

Supplementary Table 10. Post-acute COVID-19 myocardial involvement (continue).

Study, year	Type of assessments	Time of assessments	Control group	Findings
Anastasio, 2021	ECG, echocardiography, blood samples, pulmonary function testing, CPET, bio-electrical impedance analysis	On average between 4-6 weeks after initial diagnosis of COVID-19	Yes	COVID-19 athletes had reduced aerobic threshold in comparison to controls. The remaining CPET parameters were not different between groups, and there was no difference in resting pulmonary and cardiac examination
Brito, 2020	Troponin-I, ECG, echocardiography, CMR imaging	Median time interval from tests performed to the imaging assessment 27 (22 - 33) days	No	Pericardial involvement (n = 13; 27.1%) Myocardial involvement (n = 8; 16.7%) Myopericardial involvement (n = 6; 12.5%)
Cafiero, 2021	Lung function tests, CPET, echocardiography, blood chemistry	The average time taken by patients to undergo the tests compared to the days of negative swab was 70 ± 45 days	No	All results were within normal limits. No arrhythmic events or reduction in the ejection fraction were highlighted
Cavigli, 2021	Personal history and clinical profile, blood testing, ECG, echocardiography, CPET, CMR imaging and chest CT (when indicated)	Evaluation time from negativization: <15 days (41%) 16-30 days (13%) >30 days (46%)	No	Cardiac complications occurred as myopericarditis and pericarditis in 3.3% of athletes. These findings were associated with exercise-induced ventricular arrhythmias or cardiac symptoms
Clark, 2021	Clinical examination, ECG, troponin I, echocardiography, CMR imaging	Median time from COVID-19 diagnosis to CMR imaging: 21.5 days (interquartile range, 13–37; range, 10–162)	Yes	2 (3%) athletes met criteria for myocarditis; 1 athlete had pericarditis; 1 athlete developed new left ventricle dysfunction

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Costello, 2022	Biochemistry (cardiac troponin I, B-type natriuretic peptide), ECG, echocardiography, Holter, CPET, Flow-mediated dilatation, CMR imaging	Evaluation was performed between 10 and 21 days from the time of testing positive to COVID-19	Yes	No differences in imaging parameters and a lack of association with abnormalities on biochemistry, exercise testing or electrophysiology were observed.
Csulak 2021	Laboratory tests (high-sensitive Troponin T, D-dimer), ECG, echocardiography, body composition, CPET. Chest CT and CMR imaging (in case of abnormalities)	After 10–14 days of the quarantine period	Yes	No pathological ECG or echocardiography finding was confirmed; 1 female athlete had atypical chest pain. Chest CT showed COVID-19 pneumonia. After treatment she has not reported any further symptoms or exercise-related complaints
Daniels 2021	ECG, echocardiogram, troponin and CMR imaging	Median (range) time from COVID-19 test positivity to cardiac testing and diagnosis of myocarditis 22.5 (10-77) days	No	37 (2.3%) athletes had either clinical or subclinical myocarditis that restricted them from training and competitive play. Estimated prevalence of myocarditis of 2.1% (95% CI, 1.1%-4.4%).
Erickson, 2021	Physical examination, ECG. Troponin, echocardiography, VO ₂ , Holter, CMR imaging, chest CT, spirometry, D-dimer (in case of abnormalities)	The mean ± SD time between positive test result and medical screening was 22.5 ± 14.2 days	No	Cardiovascular diagnostic testing was indicative of effusive viral pericarditis in 2 athletes and xiphoiditis in 1 athlete
Fikenzer, 2021	ECG, echocardiography, CMR imaging, CPET (if no signs of myocarditis), spirometry	19 ± 7 days after the first positive PCR test	Yes	LGE was present in two athletes. No athlete reached all Lake-Louis criteria for the diagnosis of acute myocarditis; One athlete exhibited a pericardial effusion in echocardiography and CMR imaging, which declined in the subsequent examinations

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Gervasi, 2021	Physical examination, blood tests, spirometry, ECG, echocardiogram, Holter, chest CT. CMR imaging (when indicated)	At least 15 days from clinical resolution	Yes	There were no signs of cardiovascular impairment after clinical resolution.
Hendrickson, 2021	ECG, echocardiography, troponin I, and CMR imaging (in case of abnormalities)	Median time to evaluation was 16 days (interquartile range, 12–34)	No	CMR evaluations after an abnormal screening, which were almost all elevated cTn, demonstrated no imaging evidence consistent with myocardial injury or myocarditis
Hwang, 2021	ECG, troponin-I, echocardiography, sports cardiologist consultation. CMR imaging, ambulatory rhythm monitoring, and CPET with exercise ECG were at the discretion of the consulting cardiologist	After a ten-day isolation period or upon return to campus	Yes.	The rate of cardiac involvement appeared low. Two athletes received new cardiac diagnoses, one probable early cardiomyopathy and one pericarditis
Komici, 2021	Spirometry, echocardiography, cardiopulmonary exercise testing	After ending self-isolation and confirmation of negative laboratory results	Yes	Cardiorespiratory function was not significantly altered in post-COVID-19 athletes both at rest and during exercise. Post COVID-19 athletes showed a reduction in FEV1%, but ventilatory efficiency and overall performance were not impaired.
Krzywański 2022	ECG, whole blood count, C-reactive protein), high-sensitive troponin T, CMR imaging and chest CT	Median (range) time between diagnosis of COVID-19 and medical screening 20 (12-68) days	No	The CMR imaging identified no cases of active myocarditis or pericarditis. There were also no signs of fibrosis suggesting prior myocarditis or structural heart diseases

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Martinez, 2021	Blood test (troponin), ECG, echocardiography, and CMR imaging and stress echocardiography (in case of abnormalities)	Testing was performed a mean (SD) of 19 (17) days (range, 3-156 days) after a positive test result	No	0.6% (5/789) had imaging findings suggestive of inflammatory heart disease (0.4% [3/789] myocarditis and 0.3% [2/789] pericarditis)
Mascia, 2021	Blood test, clinical examination, ECG, echocardiography, CPET, Holter, and CMR imaging (in case of elevated high-sensitive troponin)	CMR imaging was performed at 27–41 days after COVID-19 diagnosis	Yes	All athletes with abnormal high-sensitive troponin (15%; 2/13) underwent CMR imaging, that excluded any cardiac injury
Milovancev, 2021	Pulmonary function, ECG, CPET	NR	No	CPET and pulmonary function data can be classified as standard for their age and level of competition. ECG testing revealed no cardiac abnormalities
Moulson, 2021	Clinical assessment, ECG, troponin, echocardiography, CMR imaging	Median (IQR) time from initial infection to cardiac testing: CMR: 33 (18-63) days Echocardiography: 15 (11-25) days Troponin: 12 (10-17) days ECG: 12 (10-16) days	No	Definite, probable, or possible SARS-CoV-2 cardiac involvement was identified in 0.7% (21/3018) athletes

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Peidro, 2021	ECG, Doppler echocardiography, CMR imaging	At least 10 days after COVID-19 diagnosis or disappearance of symptoms (18-22 days for CMR)	No	ECG and echocardiographic examinations did not reveal heart disease. CMRs showed ventricular thicknesses and volumes consistent with high-performance athletes. No late enhancement after gadolinium injection.
Petek, 2021	ECG, troponin, echocardiogram, CMR imaging, cardiac stress testing, cardiopulmonary exercise testing, chest X-ray, coronary CT angiography, CT-PE protocol, Holter, pulmonary function testing	Median time from initial infection (symptom onset or positive SARS-CoV-2 test) to return to exercise 17 (13–21) days Median time from initial infection to CMR 44 (29–70) days	No	No diagnosis of SARS-CoV-2-associated sequelae was made following clinical evaluation or advanced diagnostic testing in athletes with only persistent symptoms; 8.8% (12/137) of athletes with exertional cardiopulmonary symptoms on return to exercise had SARS-CoV-2-associated sequelae (5 cardiac involvement, 2 pneumonia, 2 inappropriate sinus tachycardia, 2 postural orthostatic tachycardia syndrome and 1 pleural effusion); In athletes who had chest pain on return to exercise and underwent CMR (n=24), probable or definite SARS CoV-2 cardiac involvement was found in 20.8% of cases;
Rajpal, 2021	ECG, troponin I, echocardiography, CMR imaging	Cardiac magnetic resonance imaging was performed after recommended quarantine (11-53 days)	No	4 (15%) had CMR findings suggestive of myocarditis and 8 additional athletes (30.8%) exhibited LGE without T2 elevation suggestive of prior myocardial injury
Shah, 2021	Physical examination, ECG, echocardiography, high-sensitive troponin I, pulmonary function, cardiology consultation, CMR imaging (in case of abnormalities)	NR	Yes	No cardiopulmonary pathology attributable to COVID-19 was detected

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Starekova, 2021	Clinical data, ECG, echocardiography, troponin-I, B-type natriuretic peptide, C-reactive protein, erythrocyte sedimentation rate, CMR imaging, chest radiography (if performed)	Median (range) from positive COVID-19 test result to CMR imaging 15 (11-194) days	No	CMR imaging findings consistent with myocarditis = 2 (1.4%): 1 patient had marked nonischemic LGE and T2-weighted signal abnormalities over multiple segments, along with an abnormal serum troponin-I level; 1 patient had 1-cm nonischemic mild LGE and mild T2-weighted signal abnormalities, with normal laboratory values;
Vago, 2021	Laboratory tests (high-sensitive troponin T, C-reactive protein, N-terminal pro-B-type natriuretic protein), CMR imaging	Median time from positive PCR to CMR was 17 (IQR 17-19) days in 10 female athletes, and 67 and 90 days in 2 male athletes, respectively	Yes	No signs of cardiac involvement on CMR

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