Quality Systems. Trusted Results.
Look with confidence to WR Medical to be your partner in Autonomic and Peripheral Nerve Testing.

Autonomic and peripheral neuropathies affect nerves that manage everyday body functions such as blood pressure, heart rate, bowel and bladder emptying, digestion, and the ability to feel sensation.

Autonomic and peripheral neuropathies can be acquired or hereditary. The degree and type of involvement varies extensively, and can range from subclinical or clinically irrelevant symptoms to those that are disabling. Symptoms may include constipation, nausea, diarrhea, shortness of breath with exercise or activity, dizziness when standing, abnormal sweating, heat or cold intolerance, and urinary incontinence.

Testing in a standardized, recognized, and quantified way is the necessary step between recognizing symptoms and providing proper treatment.

Physicians and researchers world-wide rely on WR Medical Electronics Co. for scientifically validated equipment and exceptional support.

WR TestWorks labs provide answers on the severity, pattern, and distribution of autonomic and peripheral nerve disorders, enhancing the opportunity for early detection and proper treatment, thereby significantly increasing positive outcomes.

WR TestWorks labs add value to your practice and to your facility, by creating modern, full service neurological testing and neurodiagnostic centers of excellence.

WR TestWorks labs are modular, so you can start with one or more types of testing (cardiovagal, sudomotor, Adrenergic, or QST) and add other systems as your interests, needs, and budget grow.

WR TestWorks labs are standardized and well established, so results can be compared to normative data compiled using the same methodology, and interpreted easily and consistently.

WR TestWorks labs are non-invasive, and can be performed by trained technicians, typically EMG or EEG personnel. Training is provided by WR Medical Electronics Products Specialists for all labs in the USA and Canada.

Our Commitment to You...

When considering a new equipment purchase, you look for a manufacturer that provides more than exceptional products and a stable history. You require the service and support to keep things running smoothly for years. We at WR Medical Electronics Co. take pride in manufacturing high-quality robust equipment and supporting our customers, allowing you to stay focused on your patients.

I look forward to working with you, and together we’ll set the pace for autonomic function testing.
Heart Rate Variation is a measure of Cardiovagal (Parasympathetic) Function. Two commonly used and simple measures of HRV:
- HRDB (Heart Rate Response to Deep Breathing)
- Valsalva Ratio

Cost effective, easy-to-perform, and time efficient measurements.

Tests and Analyses available:
- Heart rate response to deep breathing (HRDB), using either ECG or R-R interval
- Valsalva Maneuver, using either ECG or R-R interval
- Head-up Tilt (Requires optional Tilt Table)
- E:I Ratio
- Cardiovagal and Adrenergic Analysis (BRS_A1 Method)

Included are the all new HRV Acquire, testing computer, software, cart, medical grade power isolation transformer, and all necessary connective hardware. The HRV Acquire combines an ECG, patient cue, manometer, chest expansion bellows, and beat to beat blood pressure inputs all in a single, easy to use device. Comparative reference ranges are included in the WR TestWorks software.
A key component in determining the severity and pattern of autonomic disorders is the study of a patient’s sudomotor response. The Q-Sweat, provided by WR Medical Electronics, brings sudomotor testing to your clinic. The Q-Sweat examines the integrity of the postganglionic sympathetic sudomotor axon, assisting in the diagnosis of small fiber neuropathies.

The Q-Sweat Quantitative Sweat Measurement Lab provides physicians with several useful tools, including:

- Measurements of rate in nL/minute and totalized volume in mL
- Two different ways to test sweat utilizing up to 4 body sites simultaneously
  - Resting Sweat test - a measurement of the body’s resting sweat rate
  - Evoked Sweat test – a measurement of the body’s response to stimuli (QSART)
- Accuracy down to .1 nL, with traceable history of output that is standardized and repeatable
- Time efficient testing, with a standard recording completed in as little as 11 minutes.
- WR TestWorks software, providing the ability to compare a patient’s results to published reference data

The Q-Sweat System can easily be added to an existing CASE IV QST or WR TestWorks Cardiac Testing lab for enhanced capabilities.

All labs include on-site installation and training within the United States and Canada.
A variety of complaints and conditions bring patients to the Autonomic Function Laboratory:

- Diabetes
- Orthostatic Hypotension
- Syncope
- Tachycardia
- Shy-Drager Syndrome
- Amyloidosis
- Peripheral Autonomic Neuropathy
- Multiple Sclerosis
- Chronic Hypotension
- Causalgia
- Hyperhidrosis

Tests and analyses available to assist in patient diagnosis include:

- Heart Rate Response to Deep Breathing (HRDB), using ECG or R-R interval
- Valsalva Maneuver, using ECG or R-R interval
- 30:15 Ratio, using ECG or R-R interval
- E:I Ratio
- Baroreflex sensitivity including cardiovagal and adrenergic analyses
- Head-up tilt analysis (requires optional tilt table)
- Quantitative sweat measurements of both resting and evoked sweat potential

WR TestWorks Full Autonomic Lab

The full autonomic lab available from WR-TestWorks allows clinicians to perform a broad range of tests in the search for autonomic neuropathies and dysfunction. This lab includes the cardiac lab, the Q-Sweat quantitative sweat measurement system, and beat-to-beat blood pressure acquisition for testing of cardiovagal (parasympathetic) function, adrenergic (sympathetic) function, and sudomotor axon reflex function. With the inclusion of the optional WR Tilt Table even more functionality is added, which can be used to create a Composite Autonomic Severity Score (CASS).

All tests are non invasive, standardized, quantitative, and easy to perform. A full autonomic assessment can be performed in as little as one hour per patient.
The **WR Tilt Table** is a useful tool for Cardiac (HRV) and Full Autonomic Function labs, giving the ability to perform head-up tilt testing. The **WR Tilt Table** provides near effortless evaluation of patients presenting with syncope and dizziness.

Designed specifically for autonomic testing, this table has a rapid tilt (0 to 70 degrees in 9 seconds). There is a wide choice of positions for a clinician to choose for patient testing, including a -12 degree Trendelenberg position. Up to three pre-set tilt angles can be programmed into the programmable tilt control hand switch, which are then available at the push of a button.

Transitioning from supine to vertical positions is smooth, thanks to a powerful electromechanical drive. The **WR Tilt Table** also includes a removable footboard for stress free patient access and 2 restraining belts for comfort and safety. The **WR Tilt Table** is ergonomically designed with both clinician ease and patient comfort in mind.

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CPT codes allow for 3 separate tests of the autonomic nervous system by neurologists.

- **95921** Cardiovagal innervation (parasympathetic function), including 2 or more of the following: heart rate response to deep breathing with recorded R-R interval; Valsalva ratio, and 30:15 ratio

- **95922** Vasomotor adrenergic innervation (sympathetic adrenergic function), including beat-to-beat blood pressure and R-R interval changes during Valsalva maneuver and at last 5 minutes of passive tilt

  *(Do not report 95922 in conjunction with 95921)*

- **95923** Sudomotor, including 1 or more of the following: quantitative sudomotor axon reflex test (QSART), silastic sweat imprint, thermoregulatory sweat test, and changes in sympathetic skin potential

- **95924** Combined parasympathetic and sympathetic adrenergic function testing with at least 5 minutes of passive tilt

  *(Do not report 95924 in conjunction with 95921 or 95922)*

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Service and support are a very important part of your purchasing decisions, and can have a significant impact on you and your patients.

Our knowledgeable Help Desk staff understands the importance of reliable equipment. By phone or e-mail, you can reach friendly assistance for hardware and software issues. We work with biomed and IT departments at your facility to assure that your lab will be running smoothly and seamlessly with as little interruption as possible.

We aim to have long-lasting, sound relationships with our customers. We know that to maintain them we must be available and ready to help when ever assistance is required.
The CASE IV QST lab focuses on the testing of sensory abnormalities in the areas of temperature change sensation, vibration, and pain threshold testing. Safe and proven testing patterns developed at the Mayo Clinic® assist in the assessment of sensory abnormalities due to neurologic disease, help in the determination of type of dysfunctional fibers, and quantitatively verify the effectiveness of small and large unmyelinated nerve fibers.

The CASE IV QST lab utilizes two stimulators to determine sensory threshold. Patient responses to safe, effective stimuli are used to generate a sensory threshold level which are then compared to reference data available with the WR TestWorks software.

The CASE IV QST lab includes stimulators, patient instruction cards for clear, concise, and standardized instruction, a patient supply kit, an equipment cart, and a computer running the WR TestWorks software with printer.

Get more functionality from your lab by adding a Q-Sweat or Cardiac system. On-site installation and training is included for all labs in the United States and Canada.
Manual Quantitative Sensory Testing (QST) Tools

For clinicians who require more portability or simply need a quick and inexpensive method for assessing sensory neuropathies, consider WR Medical Manual QST tools. These include the Minnesota Thermal Disks and a Logarithmic Filament Set. With these simple instruments tests can be performed that include touch-pressure sensation threshold, warming/cooling of different material thresholds, and touch-pressure-as-pain threshold.

These tools can be purchased individually or with the WR TestWorks software, to provide guidance in testing steps, a patient database for record keeping, and automated evaluation of threshold values.

Smart Somatotopic Sensation Testing (S-ST-QSTing)

The WR TestWorks S-ST Logarithmic monofilament set is a simple yet ‘Smart QST’ system for standard, quantitated, and validated touch pressure threshold measurements of large fiber sensation.

Testing is done on 10 body surface areas to assess distributed sensation loss of touch pressure. S-ST QSTing is highly standardized and validated in the scientific literature.

Use in conjunction with WR TestWorks software to provide valuable guidance on testing sequence and for patient database management. WR TestWorks software will generate a report summarizing patient data, stimuli given, choices made, and comparison to reference values.

Part of the ‘Smart QST’ suite of products.
Minnesota Thermal Disks

Minnesota Thermal Disks are simple, inexpensive thermal stimulators, for hand-administered stimuli of small fiber function. The design is based on the differences in heat transfer of copper, stainless steel, glass, and polyvinyl chloride. Measurements can be taken on several body locations to assess sensory neuropathies.

Minnesota Thermal Disks can be purchased stand alone (with laminated instructions) or in conjunction with the WR TestWorks software to provide guidance in testing steps, a patient database for record keeping, and automated evaluation of threshold values.

Part of the ‘Smart QST’ suite of products.

Sniff Magnitude Testing (SMT)

Winner of the Popular Science Award for Best of What’s New 2007

The Sniff Magnitude Testing kit allows clinical evaluation of olfactory sensory capabilities. This kit is able to quantitatively measure sniff pressure, measuring and comparing results across four separate scents to determine the ratio of odor to malodor. These values are automatically computed by the included WR TestWorks software, placing the calculated values at your fingertips for ease of evaluation.

There is minimal dependence on language, cognitive ability, memory, or the ability to name specific odors. Testing is simple to perform even with older adults and young people, and can be done rapidly, allowing for fast, easy, quantified testing of olfactory function.

The SMT Kit includes the Sniff Magnitude interface, four scent canisters, scent pads, tubes, computer interface cable, and computer running the WR TestWorks software.

* Popular Science is a registered trademark of Bonnier Corporation.
**Iontophoresis**

**Iontophor® - II Iontophoresis Device**

In Physical Medicine and Pain Management, iontophoresis is used to deliver anti-inflammatory drugs and local anesthetics to localized areas of inflammation. The fully-programmable **Iontophor-PM/DX**, allows you to perform both single and dual phase treatments. Iontophor-PM/DX’s dual site treatment function enables you to treat two sites simultaneously, saving time and increasing cost-effectiveness.

The **Iontophor-PM/DX** also identifies and displays Open Circuit. When inadequate patient contact occurs, Iontophor-PM/DX indicates “Open”. When patient contact is re-established, the current automatically returns to the preset level, and delivery continues until the required dose is achieved.

**Meditrode® Drug Delivery Electrodes**

Meditrodes are available in seven different sizes and five different shapes to enable application over a variety of surface areas, including finger, elbow, ankle, shoulder and temporomandibular joint. Each Meditrode features a flexible backing on a conformable absorbent pad, making local iontophoretic drug delivery safer and easier than ever.
WR Medical Electronics Co. is a privately-held company located near St. Paul, Minnesota. Our customers have enjoyed our quality products and superior service since 1962.

It has been our privilege to collaborate with world-renowned physicians in the neurology field, such as Peter J. Dyck and Phillip A. Low, both of Rochester, MN, on innovative products for the assessment of peripheral sensory thresholds and autonomic function testing.

We intend to continue to work closely with other physicians and practitioners on original and marketable ideas to advance the study and practice of neurophysiology.

Our commitment to quality control and customer satisfaction is evident in all we do. Please contact us for more information on any of our products. We look forward to hearing from you.