



think
ANAESTHESIA

Going with the flow: Understanding Anaesthesia Breathing Systems

Free Webinar Summary



Speaker

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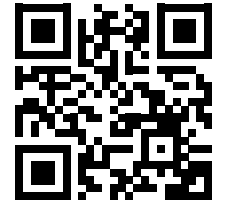
DipVN, NCert(Anaesth), RVN

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Fresh Gas Flow (FGF)

- Calculations overestimate for safety
- Ensures the patient is receiving fresh gas (no breathing of expired gases)
- The use of capnography provides information that allows the FGF to be decreased to the minimum required rate

To calculate FGF:

- $FGF = \text{minute volume (MV)} \times \text{circuit factor (CF)}$
 - $MV = \text{tidal volume (TV)} \times \text{respiratory rate (RR)}$
 - $TV = 10\text{-}20\text{ml/kg}$
- FGF estimated shortcut = 200ml/kg/min

*Note: For circuit factors, see next page

Breathing Systems

- Deliver oxygen and volatile agent
- Remove carbon dioxide and waste gases
- Provide assisted ventilation

Types of Breathing Systems

- Non-Rebreathing (NRB)
 - Constant oxygen flow on flowmeter
 - Fresh gas is always delivered
 - Patient receives reliable concentration of volatile agent
 - Low resistance (no valves or carbon dioxide absorber)
 - Many different types and tubing sizes
 - Delivers dry and cold gas (compressed oxygen)
 - Due to higher FGF required; can be uneconomical, environmental pollution
- Rebreathing (RB)
 - Varied oxygen flow
 - Contains a carbon dioxide absorber allowing a lower FGF
 - Economical
 - Decreases patient loss of heat and moisture
 - Adult and paediatric tubing sizes

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Breathing System	Type	Circuit Factor (no capnography)	Fresh Gas Flow	IPPV?
Paediatric T Piece	NRB	2.5	500-600ml/kg/min	Yes
Bain	NRB	2.5	200-400ml/kg/min	Yes
Lack	NRB	1	200ml/kg/min	Yes, if FGF increased
Circle	RB		100ml/kg/min for 10mins Then 0.5-1L/min	Yes
Humphrey ADE	NRB (A mode)	0.5	2L/min for 1 minute Then 0.5L/min	Yes
Humphrey ADE with CO ₂ absorber	RB		3L/min for 2 minutes Then 0.5L/min	Yes