

# What You Need to Know About... Medical Testing



The majority of attending physician statements (APS) reviewed during underwriting include some form of medical testing. Whether completed for a specific impairment, such as cancer or heart disease, or done as a part of routine follow-up care, such as a colonoscopy or mammogram, almost all medical files include the results of medical testing performed by the clients' doctors.

The information below serves to educate you about the different forms of medical testing and why they are completed so you can better understand your client's medical history and why certain medical tests are performed by a physician and/or requested by a carrier underwriter.

## Magnetic Resonance Imaging (MRI)

This test uses large magnet and radio waves to look at organs and structures inside the body.

**Brain and spinal cord:** An MRI is the most frequently used test to diagnose brain and spinal cord abnormalities. An MRI can help in the detection of aneurysms, multiple sclerosis, spinal cord disorders, stroke, tumors, and brain injury from trauma.

**Other organs:** An MRI can check for tumors or other abnormalities of the liver, kidneys, spleen, pancreas, uterus, ovaries, and prostate. It can also evaluate joint and disc abnormalities of the bones and joints as well as disk abnormalities of the spine, bone infection, and tumors of the bone and soft tissues. Finally, it can be used with mammography to detect breast cancer, especially in women who have dense breast tissue.

## Computed Tomography Scan (CT or CAT Scan)

This test produces two-dimensional images of a section of the body. This data can also be used to construct three-dimensional images. A CT scanner emits a series of narrow beams through the body as it moves through an arc. The CT scan differs from a regular x-ray as the CT produces a more detailed final picture due to its ability to use multiple beams versus an x-ray, which sends just one radiation beam. A spiral CT is a relatively new form of technology that takes a spiral path through the body gathering continuous data with no gaps between images.

**Bones and joints:** A CT scan can detect bone and joint issues such as fractures and tumors.

**Cardiac:** Electron Beam Computed Tomography (EBCT), Ultrafast CT, or Coronary Artery Calcium Score detects coronary artery disease by measuring calcium deposits and blockages in the coronary arteries. The EBCT measures the amount of calcium in each coronary artery expressed as a percentage. The percentages are then added up to equal a final calcium score.

**Other organs:** A CT scan can spot cancer, emphysema, or liver masses and can compare CTs to find out if certain treatments are working. They can also show internal injuries and bleeding, such as caused by an accident and can help locate tumors, blood clots, excess fluids, or infections. Finally, doctors can use CT scans to guide procedures such as biopsies, surgeries, and radiation therapy.

## Ultrasound (also known as sonography)

An ultrasound uses high-frequency sound waves to capture live images from inside the body.

**Cardiac:** An echocardiogram is an ultrasound of the heart that provides moving pictures and provides information on the structure and function of the heart. It checks how the heart's chambers and valves are pumping blood through the heart.

**Vascular:** A carotid doppler is an ultrasound of the carotid arteries that uses sound waves to produce pictures of the carotid arteries in the neck that carry blood from the heart to the brain. A Doppler ultrasound is a technique that evaluates the blood flow through a blood vessel. This test is used to diagnose a blockage or narrowing of the carotid arteries, also called stenosis. An arterial duplex scan is a form of ultrasound to capture internal images of the major arteries of the arms and legs. Arterial duplex

# What You Need to Know About... Medical Testing



can show plaque buildup in arteries and can detect peripheral vascular disease, a circulatory condition in which narrowed blood vessels reduce blood flow to the limbs.

**Other organs:** Doctors can use ultrasounds to diagnose conditions of the blood vessels, liver, gallbladder, spleen, pancreas, kidneys, bladder, uterus, ovaries, thyroid, and testicles. Ultrasound waves do not, however, transmit well through dense bones or parts of the body that hold air or gas.

## Positron Emission Tomography Scan (PET)

A PET scan is an imaging test that helps reveal how tissues and organs are functioning using a radioactive drug (tracer). PET scans detect metabolism within the body tissues.

**Cancer:** Cancer cells show up as bright spots on PET scans, which makes them useful for detecting cancer as well as seeing if it has spread, determining if a cancer treatment is working, and/or checking for cancer recurrence.

**Cardiac:** PET scans reveal areas of decreased blood flow in the heart, as healthy heart tissue will take in more tracer than unhealthy tissues, or tissues that have decreased blood flow.

**Brain:** Tracers are attached to glucose, the main fuel of the brain, and can detect which areas of the brain are utilizing glucose at a high rate. PET scans can help diagnose many central nervous system disorders such as Alzheimer's disease, depression, epilepsy, head trauma, and Parkinson's disease.

## Single-Photon Emission Computerized Tomography (SPECT)

A SPECT is a type of nuclear imaging test using radioactive substances in conjunction with a special camera to create three-dimensional pictures. A SPECT scan shows how organs work. SPECT scans measure gamma rays.

**Brain:** A SPECT can determine which areas of the brain are affected by dementia, clogged blood vessels, seizures, epilepsy, and head injuries.

**Cardiac:** A SPECT (myocardial perfusion imaging (MPI) or nuclear stress test) can show narrowing or clogging of the coronary arteries as well as how completely heart chambers empty during contractions. It is often used in conjunction with a treadmill stress test or to rule out a false positive on a treadmill stress test.

**Bones:** SPECT testing can help diagnose hidden bone fractures and cancer.

## X-ray

X-rays are a type of radiation known as electromagnetic waves. An x-ray creates images of the inside of the body that show up in different shades of black and white due to the way different tissues absorb different amounts of radiation.

**Cardiac and Respiratory:** The chest x-ray is the most commonly performed type of x-ray and produces images of the heart, lungs, airways, blood vessels, and the bones of the spine and chest. Chest x-rays can help doctors diagnose emphysema, broken ribs, heart failure, cardiomegaly (enlarged heart), lung cancer, and pneumonia. Another form of cardiac x-ray testing is called an angiogram, which provides doctors with information on blood vessels. An angiogram, or cardiac catheterization, consists of injecting a special fluid into an artery through a catheter so that the coronary arteries show up well on the x-ray. By studying the x-ray images, doctors can see any problems with coronary arteries.

**Mammograms:** A mammogram is an x-ray used to detect cancer or other abnormalities of the breast.

**Musculoskeletal:** X-rays are often used to check for fractures or broken bones. A Dual Energy X-ray Absorptiometry (DEXA), or

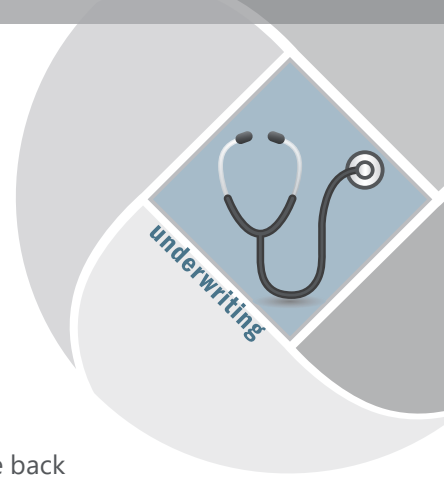


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Page 2 of 4

# What You Need to Know About... Medical Testing



Bone Densitometry X-ray (BMD), is a form of x-ray used to measure bone loss. A DEXA uses a very small dose of ionizing radiation to produce pictures inside of the body and is used to diagnose osteoporosis and osteopenia.

**Gastrointestinal:** A barium swallow is a special type of x-ray test that takes a close look at the back of the mouth, throat, and esophagus, and can help diagnose oral cancer and other diseases.

## Endoscopy

An endoscopy is a procedure using an endoscope to examine the interior of a hollow organ or cavity in the body. An endoscope is a flexible tube with a light and camera attached to it. A doctor can view pictures of the inside of the body on a computer monitor.

**Gastrointestinal:** A colonoscopy is the most common form of endoscopy and is used to investigate the large intestine and colon for diseases such as cancer, diverticulosis, diverticulitis, and polyps. An Esophagogastroduodenoscopy (EGD) is a form of endoscopy used to evaluate the esophagus, stomach, and duodenum for diseases such as reflux, gastritis, and Barrett's esophagus. A capsule endoscopy is a small camera, about the size of a pill, that is swallowed and allows a doctor to visualize the small intestine. Finally, a flexible sigmoidoscopy allows a doctor to examine the rectum and lower colon.

**Genitourinary system:** A cystoscopy is a form of endoscopy used to investigate the urinary tract to include the lining of the bladder and urethra.

**Female reproductive system:** A colposcopy is used to visualize the cervix while a hysteroscopy is used to visualize the uterus. A colposcopy is a cervical biopsy normally done after an abnormal pap smear.

## Tests Measuring Electrical Output

The cells of the human body are specialized to conduct electrical currents. Our nervous system is continuously sending electrical signals to the brain and almost all of our cells are capable of generating electricity.

**Cardiac:** Electrocardiogram (EKG): An EKG determines heart activity by measuring signals from electrodes placed on the torso, arms, and legs. It measures the electrical signals in your heart. An EKG can show if the heart is beating at a normal rate and strength. An EKG can detect arrhythmias (irregular heart rates), ischemia (lack of oxygen and blood to the heart), heart attacks, and heart enlargement.

**Brain:** Electroencephalography (EEG): An EEG records the electrical activity in the brain and can diagnose epilepsy and other seizure disorders.

**Nerves and muscles:** Electromyography (EMG): An EMG evaluates and records the electrical activity produced by skeletal muscles. An EMG can reveal nerve dysfunction, muscle dysfunction, or problems with the nerve to muscle signal transmission, and can help in the diagnosis of diseases such as carpal tunnel syndrome, amyotrophic lateral sclerosis (ALS or Lou Gehrig's disease), and muscular dystrophy.

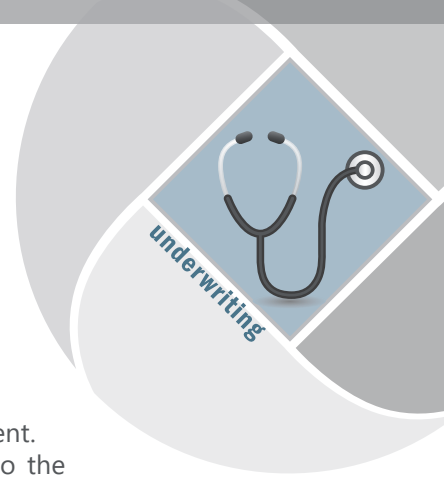
## Biopsy

A biopsy is an examination of tissue removed from the body to discover the presence, cause, or extent of a disease. The biopsy sample is then sent to a laboratory for analysis and the results help a doctor determine whether or not the cells are cancerous.

**Liver:** A liver biopsy is often seen in cases where a patient has been diagnosed with hepatitis C. The results of a liver biopsy can show the extent of the damage caused by the disease including the degree of fibrosis (formation of scar tissue in the liver) or if cirrhosis (chronic liver damage leading to scarring and liver failure) is present.



# What You Need to Know About... Medical Testing



**Skin:** Dermatologists will often take biopsies of skin lesions to determine whether they are benign, pre-cancerous, or malignant (melanoma).

**Other organs:** A biopsy can be taken from any part of the body to determine if cancer is present. A common form of biopsy is Fine Needle Aspiration (FNA) – a long needle is inserted into the suspicious area, usually, thyroid or breast, and a syringe is used to draw out fluid and cells for analysis. Mohs surgery is done on skin lesions and consists of a doctor progressively removing thin layers of cancer-containing skin and examining each layer until only cancer-free tissue remains. Bone marrow (aspiration) biopsy is completed when there is a suspicion of blood-borne cancer. A sample of bone marrow, blood, and a small piece of bone is removed from the breastbone or the hipbone. A core biopsy is normally used when there is a suspicion of prostate cancer and consists of removing several specimens (or cores) using a wide, hollow needle. Endoscopic biopsy is often used to remove tissue from the gastrointestinal tract and uses an endoscope to view the suspicious area to obtain a small amount of tissue for study.

## System Specific Testing

**Cardiac:** A treadmill stress test involves walking on a treadmill or riding a stationary bike while your heart rhythm, blood pressure, and breathing are monitored. The test shows how the heart responds to stress and if there is any ischemia (lack of blood flow or oxygen to the heart). If the treadmill stress test is positive for ischemia, a doctor may require a stress echocardiogram (the combination of a stress test and an echocardiogram) or a nuclear stress test (SPECT) to either rule out ischemia or find out what portion of the heart is affected.

**Female reproductive:** A pap smear takes cells scraped from the cervix and examines them under a microscope for any abnormalities. A human papillomavirus test (HPV) is normally done concurrently to determine if a person has HPV, which can increase a woman's risk for certain types of cancer.

**Male reproductive:** A digital rectal exam (DRE) is a procedure where the doctor palpates the anus, rectum, and prostate gland with a gloved finger and is used in the diagnosis of intestinal bleeding, anorectal pain, and both benign and malignant diseases of the prostate.

**Vascular:** An ankle-brachial index (ABI) is a simple way for a doctor to check how well blood is flowing and to rule out peripheral artery disease (blockages of the arteries in arms and/or legs). The ABI test compares the blood pressure measured at the ankle with the blood pressure measured at the arm.

**Respiratory:** A pulmonary function test (PFT or spirometry test) measures lung function and can evaluate a broad range of lung diseases including asthma, chronic obstructive pulmonary disease (COPD), and emphysema. While sitting, a person breathes into a mouthpiece that is connected to an instrument called a spirometer. The spirometer records the amount and rate of air that is breathed in and out over a period of time. Polysomnography (also known as a sleep study) is a test used to diagnose sleep apnea (when breathing is disrupted during sleep). During the test, an EEG monitors the brain to identify sleep cycles and disturbances. These results, along with movements, breathing, oxygen levels, and heart rate, help determine if a person has a sleep disorder and the severity.

## Conclusion

Hopefully, you now have a better understanding of the specific medical tests that can be performed, the reason for each particular test, and why medical testing results are so important to an underwriter when reviewing a medical file. As always, if you have any questions about a specific medical test or would like further information about medical testing, please contact your underwriter.