

# Review Period Report

## Evidence-Based Clinical Practice Guideline on the Management of Carpal Tunnel Syndrome

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# The Management of Carpal Tunnel Syndrome

## Overview of the Review Period

The reviews and comments related to this clinical practice guideline are reprinted in this document and posted on the AAOS website. All reviewers are required to disclose their conflict of interests.

### Review Process:

AAOS contacted 11 organizations with content expertise to review a draft of the clinical practice guideline during the three-week peer review period in September 2023.

Additionally, the draft was also provided to members of the AAOS Board of Directors (BOD), members of the Research and Quality Council (RQC), members of the Board of Councilors (BOC), members of the Board of Specialty Societies (BOS) and members of the Committee on Evidence-Based Quality and Value (EBQV) for review and comment.

- Fourteen (14) individuals provided comments via the electronic structured peer review form. No reviewers asked to remain anonymous.
- All fourteen reviews were on behalf of a society and/or committee.
- The work group considered all comments and made some modifications when they were consistent with the evidence.

## Reviewer Key

Each reviewer was assigned a number (see below). All responses in this document are listed by the assigned peer reviewer's number.

**Table 1. Reviewer Key**

| <b>Reviewer Number</b> | <b>Name of Reviewer</b>                 | <b>Society/ Committee Being Represented</b>   |
|------------------------|---|---|
| 1                      | Matthew Putnam, MD                      | DePuy, Key Informants Panel   |
| 2                      | Karl Echiverri, MD                      | American Academy of Neurology   |
| 3                      | Lori Algar, OTD, OTR/L, CHT             | American Society of Hand Therapists   |
| 4                      | Aviram Giladi, MD, MS                   | American Society for Surgery of the Hand  |
| 5                      | Marsha Lawrence, PT, DPT, CHT           | American Academy of Orthopaedic Surgeons, Key Informants Panel  |
| 6                      | Alfonso Mejia, MD, MPH, FAAOS           | American Academy of Orthopaedic Surgeons, Board of Councilors   |
| 7                      | Carrie Swigart, MD, FAAOS               | American Academy of Orthopaedic Surgeons  |
| 8                      | James Ausfahl, MD, FACOEM, FAAFP, FASAM | American College of Occupational and Environmental Medicine   |
| 9                      | Christopher Belyea, MD, MBA, FAAOS      | American Academy of Orthopaedic Surgeons, Board of Councilors   |
| 10                     | Peter Amadio, MD, FAAOS                 | American Academy of Orthopaedic Surgeons, Board of Councilors/ Board of Specialty Societies, Research and Quality Committee |
| 11                     | J Mark Melhorn, MD                      | American College of Occupational and Environmental Medicine   |
| 12                     | Olalekan Omolola, MD, MBA               | 3M  |
| 13                     | Dennis Chin, MD, FAAOS                  | American Academy of Orthopaedic Surgeons, Key Informants Panel  |
| 14                     | Shafic Sraj, MD, MBA, FAAOS             | American Academy of Orthopaedic Surgeons  |

## Reviewer Demographics

**Table 2: Reviewer Demographics**

| Reviewer Number | Name of Reviewer                        | Primary Specialty | Work Setting                      |
|-----------------|---|-------------------|-----------------------------------|
| 1               | Matthew Putnam, MD                      | Hand              | Other                             |
| 2               | Karl Echiverri, MD                      | Other             | Academic Practice                 |
| 3               | Lori Algar, OTD, OTR/L, CHT             | Other             | Private Group or Practice         |
| 4               | Aviram Giladi, MD, MS                   | Hand              | Academic Practice                 |
| 5               | Marsha Lawrence, PT, DPT, CHT           | Hand              | Other                             |
| 6               | Alfonso Mejia, MD, MPH, FAAOS           | Hand              | Academic Practice                 |
| 7               | Carrie Swigart, MD, FAAOS               | Hand              | Academic Practice                 |
| 8               | James Ausfahl, MD, FACOEM, FAAFP, FASAM | Other             | Private Group or Practice         |
| 9               | Christopher Belyea, MD, MBA, FAAOS      | Hand              | Military                          |
| 10              | Peter Amadio, MD, FAAOS                 | Hand              | Academic Practice                 |
| 11              | J Mark Melhorn, MD                      | Hand              | Private Group or Practice         |
| 12              | Olalekan Omolola, MD, MBA               | Other             | Other                             |
| 13              | Dennis Chin, MD, FAAOS                  | Other             | Non-Military Government or Public |
| 14              | Shafic Sraj, MD, MBA, FAAOS             | Hand              | Academic Practice                 |

## Reviewers' Disclosure Information

All reviewers are required to disclose any possible conflicts that would bias their review via a series of 10 questions (see Table 3). For any positive responses to the questions (i.e., "Yes"), the reviewer was asked to provide details on their possible conflict.

**Table 3. Disclosure Question Key**

| <b>Disclosure Question</b> | <b>Disclosure Question Details</b>  |
|----------------------------|---|
| <b>A</b>                   | A) Do you or a member of your immediate family receive royalties for any pharmaceutical, biomaterial or orthopaedic product or device?  |
| <b>B</b>                   | B) Within the past twelve months, have you or a member of your immediate family served on the speakers bureau or have you been paid an honorarium to present by any pharmaceutical, biomaterial or orthopaedic product or device company? |
| <b>C</b>                   | C) Are you or a member of your immediate family a PAID EMPLOYEE for any pharmaceutical, biomaterial or orthopaedic device or equipment company, or supplier?  |
| <b>D</b>                   | D) Are you or a member of your immediate family a PAID CONSULTANT for any pharmaceutical, biomaterial or orthopaedic device or equipment company, or supplier?  |
| <b>E</b>                   | E) Are you or a member of your immediate family an UNPAID CONSULTANT for any pharmaceutical, biomaterial or orthopaedic device or equipment company, or supplier?   |
| <b>F</b>                   | F) Do you or a member of your immediate family own stock or stock options in any pharmaceutical, biomaterial or orthopaedic device or equipment company, or supplier (excluding mutual funds)   |
| <b>G</b>                   | G) Do you or a member of your immediate family receive research or institutional support as a principal investigator from any pharmaceutical, biomaterial or orthopaedic device or equipment company, or supplier?                        |
| <b>H</b>                   | H) Do you or a member of your immediate family receive any other financial or material support from any pharmaceutical, biomaterial or orthopaedic device and equipment company or supplier?  |
| <b>I</b>                   | I) Do you or a member of your immediate family receive any royalties, financial or material support from any medical and/or orthopaedic publishers?   |
| <b>J</b>                   | J) Do you or a member of your immediate family serve on the editorial or governing board of any medical and/or orthopaedic publication?   |





## Reviewer Responses to Structured Review Form Questions

All reviewers are asked 16 structured review questions which have been adapted from the Appraisal of Guidelines for Research and Evaluation (AGREE) II Criteria\*. Their responses to these questions are listed on the next few pages.

**Table 5. Reviewer Responses to Structured Review Questions 1-4**

| <b>Reviewer Number</b> | <b>Name of Reviewer</b>                 | <b>1. The overall objective(s) of the guideline is (are) specifically described.</b> | <b>2. The health question(s) covered by the guideline is (are) specifically described.</b> | <b>3. The guideline's target audience is clearly described.</b> | <b>4. There is an explicit link between the recommendations and the supporting evidence.</b> |
|------------------------|---|--|--|---|--|
| 1                      | Matthew Putnam, MD                      | Strongly Agree   | Strongly Agree   | Strongly Agree  | Strongly Agree   |
| 2                      | Karl Echiverri, MD                      | Strongly Agree   | Agree  | Agree   | Agree  |
| 3                      | Lori Algar, OTD, OTR/L, CHT             | Agree  | Agree  | Agree   | Disagree   |
| 4                      | Aviram Giladi, MD, MS                   | Strongly Agree   | Agree  | Agree   | Strongly Agree   |
| 5                      | Marsha Lawrence, PT, DPT, CHT           | Agree  | Strongly Agree   | Strongly Agree  | Neutral  |
| 6                      | Alfonso Mejia, MD, MPH, FAAOS           |  |  |   |  |
| 7                      | Carrie Swigart, MD, FAAOS               | Strongly Agree   | Strongly Agree   | Strongly Agree  | Strongly Agree   |
| 8                      | James Ausfahl, MD, FACOEM, FAAFP, FASAM |  |  |   |  |
| 9                      | Christopher Belyea, MD, MBA, FAAOS      | Strongly Agree   | Strongly Agree   | Strongly Agree  | Strongly Agree   |
| 10                     | Peter Amadio, MD, FAAOS                 | Strongly Agree   | Strongly Agree   | Strongly Agree  | Disagree   |
| 11                     | J Mark Melhorn, MD                      | Strongly Agree   | Strongly Agree   | Strongly Agree  | Strongly Agree   |
| 12                     | Olalekan Omolola, MD, MBA               | Strongly Agree   | Strongly Agree   | Strongly Agree  | Strongly Agree   |
| 13                     | Dennis Chin, MD, FAAOS                  | Strongly Agree   | Strongly Agree   | Strongly Agree  | Strongly Agree   |
| 14                     | Shafic Sraj, MD, MBA, FAAOS             | Strongly Agree   | Strongly Agree   | Strongly Agree  | Strongly Agree   |

**Table 6. Reviewer Responses to Structured Review Questions 5-8**

| <b>Reviewer Number</b> | <b>Name of Reviewer</b>                 | <b>5. Given the nature of the topic and the data, all clinically important outcomes are considered.</b> | <b>6. The patients to whom this guideline is meant to apply are specifically described.</b> | <b>7. The criteria used to select articles for inclusion are appropriate.</b> | <b>8. The reasons why some studies were excluded are clearly described.</b> |
|------------------------|---|---|---|---|---|
| 1                      | Matthew Putnam, MD                      | Strongly Agree  | Strongly Agree  | Strongly Agree  | Agree   |
| 2                      | Karl Echiverri, MD                      | Neutral   | Agree   | Agree   | Agree   |
| 3                      | Lori Algar, OTD, OTR/L, CHT             | Disagree  | Agree   | Agree   | Neutral   |
| 4                      | Aviram Giladi, MD, MS                   | Strongly Agree  | Strongly Agree  | Strongly Agree  | Agree   |
| 5                      | Marsha Lawrence, PT, DPT, CHT           | Neutral   | Agree   | Strongly Agree  | Disagree  |
| 6                      | Alfonso Mejia, MD, MPH, FAAOS           |   |   |   |   |
| 7                      | Carrie Swigart, MD, FAAOS               | Strongly Agree  | Strongly Agree  | Strongly Agree  | Agree   |
| 8                      | James Ausfahl, MD, FACOEM, FAAFP, FASAM |   |   |   |   |
| 9                      | Christopher Belyea, MD, MBA, FAAOS      | Strongly Agree  | Strongly Agree  | Strongly Agree  | Strongly Agree  |
| 10                     | Peter Amadio, MD, FAAOS                 | Disagree  | Disagree  | Agree   | Agree   |
| 11                     | J Mark Melhorn, MD                      | Strongly Agree  | Strongly Agree  | Strongly Agree  | Strongly Agree  |
| 12                     | Olalekan Omolola, MD, MBA               | Strongly Agree  | Strongly Agree  | Strongly Agree  | Strongly Agree  |
| 13                     | Dennis Chin, MD, FAAOS                  | Strongly Agree  | Strongly Agree  | Strongly Agree  | Strongly Agree  |
| 14                     | Shafic Sraj, MD, MBA, FAAOS             | Strongly Agree  | Strongly Agree  | Strongly Agree  | Strongly Agree  |

**Table 7. Reviewer Responses to Structured Review Questions 9-12**

| <b>Reviewer Number</b> | <b>Name of Reviewer</b>                 | <b>9. All important studies that met the article inclusion criteria are included</b> | <b>10. The validity of the studies is appropriately appraised.</b> | <b>11. The methods are described in such a way as to be reproducible</b> | <b>12. The statistical methods are appropriate to the material and the objectives of this guideline</b> |
|------------------------|---|--|--|--|---|
| 1                      | Matthew Putnam, MD                      | Neutral  | Agree  | Strongly Agree   | Strongly Agree  |
| 2                      | Karl Echiverri, MD                      | Agree  | Neutral  | Agree  | Agree   |
| 3                      | Lori Algar, OTD, OTR/L, CHT             | Disagree   | Neutral  | Neutral  | Neutral   |
| 4                      | Aviram Giladi, MD, MS                   | Agree  | Strongly Agree   | Strongly Agree   | Strongly Agree  |
| 5                      | Marsha Lawrence, PT, DPT, CHT           | Disagree   | Agree  | Disagree   | Neutral   |
| 6                      | Alfonso Mejia, MD, MPH, FAAOS           |  |  |  |   |
| 7                      | Carrie Swigart, MD, FAAOS               | Agree  | Strongly Agree   | Strongly Agree   | Agree   |
| 8                      | James Ausfahl, MD, FACOEM, FAAFP, FASAM |  |  |  |   |
| 9                      | Christopher Belyea, MD, MBA, FAAOS      | Strongly Agree   | Strongly Agree   | Strongly Agree   | Strongly Agree  |
| 10                     | Peter Amadio, MD, FAAOS                 | Disagree   | Disagree   | Disagree   | Disagree  |
| 11                     | J Mark Melhorn, MD                      | Strongly Agree   | Strongly Agree   | Strongly Agree   | Strongly Agree  |
| 12                     | Olalekan Omolola, MD, MBA               | Strongly Agree   | Strongly Agree   | Strongly Agree   | Strongly Agree  |
| 13                     | Dennis Chin, MD, FAAOS                  | Strongly Agree   | Strongly Agree   | Strongly Agree   | Strongly Agree  |
| 14                     | Shafic Sraj, MD, MBA, FAAOS             | Agree  | Strongly Agree   | Strongly Agree   | Strongly Agree  |

**Table 8. Reviewer Responses to Structured Review Questions 13-16**

| <b>Reviewer Number</b> | <b>Name of Reviewer</b>                 | <b>13. Important parameters (e.g., setting, study population, study design) that could affect study results are systematically addressed.</b> | <b>14. Health benefits, side effects, and risks are adequately addressed.</b> | <b>15. The writing style is appropriate for health care professionals.</b> | <b>16. The grades assigned to each recommendation are appropriate.</b> |
|------------------------|---|---|---|--|--|
| 1                      | Matthew Putnam, MD                      | Strongly Agree  | Strongly Agree  | Strongly Agree   | Agree  |
| 2                      | Karl Echiverri, MD                      | Agree   | Neutral   | Agree  | Agree  |
| 3                      | Lori Algar, OTD, OTR/L, CHT             | Disagree  | Neutral   | Agree  | Disagree   |
| 4                      | Aviram Giladi, MD, MS                   | Agree   | Neutral   | Strongly Agree   | Strongly Agree   |
| 5                      | Marsha Lawrence, PT, DPT, CHT           | Neutral   | Strongly Agree  | Strongly Agree   | Disagree   |
| 6                      | Alfonso Mejia, MD, MPH, FAAOS           |   |   |  |  |
| 7                      | Carrie Swigart, MD, FAAOS               | Agree   | Agree   | Strongly Agree   | Strongly Agree   |
| 8                      | James Ausfahl, MD, FACOEM, FAAFP, FASAM |   |   |  |  |
| 9                      | Christopher Belyea, MD, MBA, FAAOS      | Strongly Agree  | Strongly Agree  | Strongly Agree   | Strongly Agree   |
| 10                     | Peter Amadio, MD, FAAOS                 | Disagree  | Disagree  | Agree  | Disagree   |
| 11                     | J Mark Melhorn, MD                      | Strongly Agree  | Strongly Agree  | Strongly Agree   | Strongly Agree   |
| 12                     | Olalekan Omolola, MD, MBA               | Strongly Agree  | Strongly Agree  | Strongly Agree   | Agree  |
| 13                     | Dennis Chin, MD, FAAOS                  | Strongly Agree  | Strongly Agree  | Strongly Agree   | Strongly Agree   |
| 14                     | Shafic Sraj, MD, MBA, FAAOS             | Strongly Agree  | Strongly Agree  | Strongly Agree   | Strongly Agree   |

Reviewers' Recommendation for Use of this Guideline in Clinical Practice

**Would you recommend these guidelines for use in clinical practice?**

| Reviewer Number | Name of Reviewer                        | Would you recommend these guidelines for use in clinical practice? |
|-----------------|---|--|
| 1               | Matthew Putnam, MD                      | Recommend  |
| 2               | Karl Echiverri, MD                      | Recommend  |
| 3               | Lori Algar, OTD, OTR/L, CHT             | Would Not Recommend  |
| 4               | Aviram Giladi, MD, MS                   | Strongly Recommend   |
| 5               | Marsha Lawrence, PT, DPT, CHT           | Recommend  |
| 6               | Alfonso Mejia, MD, MPH, FAAOS           | Recommend  |
| 7               | Carrie Swigart, MD, FAAOS               | Strongly Recommend   |
| 8               | James Ausfahl, MD, FACOEM, FAAFP, FASAM | Strongly Recommend   |
| 9               | Christopher Belyea, MD, MBA, FAAOS      | Strongly Recommend   |
| 10              | Peter Amadio, MD, FAAOS                 | Would Not Recommend  |
| 11              | J Mark Melhorn, MD                      | Strongly Recommend   |
| 12              | Olalekan Omolola, MD, MBA               | Strongly Recommend   |
| 13              | Dennis Chin, MD, FAAOS                  | Strongly Recommend   |
| 14              | Shafic Sraj, MD, MBA, FAAOS             | Strongly Recommend   |

## Reviewer Detailed Responses and Editorial Suggestions

### Reviewer #1, Matthew Putnam, MD

| Reviewer Number | Reviewer Name       | Society or committee you are representing | Please provide a brief explanation of both your positive and negative answers in the preceding section. If applicable, please specify the draft page and line numbers in your comments. Please feel free to also comment on the overall structure and content of the Guideline: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.  |
|-----------------|---------------------|---|---|
| 1               | Matthew Putnam, MD. | DePuy, Key Informants Panel               | <p>A. I support the CPG process (I helped and published on the first CPG for Distal Radius FX). My personal background has several areas of focus including the difficulty(s) in surgeon accuracy and training. In this context, I advise against using the phrase mini-open carpal tunnel release without putting mini in quotes ("mini").</p> <p>Why?</p> <p>Because some authors writing about this approach makes exact statements related to the length of incision without first proving (validating) that surgeons can make exact measurements (they cannot). (an example of such as article related to incision length (you should consider including this article in your report/CPG) - doi: 10.5999/aps.2018.00535) and an example of surgeon measuring difficulty - <a href="https://www.scielo.br/j/acb/a/ndrRYttMK8NpZjgDx9gx6Dq/?format=pdf(=en)">https://www.scielo.br/j/acb/a/ndrRYttMK8NpZjgDx9gx6Dq/?format=pdf(=en)</a>.</p> <p>My own experience doing this operation and measuring learners skills in performing this operation strongly suggests that the skin incision length is decidedly less important than seeing everything to be released (<a href="https://journals.lww.com/jbjsjournal/abstract/2009/12000/assessment_of_technical_skills_of_orthopaedic.5.aspx">https://journals.lww.com/jbjsjournal/abstract/2009/12000/assessment_of_technical_skills_of_orthopaedic.5.aspx</a>)</p> <p>So, while it is important to recognize that the value of endoscopic carpal tunnel release is not greater than a properly done open release using a "mini" or smaller incision, it is also important not to employ a term that does not yet have a specific meaning or proof that such a term will result in a specific action on part of the surgeon.</p> |

***Workgroup Response to Reviewer #1***

Dear Matthew Putnam, MD.,

Thank you for your expert review of the Management of Carpal Tunnel Syndrome Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

- A. Thank you for your comment.

**Reviewer #2, Karl Echiverri, MD.**

| Reviewer Number | Reviewer Name       | Society or committee you are representing | Please provide a brief explanation of both your positive and negative answers in the preceding section. If applicable, please specify the draft page and line numbers in your comments. Please feel free to also comment on the overall structure and content of the Guideline: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.   |
|-----------------|---------------------|---|--|
| 2               | Karl Echiverri, MD. | American Academy of Neurology             | <p>A. I would include recommendations regarding splinting as part of the non-operative management of carpal tunnel syndrome.</p> <p>B. Another recommendation on patient selection for carpal tunnel release surgery would be helpful and may be appropriate for the guideline's target audience.</p> <p>C. In the section on adjunctive testing (page 45), I would not consider negative downstream testing in biopsy-proven amyloidosis to be a potential harm. Carpal tunnel syndrome is often the earliest manifestation of amyloidosis and early detection may allow for earlier treatment and prevention of future complications related to progression of the disease.</p> <p>D. I would define 'CTS-6' upon its first usage and then abbreviate it. For example, in other sections of the manuscript, 'ultrasonography' is spelled out instead of using 'US,' and 'platelet-rich plasma (PRP)' is written out in later recommendations below. 'Ultrasonography' does not need to be capitalized."</p> <p>E. Removing the strength/quality of evidence at the beginning of each recommendation, like 'Strong/Moderate/Limited,' will significantly enhance readability. The evidence quality and strength of recommendation are listed below anyway, making this statement redundant within the recommendation.</p> <p>For example, instead of stating, 'Moderate evidence suggests that MRI and Upper Limb Neurodynamic Testing should not be used to diagnose carpal tunnel syndrome,' it is clearer to say, 'MRI and Upper Limb Neurodynamic Testing should not be used to diagnose carpal tunnel syndrome,' with the quality of evidence and strength of recommendation listed below. Additionally, "Upper Limb Neurodynamic Testing" does not need to be capitalized.</p> <p>The AAOS Clinical Practice Guidelines (CPGs) on the Management of Osteoarthritis of the Knee are written in this manner, and I believe changing this approach will lead to more uniformity across the AAOS CPGs and again improve readability.</p> <p>F. The headers on page 6 do not need to explicitly state 'Diagnosis.' Removing this will enhance readability and create more uniformity in the Clinical Practice Guideline (CPG). For example, 'Treatment' is not listed before 'Corticosteroid Injection' or 'Surgical Release Technique.'</p> |



- |  |  |  |   |
|--|--|--|---|
|  |  |  | <p>G. Lines 226-228: “There is no association between high keyboard use and carpal tunnel syndrome” is more concise and readable; the fact that this is a consensus opinion is listed below and need not be added to the option statement.</p> <p>H. Line 243: remove the period after VS</p> <p>I. Lines 244-247: I’d recommend rewriting it as “The following non-operative treatments are not superior to control or placebo: acupuncture, insulin injection, heath therapy, magnet therapy, nutritional supplementation, oral diuretic, oral NSAID, oral anticonvulsant, phonophoresis”</p> <p>J. I’d recommend shortening the recommendations and removing the level of evidence as this is already listed below each item separately.</p> <p>K. Line 265: the title “Non-operative treatments vs. each other” may be confusing/vague. It could read better if written as “Comparison of non-operative treatments” for example.</p> <p>L. I would clarify what is meant by “non operative treatment techniques”?</p> <p>M. Is splinting included in “non-operative treatments?”</p> <p>N. Rationale: typo--"\$" is this supposed to be a number 4?</p> <p>O. Under benefits/harms, would change to "decision-making" as earlier in the same sentence it is "decision-making" which is the correct form.</p> <p>P. Rationale: typo Change “using this tool to diagnosis” to “using this tool to diagnose”</p> <p>Q. inconsistencies in capitalization seen throughout--some "Syndrome" are lowercase some are uppercase. CTS does not need to all be uppercase, neither does upper limb neurodynamic testing.</p> <p>R. “Similarly, the use of Neurodynamic testing is as” remove the word “is”</p> <p>S. Upper Limb Neurodynamic Testing does not need to be capitalized.</p> <p>T. Carpal tunnel syndrome does not need to be capitalized and is not regularly capitalized throughout the CPG.</p> <p>U. Benefits/ Harms: specificity, sensitivity, and ultrasound do not need to be capitalized.</p> <p>V. Cost Effectiveness: Neurodynamic does not need to be capitalized.</p> <p>W. Cost Effectiveness: Carpal tunnel syndrome does not need to be capitalized and is not regularly capitalized throughout the CPG.</p> <p>X. Rationale: Night splinting is more descriptive than immobilization.</p> <p>Y. Formatting of citations is not standardized throughout the manuscript. See also page 32 (POSTOPERATIVE PAIN: NSAID, ACETAMINOPHEN)</p> <p>Z. There are citations using et al., which is not seen earlier in the manuscript. A uniform citation style should be followed.</p> <p>AA. “Ebenbichler et al. Showed more mixed” – lowercase “showed.”</p> <p>BB. Would spell out the word "month" instead of using “mo”</p> <p>CC. space between et al. and 2020</p> |
|--|--|--|---|

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|  |  |  | <p>DD. I recommend inserting citations within the sentence rather than listing them all at the end. For example when listing five studies, list the two favoring kinesiotope separately from the three demonstrating no difference.</p> <p>EE. A citation is missing under rationale, paragraph 4.</p> <p>FF. There are many inconsistencies in citation style throughout this recommendation.</p> <p>GG. What is “manual therapy?” Please add citation.</p> <p>HH. Citation formatting consistency; add year to Weintraub et al.</p> <p>II. There are no citations in the non-operative treatments vs each other section</p> <p>JJ. I would rewrite this sentence for clarity: “Not only were the treatments and their comparisons very heterogeneous, but no long-term follow up was described either – as such, this recommendation has been downgraded.”</p> <p>KK. define ESWT</p> <p>LL. “The above treatments do not show a consistent significant difference from other treatments and add to the time and monetary expense for patients suffering from CTS.”</p> <p>MM. It’s not entirely clear which treatments this refers to.</p> <p>NN. Formatting of citations switches throughout the rationale paragraph.</p> <p>OO. Acetylsalicylic acid should be capitalized throughout as a proper noun.</p> <p>PP. Acceptability: I recommend rewriting this sentence for clarity: “Accepted practice that not all surgeons follow due to other guidelines from major surgery that support the routine administration of preoperative antibiotics (e.g., total joint arthroplasty).”</p> <p>QQ. Page 44 and 45: Rationale: To maintain consistency, would write out carpal tunnel syndrome and not shorten it to “carpal tunnel.”</p> <p>RR. Tramadol should be capitalized throughout.</p> |
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## ***Workgroup Response to Reviewer #2***

Dear Karl Echiverri, M.D.,

Thank you for your expert review of the Management of Carpal Tunnel Syndrome Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

- A. Thank you for your feedback, future updates to the CTS CPG may address topics not discussed in this guideline.
- B. Thank you for your feedback, future updates to the CTS CPG may address topics not discussed in this guideline.
- C. Thank you for your feedback.
- D. Thank you for your feedback, the manuscript has been edited for clarity.
- E. Thank you for your feedback. The readability of the recommendations is certainly a priority for CPG development workgroups along with language consistency across AAOS guidelines.
- F. Thank you for your feedback, the manuscript has been edited for clarity.
- G. Thank you for your feedback.
- H. Thank you for your feedback. The manuscript has been modified.
- I. Thank you for your feedback.
- J. Thank you for your feedback. The readability of the recommendations is certainly a priority for CPG development workgroups along with language consistency across AAOS guidelines.
- K. Thank you for your feedback, the manuscript has been edited for clarity.
- L. Thank you for your feedback. Due to the variety of treatments assessed for this recommendation, the workgroup voted not to include a list in the recommendation language.
- M. The literature search was designed to capture any non-operative treatment.
- N. Thank you for your comment. The manuscript has been modified for clarification.
- O. Thank you for your comment. The manuscript has been modified for clarification.
- P. Thank you for your comment. The manuscript has been modified for clarification.
- Q. Thank you for your comment. The manuscript has been modified for clarification.
- R. Thank you for your comment. The manuscript has been modified for clarification.
- S. Thank you for your comment. The manuscript has been modified for clarification.
- T. Thank you for your comment. The manuscript has been modified for clarification.
- U. Thank you for your comment. The manuscript has been modified for clarification.
- V. Thank you for your comment. The manuscript has been modified for clarification.
- W. Thank you for your comment. The manuscript has been modified for clarification.
- X. Thank you for your feedback.
- Y. Thank you for your comment. The manuscript has been modified for clarification.
- Z. Thank you for your comment. The manuscript has been modified for clarification.
- AA. Thank you for your comment. The manuscript has been modified for clarification.
- BB. Thank you for your comment. The manuscript has been modified for clarification.
- CC. Thank you for your comment. The manuscript has been modified for clarification.
- DD. Thank you for your comment. The manuscript has been modified for clarification.
- EE. Thank you for your comment. The manuscript has been modified for clarification.
- FF. Thank you for your comment. The manuscript has been modified for clarification.
- GG. Thank you for your feedback, the manuscript has been edited for clarity.
- HH. Thank you for your comment. The manuscript has been modified for clarification.
- II. Thank you for your feedback, the manuscript has been edited for clarity.
- JJ. Thank you for your feedback, the manuscript has been edited for clarity.
- KK. Thank you for your comment. The manuscript has been modified for clarification.
- LL. Thank you for your feedback, the manuscript has been edited for clarity.
- MM. Thank you for your feedback, the manuscript has been edited for clarity.

NN. Thank you for your feedback.

OO. Thank you for your comment.

PP. Thank you for your feedback, the manuscript has been edited for clarity.

QQ. Thank you for your comment. The manuscript has been modified throughout for consistency.

RR. Thank you for your comment. The manuscript has been modified.

**Reviewer #3, Lori Algar, OTD, OTR/L, CHT**

| Reviewer Number | Reviewer Name               | Society or committee you are representing | Please provide a brief explanation of both your positive and negative answers in the preceding section. If applicable, please specify the draft page and line numbers in your comments. Please feel free to also comment on the overall structure and content of the Guideline: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.  |
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| 3               | Lori Algar, OTD, OTR/L, CHT | American Society of Hand Therapists       | <p>A. Thank you for the hard work put into this important project!<br/>Here is some specific feedback:<br/>There is conflicting information in the document on the dates of the literature searches related to the studies included. There is a statement that says a systemic review of the literature occurred until August 2023 but also suggestion that literature was not searched after March 2023. (See statement below.) Also page 21 suggests one day of literature searches.</p> <p>Articles considered were published prior to the start date of the search in a minimum of three electronic databases; PubMed, EMBASE, and the Cochrane Central Register of Controlled Trials.” Is this saying that in order for the articles to be included in this project, they had to be included in at least all 3 of those data bases? That is an interesting criteria and is not stated in the full inclusion criteria.</p> <p>B. Page 22 there is an error- 9\$%</p> <p>C. The CTS-6, MRI, and ultrasound sections contains clinically useful and relevant information.</p> <p>D. For the section on Neurodynamic testing, I am curious if the findings of only one study was limited by not also using the search term of upper limb tension testing as I find several studies evaluating the upper limb tension test with CTS diagnosis. I recommend checking out Trillos et al in JHT 2018 and Talebi et al 2012 in Journal of Back and Musculoskeletal Rehab at minimum. This other evidence may then change the responses related to neurodynamic testing.</p> <p>E. Neurodynamic testing and MRI may need to be separate responses/PICO questions as they are unrelated clinically in the sense that MRI is expensive but assessing upper limb tension during an appointment with a physician is not a financial burden so the cost effectiveness category on page 24 does not make sense to me.</p> <p>F. In addition, Beddaa 2022 is referred to as a RCT but it is not.</p> <p>G. Nice work on the CSI and modes of anesthesia sections to make clinically useful and relevant.</p> <p>H. I do not agree with the PRP statement that strong evidence suggests PRP does not provide long term benefit. There is only one mentioned study that talks about the</p> |

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|  |  |  | <p>outcomes at a 12 month (long term follow up) and this had some improvement in symptoms via cross sectional area and EDS parameters. This conclusion is not accordance with the outlined recommendations of high and strong related to long-term. Recommend changing this. There is a 2022 systematic review that includes 8 studies that concludes mid-term efficacy of PRP for CTS but suggests that long term impact requires additional study.</p> <p>I. Nice work on the surgical release technique section to make clinically useful and relevant.</p> <p>J. For the immobilization following CTR section, there is a new study in Frontiers of Neurology April 2023 suggesting benefit to immobilization following endoscopic CTR. I am not able to access full text of this study to see the quality of the study, but if this fits in the inclusion criteria, it should be evaluated.</p> <p>K. In the postoperative therapy section, these two sentences are conflicting. “These studies consistently demonstrate that there are no functional or outcome benefits of using therapy after carpal tunnel release. There was one high-quality study that demonstrated short term benefits (of improved motor dexterity at one month and shorter return-to-work).” The overall statement of moderate evidence suggests post op therapy should not be routinely prescribed after CTR does not match with a high-quality study suggesting shorter return to work and improved dexterity in the short term. There are also no references in this section so I can’t refer to the studies mentioned, but there is also mention of a study that used low level laser and had decreased numbness and paresthesia. I also disagree with the statement “The benefit of the use of therapy after CTR has not been demonstrated” based on the presentation of the literature in this section. Recommend revising so that recommendations better reflect the findings in the literature.</p> <p>L. For the postop pain section, while the statement that strong evidence suggests use of NSAIDS and/or acetaminophen may be true, the rationale needs to better fit that statement. I believe that the statements on the Ilyas' studies accomplish this but maybe the other mention of studies needs to include more information such as patients only reporting 2/10 pain at worst or able to sleep through the night and perform functional tasks or whatever is true to make it better rationale for the statement of use of NSAIDS/acetaminophen.</p> <p>M. I believe that the methodology of combining non-operative treatments does not provide good information to the audience. For instance, page 36 says “There was great variation in the intervention protocols with four studies demonstrating mixed results, one study favoring exercise, and one study demonstrating no clinical benefit (Dinarvand 2017, Shem 2020, Zidkova 2019, Abdolrazaghi 2021, Hesami 2018, Salehi 2019)” Further write-up in this section suggests that given the lack of effectiveness of the treatments, they are not considered cost effective. However, the Shem 2020 study that is referred to is a double blind RCT in JHT</p> |
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|  |  |  | <p>that found that a stretch for the carpal ligament had statistically significant improvement in numbness, tingling, pinch strength, and the Symptom Severity Scale. This information is lost in the combination of non-operative treatments. I do think that this does not just apply to the exercise category and therefore, I recommend that these variables are addressed one at a time.</p> <p>N. On page 38, the title is non-operative treatment versus each other, but this section is also limited in the information that it can provide by combining all the possible evidence fitting under this broad category.</p> <p>O. The above issues likely stem from PICO questions that ask too large of a question.</p> <p>P. The site of service section, surgical draping section, anticoagulation section, prophylactic antibiotic section, adjunctive testing, and tramadol sections provide relevant and clinically useful information based on evidence.</p> <p>Q. I think these clinical practice guidelines will be a great resource but at this time they require changes for improvement.</p> |
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### ***Workgroup Response to Reviewer #3***

Dear Lori Algar, OTD, OTR/L, CHT,

Thank you for your expert review of the Management of Carpal Tunnel Syndrome Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

- A. The literature search was conducted twice, once in March 2022 and again in November 2022. The review of the literature concluded in August 2023. The article only needed to be captured in one of the databases, not all three. Thank you for the comments.
- B. Thank you for your comment. The manuscript has been edited.
- C. Thank you for your comment.
- D. The literature search was broad enough to capture upper limb tension testing. Trillos 2018 did not meet inclusion criteria, Talebi 2012 was excluded from the previous edition CTS CPG, and therefore was not assessed for inclusion for this edition.
- E. Thank you for your comment. The workgroup has opted to keep the two in the same section as while they are unrelated, the conclusion and guidance remain similar.
- F. Thank you for your comment. Staff have edited this language.
- G. Thank you for the positive feedback.
- H. Our methodology does not include the use of systematic reviews.
- I. Thank you for the positive feedback.
- J. We are unable to include literature outside the systematic literature search conducted in November 2022. Future guidelines certainly will capture this article for review.
- K. Thank you for your feedback. The workgroup balanced the positive and negative outcomes by including "routinely" in the recommendation. The intent is to imply that while physical therapy has shown utility, its use should be narrowed to patients who would benefit most.
- L. Thank you for your feedback. Staff have edited the rationale to include more items to reflect the recommendation's guidance.
- M. Thank you for your feedback. The workgroup has found that it was most appropriate to combine non-operative treatment assessments for readability. While cost was not an explicit outcome assessed, the workgroup believes that the focus on long-term outcomes and the lack of evidence to support non-operative options makes the "cost effectiveness" section of the rationale an appropriate addition.
- N. Thank you for your feedback.
- O. Thank you for your feedback.
- P. Thank you for your comment.
- Q. Thank you for your comment.



**Reviewer #4, Aviram Giladi, MD, MS**

| Reviewer Number | Reviewer Name         | Society or committee you are representing | Please provide a brief explanation of both your positive and negative answers in the preceding section. If applicable, please specify the draft page and line numbers in your comments. Please feel free to also comment on the overall structure and content of the Guideline: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.  |
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| 4               | Aviram Giladi, MD, MS | American Society for Surgery of the Hand  | <p>A. In the diagnostic section (lines 138-140) on CTS-6, NCS/EMG, and ultrasound, it does not seem that important parameters of cost, convenience, patient burden, etc were adequately considered. With regard to pain medication the statement (lines 208-210) falls short of the strength of data in the literature strongly against routine opioid use, and could be improved. I detail these comments below, along with a series of other notes.</p> <p>B. Line 138-140. This Recommendation mentioning CTS-6, ultrasound, and NCV/EMG is a nice step forward from prior CPG but the language here is a bit imprecise. CTS-6 diagnoses CTS, while ultrasound and NCV/EMG indicate median neuropathy at the carpal tunnel. They are not the same. Additionally, by saying they can be used, it doesn't give direction. And might indicate that using multiple modalities is reasonable where for most situations it is not...the literature would support CTS-6 and if CTS-6 indicates carpal tunnel syndrome the other modalities are no longer warranted. This is supported in the data presented on page 22 (no line numbers) where the PPV/NPV of ultrasound and NCV/EMG do not support routine use relative to CTS-6. Generally the recommendation suggests that these diagnostic approaches are equal and they are not. Benefits/harms via cost, inconvenience, delay of care that have all been reported on especially for NCS/EMG and do not seem to have been thoroughly considered.</p> <p>C. [also there is a typo in the reported data of 95% instead of probably 94%]</p> <p>D. Line 148 – "...should not be used to diagnose idiopathic median neuropathy at the carpal tunnel"</p> <p>E. Lines 172-175. The comparative outcomes data between endoscopic and open are long-term in nature. There are various studies looking at shorter-term/early patient-reported outcomes that indicate there may be variability. I would consider this be edited to say "strong evidence suggests that there is no difference in long term patient-reported outcomes between a mini-open carpal tunnel release and an endoscopic carpal tunnel release" as short term data are not notably reviewed</p> <p>F. Lines 190-192 – Does one visit constitute supervised therapy? There are many patients that would benefit from one session of teaching on a home program, and this recommendation (as written) risks that measures based on these CPG consider even one therapy visit as "routine postop therapy" and that could impair patient access to valuable education. Agreed multiple sessions is not something</p> |

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|  |  |  | <p>routinely needed but one education session should not be considered in the same category; clarification here could be helpful.</p> <p>G. Lines 208-210. It would seem that this is indicating (and should indicate!) that opioids should not be routinely used...but it falls short of saying that. Perhaps “Strong evidence suggests that NSAIDs and/or Acetaminophen alone should be initial postoperative pain management regiment after carpal tunnel release” -- this then leaves room for the Tramadol consideration added later in lines 335-338 for the small group that fail non-opioid management.</p> <p>H. Lines 254-255. Consider editing to “Limited evidence suggests the following non-operative treatments do not improve long-term patient reported outcomes for moderate and severe CTS:” to better align with available data</p> <p>I. Some of my comments center on the distinction between carpal tunnel syndrome and idiopathic median neuropathy at the carpal tunnel...although throughout the document IMNCT is lumped in as CTS. I understand it may be too difficult at this stage to parse those things out but they are distinct entities and perhaps deserve consideration/reporting as such in the CPG.</p> |
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***Workgroup Response to Reviewer #4***

Dear Aviram Giladi, MD, MS,

Thank you for your expert review of the Management of Carpal Tunnel Syndrome Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

- A. Thank you for your feedback.
- B. Thank you for your feedback. The workgroup voted to amend this recommendation.
- C. Thank you for your comment. The manuscript has been edited.
- D. Thank you for your comment. The workgroup crafted and approved the recommendation as-is.
- E. Thank you for your comment.
- F. Thank you for your comment.
- G. Thank you for your comment.
- H. Thank you for your comment.
- I. Thank you for your comment.

**Reviewer #5, Marsha Lawrence, PT, DPT, CHT**

| Reviewer Number | Reviewer Name                 | Society or committee you are representing                      | Please provide a brief explanation of both your positive and negative answers in the preceding section. If applicable, please specify the draft page and line numbers in your comments. Please feel free to also comment on the overall structure and content of the Guideline: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.   |
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| 5               | Marsha Lawrence, PT, DPT, CHT | American Academy of Orthopaedic Surgeons, Key Informants Panel | <p>A. The workgroup included professionals other than physicians but indicates physicians only P.2 Line 16</p> <p>B. Patient Population: The definition of adult might be helpful, e.g.: <math>\geq 18</math> years. (p.15)</p> <p>C. PICO Questions: The follow-up time is not defined in the PICO questions. Recommendations and Options for PICO question 3, were based on the result: “long-term” improvement, criteria not specified in the PICO question and undefined. This may unintentionally deter clinicians from non-operative interventions shown to provide short-term symptom relief which may be appropriate in individual patient circumstances.</p> <p>D. Evidence Quality: Was the evidence quality of each study determined by 2 or more clinicians or was this determined by AAOS staff? Not clear in the methods section. The link to the methodology on p. 12 leads to an error page.</p> <p>E. Recommendations: Recommendations should indicate the PICO question they were intended to answer.</p> <p>F. Recommendations: Inconsistent organization in recommendations: Most include Quality, Strength, Rationale, Benefits/Harms, Future Research; but some also include Cost Effectiveness, Outcome Importance, Acceptability, Feasibility.</p> <p>G. Inclusion Criteria: Confounded studies were excluded, yet many included non-operative studies are confounded, often using orthoses alone (as the control) or in combination with one or more interventions.</p> <p>H. Inclusion Criteria: Not listed in Exclusions, but excluded:</p> <ul style="list-style-type: none"> <li>•studies comparing operative and non-operative interventions (eAppendix 1: Gerritsen 2002 p. 27; Celik 2016 p.57, etc.)</li> <li>•Comparisons b/w subjects with differing classifications of CTS appear to have been excluded (Rashad 2020, p.18 of eAppendix 1)</li> <li>•Some studies comparing 2 interventions/2 versions of the same intervention: Talebi 2020, Sanaee 2017 (eAppendix1 P.38, p64 respectively) were excluded.</li> <li>•Gatheridge 2020: no reason for exclusion listed. eAppendix 1, P.34</li> <li>•(eAppendix 1) misuse of the &gt; sign. Example: P.67 Razalie 2022 shows exclusion reason “ &gt; 10 patients per group”, same issue: Paoloni, Faheed p. 9.</li> </ul> |

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|  |  |  | <ul style="list-style-type: none"> <li>I. Therapeutic US p. 34: All studies in this section except Ebenbichler also used orthoses for all subjects. There is no mention of orthoses in the conclusion.</li> <li>J. Non-Operative vs. Placebo/Control p. 35: Immobilization rated ineffective: none of the studies investigated immobilization: Mansiz-Kaplan 2019, Kocak Ulucakoy 2020 included immobilization of all studied groups, but the study focus is other interventions.</li> <li>K. Non-Operative Long Term p.36: Under “rationale” de Sire is missing the publication date.</li> <li>L. Paragraph 4 under rationale: laser study citations are omitted.</li> <li>M. Shockwave: Rationale is inconsistent with recommendation: 8 studies demonstrated benefit from shockwave.</li> <li>N. Exercise therapy: It is unclear what was classified as exercise. Dinarvand 2017 is not an exercise study, it involves bone manipulation, usually classified as manual therapy.</li> <li>O. Shem 2020 is soft tissue mobilization, again classified as manual therapy.</li> <li>P. Zidkova 2019 is a combination of neuromobilization (often classified as manual therapy) and self-stretching, not exercise.</li> <li>Q. Salehi and Abdolrazaghi 2021 were a combination of differential tendon gliding and neuromobilization. (exercise and manual therapy)</li> <li>R. Hesami compared gabapentin to tendon gliding exercises. All groups used an orthosis.</li> <li>S. The full citation for the Bahrami reference (reference #25, p.48) is missing the journal title.</li> <li>T. Manual therapy: It is unclear what was classified as manual therapy (see previous comments). This section is missing citations. Again, the conclusion conflicts with the rationale: all studies showed small positive results in favor of manual therapy. There are studies with long-term follow-up demonstrating the efficacy of manual therapy vs. surgery which were not included.</li> <li>U. "Non-Operative Treatments vs. Each Other p.38:</li> <li>V. As noted above, many of the previously cited studies are confounded-using non-operative interventions combined with an orthosis or compared to an orthosis as the control group. It is unclear how the decision was made to include these in other categories as opposed to this category. There are no citations so further evaluation of the studies used to reach this recommendation cannot be done by this reviewer. The final sentence of the rationale implies there was a benefit to ESWT, yet the conclusion drawn was “no benefit” overall. The conclusion and the rationale are inconsistent."</li> <li>W. The use of neutral wrist orthosis is omitted from this guideline. This is the most used non-operative intervention. The 2016 AAOS CTS CPG strongly</li> </ul> |
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|  |  |  | <p>recommended orthosis use. There is no explanation for the omission in this guideline.</p> <p>X. The work of the guideline group is appreciated. Thank you for the opportunity to review this draft and provide input.</p> |
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### ***Workgroup Response to Reviewer #5***

Dear Marsha Lawrence, PT, DPT, CHT,

Thank you for your expert review of the Management of Carpal Tunnel Syndrome Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

- A. Thank you for your comment. This section has been edited to more accurately reflect the body of volunteers.
- B. Thank you for your comment. Clarification has been added to this section.
- C. Thank you for your comment. Follow up times are discussed throughout the rationale and while they are specific to each article, overall they are short term, i.e. < 1 year.
- D. AAOS staff conducted the literature review including quality evaluation and subsequently reviewed by the workgroup.
- E. Thank you for your comment.
- F. Thank you for your comment. The workgroup may omit sections of the rationale where they feel no substantive discussion is required.
- G. Thank you for your comment. So long as the intervention of interest is the only difference between groups, we consider the comparison not confounded.
- H. Thank you for your comments. This CPG did not address direct comparison between operative and non-operative treatment options. Classification of CTS was not identified as a predictor of interest when looking at efficacy of non-operative treatments. We sought to determine non-operative treatments affects as categories without analyzing variations within the modality, Duration of splinting was not a comparison of interest for this CPG.
- I. Thank you for your comment. The rationale for this section has been expanded to reflect the use of orthoses in both treatment and control groups.
- J. Thank you for your comment. Immobilization has been removed from the recommendation.
- K. Thank you for your comment. The manuscript has been edited.
- L. Thank you for your comment. The rationale has been expanded in this section.
- M. The rationale highlights short term outcomes while the recommendation focuses on long term outcomes.
- N. Thank you for your comment. The rationale for this section has been expanded.
- O. Thank you for your comment. The rationale for this section has been expanded.
- P. Thank you for your comment. The rationale for this section has been expanded.
- Q. Thank you for your comment. The rationale for this section has been expanded.
- R. Thank you for your comment. The rationale for this section has been expanded.
- S. Thank you for your comment.
- T. We are unable to integrate manual therapy vs. surgery evidence in this recommendation. Short term benefits of manual therapy are not the focus of the recommendation.
- U. The workgroup believes that the short-term benefits that are discussed in the rationale do not conflict with the recommendation that focuses on long-term durable non-operative options for CTS.
- V. Thank you for your comment. The guideline sought to make recommendations for long term durable CTS treatments. Orthoses as common practice should not be impacted.
- W. Thank you for your participation and review.
- X. Thank you for your comment.

**Reviewer #6, Alfonso Mejia, MD, MPH, FAAOS**

| Reviewer Number | Reviewer Name                 | Society or committee you are representing                     | Please provide a brief explanation of both your positive and negative answers in the preceding section. If applicable, please specify the draft page and line numbers in your comments. Please feel free to also comment on the overall structure and content of the Guideline: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.   |
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| 6               | Alfonso Mejia, MD, MPH, FAAOS | American Academy of Orthopaedic Surgeons, Board of Councilors | <p>A. "Line 293 to 300</p> <p>"anticoagulation" encompasses a broad range of therapies from 81 mg ASA to full multidrug therapeutic anticoagulation. Perhaps what is meant by ""anticoagulation"" in regard to this recommendation should be specifically stated.</p> <p>B. I would agree overall; however, in an immunocompromised patient, I would still provide pre-operative antibiotics. Although there is evidence for no antibiotics in diabetic and RA patients, I have not been able to see a study that looks at post-solid organ transplant patients.</p> <p>Given the degree of pharmacologic immunosuppression and how devastating infections can be in these patients, I might consider antibiotics in them.</p> |



***Workgroup Response to Reviewer #6***

Dear Alfonso Mejia, MD, MPH, FAAOS,

Thank you for your expert review of the Management of Carpal Tunnel Syndrome Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

- A. Thank you for your comment.
- B. Thank you for your comment. The rationale for this recommendation does call for condition-specific analyses in the future, and this statement can be expanded.

**Reviewer #7, Carrie Swigart, MD, FAAOS**

| Reviewer Number | Reviewer Name             | Society or committee you are representing | Please provide a brief explanation of both your positive and negative answers in the preceding section. If applicable, please specify the draft page and line numbers in your comments. Please feel free to also comment on the overall structure and content of the Guideline: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.  |
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| 7               | Carrie Swigart, MD, FAAOS | American Academy of Orthopaedic Surgeons  | <p>A. This clinical practice guideline is an updated version of a previous guideline published in 2016. The specific differences are described on page 15. The development of this version utilized the GRADE Evidence-to-Decision Framework adopted by the AAOS in 2019. The quality of evidence and strength of recommendation criteria are well described in both text and table format. Although the mechanism of resolving differences among voting members of the group is described, there was consensus (100% approval) among members for all recommendations in this guideline. This guideline expands and improves the previous CPG for carpal tunnel syndrome based on the available evidence.</p> |

***Workgroup Response to Reviewer #7***

Dear Carrie Swigart, MD, FAAOS,

Thank you for your expert review of the Management of Carpal Tunnel Syndrome Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

- A. Thank you for your comment.

**Reviewer #8, James Ausfahl, MD, FACOEM, FAAFP, FASAM**

| Reviewer Number | Reviewer Name                           | Society or committee you are representing                   | <b>Please provide a brief explanation of both your positive and negative answers in the preceding section. If applicable, please specify the draft page and line numbers in your comments. Please feel free to also comment on the overall structure and content of the Guideline: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.</b> |
|-----------------|---|---|---|
| 8               | James Ausfahl, MD, FACOEM, FAAFP, FASAM | American College of Occupational and Environmental Medicine | A. No comment.  |

***Workgroup Response to Reviewer #8***

Dear James Ausfahl, MD, FACOEM, FAAFP, FASAM,

Thank you for your expert review of the Management of Carpal Tunnel Syndrome Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

A. No comment.

**Reviewer #9, Christopher Belyea, MD, MBA, FAAOS**

| Reviewer Number | Reviewer Name                      | Society or committee you are representing                     | <b>Please provide a brief explanation of both your positive and negative answers in the preceding section. If applicable, please specify the draft page and line numbers in your comments. Please feel free to also comment on the overall structure and content of the Guideline: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.</b> |
|-----------------|------------------------------------|---|---|
| 9               | Christopher Belyea, MD, MBA, FAAOS | American Academy of Orthopaedic Surgeons, Board of Councilors | A. No comment.  |

***Workgroup Response to Reviewer #9***

Dear Christopher Belyea, MD, MBA, FAAOS,

Thank you for your expert review of the Management of Carpal Tunnel Syndrome Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

A. No comment.

**Reviewer #10, Peter Amadio, MD, FAAOS**

| Reviewer Number | Reviewer Name           | Society or committee you are representing   | Please provide a brief explanation of both your positive and negative answers in the preceding section. If applicable, please specify the draft page and line numbers in your comments. Please feel free to also comment on the overall structure and content of the Guideline: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.  |
|-----------------|-------------------------|---|---|
| 10              | Peter Amadio, MD, FAAOS | American Academy of Orthopaedic Surgeons, Board of Councilors/ Board of Specialty Societies, Research and Quality Committee | <p>A. see overall comments. my main concerns relate to the lake of a comprehensive assessment of the effectiveness of treatments for CTS and a lack of critical assessment of the articles chosen. In some cases, population based natural history studies may be more relevant than RCT's but these were excluded</p> <p>B. more context is needed such as reference to previous guidelines. for example, these guidelines basically say that non-surgical treatments do not work and that there is no difference between two specific kinds of surgical treatment (mini open and endoscopic) without actually making any recommendations regarding whether surgery is effective and in which patients. No mention of ultrasound guided surgery or traditional open. The "strong evidence" that injections do not provide long term benefit actually shows in one paper (Hofer 2021) that ALL groups were on average significantly better over time (so maybe it is the natural history, or maybe the "placebo" was actually active; another paper (Atroschi 2013) was that same study but at an earlier time point, and the third (Salman 2018) was a 6 month study (so not long term) that tried 3 different forms of hydrodissection, with or without steroid, and again showed that they were ALL effective. Thus, the thrust of the recommendation is that injections don't work but the actual evidence cited shows that the patients were on average better in the long term.</p> |



***Workgroup Response to Reviewer #10***

Dear Peter Amadio, MD, FAAOS,

Thank you for your expert review of the Management of Carpal Tunnel Syndrome Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

- A. Thank you for your comment. All articles included and excluded for review were assessed using thorough AAOS CPG methodology. Any articles excluded did not meet the outlined inclusion criteria; the list of excluded articles and reason for exclusion are available in the CPG appendices.
- B. Thank you for your comment. CPG topics were discussed during the introductory meeting where some topics were prioritized over others; surgical approach was not included in the review. Given the effectiveness of control groups when compared to active treatment groups, the conclusion cannot support the active treatment, injection in this case.

**Reviewer #11, J Mark Melhorn, M.D.**

| Reviewer Number | Reviewer Name        | Society or committee you are representing                   | <b>Please provide a brief explanation of both your positive and negative answers in the preceding section. If applicable, please specify the draft page and line numbers in your comments. Please feel free to also comment on the overall structure and content of the Guideline: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.</b>   |
|-----------------|----------------------|---|---|
| 11              | J Mark Melhorn, M.D. | American College of Occupational and Environmental Medicine | <ul style="list-style-type: none"><li>A. The statement on line 225 is correct but on page 33 the statement “A single low-quality study that met inclusion criteria, (Eleftheriou et al. 2012), reported a statistically significant association between high keyboard use and carpal tunnel syndrome” would be inconsistent be with the science.</li><li>B. Reference 80 Eleftheriou,A.<br/>This study has multiple weaknesses which include:<br/>Case-Control<br/>Number pads and not keyboards were used</li><li>C. conclusions that smoking causes CTS, but age, diabetes, and thyroid disease does not is in marked contrast to the body of literature that has confirmed that they do cause CTS<br/>consider removing this reference or listing these concerns with the quality of the study</li></ul> |

***Workgroup Response to Reviewer #11***

Dear J Mark Melhorn, M.D.,

Thank you for your expert review of the Management of Carpal Tunnel Syndrome Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

- A. Thank you for your comment. As you've noted, the single included article does have limitations of concern. These were taken into account during the quality appraisal process that led to a "low quality" conclusion. The workgroup felt that this single article identifying the association was not sufficient to conclude an association. Furthermore, AAOS CPG methodology allows consensus statement at most when utilizing such a small body of evidence.
- B. Please see above comment.
- C. Please see above comment.

**Reviewer #12, Olalekan Omolola, MD, MBA**

| <b>Reviewer Number</b> | <b>Reviewer Name</b>      | <b>Society or committee you are representing</b> | <b>Please provide a brief explanation of both your positive and negative answers in the preceding section. If applicable, please specify the draft page and line numbers in your comments. Please feel free to also comment on the overall structure and content of the Guideline: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.</b> |
|------------------------|---------------------------|--|---|
| 12                     | Olalekan Omolola, MD, MBA | 3M   | A. Typo error on page 22.<br><br>“a positive predictive value of ultrasound and NCV/EMG of 9\$%”? Please check and correct. Overall, everything looks good.   |

***Workgroup Response to Reviewer #12***

Dear Olalekan Omolola, MD, MBA,

Thank you for your expert review of the Management of Carpal Tunnel Syndrome Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

- A. Thank you for the comment. The manuscript has been edited.

**Reviewer #13, Dennis Chin, MD, FAAOS**

| Reviewer Number | Reviewer Name          | Society or committee you are representing                      | <b>Please provide a brief explanation of both your positive and negative answers in the preceding section. If applicable, please specify the draft page and line numbers in your comments. Please feel free to also comment on the overall structure and content of the Guideline: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.</b>  |
|-----------------|------------------------|--|--|
| 13              | Dennis Chin, MD, FAAOS | American Academy of Orthopaedic Surgeons, Key Informants Panel | <p>A. I feel that the CPG is a very clear and complete guide regarding the diagnosis and treatment of carpal tunnel syndrome.</p> <p>B. I wholehearted agree with the recommendation</p> <ul style="list-style-type: none"><li>• regarding the use of local anesthesia (page 29),</li><li>• use of non-narcotic medications postoperatively (page 32),</li><li>• use of office based surgery (page 39), though having done personally this in the office with limited draping (page 41) for about 20 years for some 600 cases, it is clear that a study would easily support this. In a group practice covering about 250,000 patients, this was the practice with my 4 other partners doing carpal tunnel releases.</li></ul> |

***Workgroup Response to Reviewer #13***

Dear Dennis Chin, MD, FAAOS,

Thank you for your expert review of the Management of Carpal Tunnel Syndrome Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

- A. Thank you for your comment.
- B. Thank you for your comment.

**Reviewer #14, Shafic Sraj, MD, MBA, FAAOS**

| Reviewer Number | Reviewer Name               | Society or committee you are representing | Please provide a brief explanation of both your positive and negative answers in the preceding section. If applicable, please specify the draft page and line numbers in your comments. Please feel free to also comment on the overall structure and content of the Guideline: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.  |
|-----------------|-----------------------------|---|---|
| 14              | Shafic Sraj, MD, MBA, FAAOS | American Academy of Orthopaedic Surgeons  | <p>A. Overall, the CPG was well written. The organization is debatable, as it flows based on level of recommendation, not stage of management. A better flow may start with Recommendations and Options related diagnosis and risk factors, followed by evaluation, conservative management, then operative management and related considerations such as preop evaluation, anesthesia, anticoagulation, surgical venue, and postop management.</p> <p>B. Page 22: "ultrasound and NCV/EMG of 95% and 89% respectively"</p> <p>C. Harms of Implementation of NCV/EMG includes the unpleasant and invasive experience of the test which, while not specifically explored in the literature, is a well-known phenomenon related to patient experience and may qualify as 'Consensus/Expert Opinion.'</p> <p>D. Page 29: Statement is not clear: "local anesthesia has only been adopted by surgeons and patients in multiple countries as an acceptable approach for carpal tunnel release. Did you mean "local anesthesia has only been adopted...?"</p> <p>E. Page 29: Feasibility: Epinephrine is not 'added'. You either choose plain anesthetic or 'with epinephrine'. In addition, many surgeons choose to add sodium bicarbonate 8.4% to lower the acidity of the injection.</p> <p>F. Page 42: Acceptability: Use of anticoagulants as an accepted practice is irrelevant to this CPG. The question relates to continuing anticoagulants during surgery. Besides, the effect of anticoagulation and bleeding/hematoma formation is influenced by the use of tourniquet and / or epinephrine. Use of a tourniquet may hide bleeders and invite rebound bleeding and delayed postop hematoma whereas epinephrine is intended to limit intra-op bleeding thus reverse the local effect of anticoagulants.</p> <p>G. Page 44 Preoperative Testing. This is an irrelevant and misleading recommendation as testing is performed for anesthesia-related risk assessment, not carpal tunnel release in particular. Office-based WALANT CTR does not require preop testing, whereas GA-CTR in a high-risk patient may require it. I recommend excluding this recommendation, particularly because there is no direct nor relevant evidence.</p> <p>H. Other Comments:</p> |



|  |  |  |   |
|--|--|--|---|
|  |  |  | <p>How come there was no mention of immobilization as conservative management?<br/>It is well accepted, effective (at least short term), and not cost prohibitive with no sig risk of harm.</p> |
|--|--|--|---|

***Workgroup Response to Reviewer #14***

Dear Shafic Sraj, MD, MBA, FAAOS,

Thank you for your expert review of the Management of Carpal Tunnel Syndrome Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

- A. Thank you for your comment.
- B. Thank you for your comment.
- C. Thank you for your comment. The rationale has been expanded in this section.
- D. Thank you for your comment.
- E. Thank you for your comment. The manuscript has been edited for clarity.
- F. Thank you for your comment.
- G. Thank you for your comment. The consensus statement allows the workgroup to provide some guidance, and is explicitly noted as an opinion.
- H. Thank you for your comment.

## Appendix A – Structured Review Form

### Review Questions (REQUIRED)

|  | Strongly Agree        | Agree                 | Neutral               | Disagree              | Strongly Disagree     |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1. The overall objective(s) of the guideline is (are) specifically described.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 2. The health question(s) covered by the guideline is (are) specifically described.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 3. The guideline's target audience is clearly described.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 4. There is an explicit link between the recommendations and the supporting evidence.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 5. Given the nature of the topic and the data, all clinically important outcomes are considered.                                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 6. The patients to whom this guideline is meant to apply are specifically described.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 7. The criteria used to select articles for inclusion are appropriate.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 8. The reasons why some studies were excluded are clearly described.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 9. All important studies that met the article inclusion criteria are included.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 10. The validity of the studies is appropriately appraised.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 11. The methods are described in such a way as to be reproducible.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 12. The statistical methods are appropriate to the material and the objectives of this guideline.                                      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 13. Important parameters (e.g., setting, study population, study design) that could affect study results are systematically addressed. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 14. Health benefits, side effects, and risks are adequately addressed.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 15. The writing style is appropriate for health care professionals.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 16. The grades assigned to each recommendation are appropriate.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Please provide a brief explanation of both your positive and negative answers in the preceding section. If applicable, please specify the draft page and line numbers in your comments. Please feel free to also comment on the overall structure and content of the Guideline:

**Would you recommend these guidelines for use in clinical practice? (REQUIRED)**

- Strongly Recommend
- Recommend
- Would Not Recommend
- Unsure

**Additional Comments regarding this clinical practice guideline?**