

Behavioral Health Medical Directors Update: QTc Less Than 500 msec is a Safe Threshold for Admission to a Psychiatric Facility

We have reviewed the elements of medical clearance of patients with psychiatric illness who require transfer or admission to psychiatric facilities, including the guidelines on the QTc interval on electrocardiogram as part of their pre-admission/transfer medical workup in emergency departments. This workup includes a medical screening exam as required by EMTALA, but also typically includes an EKG. Historically, the QTc interval has been reviewed since many psychiatric medications can prolong the QTc, and it has been the local practice to require a QTc interval <450 msec for the patient to be considered medically cleared.

The QT interval on the electrocardiogram reflects the length of time for ventricular repolarization and varies with heart rate, with the QTc corrected for heart rate. Significant prolongation of the QTc is associated with torsades de pointes or ventricular arrhythmias. When the QTc interval is prolonged, a decision regarding choice of antipsychotic medications requires a risk-benefit assessment.

The American Association of Psychiatry *Practice Guideline for the Treatment of Patients With Schizophrenia, Third Edition*, published in 2021 included an updated review of QTc prolongation. The following is a summary of the guidelines.

In a review of various studies on QTc prolongation, the first generation antipsychotic medications posing the greatest risk include chlorpromazine, droperidol, thioridazine, and pimozide. Of these medications, only droperidol is commonly used in emergency departments. Orally administered haloperidol is associated with only a mild increase in the QTc interval in healthy patients; the risk of torsades de pointes appears greater with intravenous administration in medically ill individuals. Most second generation antipsychotic medications have been associated with some QTc interval prolongation; however, ziprasidone and iloperidone appear to post the greatest likelihood.

Factors to consider in determining selection of change of antipsychotic medications include:

1. Is the patient taking other medications that prolong the QTc interval?
2. Does the patient have other factors affecting metabolism of the antipsychotic medication such as poor metabolizer status, pharmacokinetic drug-drug interactions, hepatic or renal disease, drug toxicity?
3. Does the patient have a known significant cardiac risk factor (e.g., congenital prolonged QTc, structural or functional cardiac disease, bradycardia, and/or family history of sudden cardiac death)?
4. Does the patient have other factors associated with increased risk of torsades de pointes (e.g., female sex, advanced age (> age 65), personal history of drug-induced QTc prolongation;

severe acute illness; starvation; risk or presence of hypokalemia, hypomagnesemia, or hypocalcemia)?

For these patients, the use of medications with a regulatory warning or known risk of QTc prolongation are not recommended if safer medication alternatives are available.

Finally, a QTc interval >500 msec is sometimes viewed as a threshold for concern; however there is no absolute QTc interval at which a psychotropic should not be used. Input from cardiology consultants should be considered when significant cardiac disease or other risk factors for QTc interval prolongation are present, although routine cardiology consultation is not indicated without cardiac risk factors.

Therefore, we recommend that for patients with a QTc interval <500 msec, provided they have no other medical conditions placing them at increased risk for acute cardiac events, be accepted as medically stable for transfer/admission to psychiatric facilities.

BIBLIOGRAPHY

The American Psychiatric Association, *Practice Guideline for the Treatment of Patients With Schizophrenia, Third Edition*, 2021, pp. 70-71.

Aytemir K, Maarouf N, Gallagher MM, et al: Comparison of formulae for heart rate corrections of QT interval in exercise electrocardiograms. *Pacing Clin Electrophysiol* 22(9): 1397-1401, 1999 10527023

Funk MC, Beach SR, Bostwick JR, et al: Resource Document on QTc prolongation and psychotropic medications. APA Resource Document. Washington, DC, American Psychiatric Association, 2018. Available at: [www.psychiatry.org/File%20Library/Psychiatrists/Directories/Library-and-Archive/resource documents/Resource-Documents/Resource-Documents-2018-QTc-Prolongation-and-Psychotropic-Med.pdf](http://www.psychiatry.org/File%20Library/Psychiatrists/Directories/Library-and-Archive/resource%20documents/Resource-Documents/Resource-Documents/Resource-Documents-2018-QTc-Prolongation-and-Psychotropic-Med.pdf).

Rautaharju PM, Surawicz B, Gettes LS, et al; American Heart Association Electrocardiography and Arrhythmias Committee, Council on Clinical Cardiology; American College of Cardiology Foundation; Heart Rhythm Society: AHA/ACCF/HRS recommendations for the standardization and interpretation of the electrocardiogram, part IV: the ST segment, T and U waves, and the QT interval: a scientific statement from the American Heart Association Electrocardiography and Arrhythmias Committee, Council on Clinical Cardiology; the American College of Cardiology Foundation; and the Heart Rhythm Society. Endorsed by the International Society for Computerized Electrocardiology. *J Am Coll Cardiol* 53(11): 982-991, 2009 19281931

U.S. National Library of Medicine: Daily Med: pimozide tablet. Bethesda, MD, National Institutes of Health, May 2018a. Available at: <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=70b079e2-a1f7-4a93-8685-d60a4d7c1280>.

U.S. National Library of Medicine: Daily Med: Thioridazine Hydrochloride, Bethesda, MD, National Institutes of Health, December 21, 2018b. Available at: <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=52fea941-0b47-41c1-b00d-f88150e8ab93#boxedwarning>.

Vendenberk B, Vandael E, Robyns T, et al: Which QT correction formulae to use for QT monitoring? *J Am Heart Assoc* 5(6):e003264, 2016 27317349


Woosley RL, Heise CW, Gallo T: QTdrugs List. Oro Valley, AZ, AZCERT, March 29, 2009. Available at: www.crediblemeds.org.




Sally Taylor, MD
Senior Vice President
Chief of Behavioral Health
University Health



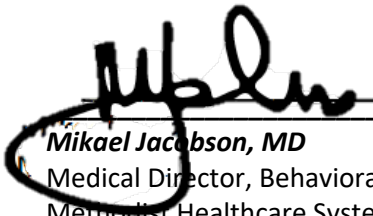
Rene Olvera, MD
Chief Medical Officer
The Center for Health Care Services



David Gonzalez, MD
Medical Director
San Antonio State Hospital



Steven Pliszka, MD
Dielmann Distinguished Professor and Chair
Department of Psychiatry and Behavioral Sciences
UT Health San Antonio



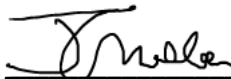
Mikael Jacobson, MD
Medical Director, Behavioral Health Services
Methodist Healthcare System



Brian Skop, MD
Medical Director of Behavioral Health Services
Methodist Healthcare Ministries



Benigno Fernandez, MD
Chief Medical Officer
Laurel Ridge Treatment Center



Jason Miller, D.O
Chief of Staff
Texas Vista Medical Center



Lizmarie González-Vega, MD
SPP Child and Adolescent Psychiatrist
Clarity Child Guidance Center Senior Medical Director