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Guideline for Diagnosis and Treatment of Biofilm Infections

By

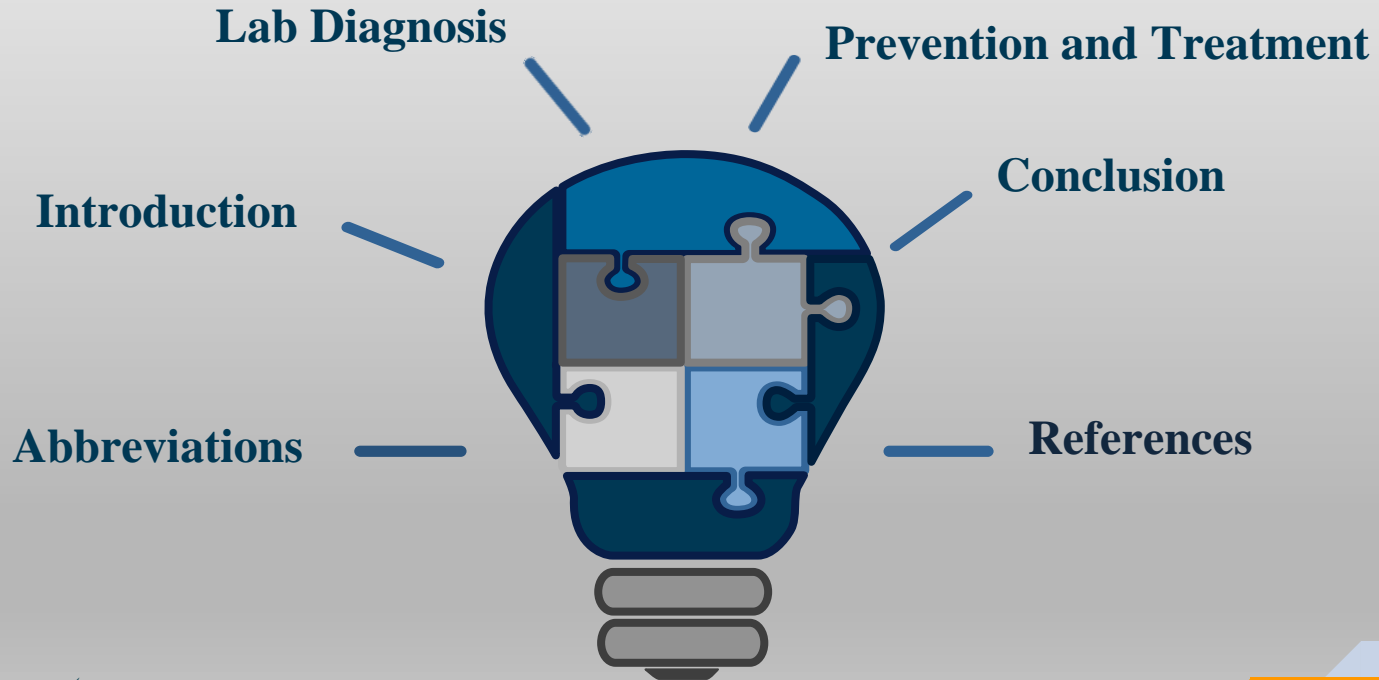
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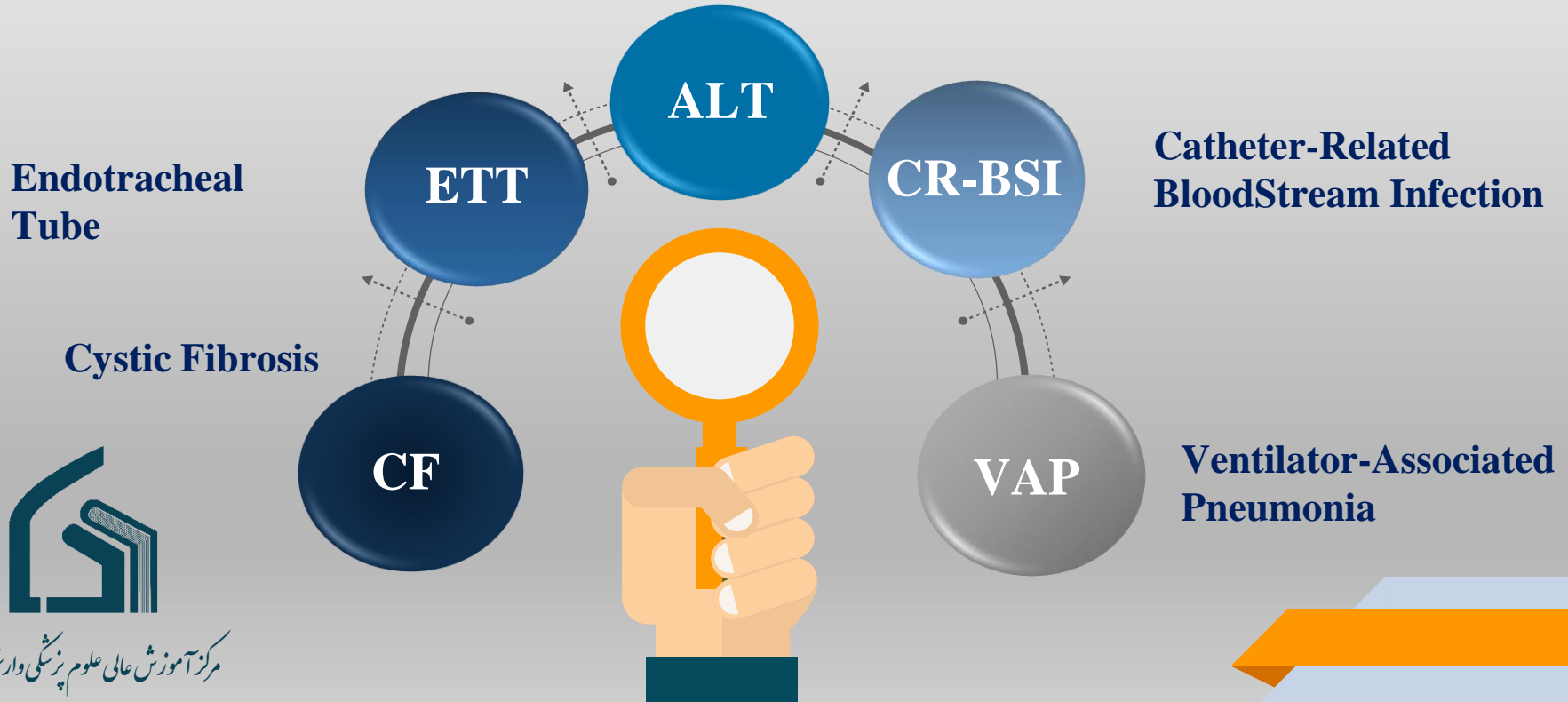


Content



List of abbreviations

Antibiotic Lock Therapy



Endotracheal
Tube

ETT

Catheter-Related
BloodStream Infection

CR-BSI

Cystic Fibrosis

CF

Ventilator-Associated
Pneumonia

VAP



Introduction

1

Biofilm

- Aggregation of microbial cells , self-matrix , component from the host.

2

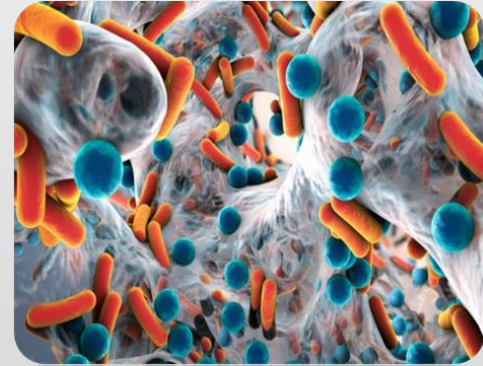
Types

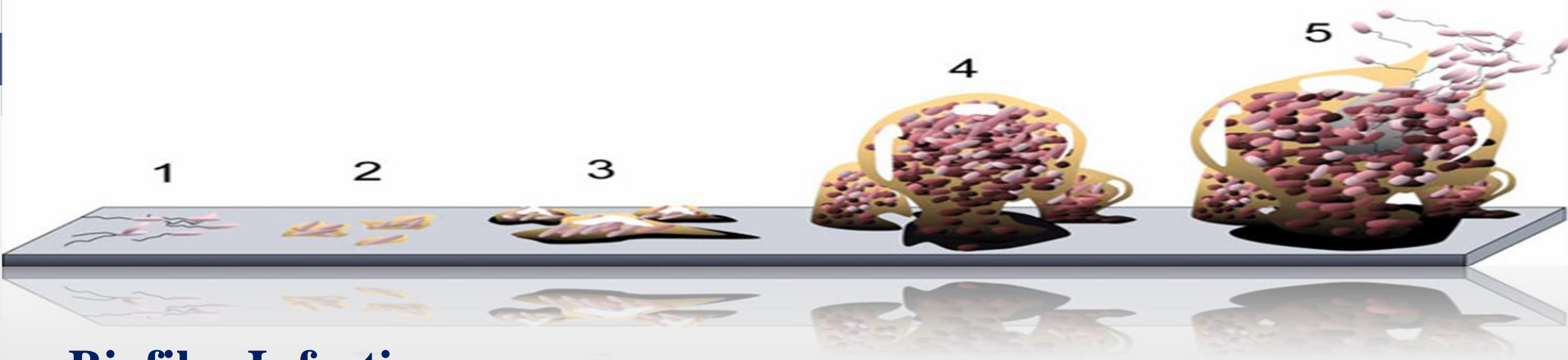
- Directly adherence
- Indirect adherence

3

Infections

- Bacteria
- Fungus



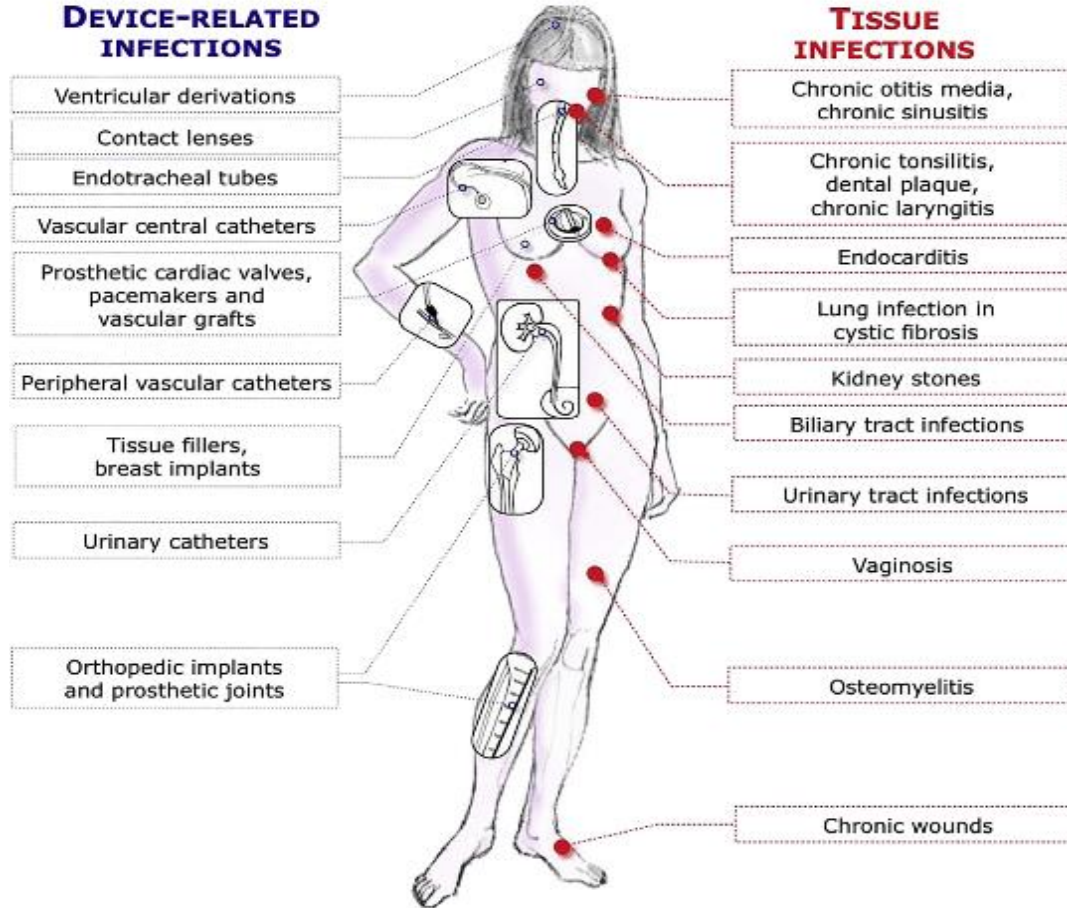


Biofilm Infection:

- Biofilm-growing microorganisms
- Tissue and Device infections
- Resistance



Guideline Goals



Samples and Lab Diagnosis

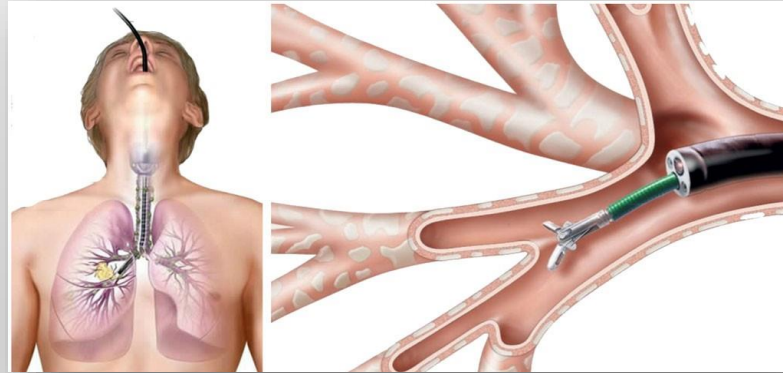


CF with chronic lung infections

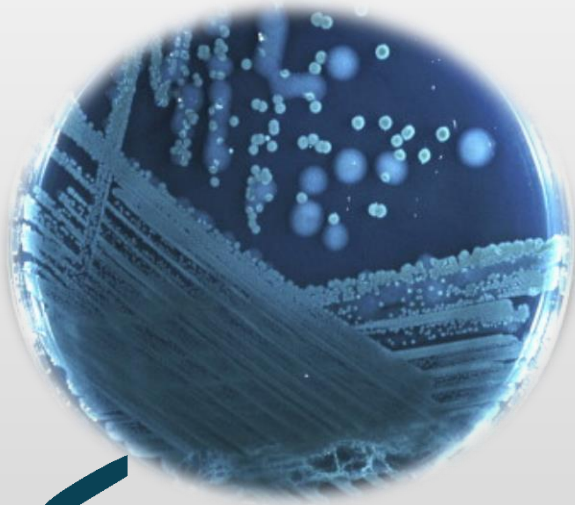
□ Contamination of lower respiratory secretion with the normal oropharyngeal flora

□ **Samples:**

- Sputum
- Bronchoalveolar lavage
- Endolaryngeal suction



Lab Diagnosis



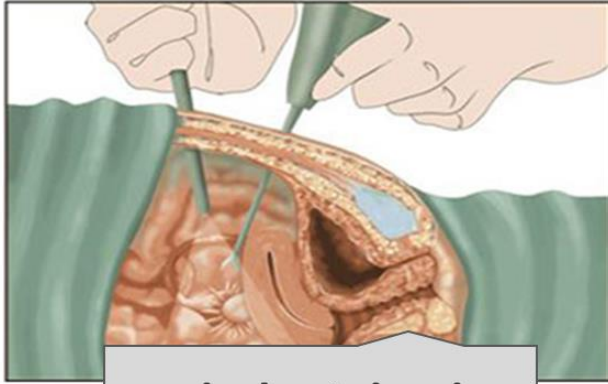
Mucoid colonies
of *P.aeruginosa*



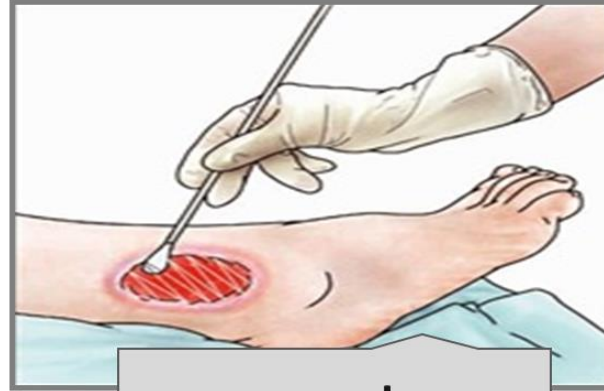
Levels of
IgG against
P.aeruginosa
antigens



Patients with chronic wound infection



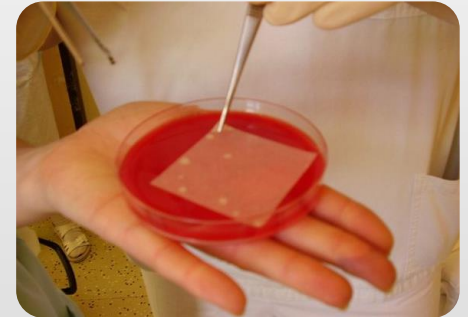
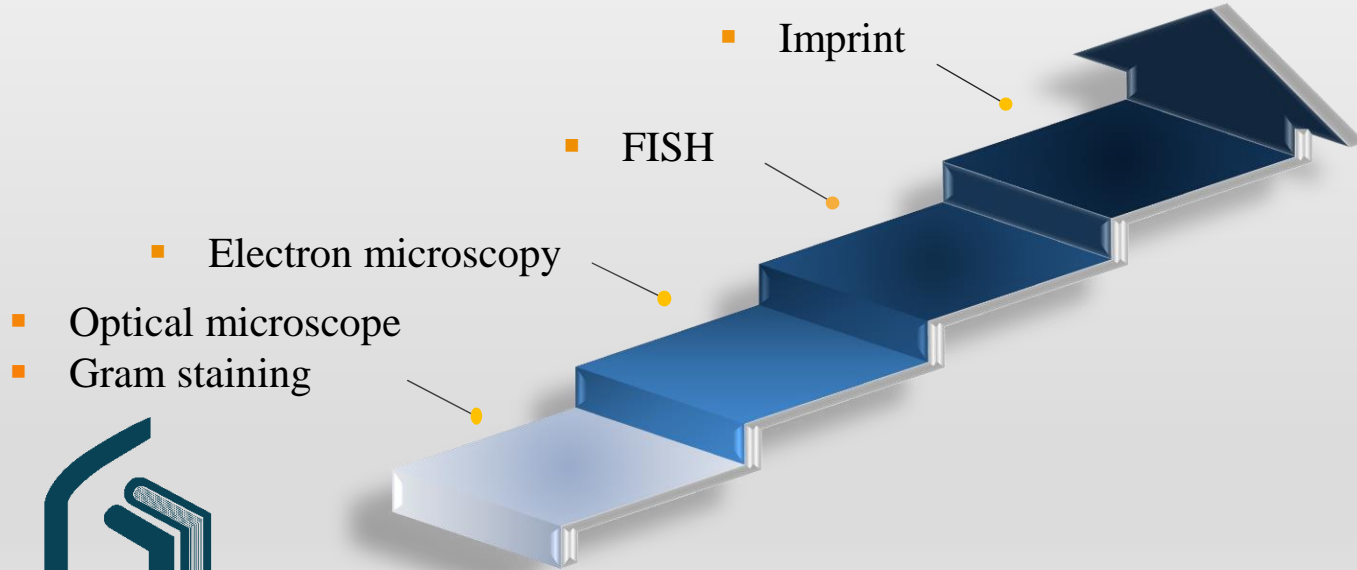
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swab



Lab Diagnosis



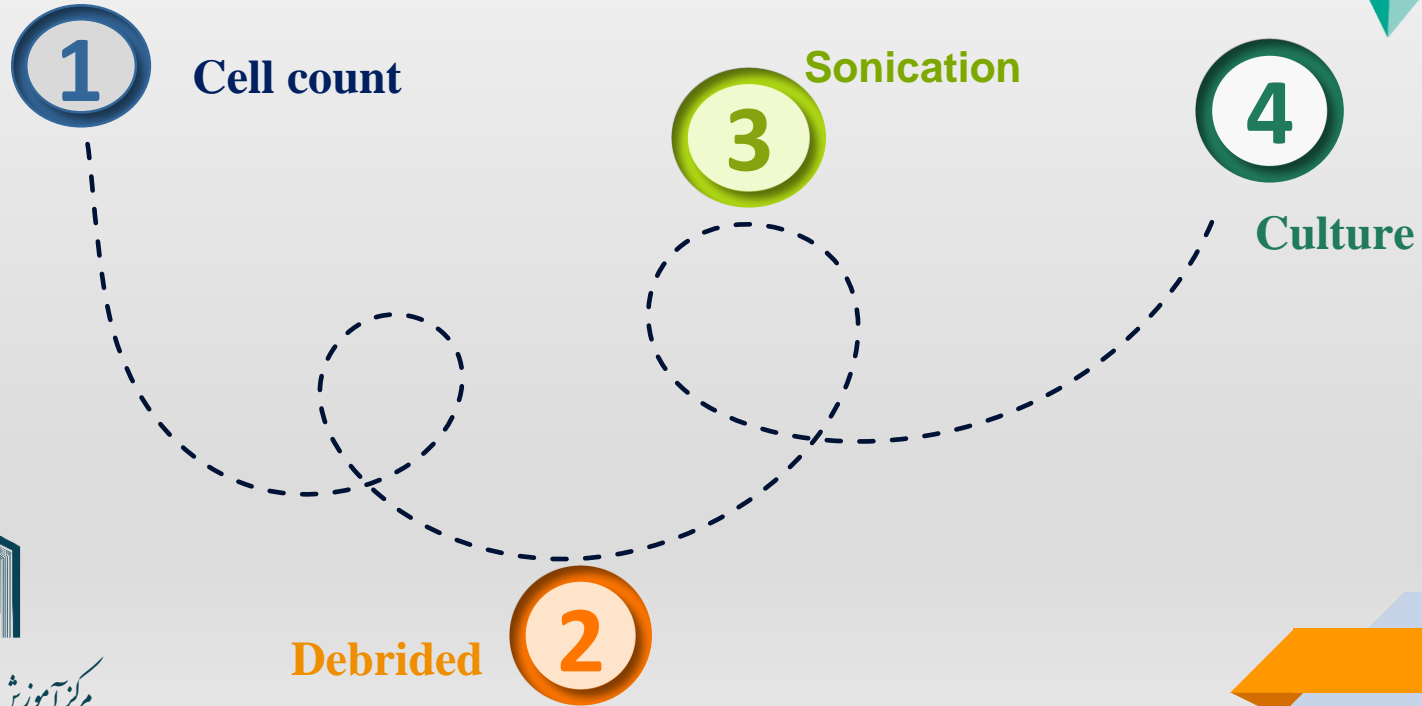
Orthopedic alloplastic device infection

□ Samples:

- Synovial fluid
- Biopsies from peri-implant tissue
- Modular part of prosthesis/device



Lab Diagnosis



Patients with endotracheal tube , VAP

➤ Ventilated patients who develop VAP:

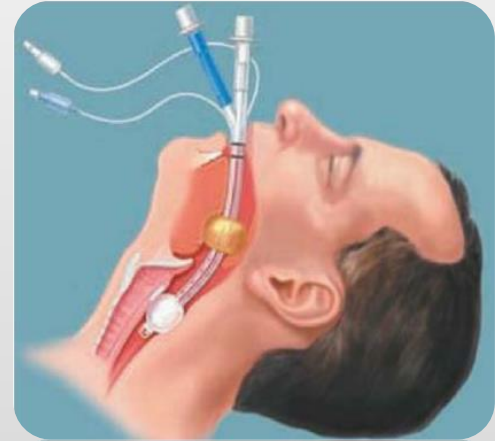
Biofilm within ETT: Primary source of the infection

Biofilm and respiratory secretions: mixed complex of bacteria

➤ Samples:

Respiratory secretions

Mucous of ETT



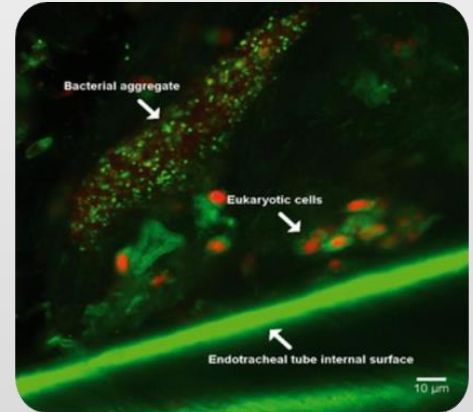
Lab Diagnosis



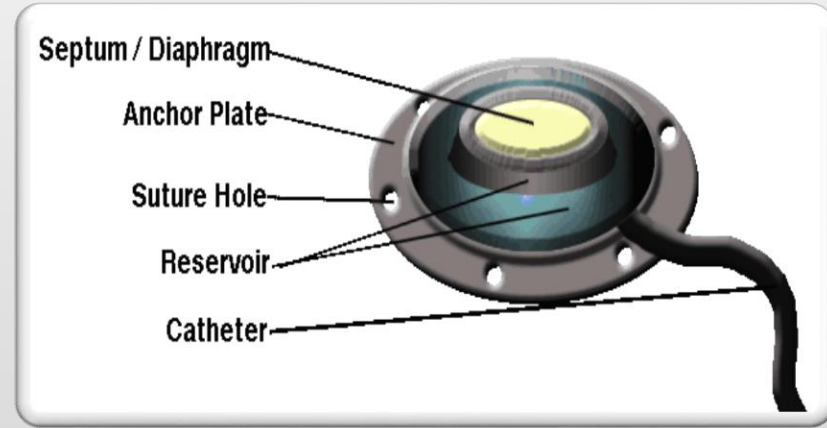
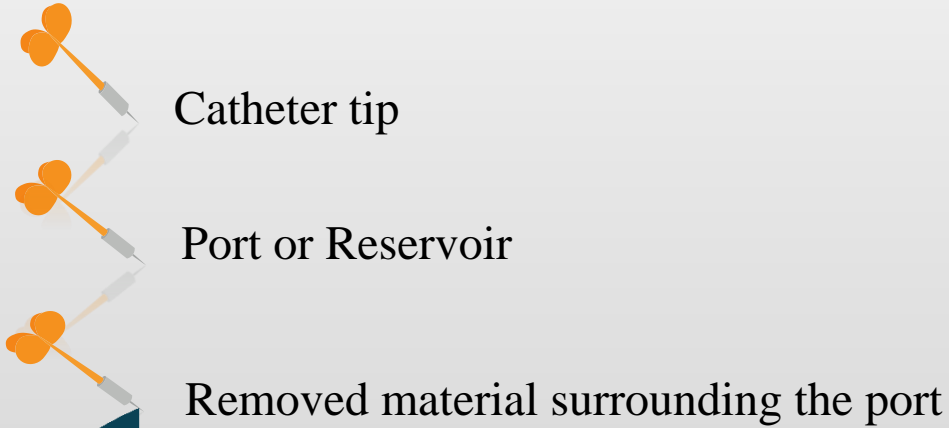
Lower respiratory secretions should be cultured



Microscopic examination of ETT inner surface



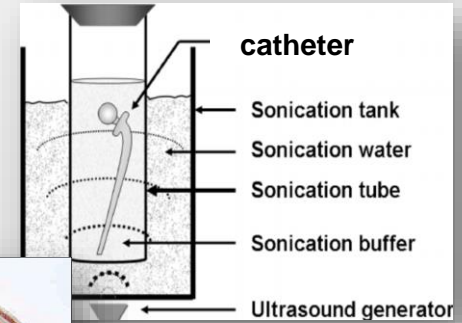
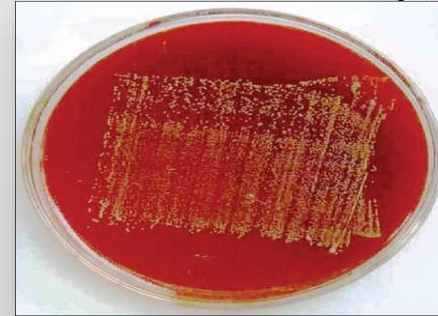
Patients with vascular catheter



Catheter

Lab Diagnosis

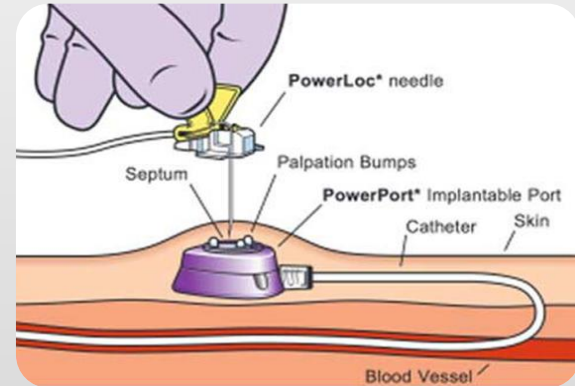
- ❑ Microscopic examination
- ❑ Gram staining
- ❑ Culture:
 - Brun-Buisson method
 - Roll-plate method
 - Removed material surrounding the catheter



Catheter-Related Bloodstream Infection

- Peripheral blood culture
- Subcutaneous septum
- Culture:
 - Brun-Bussion for septum

Swabbing of the internal surface of the port



Urinary catheter or Urethral stents



Simple sample:



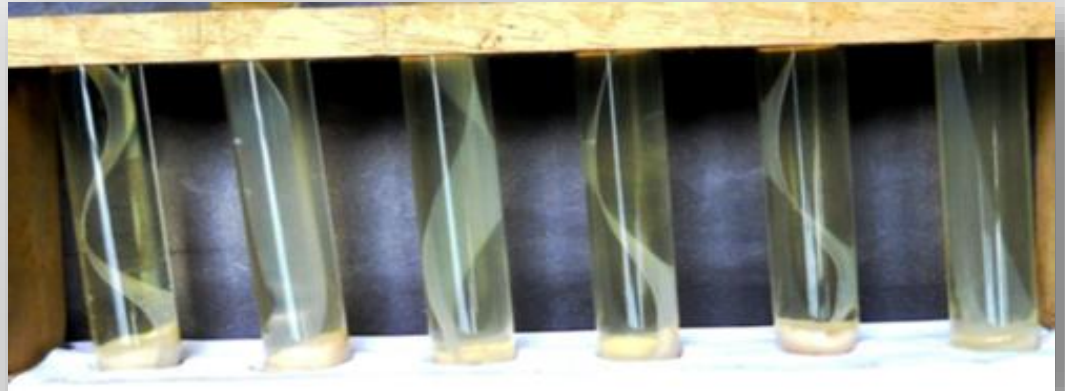
Collect urine samples



Reliable sample:

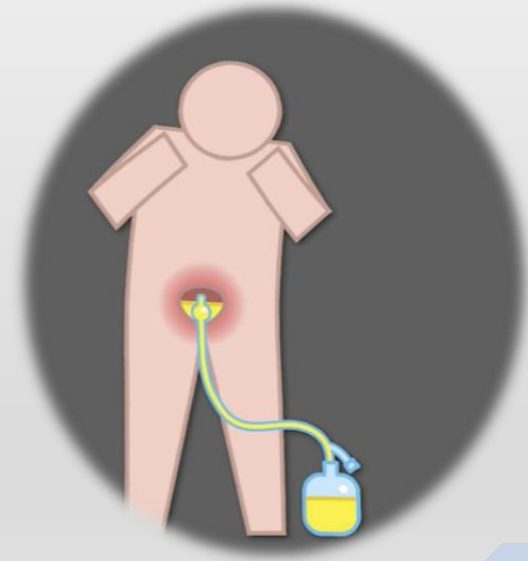


Modular part of catheter



Lab Diagnosis

- ❑ Microscopic examination of removal catheter
- ❑ Culture:
 - Fresh urine
 - Catheter



Calgary Biofilm Device (CBD)

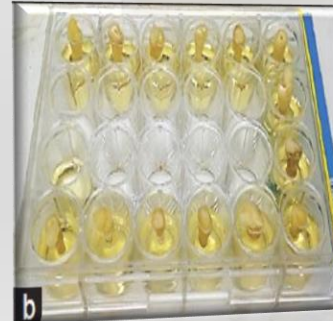
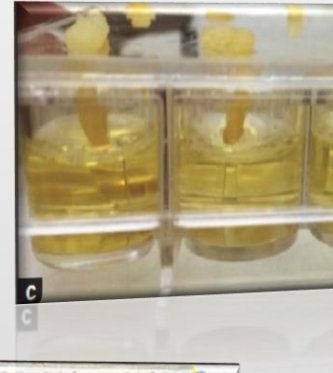
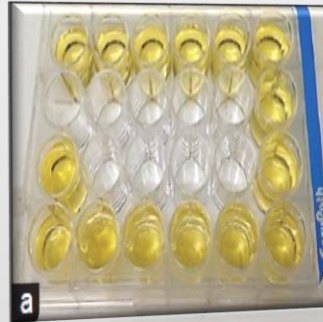
Growing bacteria biofilm



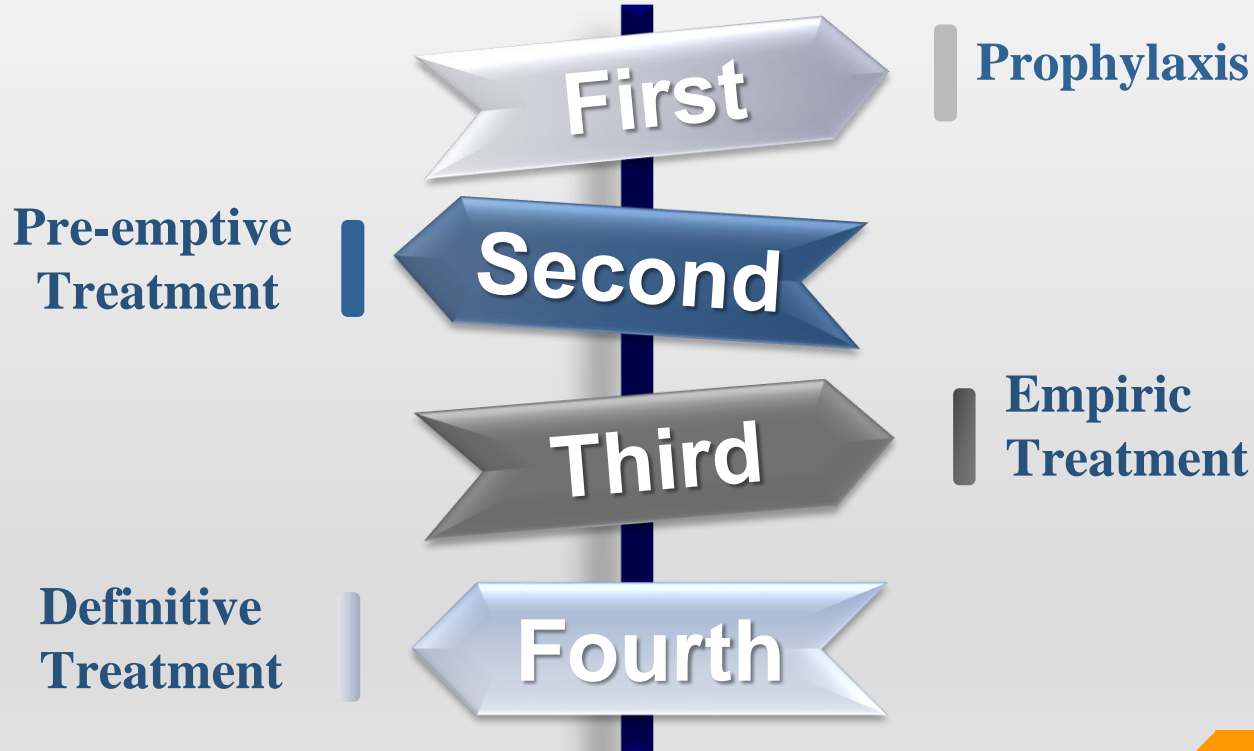
Resistant



Sensitive



Prevention and Treatment



CF with chronic lung infections

Prevention

- ❑ Before colonization:
 - Prophylaxis by systemic antibiotics
- ❑ Alternate colonization:
 - Systemic and Nebulized antibiotics



Treatment



Systemic and Nebulized antibiotics



Ciprofloxacin, Colistin, Tobramycin, β -lactam



Patient with chronic wound infection

Negative Pressure Wound Therapy

- Lower the bacteria
- Prevent biofilm formation



Treatment



**Antimicrobial
Therapy**

**Combination
Therapy**

Debrided



Orthopedic alloplastic device infection

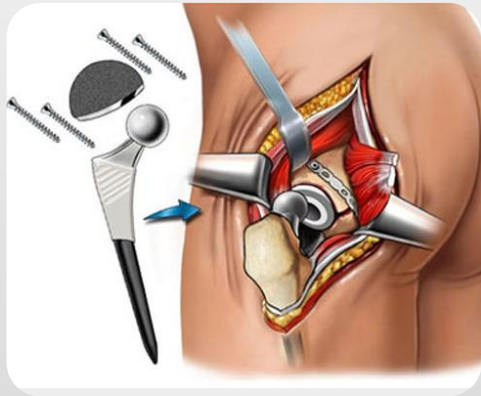
Prevention :

Preventive antibiotics before surgery

Antibiotic-impregnated materials



Treatment of acute infections



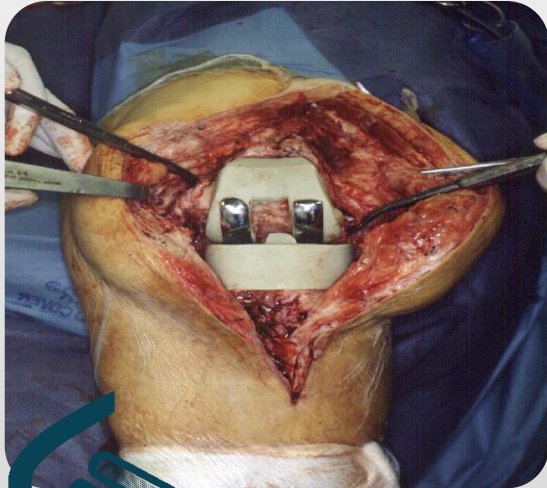
- Keep implant
- Antimicrobial therapy

- Debride
- Remove implant

- Active antibiotics



Treatment of Chronic Infection



Cement spacer
Antibiotic

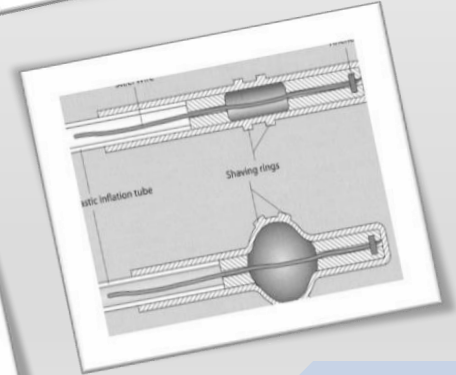
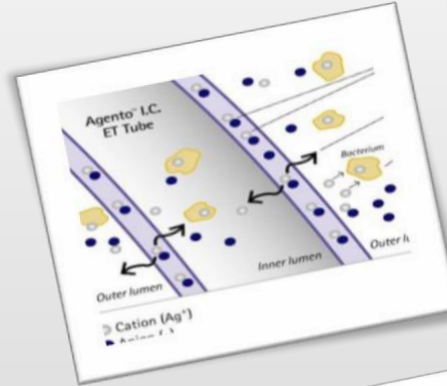
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Long-term
Antibiotic Therapy

Patients with endotracheal tube

- Nebulized antibiotic
- ETT coating by Silver
- Mucous Shaver
- Multidrug therapy



Patients with vascular catheter



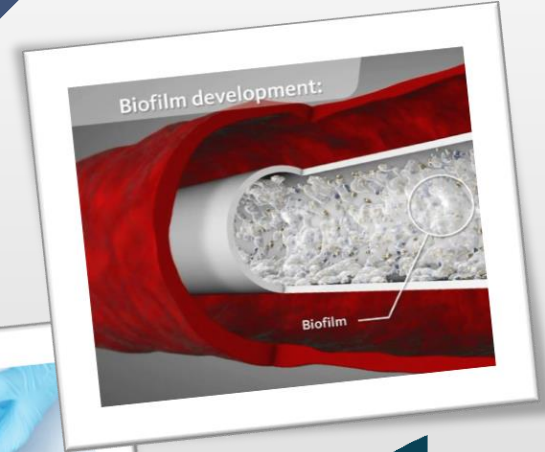
Chlorhexidine-impregnated sponges



Minocycline/Rifampin-coated catheters



ALT



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Urinary catheter or Urethral stents



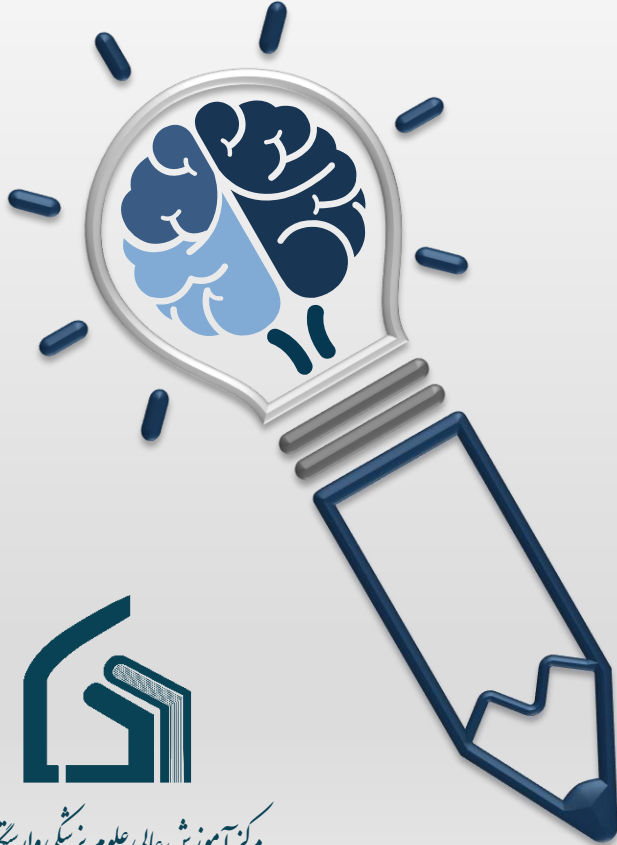
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Antibiotic Therapy

2

Remove the catheter

Conclusion



Biofilm Definition



Biofilm Diagnosis



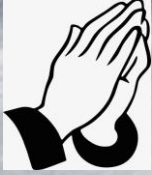
Biofilm Treatments



We Need More Studies

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Thanks for Your Attention

Any Questions ?



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