HOSPITAL ACQUIRED PNEUMONIA

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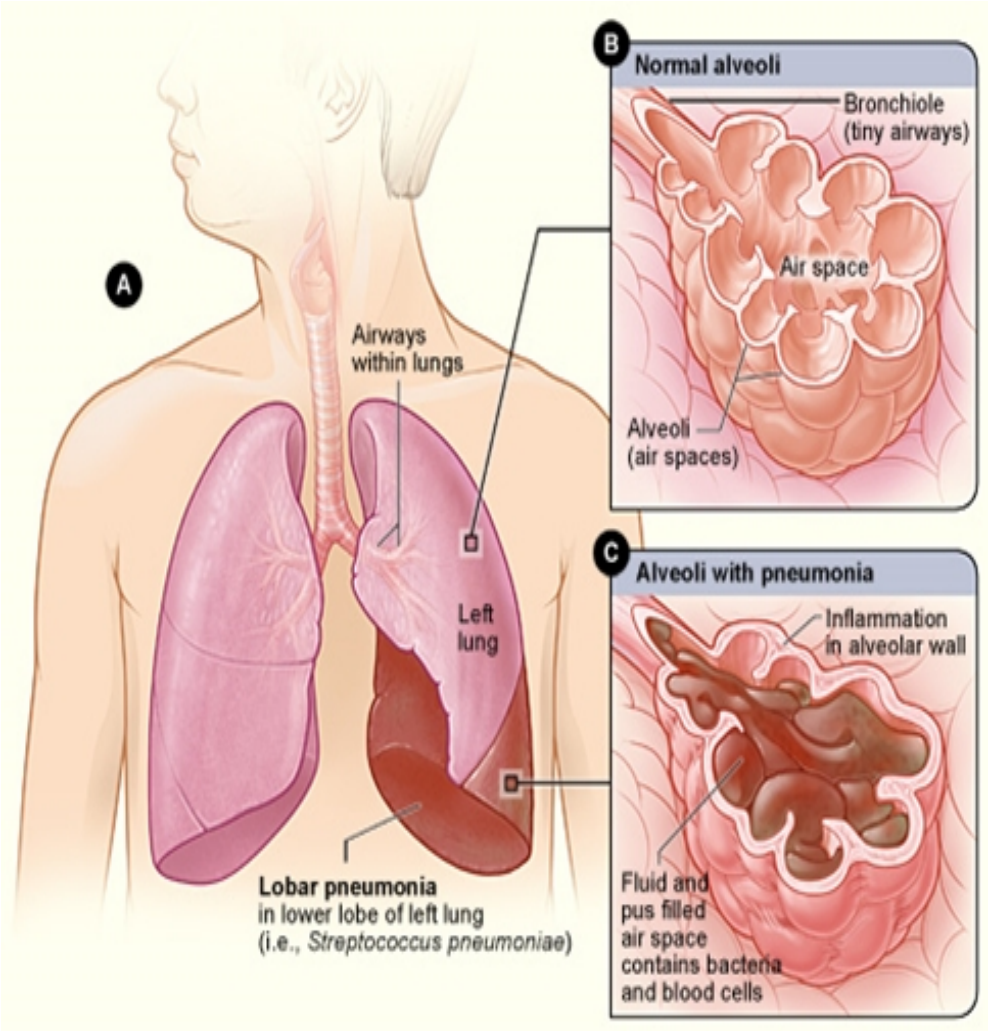
What is a pneumonia?

Pneumonia is an inflammatory condition of the lung primarily affecting the small air sacs known as alveoli. Symptoms typically include some combination of productive or dry cough, chest pain, fever, and difficulty breathing. The severity of the condition is variable. The most common pothogenic agent of pneumonia is bacteria and viruses.



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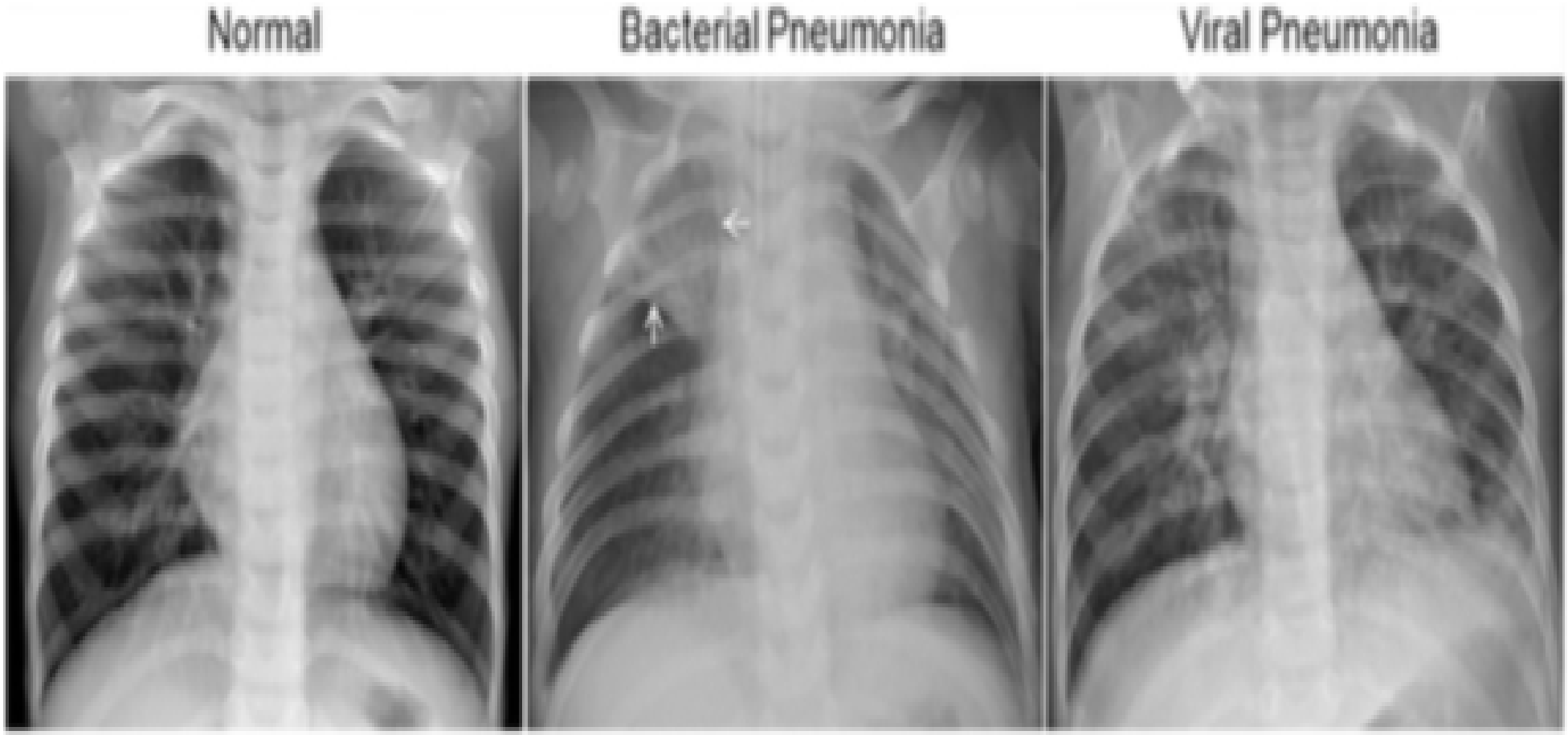

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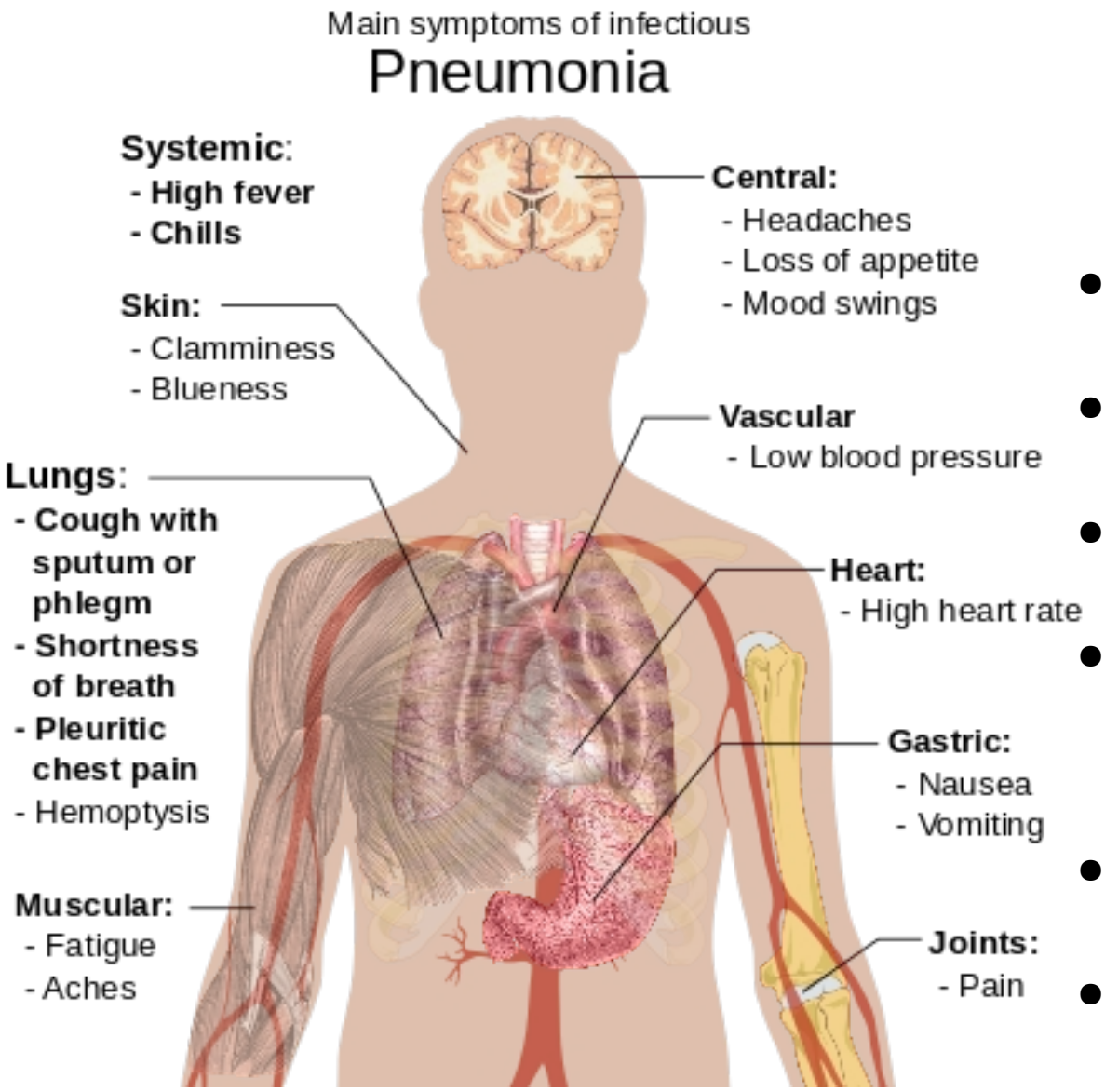

https://upload.wikimedia.org/wikipedia/commons/thumb/2/20/Symptoms_of_pneumonia.svg/435px-Symptoms_of_pneumonia.svg.png

Symptom Frequency

- Cough 79–91%
- Fatigue 90%
- Fever 71–75%
- Shortness of breath 67–75%
- Sputum 60–65%
- Chest pain 39–49%

Nasocomial pneumonia

- Hospital-acquired pneumonia (HAP) or nosocomial pneumonia refers to any pneumonia contracted by a patient in a hospital at least 48–72 hours after being admitted. It is usually caused by a bacterial infection, rather than a virus.
- Nosocomial pneumonia is the second most common group of nosocomial infections.
- Patients undergoing mechanical ventilation are exposed 10 times higher risk of acquiring pneumonia than patients spontaneously breathing.

Risk factors of HAP

Table I: Risk factors associated with hospital-acquired pneumonia and ventilator-associated pneumonia

Risk factors	
Host	• Age > 65 years • Smoking • Malnutrition • General surgery • Prolonged antibiotic therapy • Endotracheal intubation • Dental plaque and therapies that increase gastric pH • Body position during ventilation • Enteral feeding • Chronic obstructive pulmonary disease and enteral nutrition • A prolonged hospital stay of > 4 days
Environmental	• Gastro-oesophageal reflux of static oral secretions from indwelling nasogastric tubes • Positioning of intensive care unit patients for diagnostic or surgical procedures
Pharmacological	• Use of neuromuscular blocking agents • Medicines that result in an increase in the gastric pH, e.g. proton-pump inhibitors, histamine-2-receptor antagonists and miscellaneous agents, such as sucralphate

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Division:

- HAP – hospital acquired pneumonia - occurred in a non-intubated patient 48 hours after admission
- VAP – ventilator associated pneumonia - occurred in a patient 48-72 hours after intubation
- HCAP – healthcare associated pneumonia - pneumonia in a patient who was hospitalized for minimum 2 days, and the infection developed within 90 days of hospital discharge

Organisms isolated	Type of pneumonia	
	Hospital-acquired pneumonia (%)	Ventilator-acquired pneumonia (%)
Klebsiella pneumoniae	4 (57.1)	46 (45.09)
Pseudomonas	3 (42.8)	23 (22.54)
Acinetobacter	0	12 (11.7)
Escherichia coli	0	9 (8.8)
Mixed	0	6 (5.8)
Staphylococcus aureus	0	4 (3.9)
Streptococcus pneumoniae	0	2 (1.9)
Total	7 (100)	102 (100)

https://annalsafrmed.org/articles/2017/16/3/images/AnnAfrMed_2017_16_3_107_209090_t3.jpg

Bacteria and risk of severe course

TABLE III. Pathogens Associated with Nosocomial Pneumonia

Low Risk Pathogens	High Risk Pathogens
Streptococcus pneumoniae	*Pseudomonas aeruginosa*
Haemophilus influenzae	Methicillin-resistant *Staphylococcus aureus* (MRSA)
Methicillin-sensitive *Staphylococcus aureus* (MSSA)	Acinetobacter species
Escherichia coli	
Klebsiella pneumoniae	
Enterobacter species	

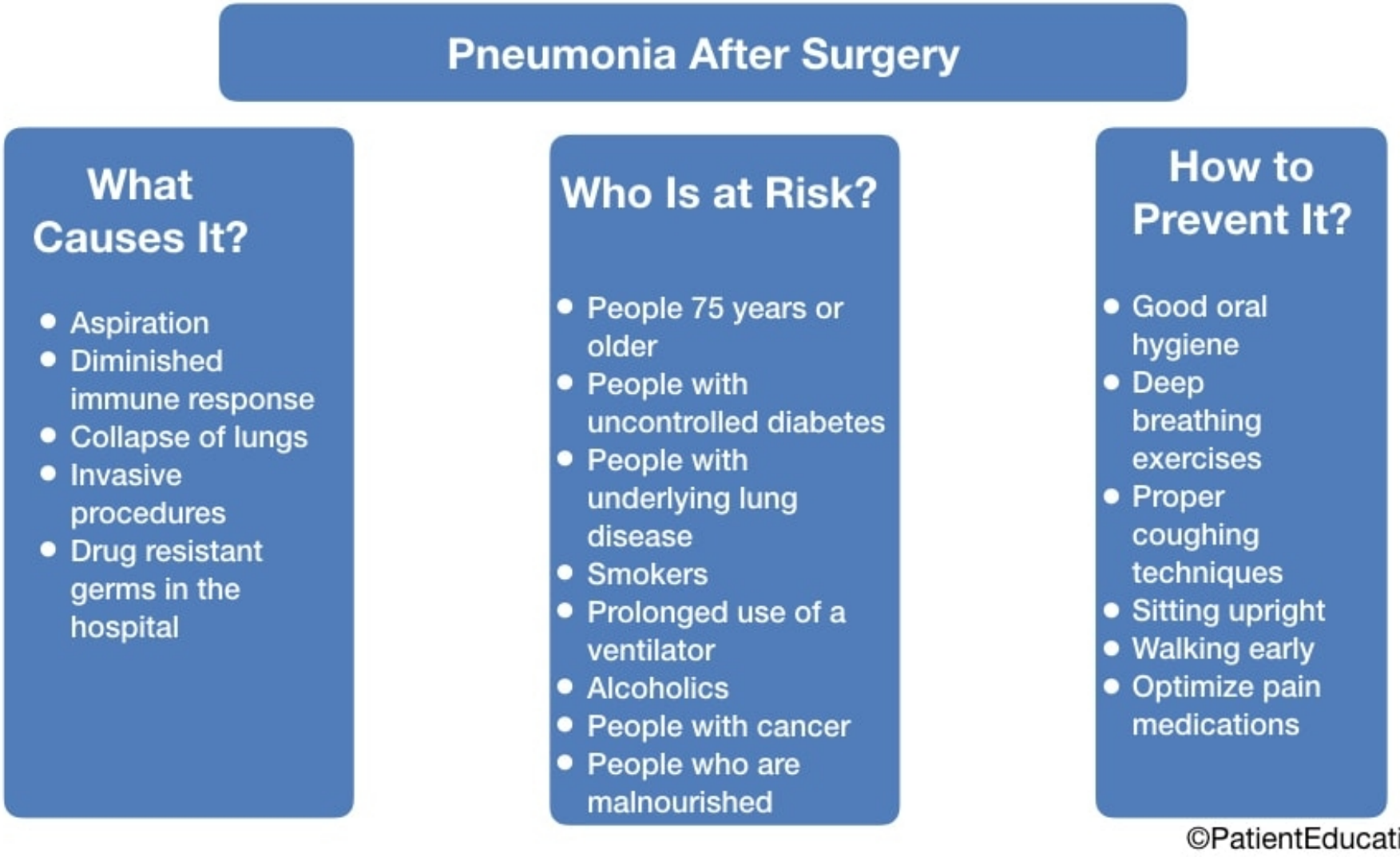
Prevention

Nursing activities for the prevention of HAP include:

- in patients with swallowing disorders it is recommended:careful feeding, ensuring proper position while eating, giving fluids through a straw.
- systematic change of the patient's body position,
- tapping,
- Lifting the head of the bed and the high position of the patient in bed,
- Encouraging patient for deep breathing and effective coughing.

Postoperative pneumonia

- Postoperative pneumonia is one of the most common diseases. It also increases the risk of postoperative mortality.
- For the prevention of pneumonia in the postoperative period in patients undergoing procedures under general anesthesia combined with intubation and artificial ventilation is particularly important shortening the duration of the procedure.
- Use of epidural or other forms of anesthesia regional anesthesia (TAPblock, intercostal nerve blocks, injection of laparoscopic port punctures) has been proven effectiveness in reducing pulmonary complications and postoperative development pneumonia compared to systemic opioids.



https://patienteducationmd.com/wp-content/uploads/pneumonia-after-surgery.jpg

(a) Normal

(b) Bacterial Pneumonia

(c) Viral Pneumonia

(d) COVID-19 Pneumonia

Treatment

Treatments may include:

- Antibiotics through your veins (IV) to treat the lung infection. The antibiotic you are given will fight the germs that are found in your sputum culture or are suspected to be causing the infection.
- Oxygen to help you breathe better and lung treatments to loosen and remove thick mucus from your lungs.
- Ventilator (breathing machine) using a tube or a mask to support your breathing.

Vascular line infection

https://upload.wikimedia.org/wikipedia/commons/thumb/8/82/Hickman_line_catheter_with_2_lumens.jpg/170px-Hickman_line_catheter_with_2_lumens.jpg

What are vascular lines:

- Vascular lines are used for infusion therapy or diagnostic procedure (blood sampling for laboratory tests, blood pressure measurement).
- Vascular accesses can be divided into:

  a) peripheral intravenous,

  b) intra-arterial (mainly radial artery for monitoring blood pressure)

  c) central intravenous

The choice of the type of vascular access results from:

► purpose of the inserted catheter and planned duration

intravenous therapy,

► the condition of the vascular system and accessibility of the puncture site,

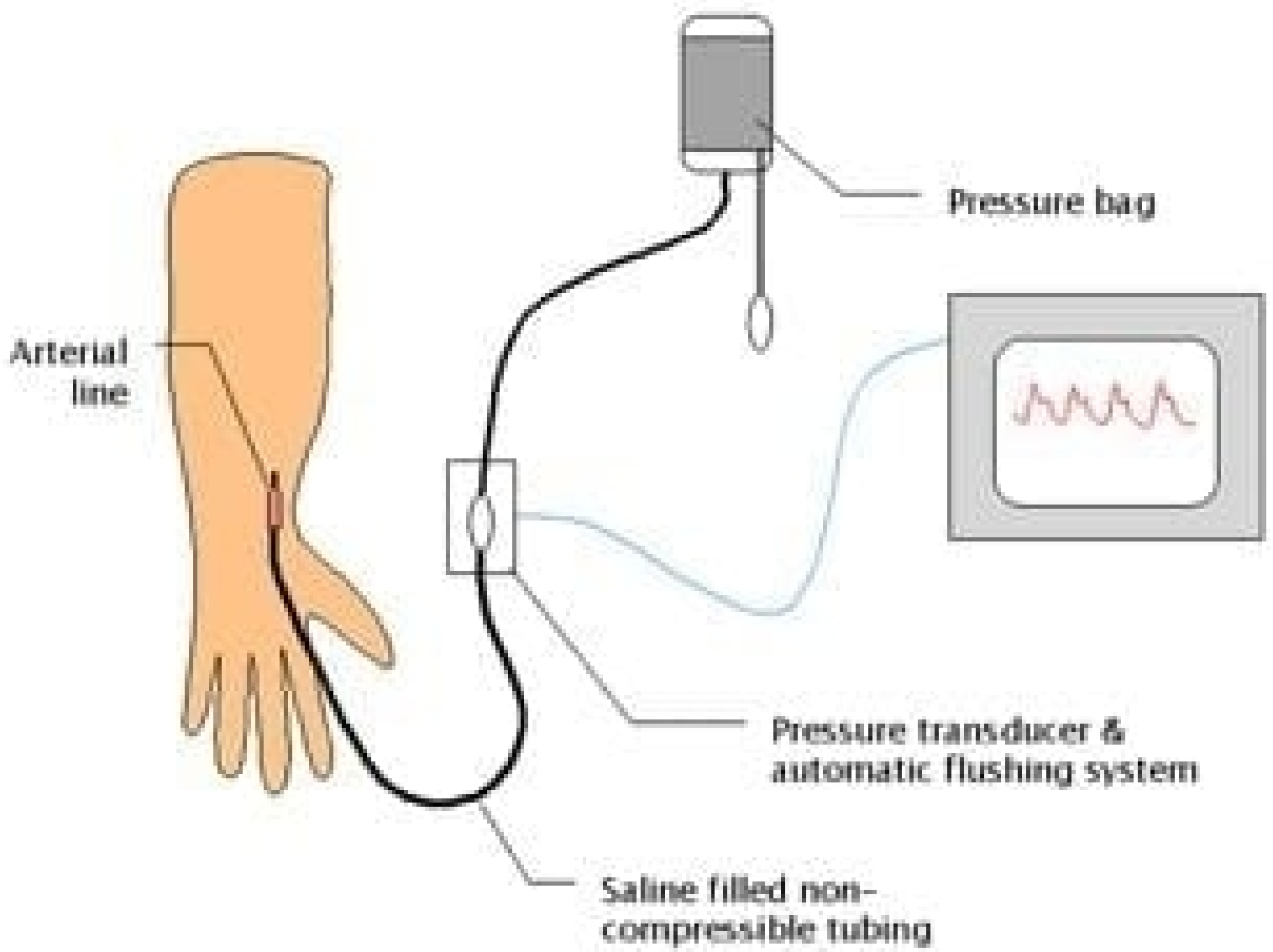
► type of administered fluids and drugs (pH and osmolarity),

► general condition of the patient and his age,

► the comfort of the patient and the skills of the person performing the procedure.

Peripherals are most often used in clinical practice intravenous access, and their use concerns even 80-100% hospitalized, while central external ones are usually used in severely ill patients treated in intensive care units.

Arterial line



https://litfl.com/wp-content/uploads/2019/01/art-line-1.jpg

Central line

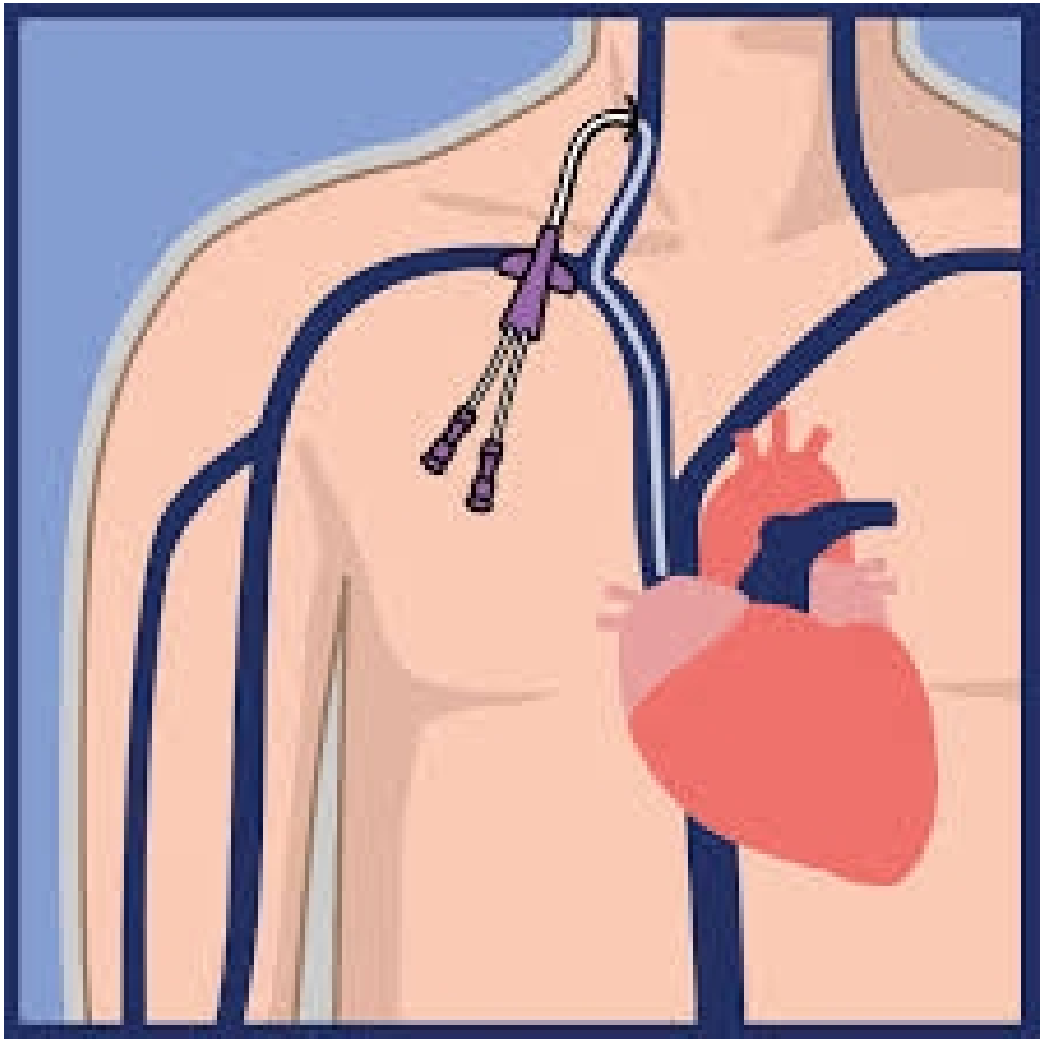


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Figure 2

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- https://www.youtube.com/watch?v=aq8OwFaIQ4I
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It is necessary to follow the basic rules:

- asepsis and antiseptic during installation and access care,
- use transparent dressings that allow observation puncture sites,monitoring possible changes on site and above site creating access in the form of redness, swelling and others signs of inflammation, as well as the general condition of the patient,
- keeping records of vascular access care from
- from the time of its creation until it is deleted.

The risk of developing infections in a patient with vascular access is associated with:

- non-compliance with the rules of asepsis during access preparation vascular and its care,
- skin contamination around the catheter,
- direct contamination of the vascular catheter,
- hematogenous infection from distant infection sites in the body,
- transfusion of contaminated infusion fluid or drug solution.

The application and use of vascular lines requires tremendouscareful selection of well-trained people with awareness of threats and not treating the implemented procedures as routine.

The source of microorganisms causing the development of infections in patients with vascular access are primarily: the skin of the staff and patient, but also the inanimate environment (worktops, gloves, packaging of medicines or medical devices).

WORK CARD

1) List pneumonia symptoms.

2) List risk factors of HAP.

3) What can you do to prevent valscular lines infections?

4) Divide vascuar accesses.