Continue

# اكتشاف مرض سرطان الثدي

رفع التحرّك[1]سرطان الثدي[2]مصطلح طبي[3] يشير إلى الخلايا الأكثر عرضة للإصابة بالسرطان في الثدي[4] وهي الخلايا التي تبطن الفصوص والقنوات[5] في الثدي[6] وتتحول إلى خلايا سرطانية[7] بسبب طفرات في الحمض النووي[8] تؤدي إلى انقسام الخلايا بشكل غير منضبط[9] وتكوين ورم[10] يمكن أن يكون حميدًا أو خبيثًا[11] وتختلف أنواع سرطان الثدي[12] وأسباب كل نوع[13] وأعراضه[14] وطرق علاجه[15] وتشخيصه[16] وتوقعات المرضى[17] وفقًا لمكان نشأته[18] وما إذا كان قد انتشر[19] إلى أجزاء أخرى من الجسم[20] وكذلك وفقًا لعوامل أخرى[21] مثل العمر[22] والجنس[23] والتاريخ الطبي[24] والعوامل الوراثية[25] والهرمونات[26] والتغذية[27] والتدخين[28] والكحول[29] والتعرض للإشعاع[30] والتعرض للمواد الكيميائية[31] والسمنة[32] والنشاط البدني[33] والتلوث[34] والضغوط[35] والعدوى[36] والمناعة[37] والتهابات الثدي[38] والتهاب الحلمة[39] والتهاب الهالة[40] وتليف الثدي[41] وتكيس الثدي[42] وأورام الثدي الحميدة[43] وأورام الثدي الخبيثة[44] وسرطان الثدي الغازي[45] وسرطان الثدي الغير غازي[46] وسرطان الثدي الالتهابي[47] وسرطان الثدي الثلاثي السلبي[48] وسرطان الثدي الإيجابي للهرمون المستقبل[49] وسرطان الثدي الإيجابي للبروتين المستقبل[50] وسرطان الثدي الإيجابي للهرمون المستقبل والبروتين المستقبل[51] وسرطان الثدي الإيجابي للهرمون المستقبل والسلبي للبروتين المستقبل[52] وسرطان الثدي السلبي للهرمون المستقبل والإيجابي للبروتين المستقبل[53] وسرطان الثدي الإيجابي للهرمون المستقبل والبروتين المستقبل[54] وسرطان الثدي الإيجابي للهرمون المستقبل والسلبي للبروتين المستقبل[55] وسرطان الثدي السلبي للهرمون المستقبل والإيجابي للبروتين المستقبل[56] وسرطان الثدي السلبي للهرمون المستقبل والبروتين المستقبل[57] وسرطان الثدي الثلاثي السلبي[58] وسرطان الثدي الالتهابي[59] وسرطان الثدي الغير غازي[60] وسرطان الثدي الغازي[61] وسرطان الثدي الخبيثة[62] وسرطان الثدي الحميدة[63] وأورام الثدي[64] وتكيس الثدي[65] وتليف الثدي[66] والتهاب الهالة[67] والتهاب الحلمة[68] والعدوى[69] والمناعة[70] والتهابات الثدي[71] والضغوط[72] والتلوث[73] والسمنة[74] والنشاط البدني[75] والكحول[76] والتدخين[77] والتغذية[78] والهرمونات[79] والتعرض للإشعاع[80] والتعرض للمواد الكيميائية[81] والعوامل الوراثية[82] والتاريخ الطبي[83] والعمر[84] والجنس[85] والعوامل الأخرى[86] ما يقارب الثلاثة وعشرين بالمئة، وينسّب في وفاة حوالي نصف مليون نسمة حول العالم سنويا، وهو من أبرز الأسباب المؤدّية لوفاة الإناث حول العالم، وتختلف معدلات الوفاة حسب طبيعة الحالات وتوقيت اكتشاف الإصابة والموقع الجغرافي للحالة، حيث تقل نسب الوفيات في الدول المتقدّمة عن الدول النامية، ويشكل عام فإن نسب الوفيات بسرطان الثدي في تراجع مستمرّ بسبب حملات التوعية المنتشرة في مختلف أنحاء العالم وتطوّر علاجات الأورام بصفة عامّة.[3]حلقة خاصة حول سرطان الثدي المبكر مع الدكتورة أم الخير بالتعاون مع شركة نوفارتس وجمعية زهرة، تسلّط الضوء على أهمية الكشف المبكر، أساليب الوقاية والعلاج المتاحة، وتجارب دعم المرأة في مواجهة المرض. المراجع [1] [2] [3] [4] [5] [6] [7] [8] [9] [10] [11] [12] [13] [14] [15] [16] [17] [18] [19] [20] [21] [22] [23] [24] [25] [26] [27] [28] [29] [30] [31] [32] [33] [34] [35] [36] [37] [38] [39] [40] [41] [42] [43] [44] [45] [46] [47] [48] [49] [50] [51] [52] [53] [54] [55] [56] [57] [58] [59] [60] [61] [62] [63] [64] [65] [66] [67] [68] [69] [70] [71] [72] [73] [74] [75] [76] [77] [78] [79] [80] [81] [82] [83] [84] [85] [86]

Donald, baru-baru ini... Baca Lebih Lanjut Ayam Kunyit Panggang adalah pilihan hidangan sehat yang tidak hanya menggugah selera tetapi juga kaya... Baca Lebih Lanjut Alpukat, dengan tekstur lembut dan rasa yang kaya, tidak hanya lezat tetapi juga penuh dengan... Baca Lebih Lanjut To make science and data easier for broad audiences to interpret, CDC is translating science into practical, easy to understand policy by clarifying and presenting scientific language so that anyone can understand it and standardizing guideline development across the agency. This article is about imaging the human body. For imaging of animals in research, see Preclinical imaging. For therapeutic use of ultrasound, see Focused ultrasound. "Echography" and "Echograph" redirect here. Not to be confused with Echo sounding. Medical intervention Medical ultrasoundSonographer carrying out echocardiography on a childICD-10-PCSB74ICD-9-CM88.7MeSHD014463OPS-301 code3-03. ..3-05[edit on Wikidata] Medical ultrasound includes diagnostic techniques (mainly imaging) using ultrasound, as well as therapeutic applications of ultrasound. In diagnosis, it is used to create an image of internal body structures such as tendons, muscles, joints, blood vessels, and internal organs, to measure some characteristics (e.g., distances and velocities) or to generate an informative audible sound. The usage of ultrasound to produce visual images for medicine is called medical ultrasonography or simply sonography, or echography. The practice of examining pregnant women using ultrasound is called obstetric ultrasonography, and was an early development of clinical ultrasonography. The machine used is called an ultrasound machine, a sonograph or an echograph. The visual image formed using this technique is called an ultrasonogram, a sonogram or an echogram. Ultrasound of carotid artery Ultrasound is composed of sound waves with frequencies greater than 20,000 Hz, which is the approximate upper threshold of human hearing.[1] Ultrasonic images, also known as sonograms, are created by sending pulses of ultrasound into tissue using a probe. The ultrasound pulses echo off tissues with different reflection properties and are returned to the probe which records and displays them as an image. A general-purpose ultrasonic transducer may be used for most imaging purposes but some situations may require the use of a specialized transducer. Most ultrasound examination is done using a transducer on the surface of the body, but improved visualization is often possible if a transducer can be placed inside the body. For this purpose, special-use transducers, including transvaginal, endorectal, and transesophageal transducers are commonly employed. At the extreme, very small transducers can be mounted on small diameter catheters and placed within blood vessels to image the walls and disease of those vessels. The imaging mode refers to probe and machine settings that result in specific dimensions of the ultrasound image.[2] Several modes of ultrasound are used in medical imaging.[3][4] A-mode: Amplitude mode refers to the mode in which the amplitude of the transducer voltage is recorded as a function of two-way travel time of an ultrasound pulse. A single pulse is transmitted through the body and scatters back to the same transducer element. The voltage amplitudes recorded correlate linearly to acoustic pressure amplitudes. A-mode is one-dimensional. B-mode: In brightness mode, an array of transducer elements scans a plane through the body resulting in a two-dimensional image. Each pixel value of the image correlates to voltage amplitude registered from the backscattered signal. The dimensions of B-mode images are voltage as a function of angle and two-way time. M-mode: In motion mode, A-mode pulses are emitted in succession. The backscattered signal is converted to lines of bright pixels, whose brightness linearly correlates to backscattered voltage amplitudes. Each next line is plotted adjacent to the previous, resulting in an image that looks like a B-mode image. The M-mode image dimensions are however voltage as a function of two-way time and recording time. This mode is an ultrasound analogy to streak video recording in high-speed photography. As moving tissue transitions produce backscattering, this can be used to determine the displacement of specific organ structures, most commonly the heart. Most machines convert two-way time to imaging depth using as assumed speed of sound of 1540 m/s. As the actual speed of sound varies greatly in different tissue types, an ultrasound image is therefore not a true tomographic representation of the body.[5] Three-dimensional imaging is done by combining B-mode images, using dedicated rotating or stationary probes. This has also been referred to as C-mode.[4] An imaging technique refers to a method of signal generation and processing that results in a specific application. Most imaging techniques are operating in B-mode. Doppler sonography: This imaging technique makes use of the Doppler effect in detection and measuring moving targets, typically blood. Harmonic imaging: backscattered signal from tissue is filtered to comprise only frequency content of at least twice the centre frequency of the transmitted ultrasound. Harmonic imaging used for perfusion detection when using ultrasound contrast agents and for the detection of tissue harmonics. Common pulse schemes for the creation of harmonic response without the need of real-time Fourier analysis are pulse inversion and power modulation.[6] B-flow image of venous reflux. Video is available. B-flow is an imaging technique that digitally highlights moving reflectors (mainly red blood cells) while suppressing the signals from the surrounding stationary tissue. It aims to visualize flowing blood and surrounding stationary tissues simultaneously.[7] It is thus an alternative or complement to Doppler ultrasonography in visualizing blood flow.[8] Therapeutic ultrasound aimed at a specific tumor or calculus is not an imaging mode. However, for positioning a treatment probe to focus on a specific region of interest, A-mode and B-mode are typically used, often during treatment.[9] This section does not cite any sources. Please help improve this section by adding citations to reliable sources. Unsourced material may be challenged and removed. (May 2025) (Learn how and when to remove this message) Compared to other medical imaging modalities, ultrasound has several advantages. It provides images in real-time, is portable, and can consequently be brought to the bedside. It is substantially lower in cost than other imaging strategies. Drawbacks include various limits on its field of view, the need for patient cooperation, dependence on patient physique, difficulty imaging structures obscured by bone, air or gases,[note 1] and the necessity of a skilled operator, usually with professional training. Urinary bladder (black butterfly-like shape) and hyperplastic prostate (BPH) visualized by medical ultrasound Sonography (ultrasonography) is widely used in medicine. It is possible to perform both diagnosis and therapeutic procedures, using ultrasound to guide interventional procedures such as biopsies or to drain collections of fluid, which can be both diagnostic and therapeutic. Sonographers are medical professionals who perform scans which are traditionally interpreted by radiologists, physicians who specialize in the application and interpretation of medical imaging modalities, or by cardiologists in the case of cardiac ultrasonography (echocardiography). Sonography is effective for imaging soft tissues of the body.[10] Superficial structures such as muscle, tendon, testis, breast, thyroid and parathyroid glands, and the neonatal brain are imaged at higher frequencies (7–18 MHz), which provide better linear (axial) and horizontal (lateral) resolution. Deeper structures such as liver and kidney are imaged at lower frequencies (1–6 MHz) with lower axial and lateral resolution as a price of deeper tissue penetration.[citation needed] In anesthesiology, ultrasound is commonly used to guide the placement of needles when injecting local anesthetic solutions in the proximity of nerves identified within the ultrasound image (nerve block). It is also used for vascular access such as cannulation of large central veins and for difficult arterial cannulation. Transcranial Doppler is frequently used by neuro-anesthesiologists for obtaining information about flow-velocity in the basal cerebral vessels.[citation needed] Intravascular ultrasound image of a coronary artery (left), with color-coding on the right, delineating the lumen (yellow), external elastic membrane (blue) and the atherosclerotic plaque burden (green) Further information: Doppler ultrasonography and Intravascular ultrasound In angiology or vascular medicine, duplex ultrasound (B Mode imaging combined with Doppler flow measurement) is used to diagnose arterial and venous disease. This is particularly important in potential neurologic problems, where carotid ultrasound is commonly used for assessing blood flow and potential or suspected stenosis in the carotid arteries, while transcranial Doppler is used for imaging flow in the intracerebral arteries.[citation needed] Intravascular ultrasound (IVUS) uses a specially designed catheter with a miniaturized ultrasound probe attached to its distal end, which is then threaded inside a blood vessel. The proximal end of the catheter is attached to computerized ultrasound equipment and allows the application of ultrasound technology, such as a piezoelectric transducer or capacitive micromachined ultrasonic transducer, to visualize the endothelium of blood vessels in living individuals.[11] In the case of the common and potentially, serious problem of blood clots in the deep veins of the leg, ultrasound plays a key diagnostic role, while ultrasonography of chronic venous insufficiency of the legs focuses on more superficial veins to assist with planning of suitable interventions to relieve symptoms or improve cosmetics.[citation needed] Main article: Echocardiography Ultrasound of human heart showing the four chambers and mitral and tricuspid valves Echocardiography is an essential tool in cardiology, assisting in evaluation of heart valve function, such as stenosis or insufficiency, strength of cardiac muscle contraction, and hypertrophy or dilatation of the main chambers. (ventricle and atrium)[citation needed] Main article: Emergency ultrasound Point of care ultrasound has many applications in emergency medicine.[12] These include differentiating cardiac from pulmonary causes of acute breathlessness, and the Focused Assessment with Sonography for Trauma (FAST) exam, extended to include assessment for significant hemoperitoneum or pericardial tamponade after trauma (EFAST). Other uses include assisting with differentiating causes of abdominal pain such as gallstones and kidney stones. Emergency Medicine Residency Programs have a substantial history of promoting the use of bedside ultrasound during physician training.[citation needed] Further information: Abdominal ultrasonography and Endoanal ultrasound Both abdominal and endoanal ultrasound are frequently used in gastroenterology and colorectal surgery. In abdominal sonography, the major organs of the abdomen such as the pancreas, aorta, inferior vena cava, liver, gall bladder, bile ducts, kidneys, and spleen may be imaged. However, sound waves may be blocked by gas in the bowel and attenuated to differing degrees by fat, sometimes limiting diagnostic capabilities. The appendix can sometimes be seen when inflamed (e.g.: appendicitis) and ultrasound is the initial imaging choice, avoiding radiation if possible, although it frequently needs to be followed by other imaging methods such as CT. Endoanal ultrasound is used particularly in the investigation of anorectal symptoms such as fecal incontinence or obstructed defecation.[citation needed] It images the immediate perianal anatomy and is able to detect occult defects such as tearing of the anal sphincter. Ultrasonography of liver tumors allows for both detection and characterization.[13] Ultrasound imaging studies are often obtained during the evaluation process of Fatty liver disease. Ultrasonography reveals a "bright" liver with increased echogenicity. Pocket-sized ultrasound devices might be used as point-of-care screening tools to diagnose liver steatosis.[14][15] Main articles: Gynecologic ultrasonography and Obstetric ultrasonography Orthogonal planes of a three-dimensional sonographic volume with transverse and coronal measurements for estimating fetal cranial volume[16][17] Gynecologic ultrasonography examines female pelvic organs (specifically the uterus, ovaries, and fallopian tubes) as well as the bladder, adnexa, and pouch of Douglas. It uses transducers designed for approaches through the lower abdominal wall, curvilinear and sector, and specialty transducers such as transvaginal ultrasound.[18] Obstetrical sonography was originally developed in the late 1950s and 1960s by Sir Ian Donald[19][20] and is commonly used during pregnancy to check the development and presentation of the fetus. It can be used to identify many conditions that could be potentially harmful to the mother and/or baby possibly remaining undiagnosed or with delayed diagnosis in the absence of sonography. It is currently believed that the risk of delayed diagnosis is greater than the small risk, if any, associated with undergoing an ultrasound scan. However, its use for non-medical purposes such as fetal "keepsake" videos and photos is discouraged.[21] Obstetric ultrasound is primarily used to:[citation needed] Date the pregnancy (gestational age) Confirm fetal viability Determine location of fetus, intrauterine vs ectopic Check the location of the placenta in relation to the cervix Check for the number of fetuses (multiple pregnancy) Check for major physical abnormalities. Assess fetal growth (for evidence of intrauterine growth restriction (IUGR)) Check for fetal movement and heartbeat. Determine the sex of the baby According to the European Committee of Medical Ultrasound Safety (ECMUS)[22] Ultrasonic examinations should only be performed by competent personnel who are trained and updated in safety matters. Ultrasound produces heating, pressure changes and mechanical disturbances in tissue. Diagnostic levels of ultrasound can produce temperature rises that are hazardous to sensitive organs and the embryo/fetus. Biological effects of non-thermal origin have been reported in animals but, to date, no such effects have been demonstrated in humans, except when a micro-bubble contrast agent is present.Nonetheless, care should be taken to use low power settings and avoid pulsed wave scanning of the fetal brain unless specifically indicated in high risk pregnancies.[citation needed] Figures released for the period 2005–2006 by the UK Government (Department of Health) show that non-obstetric ultrasound examinations constituted more than 65% of the total number of ultrasound scans conducted. Blood velocity can be measured in various blood vessels, such as middle cerebral artery or descending aorta, by relatively inexpensive and low risk ultrasound Doppler probes attached to portable monitors.[23] These provide non-invasive or transcutaneous (non-piercing) minimal invasive blood flow assessment. Common examples are transcranial Doppler, esophageal Doppler and supraternal Doppler.[citation needed] Neck ultrasound Most structures of the neck, including the thyroid and parathyroid glands,[24] lymph nodes, and salivary glands, are well-visualized by high-frequency ultrasound with exceptional anatomic detail. Ultrasound is the preferred imaging modality for thyroid tumors and lesions, and its use is important in the evaluation, preoperative planning, and postoperative surveillance of patients with thyroid cancer. Many other benign and malignant conditions in the head and neck can be differentiated, evaluated, and managed with the help of diagnostic ultrasound and ultrasound-guided procedures. [citation needed] In neonatology, transcranial Doppler can be used for basic assessment of intracerebral structural abnormalities, suspected hemorrhage, ventriculomegaly or hydrocephalus and anoxic insults (periventricular leukomalacia). It can be performed through the soft spots in the skull of a newborn infant (Fontanelle) until these completely close at about 1 year of age by which time they have formed a virtually impenetrable acoustic barrier to ultrasound.[25] The most common site for cranial ultrasound is the anterior fontanelle. The smaller the fontanelle, the more the image is compromised.[citation needed] Lung ultrasound has been found to be useful in diagnosing common neonatal respiratory diseases such as transient tachypnea of the newborn, respiratory distress syndrome, congenital pneumonia, meconium aspiration syndrome, and pneumothorax.[26] A neonatal lung ultrasound score, first described by Brat et al., has been found to highly correlate with oxygenation in the newborn.[27][28] In ophthalmology and optometry, there are two major forms of eye exam using ultrasound: A-scan ultrasound biometry, is commonly referred to as an A-scan (amplitude scan). A-mode provides data on the length of the eye, which is a major determinant in common sight disorders, especially for determining the power of an intraocular lens after cataract extraction.[citation needed] B-scan ultrasonography, or B-scan Brightness scan, is a B-mode scan that produces a cross-sectional view of the eye and the orbit. It is an essential tool in ophthalmology for diagnosing and managing a wide array of conditions affecting the posterior segment of the eye.It is not invasive and uses frequency 10-15 MHz. It is often used in conjunction with other imaging techniques (like OCT or fluorescein angiography) for a more comprehensive evaluation of ocular conditions. Ultrasound is used to assess the lungs in a variety of settings including critical care, emergency medicine, trauma surgery, as well as general medicine. This imaging modality is used at the bedside or examination table to evaluate a number of different lung abnormalities as well as to guide procedures such as thoracentesis, drainage of pleural fluid (effusion) needle aspiration, and placement of various types of catheters.[29] Although the use of ultrasound in the lung was initially neglected, it has been shown that ultrasonography is more sensitive than chest radiography in detecting many lung abnormalities such as pleural effusions, pulmonary edema, and various types of pneumonia. These may be difficult to see using standard radiography, which has been the mainstay of lung imaging for many years. However, ultrasonography is not yet in widespread use in the lung because of its complexity and the need for training and practice. Ultrasonic waves do not pass through air or lung tissue well, so most of the ultrasonic signal used in lung ultrasonography is generated by the chest wall. Ultrasonic waves do pass well through fluid and other soft tissues, so ultrasonography can be used to visualize the pleural space, the space between the lung and the chest wall, and the lung tissue immediately adjacent to the chest wall. Ultrasonography can be used to visualize the pleural space in the hemithorax (half of the chest) to which the patient is most vulnerable when lying in bed, because it is the most superior part of the chest when the patient is lying on their back. The pleural space is visualized as a hyperechoic (bright white) horizontal line if the ultrasound probe is applied perpendicularly to the skin. Artifacts: Lung ultrasound relies on artifacts, which could be confused with pathology if one is not trained to recognize them. Artifacts are not a hindrance in imaging. Air blocks the ultrasound beam and thus visualizing healthy lung consequently itself with this mode of imaging is not practical. Consequently, physicians and sonographers have learned to recognize patterns that ultrasound beams create when imaging healthy versus diseased lung tissue. Three commonly seen and utilized artifacts in lung ultrasound include lung sliding, A-lines, and B-lines.[31] § Lung Sliding: The presence of lung sliding, which indicates the shimmering of the pleural line that occurs with movement of the visceral and parietal pleura against one another with respiration (sometimes described as 'ants marching'), is the most important finding in normal aerated lung.[32] Lung sliding indicates both that the lung is present at the chest wall and that the lung is functioning.[31] § A-lines: When the ultrasound beam makes contact with the pleural line, it is reflected back creating a bright white horizontal line. The subsequent reverberation artifacts that appear as equally spaced horizontal lines deep to the pleura are A-lines. Ultimately, A-lines are a reflection of the ultrasound beam from the pleura with the space between A-lines corresponding to the distance between the parietal pleura and the skin surface.[31] A-lines indicate the presence of air, which means that these artifacts can be present in normal healthy lung and also in patients with pneumothorax.[32] § B-lines: B-lines are also reverberation artifacts. They are vertical, hyperechoic, well-defined lines that originate from the pleural line and extend to the bottom of the screen without fading in intensity. They are so-called "comet tail artifacts" and are named after the Greek letter beta because they are a variant of A-lines. B-lines are formed when there are areas of thickening in the interstitial space that are sufficient to reflect the ultrasound beam back to the probe but not sufficient to cause complete acoustic shadowing. B-lines are a sensitive but nonspecific finding that can be seen in many pulmonary diseases. It allows for improvement in diagnosis and management of critically ill patients, particularly when used in combination with echocardiography. The sonographic feature that is present in pulmonary edema is multiple B-lines. B-lines can occur in a healthy lung; however, the presence of 3 or more in the anterior or lateral lung regions is always abnormal. In pulmonary edema, B-lines indicate an increase in the amount of water contained in the lungs outside of the pulmonary vasculature. B-lines can also be present in a number of other conditions including pneumonia, pulmonary contusion, and lung infarction.[33] Additionally, it is important to note that there are multiple types of interactions between the pleural surface and the ultrasound wave that can generate artifacts with some similarity to B-lines but which do not have pathologic significance.[34] Pneumothorax: In clinical settings when pneumothorax is suspected, lung ultrasound can aid in diagnosis.[35] In pneumothorax, air is present between the two layers of pleura and lung sliding on ultrasound is therefore absent. The negative predictive value of lung sliding on ultrasound is reported as 99.2–100% – briefly, if lung sliding is present, a pneumothorax is effectively ruled out.[32] The absence of lung sliding, however, is not necessarily specific for pneumothorax as there are other conditions that also cause this finding including acute respiratory distress syndrome, lung consolidations, pleural adhesions, and pulmonary fibrosis.[32] Pleural effusion: Lung ultrasound is a cost-effective, safe, and non-invasive imaging method that can aid in the prompt visualization and diagnosis of pleural effusions in the critically ill patient.[36] Compared with supine chest radiography, lung ultrasonography is more sensitive and specific for the diagnosis of pleural effusions.[37] Lung ultrasound has been found to be more accurate than chest radiography in the assessment of pleural effusions in critically ill patients.[38] Ultrasound can be used to guide thoracentesis to drain the pleural fluid, which can be life-saving in the critically ill patient with a large pleural effusion causing cardiopulmonary compromise. Ultrasound can be used to mark the ideal location for chest tube insertion.[36] lung cancer staging: In pulmonology, endobronchial ultrasound (EBUS) probes are applied to standard flexible endoscopic probes and used by pulmonologists to allow for direct visualization of endobronchial lesions and lymph nodes prior to transbronchial needle aspiration. Among its many uses, EBUS aids in lung cancer staging by allowing for lymph node sampling without the need for major surgery.[37] COVID-19: Lung ultrasound has proved useful in the diagnosis of COVID-19 especially in cases where other investigations are not available.[38][39][40] Main article: Urinary tract ultrasound Urinary bladder (black butterfly-like shape) and hyperplastic prostate (BPH) visualized by medical sonographic technique Ultrasound is routinely used in urology to determine the amount of fluid retained in a patient's bladder. In a pelvic sonogram, images include the uterus and ovaries for urinary bladder in females; in males, sonogram will provide information about the bladder, prostate, or testicles (for example in urgent distinguish epididymitis from testicular torsion). In young males, it is used to distinguish more benign testicular masses (cocoele or hydrocele from testicular cancer, which is curable but must be treated to preserve fertility. There are two methods of performing pelvic sonograms (externally or internally. The internal pelvic sonogram is performed either transvaginally (in a woman) or transrectally (in a man). Sonographic evaluation of the prostate gland is most accurate when performed transrectally, because of the superior resolution of the prostate that can be achieved with this approach. Transrectal ultrasonography is also used to guide needle biopsies of the prostate and to stage prostate cancer. Musculoskeletal ultrasonography is used to evaluate tendons, muscles, nerves, ligaments, soft tissue masses, and bone surfaces.[44] It is helpful in diagnosing ligament sprains, muscles strains and joint pathology. It is an alternative or supplement to x-ray imaging in detecting fractures of the wrist, elbow and shoulder for patients up to 12 years;45] (Fracture sonography). Quantitative ultrasound is an adjunct musculoskeletal test for myopathic disease in children;[46][47] estimates of lean body mass in adults;[48] proxy measures of muscle or joint injections, as in ultrasound-guided hip joint injection.[citation needed] Main article: Renal ultrasonography In nephrology, ultrasonography of the kidneys is essential in the diagnosis and management of kidney-related diseases. The kidneys are easily examined and most pathological changes are distinguishable with ultrasound. It is also possible, versatile, relatively economic, and fast and for decision-making in patient with renal symptoms and for guidance in renal intervention.[52] Using B-mode imaging, assessment of renal anatomy is easily performed, and US is often used as image guidance for renal interventions. Further, more advanced applications renal US have been introduced with contrast-enhanced ultrasound (CEUS), elastography and fusion imaging. However, renal US has not been widely adopted in clinical practice, in part because of a lack of standardization and training. Ultrasound imaging studies are often obtained during the evaluation process of Fatty liver disease. Ultrasonography reveals a "bright" liver with increased echogenicity. Pocket-sized ultrasound devices might be used as point-of-care screening tools to diagnose liver steatosis.[14][15] Main articles: Gynecologic ultrasonography and Obstetric ultrasonography Orthogonal planes of a three-dimensional sonographic volume with transverse and coronal measurements for estimating fetal cranial volume[16][17] Gynecologic ultrasonography examines female pelvic organs (specifically the uterus, ovaries, and fallopian tubes) as well as the bladder, adnexa, and pouch of Douglas. It uses transducers designed for approaches through the lower abdominal wall, curvilinear and sector, and specialty transducers such as transvaginal ultrasound.[18] Obstetrical sonography was originally developed in the late 1950s and 1960s by Sir Ian Donald[19][20] and is commonly used during pregnancy to check the development and presentation of the fetus. It can be used to identify many conditions that could be potentially harmful to the mother and/or baby possibly remaining undiagnosed or with delayed diagnosis in the absence of sonography. It is currently believed that the risk of delayed diagnosis is greater than the small risk, if any, associated with undergoing an ultrasound scan. However, its use for non-medical purposes such as fetal "keepsake" videos and photos is discouraged.[21] Obstetric ultrasound is primarily used to:[citation needed] Date the pregnancy (gestational age) Confirm fetal viability Determine location of fetus, intrauterine vs ectopic Check the location of the placenta in relation to the cervix Check for the number of fetuses (multiple pregnancy) Check for major physical abnormalities. Assess fetal growth (for evidence of intrauterine growth restriction (IUGR)) Check for fetal movement and heartbeat. Determine the sex of the baby According to the European Committee of Medical Ultrasound Safety (ECMUS)[22] Ultrasonic examinations should only be performed by competent personnel who are trained and updated in safety matters. Ultrasound produces heating, pressure changes and mechanical disturbances in tissue. Diagnostic levels of ultrasound can produce temperature rises that are hazardous to sensitive organs and the embryo/fetus. Biological effects of non-thermal origin have been reported in animals but, to date, no such effects have been demonstrated in humans, except when a micro-bubble contrast agent is present.Nonetheless, care should be taken to use low power settings and avoid pulsed wave scanning of the fetal brain unless specifically indicated in high risk pregnancies.[citation needed] Figures released for the period 2005–2006 by the UK Government (Department of Health) show that non-obstetric ultrasound examinations constituted more than 65% of the total number of ultrasound scans conducted. Blood velocity can be measured in various blood vessels, such as middle cerebral artery or descending aorta, by relatively inexpensive and low risk ultrasound Doppler probes attached to portable monitors.[23] These provide non-invasive or transcutaneous (non-piercing) minimal invasive blood flow assessment. Common examples are transcranial Doppler, esophageal Doppler and supraternal Doppler.[citation needed] Neck ultrasound Most structures of the neck, including the thyroid and parathyroid glands,[24] lymph nodes, and salivary glands, are well-visualized by high-frequency ultrasound with exceptional anatomic detail. Ultrasound is the preferred imaging modality for thyroid tumors and lesions, and its use is important in the evaluation, preoperative planning, and postoperative surveillance of patients with thyroid cancer. Many other benign and malignant conditions in the head and neck can be differentiated, evaluated, and managed with the help of diagnostic ultrasound and ultrasound-guided procedures. [citation needed] In neonatology, transcranial Doppler can be used for basic assessment of intracerebral structural abnormalities, suspected hemorrhage, ventriculomegaly or hydrocephalus and anoxic insults (periventricular leukomalacia). It can be performed through the soft spots in the skull of a newborn infant (Fontanelle) until these completely close at about 1 year of age by which time they have formed a virtually impenetrable acoustic barrier to ultrasound.[25] The most common site for cranial ultrasound is the anterior fontanelle. The smaller the fontanelle, the more the image is compromised.[citation needed] Lung ultrasound has been found to be useful in diagnosing common neonatal respiratory diseases such as transient tachypnea of the newborn, respiratory distress syndrome, congenital pneumonia, meconium aspiration syndrome, and pneumothorax.[26] A neonatal lung ultrasound score, first described by Brat et al., has been found to highly correlate with oxygenation in the newborn.[27][28] In ophthalmology and optometry, there are two major forms of eye exam using ultrasound: A-scan


Baca Lebih Lanjut 1. Terinspirasi dari Kehidupan Nyata Crayon Shinchan diciptakan oleh Yoshito Usui dan terinspirasi dari kehidupan... Baca Lebih Lanjut Xiaolongbao Ala Rumah: Resep Sederhana untuk Dumpling Khas Shanghai Xiaolongbao adalah dumpling khas Shanghai yang... Baca Lebih Lanjut breastcancertalk – Greenland, pulau raksasa yang terletak di antara Samudra Atlantik dan Samudra Arktik, telah... Baca Lebih Lanjut breastcancertalk.net – Kepala Kepolisian Resor Metropolitan Jakarta Barat, Komisaris Besar Polisi (Kombes) Donald, baru-baru ini... Baca Lebih Lanjut Ayam Kunyit Panggang adalah pilihan hidangan sehat yang tidak hanya menggugah selera tetapi juga kaya... Baca Lebih Lanjut Alpukat, dengan tekstur lembut dan rasa yang kaya, tidak hanya lezat tetapi juga penuh dengan... Baca Lebih Lanjut To make science and data easier for broad audiences to interpret, CDC is translating science into practical, easy to understand policy by clarifying and presenting scientific language so that anyone can understand it and standardizing guideline development across the agency. This article is about imaging the human body. For imaging of animals in research, see Preclinical imaging. For therapeutic use of ultrasound, see Focused ultrasound. "Echography" and "Echograph" redirect here. Not to be confused with Echo sounding. Medical intervention Medical ultrasoundSonographer carrying out echocardiography on a childICD-10-PCSB74ICD-9-CM88.7MeSHD014463OPS-301 code3-03. ..3-05[edit on Wikidata] Medical ultrasound includes diagnostic techniques (mainly imaging) using ultrasound, as well as therapeutic applications of ultrasound. In diagnosis, it is used to create an image of internal body structures such as tendons, muscles, joints, blood vessels, and internal organs, to measure some characteristics (e.g., distances and velocities) or to generate an informative audible sound. The usage of ultrasound to produce visual images for medicine is called medical ultrasonography or simply sonography, or echography. The practice of examining pregnant women using ultrasound is called obstetric ultrasonography, and was an early development of clinical ultrasonography. The machine used is called an ultrasound machine, a sonograph or an echograph. The visual image formed using this technique is called an ultrasonogram, a sonogram or an echogram. Ultrasound of carotid artery Ultrasound is composed of sound waves with frequencies greater than 20,000 Hz, which is the approximate upper threshold of human hearing.[1] Ultrasonic images, also known as sonograms, are created by sending pulses of ultrasound into tissue using a probe. The ultrasound pulses echo off tissues with different reflection properties and are returned to the probe which records and displays them as an image. A general-purpose ultrasonic transducer may be used for most imaging purposes but some situations may require the use of a specialized transducer. Most ultrasound examination is done using a transducer on the surface of the body, but improved visualization is often possible if a transducer can be placed inside the body. For this purpose, special-use transducers, including transvaginal, endorectal, and transesophageal transducers are commonly employed. At the extreme, very small transducers can be mounted on small diameter catheters and placed within blood vessels to image the walls and disease of those vessels. The imaging mode refers to probe and machine settings that result in specific dimensions of the ultrasound image.[2] Several modes of ultrasound are used in medical imaging.[3][4] A-mode: Amplitude mode refers to the mode in which the amplitude of the transducer voltage is recorded as a function of two-way travel time of an ultrasound pulse. A single pulse is transmitted through the body and scatters back to the same transducer element. The voltage amplitudes recorded correlate linearly to acoustic pressure amplitudes. A-mode is one-dimensional. B-mode: In brightness mode, an array of transducer elements scans a plane through the body resulting in a two-dimensional image. Each pixel value of the image correlates to voltage amplitude registered from the backscattered signal. The dimensions of B-mode images are voltage as a function of angle and two-way time. M-mode: In motion mode, A-mode pulses are emitted in succession. The backscattered signal is converted to lines of bright pixels, whose brightness linearly correlates to backscattered voltage amplitudes. Each next line is plotted adjacent to the previous, resulting in an image that looks like a B-mode image. The M-mode image dimensions are however voltage as a function of two-way time and recording time. This mode is an ultrasound analogy to streak video recording in high-speed photography. As moving tissue transitions produce backscattering, this can be used to determine the displacement of specific organ structures, most commonly the heart. Most machines convert two-way time to imaging depth using as assumed speed of sound of 1540 m/s. As the actual speed of sound varies greatly in different tissue types, an ultrasound image is therefore not a true tomographic representation of the body.[5] Three-dimensional imaging is done by combining B-mode images, using dedicated rotating or stationary probes. This has also been referred to as C-mode.[4] An imaging technique refers to a method of signal generation and processing that results in a specific application. Most imaging techniques are operating in B-mode. Doppler sonography: This imaging technique makes use of the Doppler effect in detection and measuring moving targets, typically blood. Harmonic imaging: backscattered signal from tissue is filtered to comprise only frequency content of at least twice the centre frequency of the transmitted ultrasound. Harmonic imaging used for perfusion detection when using ultrasound contrast agents and for the detection of tissue harmonics. Common pulse schemes for the creation of harmonic response without the need of real-time Fourier analysis are pulse inversion and power modulation.[6] B-flow image of venous reflux. Video is available. B-flow is an imaging technique that digitally highlights moving reflectors (mainly red blood cells) while suppressing the signals from the surrounding stationary tissue. It aims to visualize flowing blood and surrounding stationary tissues simultaneously.[7] It is thus an alternative or complement to Doppler ultrasonography in visualizing blood flow.[8] Therapeutic ultrasound aimed at a specific tumor or calculus is not an imaging mode. However, for positioning a treatment probe to focus on a specific region of interest, A-mode and B-mode are typically used, often during treatment.[9] This section does not cite any sources. Please help improve this section by adding citations to reliable sources. Unsourced material may be challenged and removed. (May 2025) (Learn how and when to remove this message) Compared to other medical imaging modalities, ultrasound has several advantages. It provides images in real-time, is portable, and can consequently be brought to the bedside. It is substantially lower in cost than other imaging strategies. Drawbacks include various limits on its field of view, the need for patient cooperation, dependence on patient physique, difficulty imaging structures obscured by bone, air or gases,[note 1] and the necessity of a skilled operator, usually with professional training. Urinary bladder (black butterfly-like shape) and hyperplastic prostate (BPH) visualized by medical ultrasound Sonography (ultrasonography) is widely used in medicine. It is possible to perform both diagnosis and therapeutic procedures, using ultrasound to guide interventional procedures such as biopsies or to drain collections of fluid, which can be both diagnostic and therapeutic. Sonographers are medical professionals who perform scans which are traditionally interpreted by radiologists, physicians who specialize in the application and interpretation of medical imaging modalities, or by cardiologists in the case of cardiac ultrasonography (echocardiography). Sonography is effective for imaging soft tissues of the body.[10] Superficial structures such as muscle, tendon, testis, breast, thyroid and parathyroid glands, and the neonatal brain are imaged at higher frequencies (7–18 MHz), which provide better linear (axial) and horizontal (lateral) resolution. Deeper structures such as liver and kidney are imaged at lower frequencies (1–6 MHz) with lower axial and lateral resolution as a price of deeper tissue penetration.[citation needed] In anesthesiology, ultrasound is commonly used to guide the plac