

# ECG Monitoring for QT Prolongation in Hospitalized Patients with COVID-19



## **Pre-Treatment Assessment**

1. Obtain a QTc using a standard 12-lead ECG, telemetry, or mobile ECG device
2. Obtain baseline electrolytes, including calcium, magnesium, and potassium; correct abnormalities
3. Review the patient's medications; discontinue any QTc prolonging medications that are not necessary
4. Document high-risk cardiovascular and comorbid conditions<sup>a</sup>
5. Assess and adjust for hepatic and renal dysfunction

## **Patients taking ONE of the following ONLY: azithromycin, hydroxychloroquine, chloroquine, or lopinavir; ritonavir<sup>1</sup>**

Baseline QTc is 500 msec or more OR QTc increases by 60 msec or more after drug initiation

1. Consider withholding treatment
2. Correct electrolyte abnormalities
3. Obtain an on-therapy QTc 2 to 4 hours after the first dose and repeat in 48 and 96 hours

Baseline QTc is 460 to 499 msec (prepubertal patients), 470 to 499 msec (postpubertal males), or 480 to 499 msec (postpubertal females)

1. Correct electrolyte abnormalities before drug initiation
2. Obtain an on-therapy QTc at 48 hours and 96 hours after drug initiation

Baseline QTc is less than 460 msec (prepubertal patients), less than 470 msec (postpubertal males), or less than 480 msec (postpubertal females)

1. Measure an on-therapy QTc at 48 and 96 hours after drug initiation
2. Correct electrolyte abnormalities once known

## **Patients taking azithromycin WITH hydroxychloroquine OR chloroquine<sup>2</sup>**

1. In patients with a baseline QTc more than 500 msec or a history of long QT syndrome, the combined use of these agents is relatively contraindicated.
2. Place patient on telemetry before drug initiation.
3. Monitor and correct electrolytes at baseline and daily thereafter.
4. Obtain an ECG 2 to 3 hours after the second dose of antimalarial and then daily thereafter.
5. If QTc is more than 500 msec or increases by 60 msec or more over baseline, discontinue azithromycin and/or decrease dose of the antimalarial. Continue to monitor ECG daily.
6. If QTc continues to be more than 500 msec or increased by 60 msec or more, consider discontinuing the antimalarial.

## **Immediately discontinue all QT prolonging medications in any patient with Torsade de Pointes**

### **References**

1. Giudicessi JR, Noseworthy PA, Friedman PA, Ackerman MJ. Urgent guidance for navigating and circumventing the QTc prolonging and torsadogenic potential of possible pharmacotherapies for COVID-19 [published online ahead of print, March 25, 2020]. *Mayo Clin Proc* 2020; 95.
2. Simpson TF, Kovacs RJ, Stecker EC. Ventricular arrhythmia risk due to hydroxychloroquine-azithromycin treatment for COVID-19. Accessed April 10, 2020. Available at: <https://www.acc.org/latest-in-cardiology/articles/2020/03/27/14/00/ventricular-arrhythmia-risk-due-to-hydroxychloroquine-azithromycin-treatment-for-covid-19>

<sup>a</sup>High risk conditions include age > 65 years, female patients, bradycardia, heart failure, recent acute coronary syndrome, atrial fibrillation, hypertension, heart valve disease, hypocalcemia, hypokalemia, hypomagnesemia, hypothyroidism, systemic inflammation (e.g., HIV infection, sepsis, lupus, rheumatoid arthritis), hypothermia, and sleep deprivation