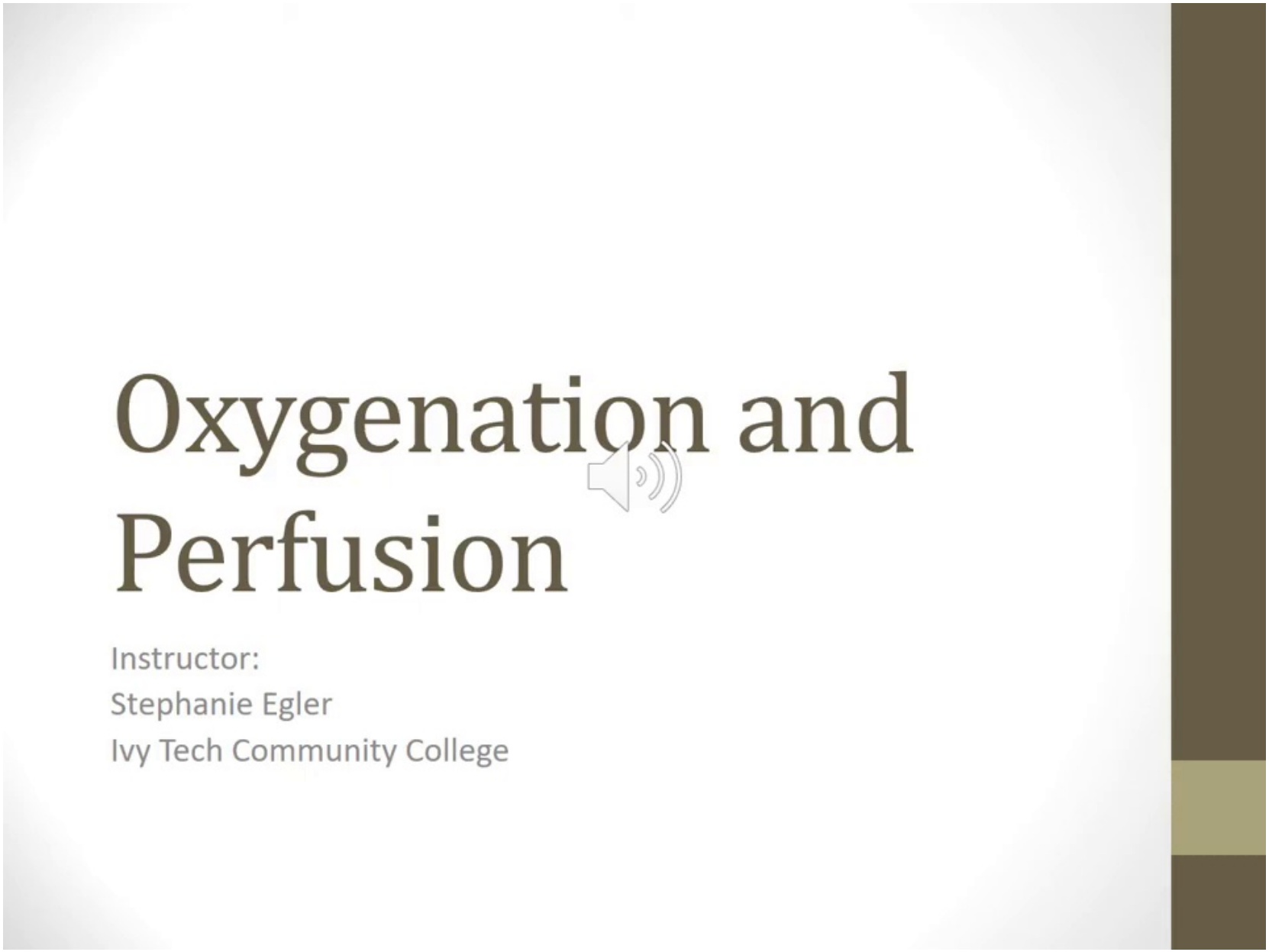
[2.0 - 66.0]



Made with Vizle #1

We are going to go through this PowerPoint today. In the beginning, we have a lot of anatomy. The book starts off with a lot of anatomy and explaining the respiratory system and a little bit of our cardiac

because of profusion and how that affects our situation. I know you've all had anatomy. So the beginning of these PowerPoints, I'm just going to briefly run through anatomy on the slides

and then we'll get into more of the content as we go through the PowerPoint. So when we think about the anatomy of our respiratory system, we want to ask ourselves, why is this important?

And basically, it is the pathway for transport and exchange of oxygen and carbon dioxide. So if we understand the role of our respiratory and our cardiovascular systems, we have a better foundation for understanding and assessing oxygenation in our patients.

Made with Vizle #2

Anatomy of Respiratory System

- **Why is anatomy important?**
- It is the pathway for transport and exchange of oxygen and carbon dioxide
- Understanding the role of the respiratory and cardiovascular systems provides foundation for assessing oxygenation in our patients
- This assessment assist us in planning and implementing interventions to promote optimal oxygenation.

Made with Vizle #3

And this assessment when we are assessing that oxygenation of our patients can assist us in planning and determining what interventions we are going to want to promote for that optimal oxygenation. So as we get started, as I said, we're going to go through the anatomy of our respiratory system.

So just a basic overview, the respiratory system consists of our airway, which begins at our nose and ends at the terminal bronchules. We have our upper airway, which consists of our nose, our pharynx, our larynx, and our upper glottis.

Made with Vizle #4

Anatomy of Respiratory System

- **Airway**-begins at the nose ends at the terminal bronchioles
- **Upper airway**
  - Nose, pharynx, larynx, epiglottis
- **Lower airway**
  - Trachea, right/left main stem bronchi, segmental bronchi, terminal bronchioles
- **Mucous**
  - Lines airway
  - Helps trap debris
  - Protects underlying tissue
- **Cilia**
  - Helps propel trapped material up the airway
    - Thinner mucous helps this process

Made with Vizle #5

[99.0 - 165.0]

Then our lower airway is our trachea. We have a left and right main stem bronchye, segmental bronchye, and terminal bronchules. The mucus. So we have mucus within our naries and that lines our airway.

It now helps us trap debris and protects us from underlying our protects our underlying tissues. And then we have silia, which help propel trapped material up the airway.

The thinner our mucus is helps with this process as well. So when we think of our respiratory system, we need to think of all these different parts that make up our respiratory system.

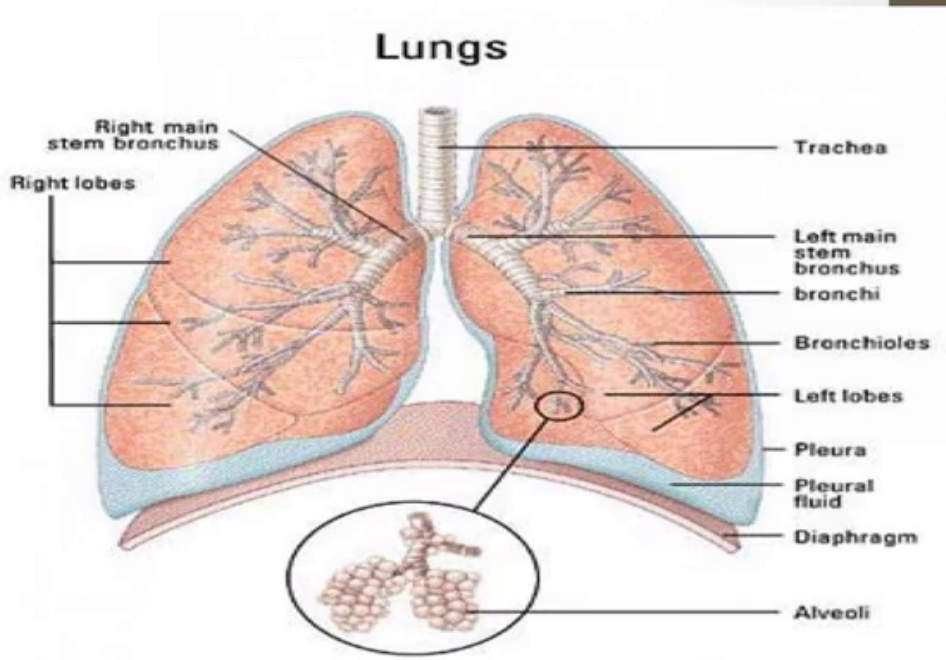
As we continue on, our respiratory system is also composed of our lungs. So our right lung has three lobes and our left lung has two lobes. They're composed of elastic tissue.

And this is good to think about because as we start to age, we may see a decrease in the elastic tissue, which is going to cause some compliance problems with having that lung being able to expand.

Made with Vizle #6

Anatomy of the Respiratory System

- Lungs
  - Right lung 3 lobes
  - Left lung 2 lobes
  - Composed of elastic tissue



- Alveoli
  - Small air sacs at the end of bronchioles
  - Made of single cell layer of squamous epithelium
  - Covered in capillaries
  - Site of gas exchange
  - Surfactant reduces surface tension in alveoli helping prevent collapse

Made with Vizle #7

[165.0 - 231.0]

So we'll talk about that in a few slides down. We also within our respiratory system have a VLI, which are small air sacs at the end of the bronchules.

They're made of single cell layer of squamous epithelium. They're covered in capillaries. And this is our site for gas exchange.

So if we have a surfactant reduces surface tension in our VLI, helping prevent their collapse. As we continue to review our anatomy of our respiratory system, we have Plora.

And this is a serious, our serious membrane. The visceral plural covers are lungs. The parietal plural lines are thoracic cavity.

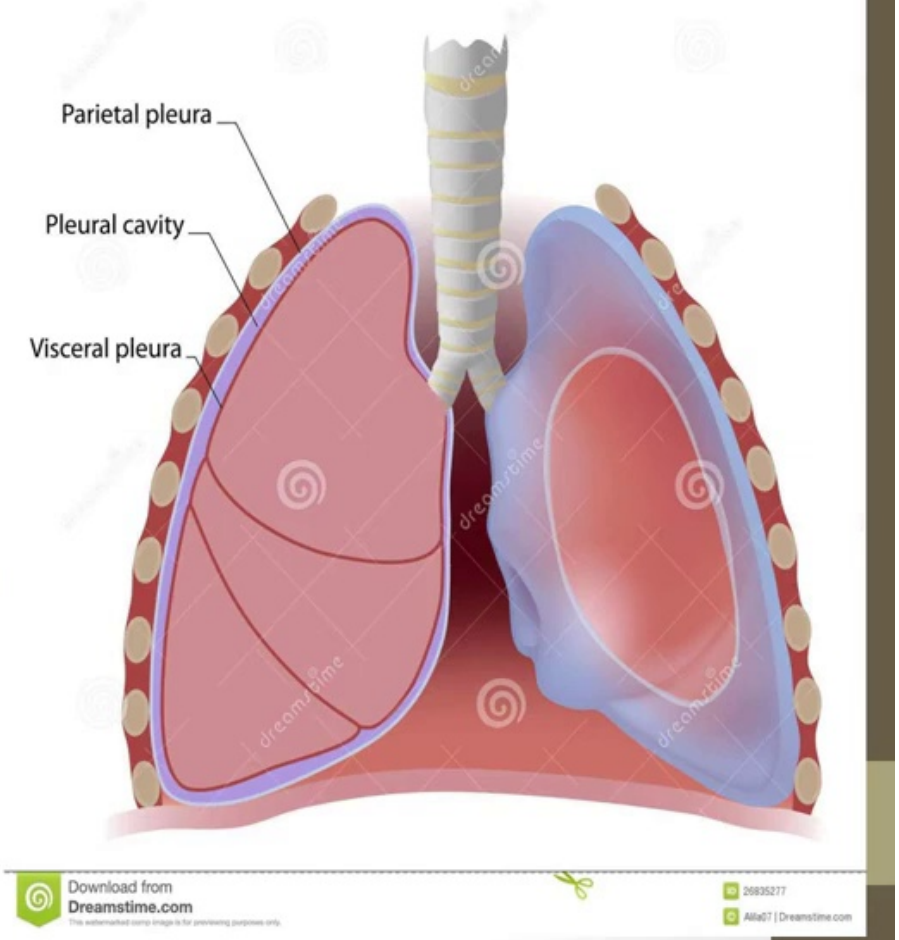
And these are continuous and form a sac. This, the sac is filled with Plora fluid. This fluid is lubricant.

Made with Vizle #8

Anatomy of Respiratory System

Pleura

- Serous membrane
- Visceral pleura covers lung
- Parietal pleura lines thoracic cavity
- These are continuous and form a sac
  - Sac is filled with pleural fluid
    - Fluid is lubricant that allows lungs to easily move along the chest wall
  - Pressure in the pleural space is always sub-atmospheric
    - Holds the lungs in the expanded position



Made with Vizle #9

And this is what allows our lungs to easily move along the chest wall. The physiology of our respiratory system. So pulmonary ventilation.

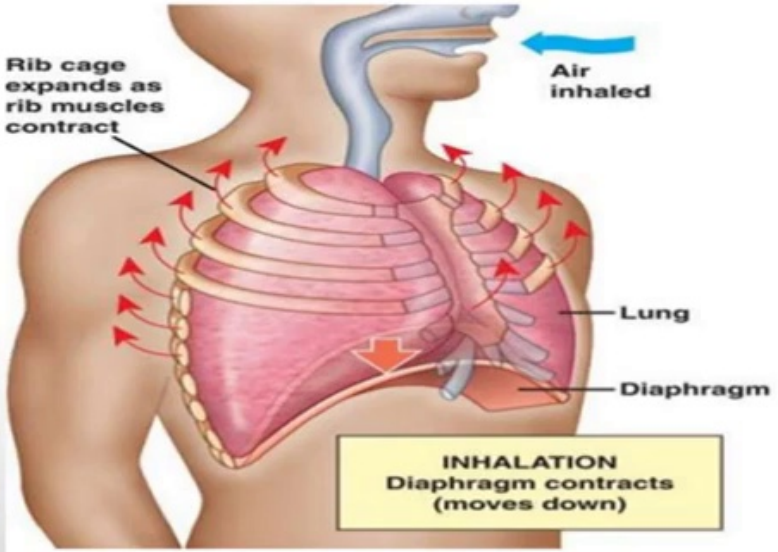
We have the movement of air in and out of our lungs. And this takes place with two steps, inhalation and exhalation.

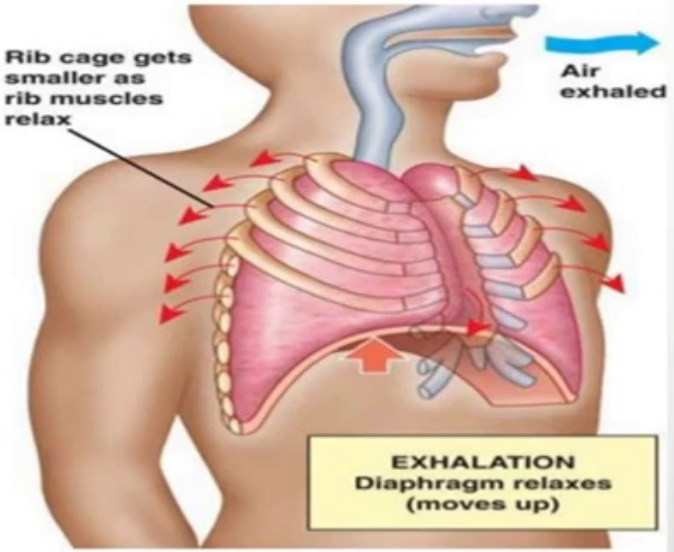
With inhalation, our diaphragm contracts and descends into the thoracic cavity. This is the active phase that brings air into our lungs.

Made with Vizle #10

Physiology of Respiratory System

- **Inhalation**
  - **Active phase**
    - Diaphragm contracts and descends into thoracic cavity
    - Intercostal muscles contract lifting the ribs
    - Sternum pushes forward enlarging the chest
  - Process increases lung volume and decreases intrapulmonary pressure
    - Allows for atmospheric air to move from area of greater pressure (outside body), to area of lesser pressure (lungs).





Made with Vizle #11

The next phase, exhalation, diaphragm relaxes. This is the passive phase where the air moves out of our lungs.

Air moves from a greater pressure in the lungs to an area of less pressure outside of the body within this phase. Some other factors that contribute to air flow in and out of our lungs is our compliance of our lungs.

So, as I mentioned earlier, our ability of our lung to be inflated depends on upon its elasticity.

Made with Vizle #12

Compliance

- Ability of lungs to be inflated
- Depends upon elasticity
  - Decreased elasticity decreases compliance
    - Aging
    - Emphysema

Made with Vizle #13

So, there are conditions such as infosema, as well as aging, that cause that decrease elasticity or that compliance. And so, if you think about it, the ability of the lung to inflate depends upon its elasticity.

If you think about trying to blow up a balloon. And it doesn't want to blow up very easily.

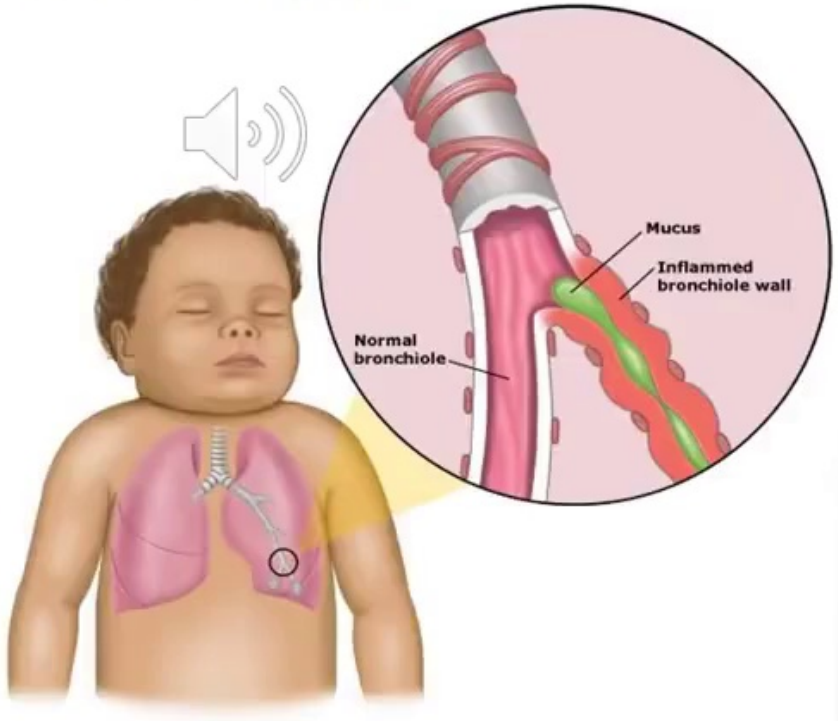
That can be what you can think of when you think about compliance in that elasticity. Is it requires a greater inspiration or a greater push of air to inflate those lungs.

So, compliance will affect the amount of oxygenation a patient has and how much effort it takes to actually inflate their lungs while they're breathing. And my resistance is another factor when we're thinking about our respiratory system that can have an impact.

Made with Vizle #14

Airway Resistance

- Impedes air movement into lungs
  - Obstruction
    - Foreign body, tumors, thick mucous, liquids
  - Constriction
    - Asthma



And so, any process that changes the bronchial diameter or the width can cause a resistance, which can impede that air movement into the lungs. So, any obstruction, whether it's a form body, tumors, maybe the patients really ill with.

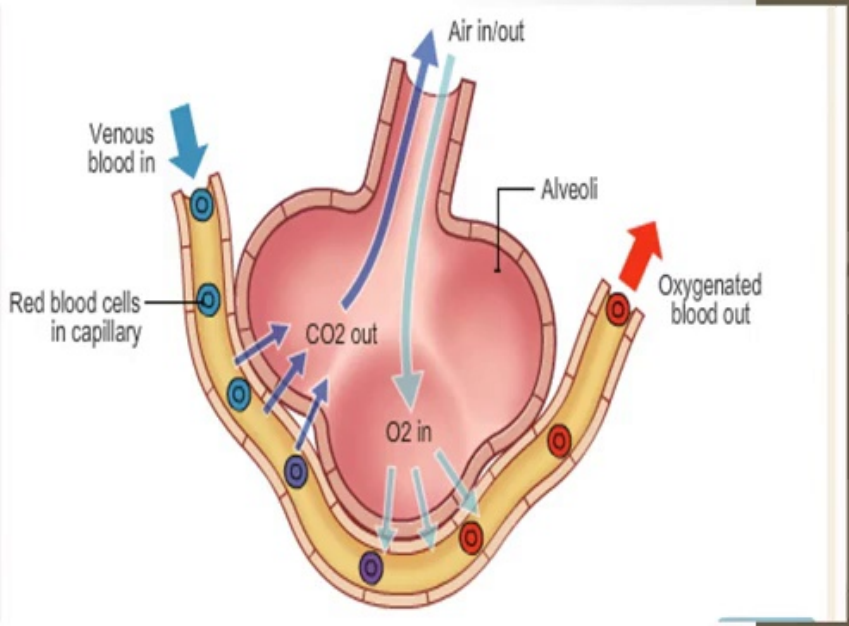
In ammonia, they may have the stick mucus that kind of blocks that airway or some conditions such as asthma which kind of constrict or narrow that airway are going to cause airway resistance. And they're going to impede that air movement into the lung.

As I said earlier with our respiratory respirations, we have gas exchange. The rest of the respiratory system involves the gas exchange between the atmospheric air and the VLI and blood in the capillaries.

This gas exchange, as I said earlier, occurs in the VLI. And it takes diffusion, which diffusion, I don't know if you have that anatomy or biology, is that movement from an area of higher concentration to lower.

Made with Vizle #16

Respiration



Gas exchange

- Occurs in the alveoli
- Diffusion
  - Movement of gas particles from area of higher pressure/concentration to area of lower pressure/concentration

Affected by:

- Changes in surface area (loss of tissue, tissue damage)
- Incomplete lung expansion (atelectasis)
  - Thickening of alveolar capillary membrane (PNA, Edema)
  - Partial pressure (altitude)
  - Obstruction
  - Immobility

Made with Vizle #17

[429.0 - 528.0]

So, the greater the pressure of oxygen in the VLI causes it to move to the capillaries containing the unoxygenated venous blood. And then carbon dioxide in the venous blood exerts greater pressure than the carbon dioxide in the VLI.

And therefore, carbon dioxide defuses across the capillary into the VLI. And then that is exhale.

Gas exchange and diffusion can be affected by, as I said earlier, surface area, so loss of tissue or any tissue damage. In complete lung expansion or collapse of the VLI can prevent those pressure changes.

Again, obstruction, just immobility and that's not expanding our lungs is fully. So, make sure you are, you know, again, that's why I said it was important to understand the anatomy so that we can realize if our patients have some of these problems, we will realize that that's going to affect their gas exchange and their oxygenation.

We're still in some of the slides with anatomy, so. I'm kind of talked about what our air-array system consists of and having adequate, being able to inhale, exhale and what's involved with those systems.

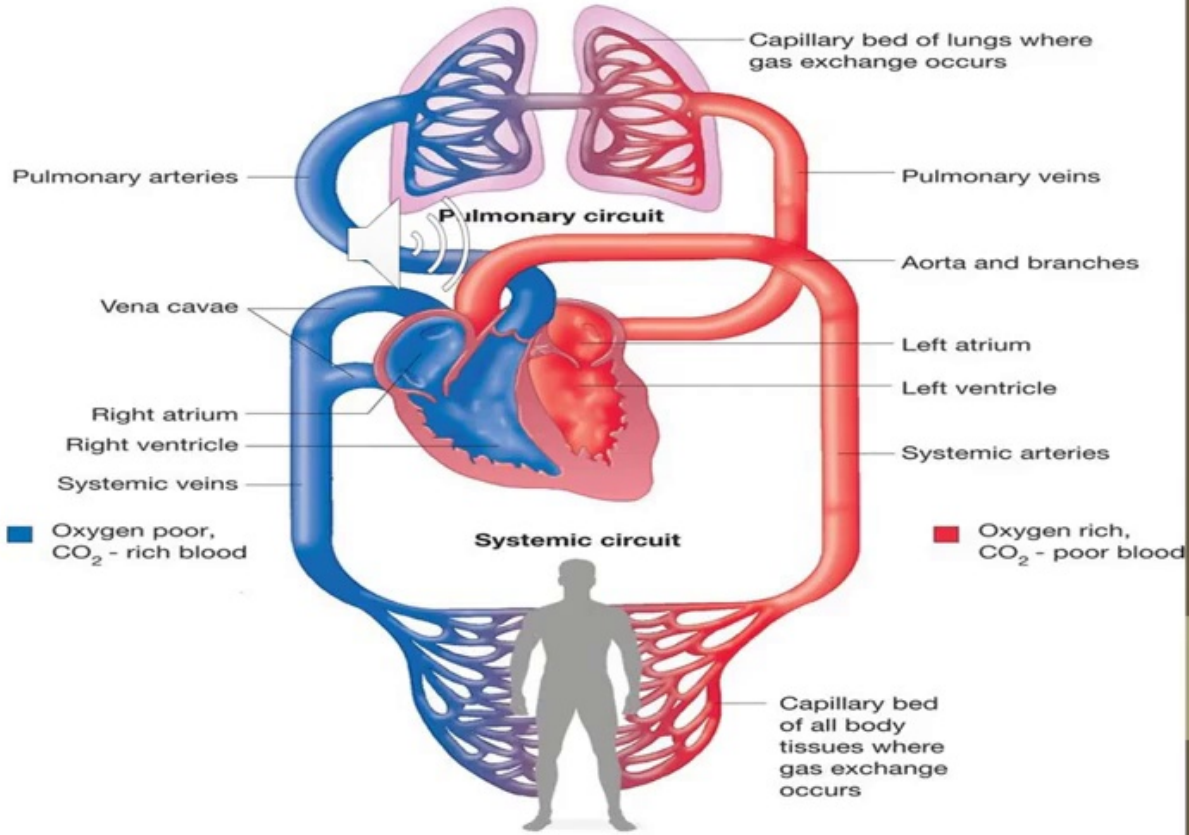
So, we also have to have adequate perfusion. So, our blood carries our oxygen to our tissues and this is dependent upon that adequate blood supply and our cardiovascular function.

Made with Vizle #18

[528.0 - 561.0]

Perfusion

- Blood carries oxygen to tissues
- Depends upon adequate blood supply and cardiovascular function



Made with Vizle #19

Regulation of our respiratory system is done with them within the medulla. So, we have already this stimulated by increased concentrations of carbon dioxide and hydrogen and decreased amounts of oxygen in their arterial blood.

The medulla sends an impulse down the spinal cord to the respiratory muscles to stimulate an inhalation. If we have a patient that has conditions that causes chronic changes in their oxygen and carbon dioxide levels, then we may see that their chemo receptors become desensitized and they are able to really regulate their ventilation adequately.

Made with Vizle #20

Regulation of the Respiratory System

- **Medulla**
  - Stimulated by increased concentration of CO_2 and H^+
    - Decreased O_2 to a lesser degree
  - Stimulation increases rate and depth of ventilation
- **Chemo Receptors in aortic arch**
  - Sensitive to changes in ABG's
  - Can activate the medulla

And that is based off of this driver, the stimulation within the medulla. So, alterations with our respiratory function.

We've went through our anatomy. If we have any problems within ventilation, respiration or perfusion, then that will develop into hypoxia.

Made with Vizle #22

Alterations in Respiratory Function

- **Hypoxia** –inadequate amount of oxygen is available to cells.
  - Often caused by **hypoventilation** (decreased rate or depth of air movement into the lungs).
- **Signs of Hypoxia include:**
- **Dyspnea**- difficulty breathing
  - Elevated blood pressure w/small pulse pressure
  - Increased respiratory and pulse rate
  - Pallor
  - Cyanosis
  - **Anxiety**
  - **Restlessness**
  - **Confusion**
  - **Drowsiness**

Made with Vizle #23

[594.0 - 693.0]

And hypoxia is an inadequate amount of oxygen that is available to the cells. It's often caused by hypoventilation.

So, it decreased rate or death of air movement into the lungs. And so, some kinds of hypoxia include dysmia, which is just difficulty breathing.

And so, with somebody cannot, they're having difficulty breathing. You may also see correlate with that in elevated blood pressure.

They're going to have an increased respiratory rate and a pulse rate, because they're trying, they're working harder to try to get that area. They may seem pale.

You may see some cyanosis, so some bluish tinge to maybe their lips, their fingertips. The big thing is when you can't breathe and you can't catch your breath.

You may also become very anxious, anxiety may set in, which then even increases more of your respiratory rate that's going on. You may see the patient become restless.

You suddenly have a very restless, confused patient, or they become very drowsy all of a sudden. Probably going to want to check a pulse off to see what it's registered and what is their oxygenation, because those kind of go hand in hand as well.

If we have a patient that has chronic hypoxia, which some conditions can cause that. Someone thinking ever inphysema, COPD or chronic obstructive pulmonary disease, you will begin to see that hypoxia being detected in all the body systems.

Made with Vizle #24

Chronic Hypoxia

- **Can be detected in all body systems**
- **Manifest as:**
  - Altered thought process
  - Headaches
  - Chest pain
  - Enlarged heart
  - Clubbing of fingers and toes
  - Anorexia
  - Constipation
  - Decreased urinary output
  - Decreased libido
  - Weakness of extremity muscles
  - Muscle pain

Made with Vizle #25

[693.0 - 759.0]

So they can be manifested as an altered phosphorous process. Maybe the patient has headaches or chest pains.

We may start to see that they have enlarged heart, clubbing of the fingers and toes. Anorexia, and constipation.

They may begin to have some decrease in their urinary output, weakness of their extremities and muscles and also muscle pain. So oxygen, as we said, in carbon dioxide, must move through the VLA and be carried to and from body cells by blood.

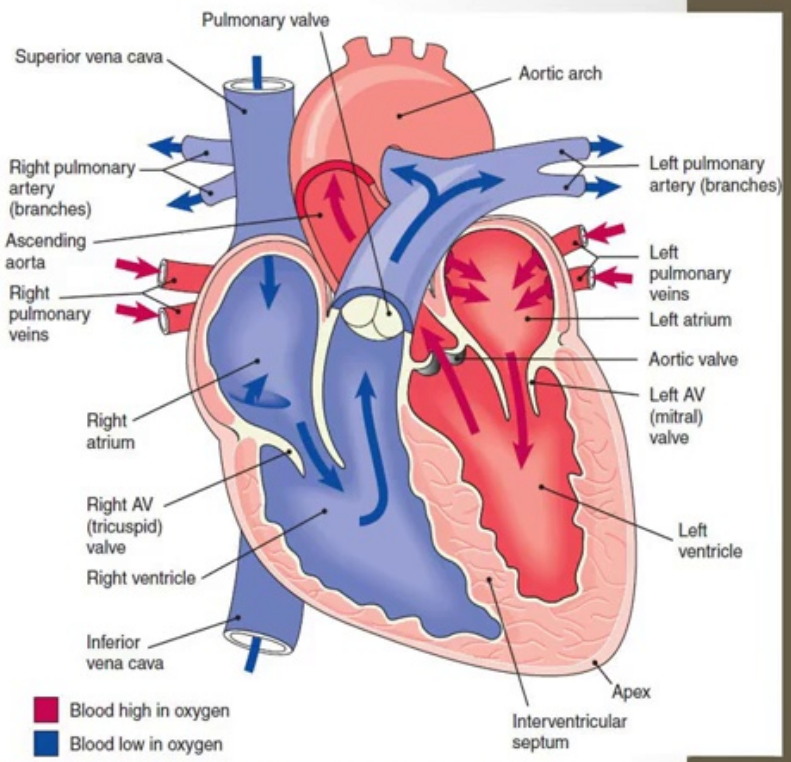
And this is why we have to have an adequate functioning cardiovascular system in order to have that exchange of gas. So again, this is just the anatomy of the heart.

The heart, you've had that in your anatomy class, but the heart has valves that atrias are the two upper chambers, they receive blood from the veins and the ventricles that you lower chambers, simply through the arteries.

Made with Vizle #26

Cardiovascular System

- Heart
  - Atria
    - Upper chambers
    - Receive blood from veins
  - Ventricles
    - Lower chambers
    - Send blood through the arteries
  - Stroke volume
    - Quantity of blood forced out of left ventricle with each contraction
  - Cardiac output
    - Amount of blood pumped/minute
    - Average 3.5-8L/min
    - Cardiac output = stroke volume X heart rate



Made with Vizle #27

And then when we think about the pumping of the heart, we have a stroke volume. So that's the quantity of blood forced out of the left ventricle with each contraction.

And our cardiac output, the amount of blood that's pumped each minute cardiac output is equal to the stroke volume. By the heart rate, we are not going to ask you a test question on that.

But just realize that that having a heart that efficiently pumps is very important to our oxygenation system. The physiology of our cardiovascular system oxygen is carried primarily by our red blood cells and just a small amount via plasma to the tissues of our body.

The hemoglobin in the RBCs has a strong attraction to oxygen and therefore about 97% of oxygen is carried in the form of oxy hemoglobin. And once those red blood cells reach the tissue, we will see internal respiration must occur.

Made with Vizle #28

Physiology of the Cardiovascular System

- **Oxygen is carried primarily by red blood cells** (small amount via plasma) to the tissues of the body.
  - **Hemoglobin** in the RBC's has a strong attraction to oxygen and therefore 97% of oxygen is carried in the form of **oxyhemoglobin**
- Once RBC's reach tissue **Internal Respiration** must occur
- **Internal Respiration:** Exchange of O2 and CO2 between circulating blood and tissue cells
  - Affected by any abnormality in blood components/volume
    - Hemorrhage, anemia
  - Exercise increases heart's effectiveness

Made with Vizle #29

And all that means this internal respiration is that exchange of oxygen and carbon dioxide between the circulatory circulating blood and the tissues and cells. So based on this, this physiology of the cardiovascular system and how our oxygen is carried in our hemoglobin, that can be, you know, if our oxygenation can be affected by any abnormality in blood components.

So if you have a patient that's having a hemorrhage or they have a neemia, you're probably going to see maybe that have an impact on their oxygenation. Another one I think of is sickle cell disease.

And so just being aware that if you have somebody coming in with those conditions, you're going to want to be looking at their. Their RBCs, their hemoglobin levels and keeping an eye out on their oxygenation levels.

So cardiovascular blood flow, the muscles of the heart have their own blood vessels that provide oxygen and nourishment and remove waste products, the main blood vessels are the coronary arteries. And as we get into in the next slide, any alteration and that will also affect oxygenation of the patient.

So alterations in our cardiovascular function. Patients with dysritamia, this is a disturbance in the rhythm of the heart.

Our some kind of abnormal conduction, whether it's regarding, or whether it's from hypertension, heart disease, heart damage.

Made with Vizle #30

Alterations in Cardiovascular Function

- **Dysrhythmia**
  - Disturbance in rhythm of the heart
  - Abnormal impulse from SA node
  - Abnormal conduction: HTN, heart disease, heart damage (MI), trauma, drugs, decreased oxygenation

Heart Failure

- Heart unable to pump sufficient blood supply
- Multiple causes
  - HTN, CAD, heart valve disease
- Sx- **SOB, edema, fatigue**

- **Myocardial Ischemia**
- Decreased O2 to the heart
- Commonly caused by artherosclerosis
- Angina
  - Chest pain
  - Imbalance between amount of O2 available to the heart and amount needed by the heart
- Myocardial infarction
  - Death of heart tissue
  - Heart attack
    - Sx- **pain, anxiety, nausea/vomiting, indigestion, SOB**

Made with Vizle #31

[924.0 - 1056.0]

But this can decrease the oxygenation because it's the heart is not pumping effectively when a patient's having a disturb rhythm. Heart failure is another alteration and cardiovascular function that will affect our oxygenation.

The heart is unable to pump sufficient blood supply. There's a multiple causes for that hypertension, coronary artery disease, heart valve disease.

But some signs and symptoms, you'll see with heart failure or shortness of breath. The patient will have some edema and fatigue.

And then the last one, myocardia, ischemia. So again, when I said that the heart has its own blood supply to it.

If we have any decrease oxygen to the heart, such as a blockage. The patient can experience chest pain.

They'll experience an imbalance between the amount of oxygen that's available to the heart and the amount needed by the heart. And this can cause a myocardial infarction, which is basically.

Death of heart tissue. So they, the patient is suffering a heart attack.

But when the patient presents. You may say them having like I said the chest pain.

They'll have the anxiety because they can't breathe as well. They may be nausea, nauseated and have some vomiting.

They may feel like they have indigestion. But another big one is they will be very short of breath.

So. Those are alterations and cardiac cardiovascular function.

That affect oxygenation in our patients. So factors that will affect the patient's cardiopomponinary functioning and oxygenation.

So your book goes into discuss several things. The first is they're just in general, our patients level of health and some of these we've already had on.

Renewal condition. So if the kidneys are functioning properly and they are not expediting urine.

Made with Vizle #32

Diseases/Conditions Affecting Cardiopulmonary Functioning and Oxygenation

- Renal conditions cause fluid overload and impaired tissue perfusion
- Anemia
- Weakened muscles (sedentary)
- Damage to heart muscle
- Obesity

Made with Vizle #33

[1056.0 - 1188.0]

, because they're not functioning at full capacity. This can cause fluid overload in the patient.

And it can impair. You know, with food or fluid overload, the heart can't pump us efficiently.

And that can impair tissue perfusion and oxygenation. As I've already stated earlier, we want to watch.

Our patients with anemia because we know oxygen's carried be of a hemoglobin. So those patients oxygenation could be affected.

We can muscles just a sedentary lifestyle. Can really affect how well we are able to inhale and exhale and breathe.

As I just got done talking about any damage to our heart muscle. , we don't perfuse as well.

And then there's a been a. I'm sorry.

There's been a correlation between obesity and patients having conditions like chronic bronchitis. And it's thought that those who are beasts are often short of breath during activity,

which ultimately leads to to less participation and exercise. And as a result, the a VLI are rarely stimulated and they don't expand.

So there is some correlation between again, that sedentary lifestyle and obesity and muscle weakness or poor muscle term. And some of these again, we've already talked about, but just being aware that the diseases or conditions that affect our cardiac and our.

Our cardiopulmonary and our oxygenation. Our lives are, I'm sorry, our level of health.

And these are listed here. Your book goes on to talk about developmental considerations being a factor that affect our cardiopulmonary.

Made with Vizle #34

Developmental Considerations

- Infants
  - Short airways
  - Increased respiratory rate (30-55)
  - Surfactant
    - Formed 34-36wks in-utero
  - Respirations primarily abdominal
- Toddlers/Preschoolers
  - Eustachian tubes, bronchi, bronchioles are elongated and less angular
    - Increased risk for colds/infections
- Older adults
  - Elasticity of lung and heart tissue decreases
  - Muscles of inspiration/expiration weaken
  - Airway collapse easier

Made with Vizle #35

[1188.0 - 1287.0]

And although we won't test you on any pediatric patients, it is good to be aware that infants have a short airway. Their surfactant isn't formed until 34 to 36 weeks in uterus.

So if they're born prematurely, they may not have that development of that yet. But this is why infants have an increased respiratory rate and their normal rate runs at 30 to 55.

And when we look at it infant and their breathing, their respirations are primarily abdominal. So you'll see more abdominal breathing with that patient.

Toddlers and preschoolers. Sometimes have an increased risk for cold and infections and that has to relates to where they're.

They're bronchial are elongated, but they're less angular. And then again, we kind of talked about already the older adult as we age that elasticity of the lung and heart tissue decreases.

The muscles of our respiratory system of inspiration, expiration can be more weak airway collapse easier. So just that older patient in general.

We're going to want to consider them and keep an eye on them for cardiopulmonary alterations and alterations and functioning. Medications are another consideration when we're thinking about cardiopulmonary.

Functioning in our oxygenation and that's just because many medications can.

Made with Vizle #36

[1287.0 - 1353.0]

Medication Considerations

- Opioids
  - Depress medullary respiratory center
    - Decreases rate/depth of respirations

Made with Vizle #37

[1287.0 - 1353.0]

Or any medication that has an effect on our central nervous system. We need to be monitoring carefully for respiratory complications.

An example of this would be pain medications or opioids. That can depress the medulary respiratory center and that can cause a decrease rate or death of respirations.

So we definitely want to keep an eye on our patients. As far as how much pain medication they're getting how often they're getting it.

How is there oxygenation after they take the med we want to go see how they're reacting to it. So we need to set a vitals if we need to base on this information.

The next one your book talks about is lifestyle considerations. We kind of mentioned this briefly when we talked about obesity.

But just that sedentary lifestyle can impact our decreased pulmonary and circulatory functions.

Made with Vizle #38

Lifestyle Considerations

- Sedentary lifestyle
  - Decrease pulmonary and circulatory function
    - Decreases ability to respond to stressors/illnesses
- Cultural implications
- Environmental Considerations
  - Air pollution
    - Causes coughing, choking, irritated nasal passages
  - Occupational exposure
    - Asbestos, coal dust, silica

Made with Vizle #39

[1353.0 - 1485.0]

And it's a great way to increase the ability to respond to stressors and illness for that sedentary person. It's thought that the activity patterns do not encourage the expansion of Vali and development of.

Pulmonary exercise patterns are deep breathing for those who have a sedentary lifestyle. Your book goes on to talk about considering cultural implications.

An understanding of patients cultural background is now search for health and disease prevention. And lastly, you know, a good example might be cigarette smoking for example.

Is a major, you know, when we think about that and culture maybe. Depending on how they were brought up or what is important to that person, what they value.

I want to try to promote strategies that's encouraged that person to stop smoking cigarettes. Because as we know cigarettes are a major contributor to lung disease, to respiratory distress, heart disease, lung cancer.

They're one of the most important risk factors for patient developing COPD. So it's very important to try to work with that patient to have them understand the implications.

If they, if their lifestyle is one that they are a smoker. Other things to think about environmental considerations, you know, just occupational exposure.

Where do they work at? What are they exposed to in those areas? Air pollution.

I know some patients who have severe asthma depending on times of the year. You know, if the air pollution's bad, that can cause them to have problems with their.

Oxygenation and breathing. So just being aware of lifestyle considerations when we're taking care of our patients and how that can affect their oxygenation.

So the getting in this PowerPoint, we've reviewed anatomy of our respiratory and cardiovascular systems.

Made with Vizle #40

Nursing History

- Interview with patient
- Helps identify current/potential health concerns and needs for focused assessment
- Factors to assess and appropriate questions: **See Focused Assessment Guide 39-1 P. 149**

Made with Vizle #41

[1485.0 - 1617.0]

We've kind of reviewed every window where our factors affecting these systems and how they can affect those systems. And we are moving on to how we assess our patient.

And so the first thing when a patient comes in is we want to get that nursing history. We want to interview that patient.

We want to try to identify any current potential health concerns and needs that they may have that we want to keep an eye on. And then your book I was looking through and it's called the focus assessment guide 39 to S1.

It's on page 1493. And it gives great kind of suggestions for factors to assess.

And what are the questions that are how should you approach that? So when you're trying to assess their usual pattern of respirations.

You know, questions you could ask your patient in a history of how would you describe your breathing. You know, do you have any allergies, what type of allergies do you have.

You may go on to say do you have any difficulty breathing when you're having allergy issues. Do we always want to know what kind of medications they are taking.

Any health history do you have heart and long breathing conditions. Life style and environments as we talked about we want to know if they smoke.

If they've had any recent cough, spew them, what color is it, are they ever sort of breath. And are they having any fatigue.

And so it gives this kind of overview of things you should assess for with nursing history and kind of the appropriate question you can ask your patient. To try to get that information.

So I highly recommend having a look of that. And then on next slide we're going to talk about what we assess for physically on our patient.

The next part as we are assessing our patient is our physical assessment. So when we walk in the room, we want to look at our patient.

Do they have any signs and symptoms that they are in distress? Does there skin as we look at it? Does it have any paleness or sinosis to it?

Made with Vizle #42

Physical Assessment

- Inspection
  - Observe for s/s of distress
  - Inspect skin for pallor/cyanosis
  - Note shape of chest
  - Note rate/rhythm/depth of respiration
- Palpation
  - Note skin temp/moisture
  - Note chest expansion (symmetrical)
- Percussion
  - Used to assess position and density of lungs
  - Not used often by nursing
- Auscultation
  - Assesses airflow through the airways
    - Vesicular- low pitch soft sounds in peripheral lung fields
    - Bronchialvesicular- medium pitched blowing sounds over upper anterior chest and intercoastal area
    - Bronchial- loud high pitched sounds heard over trachea/larynx

Made with Vizle #43

[1617.0 - 1716.0]

What is the shape of their chest? We're also noting their respiratory rate.

But what is their depth? Are their respiration shallow? Are they able to take deep breaths? What is their rhythm? Is it irregular?

And we want to note that as we look at our patient. Do they appear like they're shorter breaths?

Then we want to palpate. So we want to notice the skin and temperature.

And do they have moisture? They sweating? Is it possible they have a fever?

And that's why they have this increased respiratory rate? Do they feel cool to touch?

Her question is usually not often used by nursing. It's used by more of a band's practitioner.

But we can do percussion over the lungs. But I'm not going to go into great detail.

Because as I said, most of the time when you guys do your head to tell assessment, you will not be using percussion.

We're going to also take our lungs sounds. We're going to assess for air flow through the airways.

What sounds are they having? And in the next slide, we're going to talk about what are

Adventacious breath sounds that we're noting that can Drawless to conclude that they're doing not have good air flow.

So when we're also taking our patients and we're listening for breath sounds, we want to note if they have crackles.

Crackles can be an indicator of fluid in the VLI. Sometimes patients have, especially if they've got a history of congestive

Heart failure, our chronic obstructive pulmonary disease.

Made with Vizle #44

[1716.0 - 1782.0]

Adventitious Breath Sounds

- Crackles
  - High pitched intermittent popping
  - Secondary to fluid in alveoli
    - CHF, PNA, COPD
- Wheezes
  - Musical high pitched sounds
  - Secondary to:
    - Obstruction
      - Foreign body, mucous buildup
    - Constriction
      - asthma

Made with Vizle #45

[1716.0 - 1782.0]

And it sounds like a high-pitched intermittent poppy. I almost, I always tell students, crackles for me sound like

If you have a bowl of rice crispy cereal and then you pour milk over the top and you hear the little poppy, that is what crackles will sound like.

If you have a patient and you hear crackles, you should automatically think fluid that they possibly have fluid

in the VLI or in their lungs. Weasin is this more musical, high-pitched sound.

As we talked about with restriction in the lungs, a lot of times we'll see weasin if they have that obstruction.

So if they have some type of mucus build up, possibly a foreign body, or if they have any kind of constriction, like we see with asthma patients,

we will hear that weasin sound. We've assessed our patient and your book goes on to talk about common diagnostic tests

that we can do for our patients depending on whether we think they have some type of

Made with Vizle #46

Electrocardiogram

- ECG
- Measures heart electrical activity
- Can identify MI, rhythm disturbances, chamber enlargement, electrolyte imbalance

Illustration of a patient getting an ECG.

Made with Vizle #47

[1782.0 - 1848.0]

issue with their lungs or with their heart. The first one your book talks about is an electrocardiogram.

You can hear this referred to as an ECG. It's essentially my hearing every referred to as EKG.

And what we're measuring is heart-electrical activity. And this can help us identify that myocardic infection,

or if we think we're patients having a heart attack, rhythm disturbances, chamber enlargement,

and even possibly electrolyte balances, because electrolyte balances can cause a dysrhythmia within our heart.

And so that is a common if we are thinking the patient has cardiovascular issues, and that is affecting their oxygenation.

We can provide that recommendation for the physician and possibly get an ECG for our patients.

The next test we're going to talk about is a pulmonary function study.

Made with Vizle #48

Pulmonary Function Studies

- Normally conducted by respiratory therapist
- A group of test that assess respiratory function to assist in evaluating respiratory disorders
- Provides evaluation of lung dysfunction, diagnose disease, assess disease severity, assist in management of disease and assist in evaluating respiratory interventions

Made with Vizle #49

[1848.0 - 1980.0]

These are normally conducted by a respiratory therapist. This is a group of tests that assess respiratory function

to assist in evaluating a respiratory disorder. And so my son, who is an asthmatic,

will every time he visits the allergist, we do a pulmonary function study.

And they have been taken deep breath in. He puts this device that you can see in the picture in his mouth.

And they have been blown out as hard and long as he can. You can see the monitoring the background.

It's taking the readings. When my son does this because he's a pediatric patient,

they'll usually have him look at the screen, and they have a picture of a brick house and some little pigs,

and they'll tell him to blow as hard as he can to try to knock over the brick house.

And what they're doing when they're doing that test is they're trying to evaluate his lung function.

Because they already have diagnosed him with asthma or the disease, they're assessing how severe his asthma currently.

They're looking at what medications do they have him on as an intervention for his asthma and are those working for him.

What is his lung function with those interventions? And they kind of, his test, he goes every six months,

they kind of assist in the management of his disease. So, based on his lung function test,

they can determine whether maybe we can stop using a certain medication, maybe we need to up the dosage of a different inhaler or medication.

So, they do provide valuable resources. And so, you may see if you have a patient,

possibly asthma, inphysema, COPD.

They may want to do a pulmonary function test just to see or evaluate what is their lung function currently.

Made with Vizle #50

And how severe is their disease? So, our next device is a spirometer.

We use this to measure, or can be used to measure volumes of air and

Made with Vizle #51

Spirometry

- Measures volume of air in liters exhaled or inhaled by a patient over time
- Client deeply inhales and exhales into spirometer
- Review Guidelines for Nursing Care 39-1 p. 1504 on how to teach your patient to use an incentive spirometer.

Made with Vizle #52

[1980.0 - 2112.0]

liters, exhale, or inhale by a patient over time. Your book talks a little bit about this on page 1496.

But basically, if we're trying to evaluate lung function and airway obstruction through respiratory mechanics,

we can use this to measure the degree of airway obstruction. And so, the patient inhales deeply,

and then exhales forcefully into the spirometer. Now, if we're wanting to use the spirometer to promote deep breathing,

possibly because our patient has just had surgery, maybe they have pneumonia and we're trying to get them to take a big deep breath in

to inflate those lungs. We're going to use it just a little bit differently.

And with that, we are going to always promote that they suck, they don't blow.

So, you're nursing book, and I hope you'll take time to look at this, but has some guidelines for nursing care on page 1504.

And this is how the teacher patient to use the symptoms for our care, if we're trying to get them to engage in more deep breath exercises,

such as with the postdoc patient. And basically, we have our patient in exhale.

We have them put the sprometer in their mouth, and we want to take a long inhale,

and hold that for as long as they can. And eventually, we always try to come up with some type of test

question on sprometry. So, I highly suggest that you review that guidelines for nursing care,

and you are very aware of how to teach your pressure to use the sprometer for deep breathing.

The next advice we're going to talk about is a peak flow meter that we like to call it. And we're measuring the size of the pulmonary airways,

so that point of highest flow during forced expiration. We will see this a lot with especially patients with asthma.

Made with Vizle #53

Peak Expiratory Flow Rate

- Point of highest flow during forced expiration
- Measuring size of pulmonary airways
- Patient takes as deep breath a breath as possible then forcibly exhales into peak flow meter
- Test repeated three times and highest number is recorded

[2112.0 - 2244.0]

We will see this a lot with especially patients with asthma. We will have them use a peak flow meter to measure that.

And basically, the patient takes a deep breath, and then they breathe, or they exhale as forceably as they can,

and to the peak flow meter. And they, we instruct patients to do this three times,

and we record their highest number. And if you can see on the picture on this peak flow,

we've got a red, yellow, and a green area on this. So depending on what the patient blows out what their highest number is,

we want our patients in the green. That way, that their airways are open and they have good function.

If we're in the yellow, that could be a warning sign. Maybe it's time to use their inhaler.

Maybe the air pollution, or their allergies are really bad. They may need to take some allergy medication.

But the yellow is more of a warning sign. And then if we have a patient who has asthma and they're using this at home,

and they're in that red zone, that means we need to contact the physician that their airways

are not open as they should be, and they do not have optimal oxygenation going on

in regards to probably constriction from their disease process. So again, this is a valuable tool.

And again, if you have a severe asmatic patient, you're probably going to see that they need to use this during the day.

I am sure from doing vital signs in the skills lab, that you already know what a pulse ox is.

But this is measuring a patient saturation of hemoglobin in their arterial blood. It is good to note that clients with low hemoglobin,

they may have a normal pulse ox reading, even though they may not have enough oxygen to meet the body's demands.

It is possible at something to keep an eye on.

Made with Vizle #55

Pulse Oximetry

- Measures oxygen saturation of Hgb in arterial blood
  - Clients with low Hgb may have normal pulse ox readings, however may not have enough oxygen to meet the body's demands

Made with Vizle #56

[2244.0 - 2343.0]

It is possible at something to keep an eye on. But this is what the pulse ox is measuring.

I always tell students to highlight this, because I could see this being a test question that we ask you,

what is the pulse ox measuring? And then a lot of students miss it.

But we are checking this. Most of the time we want our patient to be 92%

or above, there are cases when we're dealing with when we're dealing with a COPD patient,

where their normal is 89% and we're okay with that. Just because we already know with their condition,

that they're going to have that poor cardiovascular pulmonary oxygenation. It's a factor because of their disease process,

and they tend to run a little bit lower. But this is another way that we can,

another type of diagnostic test we can do with our patients. We do not have to have an order for this.

We can go in and obtain this with a set of vital signs. Capnography is the other one that I want to talk about here.

Capnography, we are measuring the rate in depth of respirations, and the amount of CO2 that patient is having come off when they exhale.

We often use this with clients when they come out of surgery, or if they're on a PCA, which is a pain medication pump,

and we want to measure their opioid induced respiratory depression.

Made with Vizle #57

Capnography

- Measures rate/depth of respiration and CO2
- Often used for client's with PCA to measure opioid induced respiratory depression
- Used to confirm ET placement

[2343.0 - 2475.0]

So if you have a patient, you can see it in the picture here, where they're on this type of pump for pain control,

we are worried that they will go into respiratory depression. And we talk more about a PCA pump in our pain chapter.

But we do want to monitor these patients. And so we will put in this tubing,

and you can see it in the picture here on the left. And it almost looks like oxygen tubing.

If we were going to get patient oxygen, but it actually has a little bubble on the other end of the prongs.

And that's how we know this is for capnography. So we know that this tubing, if we hook it up to the device here,

the pump that we can measure if that patient has the correct amount of CO2 coming off. If a patient starts to go into respiratory depression,

it will monitor this, and it will alarm us, so that we can go in on that patient and check and make sure they are all right.

You can give oxygen through this tubing as well, but I know a lot of students,

when they go into the clinical setting, and maybe their patient has this on,

because of the pain medications they're on, and students will see this tubing,

and they automatically think that their patient is on oxygen. And that's not always the case.

This tubing does, like I said, look very similar to oxygen tubing, but it does have a little bubble on it,

which means it's for capnography. It's a special tubing for that.

Next agnostic test, we're going to talk about a story of synthesis.

This is basically where we puncture the chest wall, and we ask for a fluid.

We may be doing this procedure to remove fluid or air via a syringe. Or we may,

Made with Vizle #59

the physician may want to connect that patient to a chest tube. So this is performed at the bedside.

It is performed by a physician, or a advanced practice individual,

Made with Vizle #60

Thoracentesis

- Air/fluid removed from pleural space via catheter
- Performed at bedside
- May be performed to obtain specimen
- Surgical asepsis required
- Patient sits at edge of bed and [illegible]ends over table
- Fluid/air collected in vacuumed container
- Nursing responsibilities
  - Obtain baseline VS/info
  - Support patient during procedure
  - Remind client not to deep breath, cough, sudden movements
  - Post procedure assessment/monitoring
    - Monitor for blood in sputum, respiratory distress, severe coughing

Made with Vizle #61

or a advanced practice individual, such as a PA or a nurse practitioner.

surgical asupsis is required. However, the nurse can assist at the bedside.

Basically, the patient sits at the edge of the bed, and kind of ends over a table,

and the needles inserted and fluid are air is collected into a vacuum container.

For the nurse, the reason we even go over this test is, you as the nurse will have responsibilities.

You need to obtain a baseline vital sign. Vital signs before you begin the procedure.

You're going to be there to support the patient during the procedure. You're going to want to try to have them running calm

and stay as still as they can. You're going to remind that client not to take a big deep breath,

or cough, or have any sudden movements. And then post procedure.

You're going to want to be assessing that patient and monitoring for blood in the sputum, any respiratory distress,

any severe coughing. You'll want to get a set of vital signs after that procedure is done.

So, we've been over factors that can cause problems for our patients,

as far as cardiovascular pulmonary functioning and oxygenation. We've talked about assessing our patient.

We've talked about diagnostic tests. We can do depending on the condition for our patient.

And now, as nurses, we want to promote optimal function. So, your book goes through some different things

for promoting optimal function. One is health and lifestyle.

Encourage our client to eat healthy. We want to encourage them to exercise.

Made with Vizle #62

Promoting Optimal Function

- Health Lifestyle
  - Encourage client to eat healthy, exercise, avoid smoking and excess alcohol use
- Vaccines
  - Yearly flu
  - PNA vaccine for adults over 65
- Pollution free environment
  - Vacuum/dust often
  - Avoid cigarette smoke
- Reduce anxiety
- Good Nutrition
  - Low fat/cholesterol/salt diet
  - COPD patients need high protein/calorie diet d/t increased energy demand
- Positioning
  - High fowlers
  - Intermittent prone position has been shown to promote oxygenation in acutely ill clients
- Maintain adequate hydration
  - 2-3 quarts (1.9-2.9L) of clear liquid (water) a day helps promote thin secretions
    - Always check for fluid restrictions before encouraging fluids
- Provide humidified air

Made with Vizle #63

[2574.0 - 2706.0]

We want to encourage them to exercise. Avoid things such as smoking, excessive alcohol abuse.

And other one is to obtain their vaccines. A yearly flu vaccine.

A pneumonia vaccine for adults over 65. Pollution free environment.

You know, talking to them about environment. Again, my child has allergies and asthma and years ago.

I work for an allergist. You know, they were always discussing for our discussing for

the children and hence of your allergies to things. You know, if your child is severely allergic to dust,

it's a good idea to maybe get rid of carpet in the house and have wood floors. Not having a parent smoke in the house would be good education.

And so those type of issues are type of interventions. Can promote optimal functioning.

We want to talk about good nutrition again with the patient. If we have a patient with certain disorders such as chronic obstructive

pulmonary disease or infosema, that patient needs a higher protein calorie diet because they have increased energy demands from trying to breathe.

Positioning can be another thing. If we're having a patient that is not breathing optimally,

we may want to place them in high fowlers. So that they can have good exchange of oxygenation.

We're going to maintain adequate hydration for our patients. We're going to encourage water.

This helps promote infant secretions. And then sometimes even we can recommend providing some humidified air.

So those are a few of some ways nurses can promote optimal functioning. If we want to promote proper breathing with our patients.

These are some different types of breathing exercises we can do. There's deep breathing where we encourage deep inhalation through the nose.

Made with Vizle #64

Breathing Exercises

- **Deep breathing**
  - Encourage deep inhalation nasally
    - Exhale orally
- **Incentive spirometry**
  - Deep breathing with visual reinforcement
  - Assists patient to deep breath slowly
  - Decreases atelectasis
  - Pg 1503.
  - **Review how to teach a patient to use an incentive spirometer (Guidelines for Nursing Care**
  - **39-1, p. 1504)**
- **Pursed lip breathing**
  - Can help reduce dyspnea/anxiety
  - Inhale through nose to count of 3
  - Exhale through pursed lips to count of 7
- **Diaphragmatic breathing**
  - Decreases respiratory rate, increases alveolar ventilation, may help expel as much air as possible during expiration
  - Place 1 hand on stomach and other in middle of the chest
  - Breath in slowly through nose letting abdomen protrude as far as possible
  - Exhale through pursed lips contracting the abdominal muscles with 1 hand pressing in and up on the abdomen
  - Repeat steps for 1 minute, rest for 2 minutes

Made with Vizle #65

[2706.0 - 2838.0]

And we have the patient exhale out the mouth. I've seen this done a lot with patients who maybe they're having an anxiety attack.

Or just having some trouble catching the breath getting them to do this sometimes helps. We've talked about incentive spirometry for wanting that patient to have deep breathing.

And this also decreases adolescence in our patients. And again, I have that guideline for how to teach that there.

Purcellipped breathing. This can reduce dysmia and anxiety.

The patient exhales through the nose to account of three. And then I'm sorry, they inhale through the nose to account of three.

And then they exhale through Purcellips to account of seven. We've seen this done, especially with the COPD patient.

The patient or the imposema patient. Purcellipped breathing can sometimes improve their dysmia.

Diatformatic breathing. This has been noted decreased respiratory rate increase of ventilation and may help expose much airs possible during expiration.

The person places one hand on the stomach, the other in the middle of the chest. They breathe in slowly through their nose, letting the abdomen protrude as far as possible.

then they exhale through per slips, contracting the abdominal muscles with one hand pressing in and up on the abdomen. Again, I highly recommend looking over these different breathing exercises

in your textbook. As a student going in, you may need to use one of these with your patients, so it's important to understand when you would use this breathing exercise, what it's for and

how would you tell your patient to use it? This next slide is about promoting or controlling a cough of a patient has a cough and it's important to be aware that coughing is a mechanism for

querying our respiratory tract of irritants and congestion and so basically it causes the explosive

Made with Vizle #66

Promoting/Controlling Cough

- Cough
  - Mechanism for clearing respiratory tract of irritants/congestion
    - Initial irritant, deep inspiration, quick/tight closure of glottis, forceful contraction of intercostal muscles, upward push of diaphragm
  - Causes explosive movement of air from lower to upper respiratory tract
  - Most effective when client sitting with feet flat on the floor
  - May be voluntary or involuntary
    - Voluntary cough important aspect of pre and post surgical care
  - For those unable to cough voluntarily manual stimulation over trachea and prolonged exhalation may be helpful
  - Assisted cough- for those with neuromuscular disorder that prevents cough
    - Firm pressure on abdomen below diaphragm in rhythm with expiration

Made with Vizle #67

[2838.0 - 2937.0]

movement of air from the lower to the upper respiratory tract. Coughing can be good. We sometimes want our patients to cough. A cough is most effective when a client is sitting with their feet

flat on the floor. It's important to be aware that sometimes a cough can be voluntary or involuntary. So when I think about voluntary, a voluntary cough is important aspect of pre-imposed surgical care.

You know, if we're wanting our patient to debrief and use this parameter after surgery, a lot of times when they do not able cause them to cough or loosen any secretions in there.

And so that is important. We want that voluntary cough. For those that are unable to cough, there are manual stimulation that you can do for that. But at times, sometimes a cough is involuntary.

Patients that are sick, maybe have a cold or, you know, some type of respiratory infections. And sometimes that involuntary cough can be disruptive. So the next side we're going to talk about

possible cough medications that can assist with that involuntary cough. So the one thing I want you to realize with cough medicines, they act in different ways.

So there are different types of cough medicine out there. Sometimes they are expectants. And these are good because if you have a patient that's coughing a lot,

this will help thin secretions. And it will make it easier for them to cough out or remove

Made with Vizle #68

Cough Medications

- Expectorants
  - Help thin secretions making them easier to cough out and remove
- Suppressants
  - Depress cough reflex
- Lozenges
  - Local anesthetic helps decrease cough mechanism
- Avoid prolonged use of cough meds
  - For coughs lasting over 7 days encourage client to visit PCP

Made with Vizle #69

what's in there that irritate that's causing the problem. Suppressants tend to depress the cough reflex. I know sometimes if patients have been sleeping well because of a cough, they've been

up coughing on night. Occasionally, you know, they may take an over-the-counter suppressant. But rarely, we don't want to suppress the cough constantly because it does serve as a purpose.

Los Angeles can help decrease the cough mechanism. But the important thing we want to teach our patients about this is to avoid prolonged use of cough medication. I mean, if coughing

lasts over seven days, we want to encourage that patient to visit their physician to figure out what's going on. The next intervention for nurses suctioning of the airway, this can assist with removing

saliva, pulmonary secretions, blood, vomit, foreign material from the pharynx. So it is used at times, a physician order is needed. We need to be aware as nurses irritate the mucosa. And it does remove oxygen

Made with Vizle #70

Suctioning

- Removes saliva, blood, emesis, phlegm from oro/nasopharynx
- Irritates mucosa and removes oxygen from respiratory tract
  - May cause hypoxemia
- Can be painful/distressing
  - Use pain meds prior to suctioning if needed
- Assess heart rate, color, amount/type of secretions
  - Cyanosis, change in HR indicate hypoxemia

Refer to Skill 39-2 P. 1528-1532

Made with Vizle #71

from the respiratory tract, possibly causing hypoxia. It can be painful and distressful at times. We always want to assess for that pain and if we can provide pain medication prior to suction,

that's not always possible. But if we can, that's good to do. It's important to remember we're going to wear our PPE, our gloves, our goggles, mask, whatever is needed for a proper protection when

we're suctioning a patient. And then when we're suctioning, we want to monitor the patient's color. What's their heart rate? What is the amount and consistencies of the secretions we are getting now?

Does their heart rate and their respiratory indicate their, they have hypoxia because we want to watch for that? And you guys will be suctioning a patient and it's important that you refer to your skills.

Their, the skill for suction is 39-2 and it's on pages 1528 to 1532. The next thing I want to go through is inhale medications. Inhalmedications are administered

to open narrowed airway so you'll see this a lot with asthma patients, particularly. There's several different types of inhale medications that you can be given. We

won't test you really on, for instance, a brand name of a medication. But as you go into the clinical

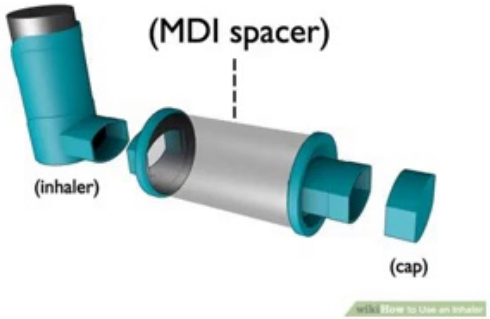
Made with Vizle #72

Inhaled Medications

- Nebulizers
  - Disperse fine particles of liquid meds

MDI

- Delivers controlled dose of med with each compression of the canister
- Common mistakes: failing to shake before dose, holding MDI upside down, inhaling too rapidly, stopping inhalation when propellant felt in back of throat, not hold breath after inhalation



- Dry Powder Inhaler
  - Breath activated
  - Quick deep breath by client
  - May clump if exposed to humidity

Teaching on these devices is on P. 865 (not in chapter 39)

Made with Vizle #73

setting, it's important to understand if they say your patients on a nebulizer treatment. Well, what is that? And basically they take liquid medication. They put it in this machine. That's

at the top of this page, the picture that's at the top of this page. And it disperses fine particles of that liquid medication that the patient breathes in. The patient, if they're older, they can

just put this in their mouth and breathe in and out while the medication is going. If you have a younger patient, you may see them putting mass to this and put the mask over the nose and mouth to

get this medication. MDIs are metardostin halers. They deliver to cancral dose of medication with each compression of the canister. Common mistakes when patients give this medication is

they fail to shake it before the dose. So it's important to teach that. They need to shake the canister. They need to hold the inhaler or they need to hold the inhaler upright. Sometimes they've

hold it upside down, which is not good. They inhale to rapidly when they're taking this medication. Or they stop inhaling and the medication just gets to the back of the throat. And it's important

that they hold their breath after taking this medication. The reason I put this picture on here is the MDI is most effective with it's used in conjunction with a spacer, which is what this

tube is here. So this helps that problem of that medication getting stuck to the back of the throat. The other thing is to teach the patient they want to exhale the want to shake their medicine,

put it on the spacer, put the spacer in their mouth and they want to take a long, slow, deep breath. Then they will remove this and they want to hold their breath for a count of 10 and then they can exhale.

And the last medication we're going to go over here is the dry powder inhaler. Again, this is breath activated. So the patient clicks the lever down on the medication

that I'm showing in this last picture at the bottom. They're going to take a quick deep breath in and that breath activates that powder for them to inhale. And so that's, if your patients

on one of these I just wanted you to be aware of what they were and how those devices work and the teaching involved around those. So this next slide's about supplemental oxygen. So if our patient has a

Made with Vizle #74

low pulse ox, they are not breathing optimally. We can perform this intervention of supplying oxygen. However, oxygen is considered a medication and you have to have a physician's order for that.

Made with Vizle #75

Supplemental Oxygen

- O2 is considered a med and must have order
  - In emergency patient be given O2 if needed, then call MD immediately for order
    - Often a part of emergency protocols with standing orders
- Canisters
  - Portable
  - Can be heavy and burdensome
- Concentrators
  - Concentrate oxygen from room air
  - Used in homes
  - Can deliver up to 5L O2/min
- Be careful with O2 in COPD clients
  - Hypoxia may be the stimulant that keeps them breathing
    - Too much O2 may cause client to lose the stimulus and stop breathing
- Humidification
  - Added to O2 delivery to help keep mucous membranes moist
  - Sterile water

Made with Vizle #76

In some cases such as, you know, patient comes in the emergency room and it's emergency. The patient can be given oxygen if needed, but the physician has to be called immediately for that order. Oxygen can be supplied

in many different ways from wall units that you might see in the hospital to possibly a cylinder or tank that's portable. But basically, there is a flow meter that is attached

to the wall unit or, you know, on the cylinder or tank and it has a valve and that regulates how much oxygen that patient is getting. Canisters are nice because they're portable, but they can be

heavy and birds, birds, and some two patients, concentrators. So your book has a small section that talks about this. And these are used in homes. They are a little cheaper because they are taking

concentrate oxygen from room air and recycling it basically so that the patient gets that through the device. It can deliver anywhere up to five liters of O2 per minute. So it's a nice option for that patient

that's at home that needs to be on oxygen. It's a little bit cheaper than actually purchasing an oxygen tank or canisters. We always want to be careful with oxygen in the COPD client. And basically,

hypoxia may be the stimulant that keeps them breathing. They have too much O2 may cause this kind to lose the stimulus and they stop their breathing. So again, when I was talking about pulse

oxygen and normal ranges, this is the reason that sometimes we're okay with the COPD patient running in the 88-89 percent because we know if we give them too much oxygen, we can stop their drive to breathe.

So we want to be very careful with how much oxygen we're giving us COPD patient. Humanification can be added to an oxygen delivery system. And sometimes that is needed because that helps keep the mucus

membrane moist. And basically, you're just adding a little sterile water to the flow meter or the valve as the oxygen comes out and it humidifies it and it does assist with a patient's complaining that their

nose is feeling dry from that oxygen. It's always good to provide that. You do not have to have an order to add sterile water or humidification to if a patient's on oxygen. However, you do need an order

for the actual oxygen. If you have a patient that's put on oxygen in the hospital or maybe it's new, they're going to go home on oxygen or maybe they're already are but it's it is good to reinforce

Made with Vizle #77

teaching about oxygen precautions. So oxygen is combustible. We want to make sure that patient knows not to be around an open flame. It is advisable that they do not smoke when they're on their

Made with Vizle #78

[3498.0 - 3564.0]

Oxygen Precautions

- Combustible
  - No smoking/open flames
  - No electric razors
  - Avoid synthetic materials that build static
  - Avoid using combustible oils

Made with Vizle #79

oxygen because it is combustible. We want them to avoid using electric razors. They can, you know, we want to warn them about synthetic materials that could build static and cause a shock and avoid

using any combustible oils. So it's good to give that education to that patient. Like I said, if oxygen is new to them, they need this information. If they're already on oxygen, it's good to reinforce

this information with them. This slide is about the different types of oxygen delivery. Depending on how much oxygen your patient is need, it will determine what type of device that you will put on them. So the

nasal cannula is the most common delivery device. This is for a low flow oxygen. And we can we can deliver anywhere from 1 to 6 liters a minute with this device. Again, this is where you can add

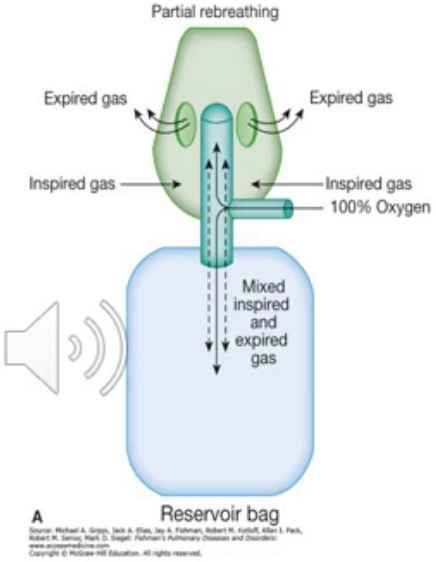
Made with Vizle #80

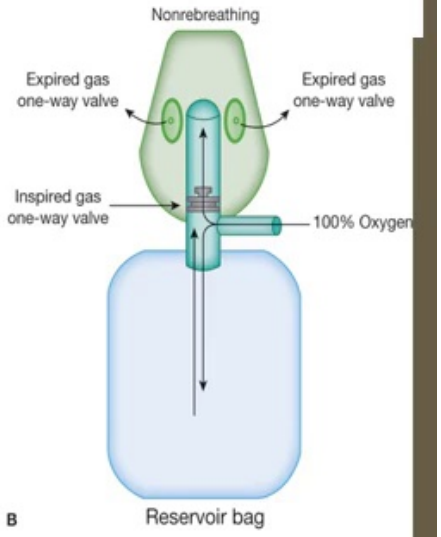
[3564.0 - 3828.0]

Oxygen Delivery

- Nasal cannula
  - Most common delivery device
  - Low flow
  - Can cause pressure ulceration behind the ears and on face
  - Delivers 1-6L/min 23-42%
- Face mask
  - Fit comfortably snug, but not too tight
  - Used to increase O2 delivery for short periods of time
  - Only use with 5-8L/min 40-60%
  - **NEVER USE LESS THAN 5L**
- Partial rebreather
  - Has reservoir bag
  - 8-11L/min 50-75%
- Nonrebreather
  - 12L/min = 80-100%
- Venturi Mask
  - High flow
  - Delivers precise concentrations
  - 4-10L/min
  - Careful monitoring of FiO2
- Oxygen tent
  - Commonly used with children

See Table 39-4 P. 1511





Made with Vizle #81

that humanification that may need to be given. We want to be aware that the patient puts that, you know, puts the device in their nose. And the tubing goes up along the face and over the back of

their ears. So we want to be checking those areas to make sure that they're not getting any all serrations or pressure areas or that tubing's not causing any skin alterations on that patient.

The next device we're going to talk about is the face mask. And again, I've tried to give you pictures here. So the top, the first picture is the nasal cannula. The next one is the face mask. And this

we want to fit comfortably snug, but we again want to make sure it's not too time. And this is used to increase oxygen delivery for short periods of time. We can only use this with 5 to 8

liters of oxygen. And it will not be effective. We never use it with less than 5 liters. So if you're a patient, only on 3 liters of oxygen, then you just need to put them on the nasal cannula.

We don't need to use this face mask. This again is for a short period of time and can be used anywhere from 5 to 8 liters. The next one that we're showing here is the partial rebrother. This has a

reservoir bag that collects the first part of the patient's exhalation. It mixes it with 100% of oxygen for the next inhalation. The rest of exhalation is released in the vents on the side. When we use this,

we can, this is used with 8 to 11 liters of oxygen if your patient's needy mat. The next one, your book talks about is the non-rebrother. This is for when we need high concentrations of oxygen.

Like the partial rebrother, but this one has a two-way bag that prevents the patient from inhaling their exhaled air. We use this when patients on 12 liters of oxygen or they're needing 12 liters of

oxygen. Again, with each of these, oxygen is a physician's order and with that order of a doctor needs to be riding how many liters he wants the patient on, what's the max? If you've got your

patient on 5 liters and that's the max the doctor wrote for. They, you feel like they need more based on their signs and symptoms. You're going to have to call and get another order to increase

that and, and to figure out what device here that the physician wants them on. The Venturi mask has a large tube with an oxygen inlet. As the tube narrows, the pressure drops causing the air to be pulled

Made with Vizle #82

in through the side ports. Ports are adjusted according to the prescribed oxygen concentration for the Venturi. This is, I'm used when we need some high flow oxygen because it delivers very

precise concentrations. This can be used for at four to ten liters a minute and again, it requires careful monitoring, but it is for patients who really need that precision of concentration and they

need to be on high flow. Oxygen tents, commonly used with children, your book does not talk about these, anymore. So you don't need to worry about it. Oxygen, I did put a picture here to show what that might

look like if you had a patient on it. There's also a table that talks about these oxygen delivery systems here on page 1511. It's table 39-4. The next advice we're going to talk about is positive

airway pressure. This uses mild air pressure to keep airways open. It's referred to and there's by-pap and there's CPAP. By-pap changes air pressure while the client breathes in and out.

Made with Vizle #83

[3828.0 - 3894.0]

Positive Airway Pressure

- Uses mild air pressure to keep airways open
- BIPAP changes air pressure while client breaths in and out
- CPAP continuous air pressure
- Usually fits over the client's nose or mouth/nose
- Support/encourage use
  - High noncompliance rate

Made with Vizle #84

[3828.0 - 3894.0]

CPAP is continuous air pressure. This usually will fit over the client's nose and mouth if you have them on it. It's often used to treat sleep apnea in patients, so you will see that

on a patient that may have sleep apnea. This keeps their airway open at night and that's, I just wanted to do a quick overview of what that is. The next thing we're going to talk about is an

overview of managing chest tubes. A chest tube is indicated when there's negative pressure in the porous space or it's disrupted and this can happen from a thoracic surgery or trauma patients with

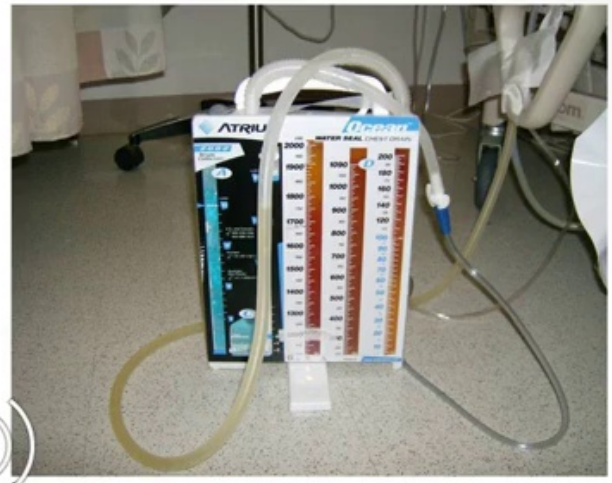
fluid, like such as a porous fusion, patients with blood, such as the hemothorics or air enumothorics in the porous space required chest tube to drain these substances and that allows the compressed

long to re-expand. All chest tube is a firm plastic tube. It's placed in the porous spaces by a

Made with Vizle #85

Managing Chest Tubes

- **Chest tube**
  - Firm plastic tube
  - Placed in the pleural space
  - Sutured in place
  - Covered with air tight dressing
  - Drains air or fluid
    - Air tube placed high
    - Fluid placed lower
  - **Nursing responsibilities**
    - Continually assess respiratory status/pain
    - Observe dressing
    - Palpate around insertion site for crepitus (rice crispies)
    - Assess water seal for bubbling
      - Maintain water at the 2cm mark
    - Avoid milking tubing
    - If tubing becomes disconnected from system, immediately submerge end of tubing into sterile water
    - **Keep rubber tipped clamps and Vaseline gauze dressing at bedside.**
    - **Review Guidelines for Nursing Care 39-3 p. 1514**



Made with Vizle #86

[3894.0 - 4026.0]

physician. It's sutured into place. We cover it with an airtight dressing and it drains that air our fluid from that area. Nursing responsibility, so we're going to continue to assess the respiratory

status and pain status of our patients. We're going to observe that dressing around that site. We're going to palpate around the insertion site for crepatives. We're going to assess water seal

for bubbling and make go into more chest tubes and medsurge once. So again, this is just a little overview of chest tubes. You will get more in depth of how to care for chest tubes as you advance through the

program. But when we're caring for these again, we want to assess the water seal. It should be bubbling. We want to avoid milking the tubes. If we get some type of clot, you don't want to milk that tube to

try to get that clot out of that tubing. This is a very important to remember. If the tubing becomes disconnected from the system, so meaning not from the patient, the tube's still in the patient,

but it's not connected to the system. We want to immediately submerge the end of that tubing into sterile water. So that's why it's important to keep sterile water at the bedside. We also want to keep rubber

tipped clamps and vasselin glass dressing at the bedside. And your book does give some really good guidelines as far as monitoring a patient with a chest tube and the guidelines for nursing care. And you can see

it on page 1514. It's guidelines for nursing care 39-3. As we come to the end, our near the end of this chapter, the last few slides are about artificial airways. And so the URL fair and geo-airway,

this is a tube or a plastic or rubber. And we see this inserted in the back of the fair necks through the nose or the mouth. This is often used postopperally and it keeps the tongue from blocking

Made with Vizle #87

Oropharyngeal Airway

- Tube of plastic or rubber inserted into the back of the pharynx through the mouth or nose
- Often used post-operatively

Made with Vizle #88

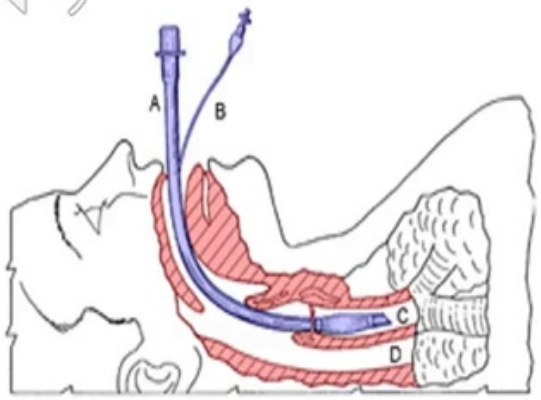
the airway. So it's really important that the correct size is used as to not to hinder that airway. So again, this is just an overview so that if you see this, you understand what it is and what it's

used for. So the next artificial airway, we're going to talk about the endotracheal tube, this is inserted into the trachea, a lorange scope is used to insert. This is usually done again by

Made with Vizle #89

Endotracheal Tube

- Inserted into trachea
- Laryngoscope used to insert tube
- Used to administer O2 by mechanical ventilation



advanced practitioner or physician. We can use this to administer oxygen, my mechanical ventilation. Most commonly we use a cuffed endotracheal tube to prevent air leakage and bronchial aspirations.

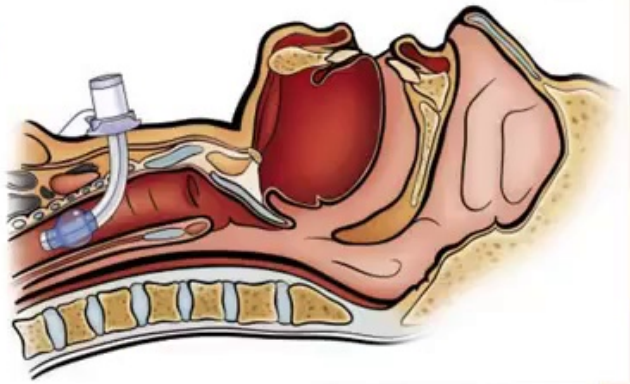
Once this is put into a patient, the patient cannot speak. And once we put this in often, it requires suctioning to remove secretions. The last couple of slides here are about a

tracheostomy. This is inserted for mechanical ventilation. It bypasses the upper airway.

Made with Vizle #91

Tracheostomy

- Inserted for mechanical ventilation, bypass upper airway obstruction, or remove endotrachial secretions
- Artificial opening into trachea normally at 2nd/3rd cartilage ring
- Can be permanent or temporary
- Tube consists of outer cannula and inner cannula
  - Obturator guides direction of outer cannula during insertion, removed once trach in place
- May be cuffed or non-cuffed
- Held in place with twill tape or velcro straps
- Nursing implications
  - Administer heated/humidified oxygen
  - Keep trach free from foreign objects
  - Clean/replace inner cannula
  - Regularly change dressings/ties
  - Clean skin surrounding tube



Made with Vizle #92

If a patient has an upper airway obstruction and to remove endotracheal secretions. And this is an artificial opening into the trachea. Normally, about the second or third cartilage ring.

It can be permanent or temporary. The tube consists of an outer canula in an inner canula. There's an operator that guides the direction of the outer canula during insertion.

Again, this can be cuffed or non cuffed. But it's held in place with a Velcro strap or tape. And so there's nursing implications with this.

In ministering a heat or humidified oxygen, we want to keep the trachea free from foreign objects. We want to keep that clean and replace the inner canula as needed. We want to do regular changing

of the dressing and ties and assess and clean that skin area around the tube. Standard bedside equipment that should be kept at the bedside should your patient have a

tracheostomy is the aterator, the suction equipment, oxygen, a manual ventilation bag, and a spare tracheostomy tube should that come out of the patient.

Tracheal suction is one of the skills that is usually performed or taught in the skills lab.

Made with Vizle #93

Tracheal Suctioning

- Performed by passing sterile catheter through ET or trach
- Performed using sterile technique in hospital
  - Clean technique in the home
- Uncomfortable, can be painful
  - May need to admin pain med prior if necessary
- Risks- hypoxia, mucosal damage, dysrhythmia, infection, atelectasis
- Hyperoxygenate the client before and after each suction attempt
- Limit suctioning to 10-15 seconds
- Do not insert suction tube more than 1cm beyond the length of the tube

Made with Vizle #94

[4191.0 - 4312.8]

You should review that providing tracheostomy care. That skill can be found 39-5 on page 1540. And you should be reviewing tracheal suction, which is a skill on 39-6 in the back of your book.

But we do when we do tracheal suctioning, we want to perform this, using a sterile catheter, and we want to use sterile technique in the hospital.

If a patient has to do this at home, our loved one has to do it for our patient at home. We usually recommend clean technique in the home. This can be very uncomfortable and it can be painful.

So we want to make sure we administer any pain medicines prior if necessary. And if it's not an emergency situation, the patient when we are doing tracheal suction, he is at risk for epoxy,

you coastal damage, dysrhythmia, infection, and adolescences. So before we start the procedure, we always want to hyperoxinate the client before and after each suction attempt. We want to make sure

that we limit the suctioning to 10 to 15 seconds. That's what your textbook calls for, so we want to make sure we're not doing anything. Over that, we also when we're suctioning our

patients, we do not want to insert the suction to more than one centimeter beyond the length of the tube that they have. Again, I find it very important that you go over that skill,

look at those directions in that information. That concludes the end of this PowerPoint for this chapter on oxygenation. Thanks.

Made with Vizle #95