Cigna Medical Coverage Policies – Musculoskeletal Sacroiliac Joint Procedures

Effective August 1, 2024





Instructions for use

The following coverage policy applies to health benefit plans administered by Cigna. Coverage policies are intended to provide guidance in interpreting certain standard Cigna benefit plans and are used by medical directors and other health care professionals in making medical necessity and other coverage determinations. Please note the terms of a customer's particular benefit plan document may differ significantly from the standard benefit plans upon which these coverage policies are based. For example, a customer's benefit plan document may contain a specific exclusion related to a topic addressed in a coverage policy.

In the event of a conflict, a customer's benefit plan document always supersedes the information in the coverage policy. In the absence of federal or state coverage mandates, benefits are ultimately determined by the terms of the applicable benefit plan document. Coverage determinations in each specific instance require consideration of:

- 1. The terms of the applicable benefit plan document in effect on the date of service
- 2. Any applicable laws and regulations
- 3. Any relevant collateral source materials including coverage policies
- 4. The specific facts of the particular situation

Coverage policies relate exclusively to the administration of health benefit plans. Coverage policies are not recommendations for treatment and should never be used as treatment guidelines.

This evidence-based medical coverage policy has been developed by eviCore, Inc. Some information in this coverage policy may not apply to all benefit plans administered by Cigna.

CPT® (Current Procedural Terminology) is a registered trademark of the American Medical Association (AMA). CPT® five digit codes, nomenclature and other data are copyright 2024 American Medical Association. All Rights Reserved. No fee schedules, basic units, relative values or related listings are included in the CPT® book. AMA does not directly or indirectly practice medicine or dispense medical services. AMA assumes no liability for the data contained herein or not contained herein.

©Copyright 2024 eviCore healthcare

CMM-203: Sacroiliac Joint Procedures
Definitions
General Guidelines
Indications
Non-Indications
Procedure (CPT®) Codes (CMM-203)
References (CMM-203)

Definitions

- ➤ Intra-Articular Sacroiliac Joint (SIJ) Injection: the injection of contrast (absent allergy to contrast), followed by the introduction of a corticosteroid and/or a local anesthetic into the sacroiliac joint under fluoroscopic or CT guidance.
 - ◆ Sacroiliac joint (SIJ) injections performed for determining if the sacroiliac joint is the source of the pain are termed 'diagnostic SIJ injections'.
 - Sacroiliac joint (SIJ) injections performed for the purpose of treating sacroiliac joint pain are termed 'therapeutic sacroiliac joint (SIJ) injections'.
- ➤ Sacral Lateral Nerve Block: an injection of corticosteroid and/or local anesthetic adjacent to the sacral lateral nerve resulting in the temporary interruption of conduction of impulses for analgesia. Sacral lateral nerve blocks attempt to block pain signals and theoretically provide relief from pain. The duration of the block depends on the dose, concentration, and type of pharmacological agent injected.
- > Sacroiliac Joint (SIJ): the synovial joint formed at the junction of the sacrum and ilium.
- Sacroiliac Joint (SIJ) Pain: pain originating from the sacroiliac joint as a result of injury, disease, or surgery.
 - Note: The presence of pain over the sacroiliac joint in the absence of radicular findings in and of itself does not substantiate the diagnosis of sacroiliac joint pain. There must also be clinical evidence as described below in the <u>Indications</u> section for <u>Diagnostic Sacroiliac Joint Injection</u>.

General Guidelines

Application of Guideline

- ➤ The determination of medical necessity for the performance of sacroiliac joint injections is always made on a case-by-case basis.
- ➤ The performance of interventional pain procedures such as a sacroiliac joint injection does not require the need for supplemental anesthesia in addition to local anesthesia.

<u>Injectates</u>

➤ This guideline only applies to injections of an anesthetic, corticosteroid, and/or contrast agent and does not include injections of biologics (e.g., platelet rich plasma, stem cells, amniotic fluid, etc.) and/or any other injectates that are not in scope of management.

Image Guidance

➤ Intra-articular sacroiliac joint injections should be performed using fluoroscopic or CT guidance with injection of contrast (absent allergy to contrast)

Frequency & Number of Injections/Procedures

- ➤ Only one invasive modality or procedure will be performed on the same date of service (e.g., facet joint block, epidural steroid injection, or lumbar sympathetic chain block).
- ➤ When medical necessity criteria is met, up to 2 diagnostic sacroiliac joint (SIJ) injections may be performed to determining if the sacroiliac joint (SIJ) is the source of the pain
- ➤ When medical necessity criteria is met, a total of four (4) therapeutic sacroiliac joint (SIJ) injections for the treatment of sacroiliac joint pain may be performed per joint during a rolling 12 month period of time.
 - ◆ For the recurrence of pain, a minimum of two (2) months duration is required between each therapeutic sacroiliac joint injection.

Indications

Diagnostic Sacroiliac Joint Injection

Initial

- An initial diagnostic sacroiliac joint injection for localized sacroiliac joint pain resulting from disease, injury, or surgery, is considered medically necessary when ALL of the following criteria have been met:
 - Pain primarily experienced between the upper level of the iliac crests and the gluteal fold (the pain can refer distally, even below the knee)
 - Clinical findings and imaging studies suggest no other obvious cause of the pain (e.g., central spinal stenosis with neurogenic claudication/myelopathy; foraminal stenosis or disc herniation with concordant radicular pain/radiculopathy; infection; tumor; fracture; pseudoarthrosis; or, pain related to spinal instrumentation).
 - Reproduction of pain using at least three (3) of the following provocative tests:
 - Distraction or "Gapping" or FABER/Patrick's Test
 - Thigh Thrust or Posterior Pelvic Pain Provocational Test
 - Gaenslen's Test
 - Sacroiliac Joint Compression Test
 - Sacral Thrust or Yeoman's Test
 - Pain persists despite BOTH of the following:
 - A minimum of four (4) weeks of noninvasive conservative therapy (e.g., home exercise program, physical therapy, chiropractic care, nonsteroidal antiinflammatory drugs [NSAIDs], or analgesics)
 - Continued active participation in a rehabilitative program or home exercise program

Repeat

➤ A repeat diagnostic sacroiliac joint injection is considered **medically necessary** when the initial diagnostic sacroiliac joint injection produced a positive response of ≥75% reduction in the reported pain for the duration of the local anesthetic.

Sacroiliac Joint Procedures

Therapeutic Sacroiliac Joint Injection

Initial

➤ An initial therapeutic sacroiliac joint injection for the treatment of sacroiliac joint pain is considered **medically necessary** following a diagnostic injection with ≥75% reduction in the reported pain for the duration of the local anesthetic.

Repeat

- ➤ A repeat therapeutic sacroiliac joint injection for the treatment of sacroiliac joint pain is considered **medically necessary** following a therapeutic injection when **ALL** of the following have been met:
 - ◆ A minimum of two (2) months since the prior therapeutic injection
 - ◆ Positive response to the prior therapeutic sacroiliac joint injection with ≥75% reduction in the reported pain for two (2) or more weeks duration and EITHER of the following:
 - Increase in the individual's level of function (i.e., return to work) for at least two (2) weeks
 - Reduction in the use of pain medication and/or additional medical services such as physical therapy/chiropractic care for at least two (2) weeks
- ➤ No more than four (4) therapeutic injections per SI joint are performed within a rolling 12 month period.

Non-Indications

Not Medically Necessary

- ➤ ANY of the following are considered **not medically necessary**:
 - A diagnostic intra-articular sacroiliac joint (SIJ) injection performed without meeting the criteria listed in the <u>Definitions</u>, the <u>General Guidelines</u>, and the <u>Indications</u> sections
 - A <u>therapeutic intra-articular sacroiliac joint (SIJ) injection</u> performed without meeting the criteria listed in the <u>Definitions</u>, the <u>General Guidelines</u>, and the <u>Indications</u> sections
 - Ultrasound guidance for an intra-articular sacroiliac joint injection, for ANY indication
 - ◆ An intra-articular sacroiliac joint injection when performed using injectates other than anesthetic, corticosteroid, and/or contrast agent (e.g., biologics [platelet rich plasma, stem cells, amniotic fluid]), administered alone or in combination.

Experimental, Investigational, or Unproven (EIU)

➤ L5 medial nerve branch and sacral lateral nerve branch blocks and/or ablations/neurotomies used for the diagnosis and/or treatment of sacroiliac joint mediated pain are considered experimental, investigational, or unproven (EIU).

Sacroiliac Joint Procedures

Procedure (CPT®) Codes (CMM-203)

This guideline relates to the CPT® code set below. Codes are displayed for informational purposes only. Any given code's inclusion on this list does not necessarily indicate prior authorization is required.

CPT ®	Code Description/Definition
CPI	Code Description/Definition
27096	Injection procedure for sacroiliac joint, anesthetic/steroid, with image guidance (fluoroscopy or CT) including arthrography when performed
G0260	Injection procedure for sacroiliac joint; provision of anesthetic, steroid and/or other therapeutic agent, with or without arthrography
CPT ®	Codes Considered Experimental, Investigational, or Unproven (EIU)
64451	Injection(s), anesthetic agent(s) and/or steroid; nerves innervating the sacroiliac joint, with image guidance (i.e., fluoroscopy or computed tomography)
64625	Radiofrequency ablation, nerves innervating the sacroiliac joint, with image guidance (i.e., fluoroscopy or computed tomography)

This list may not be all-inclusive and is not intended to be used for coding/billing purposes. The final determination of reimbursement for services is the decision of the health plan and is based on the individual's policy or benefit entitlement structure as well as claims processing rules.

References (CMM-203)

- American College of Occupational and Environmental Medicine. Occupational Medicine Practice Guideline. 2nd ed. 2008.
- 2. American Medical Association. Current Procedural Terminology. 2016 Professional Edition.
- American Society of Anesthesiologists. Statement on Anesthetic Care During Interventional Pain Procedures for Adults. October 22, 2005, amended October 26, 2016.
- American Society of Anesthesiologists (ASA) Task Force on Chronic Pain Management; American Society of Regional Anesthesia and Pain Medicine. Practice guidelines for chronic pain management: an updated report by the American Society of Anesthesiologists Task Force on Chronic Pain Management and the American Society of Regional Anesthesia and Pain Medicine. *Anesthesiology*. 2010;112:810-33.
- 5. Appropriate Use Criteria for Fluoroscopically-Guided Diagnostic and Therapeutic Sacroiliac Interventions: Results from the Spine Intervention Society-Convened Multispecialty Collaborative.
- 6. Aydin SM, Gharibo CG, Mehnert M, Stitik TP. The role of radiofrequency ablation for sacroiliac joint pain: a meta-analysis. *PMR*. 2010;2(9):842-851.
- 7. Bellini M, Barbieri M. Cooled radiofrequency system relieves chronic knee osteoarthritis pain: the first caseseries. *Anaesthesiol Intensive Ther.* 2015;47(1):30-33.
- 8. Berthelot J, Labat J, Le Goff B, et al. Provocative sacroiliac joint maneuvers and sacroiliac joint block are unreliable for diagnosing sacroiliac joint pain. *Joint Bone Spine*. 2006;73(1):17-23.
- 9. Bhatia A, Peng P, Cohen SP. Radiofrequency Procedures to Relieve Chronic Knee Pain: An Evidence-Based Narrative Review. *Reg Anesth Pain Med.* 2016;41(4):501-510.
- 10. Bhatia A, Hoydonckx Y, Peng P, Cohen SP. Radiofrequency Procedures to Relieve Chronic Hip Pain: An Evidence-Based Narrative Review. *Reg Anesth Pain Med.* 2018;43(1):72-83.
- 11. Buijs EJ, Kamphuis ET, Groen GJ. Radiofrequency treatment of sacroiliac joint-related pain aimed at the first three sacral dorsal rami: a minimal approach. *Pain Clinic*. 2004;16:139-146.
- 12. Cheng J, Chen SL, Zimmerman N, Dalton JE, LaSalle G, Rosenquist R. A New Radiofrequency Ablation Procedure to Treat Sacroiliac Joint Pain. *Pain Physician*. 2016;19(8):603-615.
- 13. Cheng J, Pope JE, Dalton JE, Cheng O, Bensitel A. Comparative outcomes of cooled versus traditional radiofrequency ablation of the lateral branches for sacroiliac joint pain. *Clin J Pain*. 2013;29:132-137.
- 14. Cohen SP, Abdi S. Lateral branch blocks as a treatment for sacroiliac joint pain: a pilot study. *Reg Anesth Pain Med.* 2003;28(2):113-119. doi:10.1053/rapm.2003.50029..
- 15. Cohen SP, Hurley RW, Buckenmaier CC 3rd, et al. Randomized placebo-controlled study evaluating lateral branch radiofrequency denervation for sacroiliac joint pain. *Anesthesiology*.2008;109:279-288.
- 16. Cohen SP, Strassels SA, Kurihara C, Crooks MT, Erdek MA, Forsythe A, Marcuson M. Outcome predictors for sacroiliac joint (lateral branch) radiofrequency denervation. *Reg Anesth Pain Med.* 2009;34(3):206-214.
- 17. Derendorf H, Möllmann H, Grüner A, et al. Pharmacokinetics and pharmacodynamics of glucocorticoid suspensions after intra-articular administration. *Clin Pharmacol Ther.* 1986;39:313–317.
- 18. Dickinson R, Reid J, Nicholson W, Lamer T, Hooten W. Corticosteroid and Cortisol Serum levels following Intrarticular Triamcinolone Acetonide lumbar Facet joint injections. *Pain Pract.* 2018;18(7):864–870.
- 19. Foley B, Buschbacher R: Sacroiliac joint pain: anatomy, biomechanics, diagnosis and treatment. *Am J Phys Med Rehabil.* 2006;85:997–1006.
- 20. Forst S, Wheeler M, Fortin J, Vilensky J. The sacroiliac joint: anatomy, physiology and clinical significance. *Pain Physician*. 2006;9(1):61-67.
- 21. Gevargez A, Groenemeyer D, Schirp S, Braun M. CT-guided percutaneous radiofrequency denervation of the sacroiliac joint. *Eur Radiol.* 2002;12(6):1360-1365. doi: 10.1007/s00330-001-1257-2.
- 22. Gunaydin I, Pereira P, Fritz J, et al. Magnetic resonance imaging guided corticosteroid injection of sacroiliac joints in patients with spondylarthropathy. Are multiple injections more beneficial?. *Rheumatol Int.* 2006;26(5):396-400.
- 23. Hansen H, Manchikanti L, Simopoulos TT, Christo PJ, Gupta S, Smith HS, Hameed H, Cohen SP. A systematic evaluation of the therapeutic effectiveness of sacroiliac joint interventions. *Pain Physician*. 2012;15(3):E247-E278.
- 24. Hayes, Inc. Medical Technology Directory Report. *Radiofrequency Ablation for Sacroiliac Joint Denervation for Chronic Low Back Pain*. Lansdale, PA: Hayes, Inc. Published June 30, 2017c. Reviewed August 19, 2019c.
- 25. Ho KY, Hadi MA, Pasutharnchat K, Tan KH. Cooled radiofrequency denervation for treatment of sacroiliac joint pain: two-year results from 20 cases. *J Pain Res.* 2013;6:505-511.
- 26. Hooten M, Thorson D, Bianco J, et al. Institute for Clinical Systems Improvement. Pain: Assessment, Non-Opioid Treatment Approaches and Opioid Management. Updated August 2017.
- 27. Juch JNS, Maas ET, Ostelo RWJG, et al. Effect of Radiofrequency Denervation on Pain Intensity Among Patients With Chronic Low Back Pain: The Mint Randomized Clinical Trials. *JAMA*. 2017;318(1):68-81.
- 28. Karabacakoglu A. Karakose S. Ozerbil O. Odev K. Fluoroscopy-guided intraarticular corticosteroid injection into the sacroiliac joints in patients with ankylosing spondylitis. *Acta Radiologica*. 2002;43(4):425-427.

- 29. Karaman H, Kavak GO, Tüfek A, Çelik F, Yildirim ZB, Akdemir MS, Tokgöz O. Cooled radiofrequency application for treatment of sacroiliac joint pain. *Acta Neurochir (Wien)*. 2011;153(7):1461-1468.
- 30. Kennedy DJ, Engel AJ, Kreiner DS, Nampiaparampil D, Duszynski B, MacVicar J. Fluoroscopically guided diagnostic and therapeutic sacroiliac joint injections: a systematic review. *Pain Med.* 2015;16:1500-1518.
- 31. King W, Ahmed SU, Baisden J, Patel N, Kennedy DJ, MacVicar J, Duszynski B. Diagnosis and treatment of posterior sacroiliac complex pain: a systematic review with comprehensive analysis of the published data. *Pain Med.* 2015;16(2):257.
- 32. Laslett M. Evidence-Based Diagnosis and Treatment of the Painful Sacroiliac Joint. *J Man Manip Ther.* 2008;16(3):142–152.
- 33. LCD Pain Management (L33622) effective 10/01/2015. CMS.gov. https://www.cms.gov/medicare-coverage-database/view/lcd.aspx?lcdid=33622&ver=27&keyword=L33622&keywordType=starts&areald=all&docType=NC A,CAL,NCD,MEDCAC,TA,MCD,6,3,5,1,F,P&contractOption=all&sortBy=relevance&bc=1. Revised 06/24/2020.
- 34. Leggett LE, Soril LJ, Lorenzetti DL, et al. Radiofrequency ablation for chronic low back pain: a systematic review of randomized controlled trials. *Pain Res Manag.* 2014;19(5):e146-e53.
- 35. Ling B. Lee J. Man H. et al. Transverse morphology of the sacroiliac joint: effect of angulation and implications for fluoroscopically guided sacroiliac joint injection. *Skeletal Radiology*. 2006;35(11):838-846.
- 36. Luukkainen R. Wennerstrand P. Kautiainen H. et al. Efficacy of periarticular corticosteroid treatment of the sacroiliac joint in non-spondylarthropathic patients with chronic low back pain in the region of the sacroiliac joint. *Clin Exp Rheumatol.* 2002;20(1):52-54.
- 37. McKenzie-Brown A, Shah R, Sehgal N, Everett C. A Systematic Review of Sacroiliac Joint Interventions. *Pain Physician*. 2005;8;115-125.
- 38. MacVicar J, Kreiner DS, Duszynski B, et. al. Appropriate Use Criteria for Fluoroscopically Guided Diagnostic and Therapeutic Sacroiliac Interventions: Results from the Spine Intervention Society Convened Multispecialty Collaborative, *Pain Med.* 2017;18(11):2081–2095.
- 39. Maas ET, Ostelo RW, Niemisto L, Jousimaa J, Hurri H, Malmivaara A, van Tulder MW. Radiofrequency denervation for chronic low back pain. Cochrane Database Syst Rev. 2015;(10):CD008572.
- 40. Manchikanti L, Abdi S, Atluri S, et al. An update of comprehensive evidence-based guidelines for interventional techniques of chronic spinal pain: Part II: Guidance and recommendations. *Pain Physician*. 2013;16:S49-S283.
- 41. Manchikanti L, Staats P, Singh V, et al. Evidence-based practice guidelines for interventional techniques in the management of chronic spinal pain. *Pain Physician*. 2003;6:3-81.
- 42. Mitchell B, MacPhail T, Vivian D, Verrills P, Barnard A. Radiofrequency neurotomy for sacroiliac joint pain: A prospective study. *Surgical Science*. 2015;6:265-272.
- 43. Murakami E, Tanaka Y, Aizawa T, et al. Effect of periarticular and intraarticular lidocaine injections for sacroiliac joint pain: prospective comparative study. *J Orthop Science*. 2007;12(3):274-280.
- 44. Nelemans P, de Bie R, de Vet H, Sturmans F, Injection therapy for subacute and chronic benign low back pain. *Cochrane Database Syst Rev.* 2000;(2):CD001824.
- 45. North American Spine Society (NASS). NASS Coverage Policy Recommendation: Sacroiliac Joint Injections. Copyright ©2015-2017 North American Spine Society.
- 46. North American Spine Society (NASS). NASS Coverage Policy Recommendation: Sacroiliac Joint Injections & Radiofrequency Ablation. Burr Ridge, IL: North American Spine Society (NASS); ©2020: 3-10.
- 47. Patel J, Schneider B, Smith C on behalf of SIS Patient Safety Committee. Intrarticular Corticosteroid Injections and hyperglycemia. 10/4/17.
- 48. Patel N, Gross A, Brown L, Gekht G. A randomized, placebo-controlled study to assess the efficacy of lateral branch neurotomy for chronic sacroiliac joint pain. *Pain Med.* 2012; 13:383-398.
- 49. Pekkafahli M, Kiralp M, Basekim C, et al. Sacroiliac joint injections performed with sonographic guidance. *J Ultrasound Med.* 2003;22(6):553-559.
- 50. Romero FR, Vital RB, Zanini MA, Ducati LG, Gabarra RC. Long-term follow-up in sacroiliac joint pain patients treated with radiofrequency ablative therapy. *Arg Neuropsiquiatr*. 2015;73(6):476-479.
- 51. Rosenberg J, Quint T, de Rosayro A. Computerized tomographic localization of clinically-guided sacroiliac joint injections. *Clin J Pain*. 2000;16(1):18-21.
- 52. Schmidt GL, Bhandutia AK, Altman DT. Management of sacroiliac joint pain. *J Am Acad Orthop Surg.* 2018;26:610-616. doi: 10.5435/JAAOS-D-15-00063.
- 53. Schneider B, Patel J, Smith C. (on behalf of the Spine Intervention Society's Patient Safety Committee). Ultrasound Guidance for Intra-Articular Sacroiliac Joint Injections. Cdn.ymaws.com. https://cdn.ymaws.com/www.spineintervention.org/resource/resmgr/factfinder/2020/sis_factfinder_20_06_ultraso. pdf. Published 2020.
- 54. Schneider BJ, Rosati R, Zheng P, McCormick ZL. Challeges in diagnosing sacroiliac joint pain: a narrative review. *PMR*. 2019;11(Suppl 1):S40-S45. doi: 10.1002/pmrj.12175.
- 55. Slipman C, Lipetz J, Plastaras C, et al. Fluoroscopically guided therapeutic sacroiliac joint injections for sacroiliac joint syndrome. *Am J Phys Med Rehabil.* 2001;80(6):425-432.
- 56. Simopoulos TT, Manchikanti L, Gupta S, et al. Systematic review of the diagnostic accuracy and therapeutic effectiveness of sacroiliac joint interventions. *Pain Physician*. 2015;18:E713-E756.

- 57. Stelzer W, Aiglesberger M, Stelzer D, Stelzer V. Use of cooled radiofrequency lateral branch neurotomy for the treatment of sacroiliac joint-mediated low back pain: A large case series. *Pain Med.* 2013;14:29-35.
- Sun HH, Zhuang SY, Hong X, Xie XH, Zhu L, Wu XT. The efficacy and safety of using cooled radiofrequency in treating chronic sacroiliac joint pain: A PRISMA-compliant meta-analysis. *Medicine (Baltimore)*. 2018:97(6):e9809.
- 59. Vallejo R, Benyamin R, Kramer J, et al. Pulsed radiofrequency denervation for the treatment of sacroiliac joint syndrome. *Pain Med.* 2006;7:429-434.
- 60. van der Wurff P. Buijs E. Groen G. A multitest regimen of pain provocation tests as an aid to reduce unnecessary minimally invasive sacroiliac joint procedures. *Arch Phys Med Rehabil*. 2006;87(1):10-14.
- 61. Workloss Data Institute. Official Disability Guidelines. www.worklossdata.com.
- 62. Yang AJ, McCormick ZL, Zheng PZ, Schneider BJ. Radiofrequency ablation for the posterior sacroiliac joint complex pain: a narrative review. *PMR*. 2019:11(Suppl 1): S105–S113. doi: 10.1002/pmrj.12200.
- Yang A, Wagner G, Burnham T, McCormick Z, Schneider B. Radiofrequency Ablation for Chronic Posterior Sacroiliac Joint Complex Pain: A Comprehensive Review. *Pain Med.* 2021;22(Supplement_1):S9-S13. doi:10.1093/pm/pnab021.
- 64. Yason SC, Sembrano JN, Polly DW Jr. Sacroiliac Joint fusion: Approaches and recent outcomes. *PMR*. 2019;11(Suppl 1):S114–S117. doi: 10.1002/pmrj.12198.
- 65. Young S, Aprill C, Laslett M. Correlation of clinical examination characteristics with three sources of chronic low back pain. *Spine J.* 2003;3(6):460-465.
- 66. Zelle B, Gruen G, Brown S, George S. Sacroiliac joint dysfunction: evaluation and management. *Clin J Pain*. 2005;21(5):446-455.
- 67. Zheng P, Schneider BJ, Yang A, McCormick ZL. Image–guided sacroiliac joint injections: an evidence–based review of best practices and clinical outcomes. *PMR*. 2019;11(Suppl 1):S98–S104. doi: 10.1002/pmrj.12191.