Supplemental Table 1: The American Society of Anesthesiologists approach to assigning levels of evidenceand grades of recommendations

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| **Level of Evidence** | **Basis** |
| **Category A**  **Level 1**  **Level 2**  **Level 3** | Randomized clinical trials (RCTs)  The literature contains a sufficient number of RCTs to conduct meta-analysis, and meta-analytic findings from these aggregated studies  are reported as evidence.  The literature contains multiple RCTs, but the number of RCTs is not sufficient to conduct a viable meta-analysis for the purpose of these Guidelines. Findings from these RCTs are reported separately as evidence.  The literature contains a single RCT, and findings from this study are reported as evidence. |
| **Category B**  **Level 1**  **Level 2**  **Level 3**  **Level 4** | Observational studies or RCTs without pertinent comparison groups  The literature contains nonrandomized comparisons (*e.g.*, quasiexperimental, cohort [prospective or retrospective], or case-control research designs) with comparative statistics between clinical interventions for a specified clinical outcome.  The literature contains noncomparative observational studies with associative statistics (*e.g.*, relative risk, correlation, sensitivity, and specificity).  The literature contains noncomparative observational studies with descriptive statistics (*e.g.*, frequencies, percentages).  The literature contains case reports |
| **Insufficient Literature** | Evidence is either unavailable or inadequate |
| **Opinion-based evidence** | Findings from formal surveys are reported |

From:

a) Apfelbaum JL, Connis RT. The American Society of Anesthesiologists practice parameter methodology. Anesthesiology 2019;130:367-84

b) Practice Guidelines for Moderate Procedural Sedation and Analgesia 2018: A report by the American Society of Anesthesiologists Task Force on Moderate Procedural Sedation and Analgesia, the American Association of Oral and Maxillofacial Surgeons, American College of Radiology, American Dental Association, American Society of Dentist Anesthesiologists, and Society of Interventional Radiology. Anesthesiology2018; 128:437–79

Supplemental Table 2: Grades of Recommendation, Assessment, Development, and Evaluation (GRADE) approach to assigning levels of evidenceand grades of recommendations

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| --- | --- |
| **Level of Evidence** | **Description** |
| **High** | Very confident that the true effect lies close to that of the estimate of the effect. The true effect lies close to thatof the estimate of the effect (e.g., randomized controlled trials with consistent results or observational studies with very large effect sizes) |
| **Moderate** | Moderately confident in the effect estimate: The true effect is likely to beclose to the estimate of the effect, but there is a possibility that it is substantially different (e.g., randomized controlled trials with methodological limitations or observational studies with large effect sizes). |
| **Low** | Confident in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect (e.g., randomized controlled trials with very serious limitation or observational studies without exceptional strength). |
| **Very low** | Very little confidence in the effect estimate: The true effects is likelyto be substantially different from the estimate of effect (e.g., case reports and case series). |
| **Grade of Recommendation** | **Definition** |
| **Strong recommendations** | All or almost all informed people would make the recommended choice for or against an intervention. |
| **Weak recommendations** | Three alternative terms: conditional, discretionary, or qualified.  Recommendations may be conditional upon patient values and preferences, the resources available or the setting in which the intervention will be implemented. Recommendations may be at the discretion of the patient and clinician, or qualified with an explanation about the issues that would lead decisions to vary. |

From: Balshem H, Helfand M, Holger J, Schünemann HJ, Oxman AD, Kunz R, et al. GRADE

guidelines: 3. Rating the quality of evidence. J Clin Epidemiol 2011;64:401-6

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 2013;66:719-25

Supplemental Table 3. United States Preventive Services Task Force (USPSTF) Grades and Levels of Certainty Regarding Net Benefit

|  |  |
| --- | --- |
| **Level of Certainty** | **Description** |
| High | The available evidence usually includes consistent results from well-designed, well-conducted studies in representative primary care populations. These studies assess the effects of the preventive service on health outcomes. This conclusion is therefore unlikely to be strongly affected by the results of future studies. |
| Moderate | The available evidence is sufficient to determine the effects of the preventive service on health outcomes, but confidence in the estimate is constrained by such factors as: the number, size, or quality of individual studies, inconsistency of findings across individual studies, limited generalizability of findings to routine primary care practice, lack of coherence in the chain of evidence.  As more information becomes available, the magnitude or direction of the observed effect could change, and this change may be large enough to alter the conclusion. |
| Low | The available evidence is insufficient to assess effects on health outcomes. Evidence is insufficient because of: the limited number or size of studies, important flaws in study design or methods, inconsistency of findings across individual studies, gaps in the chain of evidence, findings not generalizable to routine primary care practice, lack of information on important health outcomes. More information may allow estimation of effects on health outcomes. |
|  | The USPSTF defines certainty as “likelihood that the USPSTF assessment of the net benefit of a preventive service is correct.” The net benefit is defined as benefit minus harm of the preventive service as implemented in a general, primary care population. The USPSTF assigns a certainty level based on the nature of the overall evidence available to assess the net benefit of a preventive service. |
| **Grade** | **Definition** |
| **A** | The USPSTF recommends the service. There is high certainty that the net benefit is substantial. |
| **B** | The USPSTF recommends the service. There is high certainty that the net benefit is moderate, or there is moderate certainty that the net benefit is moderate to substantial. |
| **C** | The USPSTF recommends selectively offering or providing this service to individual patients based on professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small. |
| **D** | The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits. |
| **I** | The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined. |

From: [US Preventive Services Task Force](https://www.ncbi.nlm.nih.gov/pubmed/?term=US%20Preventive%20Services%20Task%20Force%5BCorporate%20Author%5D), [Grossman DC](https://www.ncbi.nlm.nih.gov/pubmed/?term=Grossman%20DC%5BAuthor%5D&cauthor=true&cauthor_uid=29450531), [Curry SJ](https://www.ncbi.nlm.nih.gov/pubmed/?term=Curry%20SJ%5BAuthor%5D&cauthor=true&cauthor_uid=29450531), [Owens DK](https://www.ncbi.nlm.nih.gov/pubmed/?term=Owens%20DK%5BAuthor%5D&cauthor=true&cauthor_uid=29450531), Barry MJ, Davidson KW, et al. Screening for ovarian cancer: US Preventive Services Task Force Recommendation Statement. JAMA 2018;319:588-594

Supplemental Table 4. American College of Cardiology (ACC) and American Heart Association (AHA) classification on the levels of evidence and grades of recommendations

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| --- | --- |
| **Level of Evidence** | **Description** |

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| --- | --- |
| Level A | Data derived from multiple randomized clinical trials or meta-analyses. |
| Level B | Data derived from a single randomized trial or nonrandomized studies. |
| Level C | Only consensus opinion of experts, case studies, or standard-of-care. |
| **Grade of Recommendation** | **Definition** |
| Class I | Conditions for which there is evidence and/or general agreement that a given procedure or treatment is useful and effective. |
| Class II | Conditions for which there is conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of a procedure or treatment. |
| Class IIa | Weight of evidence/opinion is in favor of usefulness/efficacy. |
| Class IIb | Usefulness/efficacy is less well established by evidence/opinion. |
| Class III | Conditions for which there is evidence and/or general agreement that the procedure/treatment is not useful/effective and in some cases may be harmful |

From: Smith SC Jr, Feldman TE, Hirshfeld JW Jr, Jacobs AK, Kern MJ, King SB, et al. ACC/AHA/SCAI 2005 Guideline update for percutaneous coronary intervention-Summary article. A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (ACC/AHA/SCAI Writing Committee to Update the 2001 Guidelines for Percutaneous Coronary Intervention). J Am Coll Cardiol 2006;47:216–235

Supplemental Table 5a. Oxford Center for Evidence-Based Medicine Levels of Evidence and Grades of Recommendation (March 2009)

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| --- | --- |
| **Level of Evidence** | **Therapy/Prevention/Aetiology/Harm - Description** |
| 1a | Systematic review (with homogeinity) of randomized clinical trials |
| 1b | Individual randomized clinical trials (with narrow confidence interval) |
| 1c | All or none (met when all patients died before the treatment became available, but some now survive on it; or when some patients died before the Rx became available, but none now die on it.) |
| 2a | Systematic review (with homogeinity) of cohort studies |
| 2b | Individual cohort study (including low quality randomized clinical trials; e.g. 80% follow-up) |
| 2c | Outcomes research; ecological studies |
| 3a | Systematic review (with homogeinity) of case control studies |
| 3b | Individual case-control study |
| 4 | Case series (and poor quality cohort and case-control studies) |
| 5 | Expert opinion without critical appraisal, or based on physiology, bench research or “first principles: |
| **Grade of Recommendation** | **Definition** |
| A | Consistent level 1 evidence |
| B | Consistent level 2 or 3 evidence **or** extrapolations from level 1 studies |
| C | Level 4 evidence **or** extrapolations from level 2 or 3 studies |
| D | Level 5 evidence **or** troublingly inconsistent or inconclusive studies of any level |

From: The Oxford 2011 Levels of Evidence. Available at: http://www.cebm.net/index.aspx?o=5653. Accessed July 16, 2019

Supplemental Table 5b. Oxford Center for Evidence-Based Medicine 2011 Levels of Evidence

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| --- | --- |
| **Level of Evidence** | **Treatment Benefits/Harms/Screening** |
| 1 | Systematic review of randomized trials or n-of-1 trials |
| 2 | Randomized trial or observational study with dramatic effect |
| 3 | Non-randomized cohort/follow-up study (post-marketing surveillance) |
| 4 | Case series, case-control studies, or poor quality prognostic cohort study, or historically controlled studies |
| 5 | Mechanism-based reasoning |

Level may be graded down on the basis of study quality, imprecision, indirectness, because of inconsistency between studies, or because the absolute effect size is very small; Level may be graded up if there is large or very large effect size.

As always, a systematic review is generally better than an individual study.

From: Howick H, Chalmers I, Glasziou P, Greenhalgh T, Heneghan C, Liberati A, et al. Explanation of the 2011 Oxford Centre for Evidence-Based Medicine (OCEBM) Levels of Evidence (Background Document). Oxford Centre for Evidence-Based Medicine. <https://www.cebm.net/index.aspx?o=5653> Accessed June 20, 2019

Supplemental Table 6. Reporting Items for Practice Guidelines in Healthcare (RIGHT) Checklist for Standard Reporting of Guidelines

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| --- | --- |
| Section/Topic | Item |
| Basic information  Tile/subtitle  Executive Summary  Abbreviations/acronyms  Corresponding developer | Identify nature of guideline, i.e. guideline or consensus statement, or position statement.  State year of publication and focus of guideline.  Provide summary of recommendations.  Define key terms, list of abbreviations or acronyms.  Identify corresponding author. |
| Background  Description of health problem  Aims of guideline  End users and setting  Development groups | Describe epidemiology of problem.  State aims and objectives.  Identify intended primary users, settings for which guideline is intended.  Describe selection, role and responsibilities of contributors; list individuals involved. |
| Evidence  Health care question  Systematic reviews  Assessment of the certainty of the body of evidence | State questions that were basis for recommendations in population, intervention, comparator, outcome (PICO) format. Indicate selection and scoring of outcomes.  State whether new reviews were done specifically for this guideline or published reviews were used. Describe how published reviews were identified and accessed.  Note the assessment of the certainty of the body of evidence. |
| Recommendations  Recommendations  Rationale/explanation  Evidence to decision process | Clear, concise, actionable; balance benefits and harms.  Separate recommendations for important subgroups.  Indicate strength of recommendations and certainty of evidence.  Describe values and preferences of target population.  Indicate whether cost and resource implications were considered. If yes, describe approaches and methods, and summarize. If not, provide explanation.  Describe equity, feasibility, and acceptability.  Describe processes in the formulation of recommendations. |
| Review and quality assurance  External review  Quality assurance | Indicate if guideline underwent independent review  Note whether guideline was subjected to quality assurance process |
| Funding source  Source and role of funder  Declaration and management of interests | Indicate source and role of funder in all stages of development and in dissemination and implementation of guidelines  Note relevant financial and nonfinancial conflicts of interest relevant to the guideline.  Describe how conflicts were evaluated and managed. |
| Other information  Access  Suggestions for further research  Limitations of guideline | Indicate where the guideline and relevant documents can be accessed.  Describe gaps in evidence, provide suggestions for further research.  Note limitations in the development process and how these limitations may have affected validity of the recommendations |

Modified from: Chen Y, Yang K, Marušic A, Qaseem A, Meerpohl JJ, Flottorp S, et al; RIGHT

(Reporting Items for Practice Guidelines in Healthcare) Working Group. A reporting tool for

practice guidelines in health care: The RIGHT statement. Ann Intern Med 2017;166:128-32

Supplemental Table 7. Appraisal of Guidelines for REsearch and Evaluation (AGREE) II Checklist for Evaluation of Practice Guidelines

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| --- |
| **Domain and Items** |
| **Domain 1. Scope and Purpose** |
| 1. The overall objective(s) is (are) specifically described. |
| 2. The health question(s) is (are) specifically described. |
| 3. The population (patients, public, etc.) to whom the guideline is meant to apply is described. |
| **Domain 2. Stakeholder Involvement** |
| 4. The development group includes individuals from all the relevant professional groups. |
| 5. The views and preferences of the target population have been sought. |
| 6. The target users of the guideline are clearly defined. |
| **Domain 3. Rigor of Development** |
| 7. Systematic methods were used to search for evidence. |
| 8. The criteria for selecting the evidence are clearly described. |
| 9. The strengths and limitations of the evidence are clearly described. |
| 10. The methods for formulating the recommendations are clearly described. |
| 11. The health benefits, side effects, and risks have been considered in the recommendations. |
| 12. There is an explicit link between the recommendations and the supporting evidence. |
| 13. The guideline has been externally reviewed by experts prior to its publication. |
| 14. A procedure for updating the guideline is provided. |
| **Domain 4. Clarity of Presentation** |
| 15. The recommendations are specific and unambiguous. |
| 16. The options for management of the condition or health issue are clearly presented. |
| 17. Key recommendations are easily identifiable. |
| **Domain 5. Applicability** |
| 18. The guideline describes facilitators and barriers to its application. |
| 19. The guideline provides advice/tools on how the recommendations can be put into practice. |
| 20. The resource implications of applying the recommendations have been considered. |
| 21. The guideline presents monitoring and/ or auditing criteria. |
| **Domain 6. Editorial Independence** |
| 22. The views of the funding body have not influenced the content of the guideline. |
| 23. Competing interests of group members have been recorded and addressed. |

From: Modified from AGREE Next Steps Consortium (2017). *The AGREE II Instrument* [Electronic version]. Retrieved April 25, 2019, from http://www.agreetrust.org.