

PUZZLE
1138 - PRINCIPLES OF ANESTHESIA 1
UNIT II – BREATHING SYSTEM, EQUIPMENTS & MONITORING
Mapleson Circuits Logic Puzzle: Optimal Circuit Selection

Scenario:

Total marks: 10 marks

An anesthesiologist must select the correct Mapleson circuit (A, B, C, D, or E) for a pediatric patient undergoing short laparoscopic surgery. Each circuit has unique rebreathing characteristics and fresh gas flow (FGF) requirements. The OR has constraints: low gas consumption needed, spontaneous ventilation preferred, and minimal dead space to avoid CO₂ rebreathing. Only one circuit fits all criteria perfectly.

Clues:

1. Mapleson A is ideal for spontaneous ventilation but requires high FGF (>70% minute ventilation).
2. Mapleson D is common for controlled ventilation and works well with low FGF, but not optimal for spontaneous breathing.
3. Circuits B and E have very low dead space but are inefficient for longer procedures.
4. The selected circuit must allow low FGF (<2 L/min) for gas conservation during short surgery.
5. Mapleson C is used for short procedures with controlled ventilation only.
6. The pediatric patient breathes spontaneously, ruling out circuits primarily for controlled ventilation.

Question: Which Mapleson circuit should be selected, and why does it match the scenario?

Rubrics:

Criterion	Points
Key Elements	2 pts
Logical Steps	4 pts
Correct Solution	2 pts
Clinical Insight	2 pts
Total	10 pts