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TERM PAPER

# OXYGEN THERAPY

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# OXYGEN THERAPY

## ABSTRACT

**Oxygen therapy is a treatment in which patients are given more than 21 percent oxygen. It's critical to think about the drug's indications, side effects, and prescribing practises. There are two types of oxygen delivery equipment: fixed performance devices and variable performance devices. The device utilised is dictated on the state of the patient. Depending on the severity of the patient's disease, oxygen might be provided as either uncontrolled oxygen treatment or regulated oxygen therapy. Although the hazards and benefits of oxygen should be evaluated, it should not be ignored in an emergency.**

## KEYWORDS:

**Oxygen Therapy, Oxygen Treatment, FRC, Major Organs.**

# Contents

# 1 INTRODUCTION

Our planet's atmosphere is made up of around 21 percent oxygen. The colourless and odourless gas oxygen It has been used in our therapeutic practise for more than 200 years. All human tissues need on oxygen to function and survive, and even a few minutes without it can be fatal. It must be seen as a pharmacological drug with the same indications, benefits, and drawbacks as other pharmaceuticals. Oxygen therapy is a treatment that involves giving the patient additional oxygen (21 percent).It is frequently used in prehospital and hospital settings, as well as at home or for long-term oxygen therapy. This brief essay discusses the production and storage of oxygen, as well as the practical uses of oxygen therapy, oxygen delivery devices, how to prescribe oxygen, and the risks of oxygen treatment.

# 2 OXYGEN MANUFATURE AND STORAGE

Oxygen that is 99 percent or 99.5 percent pure is considered medical grade. It's created by fractionally distilling liquid air based on the different boiling points of gases in the surrounding air. It can be retained as follows after the formation of oxygen:

## 2.1 (i) Vacuum insulated evaporator (VIE):

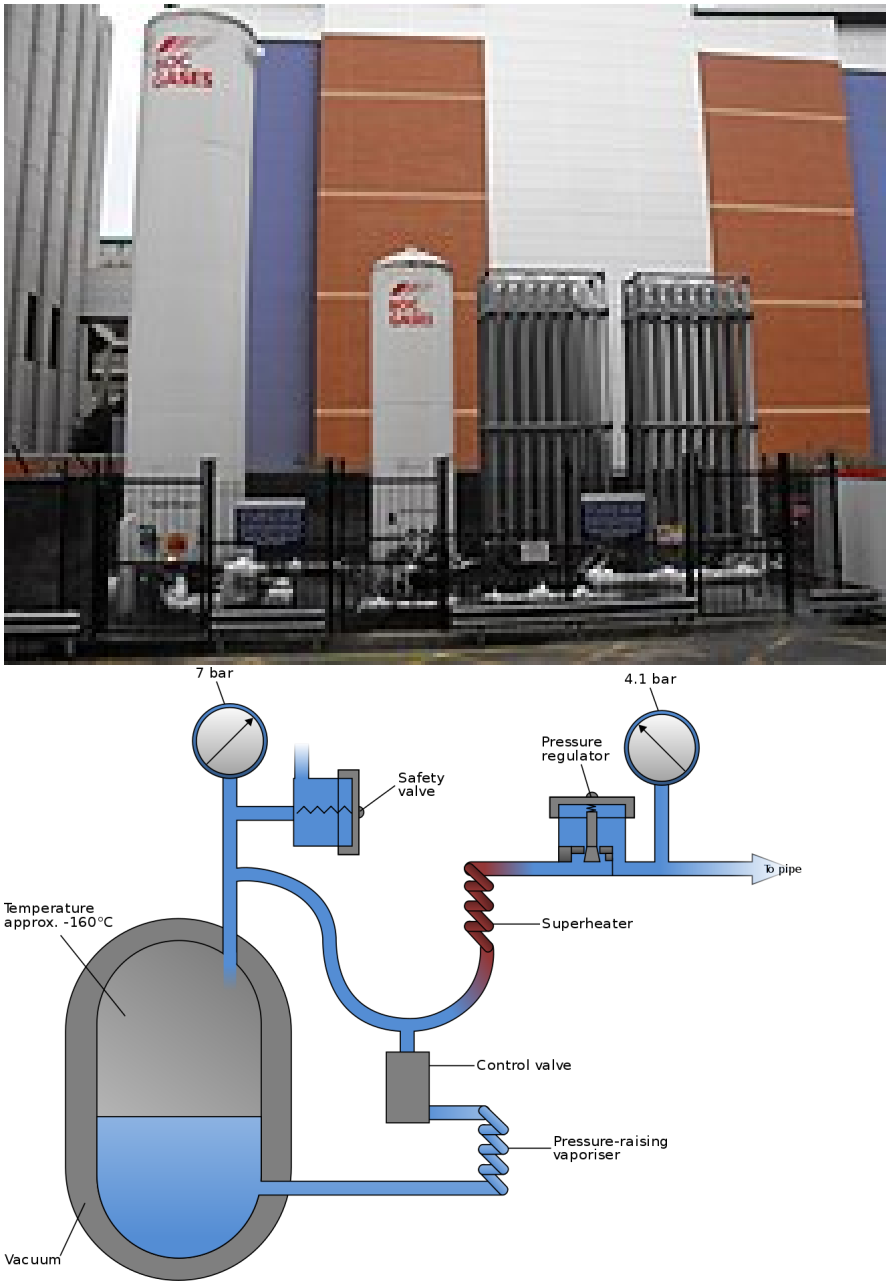


**Figure 1 : Vacuum Insutated Evaporator**

When a gas transforms into a liquid, it takes up a lot less room. As a result, a large amount of oxygen may be stored in liquid form. A VIE is a container for storing liquid oxygen. The VIE system is used in large hospitals with a pipeline system. It's the most cost-effective way to store and distribute oxygen.

## 2.2 (ii) Oxygen Cylinders :

Oxygen may be kept in cylinders under pressure. Oxygen cylinders are composed of molybdenum steel and come in a variety of sizes. The size E cylinder is generally attached to the anaesthetic machine, and it has a black body and a white shoulder.

**Figure 2 : Oxygen Cylinder**

## 2.3 (iii) Oxygen Concentrator :

An oxygen concentrator is a device that eliminates nitrogen from a gas source (often ambient air) to generate an oxygen-enriched product gas stream. They are used in business as well as in hospitals for oxygen therapy.

Two typically utilised methods are pressure swing adsorption and membrane gas separation. In pressure swing adsorption (PSA) concentrators, multiple molecular sieves composed of zeolite minerals are utilised to adsorb pressurised nitrogen in short cycles.


**Figure 3 : Oxygen Concentrator**

# 3 PRACTICAL USES OF OXYGEN THERAPY

## 3.1 (i) Pre-oxygenation:

If the patient is breathing room air, the oxygen reserve in functional residual capacity (FRC) is around 450 ml, but it may be increased to 3000 ml if the patient is breathing 100 percent oxygen. As a result, if you inhale room air during apnoea (for example, during anaesthesia induction), your oxygen saturation will drop fast. Pre-oxygenation is breathing 100 percent oxygen through an anaesthetic circuit for three to five minutes while wearing a tight face mask. Denitrogenation is the process of removing nitrogen from the FRC and replacing it with oxygen. The extra oxygen in the FRC might serve as a lifeline during the interval of apnoea that follows induction. It's crucial for difficult intubation and rapid sequence induction.

## 3.2 (ii) Hyperbaric oxygen therapy:

The term "hyperbaric oxygen treatment" refers to when a patient is exposed to oxygen pressures that are higher than the ambient barometric pressure. Decompression sickness, gas embolism, gas gangrene, and carbon monoxide poisoning are among conditions for which it is prescribed.

# 4 HOW TO PRESCRIBE OXYGEN

## 4.1 (a) Uncontrolled oxygen therapy:

Oxygen is frequently delivered freely to patients suffering from cardiac or respiratory arrest, respiratory distress, asthma, hypotension, or other severe diseases by using variable oxygen delivery systems.

## 4.2 (b) Controlled oxygen therapy:

The oxygen concentration is supplied via a HAFOE device to a small fraction of individuals with chronic obstructive pulmonary disease (COPD). These people's CO2 levels are always increased, and they rely on hypoxia to help them breathe more quickly (hypoxic respiratory drive). Oxygen concentrations in the blood can induce respiratory depression. Begin with a concentration of 24-28 percent O2 and gradually increase to PaO2 ¿50 mmHg or SpO2 85-90 percent.

# 5 RISKS OF OXYGEN TREATMENT

there are both respiratory and non-respiratory toxicity due to the effects of oxygen therapy. It depends on patient susceptibility, FiO2 and duration of therapy.

## 5.1 (i) Fire hazard:

Although oxygen is not flammable, it can allow other things that burn to ignite more easily and quickly. As a result, an oxygen-fueled fire might look explosive.

## 5.2 (ii) Depression of ventilation:

It is observed in COPD patients with prolonged CO2 retention and hypoxic respiratory desire to breathe. When arterial tension is raised to normal levels, the hypercapnoeic stimulus to maintain breathing is lost, resulting in hypoventilation in these individuals.

## 5.3 (iii) Hyperbaric oxygen toxicity:

Prozonged hyperbaric O2 treatment exposure can cause pulmonary, ocular, and central nervous system damage. Retrosternal burning, coughing, and chest tightening are symptoms of pulmonary poisoning. In adults, it can induce narrowing of the visual fields and myopia. Behavior changes, nausea, vertigo, facial twitching, and tonic-clonic seizures are all signs and symptoms of central nervous system poisoning.

# 6 CONCULUSION

Many major organs in our bodies require oxygen, which is commonly employed in all medical specialties. It is the first medicine administered in every emergency situation. Different types of oxygen giving systems are available and must be selected based on the state of particular patients. As each medicine has its own side effects, oxygen treatment has its hazards as well. However, in a crisis situation, it is the lifesaving medicine, thus it should never be avoided because lifesaving is our primary concern.

# 7 REFERENCES

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## THANK YOU...!