THE GRAM STAIN
LEARNING THE BASICS

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Radiology Model
Clinician visits radiology to see and “feel” the x-ray

Surgical Pathology Model
Surgeon visits surgical pathology to review the diagnosis and discuss therapeutic options

Cytology Model
Pap smears are screened and a specified group are reviewed

Microbiology Model
Should the Gram stain procedure be standardized?
Should important Gram stain results be reviewed?
Should important Gram stain results be viewed by the clinician?
GRAM STAIN PROCEDURAL HIGHLIGHTS

- Selecting a portion of the specimen
- Preparing the smear
- Low power (10X) examination
- High power (100X) examination
- Quantitation of cells and microorganisms
- Interpretation of morphotypes
- Minimum competency
- Slides for review

PREPARING THE SMEAR

Make a monolayer of cells

Concentrating fluids using a cytocentrifuge

LOW POWER (10X) EXAMINATION

10-20 fields, quantitate cells
select area for high power examination

HIGH POWER (100X) EXAMINATION

20-40 fields, quantitate microorganisms

GRAM STAIN QUANTITIES

- Rare (1+)
  - Less than 10 in all fields examined
- Moderate (2+)
  - More than 10 in all fields but less than 25/field
- Many (3+)
  - More than 25 in one field
**GRAM STAIN PROCEDURAL HIGHLIGHTS**

**INTERPRETATION**
Bacterial morphologies, interpretation based on specimen source

**INTERPRET GRAM STAIN BASED ON SPECIMEN SOURCE**

- **Sterile specimen source (presumed)**
  - Report PMN’s
  - Report microorganisms
  - > 3 morphologically typical shapes before reporting

- **Non-Sterile specimen source**
  - Report PMN’s
  - Name microorganisms only if potential pathogen
  - Quantitate and report normal flora

**SLIDES FOR REVIEW**

- Requested review (technologist initiated)
- Automatic review (director initiated)

**GRAM STAIN PROCEDURAL HIGHLIGHTS**

**SLIDES FOR REVIEW**

- Automatic Review (director requested)
  - Sterile source
    - Microorganism reported
    - 3-4 + PMN’s with no bacteria seen
  - Non-sterile source
    - Report is diagnostic
- Requested Review (technologist requested)
  - Unsure of finding
BACTERIAL MORPHOLOGIES
MINIMUM AND ADVANCED COMPETENCY

- Gram-positive cocci clusters
- Gram-positive coccipairs/chains
- Gram-positive diplococci
- Gram-positive cocci
- Gram-negative diplococci
- Gram-negative cocacobacilli
- Gram-negative cocci tiny
- Gram-negative rod
- Gram-negative rod thick
- Gram-negative rod thin
- Gram-negative diplodiscocci
- Gram-negative rod fusiform
- Gram-positive rod
- Gram-positive rod diphtheroid
- Gram-positive rod boxcar
- Gram-positive rod with endospor
- Gram-positive rod filamentous/branching
- Yeast cells
- Yeast cells with pseudoathyphae
- Hyphae septate
- Hyphae nonseptate
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