VAQ Answer Guide

1. A very interesting chest x-ray. A right main bronchus intubation with white-out of right chest. Massive over inflation of the cuff. The persistent air leak was not rectified by increasing the volume in the cuff. This suggests the air-leak is not at the level of the cuff and continues so where is it. An adequate description of the chest x-ray and a display of knowledge of causes of air leak.
    a. There is mediastinal shift to the right, right hemidiaphragm elevation, deviation of nasogastric tube. I think the tip of the ETT is pointed down the right main bronchus and the angle of the tip is facing the left main bronchus. This may explain the reason the left lung is still ventilating and the right may be being ventilated via the murphy's eye. There is a likely bronchopleural fistula causing this picture.
    b. The immediate management involves seeking senior assistance, anaesthetic or intensive care support.
        i. Confirm ETT position and consider urgent bronchoscopy at the bedside
        ii. A CT scan may show the tear, air leak area and mediastinal emphysema
            1. This is possible if the patient can be stabilized
            2. In a centre with these available
        iii. The tear may be seen on the bronchoscopy
        iv. Conservative management may include insertion of the cuff beyond the tear.
            1. A double lumen cuff may be an option but likely to require a specialist to perform.
        v. IV antibiotics – 3rd Generation cephalosporin & Aminoglycoside
        vi. Chest drain insertion, possibly bilaterally
        vii. Surgical opinion and consideration for surgical repair
        viii. Use of ECMO/pulmonary bypass if unable to ventilate/oxygenate.
        ix. Disposition will clearly be an appropriate intensive care unit +/- transfer to tertiary centre.

2. A mixed acid base abnormality. The initial acidosis present on the first set of bloods has a bicarbonate of 14 reflecting an elevated anion gap metabolic acidosis. (137+4.1 – 101+14 =26)
    a. Clearly not diabetic ketoacidosis or significant renal failure although maybe contributory
    b. The blood tests next morning in the short stay unit show a significant acidosis which is combined elevated anion gap and non-anion gap acidosis. Candidates should work out the anion gap and the delta gap to help decide the significance of the non-anion gap/anion gap components
    c. Useful negatives to the diagnosis include the absence of hyperglycaemia, renal failure, lactic acidosis
    d. The significance of the extremely low bicarbonate and the 'need' to replace bicarbonate should be considered
    e. A differential list to include gastro causes, iatrogenic administration of saline fluids.

3. A middle aged man, so in the realms of possibility for ACS diagnoses but a more prolonged episode of pain which are slightly unusual with associated dyspnea rather than just breathlessness.
    a. Sinus rhythm, rate <100
    b. Normal axis
    c. Significant findings of PR depression
    d. More than one area of affected ST segment elevation
    e. Inferior and lateral features

    Differential should include ACS and other possibilities of chest pain causing ECG abnormalities and therefore include pericarditis/myocarditis

    Which would you put first? With justifications either could be considered correct. I would put pericarditis first based on this ECG however my caveat is that if repeat ECGs show dynamic changes then ACS is more likely to be the first choice diagnosis.

4. A relatively young man with massive inferior STEMI with lateral ischaemia and possibly a posterior element with V2 depression.
    a. The rate is slow <40 per minute
    b. AV dissociation with P waves present but not related to the QRS complexes suggests a complete heart block.
    c. The degree of significance should be emphasized.
    d. The question does not require management but does require a degree of emphasis to the ECG.

5. A lateral foot x-ray (not ankle), with subcutaneous locules of gas.
    a. History gives no traumatic element
    b. Significant risk factors for foot problems, IDDM, cardiac and renal disease.
    c. Methadone should suggest IVDU as a possibility
    d. No bony abnormality
    e. Possible Pes Cavus foot abnormality could be a Charcot-Marie-Tooth.
    f. Emergency department treatment should include broad-spectrum antibiotics with suitable cover for gas producing organisms, penicillin, clindamycin, chloramphenicol
    g. Consideration for hyperbaric therapy
    h. Referral for surgical opinion and consideration for debridement etc.
    i. Cannot see the extent of the gas in the proximal tissues and an amputation may need to be considered if extending proximally to any significant degree.
    j. Tetanus status, immunoglobulin and toxoid
    k. Intensive care support, fluid resuscitation, fluid management-input and output (IDC) etc

6. A third ECG is unusual but not impossible to get in the VAQ paper. There is no hard and fast rule that dictates the breakdown of the paper.
    a. This ECG is sinus rhythm with rate of ^125.
    b. Axis is normal
    c. ST segment depression in the lateral leads but also in I and II
    d. ST segment elevation in aVR which is greater than 1mm
        i. This should raise alarm for a high LAD / Left main artery disease and therefore a high risk patient
        ii. Probable infarct rather than just ischaemia
        iii. Benefit greater from early PCI/angiogram with ongoing pain rather than antiplatelet/anticoagulation/analgesia algorithm
        iv. All the above should be given if the patient is going for PCI.
        v. No criteria for thrombolysis however.
    e. Evolving ECG changes may also escalate this patient to the cath lab rather than the coronary care unit.
    f. Analgesia treatment – appropriate drugs and doses etc.

7. An intubated patient with ligature mark around the neck. Ice packs around the neck post VF treatment.
    a. A good brief description of the pathophysiology and in particular mention some important differences with judicial hangings. Venous obstruction and raised ICP followed by arterial occlusion. The low incidence of cervical spine injuries from suicidal hangings
    b. Main focus will be on post VF arrest care and supportive care
        i. Cooling algorithm
        ii. Cervical spine imaging - would they provide cervical spine protection
        iii. Supportive care and treatment
        iv. Disposition - ICU

8. A positive Kleihauer test suggesting foeto-maternal haemorrhage. Unclear the significance of the other results. This should raise the possibility of placental abruption and the potential for foetal compromise/demise.

    a. A discussion on the sensitivity/specificity of these tests.
    b. CTG monitoring, ultrasound imaging
    c. Admission to combined trauma & obstetric care.
    d. Foetal maturation strategies if early delivery is required with steroids and surfactant.
    e. Minimum of 24 hours of CTG monitoring.