

# Supplement to the Clinical Practice Guideline for the Management of Anterior Cruciate Ligament Injuries

## e-Appendix 1

- Search Strategy
- AAOS Approval Bodies
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- Letters of Endorsement from External Organizations

This supplementary material has been provided by the authors to give readers additional information about their work

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## Literature Search Strategy

<b>Database:</b>	<b>MEDLINE</b>
<b>Interface:</b>	Ovid (Ovid MEDLINE <sup>®</sup> and Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Daily and Versions <sup>®</sup> 1946 to August 5, 2020)
<b>Date of Initial Search:</b>	8/4/2020
<b>Search</b>	ACL 2020
<b>Line</b>	<b>Search Strategy</b>
<b>1</b>	anterior cruciate.mp. OR ((ACL OR ACLR) AND (knee OR reconstruct* OR injur* OR repair* OR tear* OR rupture? OR avuls* OR sport*)).ti,ab.
<b>2</b>	English.lg.
<b>3</b>	(exp "Animals"/ NOT Humans/) OR exp "Cadaver"/ OR (animal? OR dog OR dogs OR canine OR horse OR horses OR equine OR mouse OR mice OR rat OR rats OR rabbit OR rabbits OR sheep OR porcine OR pig OR pigs OR rodent? OR monkey?).ti. OR (cadaver* OR in vitro).ti,ab. OR ((comment OR editorial OR letter OR historical article) NOT clinical trial).pt. OR address.pt. OR news.pt. OR newspaper article.pt. OR pmcbook.af. OR case reports.pt. OR (case report? OR abstracts OR editorial OR reply OR commentary OR letter).ti.
<b>4</b>	(1 AND 2) NOT 3
<b>5</b>	(exp Sensitivity and Specificity/ OR (sensitiv* OR (predictive AND value?) OR accuracy).ti,ab.) NOT ((exp *Diagnostic Imaging/ OR (tomograph* OR radiograph* OR magnetic resonance OR MRI OR MR OR CT OR (X AND ray*) OR imaging OR ultrasonography OR ultrasound? OR scan*).ti.) NOT (exp *Physical Examination/ OR ((physical OR clinical OR McMurray*) ADJ (examination? OR test?)).ti,ab.))
<b>6</b>	(arthrocentesis OR aspirat*).mp.
<b>7</b>	reconstruct*.mp. OR (surgery OR surgical OR repair*).ti,ab.
<b>8</b>	(conservative* OR nonoperativ* OR non operativ* OR nonsurgical* OR non surgical* OR non reconstructive OR no reconstruction OR no surgery OR without reconstruction OR without surgery OR without surgical* OR untreated).ti,ab.
<b>9</b>	tenodes*.mp. OR (anterolateral ligament OR anterolateral reconstruction OR extra?articular).ti,ab.
<b>10</b>	((((anterior cruciate OR ACL OR ACLR) ADJ4 reconstruct*) AND ((anterior cruciate OR ACL OR ACLR) ADJ4 repair*)).mp.

11	meniscectom*.mp. OR (menisc* ADJ3 (repair* OR surgery OR procedure OR resect* OR remov*)).ti,ab.
12	medial collateral.mp. OR MCL.ti,ab.
13	exp Time-to-Treatment/ OR ((time OR timing or delay* OR early) ADJ4 (surgery OR surgical OR reconstruct* OR repair*)).ti,ab.
14	(single AND double AND bundle).ti,ab.
15	(allograft* OR allogenic OR alloplastic OR homologous).mp. AND (autograft* OR auto graft* OR autogenous OR autologous).mp.
16	(brace? OR bracing?).mp.
17	((neuromuscular OR proprioceptive OR balance OR conditioning OR prevention OR plyometric? OR stretch*) ADJ3 (training OR program* OR exercis*)) OR warm* up?).ti,ab.
18	((return* OR resum*) AND (sport* OR activ* OR play* OR participat* OR competition OR athlet*)).mp.
19	randomized controlled trial.pt. OR exp Randomized Controlled Trials as Topic/ OR random allocation/ OR random*.ti,ab.
20	(MEDLINE OR (systematic* AND review*) OR meta analys*).ti,ab. OR (meta analysis OR systematic review).pt.
21	19 OR 20
22	4 AND (5 OR 14 OR 16) AND 21
23	4 AND (6 OR (7 AND (11 OR 12)) OR 13 OR 15 OR 18)
24	4 AND ((7 AND (8 OR 9)) OR 10 OR 17)
25	22 OR 23
26	limit 25 to yr="2014-Current"
27	limit 24 to yr="1966-Current"
28	26 OR 27
29	limit 28 to ez=20200804-20210827

<b>Database:</b>	Embase
<b>Interface:</b>	Elsevier
<b>Date of Initial Search:</b>	8/6/2020
<b>Search</b>	ACL 2020
<b>Line</b>	<b>Search Strategy</b>
<b>1</b>	anterior cruciate' OR ((ACL OR ACLR) AND (knee OR reconstruct* OR injur* OR repair* OR tear* OR rupture\$ OR avuls* OR sport*)):ti,ab,kw
<b>2</b>	abstract report'/de OR abstracts:ti OR 'book'/de OR 'editorial'/de OR 'editorial':it OR editorial:ti OR 'note'/de OR 'note':it OR 'letter'/de OR reply:ti OR commentary:ti OR 'letter':it OR letter:ti OR 'case study'/de OR 'case report'/de OR 'chapter':it OR 'conference paper'/exp OR 'conference paper':it OR 'conference abstract':it OR 'conference review':it OR 'cadaver'/de OR 'in vitro study'/exp OR (cadaver* OR 'in vitro'):ti,ab OR 'animal experiment'/exp OR (animal\$ OR dog OR dogs OR canine OR horse\$ OR equine OR mouse OR mice OR rat OR rats OR rabbit\$ OR sheep OR porcine OR pig OR pigs OR rodent\$ OR monkey\$):ti
<b>3</b>	(#1 NOT #2) AND [english]/lim
<b>4</b>	('Sensitivity and Specificity'/de OR 'Diagnostic Accuracy'/de OR (sensitiv* OR (predictive AND value\$) OR accuracy):ti,ab) NOT (('Radiodiagnosis'/mj OR (tomograph* OR radiograph* OR 'magnetic resonance' OR MRI OR MR OR CT OR (X AND ray*) OR imaging OR ultrasonography OR ultrasound\$ OR scan*):ti) NOT ('Physical Examination'/mj OR ((physical OR clinical OR McMurray*) NEXT/1 (examination\$ OR test\$)):ti,ab))
<b>5</b>	arthrocentesis OR aspirat*
<b>6</b>	reconstruct* OR (surgery OR surgical OR repair*):ti,ab
<b>7</b>	Conservative Treatment'/de OR (conservative* OR nonoperativ* OR 'non operativ*' OR nonsurgical* OR 'non surgical*' OR 'non reconstructive' OR ((no OR without) NEXT/2 (reconstruction OR surgery OR surgical* OR untreated))):ti,ab
<b>8</b>	tenodes* OR ('anterolateral ligament' OR 'anterolateral reconstruction' OR extra\$articular):ti,ab
<b>9</b>	((('anterior cruciate' OR ACL OR ACLR) NEAR/4 reconstruct*) AND (('anterior cruciate' OR ACL OR ACLR) NEAR/4 repair*))
<b>10</b>	meniscal repair'/de OR meniscectomy/de OR (meniscectom* OR (menisc* NEAR/3 (repair* OR surgery OR procedure OR resect* OR remov*)):ti,ab
<b>11</b>	medial collateral' OR MCL:ti,ab

<b>12</b>	Time to Treatment'/de OR ((time OR timing or delay* OR early) NEAR/4 (surgery OR surgical OR reconstruct* OR repair*)):ti,ab
<b>13</b>	(single AND double AND bundle):ti,ab
<b>14</b>	(allograft* OR allogenic OR alloplastic OR homologous) AND (autograft* OR 'auto graft*' OR autogenous OR autologous)
<b>15</b>	brace\$ OR bracing\$
<b>16</b>	((((neuromuscular OR proprioceptive OR balance OR conditioning OR prevention OR plyometric\$ OR stretch*) NEAR/3 (training OR program* OR exercis*)) OR 'warm* up\$'):ti,ab
<b>17</b>	(return* OR resum*) AND (sport* OR activ* OR play* OR participat* OR competition OR athlet*)
<b>18</b>	randomized controlled trial'/exp OR 'randomized controlled trial (topic)'/exp OR 'randomization'/de OR random*:ti,ab,kw
<b>19</b>	systematic review'/exp OR 'meta analysis'/exp OR ((systematic* NEAR/2 review*):ti,ab,kw) OR 'meta analys*':ti,ab,kw
<b>20</b>	#18 OR #19
<b>21</b>	#3 AND (#4 OR #13 OR #15) AND #20
<b>22</b>	#3 AND (#5 OR (#6 AND (#10 OR #11)) OR #12 OR #14 OR #17)
<b>23</b>	#3 AND ((#6 AND (#7 OR #8)) OR #9 OR #16)
<b>24</b>	(#21 OR #22) AND [2014-3000]/py
<b>25</b>	#23 AND [1966-3000]/py
<b>26</b>	#24 OR #25
<b>27</b>	(#24 OR #25) AND [6-8-2020]/sd NOT [28-8-2021]/sd

<b>Database:</b>	Cochrane Central Register of Controlled Trials (CENTRAL)
<b>Interface:</b>	Wiley ( <a href="https://www.cochranelibrary.com/central">https://www.cochranelibrary.com/central</a> )
<b>Date of Initial Search:</b>	8/5/2020
<b>Search</b>	ACL 2020
<b>Line</b>	<b>Search Strategy</b>
<b>1</b>	"anterior cruciate" OR ((ACL OR ACLR) AND (knee OR reconstruct* OR injur* OR repair* OR tear* OR rupture? OR avuls* OR sport*)):ti,ab
<b>2</b>	"conference abstract":pt OR (cadaver* OR "in vitro"):ti,ab OR (abstracts OR editorial OR reply OR commentary OR letter OR animal* OR dog OR dogs OR canine OR horse OR horses OR equine OR mouse OR mice OR rat OR rats OR rabbit OR rabbits OR sheep OR porcine OR pig OR pigs OR rodent? OR monkey?):ti
<b>3</b>	(#1 NOT #2)
<b>4</b>	([mh "Sensitivity and Specificity"] OR (sensitiv* OR (predictive AND value?) OR accuracy):ti,ab) NOT (([mh ^Diagnostic Imaging] OR (tomograph* OR radiograph* OR "magnetic resonance" OR MRI OR MR OR CT OR (X AND ray*) OR imaging OR ultrasonography OR ultrasound? OR scan*):ti) NOT ([mh ^"Physical Examination"] OR ((physical OR clinical OR McMurray*) NEXT/1 (examination? OR test?):ti,ab))
<b>5</b>	arthrocentesis OR aspirat*
<b>6</b>	reconstruct* OR (surgery OR surgical OR repair*):ti,ab
<b>7</b>	(conservative* OR nonoperativ* OR "non operativ*" OR nonsurgical* OR "non surgical*" OR "non reconstructive" OR ((no OR without) NEXT/2 (reconstruction OR surgery OR surgical* OR untreated))):ti,ab
<b>8</b>	tenodes* OR ("anterolateral ligament" OR "anterolateral reconstruction" OR extra?articular):ti,ab
<b>9</b>	((("anterior cruciate" OR ACL OR ACLR) NEAR/4 reconstruct*) AND ((("anterior cruciate" OR ACL OR ACLR) NEAR/4 repair*))

<b>10</b>	meniscectom* OR (menisc* NEAR/3 (repair* OR surgery OR procedure OR resect* OR remov*)):ti,ab
<b>11</b>	"medial collateral" OR MCL:ti,ab
<b>12</b>	[mh "Time-to-Treatment"] OR ((time OR timing or delay* OR early) NEAR/4 (surgery OR surgical OR reconstruct* OR repair*)):ti,ab
<b>13</b>	(single AND double AND bundle):ti,ab
<b>14</b>	(allograft* OR allogen?ic OR alloplastic OR homologous) AND (autograft* OR "auto graft*" OR autogenous OR autologous)
<b>15</b>	brace? OR bracing?
<b>16</b>	((neuromuscular OR proprioceptive OR balance OR conditioning OR prevention OR plyometric? OR stretch*) NEAR/3 (training OR program* OR exercis*)) OR "warm* up?":ti,ab
<b>17</b>	((return* OR resum*) AND (sport* OR activ* OR play* OR participat* OR competition OR athlet*))
<b>18</b>	#3 AND (#4 OR #13 OR #15)
<b>19</b>	#3 AND (#5 OR (#6 AND (#10 OR #11)) OR #12 OR #14 OR #17)
<b>20</b>	#3 AND ((#6 AND (#7 OR #8)) OR #9 OR #16) with Publication Year from 1966 to 2020, in Trials
<b>21</b>	(#18 OR #19) with Publication Year from 2014 to 2020, in Trials
<b>22</b>	#20 OR #21 ( <i>with Cochrane Library publication date from Aug 2020 to Aug 2021 - ON UPDATE</i> )
<b>23</b>	(allograft* OR allogen?ic OR alloplastic OR homologous) OR (autograft* OR "auto graft*" OR autogenous OR autologous)
<b>24</b>	#3 AND #23 <i>with Publication Year from 2014 to 2020, in Trials</i>
<b>25</b>	#3 AND #23 <i>with Cochrane Library publication date from Jan 2014 to Aug 2020</i>



## **AAOS Approval Bodies**

### **Committee on Evidence Based Quality and Value**

The committee on Evidence Based Quality and Value (EBQV) consists of twenty-three AAOS members who implement evidence-based quality initiatives such as clinical practice guidelines (CPGs), systematic literature reviews (SRs) and appropriate use criteria (AUCs). They also oversee the dissemination of related educational materials and promote the utilization of orthopaedic value products by the Academy's leadership and its members.

### **Council on Research and Quality**

The Council on Research and Quality promotes ethically and scientifically sound clinical and translational research to sustain patient care in musculoskeletal disorders. The Council also serves as the primary resource for educating its members, the public, and public policy makers regarding evidenced-based medical practice, orthopaedic devices and biologics, regulatory pathways and standards development, patient safety, and other related important research and quality areas. The Council is comprised of the chairs of the committees on Devices, Biologics, and Technology, Patient Safety, Research Development, U.S. and chair and section leaders of the Evidence Based Quality and Value committee. Also, on the Council are the second vice-president, three members at large, and representatives of the Diversity Advisory Board, Women's Health Issues Advisory Board, Board of Specialty Societies (BOS), Board of Councilors (BOC), Communications Cabinet, Orthopaedic Research Society (ORS), Orthopedic Research and Education Foundation (OREF).

### **Board of Directors**

The 18-member Board of Directors manage the affairs of the AAOS, set policy, and oversee the Strategic Plan

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Review of the clinical practice guideline is completed by interested external organizations. The AAOS solicits reviewers for each clinical practice guideline. They consist of experts in the topic area and represent professional societies other than AAOS. Review organizations are nominated by the clinical practice guideline development group at the introductory meeting. Review responses are available on [www.aaos.org/quality](http://www.aaos.org/quality).

Participation in the AAOS systematic literature review peer review process does not constitute an endorsement, nor does it imply that the reviewer supports this document.

**Letters of Endorsement from External Organizations**



October 21, 2022

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**Kaitlyn S. Sevarino, MBA, CAE**

Director

Department of Clinical Quality and Value

American Academy of Orthopaedic Surgeons

9400 West Higgins Road Rosemont, IL 60018

Dear Kaitlyn,

The American Medical Society for Sports Medicine has completed its review of the CPG for Management of ACL Injuries and has voted to ENDORSE the document. Thank you for providing the opportunity to review.

Sincerely,

A handwritten signature in black ink that reads 'Jim Griffith'.

Jim Griffith, MBA, CAE

Executive Director

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November 16, 2022

Kaitlyn S. Sevarino, MB, CAE  
Director  
Department of Clinical Quality and Value  
American Academy of Orthopaedic Surgeons  
9400 W. Higgins Road, Rosemont, IL 60018  
Submitted Via Email: [krause@aaos.org](mailto:krause@aaos.org)

RE: AAOS *Clinical Practice Guideline for the Management of Anterior Cruciate Ligament Injuries*

Dear Kaitlyn S. Sevarino,

The American Academy of Physical Medicine and Rehabilitation (AAPM&R) appreciates the opportunity to have participated in the development of the American Academy of Orthopaedic Surgeons (AAOS) *Clinical Practice Guideline (CPG) for the Management of Anterior Cruciate Ligament (ACL) Injuries*. We also appreciate the opportunity to review the CPG for endorsement consideration. AAPM&R is the national medical specialty organization representing more than 9,000 physicians who are specialists in physical medicine and rehabilitation (PM&R). PM&R physicians, also known as physiatrists, treat a wide variety of medical conditions affecting the brain, spinal cord, nerves, bones, joints, ligaments, muscles, and tendons. PM&R physicians evaluate and treat injuries, illnesses, and disability, and are experts in designing comprehensive, patient-centered treatment plans. Physiatrists utilize cutting-edge as well as time-tested treatments to maximize function and quality of life.

We are pleased to inform you that the AAPM&R Clinical Practice Guideline (CPG) Committee has voted to **endorse** the AAOS *CPG for the Management of Anterior Cruciate Ligament Injuries*. The Committee evaluated this guideline using the Appraisal of Guidelines for Research & Evaluation (AGREE) II Tool. Overall, the Committee agreed that the guideline is well done and provides pertinent recommendations for managing ACL injuries. However, the Committee did express concern with certain aspects regarding the methodology and development of the guideline.

As previously noted, when providing feedback on the development of the AAOS Clinical Practice Guideline for the Management of Hip Fractures in Older Adults, the Committee expressed concern regarding the use of the GRADE framework. Though the CPG states that the GRADE framework was used to evaluate the evidence and formulate recommendations, the minimal criteria required to state GRADE was used (per the GRADE working group) were seemingly not met. GRADE methods are standardized, and it is not recommended that any modifications to them be made to them. There is no documentation showing the GRADE EtD methods were followed for formulating recommendations and the recommendations themselves made are not in any of the standard formats recommended by GRADE. Attached you will find an



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AGREE II analysis from the AAPM&R CPG Committee with domain scores and additional feedback.

Ultimately, the Committee believes this guideline is highly valuable and supports endorsement of the guideline. This endorsement implies permission for the AAOS to officially list our organization as an endorser of this clinical practice guideline and reprint our logo in the introductory section of the clinical practice guideline review document. AAPM&R would also like your permission to post the most updated version of the guideline on our website or, if you prefer, to provide a link to the guideline on your website.

Thank you, again, for the opportunity to review the (AAOS) *Clinical Practice Guideline (CPG) for the Management of Anterior Cruciate Ligament (ACL) Injuries*. If you have any additional questions or concerns, please contact Kavitha Neerukonda, Associate Executive Director, Department of Quality & Research Initiatives, at [kneerukonda@aapmr.org](mailto:kneerukonda@aapmr.org) or (847) 737-6082.

Sincerely,

A handwritten signature in black ink, appearing to be 'D. Lee', with a long horizontal flourish extending to the right.

David W. Lee, MD  
Clinical Practice Guidelines Committee, Chair