

QT Interval

Definition

From the **start** of the QRS complex to the **end** of the T wave, which is the total duration of ventricular electrical activity (depol and repol).
Measured best using aVL, as the U waves are less prominent.

Duration

Duration is inversely proportional to heart rate.
Bazett's formula

$$QTc = \frac{QT}{\sqrt{RR}}$$

The normal QTc = 0.35 to 0.43 s, about 9-11 small squares.

Short QTc

Causes – hypercalcaemia (prominent U wave), digoxin, hyperthermia

Hypercalcaemia

Symptoms	anorexia, weight loss, n&v, abdo pain, constipation, polydipsia, polyuria, weakness, depression.
Causes	primary or secondary hyperparathyroidism, myeloma, malignancy, thiazides, excess vit D, sarcoid, milk-alkali syndrome, and thyrotoxicosis.
Treatment	rehydrate, then frusemide, pamidronate 30mg over 2 hours.

Long QTc

Important causes – hypocalcaemia, drugs, acute myocarditis, and hereditary syndromes.
(Also MI, CVA, hypertrophic cardiomyopathy, hypothermia.)

Hypocalcaemia

Symptoms	peripheral and circumoral parasthesia, tetany, fits, psychiatric disturbance, Trousseau's and Chvostek's signs, papilloedema
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Causes	hypoparathyroidism, CRF, vit D def/resistance, calcitonin, and pancreatitis.
Treatment	Ca Gluconate 10% 10ml IV, oral vit D

Drugs

Class 1A	quinidine, procainamide, dysopiramide, cocaine
Class 3	amiodarone, sotalol
H 1 antagonists	terfenadine, astemizole
Anticholinergics	cisapride, organophosphates
Antibiotics	erythro/clarithro-mycin, trimethoprim, clindamycin
Antifungals	ketoconazole
Psychiatric	haloperidol, TCA's
Cocaine	direct cardiotoxicity, long QRS and QTc

Myocarditis (usually rheumatoid)

Symptoms	fever, chest pain, palpitations
Signs	quiet heart sounds, failure, tachy, 4 th sound, gallop
Causes	viral (coxsackie, influenza), bacterial (rheumatic fever, diphtheria), protozoal (toxoplasmosis, Chaga's), rickettsial, chloroquine, lead, and peripartum.
Treatment	supportive and cause

Hereditary syndromes

Romano-Ward, autosomal dominant
 Jervill and Lange-Neilson, autosomal recessive, deafness, K out and Na into cells
 Both go into VT, Torsade-de-Pointes, VF, EMD, and sudden death.
 Treatment is by beta-blockers, Mg²⁺ 1-2g over 1 minute then infusion 3-10 mg/minute.