://doi.org/10.1016/j.jclinepi.2013.09.020>

Alexander PE, Brito JP, Neumann I, Gionfriddo MR, Bero L, Djulbegovic B, et al. World Health Organization strong recommendations based on low-quality evidence (study quality) are frequent and often inconsistent with GRADE guidance. *J Clin Epidemiol*. 2016;72:98-106. <https://doi.org/10.1016/j.jclinepi.2014.10.011>

Harris AH, Hill SR, Chin G, Li JJ, Walkom E. The role of value for money in public insurance coverage decisions for drugs in Australia: a retrospective analysis 1994-2004. *Med Decis Making*. 2008;28(5):713-22. <https://doi.org/10.1177/0272989x08315247>

Other references

Alonso-Coello P, Schunemann HJ, Moberg J, Brignardello-Petersen R, Akl EA, Davoli M, et al. GRADE Evidence to Decision (EtD) frameworks: a systematic and transparent approach to making well informed healthcare choices. 1: Introduction. *BMJ*. 2016;353:i2016. <https://doi.org/10.1136/bmj.i2016>

Andrews J, Guyatt G, Oxman AD, Alderson P, Dahm P, Falck-Ytter Y, et al. GRADE guidelines: 14. Going from evidence to recommendations: the significance and presentation of recommendations. *J Clin Epidemiol*. 2013a;66(7):719-25. <https://doi.org/10.1016/j.jclinepi.2012.03.013>

Andrews JC, Schunemann HJ, Oxman AD, Pottie K, Meerpohl JJ, Coello PA, et al. GRADE guidelines: 15. Going from evidence to recommendation—determinants of a recommendation's direction and strength. *J Clin Epidemiol*. 2013b;66(7):726-35. <https://doi.org/10.1016/j.jclinepi.2013.02.003>

Guyatt GH, Oxman AD, Kunz R, Falck-Ytter Y, Vist GE, Liberati A, et al. Going from evidence to recommendations. *BMJ*. 2008a;336(7652):1049-51. <https://doi.org/10.1136/bmj.39493.646875.ae>

Vandvik PO, Lincoff AM, Gore JM, Gutterman DD, Sonnenberg FA, Alonso-Coello P, et al. Primary and secondary prevention of cardiovascular disease: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. *Chest*. 2012;141(2 Suppl):e637S-e68S. <https://doi.org/10.1378/chest.11-2306>