

# Pressure Regulator, Pressure Gauge, Flowmeters 2016 - 2017

Description: Anaesthetists use the anaesthetic machine daily, both inside and outside the operating theatre. This session explores some of the main components of the anaesthetic machine, namely pressure gauges, regulators and flowmeters, looking at their functions and examining safety issues in their design.

# Summary session

## Objectives:

- Identify the key features and functionality of pressure gauges, regulators and flow restrictors components of the anaesthetic machine
- Recognize the components, basic designs and functionality of the anaesthetic machine flowmeters and demonstrate an awareness of their safety features
- Define the anti – hypoxic features in flowmeter design

Pressure gauges

Oxygen and nitrous oxide pressure gauges

Pressure regulators

Flow restrictors

Flow control (Needle) Valves

Flowmeters

Safety features in flowmeter design

anti – hypoxic features

Safety features in flowmeter design

Quantiflex anaesthetic machine

Safety features in flowmeter design

Bobbin Stops

Inaccuracies in Flowmeter Measurements

# Session key points

- Color coded and gas specific pressure gauges use the Bourdon pressure gauge principle to measure pressures in cylinders and pipelines.
- Pressure regulators reduce pressure of gases from cylinders to about 400KPa (similar to pipeline pressure). This allows fine control of the gas flow and protects the anaesthetic machine from high pressures
- Flow constrictors are used on pipeline supply instead
- Flowmeters are gas specific were both laminar and turbulent flows are encountered, making both the viscosity and density of the gas relevant. The bobbin should not stick to the tapered tube
- Oxygen is the last gas to be added to the mixture. The flowmeter is very accurate with an error margin of +/- 2.5%. Oxygen and nitrous oxide flowmeters are interlinked to prevent the delivery of hypoxic mixtures

# Session summery

Learning objectives:

- Identify the key features and functionality of the pressure gauges, regulators and flow restrictor components of the anaesthetic machine
- Recognize the components, basic designs and functionality of the anaesthetic machine flowmeters and demonstrates an awareness of their safety features.
- Define the anti – hypoxic features in flowmeter design and the Quantiflex anaesthetic machine