



VITAL HEALTH

GUIDELINES ON THE COMMON USE OF ULTRASOUND

Disclaimer: These “guidelines” are to be used as a resource for reference and understanding some of the more common uses of diagnostic ultrasound. The information within this document has been gathered from several online resources as noted after each item. The enclosed “guidelines” are for informational purposes only and do not constitute medical advice; the “guidelines” are not intended to be a substitute for professional medical advice, diagnosis, or treatment. Always seek the advice of a physician or other qualified health provider with any questions you may have regarding a medical condition. Never disregard professional medical advice or delay in seeking it because of something you have read within these “guidelines”.

GUIDELINES ON THE COMMON USE OF ULTRASOUND

Ultrasound: “The diagnostic use of ultrasound and especially a noninvasive technique, involving the formation of a two-dimensional image used for the examination and measurement of internal body structures, and the detection of bodily abnormalities, also called echography, sonography, ultrasonography”. (Merriam Webster- Medical Dictionary)

Medicine uses many imaging modalities and technologies to evaluate disease. All of these technologies have many strengths and limitations. Blood analysis, X-Ray, CT-Scans, MRI, EKG, Thermography, Pet Scans, and physical examinations have the need for cross-reference of data. Ultrasound can and does play that role. Ultrasound can evaluate size, measurements, thickness, volume, tissue density, calcifications, output, motion, valves, obstructions, performance and more, of most internal organs within the body. **But, most of all, it is cost effective, reproducible, serial, and portable, all while being non-invasive.** (WJ Childs, Sonographer)

ECHOCARDIOGRAM: (Over 100 Cardiac Variations) Hypertension, Chest Pain, Diabetes, Mellitus, Arrhythmia, Heart Murmur, Mitral Valve Prolapse, Aortic Sclerosis, Cardiomegaly, Myocardial Infarction (MI) / Previous MI, Congestive Heart Failure **PAGE-3**

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ECHOCARDIOGRAM

“An Echocardiogram is the application of ultrasound for imaging of the heart. Standard ultrasound techniques are used to image two-dimensional slices of the heart. Apart from 2-D, conventional echocardiography also employs M-mode and Doppler. Color Doppler is used to image flowing blood. Continuous wave Doppler and Pulsed wave Doppler are used to measure the velocity of flowing blood.”
... (Echocardiology.org)

HYPERTENSION:

Hypertension is high blood pressure. Blood pressure is the force of blood pushing against the walls of arteries as it flows through them. Arteries are the blood vessels that carry oxygenated blood from the heart to the body's tissues. Hypertension is a major health problem, especially because it has no symptoms. Many people have hypertension without knowing it. In the United States, about 50 million people age six and older have high blood pressure. Hypertension is more common in men than women and in people over the age of 65 than in younger persons. More than half of all Americans over the age of 65 have hypertension. It also is more common in African-Americans. Hypertension is serious because people with the condition have a higher risk for heart disease and other medical problems than people with normal blood pressure. (Gale Encyclopedia of Medicine)

CHEST PAIN:

A physical complaint that requires immediate diagnosis and evaluation. Chest pain may be symptomatic of cardiac disease, such as angina pectoris, myocardial infarction, aortic stenosis, or pericarditis; or of pulmonary disease, such as pleurisy, pneumonia, or pulmonary embolism or infarction. Specific cardiovascular conditions associated with chest pain are myocardial infarction, angina pectoris, pericarditis, and a dissecting aneurysm of the thoracic aorta. Musculoskeletal conditions include rib fractures, swelling of the rib cartilage, and muscle strain. GI conditions associated with chest pain include esophagitis, peptic ulcers, hiatal hernia, gastritis, cholecystitis, and pancreatitis. (Mosby's Medical Dictionary)

DIABETES MELLITUS:

Diabetes mellitus is a chronic disease that causes serious health complications including renal (kidney) failure, heart disease, stroke, and blindness. Approximately 17 million Americans have diabetes. Unfortunately, as many as one-half are unaware they have it. (Gale Encyclopedia of Medicine)

ARRHYTHMIA:

An abnormal rhythm or irregularity of the heartbeat. The heartbeat may either be too fast (tachycardia) or too slow (bradycardia). Arrhythmias may cause symptoms such as palpitation or light-headedness, but many have more serious consequences, including sudden death. (Gale Encyclopedia of Medicine)

HEART MURMUR:

Heart murmurs are sounds other than the normal heart sounds emanating from the heart region. They are often heard as blowing or hissing sounds as blood leaks back through diseased and malfunctioning

valves or as blood is pushed through narrowed or stenotic valve orifices. An auscultatory sound of cardiac or vascular origin, usually caused by an abnormal flow of blood in the heart due to structural defects of the valves or septum. Murmurs may be benign or pathological. (*Miller-Keane Encyclopedia and Dictionary of Medicine, Nursing, and Allied Health*), (*Segun's Medical Dictionary*)

MITRAL VALVE PROLAPSE:

Mitral valve prolapse (MVP) is a ballooning of the support structures of the mitral heart valve into the left upper collection chamber of the heart. Most persons do not have symptoms. Those that do may experience sharp, left- sided chest pain. Some complain of fatigue, or a pounding feeling in the chest. Others can have an irregular heart beat and even pass out. Some persons may experience difficulty breathing, ankle swelling and fluid in the lungs. Other symptoms may include anxiety, headaches, morning tiredness and constantly cold hands and feet. Death from this condition is rare. (*Gale Encyclopedia of Medicine*)

AORTIC SCLEROSIS:

Aortic sclerosis is defined as the thickening of heart valves. Typically it is diagnosed through an echocardiograph or suspected when a doctor can hear a slight heart murmur when listening to a heartbeat with a stethoscope. Sclerosis is described as the leaflet thickening and increased calcification in the arterial valves of the heart. It is most prevalent among older adult patients and adult obese patients and is considered the start or may be partnered with aortic stenosis. Aortic sclerosis can lead to angina, heart failure, and stroke in those who have been diagnosed.

(www.differencebetween.net: "Difference Between Aortic Sclerosis and Aortic Stenosis")

CARDIOMEGALY:

Enlargement of the heart. This is caused by an increase in the bulk of the heart muscle (hypertrophy) or by a ballooning out of the chambers of the heart (dilatation). (*Collins Dictionary of Medicine*)

MYOCARDIAL INFARCTION (MI) / PREVIOUS MI:

Commonly known as a Heart Attack, it is an infarction of a segment of heart muscle, usually due to occlusion of a coronary artery. MI is the most common cause of death in the U.S. Each year about 800,000 people sustain first heart attacks, with a mortality rate of 30%, and 450,000 people sustain recurrent heart attacks, with a mortality rate of 50%. The most common cause of MI is thrombosis of an atherosclerotic coronary artery. Infarction of a segment of myocardium with a borderline blood supply can also occur because of a sudden decrease in coronary flow (as in shock and cardiac failure), a sudden increase in oxygen demand (as in strenuous exercise), or hypoxemia.

(*Farlex Partner Medical Dictionary*)

CONGESTIVE HEART FAILURE:

(CHF) that which occurs as a result of impaired pumping capability of the heart that is not keeping up with the metabolic needs of body tissues and organs. It is associated with abnormal retention of water and sodium. It ranges from mild congestion with few symptoms to life-threatening fluid overload and heart failure. Congestive heart failure results in an inadequate supply of blood and oxygen

to the body's cells. The decreased cardiac output causes an increase in the blood volume within the vascular system. Congestion within the blood vessels interferes with the movement of body fluids in and out of the various fluid compartments, so that fluid accumulates in the tissue spaces, causing edema. (*Miller-Keane Encyclopedia and Dictionary of Medicine, Nursing, and Allied Health*)

ASHD:

Arteriosclerotic Heart Disease (AHSD) is a thickening and hardening of the walls of the coronary arteries. (*Mosby's Medical Dictionary*)

COPD:

Chronic Obstructive Pulmonary Disease (COPD), is a progressive disease that makes it hard to breathe. "Progressive" means the disease gets worse over time. All COPD patients are at risk for heart problems—about 30% of people with COPD die of cardiovascular disease. And those who have exacerbations are more likely to have heart problems following a flare-up. It is estimated that there's one shared risk factor for both COPD and cardiac events: smoking. Another likely cause is the chronic inflammation that occurs with COPD, which damages blood vessels. This inflammation becomes acute during a flare-up. (*National Heart, Lung, and Blood Institute*) (*Health.com "How COPD Can Harm Your Heart"*)

SHORTNESS OF BREATH:

Shortness of breath, or dyspnea, is a feeling of difficult or labored breathing that is out of proportion to the patient's level of physical activity. It is a symptom of a variety of different diseases or disorders and may be either acute or chronic. Acute dyspnea can be caused by disturbances of the heart rhythm, failure of the left ventricle, mitral valve (a heart valve) dysfunction, or an embolus (a clump of tissue, fat, or gas) that is blocking the pulmonary circulation. Most pulmonary emboli (blood clots) originate in the deep veins of the lower legs and eventually migrate to the pulmonary artery. (*Gale Encyclopedia of Medicine*)

PEDAL EDEMA:

The accumulation of fluids in the feet most prominently on the dorsum; PE is characteristic of CHF (Congestive Heart Failure). (*McGraw-Hill Precise Dictionary of Modern Medicine*)

PERICARDIAL EFFUSION:

Increased fluid within the pericardial sac; can cause circulatory compromise by compression of the heart; most often caused by inflammation, infection, malignancy, and uremia. (*Farlex Partner Medical Dictionary*)

INCREASED ALCOHOL INTAKE - HEART SIZE / LV/EF:

Heavy alcohol intake decreases Left Ventricular Ejection Fraction (LV/EF), increases blood pressure, and acutely inhibits fibrinolysis. Alcohol use has also been shown to have numerous effects on the cardiovascular system other than heart failure. It has been associated with arrhythmia (atrial fibrillation,

atrial flutter, other supraventricular arrhythmia, premature ventricular contractions), hypertension, stroke, and sudden death. In addition, the literature reports alcohol withdrawal being associated with takotsubo, or stress-induced, cardiomyopathy. (*theheart.org "Alcoholic Myopathy"*)

PULMONARY HYPERTENSION:

Pulmonary hypertension (PHT) is high blood pressure in the heart-to-lung system that delivers fresh (oxygenated) blood to the heart while returning used (oxygen-depleted) blood back to the lungs. Similar to how systemic high blood pressure can cause the heart to work harder to deliver blood to the body, pulmonary hypertension can occur when the arteries in the lungs narrow and thicken, slowing the flow of blood through the pulmonary arteries to the lungs. As a result, the pressure in your arteries raises as your heart works harder to try to force the blood through. Heart failure occurs when the heart becomes too weak to pump enough blood to the lungs. (*American Heart Association*)

LEFT VENTRICULAR HYPERTROPHY (LVH):

Left ventricular hypertrophy is enlargement and thickening (hypertrophy) of the walls of your heart's main pumping chamber (left ventricle). Left ventricular hypertrophy can develop in response to some factor, such as high blood pressure or heart condition, that causes the left ventricle to work harder. As the workload increases, the muscle tissue in the chamber wall thickens and sometimes the size of the chamber itself also increases. The enlarged heart muscle loses elasticity and eventually may fail to pump with as much force as needed. Left ventricular hypertrophy is more common in people who have uncontrolled high blood pressure. But no matter what your blood pressure is, developing left ventricular hypertrophy puts you at higher risk for a heart attack and stroke. (*mayoclinic.org*)

LEFT ATRIAL ENLARGEMENT (LAE):

Clinically speaking, left atrial enlargement (LAE) simply refers to a situation when the left atrium of the heart is larger or more dilated than normal. It is one form of cardiomegaly or enlarged heart which may, over time, lead to congestive heart failure and cardiac arrhythmias. Though there are a number of conditions, both congenital and acquired, which cause left atrial enlargement (LAE), a study by the American College of Cardiology found that the two most statistically significant causes are obesity and high blood pressure. (*Reference.com "What are some possible causes of left atrial enlargement?"*)

MITRAL REGURGITATION:

Mitral regurgitation is leakage of blood backward through the mitral valve each time the left ventricle contracts. A leaking mitral valve allows blood to flow in two directions during the contraction. Some blood flows from the ventricle through the aortic valve — as it should — and some blood flows back into the atrium. Leakage can increase blood volume and pressure in the area. The increased blood pressure in the left atrium can increase pressure in the veins leading from the lungs to the heart (pulmonary veins). If regurgitation is severe, increased pressure may result in congestion (or fluid build-up) in the lungs. If regurgitation is severe enough, the heart may enlarge to maintain forward flow of blood, causing heart failure (when the heart does not pump enough blood to the body). This may produce symptoms ranging from shortness of breath during exertion, coughing, congestion around the heart and lungs, swelling of the legs and feet. (*The American Heart Association*)

TRICUSPID REGURGITATION:

Tricuspid regurgitation is leakage of blood backwards through the tricuspid valve each time the right ventricle contracts. As the right ventricle contracts to pump blood forward to the lungs, some blood leaks backward into the right atrium, increasing the volume of blood in the atrium. As a result, the right atrium can enlarge, which can change the pressure in the nearby chambers and blood vessels. Tricuspid regurgitation often results from an enlarged lower heart chamber (the ventricle). Other diseases may also affect the tricuspid regurgitation, most commonly infective endocarditis (valve infection), and less commonly, Marfan syndrome, rheumatoid arthritis, rheumatic fever, injury, carcinoid tumors, and myxomatous degeneration. An important risk for tricuspid regurgitation is the use of the diet substance called “Fen-Phen” (phentermine and fenfluramine) or dexfenfluramine. Symptoms may include active pulsing in the neck veins, enlarged liver, fatigue or weakness, abdominal swelling, swelling in the legs, ankles, and/or feet. *(The American Heart Association)*

AORTIC INSUFFICIENCY:

Aortic insufficiency is a heart valve disease in which the aortic valve does not close tightly. This allows blood to flow from the aorta (the largest blood vessel) into the left ventricle (a chamber of the heart). This makes the heart have to work harder to force out enough blood. The left lower chamber of the heart widens (dilates) and the heart beats very strongly (bounding pulse). Over time, the heart becomes less able to supply enough blood to the body. Aortic insufficiency is most common in men between the ages of 30 and 60. The condition often has no symptoms for many years. Symptoms may come on slowly or suddenly. They may include: bounding pulse, chest pain similar to angina (rare) fainting, fatigue, palpitations (sensation of the heart beating), shortness of breath with activity or when lying down, waking up short of breath some time after falling asleep, swelling of the feet, legs, or abdomen Uneven, rapid, racing, pounding, or fluttering pulse weakness that is more likely to occur with activity.

(NIH: U.S. National Library of Medicine - Medical Encyclopedia)

PULMONIC INSUFFICIENCY:

The pulmonary valve directs blood from the right ventricle into the pulmonary artery (the large vessel that carries oxygen-poor blood to the lungs). If the pulmonary valve is leaky (insufficient), some blood may flow back into the ventricle, instead of out to the lungs. Because the insufficient pulmonary valve allows blood to backflow, the right ventricle’s workload increases. The right ventricle, and possibly the right atrium, may begin to dilate. This can result in an abnormal heartbeat (arrhythmia), fatigue, shortness of breath, heavy or rapid breathing, especially during exercise. *(UWhealth.org “Pulmonary Valve Insufficiency”)*

ABDOMINAL ULTRASOUND

Abdominal ultrasound is a type of imaging test. It is used to look at organs in the abdomen, including the liver, gallbladder, spleen, pancreas, and kidneys. The blood vessels that lead to some of these organs, such as the inferior vena cava and aorta, can also be examined with ultrasound. (NIH U.S. National Library of Medicine, Medical Encyclopedia)

KIDNEY STONES:

Imaging is used to provide your doctor with valuable information about the kidney or bladder stones, such as location, size and effect on the function of the kidneys. The exam use sound waves to provide pictures of the kidneys and bladder and can identify blockage of urinary flow and help identify stones. *(Radiologyinfo.org)*

HYDRONEPHROSIS:

Hydronephrosis is the swelling of a kidney due to a build-up of urine. It happens when urine cannot drain out from the kidney to the bladder from a blockage or obstruction. Hydronephrosis can occur in one or both kidneys. Hydronephrosis occurs when there is either a blockage of the outflow of urine, or reverse flow of urine already in the bladder (called reflux) that can cause the renal pelvis to become enlarged. Hydronephrosis may or may not cause symptoms. The main symptom is pain, either in the side and back (known as flank pain), abdomen or groin. Other symptoms can include pain during urination, other problems with urination (increased urge or frequency, incomplete urination, incontinence), nausea and fever. These symptoms depend on the cause and severity of urinary blockage. Hydronephrosis is usually caused by another underlying illness or risk factor. Causes of hydronephrosis include, but are not limited to, the following illnesses or risk factors, kidney stone, congenital blockage (a defect that is present at birth), blood clot, scarring of tissue (from injury or previous surgery), tumor or cancer (examples include bladder, cervical, colon, or prostate), enlarged prostate (noncancerous), pregnancy, urinary tract infection (or other diseases that cause inflammation of the urinary tract).*(kidney.org)*

GALLSTONES:

Your gallbladder is a pear-shaped organ under your liver. It stores bile, a fluid made by your liver to digest fat. As your stomach and intestines digest food, your gallbladder releases bile through a tube called the common bile duct. The duct connects your gallbladder and liver to your small intestine. Your gallbladder is most likely to give you trouble if something blocks the flow of bile through the bile ducts. That is usually a gallstone. Gallstones form when substances in bile harden. Gallstone attacks usually happen after you eat. Signs of a gallstone attack may include nausea, vomiting, or pain in the abdomen, back, or just under the right arm. *(NIH U.S. National Library of Medicine, Medical Encyclopedia)*

POLYCYSTIC RENALS:

Polycystic kidney disease (also called PKD) causes numerous cysts to grow in the kidneys. These cysts are filled with fluid. If too many cysts grow or if they get too big, the kidneys can become damaged. PKD can affect other organs besides the kidney. People with PKD may have cysts in their

liver, pancreas, spleen, ovaries, and large bowel. Cysts in these organs usually do not cause serious problems, but can in some people. PKD can also affect the brain or heart. If PKD affects the brain, it can cause an aneurysm. If PKD affects the heart, the valves can become floppy, resulting in a heart murmur in some patients. Most people do not develop symptoms until they are 30 to 40 years old. The first noticeable signs and symptoms may include: back or side pain, an increase in the size of the abdomen, blood in the urine, frequent bladder or kidney infections, high blood pressure (high blood pressure is the most common sign of PKD), fluttering or pounding in the chest. (*kidney.org*)

BACK PAIN:

Can be a symptom of kidney stones, hydronephrosis, gallstones, polycystic kidneys, abdominal aortic aneurysms.

INCREASED LFT'S - LIVER:

Elevated liver enzymes may indicate inflammation or damage to cells in the liver. Inflamed or injured liver cells leak higher than normal amounts of certain chemicals, including liver enzymes, into the bloodstream, which can result in elevated liver enzymes on blood tests. Ultrasound is helpful to detect structural abnormalities causing inflammation. (*mayoclinic.org*)

PANCREATITIS:

Inflammation of the pancreas. This may be a sharp, severe illness (acute pancreatitis) or a recurrent disorder (chronic pancreatitis). Acute pancreatitis is often due to blockage of the outflow from the gland by a gallstone stuck in the common outlet of the pancreatic and bile ducts, with digestion of the pancreatic tissue by its own enzymes. There is sudden severe pain in the abdomen, nausea, vomiting and shock. Chronic pancreatitis is usually related to heavy alcohol consumption. Scan shows that the pancreas is full of cysts, many of them filled with chalky stones. Attacks are short, severe and tend to recur. Extensive damage to the pancreas may result and this can cause diabetes. (*Collins Dictionary of Medicine*)

AAA:

Aneurysms can develop anywhere along the aorta, but when they occur in the upper part of the aorta, in the chest, they are called thoracic aortic aneurysms. More commonly, aneurysms form in the lower part of your aorta and are called abdominal aortic aneurysms. These aneurysms may also be referred to as AAA. Most aortic aneurysms occur in the part of your aorta that's in your abdomen. Although the exact cause of abdominal aortic aneurysms is unknown, a number of factors may play a role, including, tobacco use, hardening of the arteries (atherosclerosis), high blood pressure, blood vessel diseases in the aorta, trauma, heredity. (*mayoclinic.org* - "Abdominal Aortic Aneurysm")

SPLENOMEGALY:

Enlargement of the Spleen. (*Farlex Partner Medical Dictionary*)

HEMATURIA:

The medical name for blood in your urine is hematuria. Other more serious problems can also cause you to have blood in your urine. Some of these problems include: kidney or bladder cancer, irritation or swelling in your kidneys, prostate (in men) or another part of your urinary tract, polycystic kidney disease, blood clots or diseases that cause problems with blood clotting, sickle cell disease. (*kidneyfund.org*)

ASCITES:

A gastroenterological term for an accumulation of fluid in the peritoneal cavity. The medical condition is also known as peritoneal cavity fluid, peritoneal fluid excess, hydroperitoneum or more archaically as abdominal dropsy. Although most commonly due to cirrhosis and severe liver disease, its presence can portend other significant medical problems. Mild ascites is hard to notice, but severe ascites leads to abdominal distension. Patients with ascites generally will complain of progressive abdominal heaviness and pressure as well as shortness of breath due to mechanical impingement on the diaphragm. Other signs of ascites may be present due to its underlying etiology. For instance, in portal hypertension (perhaps due to cirrhosis or fibrosis of the liver) patients may also complain of leg swelling, bruising, gynecomastia, hematemesis, or mental changes due to encephalopathy. Those with ascites due to cancer (peritoneal carcinomatosis) may complain of chronic fatigue or weight loss. Those with ascites due to heart failure may also complain of shortness of breath as well as wheezing and exercise intolerance.

(*Surgeryencyclopedia.com*)

CIRRHOSIS:

Cirrhosis refers to the replacement of normal liver tissue with non-living scar tissue. It is always related to other liver diseases. The liver is the second largest organ in your body and is located under your rib cage on the right side. It weighs about three pounds and is shaped like a football that is flat on one side. There are usually no symptoms of cirrhosis in its early stage. Over time, cirrhosis may cause symptoms and complications: Symptoms, loss of appetite, tiredness, nausea, weight loss, abdominal pain, spider-like blood vessels, severe itching. (*liverfoundation.org*)

GALLBLADDER POLYPS:

Lesions that project from the gallbladder wall into the gallbladder interior are called gallbladder polyps (GPs). In the majority of patients, diagnosis is an incidental finding of a routine abdominal ultrasound. Even though most of the gallbladder polyps are benign in nature, malignant polyps are present in some cases, and early detection and appropriate early measure is important for curative treatment and long-term survival. The primary goal in the management of gallbladder polyps is to prevent the development of gallbladder carcinoma. (*North American Journal of Medical Sciences*)

CAROTID VASCULAR ULTRASOUND

Carotid ultrasound is done to detect plaque buildup in one or both of the carotid arteries in the neck and to see whether the buildup is narrowing your carotid arteries and blocking blood flow to the brain. Test results will help your doctor plan treatment to remove the plaque and help prevent a stroke. (NIH: U.S. National Library of Medicine - Medical Encyclopedia)

CAROTID STENOSIS:

Carotid artery stenosis is a narrowing of the large arteries on either side of the neck that carry blood to the head, face and brain. This narrowing is usually the result of a build-up of plaque within the arteries, a condition called atherosclerosis. Stenosis can worsen over time to completely block the artery which may lead to stroke. Risk factors for carotid artery stenosis include age, smoking, high blood pressure, diabetes, obesity and an inactive lifestyle. Some people with carotid artery stenosis may experience dizziness, fainting and blurred vision which may be signs of the brain not receiving enough blood. *(RadiologyInfo.org)*

HYPERTENSION:

Hypertension is high blood pressure. Blood pressure is the force of blood pushing against the walls of arteries as it flows through them. Arteries are the blood vessels that carry oxygenated blood from the heart to the body's tissues. Hypertension is a major health problem, especially because it has no symptoms. Many people have hypertension without knowing it. In the United States, about 50 million people age six and older have high blood pressure. Hypertension is more common in men than women and in people over the age of 65 than in younger persons. More than half of all Americans over the age of 65 have hypertension. It also is more common in African-Americans. Hypertension is serious because people with the condition have a higher risk for heart disease and other medical problems than people with normal blood pressure. *(Gale Encyclopedia of Medicine)*

DIABETES MELLITUS:

Diabetes mellitus is a chronic disease that causes serious health complications including renal (kidney) failure, heart disease, stroke, and blindness. Approximately 17 million Americans have diabetes. Unfortunately, as many as one-half are unaware they have it. *(Gale Encyclopedia of Medicine)*

BRUIT:

A sound heard over an artery or vascular channel, reflecting turbulence of flow. Most commonly, a bruit is caused by abnormal narrowing of an artery. Listening for a bruit in the neck with a stethoscope is a simple way to screen for narrowing (stenosis) of the carotid artery, which can be a result of cholesterol plaque accumulation. *(medicinenet.com)*

VERTIGO:

Vertigo is a sensation of motion or spinning that is often described as dizziness. Vertigo is not the same as being lightheaded. People with vertigo feel as though they are actually spinning or moving, or that the world is spinning around them. There are two types of vertigo, peripheral and central vertigo. Peripheral vertigo is due to a problem in the part of the inner ear that controls balance. These areas are called the

vestibular labyrinth or semicircular canals. The problem may also involve the vestibular nerve. This is the nerve between the inner ear and the brain stem. Central vertigo is due to a problem in the brain, usually in the brain stem or the back part of the brain (cerebellum). Central vertigo may be caused by: blood vessel disease, certain drugs such as anticonvulsants, aspirin, and alcohol, migraine, multiple sclerosis, seizures (rarely), stroke, tumors (cancerous or noncancerous). *(NIH: U.S. National Library of Medicine - Medical Encyclopedia)*

VISION ISSUES:

A narrowing, hardening or irregularity of the carotid artery can cause a blood clot or accumulation of debris to form in the artery. This is known as carotid artery disease. The debris may break off into the blood stream and interfere with blood flow to the eyes and brain. A reduction of blood flow through one of the carotid arteries may cause temporary vision loss in the eye on the same side. The loss of vision is like a curtain being drawn over the eye and usually lasts just one or two minutes. Weakness or numbness can also occur on one side of the body. Temporary blockages of the arteries are called transient ischemic attacks (TIA). A complete blockage of the carotid artery can cause a stroke. The effects of stroke can be either mild (loss of side vision or slight muscle weakness) or severe (complete loss of vision, paralysis of one side of the body, loss of speech). *(American Academy of Ophthalmology - "The Carotid Artery and the Eye")*

THYROID ULTRASOUND

An ultrasound of the thyroid produces pictures of the thyroid gland and the adjacent structures in the neck. The thyroid gland is located in front of the neck just above the collar bones and is shaped like a butterfly, with one lobe on either side of the neck connected by a narrow band of tissue. It is one of nine endocrine glands located throughout the body that make and send hormones into the bloodstream. The thyroid gland makes the thyroid hormone, which helps to regulate a variety of body functions including how fast the heart beats. It is very common for patchy areas or nodules to develop in the thyroid that may or may not be felt on the skin surface. About five to 10 percent of adults will have lumps in their thyroid that a doctor can identify on an exam. These are called palpable nodules. Ultrasound is very sensitive and shows many nodules that cannot be felt. In some age groups, nodules are seen on ultrasound in as many as 70 percent of adults. The vast majority of these are benign regions of thyroid tissue that pose no health risk. The minority of these are true tumors of the thyroid and may require further diagnosis or treatment. (Radiologyinfo.org)

CALCIFICATIONS:

Microcalcifications: small flecks of calcium within a thyroid nodule, usually seen as small bright spots on ultrasonography. These are frequently seen in nodules containing papillary thyroid cancer. Macrocalcifications: large flecks of calcium that can be seen either inside a thyroid nodule or in the periphery (so called egg-shell/rim calcifications), usually seen as large bright spots on ultrasonography.(thyroid.org)

NODULES - SIMPLE / COMPLEX:

The term thyroid nodule refers to an abnormal growth of thyroid cells that forms a lump within the thyroid gland. Although the vast majority of thyroid nodules are benign (noncancerous), a small proportion of thyroid nodules do contain thyroid cancer. In order to diagnose and treat thyroid cancer at the earliest stage, most thyroid nodules need some type of evaluation. (thyroid.org)

HAIR LOSS:

Severe and prolonged hypothyroidism and hyperthyroidism can cause loss of hair. The loss is diffuse and involves the entire scalp rather than discrete areas. The hair appears uniformly sparse. Regrowth is usual with successful treatment of the thyroid disorder, though it will take several months and may be incomplete. It is unusual for mild (e.g. subclinical) hypothyroidism or hyperthyroidism, or short-lived thyroid problems to cause hair loss. Some forms of hypothyroidism and hyperthyroidism come on abruptly and are diagnosed early, while others may have been present for months or years before diagnosis. Hair loss due to thyroid disease becomes apparent several months after the onset of thyroid disease. This is due to the long hair cycle. In such cases, paradoxically the hair loss may follow the treatment for the thyroid and the thyroid medication may be erroneously blamed, leading to withdrawal of treatment, which in turn may worsen the hair loss. (btf-thyroid.org)

ABNORMAL BLOOD:

The thyroid produces two major hormones: triiodothyronine (T3) and thyroxine (T4). If your thyroid gland doesn't produce enough of these hormones, you may experience symptoms such as weight gain, lack of energy, and depression. This condition is called hypothyroidism. If your thyroid gland produces too many hormones, you may experience weight loss, high levels of anxiety, tremors, and a sense of being on a high. This is called hyperthyroidism. Typically, a doctor who is concerned about your thyroid hormone levels will order broad screening tests, such as the T4 or the thyroid-stimulating hormone (TSH) test. If those results come back abnormal, your doctor will order further tests to pinpoint the reason for the problem. (*healthline.com* - "Thyroid Function Tests")

GOITER:

The term "goiter" simply refers to the abnormal enlargement of the thyroid gland. It is important to know that the presence of a goiter does not necessarily mean that the thyroid gland is malfunctioning. A goiter can occur in a gland that is producing too much hormone (hyperthyroidism), too little hormone (hypothyroidism), or the correct amount of hormone (euthyroidism). A goiter indicates there is a condition present which is causing the thyroid to grow abnormally. (*thyroid.org*)

WEIGHT INCREASE / DECREASE:

It has been appreciated for a very long time that there is a complex relationship between thyroid disease, body weight and metabolism. Thyroid hormone regulates metabolism in both animals and humans. Metabolism is determined by measuring the amount of oxygen used by the body over a specific amount of time. If the measurement is made at rest, it is known as the basal metabolic rate (BMR). Patients whose thyroid glands were not working were found to have low BMRs, and those with overactive thyroid glands had high BMRs. Later studies linked these observations with measurements of thyroid hormone levels and showed that low thyroid hormone levels were associated with low BMRs and high thyroid hormone levels were associated with BMRs.

Since the BMR in patients with hyperthyroidism is elevated, many patients with an overactive thyroid do, indeed, experience some weight loss. Furthermore, the likelihood of weight loss occurring is related to the severity of the overactive thyroid. Since the BMR in the patient with hypothyroidism (see Hypothyroidism brochure) is decreased, an underactive thyroid is generally associated with some weight gain. The weight gain is often greater in those individuals with more severe hypothyroidism. However, the decrease in BMR due to hypothyroidism is usually much less dramatic than the marked increase seen in hyperthyroidism, leading to more modest alterations in weight due to the underactive thyroid. The cause of the weight gain in hypothyroid individuals is also complex, and not always related to excess fat accumulation. Most of the extra weight gained in hypothyroid individuals is due to excess accumulation of salt and water. Massive weight gain is rarely associated with hypothyroidism. In general, 5-10 pounds of body weight may be attributable to the thyroid, depending on the severity of the hypothyroidism. Finally, if weight gain is the only symptom of hypothyroidism that is present, it is less likely that the weight gain is solely due to the thyroid. (*thyroid.org*)

FATIGUE:

Fatigue is a very common symptom of hypothyroidism - an underactive or low thyroid -- in many patients. When the treatment for hypothyroidism is optimized, many patients report that their fatigue

is lessened or even fully resolved. Fatigue is a symptom of hyperthyroidism -- an overactive or high thyroid -- in some patients. In some cases, fatigue is present even after you've gotten a sufficient amount of sleep. In other cases, fatigue in hyperthyroidism may result from insomnia, anxiety, or disrupted sleep patterns. Even when thyroid function tests show that the thyroid is "normal" and hormone levels fall within the reference range, the presence of elevated thyroid antibodies, which can indicate autoimmune Hashimoto's disease or Graves' disease, may cause fatigue as a symptom in some patients. (*verywell.com* - "10 Things to Know About Thyroid Disease and Fatigue")

PARATHYROID MASSES:

The thyroid and parathyroid are NOT related. Although they are neighbors and both are part of the endocrine system, the thyroid and parathyroid glands are otherwise unrelated--they do not have the same function--just similar and confusing names. Parathyroid glands are small glands of the endocrine system which are located in the neck behind the thyroid. Parathyroid glands control the calcium in our bodies--how much calcium is in our bones, and how much calcium is in our blood. With Parathyroid disease, you very likely have 3 normal parathyroid glands the size of a grain of rice and one parathyroid tumor that is as big as an olive, grape, or even a walnut. If you have parathyroid disease (hyperparathyroidism) you will need an operation to remove the one parathyroid gland which has become a tumor. (*parathyroid.com*)

PELVIC / BLADDER ULTRASOUND

*Pelvic ultrasound may be used for measurement and evaluation of pelvic organs. Ultrasound assessment of the pelvis may include, but is not limited to, the following: Size, shape, and position of the uterus and ovaries, Thickness, echo-Genicity (darkness or lightness of the image related to the density of the tissue), and presence of fluids or masses in the endometrium, myometrium (uterine muscle tissue), fallopian tubes, or in or near the bladder., length and thickness of the cervix, changes in bladder shape, blood flow through pelvic organs. Pelvic ultrasound can provide much information about the size, location, and structure of pelvic masses, but cannot provide a definite diagnosis of cancer or specific disease. A pelvic ultrasound may be used to diagnose and assist in the treatment of the following conditions: Abnormalities in the anatomic structure of the uterus, including endometrial conditions, fibroid tumors (benign growths), masses, cysts, and other types of tumors within the pelvis, presence and position of an intrauterine contraceptive device (IUD), pelvic inflammatory disease (PID) and other types of inflammation or infection, postmenopausal bleeding, monitoring of ovarian follicle size, Ectopic pregnancy (pregnancy occurring outside of the uterus, usually in the fallopian tube).
... (hopkinsmedicine.org)*

BLADDER STONES - MASSES, INCREASED WALL:

Bladder stones are hard masses of minerals in your bladder. Bladder stones develop when the minerals in concentrated urine crystallize. This often happens when you can't completely empty your bladder. Sometimes bladder stones — even large ones — cause no problems. But if a stone irritates the bladder wall or blocks the flow of urine, signs and symptoms may include: lower abdominal pain, in men - pain or discomfort in the penis or testicles, a burning sensation during urination, frequent urination, difficulty urinating or interrupted urine flow, blood in the urine, cloudy or abnormally dark-colored urine. Interstitial cystitis is a painful condition in which the bladder wall becomes irritated and inflamed. Chronic irritation can cause scarring and thickening of the bladder wall, making the bladder very stiff and unable to hold a normal amount of urine. (mayoclinic.org) (everydayhealth.com)

FIBROIDS:

Fibroids are the most frequently seen tumors of the female reproductive system. Fibroids, also known as uterine myomas, leiomyomas, or fibromas, are firm, compact tumors that are made of smooth muscle cells and fibrous connective tissue that develop in the uterus. It is estimated that between 20 to 50 percent of women of reproductive age have fibroids, although not all are diagnosed. Some estimates state that up to 30 to 77 percent of women will develop fibroids sometime during their childbearing years, although only about one-third of these fibroids are large enough to be detected by a health care provider during a physical examination. In more than 99 percent of fibroid cases, the tumors are benign (non-cancerous). These tumors are not associated with cancer and do not increase a woman's risk for uterine cancer. They may range in size, from the size of a pea to the size of a softball or small grapefruit. (obgyn.ucla.edu/fibroids)

POLYCYSTIC OVARIES:

Polycystic ovary syndrome (PCOS) is a common endocrine system disorder among women of reproductive age. Women with PCOS may have enlarged ovaries that contain small collections of fluid — called follicles — located in each ovary as seen during an ultrasound exam. Infrequent or prolonged menstrual periods, excess hair growth, acne, and obesity can all occur in women with polycystic ovary syndrome. In adolescents, infrequent or absent menstruation may raise suspicion for the condition. The exact cause of polycystic ovary syndrome is unknown. Early diagnosis and treatment along with weight loss may reduce the risk of long-term complications, such as type 2 diabetes and heart disease. (*mayoclinic.org*)

IRREGULAR MENSES:

Menstrual irregularities can be caused by a variety of conditions, including pregnancy, hormonal imbalances, infections, malignancies, diseases, trauma, and certain medications. Common causes of anovulatory bleeding (absent, infrequent periods, and irregular periods) include: adolescence, uncontrolled diabetes, eating disorders, hyperthyroidism or hypothyroidism, hyperprolactinemia (an abnormally high concentration in the blood of prolactin, a protein hormone), medications, such as antiepileptics or antipsychotics, perimenopause, polycystic ovary syndrome (PCOS), Pregnancy. (*nichd.nih.gov* - “*What causes menstrual irregularities?*”)

URINARY TRACT INFECTION - BLADDER:

Urinary tract infections (UTIs) usually occur when bacteria gets into the body through the urethra, the tube that carries urine outside the body from the bladder. Bacteria that are normally present in the large intestine and are in stool can travel from the anus through the urethra to the bladder and kidneys to create an infection. Because women have shorter urethras, and because the urethra is nearer the anus in women, women get bladder infections and other UTIs more often than men do. Other causes of UTIs or bladder infections may include: Sexual activity, which may push bacteria into the urethra; having diabetes or being pregnant; having any condition that impairs the flow of urine from the bladder (enlarged prostate gland, kidney stones); having a catheter inserted (a flexible tube inserted through the urethra to allow urine to drain); having a bacterial infection in the blood or lymph system (an unusual cause of kidney infection or bladder infection); inheriting genes that make repeated UTIs more likely (among women). When older men experience UTIs, the infection may be related to other prostate conditions, such as benign prostatic hyperplasia (BPH) or prostatitis. (*denverurology.com* - “*Urinary Tract Infections (UTIs)*”)

ECTOPIC PREGNANCY:

An ectopic pregnancy occurs when a fertilized egg implants somewhere other than the main cavity of the uterus. Pregnancy begins with a fertilized egg. Normally, the fertilized egg attaches itself to the lining of the uterus. An ectopic pregnancy most often occurs in one of the tubes that carry eggs from the ovaries to the uterus (fallopian tubes). This type of ectopic pregnancy is known as a tubal pregnancy. In some cases, however, an ectopic pregnancy occurs in the abdominal cavity, ovary or neck of the uterus (cervix). An ectopic pregnancy can't proceed normally. The fertilized egg can't survive, and the growing tissue might destroy various maternal structures. Left untreated, life-threatening blood loss is possible. Early treatment of an ectopic pregnancy can help preserve the chance for future healthy pregnancies. (*mayoclinic.org*)

ENDOMETRIAL STRIPE: (*livestrong.com - 'What Causes A Thickening Endometrial Stripe'*)

The endometrium is the lining of the uterus, and on imaging tests like ultrasounds, the lining is referred to as the endometrial stripe, according to the gynecologic oncologist Dr. Kate O'Hanlan. Increased thickening of the endometrial stripe may be indicative of precancerous or cancerous changes in the uterus and needs to be evaluated promptly. Once the underlying cause of the endometrial thickening is determined, treatment can be administered.

PROSTATE ULTRASOUND

A prostate ultrasound can help diagnose medical conditions such as cancer, inflammation of the prostate gland or infertility.

PROSTATITIS:

Prostatitis may be the symptom-producing disease of the genitourinary tract for which men most often seek medical help. Forms of prostate inflammation include acute and chronic bacterial prostatitis and inflammation not caused by bacterial infection. A painful condition called prostatodynia, which may be caused by abnormal nerves or muscles in the region, is also thought to be a form of prostatitis. Other cases occur when small stones form within the prostate and become infected. Sometimes infection is caused by poor hygiene, surgical procedures, or even swimming in polluted water. Some men whose prostatitis is not caused by any microorganism have microscopic collections of cells called granulomas in their prostate tissue. When prostatitis develops gradually, trouble with the flow of urine may be the first symptom. Small stones may form, because the body attempts to neutralize bacteria by coating them with calcium. These stones may become infected themselves and make the condition worse. (*Gale Encyclopedia of Medicine*)

BPH:

Benign prostatic hyperplasia (BPH) is an enlarged prostate. The prostate goes through two main growth periods as a man ages. The first occurs early in puberty, when the prostate doubles in size. The second phase of growth begins around age 25 and continues during most of a man's life. As you age, your prostate may get larger. Benign prostatic hyperplasia often occurs with the second growth phase. As the prostate enlarges, it can then squeeze down on your urethra. The bladder wall becomes thicker. Eventually, the bladder may weaken and lose the ability to empty completely, leaving some urine in the bladder. The narrowing of the urethra and urinary retention--the inability to empty the bladder completely--cause many of the problems associated with benign prostatic hyperplasia. BPH is benign. This means it is not cancer. It does not cause nor lead to cancer. But BPH and cancer can happen at the same time. BPH is common in aging men. About half of all men between the ages of 51 and 60 have BPH. Up to 90% of men over age 80 have BPH. (*urologyhealth.org*)

INCREASED PSA:

Prostate-specific antigen (PSA) is a protein produced by the prostate gland. Blood levels of PSA can be elevated in men with prostate cancer. (*clevelandclinic.org*)

NOCTURIA:

Nocturia is a condition in which you wake up during the night because you have to urinate. This condition becomes more common as people age and occurs in both men and women, sometimes for different reasons. There are many possible causes of nocturia, depending on the type: congestive heart failure, edema of lower extremities (swelling of the legs), sleeping disorders such as obstructive sleep apnea (breathing is interrupted or stops many times during sleep), certain drugs, including diuretics (water pills), cardiac glycosides, demeclocycline, lithium, methoxyflurane, phenytoin, propoxyphene, and excessive vitamin D, drinking too much fluid before bedtime, especially coffee, caffeinated beverages, or alcohol. Causes of low nocturnal bladder capacity, bladder obstruction, bladder overactivity, bladder infection or recurrent urinary tract infection, bladder inflammation (swelling), interstitial cystitis (pain in the bladder), bladder malignancy, benign prostatic hyperplasia (men), a non-cancerous overgrowth of the prostate that obstructs the flow of urine. Possible causes of mixed nocturia, any of the possible causes listed under nocturnal polyuria and low nocturnal bladder capacity. (*clevelandclinic.org*)

DECREASED URINE FLOW:

Difficulty starting or maintaining a urine stream is called urinary hesitancy. Urinary hesitancy affects people of all ages and occurs in both sexes. However, it is most common in older men with an enlarged prostate gland. Urinary hesitancy most often develops slowly over time. You may not notice it until you are unable to urinate (called urinary retention). This causes swelling and discomfort in your bladder. (*NIH: U.S. National Library of Medicine - Medical Encyclopedia*)

SCROTAL/TESTICULAR ULTRASOUND

Ultrasound imaging of the scrotum is the primary imaging method used to evaluate disorders of the testicles, epididymis (a tube immediately next to a testis that collects sperm made by the testicle) and scrotum. This study is typically used to determine whether a mass in the scrotum felt by the patient or doctor is cystic or solid and its location, diagnose results of trauma to the scrotal area, diagnose causes of testicular pain or swelling such as inflammation or torsion, evaluate the cause of infertility such as varicocele, look for the location of undescended testis. (radiologyinfo.org)

HYDROCELE:

A hydrocele is the most common cause of scrotal swelling. The normal scrotum contains small amounts of serous fluid between the layers of the tunica vaginalis. Abnormal collection of fluid in the space between the visceral and parietal layers of the tunica vaginalis results in a hydrocele. The fluid collections are usually confined to the anterolateral portions of the scrotum because of the posterior location of attachments of the tunica to the testis and scrotum. Hydroceles may be unilateral or bilateral and can be seen as an isolated finding or in conjunction with acute or chronic pathology. Many of these fluid collections are congenital. Acquired hydroceles are associated with infection, tumors, trauma, torsion and radiation therapy. Hematoceles and pyoceles are complex hydroceles. Sonographically, a simple hydrocele is seen as an anechoic dark fluid collection surrounding the testicle, whereas a complex hydrocele may contain internal echoes with septations and loculations. A chronic hydrocele may also demonstrate internal echoes from cholesterol crystal formation. (*sonoguide.com - Testicular Ultrasound*)

EPIDIDYMITIS:

Epididymitis is the most common cause of acute scrotal pain in postpubertal males. Classically, patients present with a painful tender scrotum, dysuria, and fever. Retrograde spread of infection from the bladder or prostate is usually the underlying etiology with the head of the epididymis most commonly involved. Gray-scale findings of acute epididymitis include an enlarged epididymis with decreased echogenicity. Often, a reactive hydrocele is noted as well. A chronically inflamed epididymis becomes thickened and has focal echogenicity with areas of calcification. With Doppler sonography increased blood flow secondary to epididymal inflammation is noted. The presence of normal or increased blood flow in the affected testicle when compared to the contralateral side differentiates epididymitis from testicular torsion. (*sonoguide.com - Testicular Ultrasound*)

ORCHITIS:

Orchitis is an acute infection of the testicle usually following epididymitis. Orchitis often presents with a tender and inflamed testicle. On gray-scale ultrasound, orchitis is seen as an enlarged testicle with heterogeneous echogenicity. This appearance is nonspecific and can be seen in many other conditions such as tumors, metastasis, infarct and torsion. Standard B-mode is not a reliable method to differentiate between orchitis and testicular torsion. For both orchitis and torsion, inflammation and edema can lead to enlargement and heterogeneous echogenicity of the testis. Color Doppler is helpful to differentiate between orchitis and torsion since blood flow in orchitis is increased in comparison with the unaffected side due to inflammation. (*sonoguide.com - Testicular Ultrasound*)

TESTICULAR TORSION:

Prompt diagnosis and early treatment is essential as time is critical for testicular salvage. Torsion is more common in children but can occur in post pubertal males. The majority of testicular torsions result from anatomic defects that lead to redundant spermatic cord and anomalous suspension of the testes in the scrotum. An undescended testicle also increases the likelihood of torsion. A redundant spermatic cord is mobile and during torsion it begins to twist upon itself. As the twisting progresses, venous flow is interrupted initially due to easily collapsible vessel walls and the low intravascular pressure. Venous obstruction is followed by a decrease in arterial inflow, which eventually progresses to complete obstruction. Sonographic findings can be variable depending on the duration of torsion and extent of vascular compromise. The testicle can appear enlarged and hypoechoic and the parenchyma of the testicle will become less homogenous when compared with the unaffected testicle. When blood flow is absent in the affected testicle, the diagnosis of testicular torsion is clear. Occasionally decreased blood flow seen in early torsion can be erroneously diagnosed as normal. Thus, comparison to the contralateral side is crucial. *(sonoguide.com - Testicular Ultrasound)*

SCROTAL TRAUMA:

Blunt trauma to the scrotum can lead to damage of the testicle and adjacent structures. Injuries to scrotum include laceration, hemorrhage, or contusion of the testicle. The goal of scrotal ultrasound in patients with acute trauma to the scrotum is to evaluate injury to the testicle. Blood flow to the testicle should also be evaluated since trauma could lead to testicular torsion. Visualization of a normal testicle on ultrasound virtually excludes any significant injury. Any abnormalities visualized within the testis in the setting of scrotal trauma should be considered as testicular rupture. Sonographic findings suggestive of testicular injury include irregular outline and a inhomogeneous echotexture from hemorrhage or infarction. A discrete fracture line is seen by ultrasound in only 17 % of ruptures. A significant hematocele is an indirect finding for possible testicular rupture. Hemorrhage within the testicle changes its appearance depending on the age of the hemorrhage. Acute hemorrhage will appear inhomogeneously echogenic, but later will develop large anechoic regions within it. Color Doppler helps to differentiate hematomas from tumors. Tumors are usually vascular, whereas hematomas will not reveal any blood flow. *(sonoguide.com - Testicular Ultrasound)*

CYSTS / MASSES / CANCER:

Ultrasound also can be used to locate and evaluate masses (lumps or tumors) in the testicle or elsewhere in the scrotum. Collections of fluid and abnormalities of the blood vessels may appear as masses and can be assessed by ultrasound. Masses both outside and within the testicles may be benign or malignant and should be evaluated as soon as they are detected. Scrotal masses are abnormalities in the contents of the scrotum, the bag of skin hanging behind the penis. The scrotum contains the testicles and related structures that produce, store and transport sperm and male sex hormones. Scrotal masses might be an accumulation of fluids, the growth of abnormal tissue, or normal contents of the scrotum that have become swollen, inflamed or hardened. Signs and symptoms of scrotal masses vary depending on the abnormality. Signs and symptoms might include: an unusual lump, sudden pain, a dull aching pain or feeling of heaviness in the scrotum, pain that radiates throughout the groin, abdomen or lower back, tender, swollen or hardened testicle, tender, swollen or hardened epididymis, swelling in the scrotum, redness of the skin of the scrotum, nausea or vomiting *(radiologyinfo.org)* *(mayoclinic.org)*

EXTREMITIES ULTRASOUND

Ultrasonography of leg veins is a risk-free, non-invasive procedure that uses ultrasound technology to give information about the anatomy, physiology and pathology of both the superficial and the deep venous systems, (SVS) and (DVS). It is indicated mainly on the study of two pathologies: venous thrombosis and venous insufficiency. As with heart ultrasound (echocardiography) studies, venous ultrasonography requires an understanding of hemodynamics in order to give useful examination reports. In chronic venous insufficiency, sonographic examination is of most benefit; in confirming varicose disease, making an assessment of the hemodynamics, and charting the progression of the disease and its response to treatment. It has become the reference standard for examining the condition and hemodynamics of the lower limb veins. (wikipedia.org)

EXTREMITIES - VASCULAR FLOWS: ARTERIAL FLOWS:

Peripheral artery disease (PAD) is a condition of the blood vessels that supply the legs and feet. It leads to narrowing and hardening of the arteries. This causes decreased blood flow, which can injure nerves and other tissues. PAD is caused by “hardening of the arteries.” This problem occurs when fatty material (plaque) builds up on the walls of your arteries and makes them narrower. The walls of the arteries also become stiffer and cannot widen (dilate) to allow greater blood flow when needed. As a result, the muscles of your legs cannot get enough blood and oxygen when they are working harder (such as during exercise or walking). If PAD becomes severe, there may not be enough blood and oxygen, even when the muscles are resting. PAD is a common disorder. It most often affects men over age 50, but women can have it as well. People are at higher risk if they have a history of: abnormal cholesterol, diabetes, heart disease (coronary artery disease), high blood pressure (hypertension), kidney disease involving hemodialysis, smoking, stroke (cerebrovascular disease). (*pennstatehershey.adam.com*)

VENOUS FLOWS:

Venous insufficiency is a condition in which the veins have problems sending blood from the legs back to the heart. Normally, valves in your deeper leg veins keep blood moving forward toward the heart. With long-term (chronic) venous insufficiency, vein walls are weakened and valves are damaged. This causes the veins to stay filled with blood, especially when you are standing. Chronic venous insufficiency is a long-term condition. It is most commonly due to malfunctioning (incompetent) valves in the veins. It may also occur as the result of a past blood clot in the legs. (*NIH U.S. National Library of Medicine, Medical Encyclopedia*)

DVT:

Deep vein thrombosis (DVT) is a condition that occurs when a blood clot forms in a vein deep inside a part of the body. It mainly affects the large veins in the lower leg and thigh, but can occur in other deep veins such as in the arms and pelvis. (*NIH U.S. National Library of Medicine, Medical Encyclopedia*)

EXTREMITIES - NON VASCULAR ABNORMALITIES:

HEMATOMAS:

Hematoma in leg is accumulation of blood in the soft tissue of leg which has leaked from the broken blood vessel. A hematoma is a type of blood clot, large in size and can develop from damaged artery or a vein. Hematoma can form anywhere on the leg, either on upper leg or on lower leg. The blood circulation is affected in the surrounding tissues of hematoma. Hematoma in lower leg can be very distressing, especially when it develops on the shin of tibia. Often the clotted blood in this area requires to be removed surgically. Hematoma on leg in majority of cases is due to a blunt injury. It can develop in any person, but commonly it is observed among elderly individuals having lax tissues. A large collection of blood may take time to resolve while a small hematoma may take few days to dissipate. (*tandurust.com*)

LIPOMAS:

A lipoma is a benign (noncancerous) tumor made up of fat tissue. The typical lipoma is a small, soft, rubbery lump located just beneath the skin. They are usually painless and are most often found on the upper back, shoulders, arms, buttocks, and upper thighs. Less commonly, these tumors can be found in deeper tissue of the thigh, shoulder, or calf. (*orthoinfo.aaos.org*)

CYSTS:

A Baker's cyst is a fluid-filled cyst that causes a bulge and a feeling of tightness behind your knee. The pain can get worse when you fully flex or extend your knee or when you're active. A Baker's cyst, also called a popliteal cyst, is usually the result of a problem with your knee joint, such as arthritis or a cartilage tear. Both conditions can cause your knee to produce too much fluid, which can lead to a Baker's cyst. In some cases, a Baker's cyst causes no pain, and you may not notice it. If you do have signs and symptoms, they might include: swelling behind your knee, and sometimes in your leg, knee pain, stiffness and inability to fully flex the knee, your symptoms may be worse after you've been active or if you've been standing for a long time.

(*mayoclinic.org*)

HERNIAS:

Muscle hernias, also referred as myofascial defects, are most commonly found in the lower extremities, and represent a focal defect in the muscle fascia with protrusion of muscle through the defect. Muscle hernias may be found occasionally in the upper extremities, and may be single or multiple. The most commonly involved muscle is the tibialis anterior. Muscle hernias are typically asymptomatic, although can cause cramping sensations or pain with or after activity. They may also present as a palpable mass, and be referred for imaging to evaluate for neoplasia. (*radiopaedia.org*)

BREAST ULTRASOUND

Ultrasound is useful for looking at some breast changes, such as those that can be felt but not seen on a mammogram or changes in women with dense breast tissue. It also can be used to look at a change that may have been seen on a mammogram. Ultrasound can be used to tell the difference between fluid-filled cysts and solid masses. (If a lump is really a cyst, it's not cancer.) ... (cancer.org - American Cancer Society "Breast Ultrasound")

FIBROCYSTIC:

Fibrocystic breasts are composed of tissue that feels lumpy or rope-like in texture. Doctors call this nodular or glandular breast tissue. It's not at all uncommon to have fibrocystic breasts. More than half of women experience fibrocystic breast changes at some point in their lives. In fact, medical professionals have stopped using the term "fibrocystic breast disease" and now simply refer to "fibrocystic breasts" or "fibrocystic breast changes" because having fibrocystic breasts isn't really a disease. Breast changes categorized as fibrocystic are considered normal. Although many women with fibrocystic breasts don't have symptoms, some women experience breast pain, tenderness and lumpiness — especially in the upper, outer area of the breasts. (*mayoclinic.org*)

CALCIFICATIONS:

Breast calcifications are calcium deposits within breast tissue. Although breast calcifications are usually noncancerous (benign), certain patterns of calcifications — such as tight clusters with irregular shapes — may indicate breast cancer or precancerous changes to breast tissue. (*mayoclinic.org*)

LUMPS / MASSES:

A breast lump is a growth of tissue that develops within your breast. Different types of breast lumps can vary in the way they look and feel. You may perceive a lump as a mass, growth, swelling, thickness or fullness. You might notice: a distinct lump with definite borders, a firm, hard area within your breast, a thickened, slightly more prominent area in your breast that's different from surrounding breast tissue, other breast changes, such as redness, dimpling or pitting of the skin, one breast that's noticeably larger than the other, nipple changes, such as a nipple that's pulled inward or spontaneous fluid discharge from your nipple, persistent breast pain or tenderness, which might increase during your menstrual period, sometimes, a breast lump is a sign of breast cancer. (*mayoclinic.org*)