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# CONTEMPORARY ANAESTHETIC EQUIPMENT'S

( An aid for healthcare professionals).



Joshua Jataunamo Oscar

**CONTEMPORARY  
ANAESTHETIC EQUIPMENTS.  
AN AID FOR HEALTHCARE PROFESSIONALS.**

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(RN, RM, RNAs, RNE, BNSc, PDGE, MSc, FWACN PhD)

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Vapourizer inside the circle breathing system

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Mapleson E System

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Bain Circuit

## **Endotracheal Tubes and Airways**

Endotracheal tubes

Length of the tube:

Type of cuff:

Oxford endotracheal tube

Armoured endotracheal tube

RAE (Ring, Adair and Elwyn) endotracheal tube

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# **SECTION ONE:**

# EQUIPMENT'S USED IN ANAESTHESIOLOGY

## Introduction

The anaesthetic machine enables to deliver gas and vapour mixtures to the patient accurately and continuously. The Boyle anaesthetic machine is designed by **HEG**. Boyle in 1915. Modern machine differs greatly in detail and modified time-to-time, but the basic principles remain the same. It consists of:

- i. Oxygen and anaesthetic gas supply
- ii. Pressure gauges
- iii. Reducing valves
- iv. Flow meters
- v. Vapourizers
- vi. Common gas outlet
- vii. Certain other features:

High flow oxygen flush, pressure relief valve, oxygen supply failure alarm, suction apparatus! Monitoring devices.

## Medical Gas Supply

### Cylinders

- Made of molybdenum steel to withstand high pressures
- Made of different sizes (A to J). Size E cylinders are used in the anaesthetic machine
- Oxygen is stored as gas at about 2000 lb/inch<sup>2</sup> and nitrous oxide is stored in a liquid phase with vapour on the top at a pressure of 760 lb/inch<sup>2</sup>. It is 75% filled with liquid nitrous oxide  
**Note:** Filling ratio is the weight of fluid in the cylinder divided by the weight of water need to fill the cylinder.
- Cylinders are colour coded.
  - Oxygen: Black with white shoulders, green in some countries.

- Nitrous oxide: Blue
  - Carbon dioxide: Grey
  - Entonox: Blue with white /bluequarters shoulder
  - Air: Grey with white/black quarters shoulder.
- Some markings engraved on the cylinders: Test pressure, chemical formula, Tare weight, dates of test performed, etc.
  - Checking and testing by manufacturers at regular intervals:
    - Flattening test
    - Bending test
    - Impact test
    - Pressure test
    - Tensile test.
  - Gases and vapour must be free from water vapour as it may freeze and block the exit port at a decreased temperature particularly when opening
  - Cylinder valve provides *pin index- system* as a safety feature to make it almost impossible to connect a cylinder to a wrong yoke
  - Should be stored in a dry, well-ventilated and fire proof room. Avoid dampness, corrosives and fumes nearby. No oil or grease or any other flammable materials or any source of heat ; should be allowed
  - Full cylinders should be kept separately and should not be mixed with empty ones
  - Avoid over pressurized full cylinders..

### **Pin index system**

A specific pin configuration for each medical gas on the yoke of the anaesthetic machine. The pin will match the holes on the valve block. It permits only the correct gas cylinder to be fitted in the

yoke.

- Oxygen: 2 and 5
- Nitrous oxide: 3 and 5
- Cyclopropane: 3 and 6
- Entonox: 7
- Air: 1 and 5
- Carbon dioxide: 1 and 6

### **Pressure in the cylinders**

- Oxygen: About 2000 lb/inch<sup>2</sup>
- Nitrous oxide: About 750 lb/inch<sup>2</sup>
- Cyclopropane: 751b/inch<sup>2</sup> [stored in light alloy cylinders as a liquid]
- Carbon dioxide: 720 lb/inch<sup>2</sup>.

### **Cylinder valve**

- Mounted on the neck of the cylinder, screwed with threaded connection
- The valve can be opened or closed by an off/on spindle for gas pathway
- Non inter changeable safety device (pin index system) prevents wrong cylinder assembly
- Bodok seal is placed between the valve outlet and yoke of the machine to make the gas tight joint.

[OBJ]

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