

Objectives

Were not given



Mind map

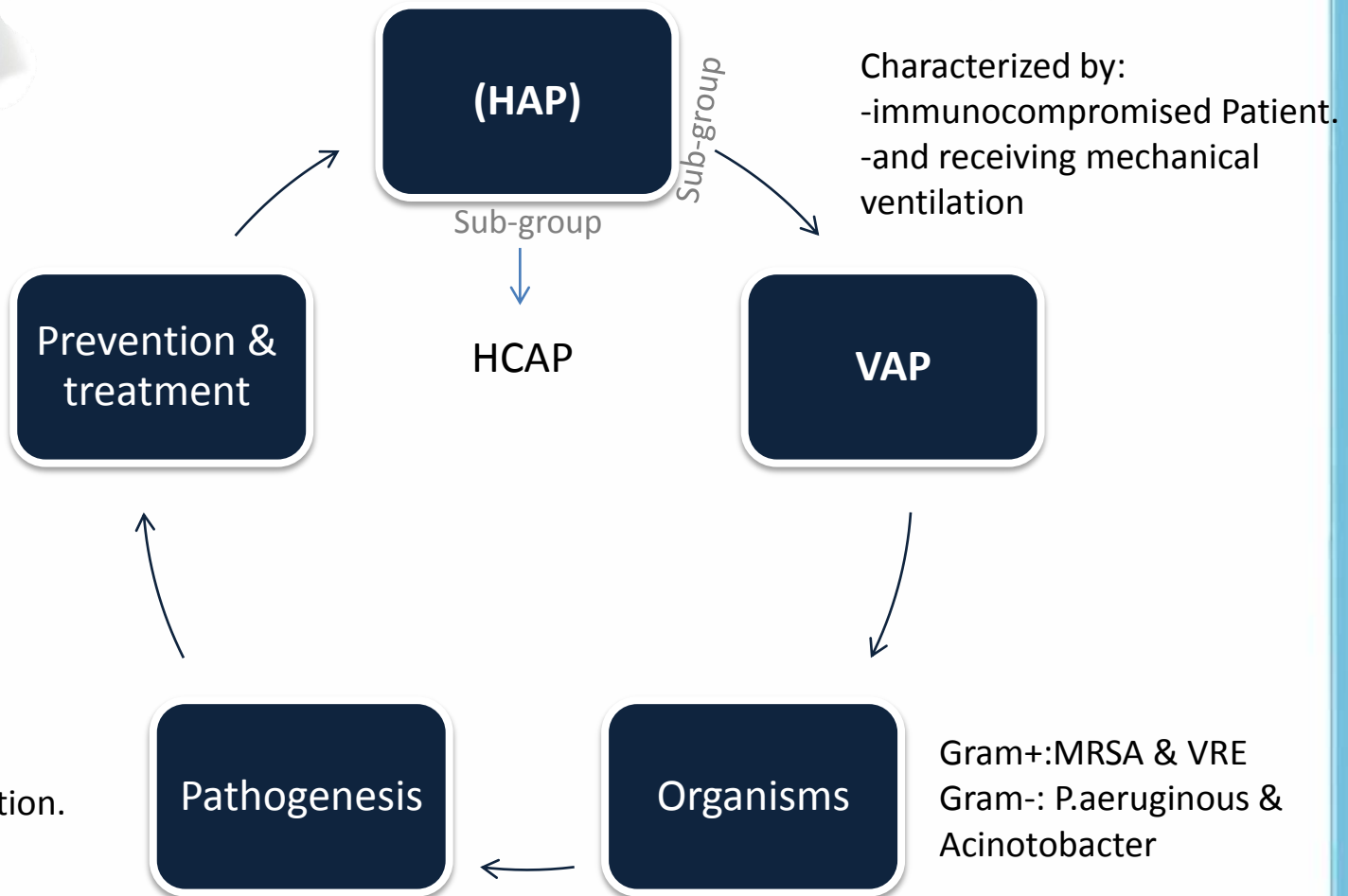
(Hospital acquired pneumonia)

important things are highlighted in **RED**

Prevention:
Effective washing hand...etc

Treatment by
Vancomycin &
colistin

-Pulmonary Aspiration.
- impaired host defenses... etc



Definition:

Nosocomial pneumonia:

Occurring at least **48 hours after admission** and not incubating at the time of hospitalization. The organisms causing these pneumonia are **resistant** to normal Antibiotics and found **only in the Hospital**.

Nosocomial pneumonia
(HAP)

HCAP

VAP

Introduction:

- Nosocomial pneumonia is the **2nd most common** hospital-acquired infections after **UTI**. Urinary Tract Infection
- The incidence of nosocomial pneumonia is highest in **ICU** Intensive Care Unit
- The incidence of nosocomial pneumonia in **ventilated patients was 10-fold higher** than non-ventilated patients

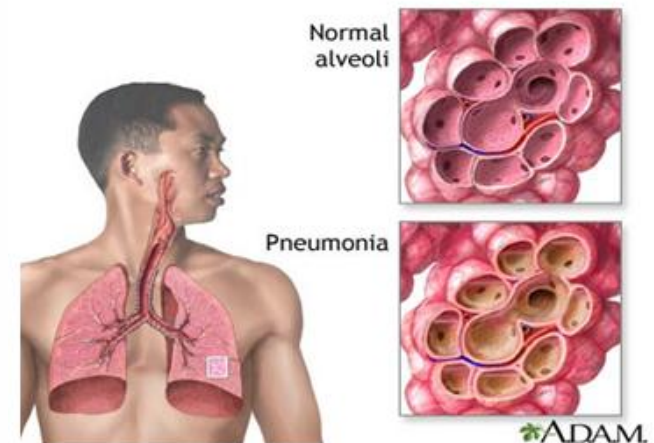
Definition:

Pathogenesis:

-For pneumonia to occur, at least one of the following three conditions must occur:

1. Significant **impairment of host defenses** e.g catheters
2. Introduction of a **sufficient-size inoculum** to overwhelm the host's lower respiratory tract defenses
3. The introduction of **highly virulent organisms** into the lower respiratory tract.

-Most common is **microaspiration of oropharyngeal secretions** colonized with pathogenic bacteria.



Classification:

1- Early-onset nosocomial pneumonia:

Occurs during the **first 4 days** of admission.

Usually is due to **S. pneumoniae**, **MSSA** (Methicillin sensitive **S.aureus**), **H. Influenza**, or **anaerobes**.

2- Late-onset nosocomial pneumonia:

occurs **more than 4 days** of admission.

More commonly by **Gram negative** organisms, especially **aeruginosa**, **Acinetobacter**, **Enterobacteriaceae** (**Klebsiella**, **Enterobacter**, **Serratia**) or **MRSA (+)**.

Classification:

- P. aeruginosa* and *Acinetobacter* are common causes of late-onset pneumonia, particularly in the **ventilated patients**.
- Anaerobes** are common in patients predisposed to aspiration.
- Ventilator associated pneumonia (VAP) with anaerobes occurred more often with **oropharyngeal** intubation than nasopharyngeal intubation.

REMEMBER:

- Hospital acquired pneumonia "Nosocomial pneumonia" (HAP)
 - Health-care associated pneumonia (HCAP)
patients with recent close contact with the health care system,
NOT in Hospital..Like in Elderly Care Homes
 - Ventilator Associated Pneumonia (VAP)

Ventilator associated pneumonia (VAP):

Nosocomial pneumonia that has developed in patient who are receiving **mechanical ventilation**.

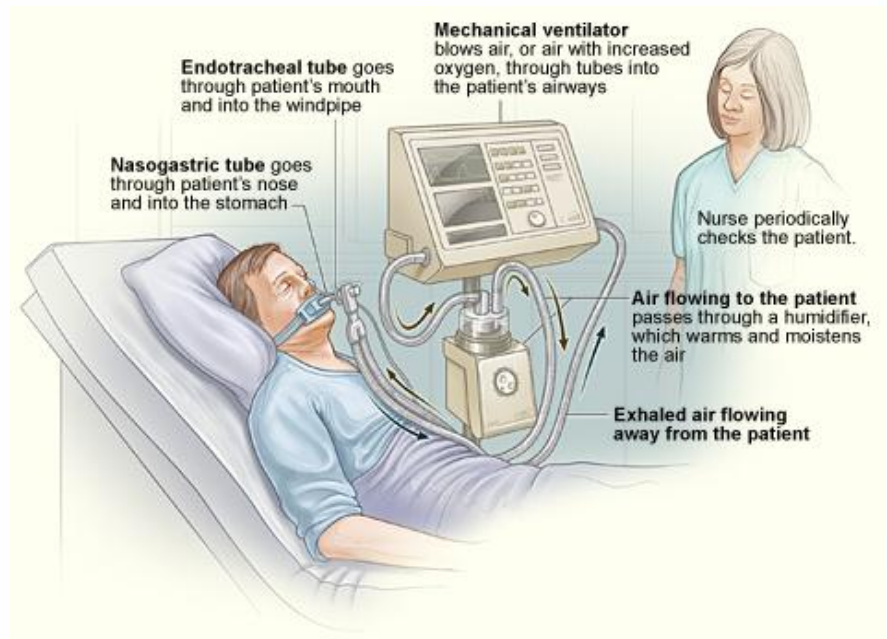
Pathogenesis:

***Requires 2 important processes:**

1. Bacterial **colonization** of the aerodigestive tract
2. **Aspiration** of contaminated secretion into the Lower airway

-Prevents mechanical clearance by **cough** and the **mucociliary** escalator.

Aerodigestive: A term that encompasses the oral cavity, sinonasal tract, larynx, pyriform sinus, pharynx, and esophagus



Prevention for VAP:

-The oral regimen (topical **gentamicin**, **Colistin**, **Vancomycin** cream q6h for 3 weeks) treating oropharyngeal colonization could prevent VAP.

"q6h" stand for every 6 hours,
q=every and
h=hours

*Non-pharmacologic strategies :

-Effective hand washing and use of protective **gowns** and

Gloves.

-**Semirecumbent positioning**

-Avoidance of **large gastric volume**

*pharmacologic strategie:

-**Combination antibiotic** therapy

Treatment :

- Most initial therapy is **empiric** with a broadspectrum antibiotic because no pathogen is Identified, Then using narrowed antibiotics after knowing the cause.
- Patients for *S. aureus* infection, agents against this organism are necessary, including **Vancomycin** if **MRSA** is suspected.
- Linezolid** is comparable with Vancomycin.
The advantage of Linezolid is less possible **Nephrotoxicity**.

Very important notes:

Definition:

*Nosocomial pneumonia: * Occurring at least 48 hours after admission and not incubating at the time of hospitalization. The organisms causing these pneumonia are **resistant** to normal Antibiotics and **found only in Hospitals**.

***HAP** most commonly occurs on **surgical floors**.

***VAP** most commonly occurs in **trauma ICU**.

***Treatment by: antipseudomonal** antibiotics (**Colistin**, Aminoglycosides, Fluroquinolones or Carbapenem).

Very important notes:

What are these organisms that can cause HAP?

***Gram+**: -**MRSA** "Methicillin-resistant Staphylococcus aureus":

Treatment by: **Vancomycin**.

-**VRE** " Vancomycin-Resistant Enterococci": Treatment by:

Linezolid.

V.important

***Gram-** -**Pseudomonas aeruginosa**: "Oxidase **+** on Oxidase test"

- **Acinetobacter**: "Oxidase - on Oxidase test"

Treatment by: **antipseudomonal** antibiotics (**Colistin**, Aminoglycosides, Fluroquinolones or Carbapenem).

Very important notes:

Ventilator associated pneumonia (VAP):

*Nosocomial pneumonia that has developed in patient who are receiving **mechanical ventilation**. They are :

-immunocompromised patients.

-using ventilation mechanism "*more likely to get infection because of the foreign body (Ventilation tube\Catheter). The foreign bodies will increase the rate of infection(Foreign body reduces the immune system)* “

How do people get VAP?

* They get it from contamination(Ex:From Doctors', nurses' hands) of nasopharynx or oropharynx by Bacteria. Then, it “the bacteria” go down to the lungs by:

Very important notes:

1-Endotracheal or tracheostomy tube **which allows free passage of Bacteria into the lower respiratory tract and the parenchyma.**

2-Bacteria also travel from sinuses of the stomach into the lungs

1 & 2 can lead to **Pulmonary aspiration.**

Pulmonary aspiration: inhaling food, water, stomach acid, vomit or another material into the lungs.

***Anaerobes** are common in patients predisposed to aspiration.

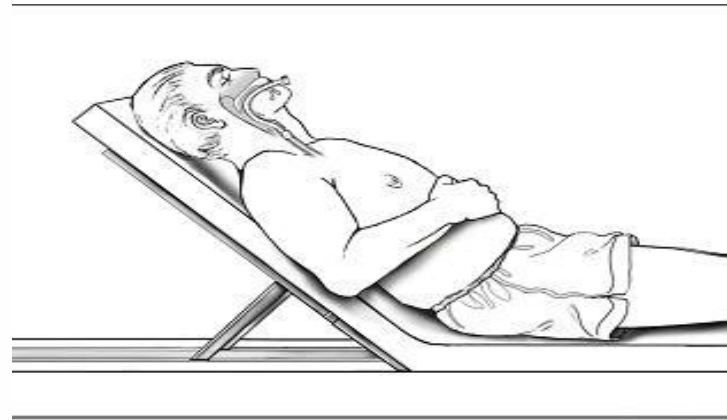
***Nosocomial pneumonia most likely** occurs due to microaspiration of bacteria **colonising the upper respiratory tract.**

***Other** routes of infection include microaspiration of **gastric contents, inhaled aerosols, haematogenous spread**, spread from pleural space and direct inoculation and touching from Hospital/ICU personnel.

Very important notes:

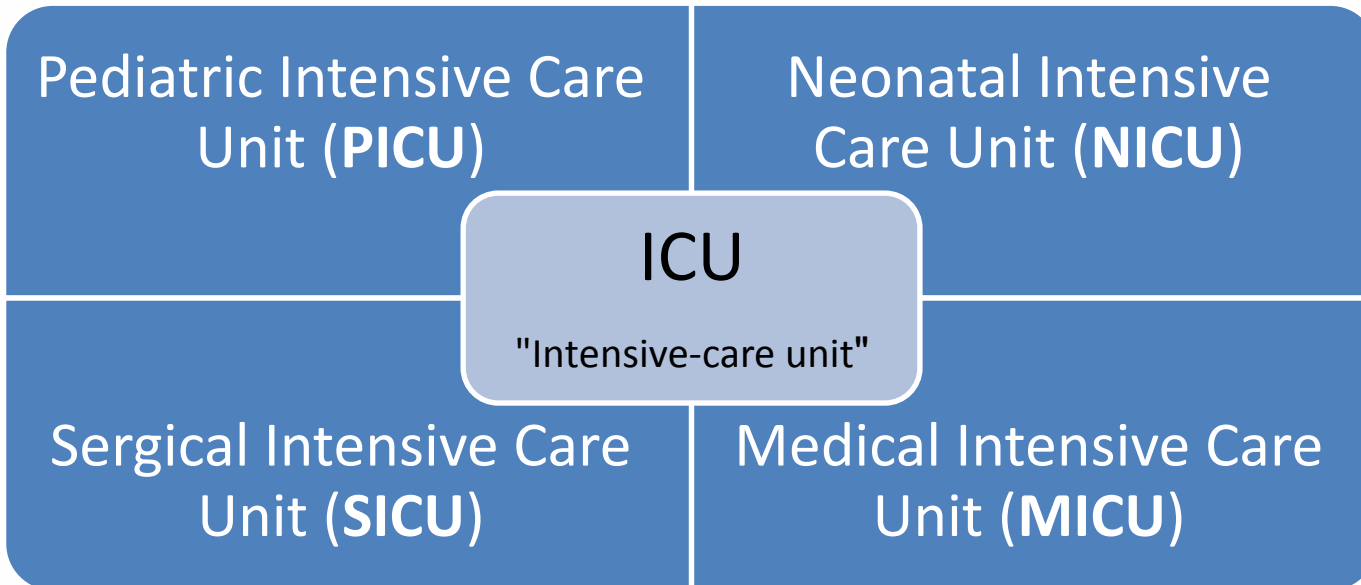
Prevention of VAP/HAP:

- Effective **hand washing**.
- **Semirecumbent position**.
- Sterilize the **pharynx** by giving **localized Antibiotics**.
- Avoidance of large gastric volume.



Semirecumbent position

REMEMBER



Questions

Q1\ Which part of the Hospital has got the highest incidence of HAP?

ICU

Q2\ Patient complains about Nosocomial Pneumonia, which ABs would you use on him?

-**Vancomycin** and **colistin** "empiric therapy"

Note: we initial therapy by empiric drugs, then narrowed ABs after knowing the organism.

Q3\ Patient complains about pneumonia, and he is under ventilation system, his oxidase test was positive. What's is the organism?

A-MRSA

C-VRA

B-P.aeruginosa

D-Acinetobacter

Q4\ what is the most common organism that can cause HAP?
(**mainly gram- pseudomonas aeruginosa**) and gram+ MRSA