OXYGEN THERAPY

PREPARED BY

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OBJECTIVES

- THE STUDENT KNOWS WHAT OXYGEN IS, ITS BENEFITS TO THE BODY
- TO KNOW OXYGEN THERAPY AND TO DISTINGUISH THE WAYS TO GIVE IT.

INTRODUCTION

- **OXYGEN:** IS A GAS TRANSPORTED IN THE BLOOD IN TWO FORMS: PHYSICALLY DISSOLVED IN PLASMA (2%) AND CHEMICALLY BOUND TO THE HEMOGLOBIN MOLECULE IN RED BLOOD CELLS (98%).

- **OXYGEN THERAPY:** IS THE ADMINISTRATION OF OXYGEN, THROUGH A VARIETY OF DELIVERY METHODS, FOR BOTH ACUTE AND CHRONIC RESPIRATORY CONDITIONS.

THE GOALS OF OXYGEN THERAPY ARE TO PROVIDE ADEQUATE OXYGEN TO THE TISSUES, PREVENT LACTIC ACID ACCUMULATION RESULTING.

INDICATION

- HYPOXIA
- HYPOXEMIA
- PNEUMONIA
- OXYGEN IS USUALLY REQUIRED FOR CHILDREN WHO HAVE
- A PARTIAL PRESSURE OF ARTERIAL OXYGEN (PAO2) LESS THAN

60 MM HG OR AN OXYGEN SATURATION RANGE OF **89%** TO **92%** ON PULSE OXIMETRY.

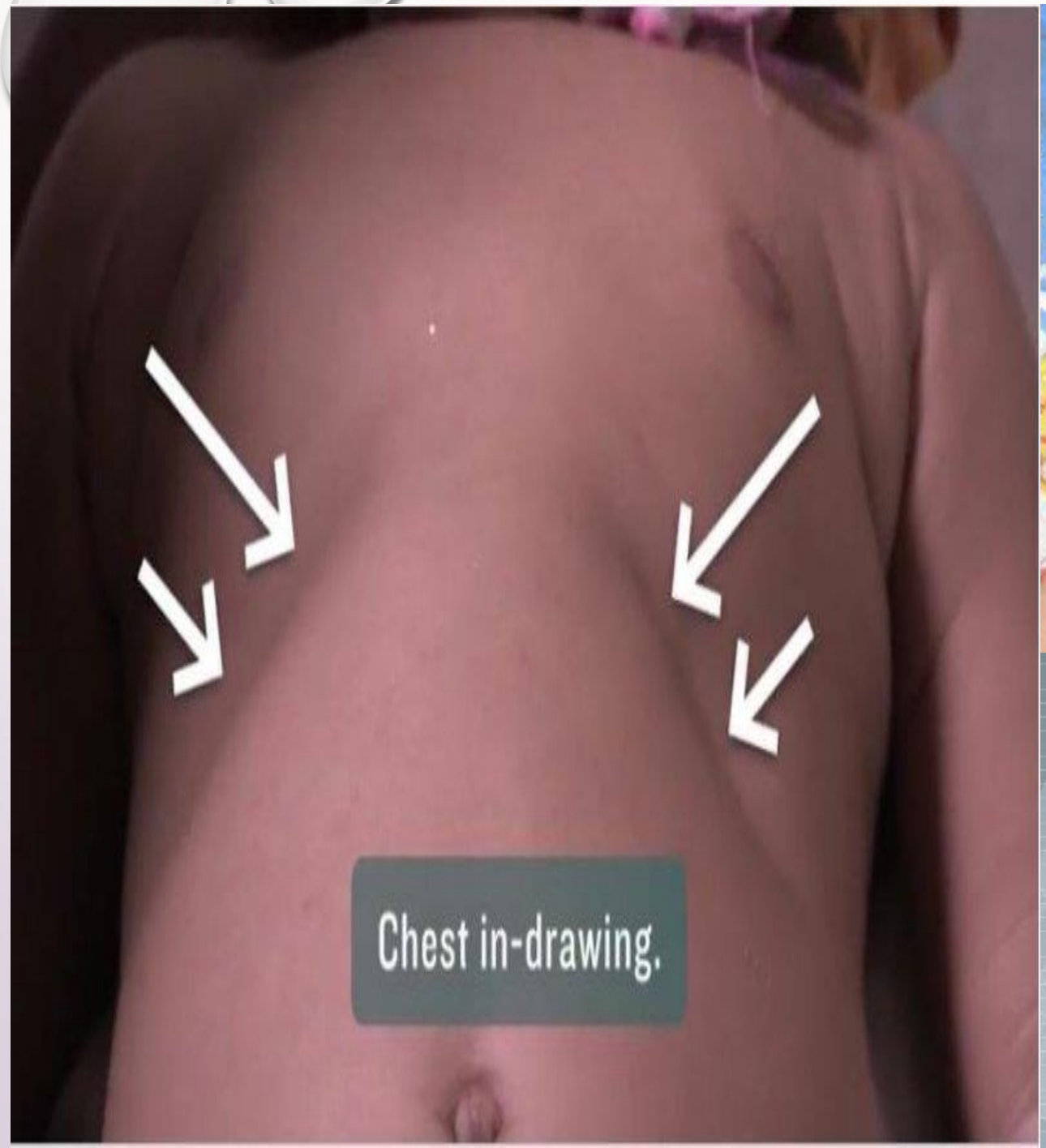
METHODS TO DETECT OXYGEN LEVEL

- CLINICAL SIGNS
- PULSE OXIMETRY
- ARTERIAL BLOOD GAS ANALYSIS : ASSESSES A PATIENT'S PARTIAL PRESSURE OF OXYGEN (PAO2) AND CARBON DIOXIDE (PACO2)

CLINICAL SIGNS

THE CLINICAL SIGNS APPEARS ON THE CHILD THAT MEANS NEED FOR OXYGEN THERAPY

1. **CENTRAL CYANOSIS**
2. **NASAL FLARING**
3. **INABILITY TO DRINK OR FEED** (WHEN DUE TO RESPIRATORY DISTRESS)
4. **GRUNTING WITH EVERY BREATH CREPITATIONS OR CRACKLES** : CREPITATIONS OR CRACKLES ARE ABNORMAL RESPIRATORY SOUNDS THAT CAN BE HEARD WITH A STETHOSCOPE, RESULTING FROM THE PASSAGE OF AIR THROUGH FLUID IN THE RESPIRATORY TRACT (EITHER THE BRONCHI OR ALVEOLI)
5. **DEPRESSED MENTAL STATE** (DROWSY, LETHARGIC)
6. **SEVERE LOWER CHEST WALL IN DRAWING**
7. **RESPIRATORY RATE ≥ 70/MIN**


Chest in-drawing.


Normal nostrils
Flared nostrils
Nasal Flaring

PULSE OXIMETRY TO MEASURES OXYGEN SATURATION OF HEMOGLOBIN IN THE BLOOD

SOURCES OF OXYGEN SUPPLY

Oxygen concentrators➢

Central piped oxygen➢

➢OXYGEN CYLINDERS

METHODS OF PROVIDING OXYGEN THERAPY

- 1.MASK(SIMPLY IS USED FOR TERM THERAPY 5_10 L/MIN)
- 2.NASAL CANULA
- 3.TENT
- 4.HOOD
- 5.FACE TENT
- 6. CPAP
- 7.MECHANICAL VENTILATOR
- THIS TYPES CHOOSING DEPEND ON CONCENTRATION NEEDED AND CHILD ABILITY TO COOPERATE

Table 6–3 Oxygen Delivery Methods

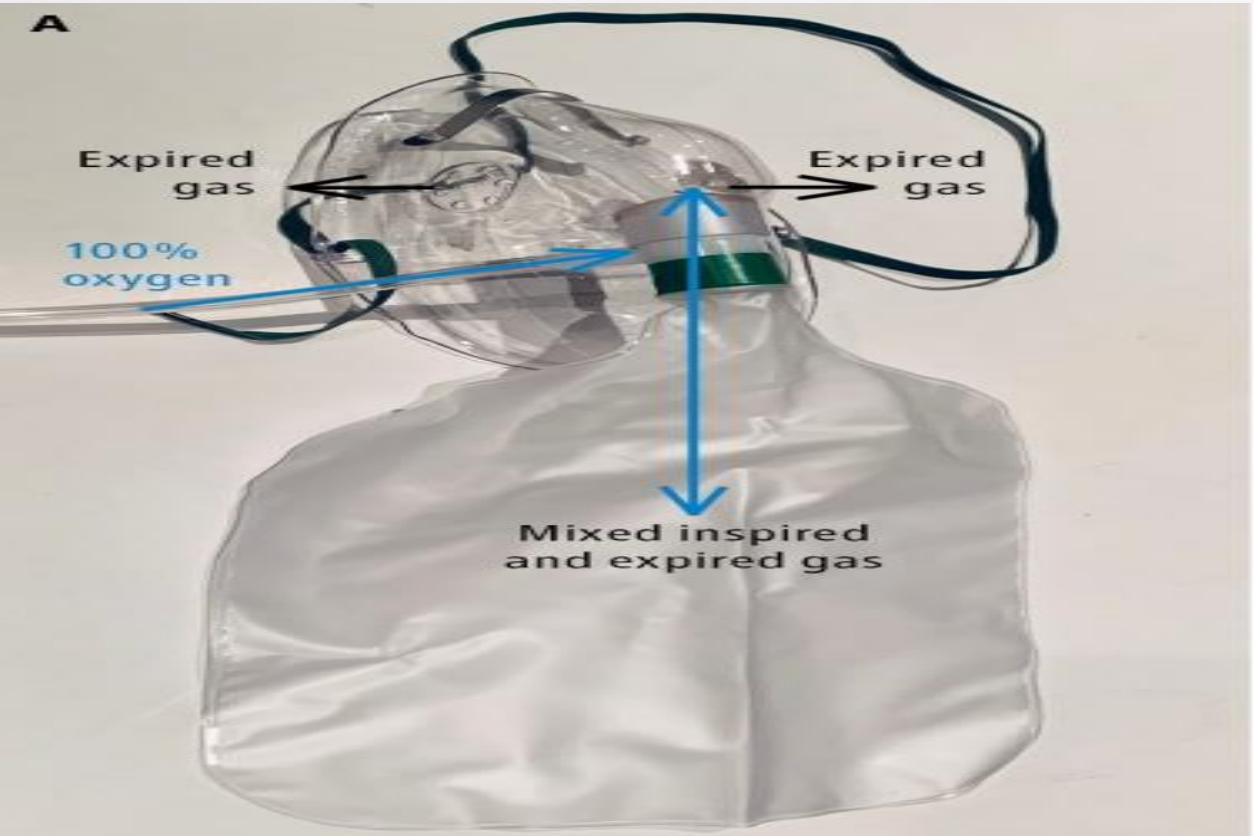
DELIVERY METHOD	EXPLANATION
Face mask	A molded covering that fits over the mouth and nose that delivers 35% to 60% oxygen with a flow rate of 6–10 L/min
Venturi mask	A high-flow oxygen therapy device that delivers a controlled concentration of oxygen (24%–50%)
Nasal cannula	Nasal tubing with prongs inserted into the nostrils that delivers 22%–44% oxygen with a flow rate of 1–6 L/min
Oxygen hood	A plastic dome that delivers high concentrations of oxygen (80%–90%) to infants who can breathe on their own but still need oxygen
Oxygen tent	A canopy placed over a bed for the continuous administration of high humidity and oxygen with up to 50% concentration
Partial rebreather mask	A face mask that fits over the mouth and nose and has an oxygen reservoir bag providing 50%–60% oxygen concentration
Nonrebreather mask	A face mask that fits over the mouth and nose and has an attached reservoir bag; exhaled air is directed through a one-way valve that prevents the inhalation of room air and the reinhalation of exhaled air; provides the administration of high concentrations of oxygen (60%–90%)

TABLE 27-8 ADVANTAGES AND DISADVANTAGES OF VARIOUS OXYGEN-DELIVERY SYSTEMS

SYSTEMS	ADVANTAGES	DISADVANTAGES
Oxygen mask	Various sizes available; delivers higher oxygen concentration than cannula Able to provide a predictable concentration of oxygen (with Venturi mask) whether child breathes through nose or mouth	Skin irritation Possibility child has fear of mask or suffocation Accumulation of moisture on face Possibility of aspiration of vomitus Difficulty in controlling precise oxygen delivery concentration
Nasal cannula	Provides low-flow and high-flow oxygen Infant/child can be held by parent/caregiver and fed as well as routine cares provided Child able to eat and talk while receiving oxygen Possibility of more complete observation of child because nose and mouth remain unobstructed	Must have patent nasal passages May cause abdominal distention and discomfort or vomiting Difficulty controlling oxygen concentrations if child breathes through mouth Inability to provide mist if desired May cause irritation to nares
Oxygen tent (rarely used)	Achievement of lower oxygen concentrations ($FiO_2 \leq 0.3$-0.5) Child able to receive increased inspired oxygen concentrations even while eating	Necessity for right fit around bed or crib to prevent leakage of gas Cool and wet tent environment Poor access to patient; inspired oxygen levels fall when tent is entered Child may not tolerate it around the bed/crib
Oxygen hood	Achievement of high oxygen concentrations ($FiO_2 < 1.00$) Free access to patient's chest for assessment Used more often to provide high humidity; less commonly used to provide oxygen to infants	Not tolerated by children who are old enough to push it off High humidity environment


Nasal Cannulae
Hood Box

Venturi Mask Valves



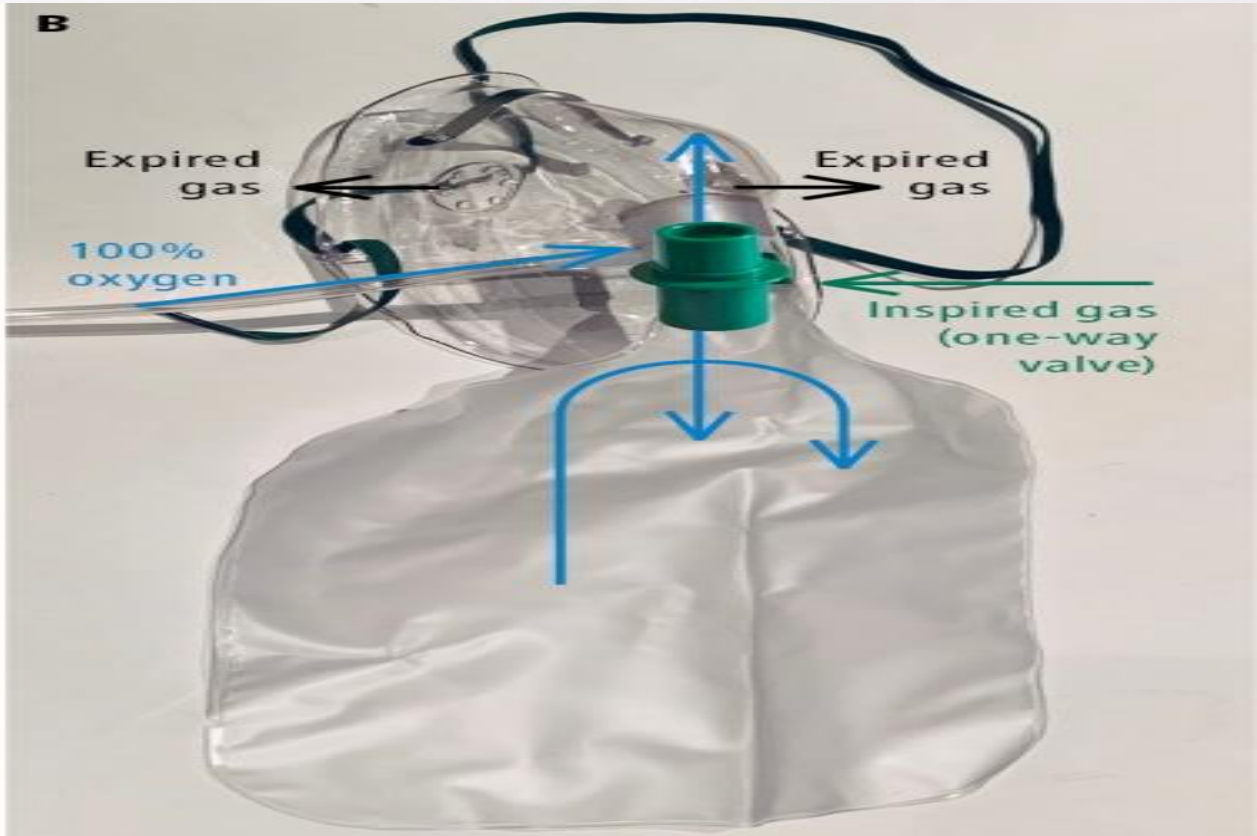


FIG. 27-11 Oxygen administered to infant by means of plastic hood. Note oxygen analyzer (blue machine).

NURSING CONSIDERATIONS

1. EXPLAIN TO THE PARENTS (AND THE CHILD, IF HE'S OLD ENOUGH) WHY OXYGEN IS BEING ADMINISTERED AND HOW IT WILL HELP THE CHILD'S CONDITION.
2. ASSESS THE CHILD'S DEVELOPMENTAL LEVEL AND ABILITY TO INTERACT.
3. SELECT THE APPROPRIATE OXYGEN DELIVERY DEVICE PER THE PRACTITIONER'S ORDER.
4. MONITOR THE EFFECTIVENESS OF OXYGEN THERAPY BY ASSESSING

THE CHILD'S COLOR, PULSE OXIMETRY, AND PAO2 USING ABG ANALYSIS.

5. MAKE SURE THAT THE PATIENT IS RECEIVING THE APPROPRIATE CONCENTRATION

OF OXYGEN; ALSO MAKE SURE THAT THE OXYGEN IS BEING

HUMIDIFIED BEFORE DELIVERY TO THE PATIENT.

NURSING CONSIDERATIONS

6. FREQUENTLY MONITOR FOR CHILD TEMPERATURE AND OXYGEN

7. SKIN CARE FOR NASAL POSING IS IMPORTANT TO PREVENT BREAKDOWN

8.MONITOR CARDIOPULMONARY AND RESPIRATORY STATUS

9. SIGNS OF CARBON DIOXIDE RE BREATH

- **DIZZINESS**
- **HEADACHE**
- **TINGLING**
- **UNCONSCIOUSNESS**
- **10** . DOCUMENT THE PROCEDURE IN THE CHILD'S RECORD.

COMPLICATION OF OXYGEN

1. DAMAGE LUNG TISSUE
2. BRONCHOPULMONARY DYSPLASIA (BPD)
3. DAMAGE TO LUNG CAPILLARIES, DIFFUSE MICRO HEMORRHAGIC
4. CHANGES, DIMINISHED MUCUS FLOW, INACTIVATION OF SURFACTANT, ALTERED CILIARY FUNCTION.

Complication of oxygen

6-ATELECTASIS MAY OCCUR AS A RESULT OF THE "WASHING OUT" OF NITROGEN FROM THE ALVEOLI BY THE HIGH CONCENTRATIONS OF OXYGEN.

7-CHANGES IN THE RENAL TUBULES

8-NEUROGENIC SEIZURES, AND AN INCREASED RATE OF DESTRUCTION OF RED BLOOD CELLS.

8- DRYNESS OF MUCOUS MEMBRANE

9- RETINOPATHY

10-INFECTION

QUESTION :OXYGEN IS A DRUG?

REFERENCE

HOCKENBERRY M., WILSON D., WONG'S NURSING CARE OF INFANTS AND CHILDREN, 10TH EDITION ,2015,CANADA,ELSEVIER,P: (1141,1142).

SUZANNE M, OXYGEN THERAPY AND OXYGEN DELIVERY (PEDIATRIC) 2020, ELSEVIER

MIERTOVÁ M. , 2012, OXYGEN THERAPY, HTTPS://PORTAL.JFMED.UNIBA.SK/DOWNLOAD.PHP?FID=329


THANK YOU