

1. Lead examiner .....

Candidate Number:

2. Co-examiner .....

Final

Mark:

**SCENARIO**

You are the ED consultant receiving morning handover, when you receive a request for your immediate help from the Emergency Short Stay Unit. You attend a 25 year-old female who is receiving her first unit of packed red cell transfusion, for anaemia complicating menorrhagia. Her vital signs are:

HR 120 (thready) BP 60/40 mmHg RR 40 /min T 40 °C

**Question 1:** Outline your differential diagnosis and your initial response to the scenario.

| Expected Response       | Details & Comments                                                                                                                                                                                                                                                                                                                             |                |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| <i>Patient in Shock</i> |                                                                                                                                                                                                                                                                                                                                                | <b>2min</b> /3 |
| Differentials           | <b>Acute transfusion reaction</b> - haemolytic or non-haemolytic-ABO incompatibility<br>Anaphylactic shock<br>Transfusion related non-cardiogenic fluid overload including transfusion related acute lung injury<br>Acute septic shock from contaminated blood<br>Hypovolaemic shock from ongoing bleeding -exclude Ruptured Ectopic Pregnancy |                |
| Response                | <b>Cease blood transfusion – mandatory</b><br><b>Move to ED resuscitation area, assemble team and roles</b>                                                                                                                                                                                                                                    |                |
| Reassess ABC            | Seek and treat immediate life threats<br>Continuous physiological monitoring<br>Ensure adequate IV access<br>Supplemental O <sub>2</sub><br>Reassess patient's PV loss                                                                                                                                                                         |                |
| Specific actions        | <b>Volume resuscitation</b><br>Consider Inotropes/Steroids/Antihistamines<br><b>Review blood products and compatibility / Return sample to blood bank ASAP / Re-Xmatch</b><br>Investigations as clinically indicated: Blood / Urine/ CXR, abdo/pelvic imaging                                                                                  |                |
| Other                   | Communications: Patient, NOK<br>Documentation / Incident report<br>Rest of ED: handover still needs to happen! Delegate tasks.                                                                                                                                                                                                                 |                |

**Question 2:** She is now in the resuscitation room. After 2L of IV Normal Saline, she remains hypotensive, with a BP 80/40 mmHg, but a stronger pulse of 100/min. Your examination has excluded vaginal bleeding, and her Beta HCG is negative. What are the issues in her ongoing treatment?

| Expected Response                                   | Details & Comments                                                                                                                                                                                                                                                          |                 |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
|                                                     |                                                                                                                                                                                                                                                                             | <b>2 min</b> /3 |
| <b>Volume resuscitation</b><br>PROMPT for endpoints | Crystalloids, although she is anaemic! – Candidates to justify and acknowledge caveats if use blood / products.<br><b>Justify resuscitation end points</b> – vital signs, ABGs, UO, CVP monitoring, peripheral perfusion, not confused, IDC with UOP 0.5-1 ml/kg/h, lactate |                 |
| Consider <b>Inotropic support</b>                   | Noradrenaline, Adrenaline, Doses – bolus vs infusion; adrenaline preferred as anaphylaxis not responsive to other vasopressor Rx; steroids helpful for allergic reaction and to augment vasopressors                                                                        |                 |
| <b>Anaemia</b>                                      | Weigh balance between benefit and risks of continuing transfusion. Depends of original Hb, ongoing losses, likelihood of Tx reaction...                                                                                                                                     |                 |
| Fever Control                                       | Paracetamol; antihistamines are antipyretic but care with vasodilatation in context of shock                                                                                                                                                                                |                 |
| ? Empiric antibiotics                               | Fever more likely to be from acute transfusion reaction, but temp is very high.<br>? Sepsis. Choice also based on clinical assessment, eg localising Sxs and signs. Broad spectrum indicated if used.                                                                       |                 |

**Question 3:** Please describe and interpret her blood tests: (hand to candidate)ABG on 6L/min O<sub>2</sub>:

|                               |     |                      |               |
|-------------------------------|-----|----------------------|---------------|
| pH                            | 7.1 |                      | (7.35 – 7.45) |
| pCO <sub>2</sub>              | 20  | mmHg                 | (34 – 45)     |
| pO <sub>2</sub>               | 120 | mmHg                 | (80 – 100)    |
| HCO <sub>3</sub> <sup>-</sup> | 10  | mmol/L               | (20 – 26)     |
| BE                            | -10 |                      | (-3 - +3)     |
| Lactate                       | 7.0 | mmol/L               | (0.5 – 2.2)   |
| WCC                           | 17  | x 10 <sup>9</sup> /L | (4 – 11)      |
| Hb                            | 88  | g/L                  | (130 – 185)   |
| Platelets                     | 170 | x 10 <sup>9</sup> /L | (150 – 450)   |

| Expected Response                                      | Details & Comments                                                                                                                                                        |    |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
|                                                        | 2 min                                                                                                                                                                     | /2 |
| Severe <b>acidaemia</b><br>Metabolic (lactic) acidosis | Consistent with prolonged hypo-perfusion or correlates with severe sepsis.                                                                                                |    |
| Resp alkalosis                                         | Significant resp compensation for primary metabolic acidosis                                                                                                              |    |
| pO <sub>2</sub>                                        | However, high Aa gradient exists (precise calculation not possible) - ?pulmonary infiltrate or fluid. PE less likely.                                                     |    |
| Elevated WCC                                           | Stress or sepsis related increased WCC                                                                                                                                    |    |
| Mild <b>anaemia</b>                                    | Hb 88 suggests not a transfusion trigger and not consistent with massive pre-event menorrhagia. But possibly partially treated with Tx. Comparison with pre-Tx Hb needed. |    |
| <b>Interpretation</b>                                  | Consistent with current clinical picture. Critically unwell patient. Severe met acidosis tissue hypoxia and/or sepsis.                                                    |    |

**Question 4:** The patient is admitted to ICU for further management of a severe transfusion reaction. What measures can be taken in the ED to prevent transfusion reactions?

| Expected Response                                                                | Details & Comments                                                                                                                                                                                                                                                                                                                                                                                 |    |
|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
|                                                                                  | 1 min                                                                                                                                                                                                                                                                                                                                                                                              | /2 |
| <b>Hospital and clinical unit blood transfusion protocol if not already done</b> | Use ANZBT/NHMRC Guidelines on Blood Product use:<br>Trigger: for packed cell use-Hb<75 or if >75 symptomatic anaemia or pre-existing COPD/CCF/IHD<br>Blood compatibility testing: in concert with Blood Bank<br>Blood product checking-pt name/ DOB, blood product expiry, macroscopic check for contamination, counter check<br>Intensive initial monitoring and surveillance for early reactions |    |
| <b>ED protocol</b>                                                               | Review ED Short Stay Unit admission Criteria<br>Consider ED Consultant / senior medical approval for blood transfusion<br>Special nursing assigned to patient initially<br>Avoid transfusions commencing overnight unless clinical status requirement<br>Monitored area with visual access                                                                                                         |    |
| <b>Education</b>                                                                 | Inservice / CME to Medical and Nursing staff within ED<br>Review of adverse events in M+M meetings                                                                                                                                                                                                                                                                                                 |    |

Comments: (if you fail the candidate, please state why)

If the candidate fails the exam overall, what feedback would you suggest CIC provide for this SCE?

## SCENARIO

You are the ED consultant receiving morning handover, when you receive a request for your immediate help from the Emergency Short Stay Unit. You attend a 25 year-old woman who is receiving her first unit of packed red cell transfusion, for anaemia complicating menorrhagia.

Her vital signs are:

|             |               |       |
|-------------|---------------|-------|
| HR          | 120 (thready) | bpm   |
| BP          | 60/40         | mmHg  |
| RR          | 40            | / min |
| Temperature | 40            | °C    |

**Question 1.** *Outline your differential diagnosis and your initial response to the scenario.*

**Question 3:** Please describe and interpret her blood tests.**ABG on 6L/min O<sub>2</sub>:**

|                                    |            |                           |                      |
|------------------------------------|------------|---------------------------|----------------------|
| <b>pH</b>                          | <b>7.1</b> |                           | <b>(7.35 – 7.45)</b> |
| <b>pCO<sub>2</sub></b>             | <b>20</b>  | <b>mmHg</b>               | <b>(34 – 45)</b>     |
| <b>pO<sub>2</sub></b>              | <b>120</b> | <b>mmHg</b>               | <b>(80 – 100)</b>    |
| <b>HCO<sub>3</sub><sup>-</sup></b> | <b>10</b>  | <b>mmol/L</b>             | <b>(20 – 26)</b>     |
| <b>Base Excess</b>                 | <b>-10</b> |                           | <b>(-3 - +3)</b>     |
| <b>Lactate</b>                     | <b>7.0</b> | <b>mmol/L</b>             | <b>(0.5 – 2.2)</b>   |
|                                    |            |                           |                      |
| <b>Hb</b>                          | <b>88</b>  | <b>g/L</b>                | <b>(130 – 185)</b>   |
| <b>WCC</b>                         | <b>17</b>  | <b>x 10<sup>9</sup>/L</b> | <b>(4 – 11)</b>      |
| <b>Platelets</b>                   | <b>170</b> | <b>x 10<sup>9</sup>/L</b> | <b>(150 – 450)</b>   |