

Pulmonary Conditions

1. Mahendiratta S, Bansal S, Sarma P, Kumar H, Choudhary G, Kumar S, Prakash A, Sehgal R, Medhi B. Stem cell therapy in COVID-19: Pooled evidence from SARS-CoV-2, SARS-CoV, MERS-CoV and ARDS: A systematic review. *Biomedicine & Pharmacotherapy*. 2021 Jan 28;111300.
2. Li DY, Li RF, Sun DX, Pu DD, Zhang YH. Mesenchymal stem cell therapy in pulmonary fibrosis: a meta-analysis of preclinical studies. *Stem Cell Res Ther*. 2021 Aug 18;12(1):461. doi: 10.1186/s13287-021-02496-2. PmiD: 34407861; PMCID: PMC8371890.
3. Qu W, Wang Z, Hare JM, Bu G, Mallea JM, Pascual JM, Caplan AI, Kurtzberg J, Zubair AC, Kubrova E, Engelberg-Cook E, Nayfeh T, Shah VP, Hill JC, Wolf ME, Prokop LJ, Murad MH, Sanfilippo FP. Cell-based therapy to reduce mortality from COVID-19: Systematic review and meta-analysis of human studies on acute respiratory distress syndrome. *Stem Cells Transl Med*. 2020 Sep;9(9):1007-1022. doi: 10.1002/sctm.20-0146. Epub 2020 May 29. PmiD: 32472653; PMCID: PMC7300743.
4. Loecher AM, West K, Quinn TD, Defayette AA. Management of diffuse alveolar hemorrhage in the hematopoietic stem cell transplantation population: A systematic review. *Pharmacotherapy*. 2021 Nov;41(11):943-952. doi: 10.1002/phar.2630. Epub 2021 Oct 20. PmiD: 34618944.
5. Calzetta L, Aiello M, Frizzelli A, Camardelli F, Cazzola M, Rogliani P, Chetta A. Stem Cell-Based Regenerative Therapy and Derived Products in COPD: A Systematic Review and Meta-Analysis. *Cells*. 2022 May 30;11(11):1797. doi: 10.3390/cells11111797. PmiD: 35681492; PMCID: PMC9180461.
6. Zhang M, Yan X, Shi M, Li R, Pi Z, Ren X, Wang Y, Yan S, Wang Y, Jin Y, Wang X. Safety and efficiency of stem cell therapy for COVID-19: a systematic review and meta-analysis. *Glob Health Res Policy*. 2022 Jun 23;7(1):19. doi: 10.1186/s41256-022-00251-5. PmiD: 35733229; PMCID: PMC9217728.
7. Rada G, Corbalán J, Rojas P; COVID-19 L·OVE Working Group. Cell-based therapies for COVID-19: A living, systematic review. *Medwave*. 2020 Dec 17;20(11):e8079. English. doi: 10.5867/medwave.2020.11.8078. PmiD: 33382060.
8. Qu W, Wang Z, Engelberg-Cook E, Yan D, Siddik AB, Bu G, Allickson JG, Kubrova E, Caplan AI, Hare JM, Ricordi C, Pepine CJ, Kurtzberg J, Pascual JM, Mallea JM, Rodriguez RL, Nayfeh T, Saadi S, Durvasula RV, Richards EM, March K, Sanfilippo FP. Efficacy and Safety of MSC Cell Therapies for Hospitalized Patients with COVID-19: A Systematic Review and Meta-Analysis.

- Stem Cells Transl Med. 2022 Jul 20;11(7):688-703. doi: 10.1093/stcltm/szac032. PmiD: 35640138; PMID: PMC9299515.
9. Wang J, Luo F, Suo Y, Zheng Y, Chen K, You D, Liu Y. Safety, efficacy and biomarkers analysis of mesenchymal stromal cells therapy in ARDS: a systematic review and meta-analysis based on phase I and II RCTs. *Stem Cell Res Ther.* 2022 Jun 25;13(1):275. doi: 10.1186/s13287-022-02956-3. PmiD: 35752865; PMID: PMC9233855.
 10. Kirkham AM, Monaghan M, Bailey AJM, Shorr R, Lalu MM, Fergusson DA, Allan DS. Mesenchymal stem/stromal cell-based therapies for COVID-19: First iteration of a living systematic review and meta-analysis: MSCs and COVID-19. *Cytotherapy.* 2022 Jun;24(6):639-649. doi: 10.1016/j.jcyt.2021.12.001. Epub 2022 Jan 31. PmiD: 35219584; PMID: PMC8802614.
 11. Bailey AJM, Kirkham AM, Monaghan M, Shorr R, Buchan CA, Bredeson C, Allan DS. A Portrait of SARS-CoV-2 Infection in Patients Undergoing Hematopoietic Cell Transplantation: A Systematic Review of the Literature. *Curr Oncol.* 2022 Jan 13;29(1):337-349. doi: 10.3390/curroncol29010030. PmiD: 35049704; PMID: PMC8774852.
 12. Weiss DJ, Casaburi R, Flannery R, LeRoux-Williams M, Tashkin DP. A placebo-controlled, randomized trial of mesenchymal stem cells in COPD. *Chest.* 2013 Jun;143(6):1590-1598. doi: 10.1378/chest.12-2094. PubMed PmiD: 23172272;
 13. Wang XX, Zhang FR, Shang YP, Zhu JH, Xie XD, Tao QM, Zhu JH, Chen JZ. Transplantation of autologous endothelial progenitor cells may be beneficial in patients with idiopathic pulmonary arterial hypertension: a pilot randomized controlled trial. *J Am Coll Cardiol.* 2007 Apr 10;49(14):1566-71. Epub 2007. PubMed PmiD: 17418297.
 14. Meng F, Xu R, Wang S, Xu Z, Zhang C, Li Y, Yang T, Shi L, Fu J, Jiang T, Huang L, Zhao P, Yuan X, Fan X, Zhang JY, Song J, Zhang D, Jiao Y, Liu L, Zhou C, Maeurer M, Zumla A, Shi M, Wang FS. Human umbilical cord-derived mesenchymal stem cell therapy in patients with COVID-19: a phase 1 clinical trial. *Signal Transduct Target Ther.* 2020 Aug 27;5(1):172. doi: 10.1038/s41392-020-00286-5. PmiD: 32855385; PMID: PMC7450163.
 15. Shu L, Niu C, Li R, Huang T, Wang Y, Huang M, Ji N, Zheng Y, Chen X, Shi L, Wu M, Deng K, Wei J, Wang X, Cao Y, Yan J, Feng G. Treatment of severe COVID-19 with human umbilical cord mesenchymal stem cells. *Stem Cell Res Ther.* 2020 Aug 18;11(1):361. doi: 10.1186/s13287-020-01875-5. PmiD: 32811531; PMID: PMC7432540.

16. Matthay MA, Calfee CS, Zhuo H, Thompson BT, Wilson JG, Levitt JE, Rogers AJ, Gotts JE, Wiener-Kronish JP, Bajwa EK, Donahoe MP, McVerry BJ, Ortiz LA, Exline M, Christman JW, Abbott J, Delucchi KL, Caballero L, Mcmillan M, McKenna DH, Liu KD. Treatment with allogeneic mesenchymal stromal cells for moderate to severe acute respiratory distress syndrome (START study): a randomised phase 2a safety trial. *Lancet Respir Med*. 2019 Feb;7(2):154-162. doi: 10.1016/S2213-2600(18)30418-1. Epub 2018 Nov 16. PmiD: 30455077; PMCID: PMC7597675.
17. Shah GL, DeWolf S, Lee YJ, Tamari R, Dahi PB, Lavery JA, Ruiz J, Devlin SM, Cho C, Peled JU, Politikos I, Scordo M, Babady NE, Jain T, Vardhana S, Daniyan A, Sauter CS, Barker JN, Giralt SA, Goss C, Maslak P, Hohl TM, Kamboj M, Ramanathan L, van den Brink MR, Papadopoulos E, Papanicolaou G, Perales MA. Favorable outcomes of COVID-19 in recipients of hematopoietic cell transplantation. *J Clin Invest*. 2020 Dec 1;130(12):6656-6667. doi: 10.1172/JCI141777. PmiD: 32897885; PMCID: PMC7685738a.
18. Sharma A, Kulkarni R, Sane H, Awad N, Bopardikar A, Joshi A, Baweja S, Joshi M, Vishwanathan C, Gokulchandran N, Badhe P, Khan M, Paranjape A, Kulkarni P, Methal AK. Phase 1 clinical trial for intravenous administration of mesenchymal stem cells derived from umbilical cord and placenta in patients with moderate COVID-19 virus pneumonia: results of stage 1 of the study. *Am J Stem Cells*. 2022 Jun 15;11(3):37-55. PmiD: 35873716; PMCID: PMC9301142.
19. Lanzoni G, Linetsky E, Correa D, Messinger Cayetano S, Alvarez RA, Kouroupis D, Alvarez Gil A, Poggioli R, Ruiz P, Martos AC, Hirani K, Bell CA, Kusack H, Rafkin L, Baidal D, Pastewski A, Gawri K, Leñero C, Mantero AMA, Metalonis SW, Wang X, Roque L, Masters B, Kenyon NS, Ginzburg E, Xu X, Tan J, Caplan AI, Glassberg MK, Alejandro R, Ricordi C. Umbilical cord mesenchymal stem cells for COVID-19 acute respiratory distress syndrome: A double-blind, phase 1/2a, randomized controlled trial. *Stem Cells Transl Med*. 2021 May;10(5):660-673. doi: 10.1002/sctm.20-0472. Epub 2021 Jan 5. PmiD: 33400390; PMCID: PMC8046040.
20. Saleh M, Vaezi AA, Aliannejad R, Sohrabpour AA, Kiaei SZF, Shadnoush M, Siavashi V, Aghaghazvini L, Khoundabi B, Abdoli S, Chahardouli B, Seyhoun I, Alijani N, Verdi J. Cell therapy in patients with COVID-19 using Wharton's jelly mesenchymal stem cells: a phase 1 clinical trial. *Stem Cell Res Ther*. 2021 Jul 16;12(1):410. doi: 10.1186/s13287-021-02483-7. PmiD: 34271988; PMCID: PMC8283394.

21. Dilogio IH, Aditianingsih D, Sugiarto A, Burhan E, Damayanti T, Sitompul PA, Mariana N, Antarianto RD, Liem IK, Kiswa T, Mujadid F, Novialdi N, Luviah E, Kurniawati T, Lubis AMT, Rahmatika D. Umbilical cord mesenchymal stromal cells as critical COVID-19 adjuvant therapy: A randomized controlled trial. *Stem Cells Transl Med.* 2021 Sep;10(9):1279-1287. doi: 10.1002/sctm.21-0046. Epub 2021 Jun 8. PmiD: 34102020; PMCID: PMC8242692.
22. Amonoo HL, Topping CEW, Clay MA, Reynolds MJ, Rice J, Harnedy LE, Longley RM, LeBlanc TW, Greer JA, Chen YB, DeFilipp Z, Lee SJ, Temel JS, El-Jawahri A. Distress in a Pandemic: Association of the Coronavirus Disease-2019 Pandemic with Distress and Quality of Life in Hematopoietic Stem Cell Transplantation. *Transplant Cell Ther.* 2021 Dec;27(12):1015.e1-1015.e7. doi: 10.1016/j.jtct.2021.09.001. Epub 2021 Sep 15. PmiD: 34536571; PMCID: PMC8442257.
23. Ercelen N, Pekkoc-Uyanik KC, Alpaysdin N, Gulay GR, Simsek M. Clinical experience on umbilical cord mesenchymal stem cell treatment in 210 severe and critical COVID-19 cases in Turkey. *Stem Cell Rev Rep.* 2021 Oct;17(5):1917-1925. doi: 10.1007/s12015-021-10214-x. Epub 2021 Jul 28. PmiD: 34319510; PMCID: PMC8317476.
24. Xu X, Jiang W, Chen L, Xu Z, Zhang Q, Zhu M, Ye P, Li H, Yu L, Zhou X, Zhou C, Chen X, Zheng X, Xu K, Cai H, Zheng S, Jiang W, Wu X, Li D, Chen L, Luo Q, Wang Y, Qu J, Li Y, Zheng W, Jiang Y, Tang L, Xiang C, Li L. Evaluation of the safety and efficacy of using human menstrual blood-derived mesenchymal stromal cells in treating severe and critically ill COVID-19 patients: An exploratory clinical trial. *Clin Transl Med.* 2021 Feb;11(2):e297. doi: 10.1002/ctm2.297. PmiD: 33634996; PMCID: PMC7839959.
25. Ye Q, Wang H, Xia X, Zhou C, Liu Z, Xia ZE, Zhang Z, Zhao Y, Yehenala J, Wang S, Zhou G, Hu K, Wu B, Wu CT, Wang S, He Y. Safety and efficacy assessment of allogeneic human dental pulp stem cells to treat patients with severe COVID-19: structured summary of a study protocol for a randomized controlled trial (Phase I / II). *Trials.* 2020 Jun 12;21(1):520. doi: 10.1186/s13063-020-04380-5. PmiD: 32532356; PMCID: PMC7290137.
26. Grégoire C, Layios N, Lambermont B, Lechanteur C, Briquet A, Bettonville V, Baudoux E, Thys M, Dardenne N, misset B, Beguin Y. Bone Marrow-Derived Mesenchymal Stromal Cell Therapy in Severe COVID-19: Preliminary Results of a Phase I/II Clinical Trial. *Front Immunol.* 2022 Jul 4;13:932360. doi: 10.3389/fimmu.2022.932360. PmiD: 35860245; PMCID: PMC9291273.
27. Ahn SY, Chang YS, Lee MH, Sung SI, Lee BS, Kim KS, Kim AR, Park WS. Stem cells for bronchopulmonary dysplasia in preterm infants: A randomized controlled phase II trial. *Stem Cells*

- Transl Med. 2021 Aug;10(8):1129-1137. doi: 10.1002/sctm.20-0330. Epub 2021 Apr 20. PmiD: 33876883; PMCID: PMC8284779.
28. Yip HK, Fang WF, Li YC, Lee FY, Lee CH, Pei SN, Ma MC, Chen KH, Sung PH, Lee MS. Human Umbilical Cord-Derived Mesenchymal Stem Cells for Acute Respiratory Distress Syndrome. *Crit Care Med.* 2020 May;48(5):e391-e399. doi: 10.1097/CCM.0000000000004285. PmiD: 32187077.
 29. Muhammad SA, Abbas AY, Saidu Y, Fakurazi S, Bilbis LS. Therapeutic efficacy of mesenchymal stromal cells and secretome in pulmonary arterial hypertension: A systematic review and meta-analysis. *Biochimie.* 2020 Jan;168:156-168. doi: 10.1016/j.biochi.2019.10.016. Epub 2019 Oct 31. PmiD: 31678635.
 30. Squassoni SD, Sekiya EJ, Fiss E, Lapa MS, Cayetano DDS, Nascimento F, Alves A, Machado NC, Escaramboni B, Lívero FADR, Malagutti-Ferreira MJ, Soares MR, Dos Santos Figueiredo FW, Kramer BKN, Zago PMJJ, Ribeiro-Paes JT. Autologous Infusion of Bone Marrow and Mesenchymal Stromal Cells in Patients with Chronic Obstructive Pulmonary Disease: Phase I Randomized Clinical Trial. *Int J Chron Obstruct Pulmon Dis.* 2021 Dec 29;16:3561-3574. doi: 10.2147/COPD.S332613. PmiD: 35002228; PMCID: PMC8733220.
 31. Rebelatto CLK, Senegaglia AC, Franck CL, Daga DR, Shigunov P, Stimamiglio MA, Marsaro DB, Schaidt B, micosky A, de Azambuja AP, Leitão CA, Petterle RR, Jamur VR, Vaz IM, Mallmann AP, Carraro Junior H, Ditzel E, Brofman PRS, Correa A. Safety and long-term improvement of mesenchymal stromal cell infusion in critically COVID-19 patients: a randomized clinical trial. *Stem Cell Res Ther.* 2022 Mar 21;13(1):122. doi: 10.1186/s13287-022-02796-1. PmiD: 35313959; PMCID: PMC8935270.
 32. KaffashFarkhad N, Sedaghat A, Reihani H, Adhami Moghadam A, Bagheri Moghadam A, KhademGhaebi N, Khodadoust MA, Ganjali R, Tafreshian AR, Tavakol-Afshari J. Mesenchymal stromal cell therapy for COVID-19-induced ARDS patients: a successful phase 1, control-placebo group, clinical trial. *Stem Cell Res Ther.* 2022 Jun 28;13(1):283. doi: 10.1186/s13287-022-02920-1. PmiD: 35765103; PMCID: PMC9241239.
 33. Aghayan HR, Salimian F, Abedini A, Fattah Ghazi S, Yunesian M, Alavi-Moghadam S, Makarem J, Majidzadeh-A K, Hatamkhani A, Moghri M, Danesh A, Haddad-Marandi MR, Sanati H, Abbasvandi F, Arjmand B, Azimi P, Ghavamzadeh A, Sarrami-Forooshani R. Human placenta-derived mesenchymal stem cells transplantation in patients with acute respiratory distress syndrome (ARDS) caused by COVID-19 (phase I clinical trial): safety profile assessment. *Stem Cell Res*

- Ther. 2022 Jul 28;13(1):365. doi: 10.1186/s13287-022-02953-6. PmiD: 35902979; PMCID: PMC9330663.
34. Bellingan G, Jacono F, Bannard-Smith J, Brealey D, Meyer N, Thickett D, Young D, Bentley A, McVerry BJ, Wunderink RG, Doerschug KC, Summers C, Rojas M, Ting A, Jenkins ED. Safety and efficacy of multipotent adult progenitor cells in acute respiratory distress syndrome (MUST-ARDS): a multicentre, randomised, double-blind, placebo-controlled phase 1/2 trial. *Intensive Care Med.* 2022 Jan;48(1):36-44. doi: 10.1007/s00134-021-06570-4. Epub 2021 Nov 23. PmiD: 34811567; PMCID: PMC8608557.
35. Karyana M, Djaharuddin I, Rifati L, Arif M, Choi MK, Angginy N, Yoon A, Han J, Josh F, Arlinda D, Narulita A, Muchtar F, Bakri RA, Irmansyah S. Safety of DW-MSC infusion in patients with low clinical risk COVID-19 infection: a randomized, double-blind, placebo-controlled trial. *Stem Cell Res Ther.* 2022 Apr 1;13(1):134. doi: 10.1186/s13287-022-02812-4. PmiD: 35365239; PMCID: PMC8972711.
36. Shi L, Yuan X, Yao W, Wang S, Zhang C, Zhang B, Song J, Huang L, Xu Z, Fu JL, Li Y, Xu R, Li TT, Dong J, Cai J, Li G, Xie Y, Shi M, Li Y, Zhang Y, Xie WF, Wang FS. Human mesenchymal stem cells treatment for severe COVID-19: 1-year follow-up results of a randomized, double-blind, placebo-controlled trial. *EBioMedicine.* 2022 Jan;75:103789. doi: 10.1016/j.ebiom.2021.103789. Epub 2021 Dec 25. PmiD: 34963099; PMCID: PMC8709782.
37. Zhu R, Yan T, Feng Y, Liu Y, Cao H, Peng G, Yang Y, Xu Z, Liu J, Hou W, Wang X. Mesenchymal stem cell treatment improves outcome of COVID-19 patients via multiple immunomodulatory mechanisms. *Cell research.* 2021 Dec;31(12):1244-62.
38. Sengupta V, Sengupta S, Lazo A, Woods P, Nolan A, Bremer N. Exosomes Derived from Bone Marrow Mesenchymal Stem Cells as Treatment for Severe COVID-19. *Stem Cells Dev.* 2020 Jun 15;29(12):747-754. doi: 10.1089/scd.2020.0080. Epub 2020 May 12. PmiD: 32380908; PMCID: PMC7310206.
39. Chen S, Zhao K, Lin R, Wang S, Fan Z, Huang F, Chen X, Nie D, Du X, Guo Z, Lin D, Xuan L, Xu N, Sun J, Peng Xiang A, Liu Q. The efficacy of mesenchymal stem cells in bronchiolitis obliterans syndrome after allogeneic HSCT: A multicenter prospective cohort study. *EBioMedicine.* 2019 Nov;49:213-222. doi: 10.1016/j.ebiom.2019.09.039. Epub 2019 Oct 23. PmiD: 31668569; PMCID: PMC6945279.

40. Wick KD, Leligdowicz A, Zhuo H, Ware LB, Matthay MA. Mesenchymal stromal cells reduce evidence of lung injury in patients with ARDS. *JCI Insight*. 2021 Jun 22;6(12):e148983. doi: 10.1172/jci.insight.148983. PmiD: 33974564; PMCID: PMC8262503.
41. Tzouvelekis, A., Koliakos, G., Ntoliou, P. et al. Stem cell therapy for idiopathic pulmonary fibrosis: a protocol proposal. *J Transl Med* 9, 182 (2011). <https://doi.org/10.1186/1479-5876-9-182>
42. Häberle H, Magunia H, Lang P, Gloeckner H, Körner A, Koeppen M, Backchoul T, Malek N, Handgretinger R, Rosenberger P, mirakaj V. Mesenchymal stem cell therapy for severe COVID-19 ARDS. *Journal of Intensive Care Medicine*. 2021 Jun;36(6):681-8.
43. Averyanov A, Koroleva I, Konoplyannikov M, Revkova V, Lesnyak V, Kalsin V, Danilevskaya O, Nikitin A, Sotnikova A, Kotova S, Baklaushev V. First-in-human high-cumulative-dose stem cell therapy in idiopathic pulmonary fibrosis with rapid lung function decline. *Stem Cells Transl Med*. 2020 Jan;9(1):6-16. doi: 10.1002/setm.19-0037. Epub 2019 Oct 15. PmiD: 31613055; PMCID: PMC6954714.
44. Hashemian SR, Aliannejad R, Zarrabi M, Soleimani M, Vosough M, Hosseini SE, Hossieni H, Keshel SH, Naderpour Z, Hajizadeh-Saffar E, Shajareh E, Jamaati H, Soufi-Zomorrod M, Khavandgar N, Alemi H, Karimi A, Pak N, Rouzbahani NH, Nouri M, Sorouri M, Kashani L, Madani H, Aghdami N, Vasei M, Baharvand H. Mesenchymal stem cells derived from perinatal tissues for treatment of critically ill COVID-19-induced ARDS patients: a case series. *Stem Cell Res Ther*. 2021 Jan 29;12(1):91. doi: 10.1186/s13287-021-02165-4. PmiD: 33514427; PMCID: PMC7844804.
45. Le Thi Bich P, Nguyen Thi H, Dang Ngo Chau H, Phan Van T, Do Q, Dong Khac H, Le Van D, Nguyen Huy L, Mai Cong K, Ta Ba T, Do minh T. Allogeneic umbilical cord-derived mesenchymal stem cell transplantation for treating chronic obstructive pulmonary disease: a pilot clinical study. *Stem cell research & therapy*. 2020 Dec;11(1):1-4.
46. Zhang Q, Huang K, Lv J, Fang X, He J, Lv A, Sun X, Cheng L, Zhong Y, Wu S, Dai Y. Case report: human umbilical cord mesenchymal stem cells as a therapeutic intervention for a critically ill Covid-19 patient. *Frontiers in medicine*. 2021:943.
47. Nguyen TT, Phan PT, Nguyen BH, Vu TT, Pham PC, Van Vu G, Nguyen KB, Vu TT, Vu LD, Ngo CQ. Autologous adipose-derived stem cells therapy in COPD treatment: a case report. *Respirology Case Reports*. 2021 May;9(5):e00748.

48. Zengin R, Beyaz O, Koc ES, Akinci IO, Kocagoz S, Sagcan G, Ovali E, Cuhadaroglu C. Mesenchymal stem cell treatment in a critically ill COVID-19 patient: a case report. Stem cell investigation. 2020;7.
49. Lu J, Xie ZY, Zhu DH, Li LJ. Human menstrual blood-derived stem cells as immunoregulatory therapy in COVID-19: A case report and review of the literature. World Journal of Clinical Cases. 2021 Mar 6;9(7):1705.
50. Primorac D, Stipičić SS, Strbad M, Girandon L, Barlič A, Frankić M, Ivić I, Krstulović DM, Jukić I, Halassy B, Hećimović A, Matišić V, Molnar V. Compassionate mesenchymal stem cell treatment in a severe COVID-19 patient: a case report. Croatian Medical Journal. 2021 Jun 1;62(3). Available from: <https://doi.org/10.3325/cmj.2021.62.ap001>
51. Wu J, Zhou X, Tan Y, Wang L, Li T, Li Z, Gao T, Fan J, Guo B, Li W, Hao J, Wang X, Hu B. Phase 1 trial for treatment of COVID-19 patients with pulmonary fibrosis using hESC-IMRCs. Cell Prolif. 2020 Dec;53(12):e12944. doi: 10.1111/cpr.12944. Epub 2020 Oct 26. PmiD: 33107132; PMCID: PMC7645925.