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# What's New in the Patient Safety World

# December 2022

# Unintended Consequences of a QTc Formula?

We've done many columns on the importance of drugs and other conditions that prolong the QT interval, predisposing to the potentially lethal arrhythmia Torsade de Pointes. But might there be unintended consequences? A recent study in the oncology literature (Richardson 2022) suggests that use of certain formulas for calculating the QTc interval may erroneously preclude some patients from receiving the most appropriate chemotherapy.

The 3 most commonly used formulas for determining the adjusted QTc by oncologists are the Bazett, Fridericia, and Framingham formulas. Because some chemotherapy agents may prolong the QTc, Richardson and colleagues looked at how inappropriate modifications to chemotherapy might occur with each of those 3 formulas.

The percentage of ECG's with grade 3 QTc prolongation differed by formula: Framingham 1.8%, Fridericia 2.8%, and Bazett 9.0% for all patients. For those patients receiving QT-prolonging chemotherapy the percentage of ECG's with grade 3 QTc prolongation were: Framingham 2.7%, Fridericia 4.5%, and Bazett 12.5%. The Bazett formula resulted in a median QTc value 26.4 milliseconds higher than Fridericia and 27.8 milliseconds higher than Framingham.

Of the ECG's classified as grade 3 by Bazett, 81.0% were grade 2 or less by either Fridericia or Framingham. 17.9% of evaluated clinical changes associated with prolonged QTc were deemed inappropriate when using either Fridericia or Framingham formula.

The authors conclude that use of the Bazett formula likely was associated with inappropriate changes in clinical management. These data support the use of a standard QTc formula (such as Fridericia or Framingham) for QTc correction in oncology. They argue for standardization of QTc monitoring practices across oncology.

The Richardson study did not report on patient outcomes or unwanted arrhythmias, so it is not known whether preferential use of the Fridericia or Framingham formulas allows more patients to receive certain chemotherapy agents safely. But it does raise the

possibility that many patients are being denied the most appropriate management simply because of the formula chosen.

**Some of our prior columns on QT interval prolongation and Torsade de Pointes**:

June 29, 2010 "Torsade de Pointes: Are Your Patients At Risk?"
February 5, 2013 "Antidepressants and QT Interval Prolongation"
April 9, 2013 "Mayo Clinic System Alerts for QT Interval Prolongation"
June 10, 2014 "Another Clinical Decision Support Tool to Avoid Torsade de Pointes"
April 2015 "Anesthesia and QTc Prolongation"
October 10, 2017 "More on Torsade de Pointes"
June 25, 2019 "Found Dead in a Bed – Part 2"
April 7, 2020 "Patient Safety Tidbits for the COVID-19 Pandemic"
February 16, 2021 "New Methods for QTc Monitoring"
November 22, 2022 "The Apple Watch and Patient Safety"

**References**:

Richardson DR, Parish PC, Tan X, et al. Association of QTc Formula With the Clinical Management of Patients With Cancer. JAMA Oncol 2022; 8(11): 1616-1623 Published online September 22, 2022
https://jamanetwork.com/journals/jamaoncology/article-abstract/2796766