# **Recognition of Drug-Induced Prolonged QT**





Genetics

**ECG from LQT2 Patient** 

"Current evidence suggests that 5 to 10 percent of persons in

whom torsade de pointes develops on exposure to

QT-interval-prolonging drugs harbor mutations associated with

the long-QT syndrome." <sup>3</sup>





# **Risk Factors**



# **Risk Factors**



## **Risk Factors**



# **Risk Factors**



# **Tools and Strategies for Measuring Difficult ECGs**





define baseline. The entire wave of repolarization includes T and T'. Use all leads to assist in defining the end of repolarization.



#### Single Lead: Use Tangent Method

At fast heart rates, the P-wave fuses with the T-wave, sometimes making it infeasible to measure the end of the T-wave. If possible, record and measure the QT at a lower heart rate. In a single lead, use tangent method to identify the end of the T-wave.

#### Inspect All 12 Leads

In normal sinus rhythm, leads V1 and II have the largest P waves. Other leads may reveal separation of P and T. Tic marks on 12SL medians report can be used to inspect 12SL measurements.



**Calculating QTc in the Presence of Varying Heart Rate** 



## **Do Not Include Normal U-Waves**



T and U waves are not superimposed and can be separated. These are normal U-waves. Either use tangent method for single lead or inspect other leads without U-waves in order to determine T-offset.

## **TP Fusion - Long PR Interval**



Due to a long PR interval, the P wave is superimposed on the T-wave. In lead II, the T wave appears flat. The tangent method will be difficult to apply. In V3, the tangent method will result in a longer PR interval than inspecting all the leads.

# By inspecting all leads, it is clear the T-wave shape is due to a long PR

interval. In leads V1 and V5, the P and T-waves are separate.

## Include U-Wave When Abnormal or Unable to Separate from T-Wave





**Abnormal U-Waves - Cannot Separate** These are abnormal U-waves. The U-waves are too large and fused with the T-wave. Include U-wave for proper measurement of QT interval.



#### References

1 Taggart NW, et. al., Diagnostic Miscues in Congenital Long-QT Syndrome, Circulation 2007; 115(20):2613-2620.

2 Topilski I, et. al., The Morphology of the QT Interval Predicts Torsade de Pointes During Acquired Bradyarrhythmias, J Am Coll Cardiol 2007; 49(3):320-328.

3 Roden DM, Drug-Induced Prolongation of the QT Interval, N Engl J Med 2004; 350(10):1013-1022.

4 Al-Khatib SM, et. al., What Clinicians Should Know About the QT Interval, Jama 2003; 289(16):2120-2127. 5 GE Healthcare, Marquette<sup>®</sup> 12SL<sup>™</sup> ECG Analysis Program Physician's Guide, 416791-004.

© 2019 General Electric Company – All rights reserved. DOC0686666 Rev2

# gehealthcare.com