
Supplementary information

**Myocarditis after COVID-19 mRNA
vaccination: clinical observations and
potential mechanisms**

In the format provided by the
authors and unedited

Publications on myo/pericarditis after COVID-19 vaccination

1. Abbate A, Gavin J, Madanchi N, et al. Fulminant myocarditis and systemic hyperinflammation temporally associated with BNT162b2 mRNA COVID-19 vaccination in two patients. *Int J Cardiol.* 2021;S0167-5273(21)01228-6. doi:10.1016/j.ijcard.2021.08.018
Case reports of 27yo male with trisomy-21 (fatal) and 34yo female (heart failure), from VA, USA
2. Abu Mouch S, Roguin A, Hellou E, et al. Myocarditis following COVID-19 mRNA vaccination. *Vaccine.* 2021;39(29):3790-3793. doi:10.1016/j.vaccine.2021.05.087
Case series of 6 male patients (ages 16-45yo) from Israel
3. Alania-Torres E, Morillas-Climent H, García-Escrivá A, et al. Case Report: Probable Myocarditis After Covid-19 mRNA Vaccine in a Patient With Arrhythmogenic Left Ventricular Cardiomyopathy. *Front Cardiovasc Med.* 2021;8:759119. Published 2021 Oct 12. doi:10.3389/fcvm.2021.759119
Case report of 28yo male with underlying heart disease, from Spain
4. Albano L, Ferrara P. Could fractional mRNA COVID-19 vaccines reduce myocarditis in adolescents? [published online ahead of print, 2021 Sep 14]. *Travel Med Infect Dis.* 2021;44:102164. doi:10.1016/j.tmaid.2021.102164
Letter suggesting reduced-dose vaccine in teens, from Italy
5. Albert E, Aurigemma G, Saucedo J, Gerson DS. Myocarditis following COVID-19 vaccination [published online ahead of print, 2021 May 18]. *Radiol Case Rep.* 2021;10.1016/j.radcr.2021.05.033. doi:10.1016/j.radcr.2021.05.033
First published US case report of one 24yo male patient from UMass, MA, USA
6. Al-Kindi S, Zidar DA. COVID-lateral Damage: Cardiovascular Manifestations of SARS-CoV-2 Infection [published online ahead of print, 2021 Nov 12]. *Transl Res.* 2021;S1931-5244(21)00268-1. doi:10.1016/j.trsl.2021.11.005
Review of infection-related cardiac issues; noting AEFI rate of 160/million, from OH, USA
7. Ambati S, Colon M, Mihic M, Sanchez J, Bakar A. Acute Myopericarditis after COVID-19 Vaccine in Teenagers. *Case Rep Cardiol.* 2021;2021:8268755. Published 2021 Sep 20. doi:10.1155/2021/8268755
Case reports of 2 teen males (ages 16 and 17yo) in NY, USA
8. Ammirati E, Cavalotti C, Milazzo A, et al. Temporal Relation Between Second Dose BNT162b2 mRNA Covid-19 Vaccine and Cardiac involvement in a Patient with Previous SARS-COV-2 Infection [published online ahead of print, 2021 Apr 5]. *Int J Cardiol Heart Vasc.* 2021;100778. doi:10.1016/j.ijcha.2021.100778
First published case report of one 56yo male patient from Italy

9. Aye YN, Mai AS, Zhang A, et al. Acute Myocardial Infarction and Myocarditis following COVID-19 Vaccination [published online ahead of print, 2021 Sep 29]. *QJM*. 2021;hcab252. doi:10.1093/qjmed/hcab252
Case series of cardiac AEFIs (29 MIs and 1 myocarditis) from Singapore
10. Azdaki N, Farzad M. Long QT interval and syncope after a single dose of COVID-19 vaccination: a case report. *Pan Afr Med J*. 2021;40:67. Published 2021 Sep 30. doi:10.11604/pamj.2021.40.67.31546
Case report of 70yo male presenting after AstraZeneca vaccine, from Iran
11. Azir M, Inman B, Webb J, Tannenbaum L. STEMI Mimic: Focal Myocarditis in an Adolescent Patient After mRNA COVID-19 Vaccine [published online ahead of print, 2021 Sep 27]. *J Emerg Med*. 2021;S0736-4679(21)00733-2. doi:10.1016/j.jemermed.2021.09.017
Case report of 17yo male from Fort Sam Houston, TX
12. Barda N, Dagan N, Ben-Shlomo Y, et al. Safety of the BNT162b2 mRNA Covid-19 Vaccine in a Nationwide Setting [published online ahead of print, 2021 Aug 25]. *N Engl J Med*. 2021;10.1056/NEJMoa2110475. doi:10.1056/NEJMoa2110475
Analysis of myocarditis and other AEFI risks, relative to COVID risk
13. Bautista García J, Peña Ortega P, Bonilla Fernández JA, Cárdenes León A, Ramírez Burgos L, Caballero Dorta E. Acute myocarditis after administration of the BNT162b2 vaccine against COVID-19 [published online ahead of print, 2021 Apr 27]. *Rev Esp Cardiol (Engl Ed)*. 2021;S1885-5857(21)00133-X. doi:10.1016/j.rec.2021.04.005
Case report of one 39yo male physician-patient from Italy
14. Boscolo Berto M, Spano G, Wagner B, et al. Takotsubo Cardiomyopathy After mRNA COVID-19 Vaccination [published online ahead of print, 2021 Jul 15]. *Heart Lung Circ*. 2021;S1443-9506(21)01133-1. doi:10.1016/j.hlc.2021.06.521
Case report of one 63yo woman with Takotsubo cardiomyopathy from Switzerland
15. Boursier C, Chevalier E, Filippetti L, et al. ⁶⁸Ga-DOTATOC digital-PET imaging of inflammatory cell infiltrates in myocarditis following COVID-19 vaccination [published online ahead of print, 2021 Nov 8]. *Eur J Nucl Med Mol Imaging*. 2021;10.1007/s00259-021-05609-4. doi:10.1007/s00259-021-05609-4
Case reports of 2 males (ages 18 and 21yo) with PET imaging from France
16. Bozkurt B, Kamat I, Hotez PJ. Myocarditis with COVID-19 mRNA Vaccines. *Circulation*. 2021;10.1161/CIRCULATIONAHA.121.056135. doi:10.1161/CIRCULATIONAHA.121.056135
Commentary on early published case reports
17. Brüssow H. mRNA vaccines against COVID-19: a showcase for the importance of microbial biotechnology [published online ahead of print, 2021 Nov 17]. *Microb Biotechnol*. 2021;10.1111/1751-7915.13974. doi:10.1111/1751-7915.13974

Review of history of mRNA science, acknowledges safety signal for myocarditis as 100 per million doses in males ages 16-29yo from Belgium

18. Cai C, Peng Y, Shen E, et al. A comprehensive analysis of the efficacy and safety of COVID-19 vaccines [published online ahead of print, 2021 Aug 5]. *Mol Ther*. 2021;S1525-0016(21)00395-6. doi:10.1016/j.ymthe.2021.08.001
Risk review (with limited early data on myocarditis) from China
19. Calcaterra G, Mehta JL, de Gregorio C, et al. COVID 19 Vaccine for Adolescents. Concern about Myocarditis and Pericarditis. *Pediatr Rep*. 2021;13(3):530-533. Published 2021 Sep 1. doi:10.3390/pediatric13030061
Commentary recommending research and caution in licensing vaccine for teens
20. Caredda G. Editorial Comment: Cardiac MRI as a Fundamental Tool in the Evaluation of Suspected Myocarditis After COVID-19 mRNA Vaccination in Young Patients [published online ahead of print, 2021 Nov 10]. *AJR Am J Roentgenol*. 2021;10.2214/AJR.21.27026. doi:10.2214/AJR.21.27026
Commentary on Chelala cMRI case series, from Italy
21. Cereda A, Conca C, Barbieri L, et al. Acute myocarditis after the second dose of SARS-CoV-2 vaccine: Serendipity or atypical causal relationship?. *Anatol J Cardiol*. 2021;25(7):522-523. doi:10.5152/AnatolJCardiol.2021.99
Case report of one 21yo male patient from Italy
22. Chai Q, Nygaard U, Schmidt RC, Zaremba T, Møller AM, Thorvig CM. Multisystem inflammatory syndrome in a male adolescent after his second Pfizer-BioNTech COVID-19 vaccine [published online ahead of print, 2021 Oct 7]. *Acta Paediatr*. 2021;10.1111/apa.16141. doi:10.1111/apa.16141
Case report of 17yo male with post-vaccine severe myocarditis and MIS-C in Denmark
23. Chamling B, Vehof V, Drakos S, et al. Occurrence of acute infarct-like myocarditis following COVID-19 vaccination: just an accidental co-incidence or rather vaccination-associated autoimmune myocarditis? [published online ahead of print, 2021 Jul 31]. *Clin Res Cardiol*. 2021;10.1007/s00392-021-01916-w. doi:10.1007/s00392-021-01916-w
Cases series of 3 patients (including 68yo female after AstraZeneca vaccine) in Germany
24. Chelala L, Jeudy J, Hossain R, Rosenthal G, Pietris N, White C. Cardiac MRI Findings of Myocarditis After COVID-19 mRNA Vaccination in Adolescents [published online ahead of print, 2021 Oct 27]. *AJR Am J Roentgenol*. 2021;10.2214/AJR.21.26853. doi:10.2214/AJR.21.26853
Cases series of 5 male teens with cMRIs, from IL and MD, USA
25. Choi S, Lee S, Seo JW, et al. Myocarditis-induced Sudden Death after BNT162b2 mRNA COVID-19 Vaccination in Korea: Case Report Focusing on Histopathological Findings. *J Korean Med Sci*. 2021;36(40):e286. Published 2021 Oct 18. doi:10.3346/jkms.2021.36.e286

Case report of 22yo male with fatal outcome, from Korea

26. Cimaglia P, Tolomeo P, Rapezzi C. Acute Myocarditis after SARS-CoV-2 Vaccination in a 24-Year-Old Man [published online ahead of print, 2021 Jul 24]. *Rev Port Cardiol*. 2021;10.1016/j.repc.2021.07.005. doi:10.1016/j.repc.2021.07.005
Case report of one 24yo male patient from Italy
27. D'Angelo T, Cattafi A, Carerj ML, et al. Myocarditis after SARS-CoV-2 Vaccination: A Vaccine-induced Reaction? [published online ahead of print, 2021 Jun 9]. *Can J Cardiol*. 2021;S0828-282X(21)00286-5. doi:10.1016/j.cjca.2021.05.010
Case report of one 30yo male patient from Canada
28. Das BB, Moskowitz WB, Taylor MB, Palmer A. Myocarditis and Pericarditis Following mRNA COVID-19 Vaccination: What Do We Know So Far?. *Children (Basel)*. 2021;8(7):607. Published 2021 Jul 18. doi:10.3390/children8070607
Review of 29 previously published cases
29. Deb A, Abdelmalek J, Iwuji K, Nugent K. Acute Myocardial Injury Following COVID-19 Vaccination: A Case Report and Review of Current Evidence from Vaccine Adverse Events Reporting System Database. *J Prim Care Community Health*. 2021;12:21501327211029230. doi:10.1177/21501327211029230
Case report of one 67yo male patient from TX, USA
30. Diaz GA, Parsons GT, Gering SK, Meier AR, Hutchinson IV, Robicsek A. Myocarditis and Pericarditis After Vaccination for COVID-19 [published online ahead of print, 2021 Aug 4]. *JAMA*. 2021;10.1001/jama.2021.13443. doi:10.1001/jama.2021.13443
Cases series of 20 myocarditis and 37 pericarditis from health network in western USA
31. Dickey JB, Albert E, Badr M, et al. A Series of Patients With Myocarditis Following SARS-CoV-2 Vaccination With mRNA-1279 and BNT162b2 [published online ahead of print, 2021 Jun 16]. *JACC Cardiovasc Imaging*. 2021;S1936-878X(21)00486-1. doi:10.1016/j.jcmg.2021.06.003
Cases series of 6 patients (males ages 17-37yo) in MA, USA
32. Dionne A, Sperotto F, Chamberlain S, et al. Association of Myocarditis With BNT162b2 Messenger RNA COVID-19 Vaccine in a Case Series of Children [published online ahead of print, 2021 Aug 10]. *JAMA Cardiol*. 2021;10.1001/jamacardio.2021.3471. doi:10.1001/jamacardio.2021.3471
Case series of 15 teens with follow-up in MA, USA
33. Dorfman AL, Murthy VL. Annals for Hospitalists Inpatient Notes - Myocarditis After Vaccination for SARS-CoV-2. *Ann Intern Med*. 2021;174(11):HO2-HO3. doi:10.7326/M21-3871
Case report of 19yo male from MI, USA

34. Eggebrecht H, Breitbart P, Koch A, et al. Trends in ambulatory cardiology consultations for suspected myocarditis after COVID-19 vaccination [published online ahead of print, 2021 Nov 23]. *Clin Res Cardiol*. 2021;1-3. doi:10.1007/s00392-021-01974-0
Case series of 4 patients confirmed by cMRI, out of 113 referrals, from Germany
35. Ehrlich P, Klingel K, Ohlmann-Knafo S, et al. Biopsy-proven lymphocytic myocarditis following first mRNA COVID-19 vaccination in a 40-year-old male: case report [published online ahead of print, 2021 Sep 6]. *Clin Res Cardiol*. 2021;10.1007/s00392-021-01936-6. doi:10.1007/s00392-021-01936-6
Case report of 40yo male, with cardiac biopsy, in Germany
36. Elhassan M, Ahmad H, Mohamed M, Saidahmed O, Elhassan AE. From Muscles to Wires: Report of Two Cases and Literature Review on COVID-19 Vaccination and Cardiac Conduction Disturbance. *Cureus*. 2021;13(10):e18805. Published 2021 Oct 15. doi:10.7759/cureus.18805
Case reports of 2 patients requiring pacemakers (89yo woman after AstraZeneca, 85yo man after Pfizer vaccine) from UK
37. Facetti S, Giraldi M, Vecchi AL, Rogiani S, Nassiacos D. Miocardite acuta in giovane adulto due giorni dopo vaccino Pfizer [Acute myocarditis in a young adult two days after Pfizer vaccination]. *G Ital Cardiol (Rome)*. 2021;22(11):891-893. doi:10.1714/3689.36746
Case report of 20yo male from Italy
38. Fiolet T, Kherabi Y, MacDonald CJ, Ghosn J, Peiffer-Smadja N. Comparing COVID-19 vaccines for their characteristics, efficacy and effectiveness against SARS-CoV-2 and variants of concern: A narrative review [published online ahead of print, 2021 Oct 26]. *Clin Microbiol Infect*. 2021;S1198-743X(21)00604-2. doi:10.1016/j.cmi.2021.10.005
Review of myocarditis after multiple vaccines, from France
39. Gargano JW, Wallace M, Hadler SC, et al. Use of mRNA COVID-19 Vaccine After Reports of Myocarditis Among Vaccine Recipients: Update from the Advisory Committee on Immunization Practices - United States, June 2021. *MMWR Morb Mortal Wkly Rep*. 2021;70(27):977-982. Published 2021 Jul 9. doi:10.15585/mmwr.mm7027e2
CDC risk-benefit review, includes 1226 VAERS reports of myocarditis thru 11 Jun 2021
40. Gautam N, Saluja P, Fudim M, Jambhekar K, Pandey T, Al'Aref S. A Late Presentation of COVID-19 Vaccine-Induced Myocarditis. *Cureus*. 2021;13(9):e17890. Published 2021 Sep 11. doi:10.7759/cureus.17890
Case report in 66yo male presenting three months after vaccine, in AR, USA
41. Glikman D, Stein M, Shinwell ES. Vaccinating children and adolescents against severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)-The Israeli experience. *Acta Paediatr*. 2021;110(9):2496-2498. doi:10.1111/apa.15982
Commentary advocating vaccination of children despite myocarditis risk, from Israel

42. Guduguntla V, Katz MH. COVID-19 Messenger RNA Vaccination and Myocarditis-A Rare and Mostly Mild Adverse Effect [published online ahead of print, 2021 Oct 4]. *JAMA Intern Med.* 2021;10.1001/jamainternmed.2021.5634. doi:10.1001/jamainternmed.2021.5634
Commentary on Simone's publication, from JAMA Internal Medicine editors
43. Gurdasani D, Bhatt S, Costello A, et al. Vaccinating adolescents against SARS-CoV-2 in England: a risk-benefit analysis [published online ahead of print, 2021 Nov 1]. *J R Soc Med.* 2021;1410768211052589. doi:10.1177/01410768211052589
Review of risk-benefit, citing myocarditis risk of 30-40 cases/million vaccines, from UK
44. Haaf P, Kuster GM, Mueller C, et al. The very low risk of myocarditis and pericarditis after mRNA COVID-19 vaccination should not discourage vaccination. *Swiss Med Wkly.* 2021;151:w30087. Published 2021 Oct 19. doi:10.4414/smw.2021.w30087
Commentary from Switzerland
45. Habedank D, Lagast A, Novoa-Usme M, Atmowihardjo I. A case of myocarditis in a 60-year-old man 48 h after mRNA vaccination against SARS-CoV2 [published online ahead of print, 2021 Nov 3]. *Clin Res Cardiol.* 2021;1-3. doi:10.1007/s00392-021-01946-4
Case report of 60yo male in Germany
46. Habib MB, Hamamyh T, Elyas A, Altermanini M, Elhassan M. Acute myocarditis following administration of BNT162b2 vaccine. *IDCases.* 2021;25:e01197. Published 2021 Jun 16. doi:10.1016/j.idcr.2021.e01197
Case report of one 37yo male patient from Qatar
47. Hajjo R, Sabbah DA, Bardaweel SK, Tropsha A. Shedding the Light on Post-Vaccine Myocarditis and Pericarditis in COVID-19 and Non-COVID-19 Vaccine Recipients. *Vaccines (Basel).* 2021;9(10):1186. Published 2021 Oct 15. doi:10.3390/vaccines9101186
Reviewed VAERS data (1579 myocarditis, 1063 pericarditis) thru 02 Sep 2021 and suggested increasing dose intervals and treating with glucocorticoids, from Jordan
48. Hasnie AA, Hasnie UA, Patel N, et al. Perimyocarditis following first dose of the mRNA-1273 SARS-CoV-2 (Moderna) vaccine in a healthy young male: a case report. *BMC Cardiovasc Disord.* 2021;21(1):375. Published 2021 Aug4. doi:10.1186/s12872-021-02183-3
Case report of one 22yo male patient from AL, USA
49. Hause AM, Gee J, Baggs J, et al. COVID-19 Vaccine Safety in Adolescents Aged 12-17 Years - United States, December 14, 2020-July 16, 2021. *MMWR Morb Mortal Wkly Rep.* 2021;70(31):1053-1058. Published 2021 Aug 6. doi:10.15585/mmwr.mm7031e1
CDC updated review describes 348 myocarditis reports in VAERS, with additional 550 chest pain reports in VAERS, among 8.9 million vaccinated teens thru 16 July 2021

50. Hendren NS, Carter S, Grodin JL. Severe COVID-19 vaccine associated myocarditis: Zebra or unicorn? [published online ahead of print, 2021 Sep 21]. *Int J Cardiol.* 2021;S0167-5273(21)01477-7. doi:10.1016/j.ijcard.2021.09.036
Commentary on Abbate's case reports
51. Ho JS, Sia CH, Ngiam JN, et al. A review of COVID-19 vaccination and the reported cardiac manifestations [published online ahead of print, 2021 Nov 19]. *Singapore Med J.* 2021;10.11622/smedj.2021210. doi:10.11622/smedj.2021210
Review of the literature from UK and Singapore
52. Høeg TB, Krug A, Stevenson J, Mandrola J. SARS-CoV-2 mRNA Vaccination-Associated Myocarditis in Children Ages 12-17: A Stratified National Database Analysis. [published online pre-peer-review 08 Sep 2021] medRxiv 2021.08.30.21262866; <https://doi.org/10.1101/2021.08.30.21262866>
Analyzed VAERS for ages 12-17 through 18 Jun 2021; found 257 cases, rates highest (162/million) after 2nd mRNA vaccine in 12-15yo boys; concluded risk exceeded benefit (120-day COVID hospitalizations) for healthy boys, challenging previous CDC analyses
53. Hudson B, Mantooth R, DeLaney M. Myocarditis and pericarditis after vaccination for COVID-19. *J Am Coll Emerg Physicians Open.* 2021;2(4):e12498. Published 2021 Jul 26. doi:10.1002/emp2.12498
Case series of 2 patients (males ages 22 and 24yo) in AL, USA
54. Ioannou A. Myocarditis should be considered in those with a troponin rise and unobstructed coronary arteries following Pfizer-BioNTech COVID-19 vaccination [published online ahead of print, 2021 Aug 31]. *QJM.* 2021;hcab231. doi:10.1093/qjmed/hcab231
Letter challenging Lee's case series from June issue of QJM, re possible myocarditis
55. Isaak A, Feisst A, Luetkens JA. Myocarditis Following COVID-19 Vaccination [published online ahead of print, 2021 Aug 3]. *Radiology.* 2021;211766. doi:10.1148/radiol.2021211766
Case report of 15yo male from Germany
56. Istampoulouoglou I, Dimitriou G, Späni S, et al. Myocarditis and pericarditis in association with COVID-19 mRNA-vaccination: cases from a regional pharmacovigilance centre. *Glob Cardiol Sci Pract.* 2021;2021(3):e202118. Published 2021 Oct 30. doi:10.21542/gcsp.2021.18
Case series of 17 cases, 11 after Moderna vaccine, from Switzerland
57. Jain SS, Steele JM, Fonseca B, et al. COVID-19 Vaccination-Associated Myocarditis in Adolescents [published online ahead of print, 2021 Aug 13]. *Pediatrics.* 2021;e2021053427. doi:10.1542/peds.2021-053427
Review of clinical 63 cases in adolescents in USA

58. Joob B, Wiwanitkit V. Acute myocarditis after coronavirus disease 2019 vaccination. *Anatol J Cardiol.* 2021;25(11):841-842. doi:10.5152/AnatolJCardiol.2021.689
Letter challenging Cereda's case report and commentary, from Thailand and India
59. Kafil T, Lamacie MM, Chenier S, et al. mRNA COVID-19 Vaccination and Development of CMR-confirmed Myopericarditis. medRxiv 2021.09.13.21262182; doi: <https://doi.org/10.1101/2021.09.13.21262182>. Pre-print posted on 16 Sep 2021; **withdrawn on 24 Sep 2021**
Case series of 32 patients in Canada. Although case series was clinically valid, initial estimate of rate was inflated by using denominator of 30,000 instead of 800,000
60. Kampmann B, Okomo U. COVID-19 vaccines for children in LMICs: another equity issue. *Lancet.* 2021;398(10302):731-732. doi:10.1016/S0140-6736(21)01748-7
Commentary encouraging vaccination of children in low-middle-income countries
61. Kaneta K, Yokoi K, Jojima K, Kotooka N, Node K. Young Male With Myocarditis Following mRNA-1273 Vaccination Against Coronavirus Disease-2019 (COVID-19) [published online ahead of print, 2021 Nov 6]. *Circ J.* 2021;10.1253/circj.CJ-21-0818. doi:10.1253/circj.CJ-21-0818
Case report of 25yo male from Japan
62. Kaul R, Sreenivasan J, Goel A, et al. Myocarditis following COVID-19 Vaccination [published online ahead of print, 2021 Sep 20]. *Int J Cardiol Heart Vasc.* 2021;36:100872. doi:10.1016/j.ijcha.2021.100872
Cases series of 2 patients (males ages 21 and 28yo) in NY, USA
63. Kerbl R. Myokarditis nach COVID-19-mRNA-Impfung [Myocarditis after COVID-19 mRNA vaccination] [published online ahead of print, 2021 Aug 10]. *Monatsschr Kinderheilkd.* 2021;1-2. doi:10.1007/s00112-021-01283-w
German commentary on Montgomery and Kim reports in JAMA Cardiology
64. Kerneis M, Bihan K, Salem JE. COVID-19 vaccines and myocarditis [published online ahead of print, 2021 Jun 26]. *Arch Cardiovasc Dis.* 2021;S1875-2136(21)00107-8. doi:10.1016/j.acvd.2021.06.001
Summary of 214 cases found in WHO VigiBase surveillance system, thru 07 May 2021
65. Khogali F, Abdelrahman R. Unusual Presentation of Acute Perimyocarditis Following SARS-COV-2 mRNA-1237 Moderna Vaccination. *Cureus.* 2021;13(7):e16590. Published 2021 Jul 23. doi:10.7759/cureus.16590
Case report of 29yo female with complicated presentation, in Qatar
66. Kim D, Choi JH, Jang JY, et al. A Case Report for Myopericarditis after BNT162b2 COVID-19 mRNA Vaccination in a Korean Young Male. *J Korean Med Sci.* 2021;36(39):e277. Published 2021 Oct 11. doi:10.3346/jkms.2021.36.e277
Case report of 29yo male from military in Korea

67. Kim HW, Jenista ER, Wendell DC, et al. Patients With Acute Myocarditis Following mRNA COVID-19 Vaccination. *JAMA Cardiol*. Published online June 29, 2021. doi:10.1001/jamacardio.2021.2828
Case series of 4 patients (males ages 20-30yo and one 23yo female) in FL, USA
68. Kim IC, Kim H, Lee HJ, Kim JY, Kim JY. Cardiac Imaging of Acute Myocarditis Following COVID-19 mRNA Vaccination. *J Korean Med Sci*. 2021;36(32):e229. Published 2021 Aug 16. doi:10.3346/jkms.2021.36.e229
Case report of one 24yo male in South Korea
69. King WW, Petersen MR, Matar RM, Budweg JB, Cuervo Pardo L, Petersen JW. Myocarditis following mRNA vaccination against SARS-CoV-2, a case series. *Am Heart J Plus*. 2021;8:100042. doi:10.1016/j.ahjo.2021.100042
Cases series of 4 patients (3 males and 1 female, ages 20-30yo) in FL, USA
70. Klein NP, Lewis N, Goddard K, et al. Surveillance for Adverse Events After COVID-19 mRNA Vaccination [published online ahead of print, 2021 Sep 3]. *JAMA*. 2021;10.1001/jama.2021.15072. doi:10.1001/jama.2021.15072
Analysis of VSD in USA did not identify safety signal for myocarditis without stratification by age and sex
71. Knowlton KU. Insights from a murine model of COVID-19 mRNA vaccination-induced myopericarditis: Could accidental intravenous vaccine injection induce myopericarditis? [published online ahead of print, 2021 Aug 28]. *Clin Infect Dis*. 2021;ciab741. doi:10.1093/cid/ciab741
Commentary on Li's mouse model of IV vaccination
72. Koizumi T, Awaya T, Yoshioka K, et al. Myocarditis after COVID-19 mRNA vaccines [published online ahead of print, 2021 Sep 21]. *QJM*. 2021;hcab244. doi:10.1093/qjmed/hcab244
Case reports of 2 males (ages 22 and 27yo), with normal biopsies, from Japan
73. Kounis NG, Koniari I, Mplani V, Velissaris D, Tsigkas G. The pathogenesis of potential myocarditis induced by COVID-19 vaccine [published online ahead of print, 2021 Nov 12]. *Am J Emerg Med*. 2021;S0735-6757(21)00920-7. doi:10.1016/j.ajem.2021.11.016
Comment on Watkins case report, suggesting PEG or polysorbate as culprit in vaccine-induced myocarditis, comment on alkylsaccharides as alternate stabilizers, from Greece
74. Kounis NG, Mplani V, Koniari I, Plotas P. Rare cases of myocarditis after COVID-19 vaccination: searching for diagnosis, type, treatment and prevention [published online ahead of print, 2021 Oct 25]. *Rev Esp Cardiol (Engl Ed)*. 2021;S1885-5857(21)00316-9. doi:10.1016/j.rec.2021.10.007
Commentary reiterating suggestion of polysorbate as potential culprit, from Greece
75. Kuehn BM. Adolescent Myocarditis After COVID-19 Vaccination Is Rare. *JAMA*. 2021;326(10):902. doi:10.1001/jama.2021.14237

Summary of CDC VAERS in teens (397 reports through mid-July 2021)

76. Kwan MYW, Chua GT, Chow CB, et al. mRNA COVID vaccine and myocarditis in adolescents [published online ahead of print, 2021 Aug 16]. *Hong Kong Med J*. 2021;10.12809/hkmj215120. doi:10.12809/hkmj215120
Review and comment on possible alternate vaccine (inactivated CoronaVac) in Hong Kong
77. Larson KF, Ammirati E, Adler ED, et al. Myocarditis after BNT162b2 and mRNA-1273 Vaccination [published online ahead of print, 2021 Jun 16]. *Circulation*. 2021;10.1161/CIRCULATIONAHA.121.055913. doi:10.1161/CIRCULATIONAHA.121.055913
Case series of 8 male patients (ages 21-56yo) from USA and Italy
78. Lazaros G, Anastassopoulou C, Hatziantoniou G, et al., A case series of acute pericarditis following COVID-19 vaccination in the context of recent reports from Europe and the United States. [published online ahead of print, 2021 Oct 8]. *Vaccine*. 2021. doi.org/10.1016/j.vaccine.2021.09.078
Case series of 8 pericarditis patients in Greece
79. Lazaros G, Klein AL, Hatziantoniou S, Tsioufis C, Tsakris A, Anastassopoulou C. The Novel Platform of mRNA COVID-19 Vaccines and Myocarditis: Clues into the Potential Association. [published online ahead of print, 2021 Jul 13]. *Vaccine*. 2021. doi.org/10.1016/j.vaccine.2021.07.016
Summary of 351 cases (8 fatal) reported to European Medicines Agency thru 29 May 2021
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Review for children and teens from Germany

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