

# Introduction of Microbiological Diagnosis

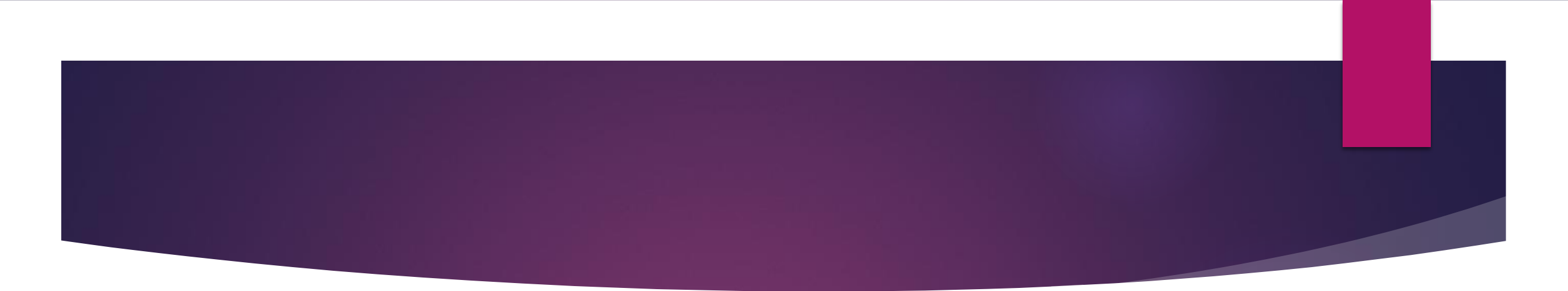
DR. AHMED HASAN

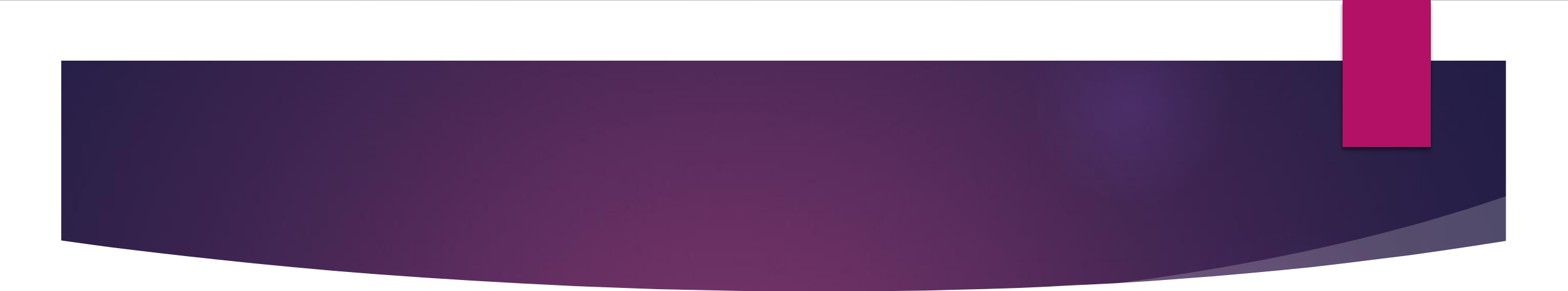
# Learning objectives:

- ▶ Knowledge the principles of microbiological diagnosis
- ▶ Look up the communication between physician and laboratory
- ▶ Specimen collection

# Principles of Diagnostic Medical Microbiology

- ▶ Morphologic identification of the agent in stains of specimens or sections of tissues (light and electron microscopy).
- ▶ Culture isolation and identification of the agent.
- ▶ Detection of antigen from the agent by immunologic assay (latex agglutination, enzyme immunoassay [EIA], etc) or by fluorescein-labeled (or peroxidase-labeled) antibody stains.
- ▶ DNA-DNA or DNA-RNA hybridization to detect pathogen-specific genes in patients' specimens.
- ▶ Detection and amplification of organism nucleic acid in patients' specimens.
- ▶ Demonstration of meaningful antibody or cell-mediated immune responses to an infectious agent.

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- ▶ In the field of infectious diseases, laboratory test results depend largely on:
    1. The quality of the specimen.
    2. The timing and the care with which it is collected.
    3. The technical proficiency and experience of laboratory personnel.

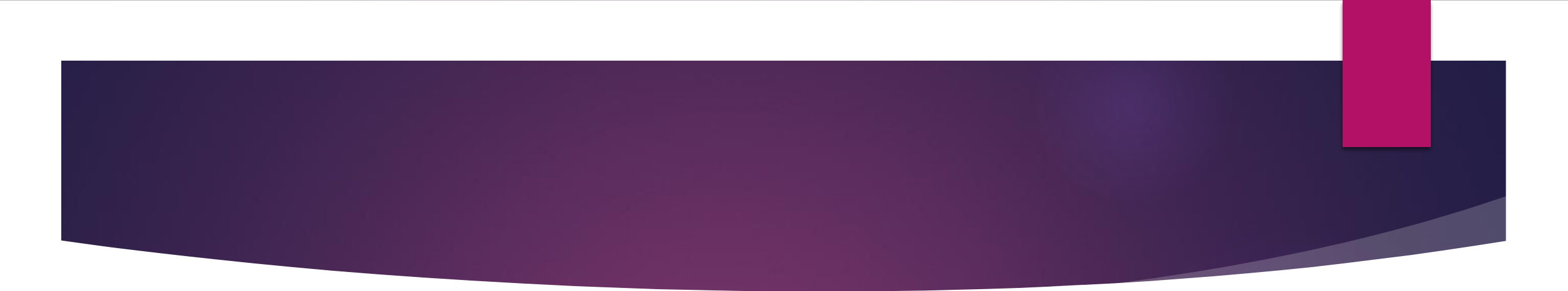
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- ▶ Physicians who deal with infectious processes must know:
    1. When and how to take specimens.
    2. What laboratory examinations to request.
    3. How to interpret the results.

# Communication between Physician & Laboratory

- ▶ The physician should inform the laboratory staff of the tentative diagnosis (type of infection or infectious agent suspected).
- ▶ Proper labeling of specimens includes such clinical data as well as the patient's identifying data (at least two methods of definitive identification) and the requesting physician's name and pertinent contact information.
- ▶ As the laboratory staff begins to obtain results, they inform the physician, who can then reevaluate the diagnosis and clinical course of the patient and perhaps make changes in the therapeutic program.

# The Specimen

- ▶ Specimen collection.
- ▶ Differentiate normal flora from real causative agent.

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- ▶ **Direct Tissue or Fluid Samples:** are collected from normally sterile tissues (lung, liver) and body fluids (cerebrospinal fluid, blood).
  - ▶ **Indirect Samples:** are specimens of inflammatory exudates (expectorated sputum, voided urine) that have passed through sites known to be colonized with normal flora.
  - ▶ **Samples from Normal Flora Sites:** Frequently, the primary site of infection is in an area known to be colonized with many organisms (pharynx and large intestine).





## ► Specimen Collection and Transport

1. The **sterile swab** is the most convenient and most commonly used tool for specimen collection.
2. The volume is important because infecting organisms that are present in small numbers may not be detected in a small sample.
3. Specimens should be transported to the laboratory as soon after collection as possible because some microorganisms survive only briefly outside the body. For example, unless special **transport media** are used, isolation rates of the organism that causes gonorrhea (*Neisseria gonorrhoeae*) are decreased when processing is delayed beyond a few minutes.