ANSWERS - MULTIPLE CHOICE

1. TFFTF

Increasing HR will increase oxygen consumption. CO = HR x Stroke Volume, and SV is proportional to preload, contractility and afterload. DM may cause an autonomic neuropathy, this can give rise to an abnormal Valsalva response. PA catheters assume a continuous column of blood from the catheter tip to the left ventri with no pressure gradients, in mitral stenosis there is a gradient between left atrium and the left ventricle.

2. FFTTF

In spontaneous ventilation the Mapleson A is extremely efficient and requires a FGF of approximately 70ml/kg/min. The Jackson Rees circuit has an open bag.

3. FFTTF

Soda lime: 94% calcium hydroxide, 5% sodium hydroxide and 1% potassium hydroxide, with a bit of silica. When fresh, soda lime contains 35% water. At the start of a case circle systems need to be denitrogenated with higher gas flows.

4. TFFFF

b) GCS 8. The patient in c) should have any haemodynamic instability resolved even if this requires laparotomy, i.e. ABC before all else. Avoid nasogastric tubes if there is a chance of skull fracture. Tension pneumothoracies should be decompressed as emergencies before an X-ray is taken.

5. FFFTF

The oculo-cardiac reflex is mediated by the parasympathetic nerve supply via the vagus. Normal IOP is 10-20mmHg. Ketamine and suxamethonium are not ideal agents for use in induction in these cases but sometimes there are no alternatives e.g. patients with a full stomach.

6. FFFTT

Renal blood supply is 20% of CO. The juxtaglomerular complex produces renin, which via aldosterone promotes K^+ excretion in the distal tubule. ANP has an anti renin and anti angiotensin II effect as well as increasing GFR.

7. TTFFF

Maintenance fluid is 4/2/1mls/kg/hr respectively for the first, second and subsequent 10kgs of weight. Infants have a higher closing volume that encroaches upon tidal volumes. Alveolar MV is 100-150ml/kg/min due to higher oxygen demand.

8. TFTFT

Resuscitation fluid bolus is 20ml/kg. Children with pyloric stenosis should have their biochemistry and hydration corrected prior to surgery.

9. FFTTF

Patients with type II block should have a cardiological referral to consider pacing. Patients with chronic lung conditions are susceptible to hypoventilation and superadded infection, and where available an epidural could be an appropriate form of analgesia. MI patients should avoid all non-urgent surgery for >3months (ideally 6).

10. TTTFF

Other causes of EMD include; hypovolaemia, hypothermia, and electrolyte imbalance.

11. TFFTT

The second dose of adrenaline is 0.1ml/kg of 1:1000, and the resuscitation dose of atropine is 20mcg/kg.

12. TFFTF

Isoprenaline:	ß1 & ß2	
Dopamine	1-2mcg/kg/min:	D receptors
Dopamine	2-10mcg/kg/min:	D & ß
Dopamine	>10mcg/kg/min:	D, ∂1 & ß
Adrenaline:		∂1, ß1 & ß2.

13 TTFFT

Ketamine induces dissociative anaesthesia by acting on the NMDA receptor hence its analgesic properties, however it takes greater than one arm brain circulation time to have its full effect. It is not a MH Trigger, unlike suxamethonium and the volatile agents.

14. TFFFT

Captopril is an angiotensin converting enzyme inhibitor hence it will decrease the amount of aldosterone present in the body (aldosterone normally promotes Na^+ retention). ADH will increase total body water not Na^+. Fludrocortisone is a synthetic analogue of Aldosterone.

15. TTFTF

Ach binds to one of the two a subunits of the Ach receptor. The normal resting potential of the NMJ is -90mV.

16. TTFFF

The last three are all useful in the secondary management of anaphylaxis but will have no impact on the initial emergency.

17. FFFTT

MAOI's interact with opiates causing both excitatory and depressive effects, morphine is thought to be the most safe and pethidine the least. They also interact with indirectly acting sympathomimetic agents producing hypertensive crisis (directly acting drugs are thought to be safer).

18. TFFTT

Maximum dose of bupivacaine with adrenaline is the same as without adrenaline i.e. 2mg/kg.

Plain lignocaine can be used up to 3mg/kg.

19. TTFFF

The last 3 along with procaine are esters. They have a more frequent incidence of allergy and are metabolised by plasma and liver cholinesterases.

20. TFTTT

Mivicurium is metabolised by pseudocholinesterases hence deficiency of this enzyme will result in prolonged apnoea.

21. FTTFT

Nail varnish can absorb coloured light, carboxyhaemoglobin has a similar absorbance to oxyhaemoglobin and methaemoglobin has a similar absorbance to deoxyhaemoglobin hence all interfering with pulse oximetry. Sickle cell and thalassaemia have no bearing on pulse oximetry.

Short Answers

Question 1

a) Tension Pneumothorax.

b) Needle decompression in the 2nd intercostal space, mid clavicular line.

c) Insertion of an intercostal drain with an underwater seal.

d) There are a number of options as to the origin of the pathology however the most important issue is that the management is the same. There may have been an underlying subclinical pneumothorax, chest contusion is a risk factor for pneumothorax and complications of central line insertion include pneumothorax.

Question 2

a) Narrow complex tachycardia.

b) Vagotonic manoeuvres including, valsalva, carotid pressure and immersion in cold water.

c) Adenosine causes transient complete a-v nodal block (for 5-10 seconds). It is given intravenously and is extremely effective in terminating supraventricular tachycardias. Adenosine has no effect in ventricular tachycardias and hence can also be used as a diagnostic tool.

a) d) DC Cardioversion.

Question 3

a) Ventricular tachycardia.

b) The patient has cardiovascular compromise hence the treatment is DC cardioversion.

Question 4

a) Atrial Fibrillation (AF)

b) The causes of AF numerous however those that are likely to be significant in this case are anaesthetic drugs (both induction and maintenance agents), electrolyte imbalance (especially K^+) and underlying cardiac disease (especially ischaemic heart disease).

c) Since the patient is now unconscious the obvious option is DC cardioversion. Correction of electrolyte disturbances is beneficial and if all this proves unsuccessful then chemical cardioversion can be attempted with drugs such as amiodarone and flecanide. Note digoxin is effective for rate control however will not cardiovert the patient into sinus rhythm.