

NEBULIZATION

Definition: -

Nebulization is means of administering drugs by inhalation.

Equalizer breaks up the solution to be inhaled into fine droplets which are then suspended in a stream of gas.

The patient actively inhales this gas stream containing the drug.

Indications of Nebulization: -

1) Delivery of bronchodilator drugs : -

On acute attack of asthma Nebulization is the most common means of delivery.

Respiratory patients who are too short of breath to use pressurized aerosol or Rota haler effectively may be prescribed bronchodilators.

2) Infants and children with asthma : -

Inhalation by nebulizer is the only means of effective inhalation therapy until a child is about 4 yrs. Old.

3) Administration of antibiotics and antifungal agents.

In some cases of resistant chest infections for e.g. cystic fibrosis or bronchiectasis, antibiotics may be prescribed to be inhaled directly into the lungs.

4) To aid expectoration: -

Inhalation of hypertonic saline has been found to increase clearance of bronchial secretions.

5) Local analgesia : -

To relieve dyspnea in some terminally in patients such as those suffering from alveolar carcinoma

Types of Nebulizer: -

I) Jet Nebulizers : -

A high velocity of gas is blown through a fine hole creating an area of negative pressure.

Fluid is drawn from the reservoir by the Bernville effect into the jet stream and is impacted

on a battle breaking the fluid into droplets large droplets fall back to into the reservoir while the smaller ones may be inhaled.

Large volume Nebulizer:-

Used for long term therapy delivers heated or cool mist.

Cool mist can be more comfortable for recently excused patients.

Cool mist also indicated for patients with trauma or recent tracheotomy, because. Heated mist increase bleeding.

Heated mist is indicated for patients with artificial airway and for neonate (cold mist can cause hypothermia in neonate)

Side – stream Nebulizer : - It is attached to a ventilator or to an intermittent positive pressure breathing machine

Mini Nebulizer or Maxi mist: - It is hand held and used to deliver aerosol medications.

II) Ultrasonic nebulizer : -

High frequency sound waves are passed through a solution in a reservoir to create an aerosol. Advantage is that they operate quietly but they are less robust and need more careful maintenance than jet nebulizers and air compressors.

Some of these nebulizers depend on patient's ability to breathe in actively to open a valve .Some children and other patients with poor lung function may find this difficult.

It is indicated for those in short therapeutic sessions.

Indicated for the patient with thick secretions, to mobilize secretions and facilitate a productive cough.

Factors which affect nebulization

Method of administration / method of inhalation.

Viscosity and other physical characteristics of the liquid aerosolized.

Distribution of inspired gas (degree of airflow obstruction)

Flow rate of gas.

Preparation of articles: -

Nebulizers

Pressurized gas source

Flow meter

Oxygen tubing

T- Piece mouthpiece or mask or other appropriate gas delivery device.

Sterile normal saline solution or sterile distilled water

5 ml syringe and water.

Prescribed medication

Suction equipment

Sputum mug

Kidney tray

Stethoscope

B.P.apparatus, TPR tray

Preparing solution: -

It is important to use a minimum of 3 ml of solution and preferably 4 ml in order to deliver an adequate percentage of the prescribed drug.

(In an assessment of jet nebulizers when 2 ml was used only 50 % of dose was released as aerosol whereas with volume of 4 ml 60 – 80%)

Preparation of patient: -

Explain the procedure to the patient

The patient should be in a well supported position.

Breathe slowly and deeply using the lower chest.

Preparation of environment: -

The environment should be free from draughts of air.

The bed should be comfortable.

Preparation of Nurse : -

Verify the order on the patient's medication record by checking it against doctor's order.

Check the label of the medication (expiry date)

Confirm patient's identity by asking his name and by checking his name, room number, bed no e

Check gas flow.

Wash hands before procedure.

Administration of Nebulization: -

Explain procedure to patient

Record patient's vital signs to establishment a baseline

Place patient in sitting or high fowlers position to facility lung expansion an aerosol dispersion

Attach free end of the oxygen tubing to pressurized gas source

Turn on the gas source and check outflow port, usually a setting of 5 – 6 liters / min is adequate.

Instruct the patient to breathe slowly deeply and evenly through his mouth

After about three deep breaths he should breath gently using his lower chest (breathing control) It encouraged to breathe deeply throughout the entire treatment the patient suffer from effect of hyperventilation .

It possible, remain with the patient during treatment (usually 15 – 20 minutes)

Take vital signs to detect adverse reactions to medications.

Encourage and assist the patient to cough and expectorate,.

Briefly stop the treatment if he needs rest.

Instruct patient to report warmth discomfort or hot tubing

Check water level frequently to prevent complications from inhaling drug hot air

Complications or Nebulization: -

Infection: -

Due to bacterial growth in the container

Prevention:- clean the container every time, fill with fresh sterile solution each time.

Increased water absorption can cause over hydration leading to pulmonary edema in

patients with decreased cardiac output.

Ultra fine particulate can act as irritant to susceptible patients and cause bronchospasms.

Monitor vital signs of Auscultate chest for wheezes during procedure.

Should be used cautiously in patients with delicate fluid balance and in asthmatic patients with active or potential bronchospasm.

Care of patient

Make sure the patient is comfortable

Provide a sputum mug for spitting the expectoration

Documentations: -

Record time date and duration of therapy type, amount of medication added to nebulizer.

Baseline and subsequent vital signs and breath sounds.

Result of therapy such as loosened secretions

Any complications and nursing action taken

Patient's tolerance of the treatment

Continuously watch changes