The isolation and /or identification of unknown disease agent is important to adequate treatment and disease control .

The numbers and types of procedures used in identifying disease agents vary significantly with the type of organism involved .

Collecting and handling specimens :

1- The types of specimens used in laboratory diagnosis include :

A-Blood .

B-Feces .

C- sputum .

D-Stool .

E-Urine .

F-Throat swabs .

2- Specimens must be obtained with care and kept in good condition during delivery to the laboratory. Holding media (nutrient preparations) and special containers are used for the transport of some materials such as throat swabs .

3- specimens should be sent to laboratories by the most rapid means available and according to federal quid lines . Proper handling of materials is essential to protecting all persons .

Laboratory Procedures :

The general procedures adopted by a diagnostic laboratory depend in part upon the volume of specimens it must handle .

1- Differential media are used to distinguish among organisms , but complete identifications involve further testing and other methods .

2- A variety of traditional or standardized biochemical tests have been combined in order to reduce time and materials used in microbial indentifications .

3- Examples of these systems include , the combination of several tests in one or two tubes (TSI) , miniaturized , multicompartment devices (API_{20}) , and biochemical substrates impregnated in paper strips .

The Blood Culture :

The detection of bacteria or other microbial types in blood may be of major importance .

Bacteremia : the presence of bacteria in blood .

*when a patient exhibits elevation of temperature that is unexplainable on a clinical basis , blood culture are usually taken .Three blood specimens are taken at approximately 2- hour intervals .

* Media for blood culture is Tryptic Soy Broth .

*Growth – inhibiting effects of natural sera ,antimicrobial compounds can be reduced or eliminated through dilution of blood specimen , which is accomplished when the blood is added to broth medium in a ratio of 1 to 10 .

*Blood cultures must be examined daily for the presence of growth of M.O.s .

- If growth is detected ,

-Subcultures should be made with fresh media .

- Incubated under aerobic and anaerobic conditions .

– Microscopic examination of the positive cultures are made .

General identification procedures :

1- All specimens must be handled aseptically .

2- Routine identification begins with staining procedures such as the

a- Gram – stain procedure .

b- Acid – Fast procedure .

Guidelines For The Identification Of Selected Microorganisms :

1- Cellular and Colonial appearance , Hemolytic reactions , and Various Biochemical Tests are important to identification of gram – positive aerobic bacteria such as ***Staphylococcus aureus*** .
Streptococcus pyogenes .

2- Biochemical tests are of major importance in differentiating and identifying Gram – negative aerobic enteric bacteria , as well as most other aerobic Gram – negative bacteria .

3- Anaerobic bacteria include both Gram – negatives (***Bacteroides, Fusobacterium , and Streptobacillus***) and Gram – positives ***(Clostridium , peptostreptococci)*** . Since these organisms are sensitive to free oxygen , care must be taken to grow them under anaerobic conditions .

Specimens : wound swabs ,

blood Specimens,

urine ,

biopsies .

Media : Specimens are inoculated in Thioglycollate Broth , and Blood Agar incubated in a special anaerobic incubator (candle jar or gas pack systems) .

4- Acid – Fast bacteria are also identified on the basis of staining reactions , colonial appearance , and biochemical tests .

Quality – Control Considerations:

Quality control measures consist of the monitoring of equipment , materials and personnel involved in the performance of diagnostic tests.