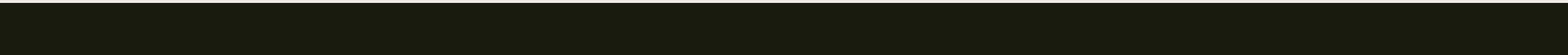


ASSESSMENT AND MANAGEMENT OF CARDIOLOGICAL EMERGENCIES



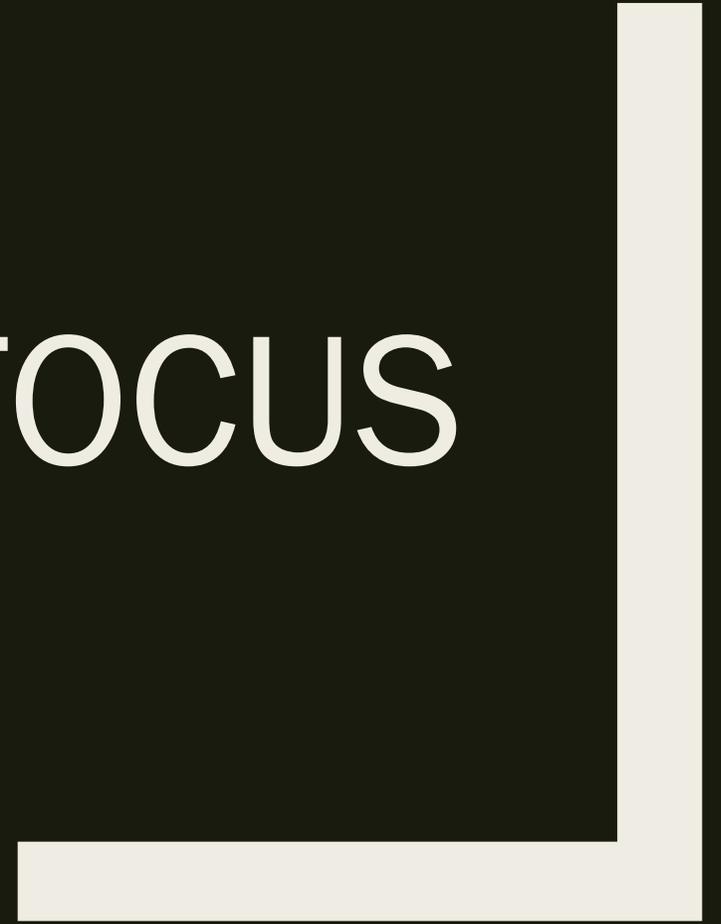
Dr Sophie Butler
ST5



We will cover

- Focus
- Context: The Perfect Storm
- The Pragmatic Assessment
- Management in Psychiatric Settings
- Context: A Storm in a Tea-cup?

FOCUS



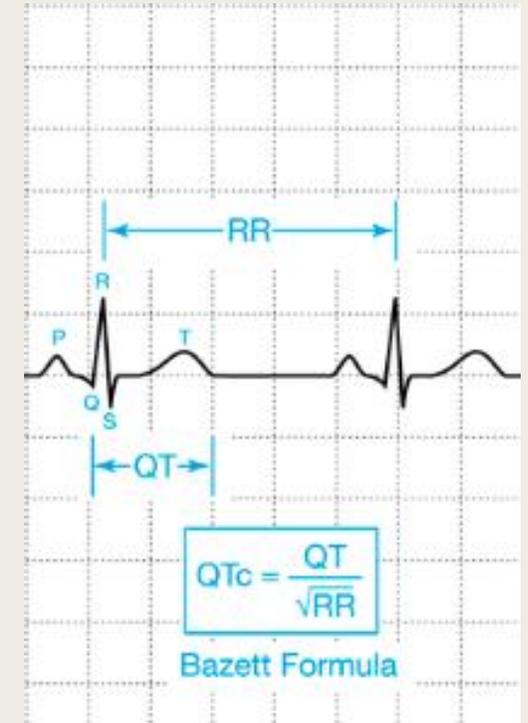
Focus

Benzodiazepines ‘The adverse effects of benzodiazepines include, but are not limited to, over-sedation, drowsiness, ataxia and **potentially cardiovascular collapse, hypotension** with the associated risk of falls and ultimately loss of consciousness.’

Antipsychotics: ‘Some antipsychotics, particularly parental haloperidol and droperidol, are known to increase the **QTc** on the ECG, even at therapeutic doses. A QTc of greater than 500 ms is associated with an increased risk of torsades de pointes (Glassman and Bigger, 2001; Haddad and Anderson, 2002; Taylor, 2003)’

Focus

- QT Interval represents the period from onset of cardiac myocardial depolarisation to the completion of repolarisation
- QTc is the QT interval adjusted for heart rate
- Recommendations (Al-Khatib et al., 2003)
 - *QT Interval should be measured manually*
 - *QT Interval should be measured from beginning of QRS complex to end of T wave and averaged over 3-5 beats*
 - *QT Interval should be adjusted for heart rate*
 - *(Should be measured during peak plasma concentration)*



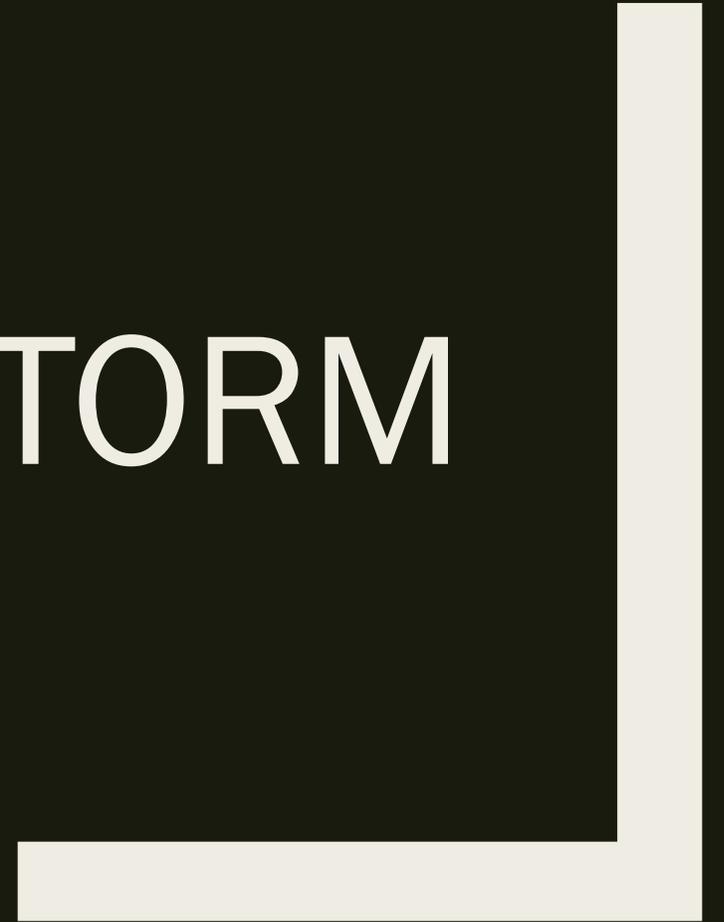
Focus

QTc prolongation is an imperfect predictor of torsades de pointes (TdP) and sudden cardiac death

Risk factors for torsades de pointes with drug induced QT prolongation

- **Demographic**
 - *Female sex, advanced age*
- **Biochemical**
 - *Electrolyte disturbances (eg hypokalaemia)*
- **Genetic**
 - *Genetic predisposition, ion channel abnormalities*
- **Systemic conditions**
 - *Hepatic impairment, renal impairment*
- **Cardiac**
 - *Occult long QT syndrome, bradycardia, baseline QT prolongation, recent cardioversion with QT prolonging drug, underlying heart disease (heart failure, left ventricular hypertrophy, myocardial infarction)*
- **Drug therapy**
 - *Concurrent use of more than one QT prolonging drug, concurrent diuretic therapy, digoxin, rapid rate of intravenous infusion of QT prolonging drug, high concentration of QT prolonging drug*

THE PERFECT STORM



The Perfect Storm

Existing co-morbidity

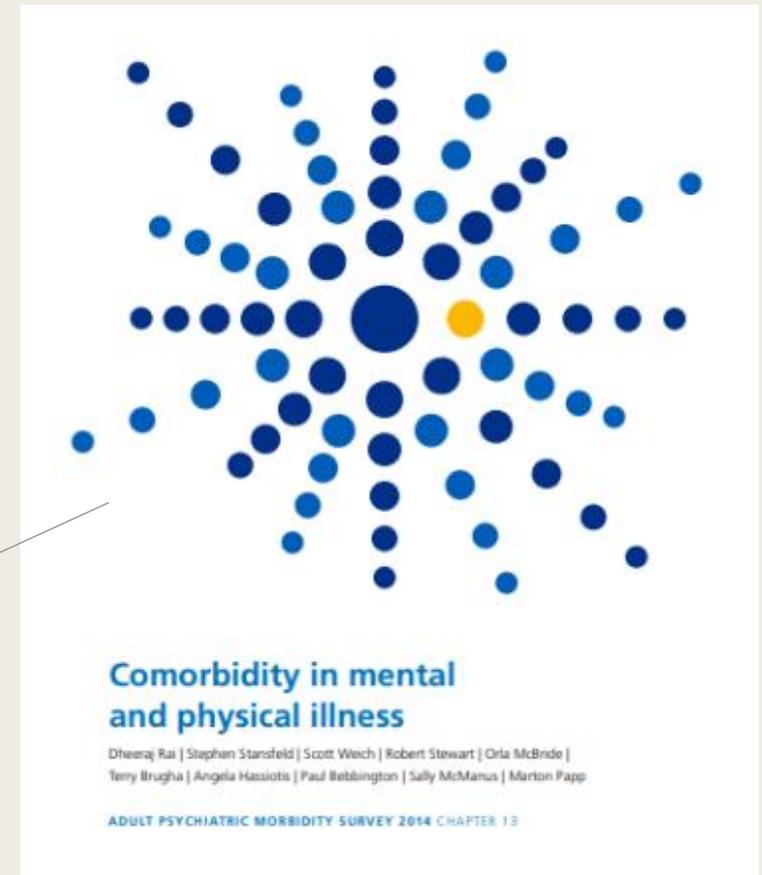
Clinicians choices

Pre-monitoring

Post-monitoring

Existing Co-morbidity

Over a third of people with **severe** symptoms (37.6%) have a long-term physical condition, compared to a quarter (25.3%) of those with no or few symptoms of a common mental health problem.



Existing co-morbidity

Local SLaM audit 1 in 8 ECG's were abnormal

Factors that predict risk of Torsades de Pointes (Yap and Camm, 2003)

- **Organic heart disease (ischaemic heart disease, congestive heart failure)**
- **Metabolic Abnormalities (hypokalaemia)**
- **Hepatic Impairment**
- Bradycardia, AV/SA blocks
- Drug related factors (narrow therapeutic windows)
- Female

Clinician Choices

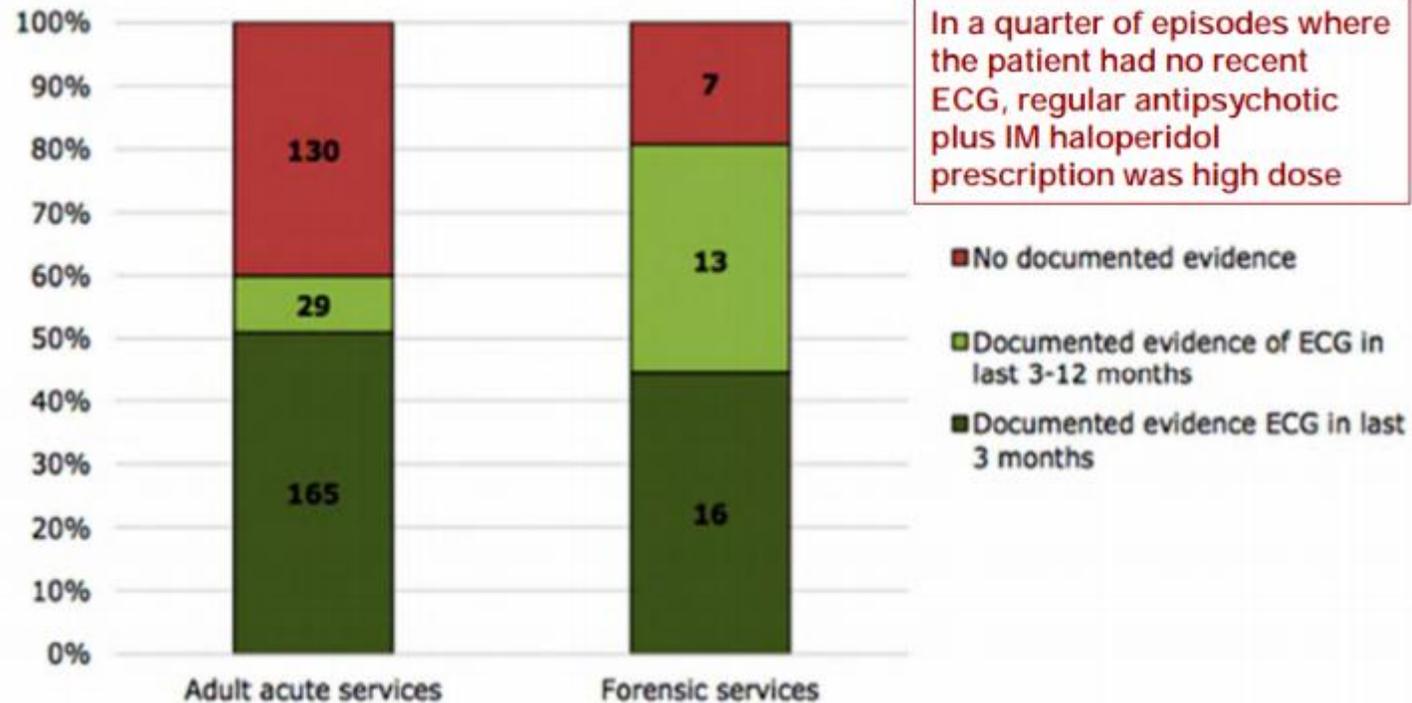


- 2017

Route of RT	When antipsychotic given, proportion that was haloperidol
IM	2/3
PO	3/4

Pre-monitoring

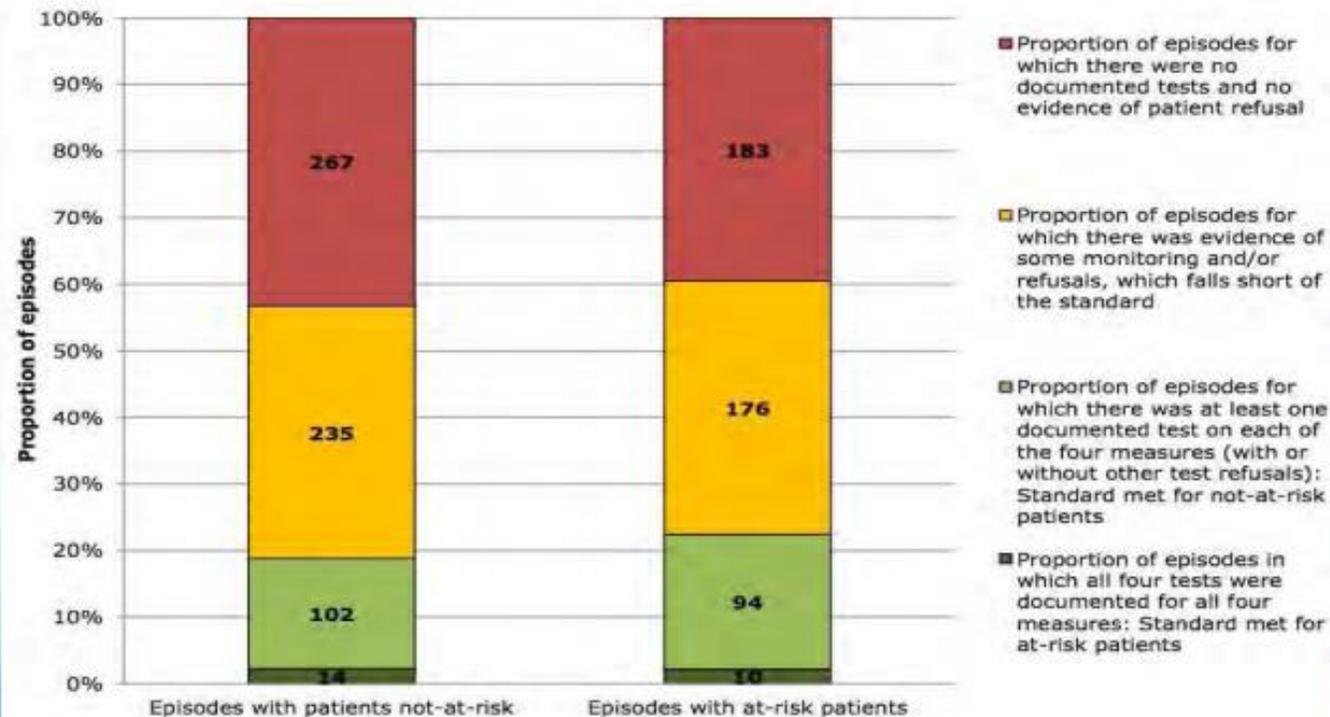
PROPORTION OF EPISODES WHERE PARENTERAL HALOPERIDOL WAS ADMINISTERED AND THERE WAS A DOCUMENTED RECENT ECG



Post-monitoring

PHYSICAL HEALTH CHECKS RECORDED IN THE HOUR FOLLOWING RT FOR 'AT RISK' PATIENTS

(asleep or sedated, known or suspected to have taken illicit substances, or
BNF maximum dose exceeded: n=483)



THE PRAGMATIC ASSESSMENT



Preventative Assessment

- The risk of torsades de pointes should be assessed for patients who are about to begin taking a QT-prolonging medication. Although inadequate clinical studies preclude prediction of absolute risk for individual patients, particularly high-risk situations can be defined based on clinical variables. (Al-Khatib et al., 2003)
 - *Physical co-morbidity*
 - *Risk factors for pre-disposition for TdP*
 - *History with medication*
 - *Other QT prolonging medications*
 - *Previous ECG*
 - *Current ECG*
 - *Physical observations*

Assessment in Cardiological Emergency

- ABCDE
- ECG
- Bloods e.g. reversible contributory factors e.g hypokalaemia

MANAGEMENT IN PSYCHIATRIC SETTINGS



Management

- ABCDE
- Cardiology Advice
- Where a QT prolonging drug is associated with a QTc of 470-500 ms in men, 480-500 ms in women, or an increase in QTc ≥ 60 ms, dose reduction or discontinuation is advised. If the QTc reaches or exceeds 500 ms, the drug should be discontinued, the ECG repeated, and specialist advice sought.
- 999

STORM IN A TEACUP



Storm in a Tea-cup

- Twenty most commonly reported drugs associated with torsades de pointes (TdP) between 1983 and 1999

Drug	TdP (n)	Fatal (n)	Total (n)	TdP/total (%)
Haloperidol	21	6	15431	0.14
Fluoxetine	20	1	70929	0.03
Loratidine	11	1	5452	0.20
Amiodarone	47	1	13725	0.34
Furosemide	15	0	15119	0.10

TdP (n), total number of adverse drug reaction reports which named TdP associated with this drug;

Fatal (n): number of adverse drug reaction reports which named TdP with fatal outcome;

Total (n): total number of adverse drug reaction reports for the drug.

Storm in a Tea-Cup?

- Harm from not acting/giving medication
- Removing potentially helpful medication from options -Droperidol
- IM droperidol studies
 - *Small RCT- IM droperidol alone was as effective as and safer than IM midazolam*
 - *Large prospective observational study, of 1009 participants who received parenteral (IM or IV) droperidol 10 mg and where a post-administration ECG was possible, just 13 participants (1.3%) had evidence of QTc prolongation, and in half of these cases other prescribed medicines are likely to have contributed. There were no cases of torsades de pointes (Calver et al., 2015b).*
- No RCTs of IV haloperidol have been published. The assertion that IV haloperidol is more likely to cause adverse cardiovascular effects may be confounded by its primary use in medically ill populations (Beach et al., 2017)

Recommendations

- Undertake an assessment to establish individuals risk factors of prolonged QTc
- Attempt pre-ECG
- Consider patient's history with QT prolonging medication
- Post-monitoring is essential