Case 13

You are an F2 working in the Emergency Department (ED) at General Hospital. Your consultant is Dr Snook.

Your bleep number is 1861

Patient name: Sarah Lincoln

Date of birth: 12th April 1981

Patient number: X991012031

Ms Lincoln was referred to ED by her general practitioner due to experiencing dizziness, light-headedness, and shortness of breath for the past 2 hours. Ms Lincoln has been very stressed at work and expresses concern that her symptoms may be related to excessive alcohol consumption the night before (>30 units).

She has a past medical history of hypertension for which she takes lisinopril, and she has no known drug allergies.

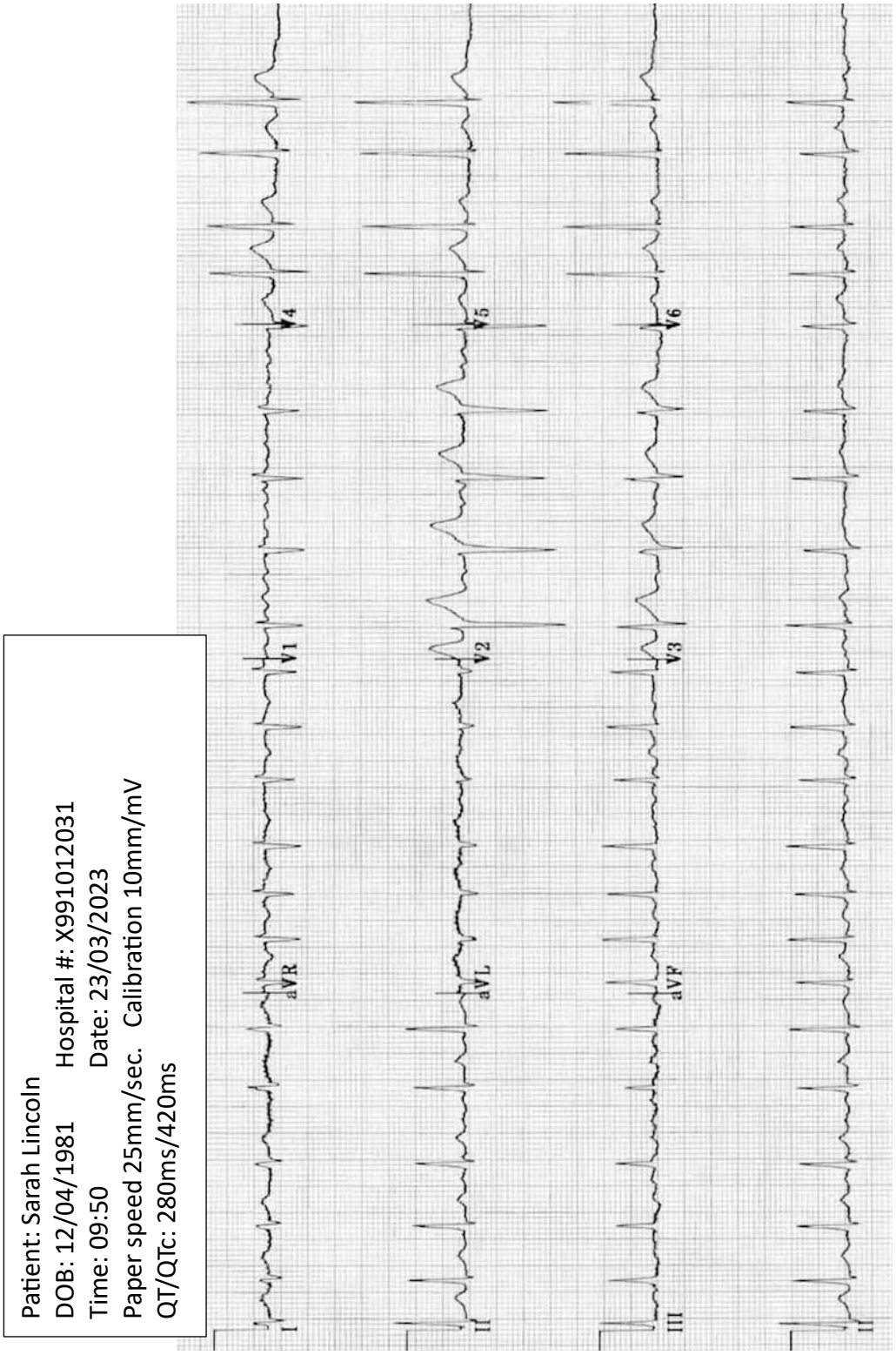
On examination the patient's airway is patent and both lungs are clear on auscultation. Heart sounds I – II + 0. Capillary refill time is 3 seconds. Abdomen soft and non-tender.

Investigations

Pulse	135 beats per minute
Blood pressure	98/74 mmHg
Respiratory rate	18 breathes per minute
Oxygen saturations	96% (room air)
Temperature	36.2 degrees Celsius

Chest x-ray and routine blood tests pending.

ECG results are below:



Task

Please report and interpret the results of the ECG on hospital notepaper. Comment on the rate, rhythm, axis, P waves, PR interval, QRS complex, T waves, ST segment and QT interval.

Make sure to include the most likely diagnosis and what the next steps in management should be.

Hospital: General Hospital **Patient name:** Sarah Lincoln

Ward: ED **Date of birth:** 12/04/1981

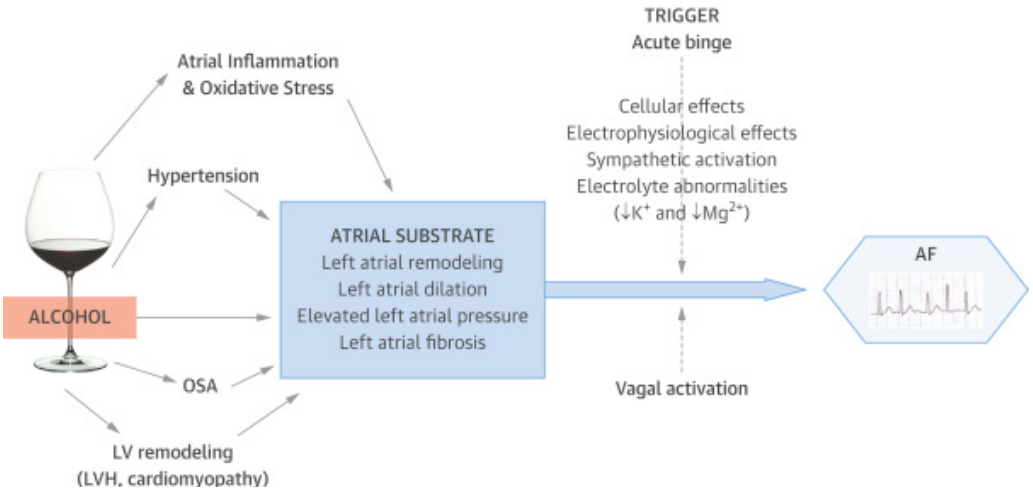
Consultant: Dr Snook **Hospital number:** X991012031

Date/Time	Documentation
23/03/2023	FRED JONES FY2
1000	Report on 12-lead ECG for Sarah Lincoln, DOB 12/04/1981
i.e. today's date	recorded today (23/03/23) at 0950 due to presentation with
	4 hour history of dizziness and shortness of breath.
	Paper speed: 25mm/sec, calibration gain: 10mm/mV
	(Ventricular) rate: 135bpm
	Rhythm: irregularly irregular
	Axis: normal
	P waves: no P waves
	PR interval: unable to assess
	QRS: <0.12, normal
	T waves: normal
	ST segment: normal
	QTc: 420, normal (≥450 for men, ≥460 women = abnormal)
	No previous ECGs for comparison
	Impression: atrial fibrillation
	- Triggered by acute alcohol consumption
	Plan:
	1. Urgent cardiology referral for ?DC cardioversion
	(AF has been present <48 hours + haemodynamic instability) F. Jones
	2. Subsequent rhythm control and FRED JONES (FY2)
	anticoagulation Bleep: 1861

Explanation

The patient's history and symptoms (dizziness, shortness of breath) are all suggestive of atrial fibrillation (AF) triggered by acute alcohol consumption on a background of hypertension. Similar question stems might mention palpitations or previous episodes.

For general interest, the relationship between alcohol consumption, hypertension and AF is succinctly explained in the figure below:



Voskoboinik, Prabhu et al. Alcohol and Atrial Fibrillation: A Sobering Review, Journal of the American College of Cardiology, Vol. 68, Iss. 23, 2016, pp. 2567-2576

The most common causes of AF can be remembered by the mnemonic SMITHS:
Sepsis, **M**itral valve pathology, **I**schaemic heart disease, **T**hyrotoxicosis, **H**ypertension and ?**S**leep Apnea (the last one was added by an RVI cardiologist specialising in… sleep apnoea, so might need checking).

AF can be diagnosed on ECG by looking for the following features:

1. An irregularly irregular ventricular rhythm (QRS complexes)
2. Absence of p-waves

ECG interpretation wrt AF is covered in more detail by Life in the Fast line (also the source for the ECG used in the question): https://litfl.com/atrial-fibrillation-ecg-library/

Management of atrial fibrillation can be divided into **rate control** (1st line with beta blockers) and **rhythm control** (DC cardioversion and/or pharmacological cardioversion). Rate control is first line unless there is:

1. A reversible cause for their AF
2. Their AF is new onset (<48hrs) – which was true of our patient
3. Their AF is causing heart failure (or haemodynamically unstable) – again, true of our patient
4. They remain symptomatic despite rate control

All patients with atrial fibrillation should be assessed for risk of stroke and need for anticoagulation (using the CHA_2-DS_2-$VASC_2$ and ORBIT bleeding risk tool (replacing HASBLED)). DOACs are recommended 1st line.

NICE guidance for atrial fibrillation can be found here:
https://www.nice.org.uk/guidance/ng196

There is also a treatment summary in the BNF which is particularly useful for your written skills exam(!):

https://bnf.nice.org.uk/treatment-summaries/arrhythmias/