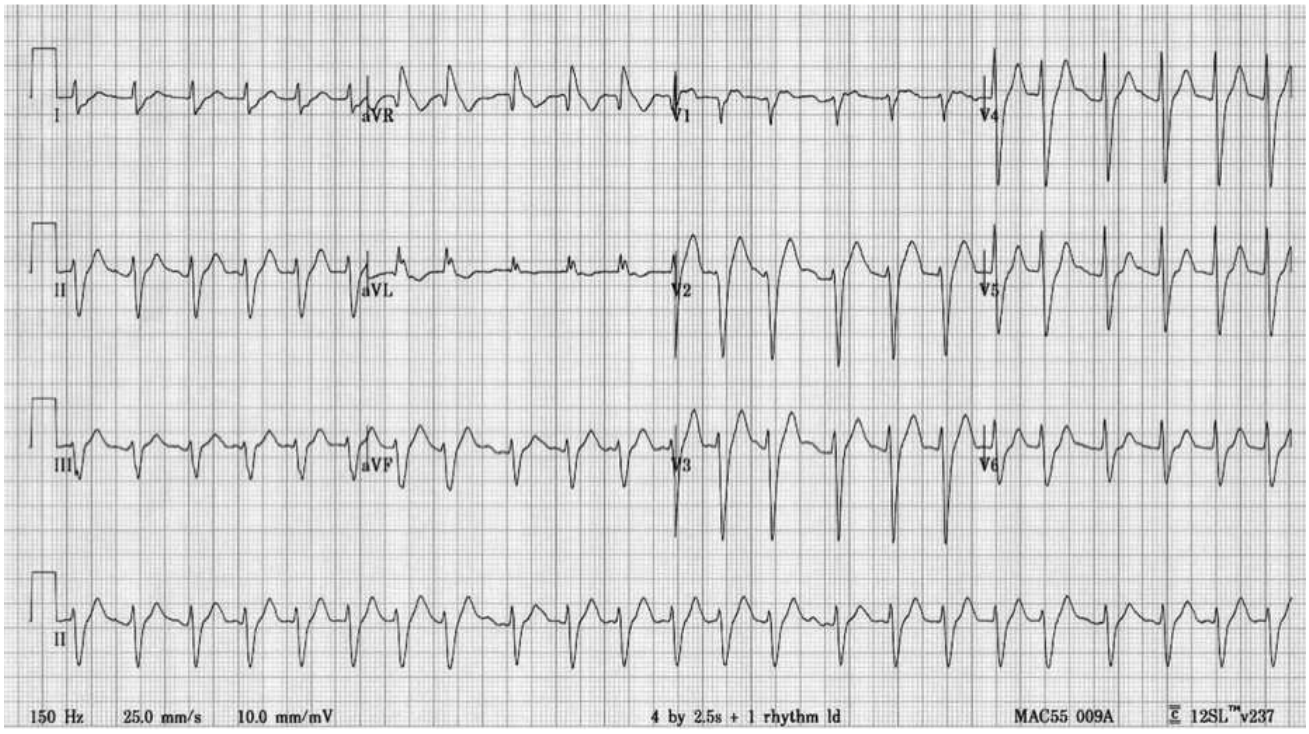
VAQ 2011.1.7 (ECG)

A 46 year old man is brought to your emergency department by ambulance following an overdose of unknown medications. He has had a brief generalized seizure en route.
On arrival his observations are:

GCS	12		
BP	85/60	mmHg	
Temperature	37.0	^{0}C	
O_2 Saturation	100	%	on 8 L/min O_2



a. Describe and interpret his ECG (50%)
b. Outline your treatment (50%)

This is a critically unwell man with an ECG showing a wide complex tachycardia with dominant R in aVR suggestive of sodium channel blocker toxicity such as TCA. He is severely symptomatic with seizures and hypotension. He requires serum alkalisation/Na supplementation with sodium bicarbonate boluses, fluid bolus +/- inotropic circulatory support, seizure control with titrated benzodiazepines, airway control with entrotracheal intubation and therapeutic hyperventilation. He will also require normal supportive care and ICU admission.

ECG
context – hypotensive, post OD and seizure, reduced GCS
rate 120-150
rhythm – wide complex tachycardia, irregular, A-V dissociation and fusion beats suggest VT
axis – rightward

Waves
P – occasional dissociated P waves seen in rhythm strip
Q – no significant Q waves in context of wide complex
R – dominant R in aVR
S – n/a
T – n/a
U – not seen

Intervals
PR – n/a with AV dissociation
QRS – wide complex approx 140ms
ST – n/a
QTc – greater than half the R-R interval is prolonged although difficult to interpret in irregular tachyarrhythmia

Findings consistent with sodium channel blocker toxicity e.g.
- TCAD
- diphenhydramine
- sotalol
- lignocaine
- cocaine

Treatment
- **manage in resuscitation area**
- team based approach

Specific
- Sodium blockade
  - **bolus 50-100mmol sodium bicarbonate**
  - aim for
    - **QRS <100**
    - **pH 7.50-7.55**
    - improvement in BP
- Hypotension
  - sodium bicarb as above
  - **fluid bolus 0.9% saline**
    - **20ml/kg**
    - **repeated up to 50ml/kg**
  - **consider inotropes,electrical cardioversion to SR if not achieving endpoints**
    - **urine output 1ml/kg/hr**
    - **low or resolving base deficit / lactate**
    - **MAP > 65**
  - adrenaline 5mcg/min infusion titrated to achieve above after sufficient fluid bolus / restoration of SR / sodium bicarbonate
- Seizures
  - **midazolam 5mg q5min titrated to response**
- Airway
  - Will require intubation with non-hypotensive RSI (fentanyl 150mcg, midazolam 1mg) and therapeutic hyperventilation to achieve pH 7.50-7.55

Supportive
- ensure normoglycaemia, avoid hypoxaemia
- assess for coingestants including paracetamol level and treat on merits
- ICU review for admission