

THE GRAM STAIN ADVANCED INTERPRETATIONS

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REVIEW OF THE BASICS

- **Procedural highlights**
 - Select area of specimen
 - Prepare smear
 - Low and high power scanning
 - Quantitate cells and microorganisms
 - Interpret by specimen source
 - Slides for review
- **Interpret bacterial morphologies**
 - Minimum competency
 - Advanced competency

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EXTRA GRAM STAIN MORPHOLOGIES INDICATORS OF PATHOLOGY

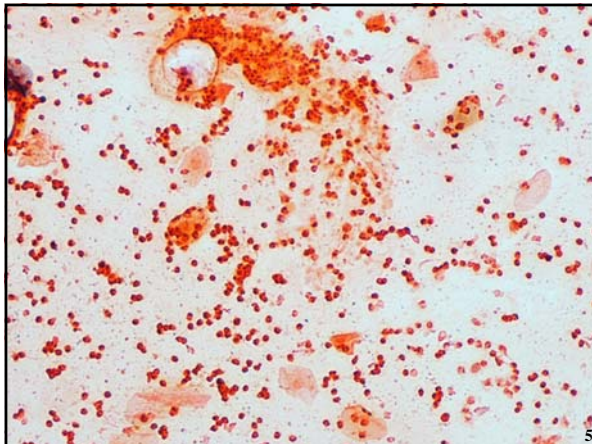
- White blood cells
(polymorphonuclear leukocytes)
- Alveolar macrophages
- Squamous/columnar epithelial
cells
- Elastin/collagen fibers
- Curschmann's spirals
- Corpora amylacea

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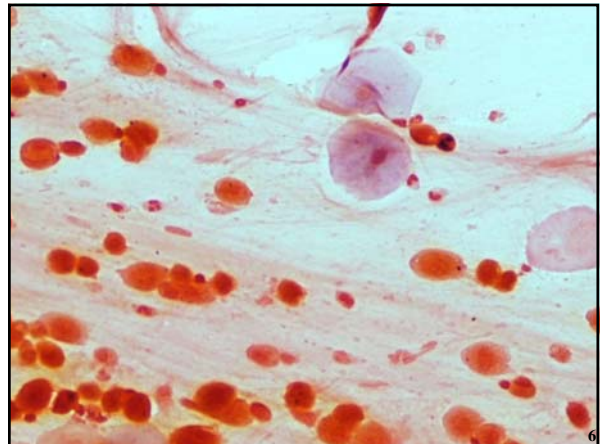
EXTRA GRAM STAIN MORPHOLOGIES INDICATORS OF PATHOLOGY

- Cell necrosis
- Intracellular bacteria/yeasts
- "Antibiotic" treated bacteria
- Crystals
- Respiratory therapy
- Other oddities

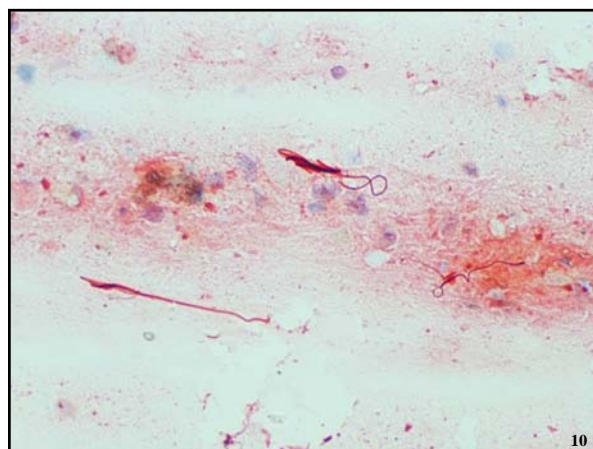
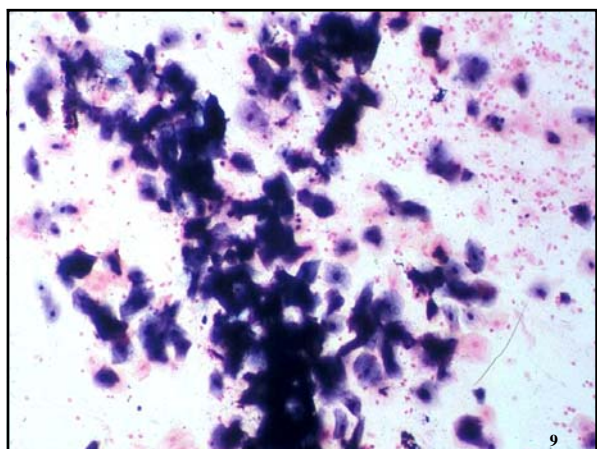
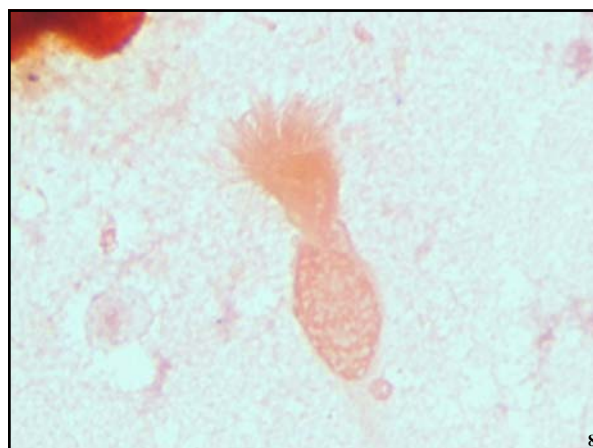
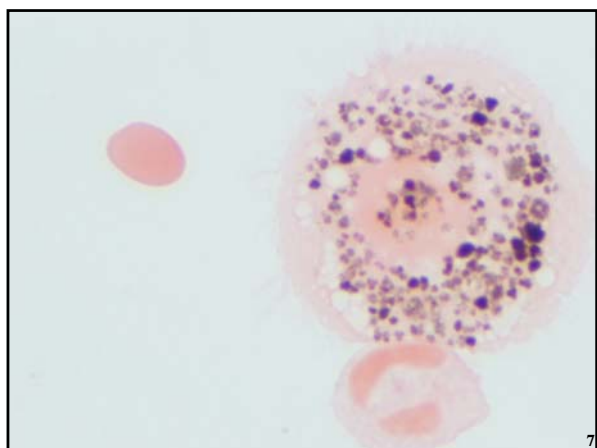
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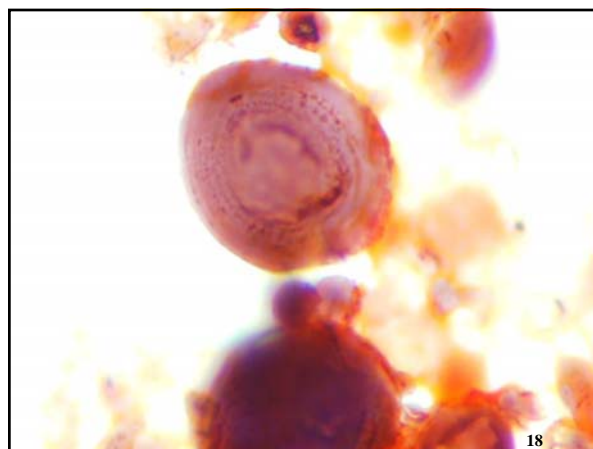
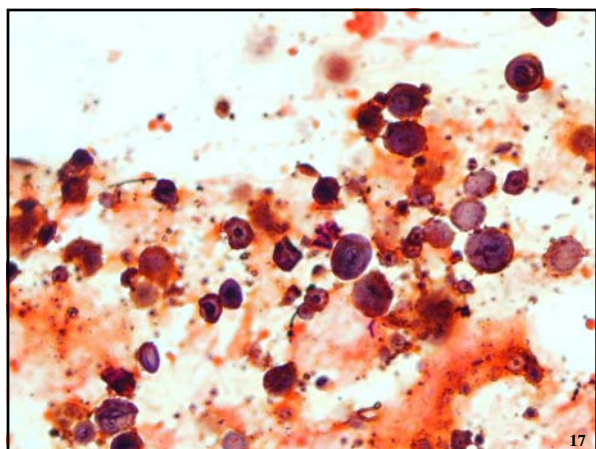
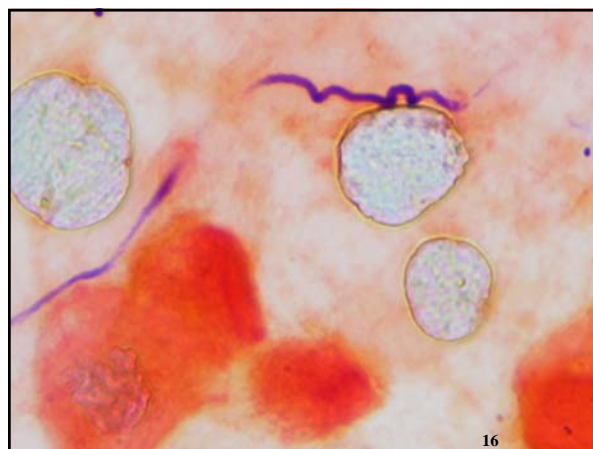
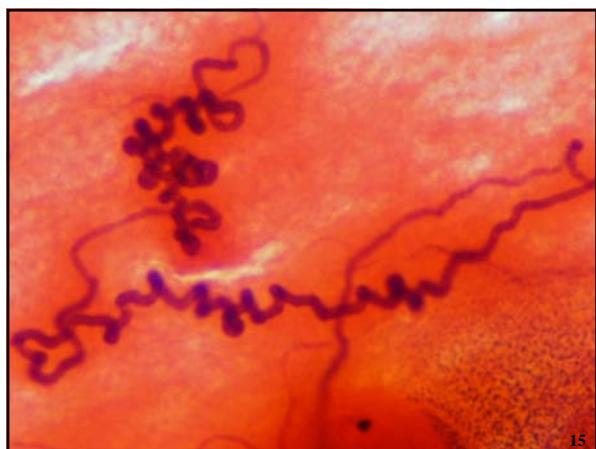
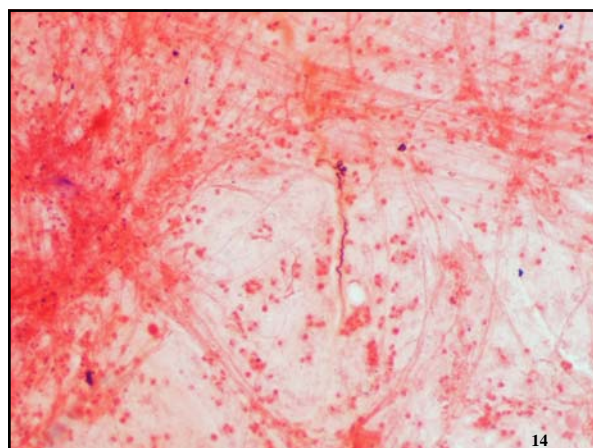
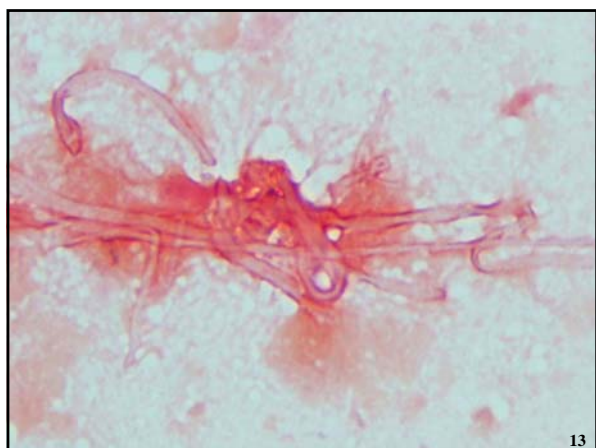


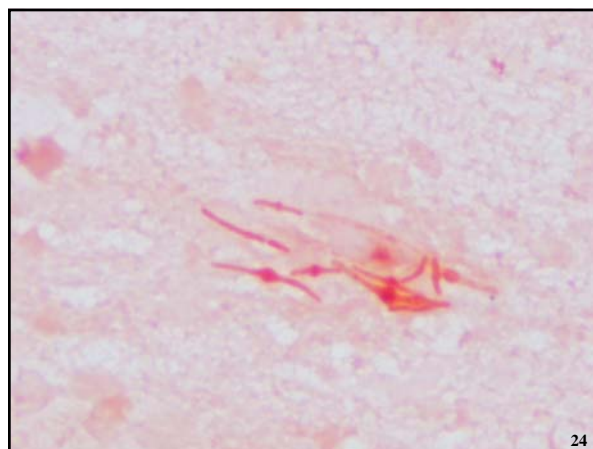
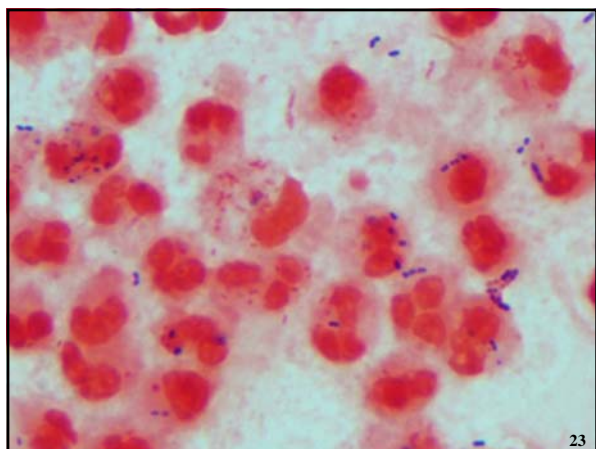
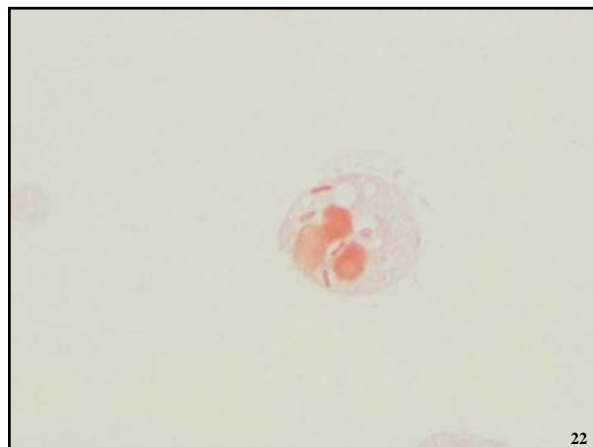
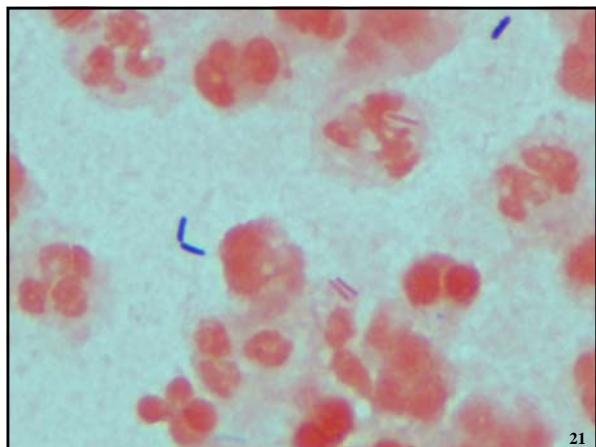
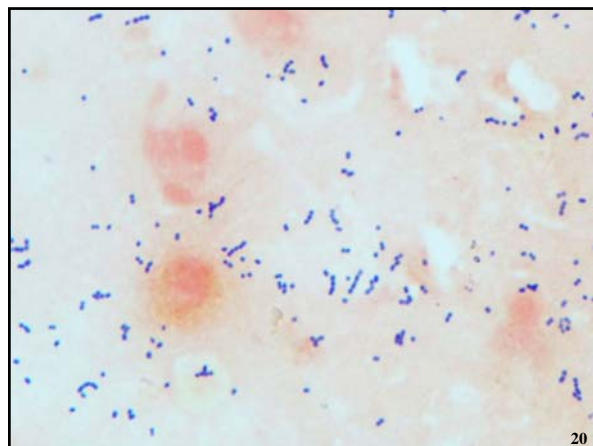
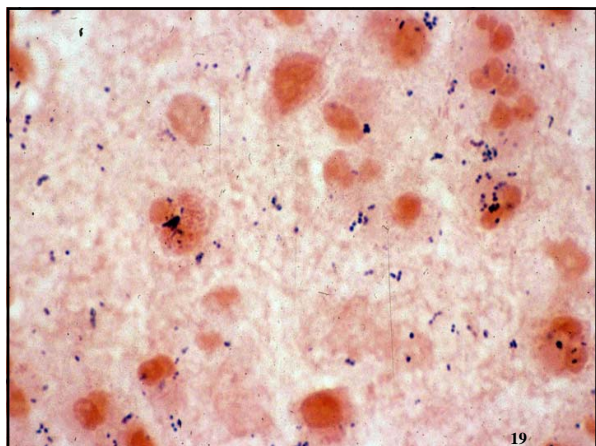
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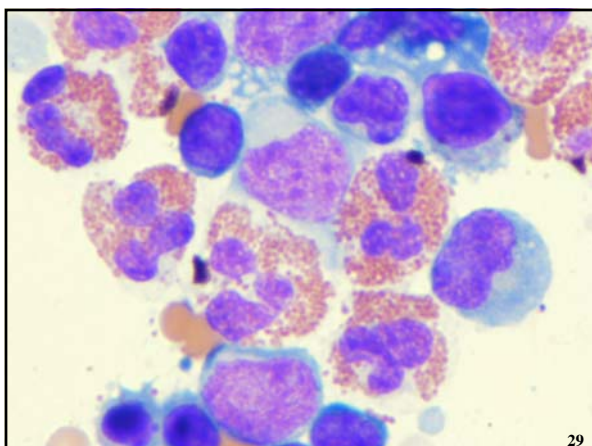
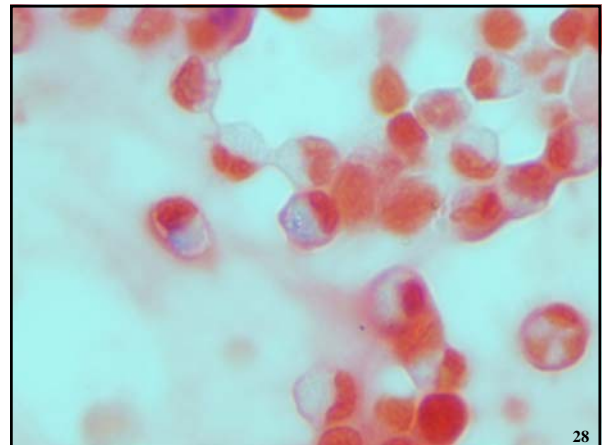
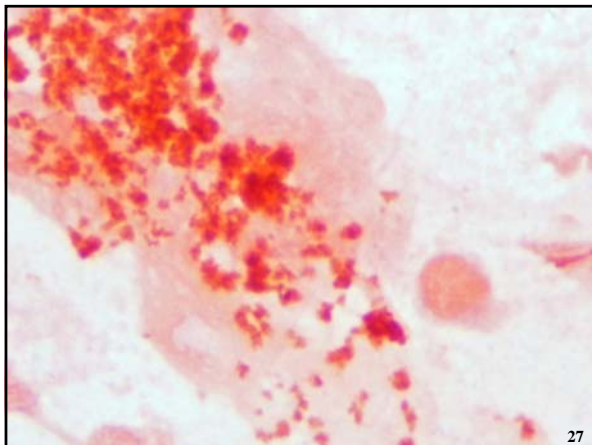
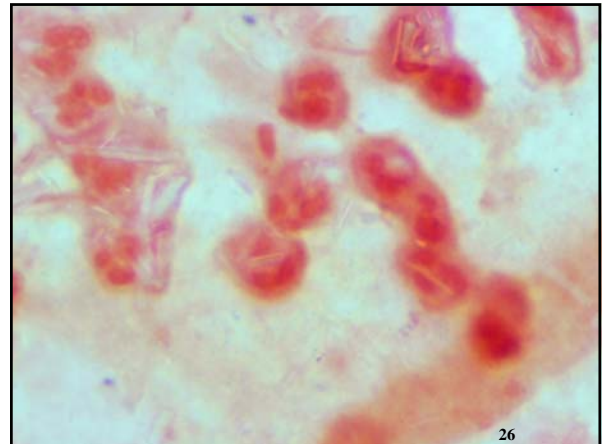
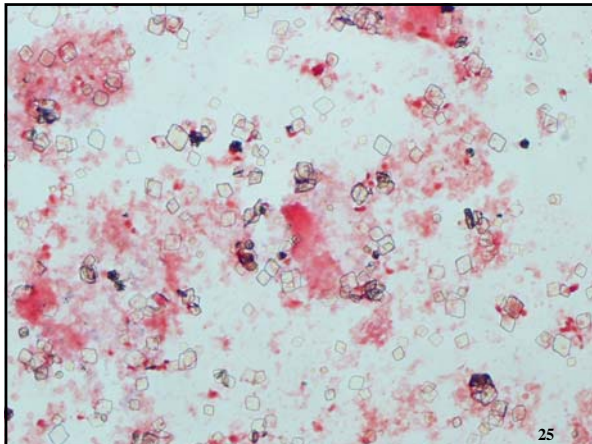


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GRAM STAIN: PATTERN RECOGNITION

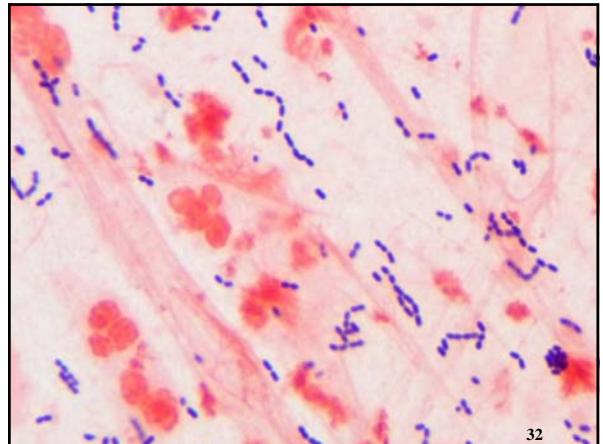
- **Respiratory tract**
 - Pneumonia/bronchitis
 - Aspiration pneumonia
 - Cystic fibrosis
 - Chronic lung disease/COPD
- **Urinary tract**
 - UTI
 - Vesicocolonic fistula
- **Meningitis**

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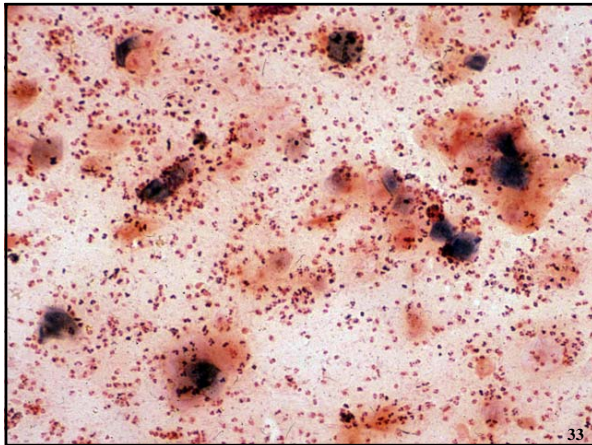
GRAM STAIN: PATTERN RECOGNITION

- **Abscess**
 - Staphylococcal
 - Mixed aerobic/anaerobic
 - Streptococcus milleri/anginosus
 - Nocardia
- **Toxemia**
 - Streptococcal necrotizing fasciitis
 - Clostridium gas gangrene
- **Miscellaneous**
 - BV (bacterial vaginosis)
 - Lemierre's disease (jugular vein thrombosis)
 - Gonococcal urethritis
 - Crystalline joint disease

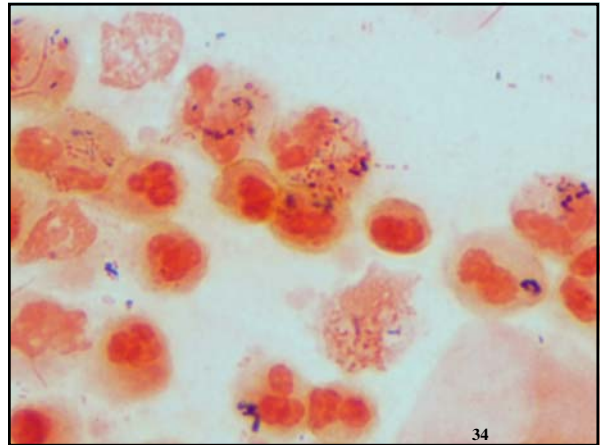
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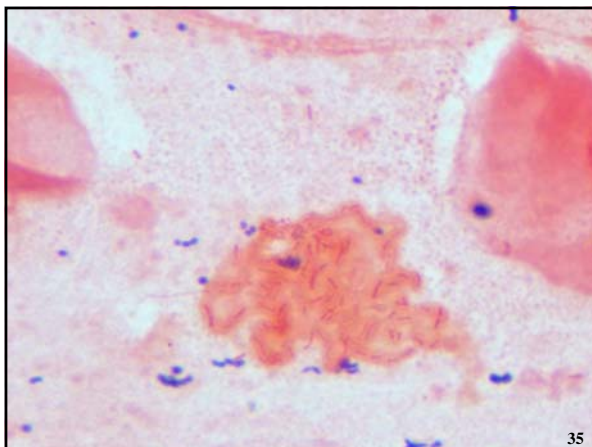
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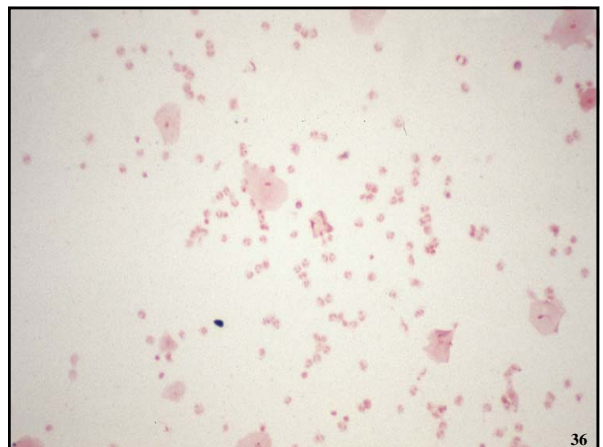
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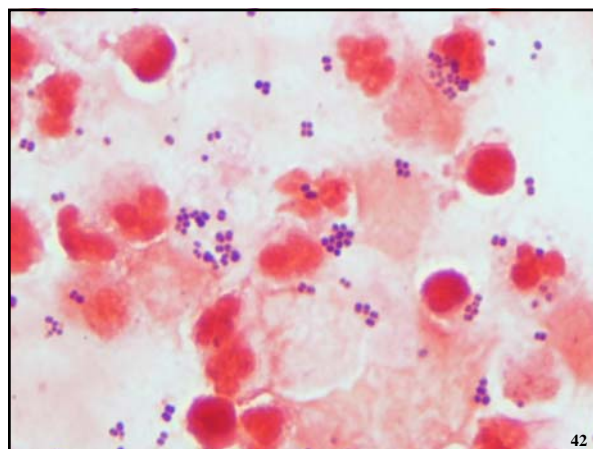
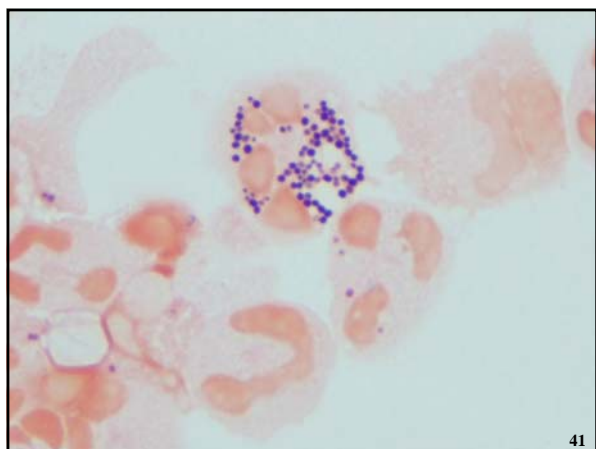
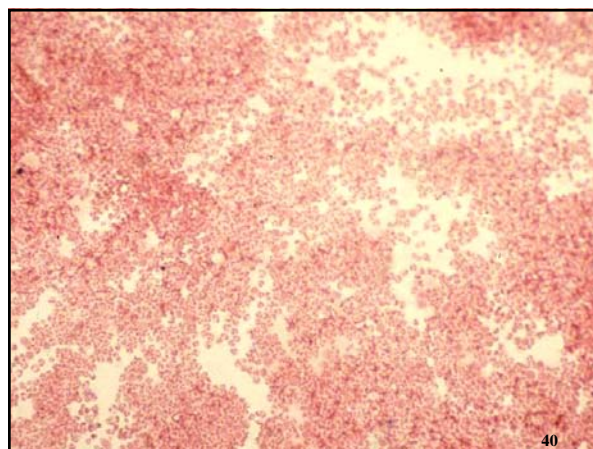
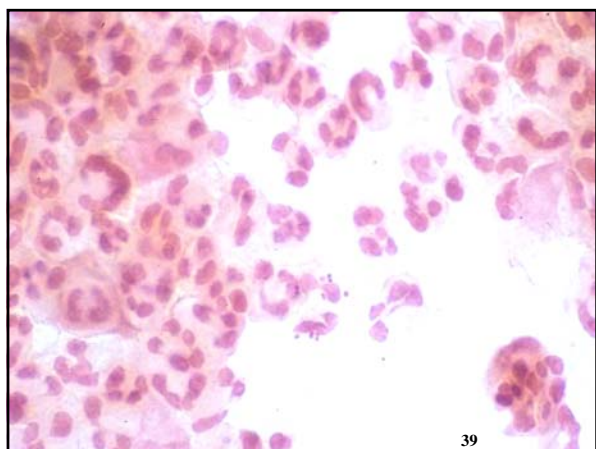
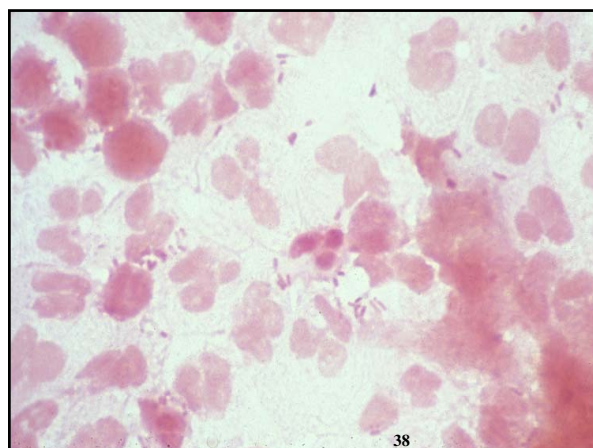
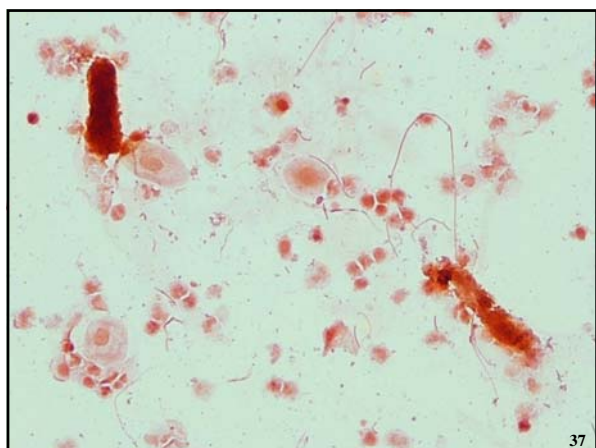
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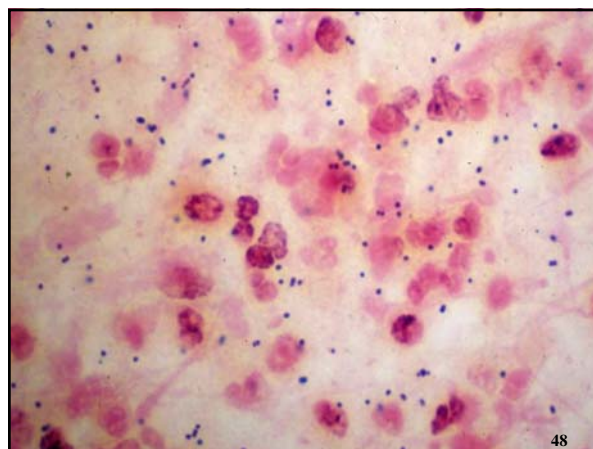
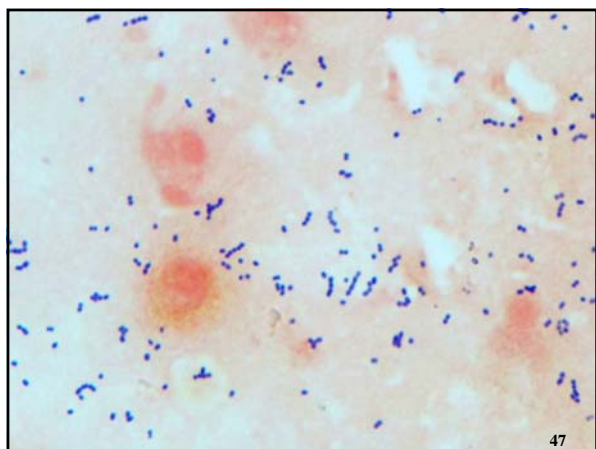
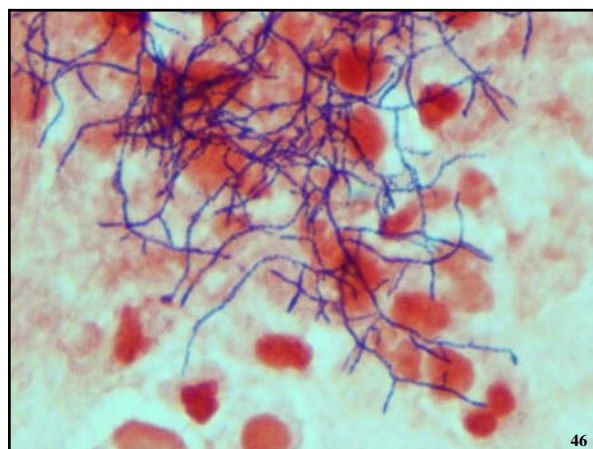
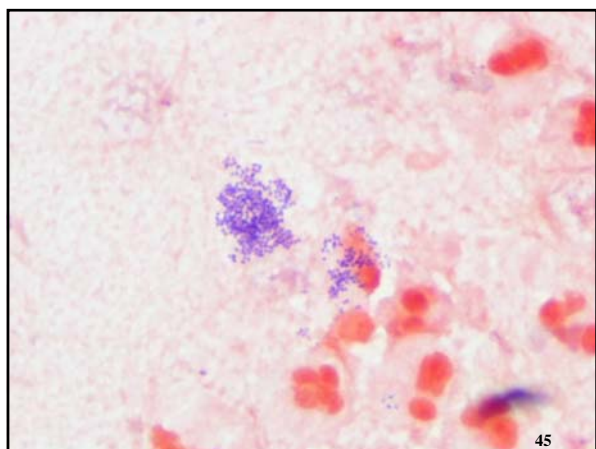
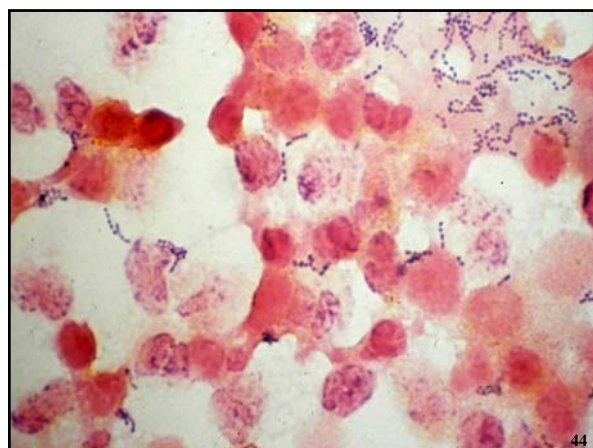
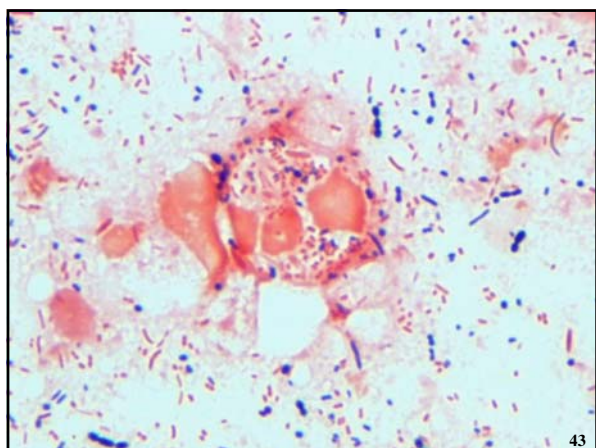


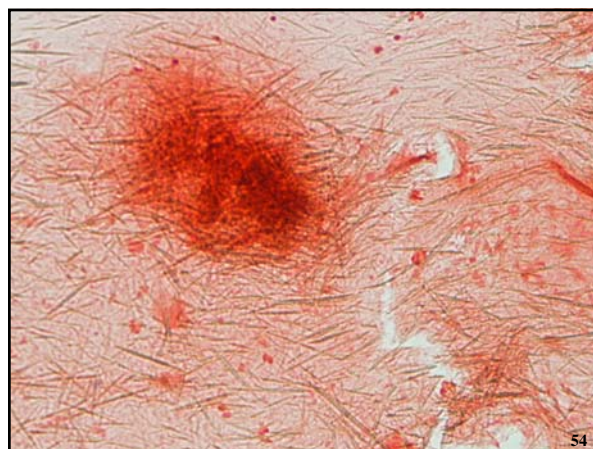
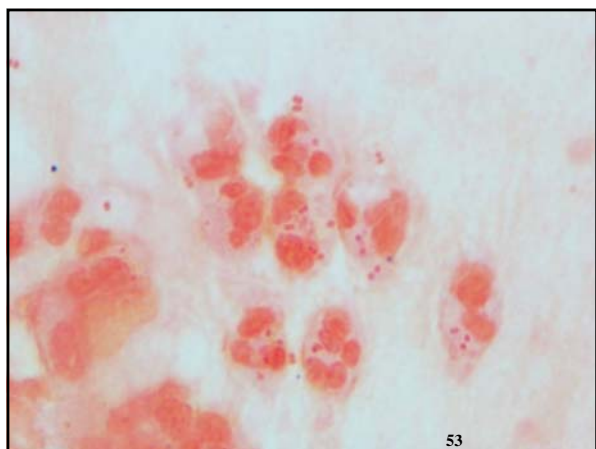
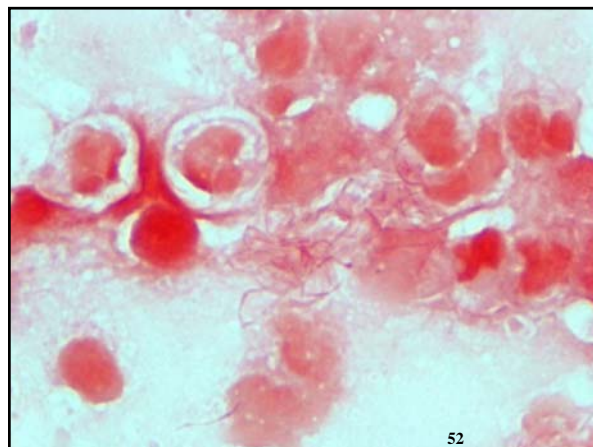
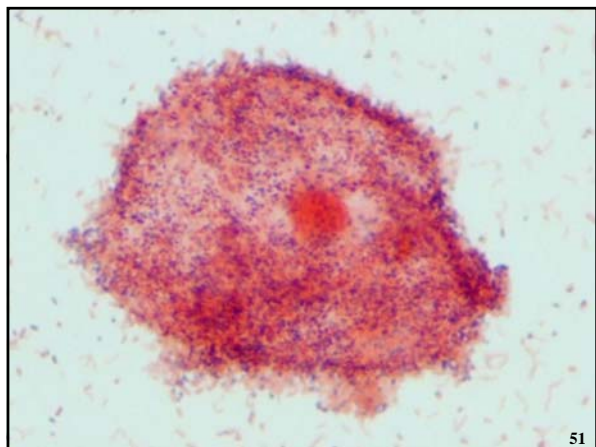
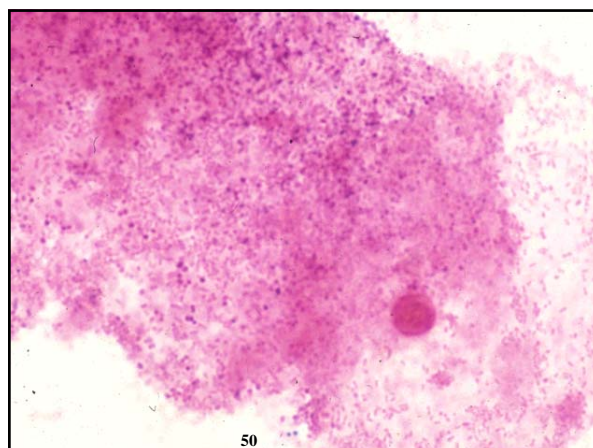
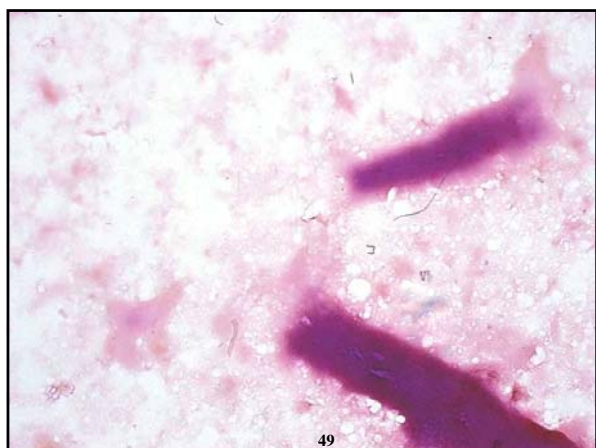
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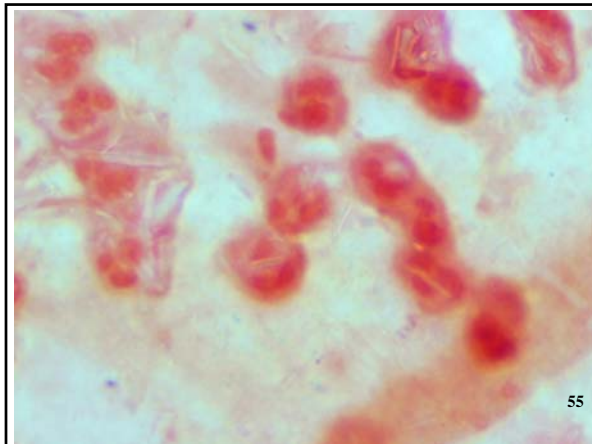


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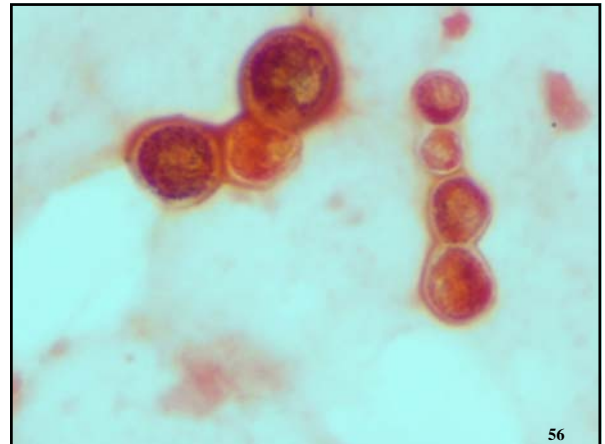








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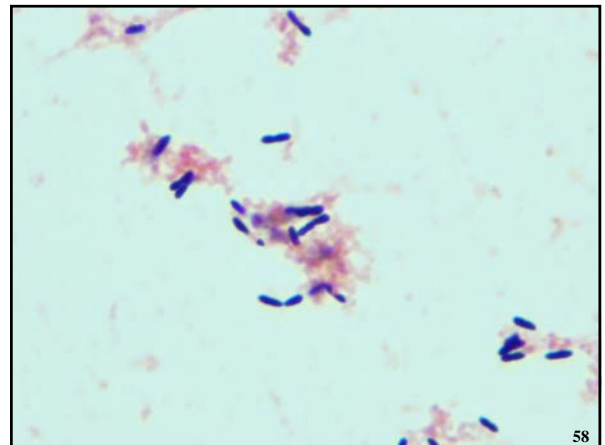


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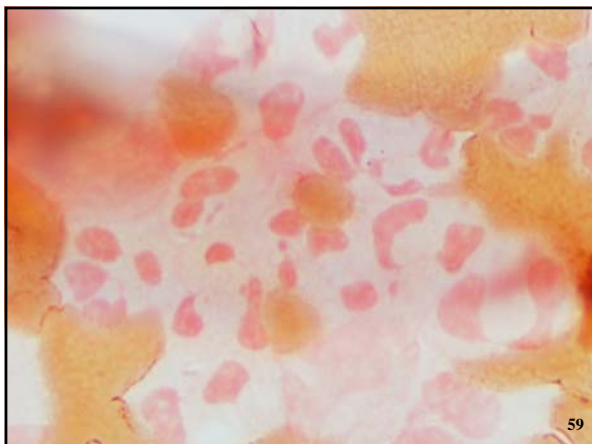
AFTER ALL THIS TRAINING

- Can you identify the pathogen in the following case?
 - Newborn sepsis
 - Mother appears at hospital in labor
 - no pre-natal care
 - Peri-partum fever
 - Child delivered vaginally
 - Blood and CSF specimens for stain/culture

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CONCLUSIONS Microbiology Model

- Standardize Gram stain procedure
- Minimum competency for laboratory personnel
- Gram stain review procedure
- Advanced interpretation
 - Indicators of pathology
 - Pattern recognition (diseases)
- Use Gram stain results in culture work-up
- Train physicians to use the Gram stain
- Future?
 - Provide images of diagnostic Gram stains (high resolution monitors)

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