Mazal Diagnostic

Services Offered

Ankle Brachial Index (ABI)

The ankle brachial index (ABI) is a noninvasive test used to determine a patient's risk for peripheral artery disease, a condition that involves a narrowing of the arteries in the leg and can lead to a heart attack or stroke.

The Ankle Brachial Index (ABI) uses a Doppler device to detect blood flow within the ankle and arm, and then compares these two results to properly assess a patient's risk. Blood pressure that is lower in the leg than in the arm may be a sign of a blocked artery.

Recent studies in the AMA Journal recognize the usefulness and value of ABI testing for the evaluation of cardiovascular risk. The study states these tests are under-utilized in routine clinical practice because:

- Most clinicians are not aware that a low ABI is a marker of cardiovascular risk
- It is perceived as a specialist test
- Most clinicians would not know how to perform the test

Our service will accurately perform this test and enable your practice to treat the patient in the most efficacious manner.

Indications:

- Peripheral artery disease
- Deep vein thrombosis
- Arterial trauma
- Aneurysm, pseudoaneurysm and arterial-venous fistula
- Carotid occlusive disease
- Abdominal aneurysm
- Assessment of patients with documented arterial disease
- Renal vascular insufficiency.
- Evaluation or follow-up of patients with claudication, ischemic rest pain, and/or arterial ulceration
- Diabetes with peripheral circulatory disorder
- Pre-procedure assessment for planning of intervention
- Follow-up to determine technical adequacy of surgical intervention, i.e., post angioplasty and/or stent placement
- Follow-up of bypass grafts to detect intrinsic stenosis or progression of disease, which may threaten graft patency
- Absent or diminished distal or pedal pulse
- Skin or nail infections
- Skin color changes or ulcerations
- Distal extremity hair loss
- Gangrene
- Extreme weakness or fatigue
- Vasomotor instability
- Numbness

Autonomic Nervous System (ANS) Test

The autonomic nervous system (ANS) regulates physiologic processes, such as blood pressure, heart rate, body temperature, digestion, metabolism, fluid and electrolyte balance, sweating, urination, defecation, sexual response, and other processes. Regulation occurs without conscious control, i.e., autonomously. The ANS has two major divisions: the sympathetic and parasympathetic systems. Many organs are controlled primarily by either the sympathetic or parasympathetic system, although they may receive input from both; occasionally, functions are reciprocal (e.g., sympathetic input increases heart rate; parasympathetic decreases it).

The Autonomic nervous system (ANS) testing, including parasympathetic function (cardio vagal innervation), sympathetic adrenergic function (vasomotor adrenergic innervation), and sudomotor function (quantitative sudomotor axon reflex test [QSART], thermoregulatory sweat test [TST], and silastic sweat imprint test), may be considered **medically necessary** for use as a diagnostic tool.

Indication:

- Orthostatic hypotension
- Heat intolerance
- Nausea
- Constipation
- Urinary retention or incontinence
- Nocturia
- Impotence
- Dry mucous membranes

Brainstem Auditory Evoked Response (BAER) Test

The Brainstem Auditory Evoked Response (BAER) test, also known as auditory brainstem evoked response, detects abnormalities within the ear or brain by measuring brainstem responses to clicks or tones in the ear. This procedure is effective in diagnosing nervous system abnormalities and hearing loss.

During this test, electrodes are placed on the scalp and subtle noises are delivered to one ear. The brain's responses to these noises are recorded by the electrodes and analyzed to evaluate neurological function and diagnose hearing, balance or brain abnormalities.

Indications:

- Acoustic neuroma
- Balance disorders
- Tinnitus
- Multiple sclerosis
- Brain tumor
- Brainstem stroke

Echocardiogram & Holter Monitor

An echocardiogram (often called "echo") provides ultrasound imaging of the heart to examine its size and strength, as well as how well it is functioning. This procedure is often combined with Doppler ultrasound and color Doppler to evaluate blood flow across the heart's valves. An echocardiogram is non-invasive, has no known side effects and may be used to provide diagnostic assessment of the heart's condition.

The Journal of the American College of Cardiology (2007) has established appropriate criteria for cardiovascular imaging. These criteria include the following generally acceptable and reasonable indications, amongst others:

- Symptoms potentially due to suspected cardiac etiology, including but not limited to dyspnea, shortness of breath, palpitations, lightheadedness, syncope, TIA, cerebrovascular events
- Prior testing that is concerning for heart disease (chest x-ray, baseline stress echo, ECG, serum BNP elevation)
- Known or suspected congenital heart disease, arrhythmias, aortic disease
- Pulmonary hypertension
- Hypotension or hemodynamic instability
- Heart murmur
- Valve function evaluation, stenosis, regurgitation, infective encarditis, mitral valve prolapse
- Evaluation of intra- and extra-cardiac structures and chambers
- LV function evaluation
- Acute myocardial infarction
- Coronary insufficiency
- Cardiotoxic agent monitoring
- Pericardial disease detection

Electroencephalogram (EEG)

The Electroencephalogram (EEG) is used in the evaluation of brain disorders. Most commonly it is used to show the type and location of the activity in the brain during a seizure. It also is used to evaluate people who are having problems associated with various types of brain functions. These problems might include confusion, coma, tumors, long-term difficulties with thinking, memory, or weakening of specific parts of the body (such as weakness associated with a stroke).

Indications:

- Altered Mental Status
- Repeated Falling
- Depression
- Insomnia
- Anxiety
- Alzheimer’s Disease
- Hemiplegia/hemiparesis
- Disturbances of vision
- Ataxia
- Aphasia

Electromyography (EMG)

Also called a **myogram**, an **electromyography (EMG)** measures muscle response or electrical activity in response to a nerve's stimulation of the muscle. The test is used to help detect neuromuscular abnormalities.

During the test, one or more small needles (also called **electrodes**) are inserted through the skin into the muscle. The electrical activity picked up by the electrodes is then displayed on an oscilloscope (a monitor that displays electrical activity in the form of waves). An**audio-amplifier** is used so the activity can be heard. A functional capacity evaluation (FCE) evaluates an individual's capacity to perform work activities related to his or her participation in employment (Soer et al., 2008). The FCE process compares the individual's health status, and body functions and structures to the demands of the job and the work environment. In essence, an FCE's primary purpose is to evaluate a person's ability to participate in work, although other instrumental activities of daily living that support work performance may also be evaluated.

Indications:

- Muscular dystrophy
- Neuromuscular diseases, such as myasthenia gravis
- Nerve compression or injury, such as carpal tunnel syndrome
- Nerve root injury, such as sciatica

Functional Capacity Evaluation (FCE)

A functional capacity evaluation (FCE) evaluates an individual's capacity to perform work activities related to his or her participation in employment. The FCE process compares the individual's health status, and body functions and structures to the demands of the job and the work environment. In essence, an FCE's primary purpose is to evaluate a person's ability to participate in work, although other instrumental activities of daily living that support work performance may also be evaluated.

The FCE typically begins with a client interview, medical record review, and musculoskeletal screening. Functional testing may include graded material-handling activities such as lifting, carrying, pushing, and pulling; and positional tolerance activities such as sitting, standing, walking, balancing, reaching, stooping, kneeling, crouching, crawling, object handling/manipulation, fingering, hand grasping, and hand manipulation. Pain monitoring is frequently performed during the FCE to document client-reported levels of pain during various activities as well as to manage pain. The FCE may also include evaluation of an individual's hand dexterity, hand coordination, endurance, and other job-specific functions. - See more at: http://www.aota.org/about-occupational-therapy/professionals/wi/capacity-eval.aspx#sthash.hXArMleR.dpuf

Musculoskeletal Ultrasound

A musculoskeletal ultrasound is performed to examine the joints, muscles, tendons and ligaments in patients with chronic pain, limited joint function and other orthopedic symptoms that may occur after an injury or disease. This procedure is considered most effective in determining the cause of shoulder pain, as well as muscle and tendon tears, after an athletic injury.

Many different orthopedic conditions can be accurately diagnosed using musculoskeletal ultrasound scanning, as its real-time imaging allows for evaluation of the anatomy, motion and function of the targeted area.

Indications for Musculoskeletal Ultrasound:

- **Tendon:** Tendons in many parts of the body are readily visible with ultrasound, in particular the shoulder, ankle and Achilles tendon.
- **Bursae:** A swollen bursa can be detected with ultrasound, most commonly used around the shoulder and knee joints.
- **Ligaments:** Some ligaments can be demonstrated with ultrasound.

- **Foreign Bodies:** Not all foreign bodies will be visible using x-rays. Most will show with ultrasound. The location and damage to any surrounding structures is readily seen.

Nerve Conduction Velocity (NCV)

Nerve conduction velocity is a diagnostic exam that evaluates the function of the motor and sensory nerves throughout the body. This test is often performed to evaluate patients with numbness, tingling and/or weakness in the arms and legs.

During the NCV test, electrodes are placed over the nerve at different locations to deliver a small electrical impulse that stimulates the nerve. Recording the distance between electrodes and the time it takes for the impulses to travel between them help determine the speed of the signals. It is important that a normal body temperature be maintained during this test.

Indications:

- Peripheral neuropathy
- Diagnosis of suspected generalized neuropathies, such as diabetic, uremic, metabolic or immune
- Carpal tunnel syndrome
- Ulnar neuropathy
- Guillain-Barré syndrome
- Facioscapulohumeral muscular dystrophy
- Spinal disc herniation
- Traumatic nerve lesions for diagnosis and prognosis

Transcranial Color Doppler Imaging

A transcranial Doppler is a noninvasive imaging procedure that documents the flow of blood through cerebral arteries and veins. This exam is often performed to determine a patient's risk for a transient ischemic attack (stroke) or to monitor patients with sickle cell disease.

During this procedure, a transducer is moved across the base of the skull to produce images of the blood vessels through sound waves. The speed of blood as it flows through the brain is highlighted through different colors on the images.

Indications:

- Stenosis or occlusion in a major intracranial artery in the circle of Willis and vertebrobasilar system, including monitoring thrombolytic therapy for acute stroke patients.
- Follow-up of patients with known stenosis or occlusion of a major intracranial artery in the circle of Willis and vertebrobasilar system.
- Evaluation and monitoring of vasospasm in patients with subarachnoid hemorrhage.
- Detection of circulating emboli in a major intracranial artery in the circle of Willis and vertebrobasilar system.
- Detection of right-to-left shunts using agitated saline injection.
- Assessment of vasomotor reactivity.
- Confirmation of the clinical diagnosis of brain death by detection of complete cerebral circulatory arrest.
- Intraoperative and periprocedural monitoring to detect embolization, thrombosis, hypoperfusion and hyperperfusion.

Somatosensory Evoked Potential Testing (SSEP)

Somatosensory evoked potential (SSEP) testing evaluates the function of the central nervous system through nerve pathways that travel through the spine to the somatosensory region of the brain. Somatosensory literally translates into "body" (somato) and "reception and transmission of sense impression" (sensory). These tests are performed to evaluate and detect spinal cord injuries and disease, neuromuscular diseases and other conditions such as multiple sclerosis.

During the SSEP procedure, electrodes are attached to different areas of the arms and legs along the nerve pathway to the brain, as well as on the scalp. Once in place, small electrical currents are applied to the skin in the targeted area. The electrodes then record the body's nerve responses to these currents. Responses are analyzed by a special computer and then further interpreted by your doctor.

SSEP's demonstrate the function of the nerve fibers, rather than the anatomical structure. Thus, patients with persistent complaints, especially radicular symptoms, yet with negative findings on X-ray, CT or MRI will often exhibit positive sensory nerve deficits with SSEP testing.

SSEP's will help in determining the segmental level of the abnormality, allowing the treating physician to be selective in the level of care.

SSEP aids in the evaluation of:

- Herniated Disks
- Spinal Cord
- Tumor
- Numbness
- Myelopathy
- Spinal Trauma
- Tingling
- Radiculopathy
- Burning Sensations
- Multiple Sclerosis
- Brachial Plexus
- Lumbar Plexus
- SSEP Indications:
- Plexus stretch injury
- Thoracic Outlet Syndrome
- Carpal Tunnel Syndrome
- Evaluation of the peripheral nervous system
- Evaluation of cervical or low back pain
- Musculoskeletal injuries
- Brachial Neuritis

Videonystagmography (VNG)

Videonystagmography testing is used to determine if a vestibular (inner ear) disease may be causing a balance or dizziness problem, and is one of the only tests available today that can decipher between a unilateral (one ear) and bilateral (both ears) vestibular loss. VNG testing is a series of assessments designed to document a person's ability to follow visual objects with their eyes and how well the eyes respond to information from the vestibular system.

This test also addresses the functionality of each ear and if a vestibular deficit may be the cause of a dizziness or balance problem. To monitor the movements of the eyes, infrared goggles are placed around the eyes to record eye activities during testing. VNG testing is non-invasive, with minimal discomfort to the patient.

Indications:

- Feeling dizzy when you stand up.
- Vertigo
- Loss of hearing
- Loss of balance
- Blurry vision
- Nauseas
- Dizziness

Abdominal Aortic Ultrasound

An abdominal aortic ultrasound is a noninvasive exam that uses high-frequency sound waves to visually evaluate the aorta, the largest blood vessel in the body that carries blood away from the heart. This test determines if there are blockages, narrowing or aneurysm (an enlargement or a "bulge") in the aorta. Ultrasound is used to obtain images of the aorta and the blood flow within.

Abdominal aortic aneurysm (AAA), which involves a weakened, bulging area in the aorta that develops from high blood pressure or infection, can be effectively screened using ultrasound technology. AAA is diagnosed when the aorta expands to over three centimeters in diameter. As the size of the aneurysm increases, so does the risk of rupture. For patients enrolled in Medicare, an AAA screening must be performed within the first 12 months of enrollment.

The Society for Vascular Surgery and the Society for Vascular Medicine and Biology recommends the following courses of action after screening:

- No further testing if aortic diameter is less than 3.0 cm;
- Yearly ultrasonographic screening if aortic diameter is between 3.0 to 4.0 cm;
- Ultrasonography every 6 months if aortic diameter is between 4.0 to 4.5 cm;
- Referral to a vascular specialist if aortic diameter is greater than 4.5 cm.

Ultrasound imaging of the aorta is useful for measuring its size to screen for AAA. This test is recommended for men over the age of 60, as well as smokers and patietns with a family history of AAA. If a diagnosis of AAA is confirmed, ultrasound can be used to monitor the condition on a regular basis and determine appropriate treatment methods.

Indications:

- Palpable pulsatile abdominal mass
- Unexplained lower back pain or abdominal pain
- Known extremity aneurysmal disease
- Follow-up of a previously demonstrated abdominal aortic aneurysm
- Follow-up of patients with history of placement of aortic or iliac endoluminal graft

Abdominal Ultrasound

An Abdominal Ultrasound is performed to visually evaluate abdominal organs, including the liver, gallbladder, pancreas, bile ducts, abdominal aorta and spleen, to help detect a wide range of conditions and also assess blood flow to these organs.

Ultrasound can detect cysts, abscesses, obstructions, fluid collection, clots and infection in the abdomen. In a recent study, the General Practitioner's anticipated patient management strategy was changed for 64% of patients following upper Abdominal Ultrasound. Negative findings are important for exclusion of diseases and, therefore, for reassurance of the patient. Abdominal Ultrasound substantially reduced the number of intended referrals to a medical specialist, and more patients could be reassured by their General Practioner.

There is no discomfort, risk or radiation exposure with ultrasound. There are some conditions that may interfere with the results of the abdominal ultrasound exam. The most common are severe obesity, intestinal gas and barium in the intestines from a GI series that was performed prior to the ultrasound exam.

Indications for use:

- Abdominal pain is the most common indication for an abdominal ultrasound.
- Abnormal liver function
- Enlarged abdominal organ
- Stones in the gallbladder or kidney

- Abnormal laboratory results suggestive for abdominal pathology
- Search for metastic disease
- Palpable abnormalities

Pelvic Ultrasound

A pelvic ultrasound is performed to visualize the organs within the pelvis, including the bladder, ovaries, prostate and other related structures in order to detect and evaluate conditions such as cancer, fibroids, ovarian cysts, kidney stones and urinary tract infections.

Doppler ultrasound technology may be used to view blood flow through the pelvis for a more accurate diagnosis. Male and female ultrasound exams may be performed using different techniques.

Indications:

- **Pelvic Pain** which is a common complaint patients present due to entities such as ovarian cysts, tubo-ovarian abscesses, and uterine fibroids.
- **Pelvic mass**
- **Pelvic Infection** particularly tubo-ovarian abscesses which are difficult to diagnose at physical examination.
- **Pelvic Trauma** to evaluate for free fluid or clotted blood, which can be present in the pouch of Douglas (cul-de-sac).
- **Abnormal Uterine Bleeding** in the premenopausal patient as well as the postpartum and post abortion patient.
- **Bladder Stone Identification**
- **Blockages to Blood Flow** (such as clots).
- **Narrowing of Vessels** (which may be caused by plaque)

Renal Ultrasound

A renal ultrasound uses sound wave technology to detect and diagnose conditions within the kidneys, bladder and ureters, such as kidney stones, cysts, masses and infection, which can be identified by changes in the tension of the bladder walls or the overall size and structure of the kidneys.

Indications:

- Flank pain, hematuria or abnormal renal function
- Assessment of renal and perirenal mass found on physical examination or other imaging study
- Assessment of dilated upper urinary tract
- Postoperative evaluation after renal and ureteral surgery
- To assess the dynamics of the upper tract effects of voiding
- Evaluation for and monitoring of urolithiasis
- Intra-operative renal parenchymal and vascular imaging for ablation or resection of masses
- Evaluation of hematuria in patients who are not candidates for IVP, CT or MRI.
- Percutaneous access to renal collecting system
- To guide transcutaneous renal biopsies, cyst aspiration or ablation of masses
- Evaluation of postoperative renal transplant patients
- Interior Vena Cava, detection of invasion by tumor & filter localization
- To preclude obstruction in symptomatic patients
- Changes in the bladder wall
- Changes in kidney size or structure
- Kidney stone, cyst, mass, or other obstruction in the kidney
- Stones in the urinary tract
- Changes in the ureters

Thyroid Ultrasound

A thyroid ultrasound produces images of the thyroid gland in patients with swelling or dysfunction, such as a lump, cancer, Grave's disease, hypothyroidism or Hashimoto's disease. The thyroid often becomes enlarged or inflamed as a result of these conditions, which may require regular monitoring.

Lumps and masses commonly develop in patients who have undergone radiation therapy, so these patients may be screened with a thyroid ultrasound.

Indications:

- Evaluation of the location and characteristics of palpable neck masses
- ABN Thyroid function test
- Thyroiditis
- Abnormalities detected by other imaging examinations or laboratory studies, including areas of abnormal uptake seen on radioisotope thyroid examinations.
- Evaluation of the presence, size, and location of the thyroid gland.
- High-risk patients for occult thyroid malignancy.
- Follow-up of thyroid nodules, when indicated.
- Recurrent disease or regional nodal metastases in patients with proven or suspected thyroid carcinoma.