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Pneumonia tests may be performed for one or more of the following reasons: Diagnosis: Many pneumonia tests are conducted in order to determine whether a person has pneumonia. Some symptoms of pneumonia also commonly occur with a cold or flu, so diagnostic testing can be important to identify the actual cause of those symptoms. Testing to rule out pneumonia is a part of diagnosing many other kinds of respiratory conditions. Assessing disease severity: After pneumonia has been identified, testing can reveal its severity and whether it affects one or both lungs. Tests can also check for complications of pneumonia that can pose significant health risks. Identifying the cause of pneumonia: There are multiple possible causes of pneumonia, and tests may be used to help find the bacteria, virus, fungus, or other pathogens that caused the infection. When possible, determining what pathogen is causing the infection can enable more tailored and effective treatment. Monitoring: Continued testing after a diagnosis of pneumonia allows doctors to see whether treatment is working and whether a person's condition is improving. Monitoring tests may lead to adjustments to the treatment plan or modifications to the initial pneumonia diagnosis. The goal of any pneumonia test can depend on many factors including the type of pneumonia a person has along with their age, overall health, and symptom severity. A doctor is in the best position to explain the purpose of a particular pneumonia test in any individual patient's case. Who should get testing? Testing is most often performed if you have symptoms that could be caused by pneumonia. This testing can help diagnose or rule out pneumonia as a cause of those symptoms. The decision to order a pneumonia test is determined by a doctor based on your specific situation. You should talk to a doctor or nurse if: You have a cough that is persistent or worsening You have difficulty breathing or shortness of breath You experience chest pain when breathing You have recovered from a cold or flu and then quickly found that your symptoms worsened It is especially important to see a doctor about these symptoms if you have risk factors for developing more complicated pneumonia. Make sure to reach out to a health care professional if you are over 65 years old, have a preexisting lung condition, and/or have a compromised immune system. If you have already been diagnosed with pneumonia, you may have additional testing to learn more about the cause and severity of your condition. Follow-up testing can also be used to observe how well treatment is working. Getting test results The timeline for receiving pneumonia test results depends on the situation. In some cases, results from initial testing may be available within a few hours to a few days. However, getting the details about test results may take longer when a greater number of pneumonia tests are required. In many situations, the doctor may be able to quickly determine whether you have pneumonia based on your symptoms and imaging tests that look at your lungs. Additional tests may be needed to assess the cause, severity, and optimal treatment. Because there are many types of pneumonia that can affect people in different ways, it is important to always review your test results with a doctor who can most clearly explain what they mean in your situation. Various types of pneumonia tests may be performed based on a patient's symptoms and overall health. In most cases, initial testing for pneumonia involves a physical examination, medical history review, and a chest x-ray. These steps often allow for an initial diagnosis to be made. Recommendations for further testing are tailored to a patient's situation. In general, patients who have more severe symptoms, may require hospitalization, or who are at higher risk of complications are more likely to undergo additional pneumonia testing. The following sections provide details about the different types of tests that may be involved in the diagnosis and evaluation of pneumonia. Medical history review and physical exam Pneumonia testing usually begins with an initial examination by a doctor that includes both a review of your medical history and a physical exam. This process helps the doctor understand your situation, check for signs of pneumonia, and look for the possible complications of an infection. A medical history review includes a discussion of your current symptoms as well as your overall health and medical history. The doctor will usually ask about how long you have had symptoms and may ask questions about your medications, vaccinations, if you have been around other people who are sick, if you smoke cigarettes, or if you have other health issues that may affect your risk for pneumonia. A physical exam for pneumonia typically includes using a stethoscope to listen to your lungs. A health care provider may tap on your chest and ask you to take several breaths while they listen. During this exam, the doctor is checking to see if they hear certain sounds that are associated with pneumonia. Most of the time, additional tests are needed after this clinical evaluation. In some situations, a medical history review and physical exam may be sufficient to diagnose mild cases of pneumonia. Chest imaging tests If your medical history review and physical exam suggest pneumonia, the doctor will normally suggest an imaging test to look more closely at your lungs. A chest x-ray is the typical imaging test used to diagnose pneumonia. This testing can show the presence of a pneumonia infection in the lungs. Although less often used in pneumonia testing, a computed tomography (CT) scan of the chest may be considered in select situations. A CT scan provides more detailed images and are usually used when the initial chest x-ray has unexpected results, if symptoms are abnormal, or if symptoms may be explained by another lung condition. In some hospitals and medical offices, an ultrasound of the lung may be used to help diagnose pneumonia. This method of imaging is not as common, but it may be most useful when it is otherwise difficult to perform a chest x-ray or CT scan. Tests to assess overall health Because pneumonia can trigger a range of potential complications, it is common for tests that assess your overall health to be included as part of pneumonia testing. Examples of these tests include: Complete blood count (CBC) with differential: This test measures the amount of each type of blood cell in a blood sample taken from a vein in your arm. In addition to providing insight about overall health, a CBC can show if there is an elevated level of white blood cells, which is associated with some infections. Basic metabolic panel (BMP): This is another routine blood test that assesses kidney function, electrolytes, and blood sugar levels. Tests to assess lung function Pneumonia directly affects the lungs, so the doctor may recommend one or more pulmonary function tests to check how well your lungs are working to provide oxygen to your body. One type of pulmonary function test is pulse oximetry, which checks whether there is enough oxygen in your blood. The test uses a sensor clipped to your ear or finger that estimates your blood oxygen levels. Another way of evaluating your blood oxygen levels is with an arterial blood gases test. This test uses a sample of blood taken from an artery and measures the amount of oxygen, blood pH, and carbon dioxide. Tests to find the cause of pneumonia Pneumonia testing may include a range of tests to identify why pneumonia occurred. There are many potential causes of pneumonia including an infection with a bacteria, virus, or fungus. When the cause is known, the doctor can choose a tailored therapy that offers the most benefit and least risk. This kind of testing is not routinely performed in patients with mild cases of pneumonia. Trying to identify the cause is of greater importance when a patient is hospitalized or at higher risk of severe complications from pneumonia. Although many tests are available to look for the underlying cause, in the majority of cases, no single cause can be conclusively identified. The following sections describe different types of tests that may be used to detect the cause of pneumonia. Each section is organized based on the type of sample that is used for testing. Sputum tests Sputum is a thick kind of mucus produced in the lungs that is also known as phlegm. It is distinct from saliva or spit because its thickness helps it trap and remove pathogens from the lungs. For this reason, sputum can be analyzed to check for signs of bacteria, viruses, or other pathogens. There are three main ways that a sputum sample can be obtained. The least invasive way of collecting sputum is by coughing deeply so that sputum can be spit into a cup. Before this, you may inhale a vapor that makes it easier to produce a testable amount of sputum. When this method fails to produce sufficient sputum, other procedures may be necessary: Bronchoscopy: This is a procedure that inserts a flexible scope with a camera into the lungs. This allows the doctor to look more closely at the inside of the lungs. During the test, a small brush may collect a sputum sample, or a saline solution can be used to wash a sample of sputum out so that it can be analyzed. This procedure is known as bronchoalveolar lavage. Lung biopsy: This is a surgery that involves removing a sample of tissue from the lung. A lung biopsy is rarely necessary for pneumonia and is generally reserved for special cases and less common types of pneumonia. Once a sputum sample has been collected, there are a number of different ways that it may be analyzed: Culture: In a sputum culture test, the lab places sputum in a special dish for a few days to see if bacteria or other infectious germs grow. If they do, the lab may be able to identify the specific bacteria or other pathogen that caused pneumonia. Gram stain: A Gram stain involves applying a purple-colored substance, known as the Gram stain, to the sample. Depending on how the sample changes color, it can indicate the type of infection present. A sputum gram stain may be repeated multiple times over several days, and it can be combined with a sputum culture test. Fungal smear: A fungal smear looks for presence of a fungal infection by examining a sputum sample under a microscope. Polymerase chain reaction (PCR): PCR is a type of molecular test that uses special laboratory techniques to check for the presence of the genetic material of a pathogen in a sputum sample. These tests can look for one or more kinds of bacteria or viruses. Direct fluorescent antibody (DFA): A sputum DFA test requires adding a fluorescent dye to a sputum sample that is then looked at under a special microscope. When certain infections are present, the sample will appear to glow. Throat or nasal swab tests Some tests use a swab of the throat, nostrils, or the area at the back of the nose to look for viruses that can cause respiratory symptoms and pneumonia. Most people with pneumonia are tested for influenza and, during the global COVID-19 pandemic, the SARS-CoV-2 virus that causes COVID-19. Depending on a patient's symptom severity and risk factors, swab tests may be used to look for other respiratory viruses. Blood tests Blood tests can be used to try to determine the cause of pneumonia. Blood culture tests involve using a blood sample to try to grow bacteria in a lab. The test usually takes a few days to see if any bacteria grow, at which point they can be identified and targeted for treatment. Blood cultures can also detect possible complications such as an infection that has entered the bloodstream. Another type of blood test that may be prescribed is a beta-D-glucan test. Beta-D-glucan is part of the cell walls of fungi, so this test can help detect a fungal infection that may have caused pneumonia. Sometimes pneumonia testing may include blood tests that look for procalcitonin or C-reactive protein (CRP). These are substances in the blood that are associated with inflammation. These tests may be used to help distinguish between causes of inflammation and to assess a patient's response to treatment. Urine tests A urine sample can be analyzed for the presence of two bacteria that can cause pneumonia, Streptococcus pneumoniae and Legionella pneumophila. These tests work by looking for antigens, which are substances found on the surface of the bacteria that trigger an immune response. Pleural fluid tests Sometimes pneumonia can be tied to the buildup of liquid in the pleura, which is the area between the wall of the chest and the lining on the outside of the lungs. In a procedure called thoracentesis, a sample of this fluid can be removed by inserting a needle through the chest wall and into the pleural space. In a pleural fluid test, this sample can be analyzed under a microscope or used to try to culture bacteria in the laboratory in order to look for an underlying infection causing pneumonia. Pneumonia tests are ordered by a doctor and normally performed in a medical setting like a hospital or doctor's office. Depending on the type of test, other medical specialists, such as a pulmonologist who focuses on lung conditions, may be a part of your health care team. If you have symptoms of pneumonia or have recently been diagnosed with pneumonia, you should talk with your doctor about the most appropriate testing and where it can be performed. At-home testing Pneumonia testing is generally not available at home. Some types of tests, such as imaging tests, require special equipment that is only available in a medical setting. In addition, many types of pneumonia tests are performed when patients need to be in the hospital because of their symptoms or the risk of complications. Pneumonia tests also require careful interpretation to determine the optimal care for any specific patient.

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Group of endocrine diseases characterized by high blood sugar levels This article is about the common insulin disorder. For the urine hyper-production disorder, see Diabetes insipidus. For other uses, see Diabetes (disambiguation). Medical conditionDiabetesUniversal blue circle symbol for diabetes[1]Pronunciation/ˌdaɪəˈbiːtiːz, -tɪs/ SpecialtyEndocrinologySymptomsFrequent urination, Increased thirst, Increased hungerComplicationsMetabolic imbalances, cardiovascular diseases, myocardial infarction, nerve and brain damage, kidney failure, gastrointestinal changes[2][3][4][5]DurationRemission may occur, but diabetes is often lifelongTypes Type 1 diabetes, type 2 diabetes, gestational diabetes CausesInsulin insufficiency or gradual resistanceRisk factors Type 1: genetics and environmental factors[6] Type 2: genetics, obesity, family history, non-alcoholic fatty liver disease, past pregnancy with gestational diabetes, lack of exercise[2][6] Diagnostic methodHigh blood sugar, increased HbA1c[2]Differential diagnosisDiabetes insipidusTreatmentLifestyle changes, diabetes medication[2]MedicationInsulin, antihyperglycemics[2][7][8]Frequency463 million (5.7%)[9]Deaths4.2 million (2019)[9] Diabetes mellitus, commonly known as diabetes, is a group of common endocrine diseases characterized by sustained high blood sugar levels.[10][11] Diabetes is due to either the pancreas not producing enough of the hormone insulin, or the cells of the body becoming unresponsive to insulin's effects.[12] Classic symptoms include the three P's: polydipsia (excessive thirst), polyuria (excessive urination), polyphagia (excessive hunger), weight loss, and blurred vision. If left untreated, the disease can lead to various health complications, including disorders of the cardiovascular system, eye, kidney, and nerves.[3] Diabetes accounts for approximately 4.2 million deaths every year,[9] with an estimated 1.5 million caused by either untreated or poorly treated diabetes.[10] The major types of diabetes are type 1 and type 2.[13] The most common treatment for type 1 is insulin replacement therapy (insulin injections), while anti-diabetic medications (such as metformin and semaglutide) and lifestyle modifications can be used to manage type 2. Gestational diabetes, a form that sometimes arises during pregnancy, normally resolves shortly after delivery. Type 1 diabetes is an autoimmune condition where the body's immune system attacks the beta cells in the pancreas, preventing the production of insulin. This condition is typically present from birth or develops early in life. Type 2 diabetes occurs when the body becomes resistant to insulin, meaning the cells do not respond effectively to it, and thus, glucose remains in the bloodstream instead of being absorbed by the cells.[14] Additionally, diabetes can also result from other specific causes, such as genetic conditions (monogenic diabetes syndromes like neonatal diabetes and maturity-onset diabetes of the young), diseases affecting the pancreas (such as pancreatitis), or the use of certain medications and chemicals (such as glucocorticoids, other specific drugs and after organ transplantation).[15] The number of people diagnosed as living with diabetes has increased sharply in recent decades, from 200 million in 1990 to 830 million by 2022.[16][17] It affects one in seven of the adult population, with type 2 diabetes accounting for more than 95% of cases. These numbers have already risen beyond earlier projections of 783 million adults by 2045.[18] The prevalence of the disease continues to increase, most dramatically in low- and middle-income nations.[19] Rates are similar in women and men, with diabetes being the seventh leading cause of death globally.[20][21] The global expenditure on diabetes-related healthcare is an estimated US$760 billion a year.[22] Overview of the most significant symptoms of diabetes Retinopathy, nephropathy, and neuropathy are potential complications of diabetesCommon symptoms of diabetes include increased thirst, frequent urination, extreme hunger, and unintended weight loss.[23][24] Several other non-specific signs and symptoms may also occur, including fatigue, blurred vision, sweet smelling urine/semen and genital itchiness due to Candida infection.[24] About half of affected individuals may also be asymptomatic.[24] Type 1 presents abruptly following a pre-clinical phase, while type 2 has a more insidious onset; patients may remain asymptomatic for many years.[25] Diabetic ketoacidosis is a medical emergency that occurs most commonly in type 1, but may also occur in type 2 if it has been longstanding or if the individual has significant β-cell dysfunction.[26] Excessive production of ketone bodies leads to signs and symptoms including nausea, vomiting, abdominal pain, the smell of acetone in the breath, deep breathing known as Kussmaul breathing, and in severe cases decreased level of consciousness.[26] Hyperosmolar hyperglycemic state is another emergency characterized by dehydration secondary to severe hyperglycemia, with resultant hypernatremia leading to an altered mental state and possibly coma.[27] Hypoglycemia is a recognized complication of insulin treatment used in diabetes.[28] An acute presentation can include mild symptoms such as sweating, trembling, and palpitations, to more serious effects including impaired cognition, confusion, seizures, coma, and rarely death.[28] Recurrent hypoglycemic episodes may lower the glycemic threshold at which symptoms occur, meaning mild symptoms may not appear before cognitive deterioration begins to occur.[28] Main article: Complications of diabetes The major long-term complications of diabetes relate to damage to blood vessels at both macrovascular and microvascular levels.[29][30] Diabetes doubles the risk of cardiovascular disease, and about 75% of deaths in people with diabetes are due to coronary artery disease.[31] Other macrovascular morbidities include stroke and peripheral artery disease.[32] Microvascular disease affects the eyes, kidneys, and nerves.[29] Damage to the retina, known as diabetic retinopathy, is the most common cause of blindness in people of working age.[24] The eyes can also be affected in other ways, including development of cataract and glaucoma.[24] It is recommended that people with diabetes visit an optometrist or ophthalmologist once a year.[33] Diabetic nephropathy is a major cause of chronic kidney disease, accounting for over 50% of patients on dialysis in the United States.[34] Diabetic neuropathy, damage to nerves, manifests in various ways, including sensory loss, neuropathic pain, and autonomic dysfunction (such as postural hypotension, diarrhoea, and erectile dysfunction).[24] Loss of pain sensation predisposes to trauma that can lead to diabetic foot problems (such as ulceration), the most common cause of non-traumatic lower-limb amputation.[24] Hearing loss is another long-term complication associated with diabetes.[35] Based on extensive data and numerous cases of gallstone disease, it appears that a causal link might exist between type 2 diabetes and gallstones. People with diabetes are at a higher risk of developing gallstones compared to those without diabetes.[36] There is a link between cognitive deficit and diabetes; studies have shown that diabetic individuals are at a greater risk of cognitive decline, and have a greater rate of decline compared to those without the disease.[37] Diabetes increases the risk of dementia, and the earlier that one is diagnosed with diabetes, the higher the risk becomes.[38] The condition also predisposes to falls in the elderly, especially those treated with insulin.[39] Comparison of type 1 and 2 diabetes[40] Feature Type 1 diabetes Type 2 diabetes Onset Sudden Gradual, Insidious Age at onset Any age; average age at diagnosis being 24.[41] Mostly in adults Body size Thin or normal[42] Often obese Ketoacidosis Common Rare Autoantibodies Usually present Absent Endogenous insulin Low or absent Normal, decreased or increased Heritability 0.69 to 0.88[43][44][45] 0.47 to 0.77[46] Prevalence (age standardized)