

PUZZLE

Subject: 1422-Cardio Pulmonary Bypass and Perfusion Technology

UNIT - II - THE IDEAL PERFUSION MONITORING DEVICES

Gamified Puzzle: "Perfusion Monitoring Device Quest"

Scenario

You are part of a perfusionist team in a high-stakes cardiac surgery simulation. The patient is on cardiopulmonary bypass (CPB), and your team must select, interpret, and troubleshoot the ideal monitoring devices to ensure safe and effective perfusion. Each "level" presents a challenge requiring device selection, data interpretation, and problem-solving.

Instructions

- Form groups of 4–5 members.
- Each group will progress through **three levels**. At each level, you must:
 1. Choose the most appropriate monitoring device(s) for the scenario.
 2. Interpret the data provided by the device(s).
 3. Identify any issues and propose corrective actions.
- You have 30 minutes to complete all levels and present your solutions.
- Use a table or flowchart to organize your answers.

Levels & Challenges

Level 1: "The Pressure Predicament"

Situation: The arterial line pressure is fluctuating, and the surgeon suspects poor organ perfusion.

- **Devices Available:**
 - Arterial pressure transducer
 - Central venous pressure (CVP) monitor
 - Blood reservoir level sensor
- **Task:**
 - Select the device(s) to monitor perfusion pressure.
 - Interpret a reading of mean arterial pressure (MAP) at 48 mm Hg.
 - Suggest an action to optimize perfusion.

Level 2: "Oxygen Odyssey"

Situation: The patient's cerebral function is at risk. You must ensure adequate oxygen delivery and detect any hypoxia early.

- **Devices Available:**
 - Cerebral oximeter (Near-Infrared Spectroscopy, NIRS)
 - In-line blood gas monitor
 - Mixed venous oxygen saturation (SvO₂) monitor
- **Task:**
 - Choose the best device(s) for real-time oxygenation monitoring.
 - Interpret a NIRS reading dropping from 70% to 55%.
 - Propose a corrective action.

Level 3: "Flow Factor Frenzy"

Situation: The surgeon requests confirmation of adequate pump flow and tissue perfusion. There is concern about possible air embolism.

- **Devices Available:**
 - Ultrasound flow meter
 - Bubble detector
 - Electronic venous clamp
- **Task:**
 - Select the device(s) to monitor flow and prevent air embolism.
 - Interpret a flow meter reading of 1.5 L/min in an adult patient (BSA 1.8 m²).
 - Suggest an action to address the issue.

Rubric (10 marks total)

Criteria	Marks	Description
Device selection (all levels)	3	Chose appropriate device(s) for each scenario
Data interpretation (all levels)	3	Correctly interpreted device readings
Problem-solving/corrective actions	3	Logical, effective solutions for each challenge
Organization & clarity of presentation	1	Clear, structured answers and teamwork