## Evidence Search Service Results of your search request

# COVID-19 & Cardiac Arrest

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Please acknowledge this work in any resulting paper or presentation as: *Evidence search: COVID-19 & Cardiac Arrest* Alison McLaren. (30 March 2020). East Surrey Hospital, UK: Surrey and Sussex Library and Knowledge Services.

## Summary

Guidance for healthcare staff at University Hospitals Birmingham NHS Foundation Trust says that patients in cardiac arrest outside the emergency department can be given defibrillator treatment if they have a “shockable” rhythm. They should not start chest compressions or ventilation in patients who are in cardiac arrest if they have suspected or diagnosed covid-19 unless they are in the emergency department and staff are wearing full personal protective equipment (PPE). (Mahase, BMJ 2020)

These results include those found by Susan Merner on 20 March 2020.

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## A. National and International Guidance

#### National Institute for Health and Care Excellence (NICE)

**COVID-19 rapid guideline: critical care in adults. NICE guideline [NG159]** (2020)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=0a385f68e8c7c9d72551e2f8066baed8)

The purpose of this guideline is to maximise the safety of patients who need critical care during the COVID-19 pandemic, while protecting staff from infection. It will also enable services to make the best use of NHS resources.

#### Public Health England (PHE)

**Guidance for first responders and others in close contact with symptomatic people with potential COVID-19** (2020)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=fdfbcd591821390d66d29892fd320902)

Updated 24 March 2020 5.3 Cardiopulmonary resuscitation: If you are required to perform cardiopulmonary resuscitation (CPR), you should conduct a risk assessment (in the Police this would be a “dynamic risk assessment”) and adopt appropriate precautions for infection control. Where possible, it is recommended that you do not perform rescue breaths or mouth-to-mouth ventilation; perform chest compressions only. Resuscitation Council (UK) Guidelines 2010 for Basic Life Support state that studies have shown that compression-only CPR may be as effective as combined ventilation and compression in the first few minutes after non-asphyxial arrest (cardiac arrest due to lack of oxygen). If a decision is made to perform mouth-to-mouth ventilation in asphyxial arrest, use a resuscitation face shield where available. Should you have given mouth-to-mouth ventilation there are no additional actions to be taken other than to monitor yourself for symptoms of possible COVID-19 over the following 14 days. Should you develop such symptoms you should follow the advice on what to do on the NHS website.

#### Resuscitation Council (UK)

**Resuscitation Council UK Statement on COVID-19 in relation to CPR and resuscitation in healthcare settings** (2020)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=9f68f5a5ad602e176c873ac5cdded4cd)

Resuscitation Council UK has created guidance on the resuscitation of COVID-19 patients in hospital. This statement is for healthcare professionals who are performing CPR in a healthcare setting. 1.2. This statement provides specific guidance for healthcare workers (HCWs) on CPR in healthcare settings for patients with suspected or confirmed COVID-19.

## B. Synopses or Summaries

#### Kings College Hospital

**King’s Critical Care – Evidence Summary** (2020)

This is a summary of the evidence available internationally on the management of COVID-19 disease. On page 14: Cardiomyopathy • COVID-19 does commonly cause troponin elevations (which generally will not represent type-I myocardial infarctions). • Ruan 3/3/20 reported that ~7% of patients die of fulminant myocarditis. This may also be a contributing factor in ~33% of deaths. • Wang 2/7 reported that arrhythmia was a cause of ICU transfer in 12% of patients. • Troponin elevation seems to be a strong prognostic indicator for mortality (see prognosis section below). It's unclear to what extent this represents cardiac involvement causing death versus troponin merely being an indicator of severe global illness placing stress on the heart. Elevated troponin levels correlate with mortality across a variety of critical illnesses.

## C. Systematic Reviews

#### JAMA Network

**Potential Effects of Coronaviruses on the Cardiovascular System: A Review** (2020)

Madjid M. et al

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=667e87c2fe73fd2155fcddce3dab7515)

Importance Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which causes coronavirus disease 2019 (COVID-19) has reached a pandemic level. Coronaviruses are known to affect the cardiovascular system. We review the basics of coronaviruses, with a focus on COVID-19, along with their effects on the cardiovascular system. Observations Coronavirus disease 2019 can cause a viral pneumonia with additional extrapulmonary manifestations and complications. A large proportion of patients have underlying cardiovascular disease and/or cardiac risk factors. Factors associated with mortality include male sex, advanced age, and presence of comorbidities including hypertension, diabetes mellitus, cardiovascular diseases, and cerebrovascular diseases. Acute cardiac injury determined by elevated high-sensitivity troponin levels is commonly observed in severe cases and is strongly associated with mortality. Acute respiratory distress syndrome is also strongly associated with mortality. Conclusions and Relevance Coronavirus disease 2019 is associated with a high inflammatory burden that can induce vascular inflammation, myocarditis, and cardiac arrhythmias. Extensive efforts are underway to find specific vaccines and antivirals against SARS-CoV-2. Meanwhile, cardiovascular risk factors and conditions should be judiciously controlled per evidence-based guidelines.

## D. Institutional Publications

#### American College of Cardiology

**COVID-19 Clinical Guidance** (2020)

Mullen B.

The guidance provided in this document is based on the best available published information and expert evaluation. This document is intended to supplement, not supersede, relevant guidance from the Centers for Disease Control and Prevention, state and local health authorities, and your institution’s infectious disease containment, mitigation, and response plan.

## E. Original Research

1. **Association of Cardiac Injury With Mortality in Hospitalized Patients With COVID-19 in Wuhan, China**  
   Shaobo Shi MD et al JAMA Cardiology 2020;(March): doi:10.1001/jamacardio.2020.0950.

Importance Coronavirus disease 2019 (COVID-19) has resulted in considerable morbidity and mortality worldwide since December 2019. However, information on cardiac injury in patients affected by COVID-19 is limited. Objective To explore the association between cardiac injury and mortality in patients with COVID-19. Design, Setting, and Participants This cohort study was conducted from January 20, 2020, to February 10, 2020, in a single center at Renmin Hospital of Wuhan University, Wuhan, China; the final date of follow-up was February 15, 2020. All consecutive inpatients with laboratory-confirmed COVID-19 were included in this study. Main Outcomes and Measures Clinical laboratory, radiological, and treatment data were collected and analyzed. Outcomes of patients with and without cardiac injury were compared. The association between cardiac injury and mortality was analyzed. Results A total of 416 hospitalized patients with COVID-19 were included in the final analysis; the median age was 64 years (range, 21-95 years), and 211 (50.7%) were female. Common symptoms included fever (334 patients [80.3%]), cough (144 [34.6%]), and shortness of breath (117 [28.1%]). A total of 82 patients (19.7%) had cardiac injury, and compared with patients without cardiac injury, these patients were older (median [range] age, 74 [34-95] vs 60 [21-90] years; P < .001); had more comorbidities (eg, hypertension in 49 of 82 [59.8%] vs 78 of 334 [23.4%]; P < .001); had higher leukocyte counts (median [interquartile range (IQR)], 9400 [6900-13 800] vs 5500 [4200-7400] cells/μL) and levels of C-reactive protein (median [IQR], 10.2 [6.4-17.0] vs 3.7 [1.0-7.3] mg/dL), procalcitonin (median [IQR], 0.27 [0.10-1.22] vs 0.06 [0.03-0.10] ng/mL), creatinine kinase–myocardial band (median [IQR], 3.2 [1.8-6.2] vs 0.9 [0.6-1.3] ng/mL), myohemoglobin (median [IQR], 128 [68-305] vs 39 [27-65] μg/L), high-sensitivity troponin I (median [IQR], 0.19 [0.08-1.12] vs <0.006 [<0.006-0.009] μg/L), N-terminal pro-B-type natriuretic peptide (median [IQR], 1689 [698-3327] vs 139 [51-335] pg/mL), aspartate aminotransferase (median [IQR], 40 [27-60] vs 29 [21-40] U/L), and creatinine (median [IQR], 1.15 [0.72-1.92] vs 0.64 [0.54-0.78] mg/dL); and had a higher proportion of multiple mottling and ground-glass opacity in radiographic findings (53 of 82 patients [64.6%] vs 15 of 334 patients [4.5%]). Greater proportions of patients with cardiac injury required noninvasive mechanical ventilation (38 of 82 [46.3%] vs 13 of 334 [3.9%]; P < .001) or invasive mechanical ventilation (18 of 82 [22.0%] vs 14 of 334 [4.2%]; P < .001) than those without cardiac injury. Complications were more common in patients with cardiac injury than those without cardiac injury and included acute respiratory distress syndrome (48 of 82 [58.5%] vs 49 of 334 [14.7%]; P < .001), acute kidney injury (7 of 82 [8.5%] vs 1 of 334 [0.3%]; P < .001), electrolyte disturbances (13 of 82 [15.9%] vs 17 of 334 [5.1%]; P = .003), hypoproteinemia (11 of 82 [13.4%] vs 16 of 334 [4.8%]; P = .01), and coagulation disorders (6 of 82 [7.3%] vs 6 of 334 [1.8%]; P = .02). Patients with cardiac injury had higher mortality than those without cardiac injury (42 of 82 [51.2%] vs 15 of 334 [4.5%]; P < .001). In a Cox regression model, patients with vs those without cardiac injury were at a higher risk of death, both during the time from symptom onset (hazard ratio, 4.26 [95% CI, 1.92-9.49]) and from admission to end point (hazard ratio, 3.41 [95% CI, 1.62-7.16]). Conclusions and Relevance Cardiac injury is a common condition among hospitalized patients with COVID-19 in Wuhan, China, and it is associated with higher risk of in-hospital mortality.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=ec7b4c3ee04465723c754d29ce58fb7c)

1. **Coronaviruses and the cardiovascular system: acute and long-term implications**  
   Tian-Yuan Xiong European Heart Journal 2020;:1-3.

Conclusion in this article comments: Pre-existing cardiovascular disease may contribute to adverse early clinical outcomes and infection may have longer-term implications for overall cardiovascular health (Take home figure). Interdisciplinary management of severe cases (with priority for those with pre-existing cardiovascular

1. **Covid-19: Doctors are told not to perform CPR on patients in cardiac arrest**  
   Elisabeth Mahase BMJ 2020;368:-.

Healthcare staff in the West Midlands have been told not to start chest compressions or ventilation in patients who are in cardiac arrest if they have suspected or diagnosed covid-19 unless they are in the emergency department and staff are wearing full personal protective equipment (PPE). The guidance from the University Hospitals Birmingham NHS Foundation Trust says that patients in cardiac arrest outside the emergency department can be given defibrillator treatment if they have a “shockable” rhythm. But if this fails to restart the heart “further resuscitation is futile,” it says. If a patient with suspected covid-19 is in cardiac arrest they should be given cardiac compressions and be ventilated only if they are in the emergency department and the person attending them is wearing aerosol generating procedures (AGP) PPE. That means wearing an FFP3 mask, full gown with long sleeves, gloves, and eye protection.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=dd014263a4a489ed044893b1d04c169c)

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**Word documents**  
Select Edit from the menu, the Find and type in your term in the search box which is presented. The search function will locate the first use of the term in the document. By pressing 'next' you will jump to further references.

## Search History

American College of Cardiology; BMJ Best Practice; EMBASE; European heart Journal; Google (Advanced); Gov.UK; JAMA; King’s Critical Care; King’s College; MEDLINE; NICE; PubMed; Resuscitation Council; TRIP PRO; UpToDate

**Date range used** (5 years, 10 years):   
**Limits used** (gender, article/study type, etc.):   
**Search terms and notes**: Hand searching NICE Evidence, journal publications. Resuscitation Council using: “cardiac arrest” AND (COVID-19 OR coronavirus)

**Date of request:** 26th March, 2020  
**Date of completion:** 30th March, 2020

**Audience/Context:** Chief of Medicine, acute hospital

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