



## Season 3 Episode 4 - All About Respiratory

### All Things Respiratory

Grab your nasal cannula and crank it up to 4L/min because in this episode, we interview [Sean Dent](#) who is an NP in acute care and discuss all things respiratory!

### Introduction to Sean Dent

- 13+ years nursing experience
- Spent almost entire career inside the ICU
- Worked for 3 months in orthopedics at the beginning of his career
- Has worked in every type of ICU in the adult world
- 6-7 years ago decided to go to NP School
- Currently working on his 5th year as an Acute Care Nurse Practitioner for a Level 2 Trauma Service that provides critical care services to all of the ICUs inside of the walls of the hospital

# Basic Things Points About A Gas Exchange A New Nurse Needs to Be Aware of

What most nurses forget about the airway is what happens between the outside and the back of your throat.

- The most important part of all that is what can the patient do to assist themselves in their pulmonary toileting
- Definition of pulmonary toileting: coughing and deep breathing. At its most basic level, can they take a deep breath, can they cough, and for those of us in the ICU world, can they protect their airway? Can they stop anything besides air from going down their trachea? Can they do that on purpose?
- There are diseases that affect the epiglottis and the ability for your epiglottis to function properly. Things like “microaspiration” and vocal cord partial paralysis.
- If you have someone that has a neurological disease process like a stroke or is weak from debilitation, their pulmonary toileting is going to be affected.
- It is your job as a nurse - no matter the level - to master what goes from the outside to the back of the throat.

## Oxygen Delivery Methods & Common Mistakes With Them

These are common mistakes with supplemental oxygen. Oxygen is a medication. It is toxic. Too much, too fast, or not enough, will kill the patient. Take it seriously.

- Nasal Cannula - Delivers up to 6 liters of oxygen. It is affective at up to 6 liters of oxygen. Anything beyond that you are talking about flow rates and whether or not the amount of oxygen that you are blowing into their nose is getting into their airways.
  - If patients don't need oxygen, don't put them on it. Oxygen can be toxic.
  - If a patient has it and doesn't need it anymore, take it off.
  - Common mistake - Putting it on too high and not humidified. Only put it on if you need to, and always put it on correctly.
    - Make sure to add humidification!
- High Flow Nasal Cannula - 6 liters up to 15 liters of oxygen.
  - Keep in mind the comfort level. You are blowing 16 liters of oxygen through their nares
  - Before you put it in their nose, put it on your hand. Feel how much is blowing on your hand. That amount of oxygen will blow on your face as if you are in a car.
  - The idea behind high flow is you are still using the nares to deliver oxygen and 6 liters wasn't enough.
  - Anyone that really needs that much oxygen better have a chronic respiratory problem that needs addressing in an aggressive manner.
  - Some patients need it because they are on an oxygen mask but can't use the mask when they are eating so they are put on high flow while they eat.

- Putting on high flow without humidifying will cause patient's lips to crack, it will dry out their airways, and cause nose bleeds. It can also mask a true assessment of your patient because it dries out the mucus membranes.
  - Add humidification!
- Simple Face Mask
  - Has no titration to it. It is basically a nasal cannula but as a face mask. This is for the mouth-breathers.
  - Can deliver the same amount of oxygen as nasal cannula.
  - Think about the delivery method and how your patient is accepting it.
    - If I am blowing 15 liters of oxygen into their nose but their mouth is open, am I really giving them 15 liters of oxygen?
  - A face mask gives them a pseudo-seal.
  - It looks like a BiPap Mask
  - It does not have an titration to it.
  - There is no advantage to it, other than if the nasal cannula isn't effective
    - Mouth breathers
    - Patients who have had facial surgeries
    - Jaw removed from cancer
  - It is not a sealed mask.
- Venti-Mask
  - A simple face mask with a dial that you can dial the titration of the oxygen
  - Some venti masks are titrated by liters
  - Some are titrated by percent of oxygen
  - Some can seal, most you cannot
    - A seal means no oxygen can escape the borders of the mask and the patient's skin.
  - New Grads, how to know what percent to set the dial at:
    - Start low and go slow.
  - If you are upping your game in any way, make a call to respiratory therapy. They are the experts and specialists that are going to augment your therapy.
  - Venti mask isn't something that is easily accessible, you have to get it from respiratory.
- Face Tent
  - Used post-operatively and on post-surgery patients.
  - A simple face mask that sits underneath their chin. It straps to the back of their head to hold it against their face.
  - It is something to augment a patient with supplemental oxygen while they wake up from anesthesia.
  - It isn't something you are going to see unless you are in a specialty area.
    - For example, after a transphenoidal tumor resection
- Humidified Face Mask
  - If you have someone that has a lot of secretions and you give them continued dry oxygen, they are going to wind up developing mucus plugs.

- Anytime you can give humidified, you should. Even on 2 liters nasal cannula.
- You are bypassing your body's natural ability to humidify air.
- Nasal Trumpet
  - This is for someone who has sleep apnea, or a history of obstruction or a deviated septum or getting frequent NT suctioning.
  - It stops the tongue from dropping in the back of the throat and creates a clear path.
  - My be used for someone who is not protecting their airway entirely, but is somewhat and they don't necessarily require intubation
- Non-Rebreather (NRB)
  - This will deliver the most amount of oxygen you can before you put them on a BiPAP / CPAP, or a ventilator.
  - Anything above a non-rebreather is called a non-invasive positive pressure ventilation - some form of pushing air into the lungs, not just throwing oxygen into the nose or mouth.
  - It delivers 100% pure oxygen at anything above 15 liters
  - It creates a pseudo-seal between the skin and the device.
  - If you don't deliver the proper amount of oxygen, it will starve your patient of oxygen.
    - You need to deliver the proper amount of oxygen.
    - There is a bladder that is supposed to be full of oxygen. If that bladder or balloon is not full, you have not turned the oxygen up high enough.
    - Check the oxygen level in the balloon and make sure it is full before putting it on the patient's face.
  - Crank it up until the dial can't turn anymore, you will hear a deafening sound from the wall.
  - Leverage the knowledge of the respiratory therapist about how to use the devices. You can't afford to use them wrong.
- BiPAP/ CPAP
  - Non-Invasive Positive Pressure Ventilation - NIPPV
  - If you use either of these 2 therapies, they better have a chronic problem or you better have involved your providers. This is *advanced*.
  - Beards can cause sealing issues.
  - Putting the mask on too tight can cause pressure sores.
  - The alarm is really annoying if air is escaping.
  - They both create a seal between the patient and the mask. Air should not be escaping between the edges of the mask.
  - CPAP vs BiPAP
    - CPAP is continuous - **Continuous Positive Airway Pressure**. Same amount of pressure no matter what the patient is doing or not doing.
    - BiPAP - There are bilevels to it. **Bi-level Positive Airway Pressure**. You can titrate what goes in and what goes out.
- Invasive Positive Pressure Ventilation

- Also known as mechanical ventilation
- Last resort
- Direct line of communication between the patient and the oxygen delivery system.
- A plastic tube in the trachea.
- You have complete control of how much oxygen they are receiving.
- Common mistakes new grads make:
  - If the monitor is alarming, look at the machine, is something not right? If you don't know, grab a respiratory therapist.
  - Tubing could be touching the screen, Is there a kink in the tube? Did it pop off? Is the patient coughing?
  - Don't just hit silence on the alarm, ask someone else. Investigate the cause of the alarm. Oxygen is a medication, treat it like that.

## The Oxygen Saturation Monitor

It is not the end-all or do-all for respiratory status.

How to know that number is accurate:

- View everything in respiratory the same way you view other things. Check the patient first, monitors second. There is always a malfunction or problem with monitors.
- Rely on your assessment skills.
- Look at the patient and their work of breathing.
  - How does the patient look? Are they in distress or completely comatose?
- Pull the covers down and see how hard they are working to breathe.
- Count respiratory rate, don't just rely on the number on the screen.

## Oxyhemoglobin Curve

- Learned this in nursing school - may need to brush up!
- PAO<sub>2</sub> vs SPO<sub>2</sub>
- Work of breathing
- Oxygen sats are the last thing to go
  - If you are treating sat you are treating the *last thing* to go.

## Respiratory Advice for New Grads

What all new grads should know about treating respiratory issues.

- Rely on your physical assessment skills and basic nursing knowledge.
- There isn't one piece of equipment out there that will trump your gut and assessment skills.

- If you feel in your gut like something is wrong, act on it.
- Something as simple as sitting them up in bed could improve their sats by 10%.
- Deep breathing and coughing (pulmonary toileting) - matters.
- Do pulmonary toileting instead of spirometry
  - Don't just leave the order for spirometry on your notes, it is actually exercise for the lungs. If they're not doing it, it can't be beneficial.
  - Educate patients on it and make sure they're doing it