#### SNS COLLEGE OF ALLIED HEALTH SCIENCE, COIMBATORE -35

(Affiliated to the Tamil Nadu Dr M.G.R Medical University, Chennai) **B.Sc. CARDIOPULMONARY PERFUSION CARE TECHNOLOGY** 



#### PUZZLE

# Subject: 1422-Cardio Pulmonary Bypass and Perfusion Technology UNIT - II - ADEQUACY OF PERFUSION

## Case Study Puzzle: "Ensuring Adequate Perfusion During Mitral Valve Repair"

### **Case Background:**

Mr. Ram is scheduled for elective mitral valve repair surgery. The cardiopulmonary bypass (CPB) circuit is set up, and the pump started. After aortic cross-clamp (ACC) application and administration of cardioplegia, the heart is arrested. As the perfusionist, you must continuously monitor and ensure adequate perfusion throughout the surgery.

#### **Puzzle Instructions:**

- Form groups of 4-5 members.
- Based on the case, analyze the following monitoring data and clinical observations during the bypass.
- Identify perfusion adequacy based on the parameters and suggest corrective steps.
- Also, propose what key parameters must be included in a perfusion adequacy monitoring chart.

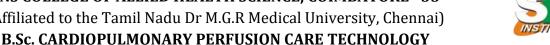
You have 30 minutes to discuss, analyze, and present your answers.

#### **Provided Data:**

Parameter	Value	Normal Range/Notes
Body Surface Area (BSA)	1.8 m <sup>2</sup>	
Flow Rate	3.0 L/min	Recommended adult flow: 1.8-2.4 L/min/m <sup>2</sup>
Mean Arterial Pressure	45 mm Hg	Minimum 50 mm Hg recommended
Hematocrit (Hct)	22%	Optimal 24-28%
PaO2	110 mm Hg	Normal ~120 mm Hg
Mixed Venous Oxygen Saturation (SvO2)	82%	Normal 65-75%; >80% may indicate shunting
Blood Lactate	2.5 mmol/L	Normal 0.5-1 mmol/L
II Lemneratiire	34°C (on bypass)	Mild hypothermia; perfusion adjusted accordingly

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## **Questions:**

- 1. Based on the flow rate and BSA, is the perfusion flow adequate? Justify your
- 2. Evaluate the mean arterial pressure and its impact on organ perfusion in this patient.
- 3. Analyze the significance of the elevated SvO2 and higher lactate levels in the context of perfusion adequacy.
- 4. Considering the hematocrit and oxygen delivery parameters, what adjustments would you recommend?
- 5. How does the patient's mild hypothermia influence oxygen consumption and perfusion targets in this scenario?
- 6. Propose three key parameters you would include in a perfusion adequacy monitoring chart for this case.

## Rubric (10 marks total):

Criteria	Marks	Description
Accuracy in assessing flow adequacy		Proper calculation & justification based on BSA & flow rates
Evaluation of arterial pressure impact	11 5 1	Understanding of MAP relevance to organ perfusion
Interpretation of SvO2 and lactate significance		Insight on perfusion vs potential shunting and metabolic status
Recommendations on hematocrit and oxygen delivery		Logical next steps for improving oxygen delivery
Explanation of hypothermia effect		Knowledge of temp-dependent oxygen consumption changes
Design of key perfusion monitoring parameters	1.5	Practical and critical parameters identified