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Microbiology lab tests

In microbiology, biochemical tests are commonly used to identify and characterize different types of microorganisms based on their metabolic activities. These tests provide valuable information about the growth requirements and physiological properties of bacteria, fungi, and other microorganisms. Here are most common biochemical tests used in microbiology:These tests are used to identify and differentiate microorganisms based on their metabolic capabilities, such as their ability to produce enzymes or utilize different nutrients. They are particularly useful for identifying bacteria species and strains, and for determining their pathogenicity and antimicrobial susceptibility.The catalase test is a biochemical test used to detect the presence of the enzyme catalase in bacteria. The test involves adding hydrogen peroxide to a colony of bacteria on a culture plate and observing for the production of bubbles of oxygen gas, indicating a positive result. The test is commonly used to differentiate between different types of bacteria, particularly Gram-positive cocci. Read More >>The oxidase test is a biochemical test used to detect the presence of cytochrome c oxidase in bacteria. The test involves adding a reagent containing the oxidase substrate to a colony of bacteria on a culture plate and observing for a color change, indicating a positive result. The test is commonly used to differentiate between different types of Gram-negative bacteria. Read More >>The coagulase test is a biochemical test used to distinguish between different species of Staphylococcus bacteria. The test involves adding a small amount of plasma to a colony of bacteria on a culture plate and observing for the formation of clots, indicating a positive result. Staphylococcus aureus is coagulase-positive, while other Staphylococcus species are coagulase-negative. Read More >>The indole test is a biochemical test used to detect the ability of bacteria to produce the enzyme tryptophanase. The test involves adding Kovac's reagent to a bacterial culture and observing for a color change, indicating a positive result. The test is commonly used to differentiate between different species of Enterobacteriaceae, which can be either indole-positive or indole-negative. Read More >>The urease test is a biochemical test used to detect the presence of the enzyme urease in bacteria. The test involves adding a urea-containing medium to a bacterial culture and observing for a color change or the presence of gas, indicating a positive result. The test is commonly used to differentiate between different species of bacteria, particularly those that can cause urinary tract infections. Read more >>The phenylalanine deaminase test is a biochemical test used to detect the presence of the enzyme phenylalanine deaminase in bacteria. The test involves adding a bacterial culture to a medium containing phenylalanine and observing for a color change, indicating a positive result. The test is commonly used to differentiate between different species of bacteria, particularly those in the family Enterobacteriaceae. Read More >>The Triple Sugar Iron (TSI) test is a biochemical test used to differentiate between different species of bacteria, particularly Enterobacteriaceae. The test involves inoculating a tube containing a semi-solid medium with a bacterial culture and observing for the production of gas, acid, and hydrogen sulfide. The test results can be interpreted based on the color change of the medium and the pattern of gas production, providing information on the bacteria's ability to ferment different sugars and produce hydrogen sulfide. Read More >>The motility test is a biochemical test used to determine the motility of bacteria. The test involves inoculating a tube containing a semi-solid agar medium with a bacterial culture and observing for the movement of the bacteria through the medium, indicating a positive result. The test is commonly used to differentiate between different species of bacteria, particularly those that can cause gastrointestinal infections. Read More >>The nitrate reduction test is a biochemical test used to detect the presence of the enzyme nitrate reductase in bacteria. The test involves adding a reagent to a bacterial culture and observing for a color change or the presence of gas, indicating a positive result. The test is commonly used to differentiate between different species of bacteria, particularly those in the family Enterobacteriaceae. Read More >>The Voges-Proskauer test is a biochemical test used to detect the ability of bacteria to produce acetoin from glucose. The test involves adding a series of reagents to a bacterial culture and observing for a color change, indicating a positive result. The test is commonly used to differentiate between different species of bacteria, particularly those in the family Enterobacteriaceae. Read More >>The citrate test is a biochemical test used to determine the ability of bacteria to utilize citrate as a sole carbon source. The test involves inoculating a bacterial culture onto a medium containing citrate and observing for growth, indicating a positive result. The test is commonly used to differentiate between different species of bacteria, particularly those in the family Enterobacteriaceae. Read More >>The methyl red test is a biochemical test used to detect the ability of bacteria to produce and maintain stable acidic end products from glucose fermentation. The test involves adding a reagent to a bacterial culture and observing for a color change, indicating a positive result. The test is commonly used to differentiate between different species of bacteria, particularly those in the family Enterobacteriaceae.The Simmons citrate agar test is a biochemical test used to determine the ability of bacteria to utilize citrate as a sole carbon source. The test involves inoculating a bacterial culture onto a medium containing citrate and observing for growth and a color change of the medium, indicating a positive result. The test is commonly used to differentiate between different species of bacteria, particularly those in the family Enterobacteriaceae. Read More >>The DNase test is a biochemical test used to detect the presence of the enzyme deoxyribonuclease (DNase) in bacteria. The test involves inoculating a bacterial culture onto a medium containing DNA and observing for the breakdown of the DNA, indicated by a clear zone around the bacterial growth, indicating a positive result. The test is commonly used to differentiate between different species of bacteria, particularly those in the genera Staphylococcus and Streptococcus. Read More >>The gelatin hydrolysis test is a biochemical test used to detect the ability of bacteria to produce the enzyme gelatinase, which hydrolyzes gelatin. The test involves inoculating a bacterial culture onto a medium containing gelatin and observing for the liquefaction of the gelatin, indicated by a liquid appearance, indicating a positive result. The test is commonly used to differentiate between different species of bacteria, particularly those in the genera Bacillus and Clostridium.The casein hydrolysis test is a biochemical test used to detect the ability of bacteria to produce the enzyme caseinase, which hydrolyzes casein, a milk protein. The test involves inoculating a bacterial culture onto a medium containing casein and observing for the hydrolysis of casein, indicated by a clear zone around the bacterial growth, indicating a positive result. The test is commonly used to differentiate between different species of bacteria, particularly those in the genera Bacillus and Pseudomonas. Read More >>The starch hydrolysis test is a biochemical test used to detect the ability of bacteria to produce the enzyme amylase, which hydrolyzes starch. The test involves inoculating a bacterial culture onto a medium containing starch and observing for the hydrolysis of starch, indicated by a clear zone around the bacterial growth, indicating a positive result. The test is commonly used to differentiate between different species of bacteria, particularly those in the genera Bacillus and Streptococcus.The catalase-peroxidase test is a biochemical test used to detect the presence of the enzymes catalase and peroxidase in bacteria. The test involves adding hydrogen peroxide and a reagent to a bacterial culture and observing for a color change, indicating a positive result. The test is commonly used to differentiate between different species of bacteria, particularly those in the genus Mycobacterium.The acid-fast staining test is a microbiological test used to identify acid-fast bacteria, which are bacteria that have a waxy coating on their cell walls that prevents them from being easily stained with traditional Gram staining methods. The test involves staining bacterial cells with a special stain, such as the Ziehl-Neelsen stain or the Kinyoun stain, and then observing them under a microscope. Acid-fast bacteria will retain the stain, while non-acid-fast bacteria will not. The test is commonly used to diagnose infections caused by acid-fast bacteria, such as tuberculosis and leprosy.The malonate utilization test is a biochemical test used to determine the ability of bacteria to utilize malonate as a sole carbon source. The test involves inoculating a bacterial culture onto a medium containing malonate and observing for growth and a color change of the medium, indicating a positive result. The test is commonly used to differentiate between different species of bacteria, particularly those in the family Enterobacteriaceae. Read More >>The camp test is a microbiological test used to differentiate between different species of bacteria, particularly those in the genus Streptococcus. The test involves streaking a bacterial culture of the test organism perpendicular to a streak of Staphylococcus aureus on a blood agar plate. The test is positive if the test organism produces a zone of hemolysis that is enhanced where it meets the streak of Staphylococcus aureus. The test is used to identify Streptococcus agalactiae, which produces a positive camp test, from other beta-hemolytic streptococci that do not. Read More >>A biochemical test is a laboratory test used to determine the metabolic capabilities of microorganisms, typically bacteria.Biochemical tests are important in microbiology because they help to identify and differentiate between different species of bacteria, which is critical for accurate diagnosis and treatment of infectious diseases.Biochemical tests are performed by inoculating a bacterial culture onto a medium containing a specific substrate, and then observing for a reaction or change in the medium that indicates the presence of a specific enzyme or metabolic pathway.Common biochemical tests used in microbiology include the catalase test, oxidase test, coagulase test, indole test, urease test, and nitrate reduction test, among others.Interpreting the results of a biochemical test involves comparing the reaction of the test organism to that of known reference strains, or to established criteria for a particular species.The catalase test is used to detect the presence of the enzyme catalase, which breaks down hydrogen peroxide into water and oxygen. This test is commonly used to differentiate between different species of bacteria, particularly those in the genera Staphylococcus and Streptococcus.The oxidase test is used to detect the presence of the enzyme cytochrome c oxidase, which is involved in cellular respiration. This test is commonly used to differentiate between different species of bacteria, particularly those in the family Enterobacteriaceae.The coagulase test is used to detect the presence of the enzyme coagulase, which causes blood plasma to clot. This test is commonly used to differentiate between different species of bacteria, particularly those in the genus Staphylococcus.The indole test is used to detect the presence of the enzyme tryptophanase, which breaks down tryptophan into indole, pyruvic acid, and ammonia. This test is commonly used to differentiate between different species of bacteria, particularly those in the family Enterobacteriaceae.The urease test is used to detect the presence of the enzyme urease, which hydrolyzes urea into ammonia and carbon dioxide. This test is commonly used to differentiate between different species of bacteria, particularly those in the genera Proteus and Klebsiella.The nitrate reduction test is used to detect the ability of bacteria to reduce nitrate to nitrite or nitrogen gas. This test is commonly used to differentiate between different species of bacteria, particularly those in the family Enterobacteriaceae. The methyl red test is used to detect the presence of mixed-acid fermentation, which produces a large amount of acid from glucose. This test is commonly used to differentiate between different species of bacteria, particularly those in the family Enterobacteriaceae.The Simmons citrate agar test is used to detect the ability of bacteria to utilize citrate as a sole carbon source. This test is commonly used to differentiate between different species of bacteria, particularly those in the family Enterobacteriaceae.Biochemical tests are performed by inoculating a bacterial culture onto a specific type of medium and observing for a particular reaction or change in the medium.Common biochemical tests used in microbiology include the catalase test, oxidase test, coagulase test, indole test, urease test, and many others.The catalase test is important because it helps to differentiate between bacteria that produce catalase and those that do not, allowing for accurate identification of bacterial species.The oxidase test is used to detect the presence of cytochrome c oxidase in bacteria, which can be used to differentiate between different species of bacteria.The coagulase test is used to differentiate between Staphylococcus aureus, which produces coagulase, and other species of Staphylococcus that do not.The indole test is used to detect the presence of tryptophanase in bacteria, which can be used to differentiate between different species of bacteria.The urease test is used to detect the presence of the enzyme urease in bacteria, which can be used to differentiate between different species of bacteria.The TSI test is used to determine the ability of bacteria to ferment different sugars and to produce gas and/or hydrogen sulfide.The motility test is used to determine the ability of bacteria to move, which can be used to differentiate between different species of bacteria.The Voges-Proskauer test is used to detect the presence of acetoin in bacteria, which can be used to differentiate between different species of bacteria.The citrate test is used to determine the ability of bacteria to utilize citrate as a carbon source.The DNase test is used to detect the presence of the enzyme DNase in bacteria, which can be used to differentiate between different species of bacteria.The gelatin hydrolysis test is used to detect the ability of bacteria to produce the enzyme gelatinase, which hydrolyzes gelatin.The acid-fast staining test is used to identify acid-fast bacteria, which have a waxy coating on their cell walls that prevents them from being easily stained with traditional Gram staining methods.In conclusion, biochemical tests are an important tool used in microbiology to identify and differentiate between different species of bacteria. There are numerous biochemical tests available, each with their own specific methodology and purpose. These tests help microbiologists to determine the metabolic capabilities of a particular bacterial species, allowing for accurate identification and diagnosis of infectious diseases.Possible References Used⚠ Disclaimer:The content on LabTestsGuide.com is for informational and educational purposes only. We do not guarantee the accuracy, completeness, or timeliness of the information provided. Always consult qualified healthcare professionals for medical advice, diagnosis, or treatment. LabTestsGuide.com is not liable for any decisions made based on the information on this site. Share — copy and redistribute the material in any medium or format for any purpose, even commercially. Adapt — remix, transform, and build upon the material for any purpose, even commercially. The licensor cannot revoke these freedoms as long as you follow the license terms. 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This article explains types of microbiology tests and how laboratory results help to determine infection and identify what treatment may be effective Identifying infection, treating it appropriately, and reviewing efficacy of the treatment is a skill that all clinical practitioners should have. All patients receiving antibiotics in an inpatient setting should be reviewed within 48 to 72 hours of treatment commencement, and antimicrobial therapy should be rationalised alongside appropriate culture results to prevent antimicrobial resistance from developing. Close communication with the multidisciplinary team improves patient outcomes. Biomarkers, such as white cell count (also known as white blood cell count), C reactive protein, and procalcitonin, can be useful to identify and monitor the course of infection but should always be correlated with the patient's clinical presentation. Citation: Kempson F (2024) Understanding microbiology tests and interpreting laboratory results. Nursing Times [online]; 120: 10. Author: Felicity Kempson is the lead critical care infection specialist nurse at Liverpool Heart and Chest Hospital NHS Foundation Trust. This article has been double-blind peer reviewed Scroll down to read the article or download a print-friendly PDF here (if the PDF fails to fully download please try again using a different browser) Click here to see other articles in this series Microbiology in healthcare is the study of organisms that cause infections within the human body. Clinical microbiologists perform various tests on samples taken from a patient to diagnose infection and identify effective treatments appropriate to the identified organism. This area of work is becoming increasingly important as cases of multi-drug resistant (MDR) infections are appearing more frequently across all healthcare settings, with antimicrobial resistance considered one of the biggest threats to public health and development globally (World Health Organization (WHO), 2023). Patients can develop life-threatening infections in any setting, from primary care and rehabilitation units to the emergency department and intensive care. As the practitioner reviewing these patients, it is important to understand how to interpret the various investigations available to evaluate a patient's infection. This article will explore some of the most commonly used microbiology investigations in the hospital setting: blood cultures, urine cultures, and sputum cultures. What is causing the problem? The accurate interpretation of laboratory tests in microbiology is highly dependent on the quality of the samples that are sent, as microorganisms can grow and die very quickly depending on how samples are collected and stored. Ideally, clinical samples should be taken before the administration of systemic antibiotics to reduce the risk of false-negative results, though treatment should not be delayed if the patient is in a critical condition and samples are not easily obtained. All samples sent for culture should be appropriate to the suspected cause and severity of infection (Miller et al, 2024; Peker et al, 2018). Blood cultures Blood cultures are a critical component of diagnosing and managing various infections, particularly those suspected of causing systemic illness, such as endocarditis and sepsis. Each blood culture set is defined as one aerobic bottle and one anaerobic bottle (UK Health Security Agency (UKHSA), 2023) to determine which bacteria require oxygen to grow (aerobic) and which do not require oxygen (anaerobic). Blood cultures should always be obtained in suspected sepsis (UKHSA, 2023). In adults, this ideally consists of two sets of two blood culture bottles, with each bottle containing a minimum of 10ml of blood (NHS England, 2023). For children, the volume of blood collected should be appropriate to the age and weight of the child (Miller et al, 2024). Blood cultures should be placed into the incubator within four hours of phlebotomy. Every hour this is delayed leads to a lower chance of identifying causative organisms, which is an important point to acknowledge if samples need to be transported to a second site for processing (Schwarzenbacher et al, 2019). Blood culture bottles are then placed into an incubator that senses when carbon dioxide levels begin to rise in the bottles and alerts the lab staff if there is a positive result. If the culture remains negative after a certain period of time (usually five days), then the sample is reported as negative. After flagging as positive, the lab staff will then proceed to attempt to identify the causative organism. Initially, the biomedical scientists will perform a Gram stain to give an early indication of the organism while plated cultures are incubating, and classify bacterial species into either gram-positive or gram-negative (Fig 1). This involves taking a small sample of the blood/broth mixture and applying various dyes to stain the cells (Peker et al, 2018). Not all bacteria can be grown in culture, so it is best to correlate negative cultures with other diagnostic tests (such as echocardiogram or computed tomography (CT) scan). If there is evidence of endocarditis on a recent echocardiogram, then it is good to bear in mind that cases of blood-culture-negative endocarditis are not uncommon and should still be treated with empirical antibiotics while awaiting review by a specialist (Delgado et al, 2023). Depending on technique, blood cultures can often be contaminated with skin commensal bacteria (bacteria that are naturally present on the skin, such as Staphylococci epidermidis). This can occur at any stage of the test, from obtaining the blood through to applying the sample onto culture plates. It may be easy to dismiss a blood culture containing S. epidermidis as a contaminated sample, but there have been many documented cases of endocarditis in patients with either native or prosthetic heart valves, so repeat samples should be taken if clinically indicated (Cordes et al, 2017) and correlated with other appropriate diagnostic tests. Urine cultures Urine cultures are only performed if a urine sample has been reviewed under microscopy and deemed to have greater than 40 x 106/L white blood cells. Despite the common misconception, urine is not sterile once it leaves the ureters. Therefore, the presence of bacteria or yeast is not always a cause for concern. Pregnant women are an exception to this rule, as they are at increased risk of infection with group B streptococcus, which may cause asymptomatic bacteriuria initially that later migrates to the reproductive tract (Grey et al, 2023). Microbial colonisation of the urinary tract of older people and those with indwelling urinary catheters is likely to happen, and there is no consensus over the role that these microbes may play in the health of the individual, though if other symptoms of urinary tract infection are present (such as lower back pain, increased frequency of micturition, increased urgency and fever) then empirical treatment should be given in line with local policy (Grey et al, 2023; Miller et al, 2024). Figure 2 shows a workflow for women under 65 years with an uncomplicated urinary tract infection (UTI) (Grey et al, 2023). Sputum cultures Sputum cultures, whether spontaneously expectorated, suctioned from the hypopharynx via the nose (as in children), or acquired as an endotracheal aspirate in ventilated patients, indicate the presence of bacteria or fungi in the respiratory tract. While expectorated sputum is often colonised with normal oropharyngeal flora, it is still valuable for diagnosing infections when clinical signs such as fever, increased sputum production or changes in sputum colour suggest an active infection, even if a chest X-ray is inconclusive. As with blood cultures, obtaining a high-quality sputum sample before starting antimicrobial therapy is best practice (Ogawa et al, 2023). In cases where tuberculosis is suspected, three separate sputum samples on three consecutive days should be sent for acid-fast bacilli stain testing (Shen and Sergi, 2023). Polymerase chain reaction (PCR) PCR is a great tool for identifying organisms that are difficult to culture, such as chlamydia, or viruses like influenza. This process involves amplifying DNA from a clinical sample, such as blood, tissue, or other bodily fluids, which is then compared to a library of clinical samples with known DNA sequences to identify the specific organism present. This used to take multiple days to perform, but is now much accelerated (Espy et al, 2006). In cases of culture-negative endocarditis, tissue samples may be processed for a 16S PCR, which looks for prokaryotic ribosomal DNA to identify organisms that are difficult to culture, such as Bartonella and Tropheryma whippelii. Similarly, if a fungal infection is suspected, samples can be sent for a 18S PCR. This test is highly sensitive, so the potential for contamination is possible, and any results should be discussed with a clinical microbiologist (Patel et al, 2017). Effective first-line treatment Antibiotics Antibiotics can be split into 'broad spectrum' and 'narrow spectrum' based on the range of organisms against which they will work. It is good to bear in mind that antibiotics will work against the patient's own commensal bacteria as well as pathogens, meaning that bacteria in the gut will also be depleted. This can have serious implications for the patient, as disrupting the ecosystem of the gut can lead to Clostridium difficile filling in the niche left by the eradication of the normal 'friendly' bacteria (Patangia et al, 2022). Antibiotics can disrupt the normal flora of the vaginal tract, leading to the development of thrush, as the pH balance change allows yeast to grow uncontrolled. Typically, the first-line treatment for a potentially life-threatening infection would be to administer intravenous (IV) broad-spectrum antibiotics, such as piperacillin-tazobactam. Then, once the causative organism has been identified, treatment can be narrowed to target the specific pathogen (for example, narrowing to flucloxacillin if methicillin-sensitive Staphylococcus aureus is identified). Local guidelines should always be followed for empirical treatment, as these will have been developed in partnership with the clinical microbiologists to reflect the local resistance rates for specific infections. Always be sure to review this treatment at 48-72 hours, alongside any culture results, to assess whether the treatment has been successful and to ensure the shortest duration of effective treatment is given. (National Institute of Health and Care Excellence, 2015). "All samples sent for culture should be appropriate to the suspected cause and severity of infection" Antifungals Fungal disease is a much larger cause of concern for neonates, people living with asthma (particularly those taking corticosteroid therapies), transplant recipients, cancer patients and individuals living with HIV/AIDS than for the general population (Bongomin et al, 2013). If fungal infection is suspected, initial management usually involves either an azole (such as fluconazole or voriconazole) or an echinocandin (such as caspofungin or anidulafungin) depending on the severity of disease. Candida species are the most common cause of invasive fungal infection and can range from simple mucosal infections, such as thrush, to life-threatening invasive disease, such as endocarditis (Pappas et al, 2009). Culture samples should be sent with an indication that fungal infection is suspected, alerting biomedical scientists that fungal cultures should be set up alongside bacterial ones, as this will help guide antifungal treatment. It is always worth bearing in mind that antifungal agents may be extremely toxic to the patient's kidneys or liver, and resistance is fast emerging as the development of new antifungal drugs lags behind. (Campoy and Adrio, 2017). Antivirals The majority of viral illnesses are self-limiting and so management of symptoms is often sufficient treatment. However, as seen with the recent Covid-19 pandemic, viral illnesses can quickly become life-threatening. People more at risk of complicated influenza (that which requires hospital admission, exhibits central nervous system dysfunction, and/or exacerbation of a chronic condition) include: Those over 65 years of age; Pregnant/recently pregnant women; Children under 6 months old; Those with a BMI over 40. Treatment for these patients usually involves a short course of oseltamivir (UKHSA, 2021). Herpes simplex virus (HSV) is the most common cause of acute encephalitis and is typically identified through the use of PCR testing of cerebrospinal fluid. IV acyclovir is often started before PCR confirmation is received due to the increased mortality associated with delayed treatment. The typical duration of treatment for viral encephalitis is approximately 14-21 days, though this should always be discussed with a consultant virologist where possible for expert advice (Divyashree et al, 2023; Bradshaw and Venkatesan, 2016). Antiparasitics People entering or returning to the UK from abroad with persistent abdominal symptoms (those lasting more than 2 weeks) should always be tested for the presence of parasites in their stool, either through microscopic analysis or PCR testing. While there are no nationally agreed guidelines for empirical treatment of parasitic infection, any suspicion for parasitic infection should be discussed with a consultant in microbiology or infectious diseases (Ross et al, 2013). Identifying improvements After commencing treatment (examples of empirical treatment options before the causative organism has been determined can be found in Table 1), it is important to review the patient at regular intervals to identify efficacy. A strong multidisciplinary team made up of surgeons, medics, nurses, pharmacists, radiologists and many more will provide the best possible outcomes for your patients and encourage more effective collaboration (Kempson et al, 2023; Sires et al, 2023). The trend in white cell count (WCC), or white blood cells (WBC), particularly neutrophils, indicates a response by the bone marrow to an acute infectious or inflammatory response. As treatment progresses, WCC is expected to decrease towards the 'normal' parameters of 4.0-11.0 x 109/L. However, if WCC is not trending downwards, further investigations may be needed to identify if there is another source of infection that has not been removed, such as an abscess or empyema. Similarly, C-reactive protein levels are expected to normalise quickly once the source of infection has been treated (Ishimine et al, 2013). Procalcitonin (PCT) is a protein biomarker that is often used to guide antimicrobial treatment, as it is positively correlated with bacterial infection. However, it does not elevate in viral infections (Assicot et al, 1993), which made it very useful during the Covid-19 pandemic to aid the de-escalation of antimicrobial therapies once PCT levels were less than 0.25µg/L (Peters et al, 2021). Procalcitonin should not be used in isolation to determine treatment courses; the clinical context and severity of illness should always be considered. Taking serial blood cultures is integral to managing bacteraemias, particularly those caused by S. aureus. These help to identify if treatment is working, as well as help identify severity of the disease (multiple positive blood cultures over a period of time may indicate endocarditis, for example) and so further tests such as a transthoracic echocardiogram (TTE) or a CT scan may be required. A single negative culture is not always enough to confirm treatment success though. The 'skip phenomenon' has been identified in some patients, where persistent positive blood cultures are intermittently interrupted with a negative culture. Therefore, it is good practice to wait for multiple consecutive negative cultures before bacterial clearance can be determined (Go et al, 2022). Conclusion Microbiology testing and regular review by a dedicated multidisciplinary team are vital to enable effective treatment of infections in accordance with antimicrobial stewardship guidelines. Being able to understand microbiology tests and results allows the clinical practitioner to properly manage the patient and prevent long courses of broad-spectrum antibiotics that will lead to high rates of antimicrobial resistance and treatment failure. However, all test results should be utilised in conjunction with sound clinical judgement and reasoning. Also in this series This series is aimed at nurses and midwives working at or towards advanced practice. Advanced practitioners are educated at masters level and are assessed as competent to make autonomous decisions in assessing, diagnosing and treating patients. Advanced assessment and interpretation is based on a medical model and the role of advanced practitioners is to integrate this into a holistic package of care. Professional responsibilities - This procedure should be undertaken only after approved training, supervised practice and competency assessment, and carried out in accordance with local policies and protocols. References Assicot M et al (1993) High serum procalcitonin concentrations in patients with sepsis and infection. Lancet; 27: 341, 515-518. Bradshaw M, Venkatesan A (2016) Herpes simplex virus-1 encephalitis in adults: pathophysiology, diagnosis, and management. Neurotherapeutics; 13: 3, 493-508. 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UK Health Security Agency (2023) UK Standards for Microbiology Investigations: Sepsis and Systemic or Disseminated Infections. UKHSA. UK Health Security Agency (2021) Influenza: Treatment and Prophylaxis Using Anti-viral Agents. Guidance on How to Manage Influenza (Flu) Using Anti-viral Agents. UKHSA. World Health Organization (2023) Antimicrobial resistance. who.it, 21 November (accessed 10 September 2024). Help Nursing Times improve Help us better understand how you use our clinical articles, what you think about them and how you would improve them. Please complete our short survey. Microbiology Tests are crucial for identifying infectious agents, guiding treatment decisions accurately. They play a key role in diagnosing various bacterial, viral, and fungal infections. This series aims to escort doctors through the realm of histological investigations, enriching their perception of tissue narratives and the pivotal role they play in unraveling disease stories. Microorganism Identification: Microbiology Tests identify and characterize microorganisms, such as bacteria, viruses, fungi, and parasites. Infection Diagnosis: They play a crucial role in diagnosing infectious diseases by detecting and studying the causative agents. Antimicrobial Susceptibility: Microbiology Tests determine the susceptibility of microorganisms to antimicrobial agents, aiding in effective treatment planning. Do You Know? Labs lacking proper systems may face a upto 24% loss in earnings with a risk of unintentionally compromising accurate Microbiology test results, impacting credibility. Without technology or software, labs may experience up to a 22% loss in ROI due to inefficient operations and mismanagement. Recommended: Best Pathology Lab Reporting Software Top Microbiology Test List Here are Top Microbiology Test List with clinical guidelines for the best report format. 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Do's Don'ts Follow aseptic techniques Avoid using outdated reagents Adhere to test protocols Neglect proper waste disposal Maintain sterile conditions Skip quality control measures Verify patient information Use contaminated equipment Record and report accurately Ignore safety protocols Communicate with the team Rush through tests, prioritize accuracy Pathology Lab Test List Here are 1000+ Pathology Lab Test List with types and purposes. Microbiology Test Report Format A standardized Microbiology Test Report Format is essential for conveying test results accurately and clearly to both patients and healthcare providers. A well-organized layout, succinct descriptions, and accurate interpretations are crucial for facilitating comprehension and informed decision-making in patient care management. Referred 1000+ Pathology Lab Report Formats & Sample PDF Adhering to a consistent format in Microbiology Test Reporting is imperative for building trust and credibility with clients, demonstrating the laboratory's dedication to providing reliable and precise results. By streamlining reporting procedures, laboratories can enhance workflow efficiency, leading to improved patient outcomes and satisfaction. Summary Overall, Drlogy Pathology Lab Software optimizes Microbiology testing with advanced features, ensuring precision, efficiency, and substantial cost savings. Elevate your lab's capabilities, streamline processes, and enhance patient service for unparalleled growth. Also Check Drlogy Pathology Lab Test List, empowering labs with a comprehensive 1000+ test directory, facilitating precise diagnostics and efficient management for superior healthcare delivery.