
QT Interval Prolongation

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What is QT Prolongation?: The QT interval on an electrocardiogram (EKG) represents the time it takes for the heart's ventricles to depolarize (contract) and repolarize (relax). These interval times are corrected to account for variations in heart rate and are specified as "QTc". QT prolongation can lead to serious arrhythmias, including torsades de pointes (TdP), and sudden death. While the link between QT and TdP is not clear, QTc above 500 msec is a significant risk factor for TdP.

QTc Interval Classification for Adults

Classification	QTc for Adult Women (msec)	QTc for Adult Men (msec)
Normal	<450	<430
Borderline	451–470	431–450
Prolonged	>480	>470

Funk MC et al. APA Resource Document on QTc Prolongation and Psychotropic Medications. *Am J Psychiatry* 177:3, March 2020

How to Assess if a new patient may have QT prolongation

While some units have a policy of ordering baseline EKGs on all patients, this is rare and probably an inefficient use of health care dollars. Here are some reasonable criteria for ordering an EKG to screen for QT prolongation:

- High risk medications. Patients taking a medication with a high risk of QT prolongation, eg., thioridazine, high doses of chlorpromazine, ziprasidone, higher-dose citalopram (>40 mg/day), amitriptyline, maprotiline, methadone.
- Recent overdose on any medication, even if considered "low risk". Usually, such patients will have already had an EKG in the emergency room or on a medical unit.
- Other common medications that are not related to psychiatry can also be culprits, including antiarrhythmics such as sotalol, amiodarone, and quinidine; macrolide antibiotics such as azithromycin; quinolone antibiotics such as levofloxacin; some antifungals; antimalarials; and other medications such as tamoxifen.
- Significant cardiac history, such as history of myocardial infarction, arrhythmia, syncope, previous history of prolonged QT interval.
- Risk factors for QT prolongation: General risk factors include being older, having electrolyte abnormalities (especially potassium, calcium, magnesium), conditions predisposing to electrolyte abnormalities (such as anorexia or bulimia), having hepatic or renal dysfunction.

What to do if your patient has QT prolongation

- **If borderline prolongation:**
 - Review medications, and if necessary, switch to a less risky agent. Lower-risk antipsychotics: Aripiprazole has minimal risk; asenapine, lurasidone, olanzapine, and quetiapine are also good options. Lower-risk antidepressants: All antidepressants at usual therapeutic doses are relatively safe (avoid citalopram >40 mg/day). However, sertraline may be the best choice because it is the most studied in cardiac patients and has few drug interactions.
- **If marked prolongation (>500 msec),** obtain a cardiologist consult.
- In all cases:

- o Periodically monitor electrolytes and EKG
- o Manage reversible factors such as repleting electrolytes, hydration