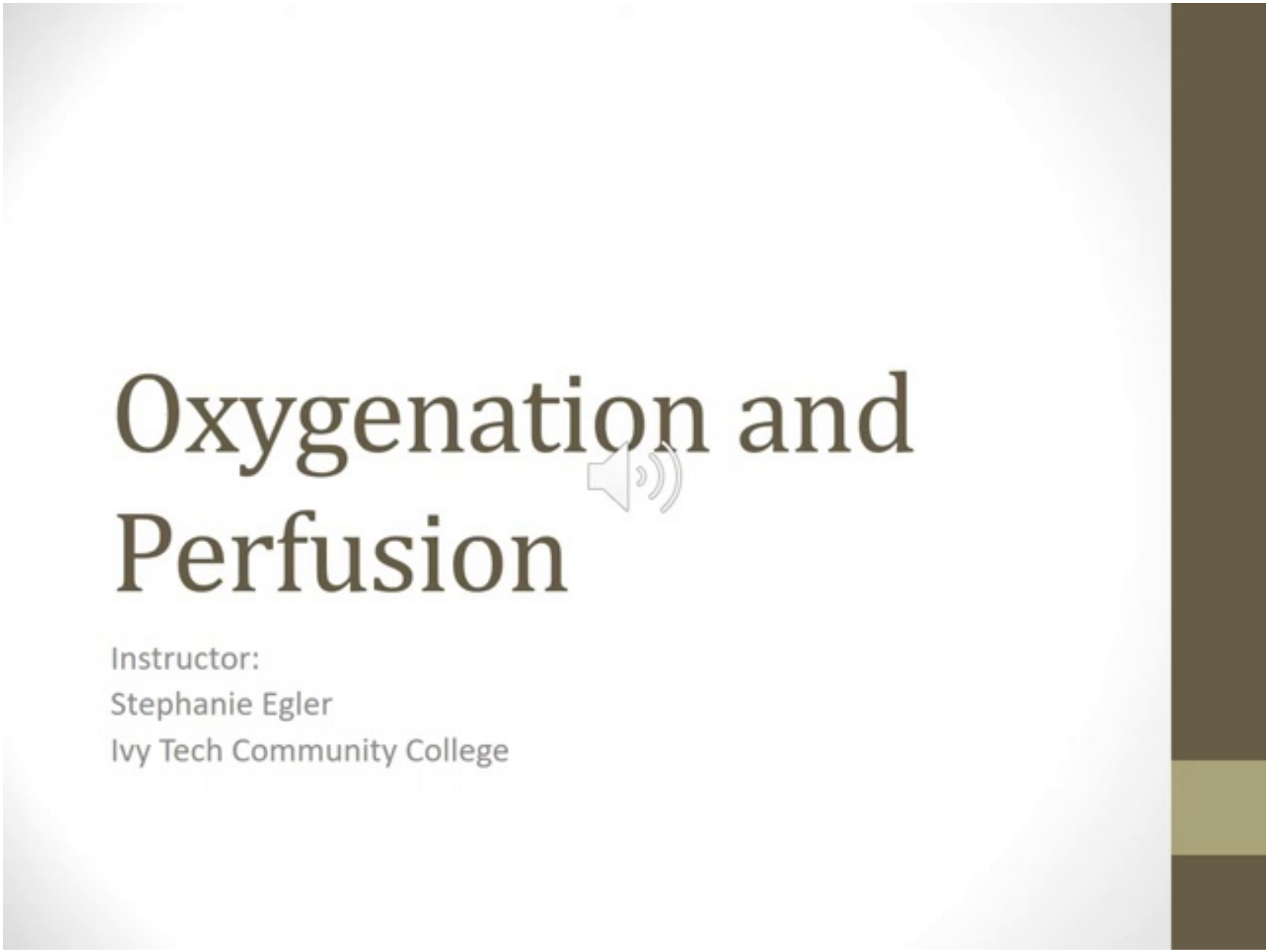
[0.0 - 60.0]



[0.0 - 60.0]

hi students this is mrs egler and this is chapter 39 oxygenation and perfusion

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 perfusion and how that affects oxygenation

i know you've all had anatomy so the

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 well 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 respiratory and our cardiovascular

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.

[60.0 - 120.0]

systems we have a better foundation for understanding and assessing oxygenation

in our patients in 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 run 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 bronchioles we have our

upper airway which consists of our nose our pharynx our

larynx and our epiglottis then our lower airway is our trachea we have a

left and right main stem bronchi segmental bronchi and terminal

bronchioles the mucus so we have mucus within our

narys and that lines our airway

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

[120.0 - 180.0]

and that helps us trap debris and protects us from underlying

or protects our underlying tissues and then we have cilia which help

propel trapped material up the airway the thinner that our mucus is

helps with this process as well so that 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

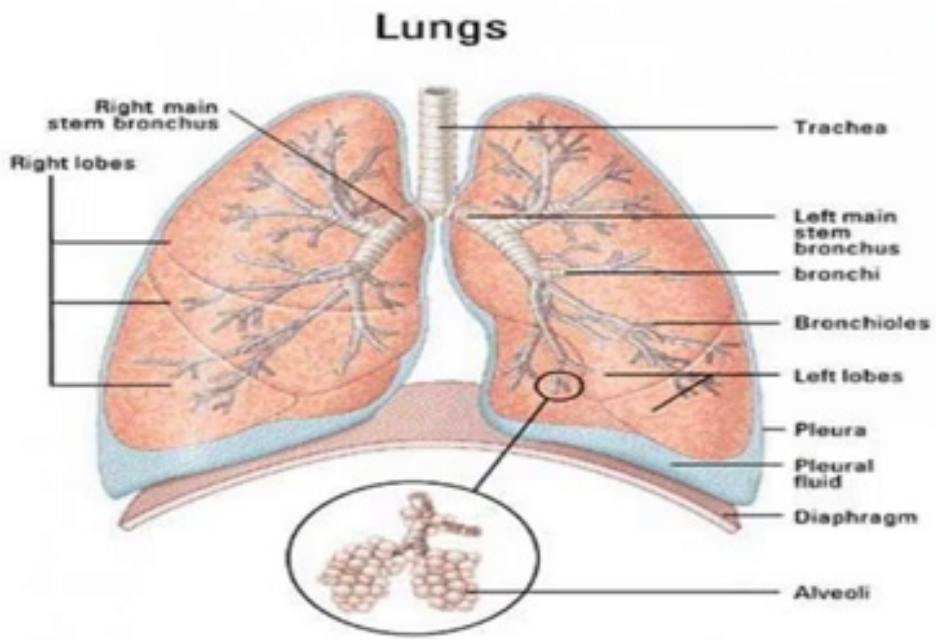
cause some compliance problems with having that lung being

able to expand so we'll talk about that in a few

[180.0 - 240.0]

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

slides down we also within our respiratory system

have alveoli which are small air sacs at the

end of the bronchioles 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 alveoli

helping prevent their collapse as we continue to review our anatomy of

our respiratory system we have pleura and this is a serious our

serous membrane the visceral pleural covers our lungs

the parietal pleural lines our thoracic cavity

and these are continuous and form a sac this the sack is filled with pleural

fluid this fluid is lubricant and this is what

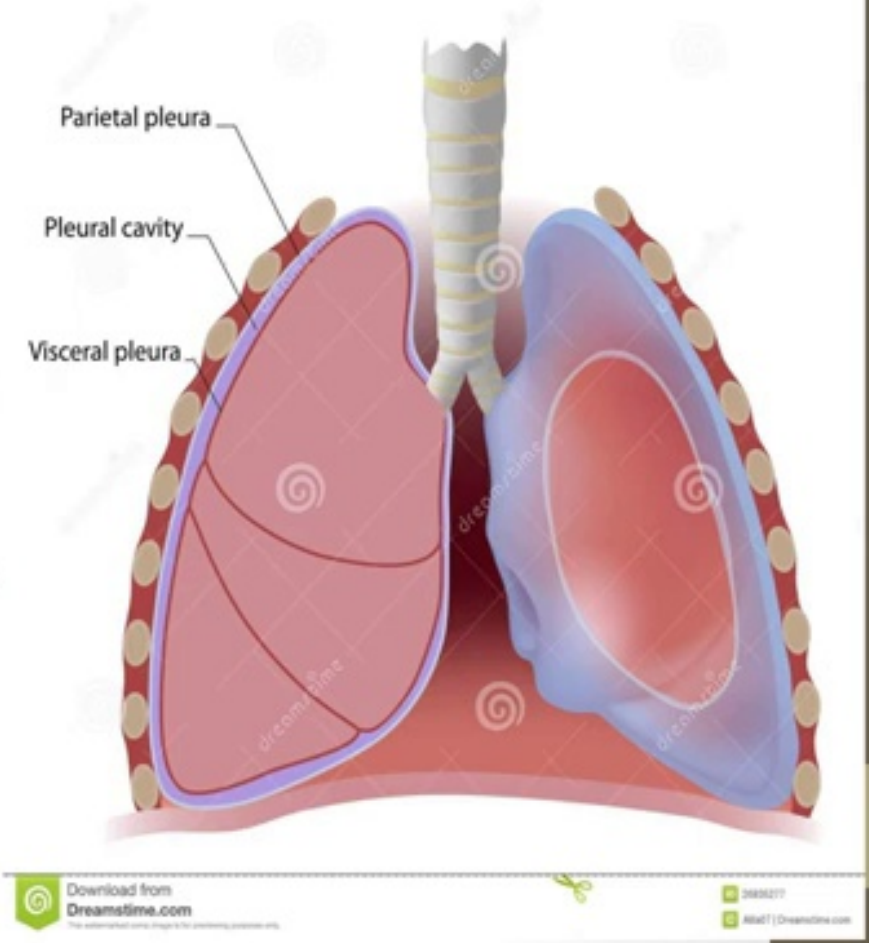
allows our lungs to even easily move along the chest wall

[240.0 - 300.0]

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



[240.0 - 300.0]

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 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 lesser pressure outside of the body within this phase

some other factors that contribute to airflow 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

Compliance

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

[300.0 - 360.0]

so there are conditions such as emphysema

as well as aging that cause that decrease elasticity or that compliance

and so if you think about it if the ability to of the lung to inflate

depends upon 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 and elasticity

is it requires a greater inspiration or a greater

push of air to inflate those lungs so compliance

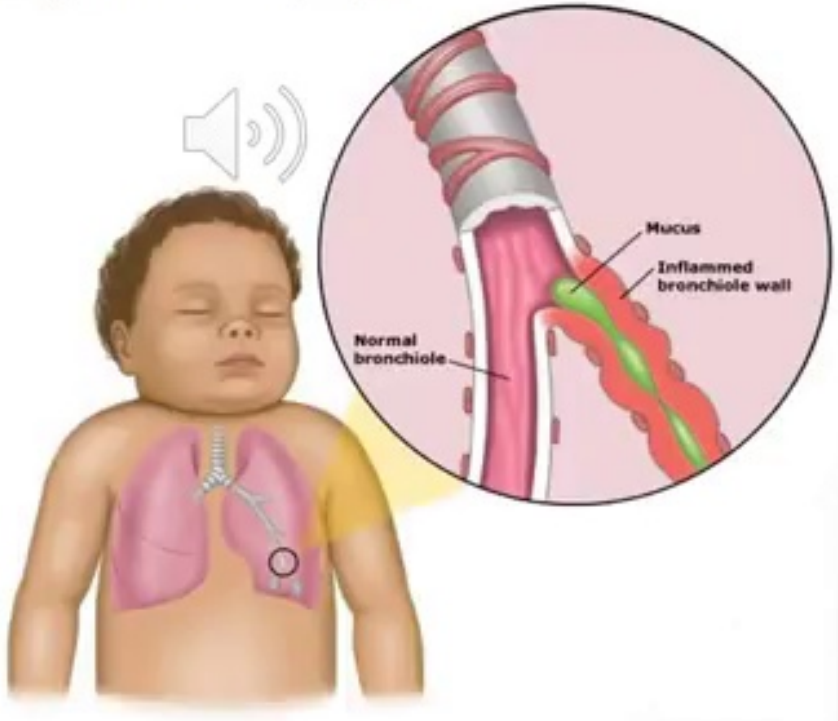
will affect the amount of oxygenation a patient has and how much

effort it takes to actually inflate their lungs while they're

breathing ri resistance is another

Airway Resistance

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



[360.0 - 420.0]

factor when we're thinking about our

respiratory system that can have an impact 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 patient's really ill with

pneumonia they may have this thick 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 respirator

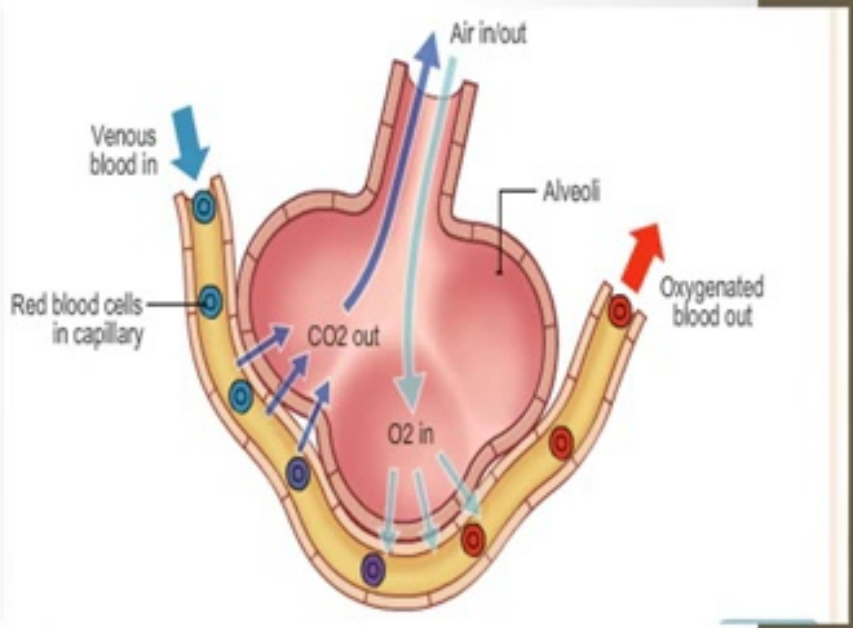
respirations we have gas exchange so respiration involves the

gas exchange between the atmospheric air and the alveoli and blood in the

capillaries this gas exchange as i said earlier

[420.0 - 540.0]

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

[420.0 - 540.0]

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 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 and the voi and therefore carbon dioxide

diffuses across the capillary into the voi 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 incomplete lung expansion or collapse of the alveoli can prevent

those pressure changes again obstruction just immobility and

that's not expanding our lungs as 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 i'm going to affect their

gas exchange and their oxygenation we're still in some of the slides with

anatomy so i kind of talked about

what our airway 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 regulation of our respiratory system is

done with within the medulla so we have

or it is stimulated by increased concentrations of carbon dioxide and

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

[540.0 - 600.0]

hydrogen and decreased amounts of oxygen in the

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 chemoreceptors become desensitized

and they are able to really regulate their ventilation

adequately and that is based off of this drive or the stimulation

within the medulla so alterations with our respiratory

function we went through our anatomy if we have any problems within

ventilation respiration

or perfusion then that will develop into hypoxia and hypoxia is an inadequate

amount of oxygen that's available to the cells it's often

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**

caused by hypoventilation so a decreased rate or

death of air movement into the lungs and so some signs of

hypoxia include dyspnea which is just difficulty breathing and so with

somebody cannot or they're having difficulty breathing

you may also see correlate with that an 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 air in 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 if you suddenly have a very restless

confused patient or they become very drowsy all of a

sudden you're probably going to want to check a pulse ox to see

what it's registering 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 some i'm thinking of

emphysema copd or chronic obstructive pulmonary disease

you will begin to see that hypoxia being detected in all the body systems

so they can be manifested as an altered thoughts

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 they and constipation

they may begin to have some decrease in

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

[720.0 - 780.0]

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 alveoli and be carried to and from

body cells by blood and this is why we have to have an adequately

functioning cardiovascular system in order to have

that exchange of gas so again this is just the anatomy of the

heart you probably had that in your anatomy class but the

heart has valves the atrias

are the two upper chambers they receive blood from the veins

and the ventricles the two lower chambers some blood through the

arteries and then when we think about the pumping of the heart we have a

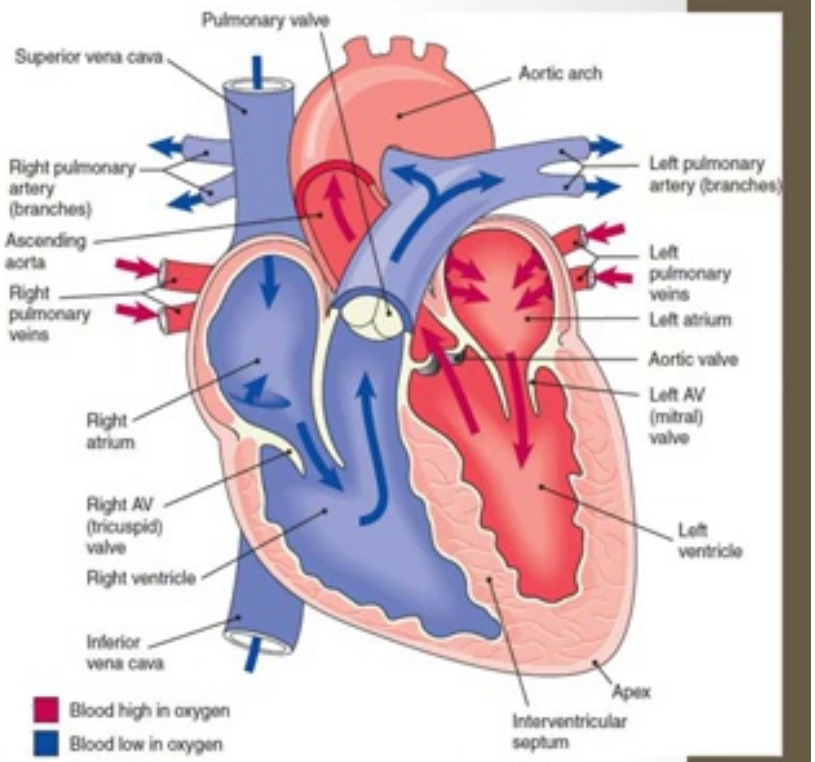
stroke volume so that's the quantity of blood forced out of the left ventricle

with each contraction and our cardiac output the amount of

blood that's pumped each minute

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



[780.0 - 840.0]

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 oxyhemoglobin

and once those red blood cells reach the tissue

we will see internal respiration must occur

and all that means is 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

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

[840.0 - 900.0]

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 anemia 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

and keeping an eye out on their oxygenation

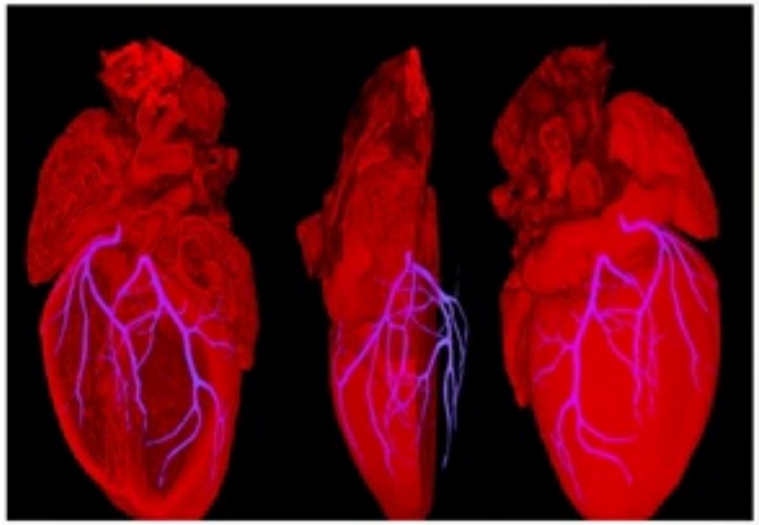
levels so cardiovascular blood flow the muscles

of the heart have their own blood vessels that provide

oxygen and nourishment and remove waste products

Cardiovascular Blood Flow

- 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

[900.0 - 960.0]

the main blood vessels are the coronary arteries

and as we get into the next slide any alteration

in that will also affect oxygenation of the patient

so alterations in our cardiovascular function

patients with dysrhythmia this is a disturbance in the rhythm of the heart

or some kind of abnormal conduction whether it's

regarding or whether it's from hypertension heart disease

heart damage but this can decrease the oxygenation because it's

the heart is not pumping effectively when a patient's

having a disturbed rhythm heart failure is another

alteration in cardiovascular function that will affect our

oxygenation the heart is i know unable to pump sufficient blood supply

there's multiple causes for that hypertension coronary artery artery

disease heart valve disease but some signs and

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**

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 myocardial

ischemia so again when i said that the heart has its own blood supply to it

if we have any decreased 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 ends up suffering a

heart attack but when the patient presents you may

see 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 in cardiac cardiovascular function that affect

oxygenation in our patients so factors that will affect a patient's

cardiopulmonary functioning and oxygenation

so your book goes in to 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 renal conditions so if the kidneys

aren't functioning properly and they are not excreting

urine out 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 as efficiently and that can impair

tissue perfusion and oxygenation

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

[1080.0 - 1200.0]

as i've already stated earlier we want to watch

our patients with anemia because we know oxygen is carried

via the hemoglobin so those patients oxygenation could be affected weakened

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 been

a hey 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

obese are often short of breath during activity which

ultimately leads to less participation in exercise and as a

result the vli are rarely stimulated and they don't

expand fuelly so there is some correlation between again

that sedentary lifestyle and obesity and muscle weakness or poor

muscle tone 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

and although we won't test you on any pediatric patients

it is good to be aware that infants have a short airway

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

[1200.0 - 1320.0]

their surfactant isn't formed until 34 to 36 weeks in utero so if they're born

prematurely they may not have that development of that yet

but it this is why infants have an increased

respiratory rate and their normal rate runs at 30 to 55.

and when we look at an 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 colds and infections

and that has to relates to where their

their brachii or their bronchula 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 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 or alterations in functioning

medications are another consideration when we're thinking about

cardiopulmonary functioning and our oxygenation

and that's just because many medications can

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 medullary respiratory center and that can cause a decreased

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

[1320.0 - 1380.0]

Medication Considerations

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

[1320.0 - 1380.0]

getting it how is their oxygenation

after they take the med we want to go see how they're reacting to it

check a set of vitals if we need to

based 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 or decrease

pulmonary and circulatory functions it also can decrease 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 vla and development of pulmonary exercise patterns or deep

breathing for those who have a sedentary lifestyle

your book goes on to talk about considering cultural implications

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

[1380.0 - 1500.0]

an understanding a patient's cultural background is necessary to promote

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 we want to try to promote strategies

that encourage 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 a 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 and you know if the air pollution is 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 beginning of this powerpoint we've reviewed anatomy of our

respiratory and cardiovascular systems we've kind of reviewed or we've went

over our factors affecting these systems and how they can affect

those systems and we are moving on to how we assess

our patient

[1500.0 - 1620.0]

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**

[1500.0 - 1620.0]

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 or 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 focused assessment guide 39-1 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 would be

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 they have heart and lung and breathing conditions

lifestyle and environments as we talked about we want to know if they

smoke if they've had any recent cough

sputum what color is it are they ever short of breath

and are they having any fatigue and so it

gives this kind of overview of things you should assess for with the nursing

history and kind of the appropriate questions

you can ask your patient to try to get that information so i

highly recommend having a look of that and then our 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 their skin as we look at it does it have any paleness or cyanosis

to it what is the shape of their chest

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

[1620.0 - 1740.0]

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 short of

breath then we want to palpate so we want to notice the skin and

temperature and do they have moisture are 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

percussion is usually not often used by nursing it's used by

more of an advanced 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 toe assessment

you will not be using percussion we're going to also take our lung sounds we're

going to assess for airflow through the airways

what sounds are they having and then the next slide we're going to talk about

what are advantageous breath sounds that we're noting that can

draw us to conclude that there do not have good air flow

so when we're auscultating our patients and we're listening for breath sounds

we want to know if they have crackles crackles can be an indicator of fluid in

the alveoli that sometimes patients have especially if they've got

a history of congestive heart failure archonic obstructive pulmonary disease

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 krispies cereal and then you pour milk over the top and

you hear the little popping 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

[1740.0 - 1800.0]

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

[1740.0 - 1800.0]

in the voi or in their lungs wheezing is this more musical high-pitched sound

as we talked about with restriction in the lungs

a lot of times we'll see wheezing if they have that obstruction so if they

have some type of mucus buildup possibly a foreign body

or if they have any kind of constriction like we see with asthma patients

we will hear that wheezing 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 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 sometimes you might hear it referred to as ekg

Electrocardiogram

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

Illustration of a patient getting an ECG.

[1800.0 - 1860.0]

and what we're measuring is heart electrical activity

and this can help us identify that myocardial infarction or you know

if we think we're patients having a heart attack

rhythm disturbances chamber enlargement and even possibly electrolyte imbalances

because electrolyte imbalances can cause a dysrhythmia within our heart

and so that is a common if we are thinking the patient has

cardio or cardiac issues and that is affecting their oxygenation

we can you know 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 these are normally conducted by a

respiratory therapist but it's a group of tests that assess

respiratory function to assist in evaluating a respiratory

disorder and so my son who is an asthmatic

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

[1860.0 - 1980.0]

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

and they have him take a deep breath in he puts this device that you can see in

the picture here in his mouth and they have him blow out as hard and

long as he can you can see the mantra in 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 is 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 emphysema

copd they may want to do a pulmonary function test just to see

or evaluate what is their lung function currently

and and how severe is their disease so our next device is a spirometer

we use this to measure or can be used to

[1980.0 - 2100.0]

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.

[1980.0 - 2100.0]

measure volumes of iron leaders exhaled or inhaled 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 they suck they don't blow

so your 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 to teach your patient to use this incentive spirometer

if we're trying to get them to engage in more deep breath

exercises such as with a post-op patient and basically and we have our patient

in exhale we have them put the spirometer in their

mouth and we want to take have them take a

long inhale and hold that for as long as they can

usually we always try to come up with some type of test question on spirometry

so i highly suggest that you review that that guidelines for nursing care and

you are very aware of how to teach your patient

to use the spirometer for deep breathing

the next device we're going to talk about is a peak flow

[2100.0 - 2220.0]

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

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

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 forcibly as they can

into 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 means that their airways are open

and they're 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 you know 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 they do not have ultima

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 asthmatic patient

you're probably going to see that they need to use this

during the day i'm sure from doing vital signs in the

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

[2220.0 - 2340.0]

skills lab that you already know what a pulse ox is

but this is measuring a patient's 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 it's 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 a lot of students miss it

but we are checking this most of the time we want our patient to be 92

percent or above there are cases

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

cardiopulmonary 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

and 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 and 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 a pca which is a

pain medication pump and we want to measure their opioid induced

[2340.0 - 2460.0]

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

[2340.0 - 2460.0]

respiratory depression 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 the little bubble on it which means it's for capnography

it's a special tubing for that next diagnostic test we're going to talk

about is thorium centesis this is basically where we puncture

the chest wall and we aspirate pleural fluid

we may be doing this procedure to remove

[2460.0 - 2580.0]

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 leans 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

[2460.0 - 2580.0]

fluid or air via syringe or we may

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 practiced individual such as a pa or a nurse practitioner

surgical asepsis is required however the nurse can assist at the bedside

basically the patient sits at the edge of the bed and kind of bends over a

table and the needle's inserted and fluid or

air is collected into a vacuum cleaner 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 remain 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 you know we've went over factors that can cause problems for our

patients as far as cardiopulmonary 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

you know avoid things such as smoking excessive

alcohol use

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

[2580.0 - 2700.0]

another 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 i again my child has allergies and asthma and years

ago i worked for an allergist and you know they were always disgusting for

or discussing for the children who had severe allergies to

things you know dust

you know if 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 or type of interventions can promote optimal

functioning we want to talk about good nutrition again with a

patient if we have a patient with certain disorders such as

chronic obstructive pulmonary disease or emphysema

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 fallers

so that they can have a good exchange of oxygenation

we're going to maintain adequate hydration for our patients we're going

to encourage water this helps promote and thin

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

- **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

[2700.0 - 2880.0]

breathing exercises we can do there's deep breathing where we

encourage deep inhalation through the nose

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

their breath getting them to do this sometimes helps we've talked

about incentive spirometry for wanting that patient to

have deep breathing and and this also decreases

atelectasis in our patients and again i have that guideline for

how to teach that there purse lip breathing this can reduce

dyspnea and anxiety the patient exhales through

the nose to a count of three and then i'm sorry they inhale through the nose

to a count of three and then they exhale through pursed lips

to a count of seven we've seen this done especially with the

copd patient or the emphysema patient personal breathing can sometimes improve

their dyspnea diaphragmatic breathing this has been

known to decrease respiratory rate increase alveolar ventilation and may

help expel as much air as 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 pursed lips 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 you know as a student going in you

may need to use one of these with your patients so it's important you

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 if a patient has a cough

and it's important to be aware that coughing is a mechanism for clearing our

respiratory tract of irritants and congestion

and so basically it causes an explosive movement of air from the lower to the

upper respiratory tract coughing can be good we

we sometimes want our patients to cough it's

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 and post surgical care you know if we're wanting our patient to

deep breathe and use the spirometer after surgery a

lot of times when they do that it will cause them to cough or loosen any

secretions in there and so that is important we want that

voluntary cough

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

[2880.0 - 2940.0]

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 slide we're going to talk

about possible cough medications that

can assist with that involuntary cough so the one thing i want you to arouse

with cough medicines they act in different ways so

there are different types of cough medicine out there sometimes they are

expectorants 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 what's in there that irritant that's causing the problem

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

[2940.0 - 3000.0]

suppressants tend to depress the cough reflex

i know sometimes if patients haven't been sleeping well

because of a cough they've been up coughing all night

occasionally you know they may take an over-the-counter suppressant

but really we don't want to suppress the cough constantly because it does serve

as a purpose lozenges 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 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

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

[3000.0 - 3120.0]

a physician order is needed we need to be aware as nurses it irritates the

mucosa and it does remove oxygen from the

respiratory tract possibly causing hypoxia

it can be painful and distressful at times

we always want to assess for that pain and and if we can provide

pain medication prior to suctioning 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 masks whatever is needed for

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 rate indicate their

they have hypoxemias 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

there the skill for suction is 39-2 and it's on pages 15-28-15-32

the next thing i want to go through is inhale medications

inhale medications are administered to open narrowed airways so you'll

see this a lot with asthma patients particularly there's several different

types of inhale medications that you could be given

we won't test you really on for instance a brand name of a

medication but as you go into the clinical setting

it's important to understand if they say your patients on a nebulizer

treatment well what is that and basically they take liquid

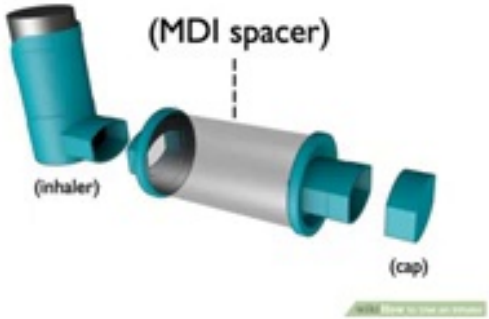
medication they put it in this machine

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)

[3120.0 - 3300.0]

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 put a mass to this and put the

mask over the nose and mouth to get this medication

mdis are meter dosed inhalers they delivered a control 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 hold it upside down which is not good

they inhale too rapidly when they're taking

this medication or they stop inhaling and

the 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 when it's used

in conduction it can con 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 they'll 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 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 patient's 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 is about supplemental oxygen so if our patient has a 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

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

[3300.0 - 3480.0]

in some cases such as you know a patient comes in the

emergency room 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 birdsome to 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 or too much o2 may cause this client to lose the stimulus

and they stop their breathing so again when i was talking about pulse

oxes and normal ranges we 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 a cobd patient

humidification can be added to an oxygen delivery

system and and sometimes that is needed because that helps keep the mucous

membranes moist and basically you're just adding a

little sterile water to the 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

[3480.0 - 3540.0]

Oxygen Precautions

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

[3480.0 - 3540.0]

oxygen in the hospital or maybe it's new they're going to go

home on oxygen or maybe they already are but it's it is good

to reinforce 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 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 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

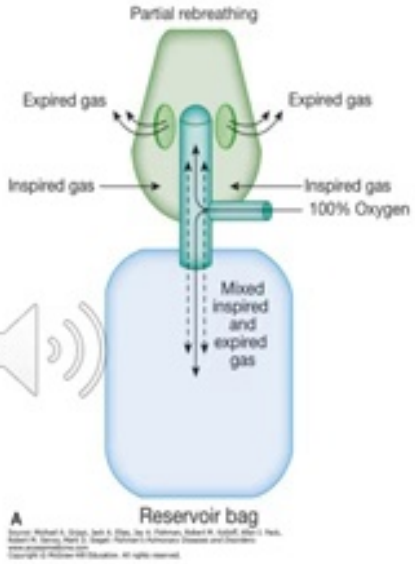
of oxygen delivery depending on how much oxygen your

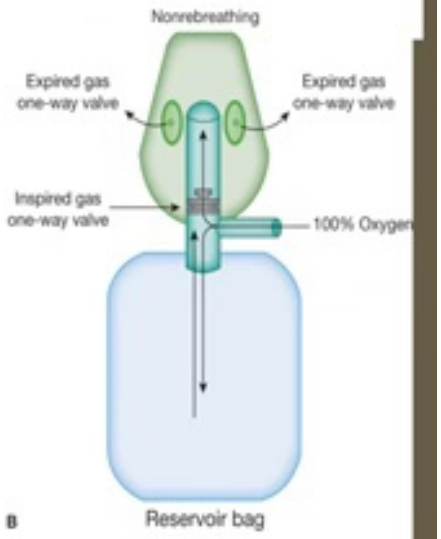
[3540.0 - 3840.0]

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





[3540.0 - 3840.0]

depending on how much oxygen your patient is needing

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 one to six liters a minute with this device again this is where

you can add the humidification 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 their 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

ulcerations or pressure areas or that tubings

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 tight

and this is used to increase oxygen delivery for short periods of time

we can only use this with five to eight liters

of oxygen and we it will not be effective we never use it

with less than five liters so if you're a patient only on

three 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 five to

eight liters the next one that we're showing here is

the partial rebreather this has a reservoir bag that collects

the first part of the patient's exhalation

it mixes it with a hundred percent 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

needing that the next one your book talks about is

the non-rebreather this is for when we need high

concentrations of oxygen like the partial rebreather

but this one has a two-way valve that prevents the patient from

inhaling their exhaled air we use this when a patient's on 12

liters of oxygen or they're needing 12 liters of oxygen

and again you know with each of these you know the oxygen is a physician's

order and with that order the doctor needs to

be writing how many liters he wants the patient on

what's the max you know if you've got your patient on

five liters and that's what the doc that's the max the doctor wrote for and

they you feel like they need more based on

their signs and symptoms you're gonna 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 in through

the side ports ports are adjusted according to the

prescribed oxygen concentration for the venturi

this is 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 be 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 an

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 15 11 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 there's bipap and there's cpap bipap

changes air pressure while the client breathes in and out

cpap is continuous air pressure this usually will

fit over the client's nose and mouth if you have them on it

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

Continuous Positive Airway Pressure

[3840.0 - 3900.0]

and 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 pleural space

or it's disrupted and this can happen from a thoracic

surgery or trauma patients with fluid like such as a pleural fusion

patients with blood such as the hemothorax

or air and pneumothorax in the pearl space require a chest tube

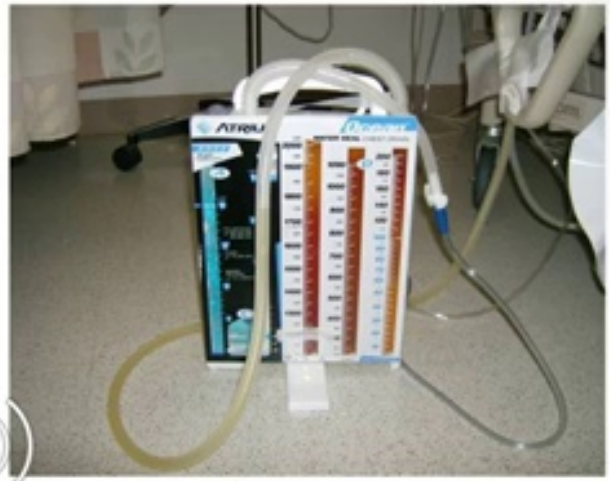
to drain these substances and that allows the compressed

lung to re-expand so all a chest tube is is a firm plastic tube

it's placed in the plural spaces by a

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**



physician it's sutured into place we cover it with an airtight dressing

and it drains that error 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 crepitus we're going to assess water seal for bubbling and they go into

more of chest tubes and med surg 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 sill it

should be bubbling we want to avoid

milking the tube so 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 and 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 two weed 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 vaseline gauze 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 that on page 15 14 it's guidelines for nursing

care 39-3

as we come to the end are near the end of this

chapter the last few slides are about artificial airways

and so your oropharyngeal airway this is a tube or

Oropharyngeal Airway

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

[4020.0 - 4080.0]

a plastic or rubber and we see this inserted in the back of the

pharynx through the nose or the mouth this is often used postoperatively and

it keeps the tongue from blocking 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 is the endotracheal

tube this is inserted into the trachea a

laryngoscope is used to insert this is usually done again by advanced

practitioner or physician we can use this to

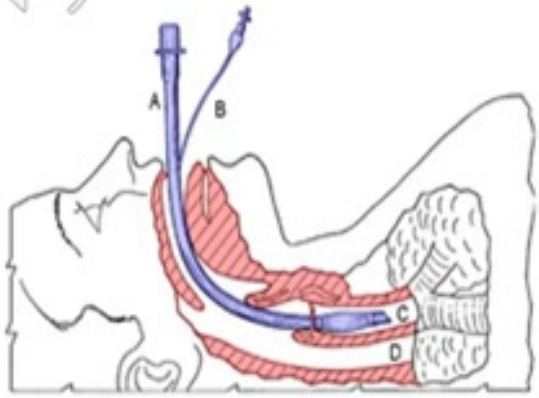
administer oxygen by mechanical ventilation most

commonly we use a cuffed endotracheal tube to prevent air leakage and

bronchial aspirations once this is put into a patient the

Endotracheal Tube

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



[4080.0 - 4140.0]

patient cannot speak and once we put this in often it

requires suctioning to remove secretions

last couple of slides here are about a tracheostomy

this is inserted for mechanical ventilation it bypasses the upper airway

if a patient has an upper airway obstruction

and or to remove endocrine 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 inner an outer cannula and an inner cannula

there's an obturator that guides the direction of the outer cannula during

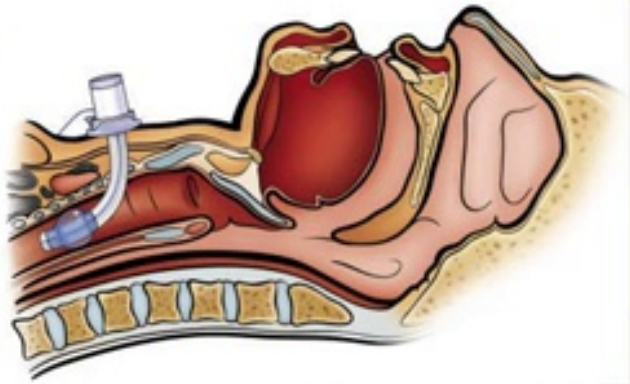
insertion again this can be cuffed or

non-cuffed but it's held in place with a velcro

strap or tape and

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



so there's nursing implications with this

administering heat or humidified oxygen we want to keep the

trach free from foreign objects we want to keep that

clean and replace the inner cannula as needed

we want to do regular changing of the dressing and ties and 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 obturator the suction equipment

oxygen a manual ventilation bag and a spare tracheostomy

tube should that come out of the patient tranquil suction is one of the skills

that is usually performed or taught in the skills lab

you should review that providing tracheostomy

care that skill can be found 39-5 on

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

[4200.0 - 4260.0]

page 1540 and you should be reviewing tracheal

suction which is a skill on of 39-6 in the back of your book

but we do when we do tracheal suctioning we want to pre-perform this

using a sterile catheter and we want to use sterile technique if

we're in the hospital if a patient has to do this at home

our loved one has to do it for a patient at home we usually recommend

clean technique in the home we want them 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

suctioning is at risk for hypoxia mucosal damage dysrhythmias

infection and atelectasis so before we start the procedure we always want to