

Question 9 (18 Marks)

An 18 year old man is transferred by ambulance to your rural emergency department after a self inflicted burn injury. Two hours ago the patient set himself alight with petrol after a fight with his girlfriend. He was intubated at the scene by the intensive care paramedic.

A clinical photograph is shown in the prop booklet, page 9 .

a) State four (4) important features of these burns. (4 marks)

1. Excessive burns involving all visible parts of body. Likely full thickness, but possibly partial thickness in some areas. Involving critical areas (face, hands, feet, perineum). (mandatory)
2. Severe systemic injury - survival questionable.
3. Pt intubated - suspected airway burns - upper and lower. (mandatory)
4. Evidence of rhabdomyolysis in IDC.
5. Circumferential burns - likely compromise of thorax expansion and limbs (feet) - likely to need escharotomies.
6. Patient uncovered - hypothermia very likely.

b) List four (4) important complications of this injury. (4 marks)

1. Airway burns - upper & lower
2. Inhalation injury - smoke, CO, ?cyanide (if in enclosed space), ARDS, VAP.
3. Limb vascular compromise - requiring escharotomies (possible compartment syndromes).
4. Ventilation compromise - requiring escharotomies.
5. Haemodynamic instability - massive fluid losses / shifts. HYPOVOLAEMIC SHOCK.
6. Rhabdomyolysis - ARF, hyperkalaemia, electrolyte abnormalities.
7. Infection / sepsis - tissue & skin loss, loss skin integrity, edema, skin and capillary leakage.
8. Hypothermia / Acidosis
9. Multi-organ failure.
10. Pain

11. Other injuries / trauma.
12. Need for transfer and associated risks.
13. Surgery - multiple, skin grafts, repeated GAs with associated risks.
14. Repeated transfusions and associated risks.
15. Long-term disfigurement.
16. Psychological - PTSD, sensory deprivation, etc.
17. Death

Question 9 (continued)

After a thorough examination, you calculate his percentage of body surface area involved to be 80%. During the two hours since the injury the patient has received 2 litres of normal saline. His current blood pressure is 100/60 mmHg and pulse rate is 80 bpm.

c) Assuming the patient weights 70kg, calculate the patient's fluid requirements for the first 24 hours. Show your calculation. (2 marks)

1. Fluid replacement for first 24/24 according to Modified Parkland's formula - Hartmans at 4mls/kg/%BSA - $4 \times 70 \times 80 = 22.4L$. FLUID CALCULATION IS FROM TIME OF INJURY (not time seen). Half (11.2L) of this fluid is given in the first 8/24, and half (another 11.2L) in the next 16/24.
2. We are 2 hours post injury (therefore 6/24 remaining for first half of fluid). 2L NS were already given. 11L (needed to be given in first 8 hours) - 2L (already given) = 9L to be given in remaining 6/24 = 1500 ml/hr, for 6/24.
3. Next half (11L) to be given over the next 16 hours = ~700 ml/hr over 16/24.
4. Would use Hartman's solution, as large volumes of chloride rich fluids associated with higher rated of ARF and mortality. Once in ICU - would convert to 4% Albumin. Will accept NS as an okay answer for short-term use.
5. No additive to fluids at this stage, as patient has myoglobinurea and likely rhabdomyolysis. Adding potassium to his IV fluids, would be considered a fatal mistake and would lead to failing the entire question.

d) Prescribe your fluid treatment for your patient for the first 8 hours ? (4 marks)

INTRAVENOUS FLUID PRESCRIPTION Chart

Fluid	Additives	Rate ml/hr
Hartmans 9L		1500 (over 6/24)
Hartmans 11L		700 (over 16/24)

Question 9 (continued)

e) List four (4) measures for monitoring adequate of fluid resuscitation. for this patient (4 marks)

1. Urine output of at least 0.5ml/kg/hr via IDC (mandatory).
2. HR < 100 - may be influenced by pain, sedation, etc.
3. MAP > 65, SBP > 90 - may be influenced by pain, sedation, etc.
4. CR may be not represent systemic circulation because of circumferential burns to all limbs and vascular compromise.
5. US - IVC distensibility (intubated).
6. CVP 8-12 - at later stage.
7. Improving pH and lactate clearance - at later stage. May worsen initially.
8. Skin turgor - unreliable in view of capillary leakage.