Inhalation Therapy

Inhalation therapies are a group of respiratory or breathing treatments designed to improve breathing and the amount of *oxygen* (air) the body is getting. Inhalation therapies are ordered for various diseases with breathing failure. The decision to use inhalation therapy is based on a number of tests including *pulmonary* (lung) function and how your body is receiving oxygen.

INHALATION THERAPIES MAY INCLUDE:

- Oxygen therapy, which is ordered to support patients with **emphysema** and other *chronic* (longstanding) obstructive pulmonary disease (COPD). The oxygen therapy is usually ordered once decreased oxygen saturation in the blood or tissues is demonstrated. Oxygen therapy may also be used in the hospital setting to help return a patient's breathing and oxygen levels to normal. In the case of respiratory distress in newborns or adults, oxygen therapy may be attempted before mechanical ventilation since it is a noninvasive and less expensive choice. Oxygen has been found to be effective in treating patients with other diseases such as **cystic fibrosis**, chronic (longstanding) congestive **heart failure**, or other lung diseases.
- Incentive spirometry is a diagnostic method for measuring gases and respiratory function. Incentive spirometry may be ordered to help patients practice and improve controlled breathing. It may be used following surgery. A device provides positive feedback when a patient inhales at a predetermined rate and sustains the breath for a specific period of time. This helps teach the patient to take long, slow, and deep breaths. A spirometer, or equipment that measures pulmonary function, is provided to the patient. A respiratory therapist will work with the patient to demonstrate and explain the technique. Once patients show mastery of the technique, they are instructed to practice the exercises frequently on their own.
- Continuous positive airway pressure (CPAP) is used commonly used to treat **sleep apnea**, **respiratory distress syndrome** in infants, and **adult respiratory distress syndrome**. Signs of **atelectasis** (collapse of small sacs in the lungs) or abnormalities of the lower airways may also indicate the need for CPAP. Patients with sleep apnea will receive continuous positive airway pressure to prevent upper airway collapse. It is usually administered through a tight-fitting mask as humidified oxygen. The pressure of flow is constant during both exhaling and inhaling and the level of pressure is determined based on each individual. Most patients undergoing CPAP in a hospital setting will receive continuous monitoring of vital signs and periodic sampling of blood gas values.
- Oxygen chamber therapy is ordered for various causes that indicate immediate need for oxygen saturation in the blood. Divers with decompression illness, climbers in high altitude, patients suffering from severe carbon dioxide **poisoning**, and children or adults in *acute* (sudden) respiratory distress may require oxygen chamber therapy. In recent years, physicians have also used the forced pressure of oxygen chambers (hyperbaric chambers) to help heal **burns** and other **wounds** since the pressure under which the oxygen is delivered can reach areas that are blocked off or suffering from poor circulation. The main purpose of the oxygen is to prevent damage to vital organs resulting from poor oxygen supply. The lowest possible saturation will be given to keep the patient's measurements at a minimum acceptable level. This treatment delivers pure oxygen under pressure equal to that of 2-3 times normal atmospheric pressure. For years, this treatment has been especially effective on scuba divers who suffer from the "bends," or decompression illness. The patient enters the chamber, a plastic cylinder-shaped structure that is normally transparent. In most cases, just one patient will enter by being rolled into the chamber on a type of stretcher. Once inside, the oxygen will be delivered under forced pressure and the patient is free to read, nap, or listen to the radio. The therapy usually lasts one hour, although it can take up to five hours in serious decompression cases. Before exiting the chamber, the pressure will eventually be lowered to normal atmospheric level.
- Mechanical ventilation is used in patients with severe breathing problems, and is often used in intensive care situations. In some cases, mechanical ventilation is a final attempt to continue the breathing function in patients whom are no longer able to adequately breathe for themselves.
- Not all infants with breathing problems will require measures as severe as mechanical ventilation. The physician will make the determination based on weight and condition of the infant. Newborns with patent ductus arteriosis, a handicap affecting the pulmonary artery, are more likely to suffer pulmonary hemorrhage

from mechanical ventilation. Infants are continuously monitored to determine even small changes in breathing function. Mechanical ventilation can result in increases in respiratory distress or other complications. It is possible for the ventilator to be accidentally disconnected and staff is trained to watch for signs or alarms indicating disconnection. Mechanical ventilation increases risk of infection in *premature* (early) babies. Complications of PEEP or CPAP may include pneumothorax or decreased cardiac output.

REASONS FOR NOT USING INHALATION THERAPY

- Patients and family members who smoke should not have oxygen prescribed or should avoid **smoking** in the area to prevent combustion. Sedatives should be avoided for patients on oxygen therapy.
- Patients who are unable or unwilling to properly and consistently practice incentive spirometry as prescribed should not receive this form of treatment.
- Patients unable or unwilling to comply with the physician's instructions for use of CPAP are not likely to have it prescribed. Extremely obese patients may have less success with this form of therapy for the treatment of sleep apnea.
- Complications may arise from oxygen chamber therapy during transport to or from the oxygen chamber. Some patients may not receive enough benefit to outweigh possible complications. All patients, particularly children, must be carefully monitored.
- Use of mechanical ventilation will be carefully weighed against benefit and possible risks. Some patients will require **sedation** to prevent fighting of the ventilator, which can increase the risk of complications.

RISKS OF INHALATION THERAPY

- At-home oxygen therapy carries risk if improper care is taken to follow instructions when handling the oxygen. Patients are cautioned not to smoke near the oxygen supply and to keep the supply away from other sources that may cause electrical spark, flames, or intense heat. Patients on home oxygen therapy should avoid use of sedatives.
- Risks of infection are present when endotracheal tubes are left in place.
- Rupture of a lung may occur when positive pressure is applied to the lungs.

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