SUPPLEMENTARY APPENDIX 1: Methods

2021 American College of Rheumatology/Vasculitis Foundation Guideline for the Management of Kawasaki Disease

Methodology Overview

This guideline was developed following the American College of Rheumatology (ACR) guideline development process (http://www.rheumatology.org/Practice-Quality/Clinical-Support/Clinical-Practice-Guidelines). This process includes the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) methodology (www.gradeworkinggroup.org (1-3).

Teams Involved

A Core Leadership Team (7 members) supervised the project and was responsible for defining the scope, drafting the clinical (Patient/Intervention/Comparator/Outcomes – PICO) questions, coordinating with the Literature Review Team, overseeing the voting process, and drafting the manuscript. The Core Team, together with the Literature Review Team, was comprised of individuals with content and methodological expertise, and included a GRADE methodologist who advised on the process of developing and presenting the evidence and provided input on the quality assessment of evidence and summary of findings (SoF) tables (provided in Supplementary Appendix 2).

The Literature Review Team (9 members) conducted a systematic search, screened papers for relevance, assessed study quality, extracted data, computed pooled estimates of outcomes, graded the quality of evidence, generated the SoF tables, and compiled an evidence report.

The role of the Expert Panel, comprised of seven content experts, was to provide consultation and feedback on the project scope, design, and PICO questions.

An initial Voting Panel consisted of 8 adult rheumatologists, 5 pediatric rheumatologists, and 2 adult patient representatives diagnosed with vasculitis. The role of the initial Voting Panel was to participate in the development of the scope and PICO questions, including making judgments regarding

the relative importance of the outcomes, and vote on the PICO questions, keeping the evidence report, their expertise and experience, and patient values and preferences in mind. To incorporate broader expertise from the pediatric community and validate the results from the initial Voting Panel, a second Voting Panel, consisting of 8 pediatric rheumatologists new to the Voting Panel, 4 pediatric rheumatologists who participated in both Voting Panels, a pediatric infectious disease physician with extensive expertise in KD, and a pediatric cardiologist with extensive expertise in KD, was established. The second Voting Panel also reviewed the Literature Review Team's evidence summaries and independently formulated and voted on recommendations. Members of the second Voting Panel who were not on the initial Voting Panel were not provided with the recommendations formulated by the initial Voting Panel prior to the second panel's voting. Each recommendation required consensus from at least 70% of the Voting Panel.

A Patient Panel was convened to discuss patient values and preferences related to outcomes, as well as evidence and drafted recommendation statements. The two patients on the initial Voting Panel also participated in the Patient Panel discussions. The Voting Panels used the input from the patient meeting to help guide their votes in balancing tradeoffs between the harms and benefits of the alternative management strategies.

The ACR provided training for everyone involved in the development of this guideline, which included sessions on the ACR guideline process and GRADE methodology. See Supplementary Appendix 3 for team/panel rosters.

Patient Panel

The Patient Panel, consisting of 11 individuals diagnosed with different types of vasculitis, was convened on September 11, 2019. A member of the Literature Review Team and one ACR staff person facilitated the day-long discussion.

The participants were first presented with the background and scope of the guideline project. They were then specifically queried on the relative importance of beneficial and adverse events of drugs and drug classes, including but not limited to efficacy, route of administration, and side effects, with particular attention paid to how values and preferences might differ. The Patient Panel reviewed the evidence synthesized by the Literature Review Team as several PICO questions were discussed. The participants were encouraged to consider their personal experiences relevant to the questions and judge the importance of the outcomes and vote on the drafted recommendation statements accordingly. The two patients on the initial Voting Panel, who had been at the patient meeting, presented the values and preferences of the Patient Panel and their voting results to the Voting Panel during the two-day Voting Panel meeting held September 15-16, 2019.

Disclosures and Management of Conflicts of Interest

Per ACR policy, everyone who was intellectually involved in the project (i.e., considered for guideline authorship) was required to disclose all relationships (https://www.rheumatology.org/Practice-Quality/Clinical-Support/Clinical-Practice-Guidelines/Vasculitis). Disclosures were compared against a previously drafted list of "affected companies" (i.e., companies or organizations that were considered reasonably likely to be positively or negatively affected by care delivered in accordance with the guideline) to determine which relationships were considered potential conflicts of interest for purposes of this project. Individuals were also asked to explicitly highlight relationships with any companies not on the affected companies list that related to the topic of the guideline. Individuals whose primary employment (> 51% of work time/effort) was with a company that manufactured or sold therapeutics or diagnostics were not eligible to participate.

The project's principal investigator (PI) and the literature review leader had no relevant conflicts of interest for the full 12 months before this project began, and the majority of the guideline development team members had no relevant conflicts of interest for the duration of the project. A

participant who had any relationship with an affected company was counted as conflicted (i.e., toward the allowed threshold) regardless of the type or subject of the relationship. Intellectual conflicts, such as a prior publication or scientific presentation on vasculitis therapy, were recognized as important and were required to be disclosed, but because they were ubiquitous, intellectual conflicts were not counted as conflicted toward the allowed threshold.

Participant disclosures were included in the project plan that was posted online for public comment (see description below). In addition, disclosures of all participants were shared, in writing, with each project participant. At the face-to-face initial Voting Panel meeting, verbal disclosures were provided before the content discussion began, and the same information was provided via tent cards and in a written summary provided to all participants at the beginning of the meeting. Verbal disclosures were provided at the beginning of the second Voting Panel's virtual webinar meeting. Updated participant disclosures, as well as ACR committee reviewer disclosures, are included online with this manuscript. Finally, author disclosures are also included in this paper.

Scope and Target Audience

The scope of this broad vasculitis project includes the use of diagnostic testing, pharmacologic treatments and non-pharmacologic interventions for the management of large vessel vasculitis (giant cell arteritis and Takayasu arteritis), medium vessel vasculitis (non-hepatitis-related polyarteritis nodosa and Kawasaki disease) and ANCA-associated vasculitides. The target audience for this guideline includes health care providers and patients with vasculitis. The ACR plans to develop derivative products to facilitate implementation of this guideline.

Establishing Key Principles and PICO Development

The Core Leadership Team collaborated with the Voting and Expert Panel members to develop the initial set of PICO-formatted clinical questions for the guideline, as well as identify pre-specified outcomes as critical or important for each PICO question (see Supplementary Appendix 2).

The Core Leadership Team held weekly conference calls, convened an initial face-to-face meeting of the Core Leadership Team, initial Voting Panel and Expert Panel in which the scope of the guideline was determined, and then developed the PICO questions. The PICO questions were posted for 30 days on the ACR website for public comment and revised accordingly. Once the PICO questions were finalized, individual online voting took place to ascertain any existing consensus, followed by a face-to-face meeting of the initial Voting Panel, where voting on the PICO questions was finalized. Following the meeting, additional clarifying questions were discussed by email and related voting took place via online survey.

Framework for the Vasculitis Guideline Development

At the scoping meeting, the Core Leadership Team, initial Voting Panel and Expert Panel agreed that the guideline would focus on the use of clinical, laboratory and imaging studies that contribute to the diagnosis and can be used to monitor large and medium vessel vasculitis, as well as recommendations for the use of glucocorticoids, non-glucocorticoid and biologic immunosuppressive agents, and non-pharmacologic interventions for the management of large and medium vessel vasculitis based on considerations of both efficacy and safety. After defining population risk groups, interventions and comparators were specified for each PICO question (see list of PICO questions in Supplementary Appendix 2).

Systematic Synthesis of the Literature

Literature Searches

To identify relevant evidence for the PICO questions, a medical librarian, in collaboration with the Literature Review Team, performed systematic searches of the published English language literature. OVID Medline, PubMed, Embase, and the Cochrane Library (including Cochrane Database of Systematic Reviews; Database of Abstracts of Reviews of Effects (DARE); Cochrane Central Register of Controlled Trials (CENTRAL); and Health Technology Assessments (HTA)) were searched from the

beginning of each database through June 21, 2018; updated searches were conducted from this date to July 1, 2019 for all topics, and a final targeted GPA search on July 14, 2020. (Supplementary Appendices 4 and 5).

Study Selection

DistillerSR software (https://distillercer.com/products/distillers-systematic-review-software) was used to aid screening the literature search results. Teams of two independent reviewers performed duplicate screening of each title and abstract with articles identified as potentially eligible passing to review of full text. Eligible articles underwent full-text screening by two independent reviewers. Selected manuscripts were then matched to PICO questions. See Supplementary Appendix 5 for details related to the study selection process.

Data Extraction and Analysis

Data from RCTs for each PICO question was extracted into RevMan software (http://tech.cochrane.org/revman). Risk of bias of each primary study was assessed using the Cochrane risk of bias tool for randomized trials and using a modified New-Castle Ottawa scale for observational studies (http://handbook.cochrane.org/). For data not appropriate for RevMan (e.g., non-comparative data), reviewers abstracted data describing details of the population, interventions (if any), and results into summary tables. When test accuracy results were available, reviewers abstracted test accuracy information and used the QUADAS tool to assess the risk of bias in the included studies. When pooling was appropriate, the review team used Open Meta Analyst (http://www.cebm.brown.edu/openmeta/) to pool test accuracy results and the GRADEpro software to created diagnosis summary of finding tables.

Evidence Report Formulation

RevMan files were exported into GRADEpro software to formulate a GRADE Summary of Findings (SoF) table for each PICO question (4). The quality of evidence for each outcome was evaluated in duplicate by two independent reviewers using GRADE quality assessment criteria (1) with discordance

resolved by discussion. The resulting SoF tables were compiled in an evidence report (Supplementary Appendix 2). The Core Leadership Team reviewed the evidence report and addressed possible evidence gaps prior to presentation to the Voting Panels.

Moving from Evidence to Recommendations

GRADE methodology specifies that panels make recommendations based on a consideration of the balance of benefits and harms of the treatment options under consideration, the quality of the evidence (i.e., confidence in the effect estimates), and patients' values and preferences. Key to the recommendation is the trade-off between desirable and undesirable outcomes; recommendations require estimating the relative value patients place on the outcomes.

A recommendation could be either in favor of or against the proposed intervention and either strong or conditional. According to GRADE, a recommendation is categorized as strong if the panel is very confident that the benefits of an intervention clearly outweigh the harms (or vice versa); a conditional recommendation denotes uncertainty regarding the balance of benefits and harms, such as when the evidence quality is low or very low, or when the decision is sensitive to individual patient preferences, or when costs are expected to impact the decision. Thus, conditional recommendations refer to decisions in which incorporation of patient preferences is a particularly essential element of decision making.

Judgments are based on the experience of the clinician panel members in shared decision making with their patients, on the experience and perspectives of the Patient Panel members and, to a considerable extent, on the results of discussion with the patient focus group.

Consensus Building

The Voting Panels received the evidence report for review before meeting to discuss and decide on the final recommendations. During the two-day, face-to-face initial Voting Panel meeting and the subsequent second Voting Panel webinar meeting, the Voting Panels, for each PICO question, reviewed

the evidence and provided votes on the direction and strength of the recommendations. For both the in-person meeting and the webinar, the voting process was conducted using Poll Everywhere software (www.polleverywhere.com), with a follow-up online survey to vote on clarifications/unresolved questions, as needed. A 70% consensus was used as the threshold for a recommendation; if 70% consensus was not achieved during an initial vote, the panel members held additional discussions before re-voting until at least 70% consensus was achieved.

Consistent with GRADE guidance, in some instances, the Voting Panels chose to provide a strong recommendation despite a low or very low quality rating of evidence (3). In such cases, a written explanation is provided describing the reasons behind this decision with reference to GRADE guidance on the matter (3). Additionally, in some instances, the Voting Panels found that the evidence for a particular PICO question did not support a graded recommendation or did not favor one intervention over the other. However, the Voting Panels believed the PICO question addressed a commonly encountered clinical question and thus felt that providing guidance for this question was warranted. For these situations, "ungraded position statements" were developed, which reflects general views of the Voting Panels.

Final Review and Approval of the Manuscript by the ACR

In addition to journal peer reviews, the manuscript was reviewed by the following committees and subcommittees of the ACR: ACR Guideline Subcommittee; ACR Quality of Care Committee; and ACR Board of Directors. These ACR oversight groups did not mandate that certain recommendations be made within the guideline, but rather, served as peer reviewers.

Moving from Recommendations to Practice

These recommendations are designed to support health care providers who work with patients in selecting therapies. Health care providers and patients must take into consideration not only clinical phenotype and level of disease activity, but also comorbidities, response and tolerance of prior

therapies, patient's values and preferences, and patient's functional status and functional goals in choosing the optimal therapy for an individual patient at the given point in treatment.

REFERENCES

1. Guyatt GH, Oxman AD, Vist GE, Kunz R, Falck-Ytter Y, Alonso-Coello P, et al. GRADE: an emerging consensus on rating quality of evidence and strength of recommendations. BMJ. 2008;336(7650):924-6.
2. 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(7):719-25.
3. 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. 2013;66(7):726-35.
4. Guyatt GH, Oxman AD, Kunz R, Atkins D, Brozek J, Vist G, et al. GRADE guidelines: 2. Framing the question and deciding on important outcomes. J Clin Epidemiol 2011;64:395-400.