WR MEDICAL

Validated and **efficient** neurological and cardiac testing solutions.

AUTONOMIC

WRTESTWORKS

PERIPHERAL

Quality Systems. Trusted Results.

The Leader in Full Autonomic Function Testing and Small Fiber Testing Solutions that are efficient, validated, and help physicians and patients find the answers they deserve sooner.

PROVIDING STANDARDIZED QUANTITATIVE ASSESSMENTS OF:

AUTONOMIC DYSFUNCTION

Integrated QSART, Heart Rate Variability and Beat-to-Beat Blood pressure testing combine cardiovagal, sudomotor and adrenergic results in one report.

SYNCOPE, POTS

Head-up Tilt is integrated with the WR Tilt Table and tests for the causes of dizziness or fainting.

NEUROPATHY

Length-dependent loss of sensation to vibration, touch, heat, and cooling can be tested using our CASE Quantitative Sensory Testing (QST) System, or monofilaments (touch test).

HYPERALGESIA

Heat Pain QST testing, a validated and repeatable method of assessing pain perception.

ABOUT US...

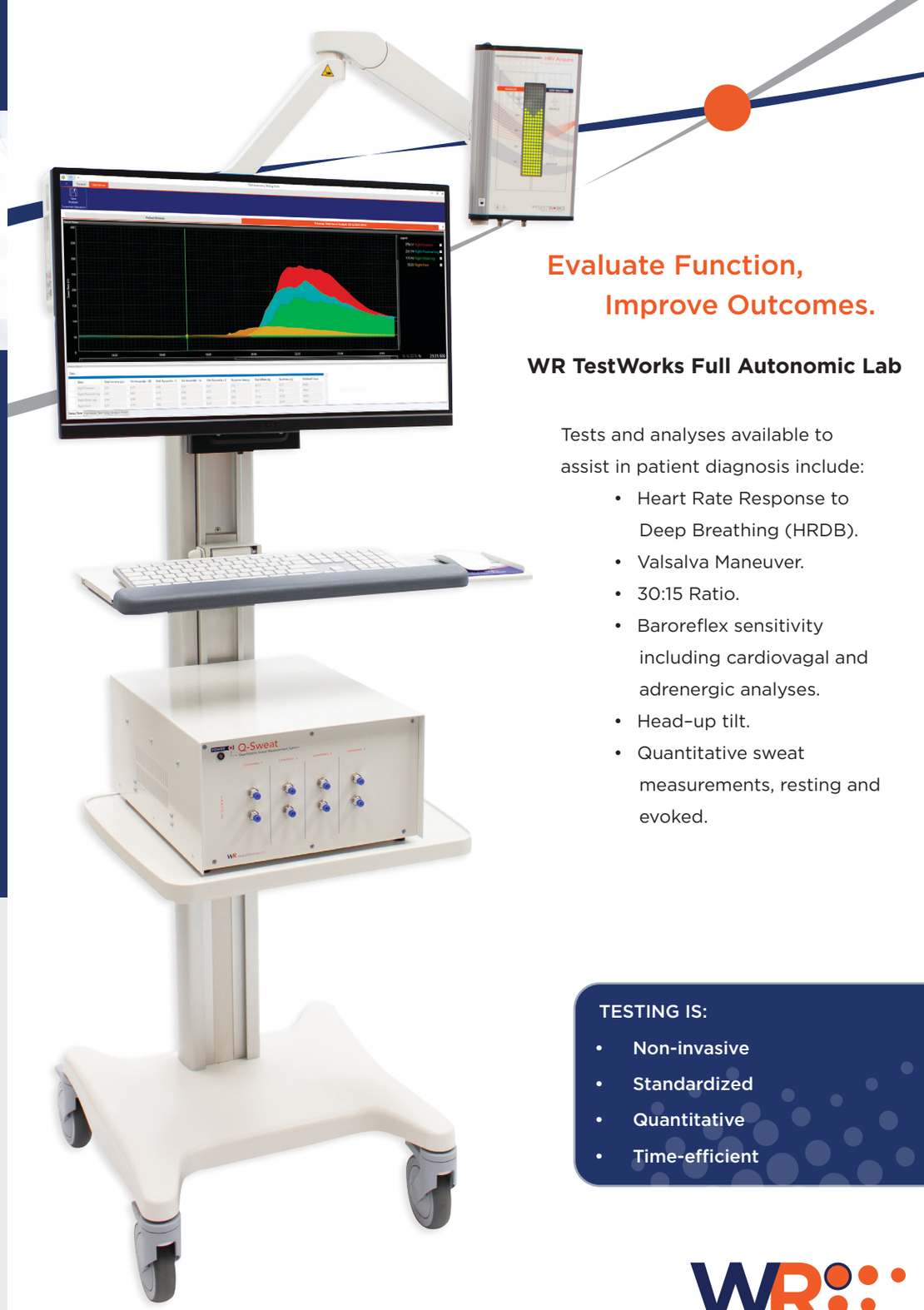
WR Medical Electronics Co. is a privately-held company located near St. Paul Minnesota. Our customers have enjoyed our quality products and superior service since 1962.

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.

1962 2022
WR MEDICAL ELECTRONICS



Evaluate Function, Improve Outcomes.

WR TestWorks Full Autonomic Lab

Tests and analyses available to assist in patient diagnosis include:

- Heart Rate Response to Deep Breathing (HRDB).
- Valsalva Maneuver.
- 30:15 Ratio.
- Baroreflex sensitivity including cardiovagal and adrenergic analyses.
- Head-up tilt.
- Quantitative sweat measurements, resting and evoked.

TESTING IS:

- **Non-invasive**
- **Standardized**
- **Quantitative**
- **Time-efficient**

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Q-Sweat

Quantitative Sweat Measurement System

WR TestWorks Q-Sweat Quantitative Sweat Measurement Lab

A key component in determining the severity and pattern of autonomic disorders is the study of a patient's sudomotor response. 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 uL.
- Determine sweat output on 4 body sites simultaneously.
    - Evoked Sweat test – a measurement of the sweat rate response to stimuli (QSART).
    - Allows Bilateral sweat testing.
    - Resting Sweat test - a measurement of the body's resting sweat rate (optional).
- Accuracy down to .25 uL, with traceable history of output that is standardized and repeatable.
- Time efficient testing, of up to four sites simultaneously in as little as 30 minutes.

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

All labs include on-site installation and training within the United States.

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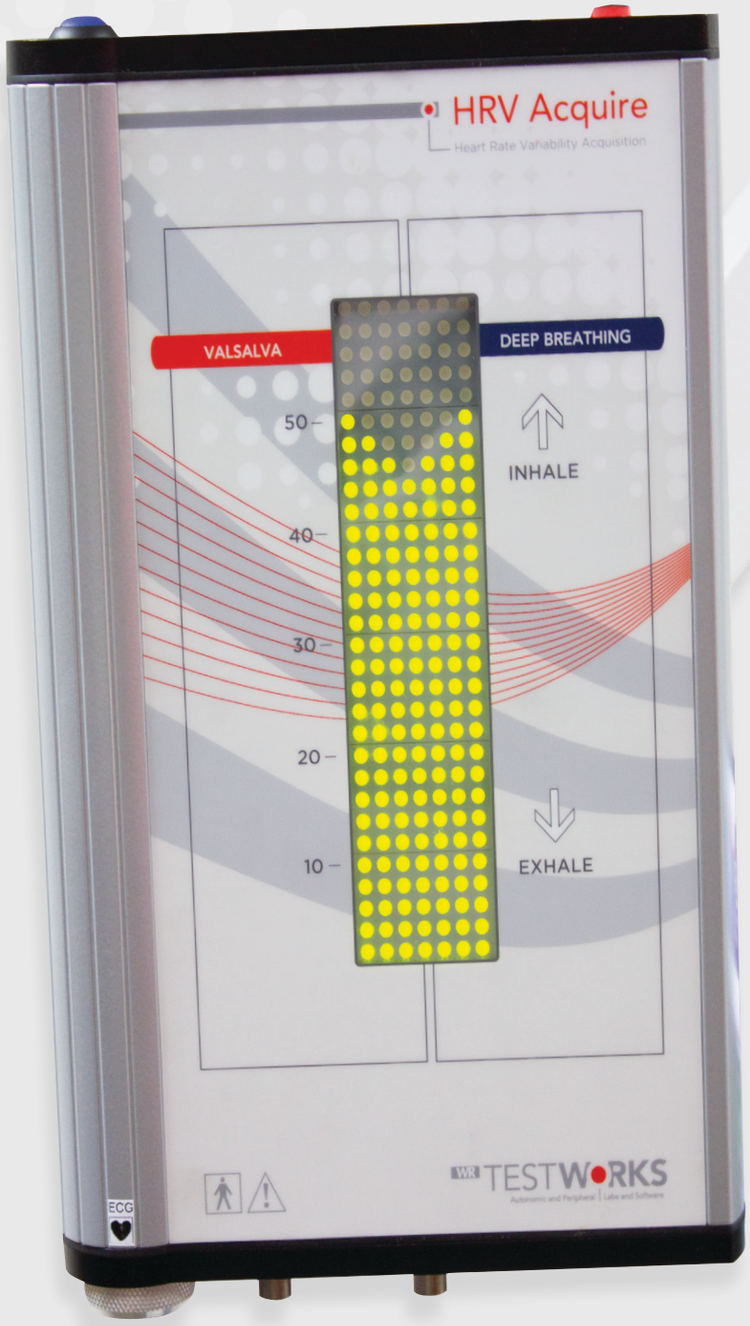

HRV Acquire

Heart Rate Variability Acquisition

Build the Foundation for your Autonomic Testing Lab

WR TestWorks Cardiac Testing Lab

Measuring heart rate variability is an essential component to autonomic testing, and a cost-effective way to begin building the foundation for a lab that produces clinically significant results.

The **HRV Acquire** is a simple to use and standardized method of assessing heart rate variability during the Heart Rate Response to Deep Breathing (HRDB) test and the Valsalva Maneuver (VM).

During HRDB patients are instructed to follow a breathing cue while chest expansion effort and heart rate are measured. A quick, automated analysis of peak-valley heart rate is then performed, either from the ECG or R-R interval, and can be compared to published normative data.

For the Valsalva Maneuver the patient is instructed to maintain an expiratory pressure of 40 mm of mercury for 15 seconds by following the visual cues and countdown shown on the **HRV Acquire** screen. Data is seamlessly transferred from the **HRV Acquire**, into our intuitive, easy to use **WR TestWorks** Software where it is automatically analyzed and compared to the most recently published normative data.

With the addition of an optional Beat-to-Beat continuous blood pressure monitor, dynamic alterations of BP can be used to detect adrenergic failure. Additional analyses are available for assessing blood pressure changes.

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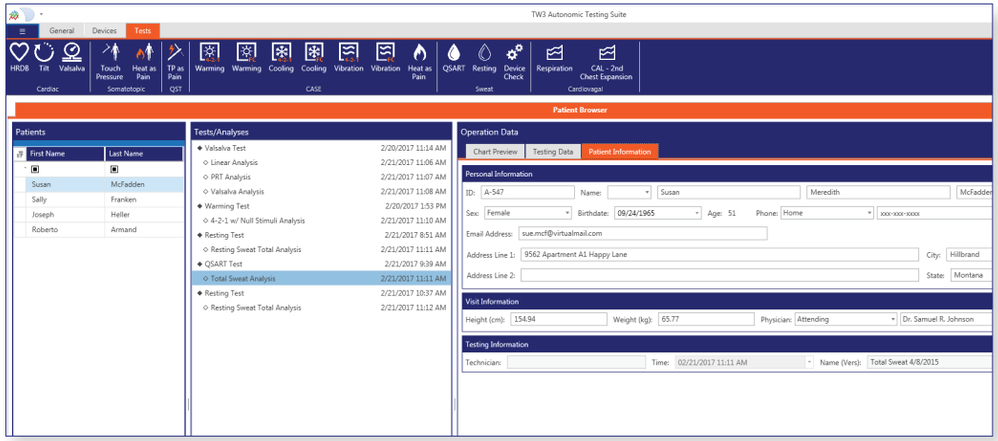
WR TESTWORKS 3 Software

Dependable, Configurable.

WR TestWorks Software has made use of extensive feedback from clinicians and technicians around the world to greatly improve the user experience and testing efficiency. **WR TestWorks** seamlessly integrates the entire range of autonomic testing products we offer into one simple to use program, loaded with tests, analyses and features that make autonomic evaluation a practical and valuable tool for providing physicians with the data they need to improve patient outcomes.



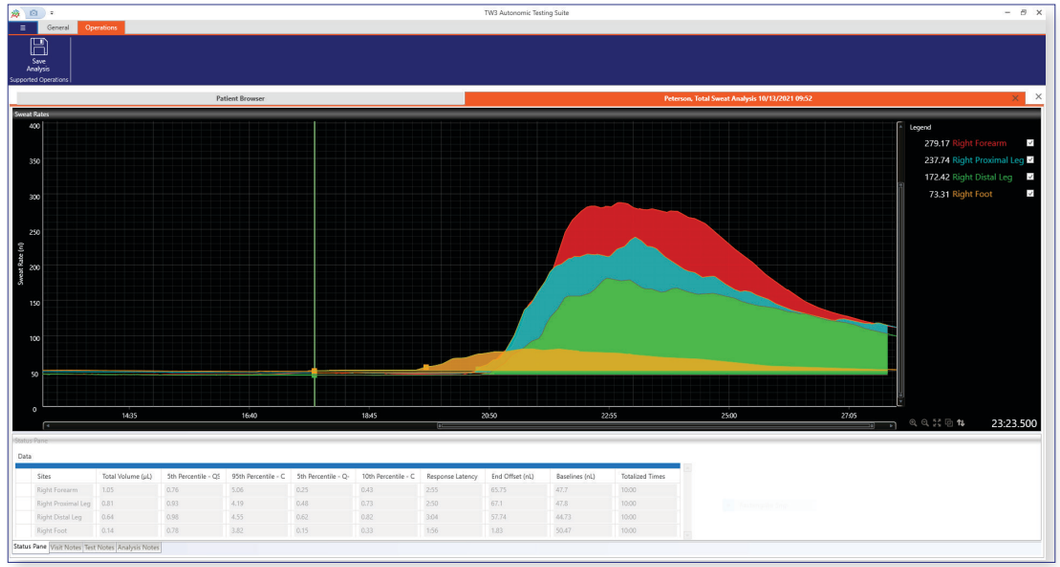
Patient Browser

KEY FEATURES:

- System can be stand-alone or connected to hospital networks.
- Data can be shared on a network connected SQL database, with multiple users accessing the same data.
- Highly Customizable report options.
- Expanded export routines.
- Single database for ease of data storage.

WR TestWorks SOFTWARE SUPPORTS THE FOLLOWING DEVICES:

- HRV Acquire
- Q-Sweat
- CASE IV
- CNSystems CNAP
- Manual QST/ Smart Somatotopic Sensation Testing



Sweat Output Analysis

TESTS AND ANALYSES IN WR TestWorks

- Tests and analyses can be customized per site/institution.
- Users can design custom tests without requiring new software.
- Display of time markers can be toggled on/off.
- Notes outside of test/analysis can be edited and saved for later recall.
- Time markers can be edited as needed.

Valsalva Maneuver Analysis

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TESTWORKS 3 Software

Dependable, Configurable.

Tilt Table

Head-up Tilt Testing


TESTWORKS 3 WR TW3 Autonomic Test Suite Report

18 September, 2018 3:08:49 PM

Testing Facility

Northland General Hospital - Neurology
495 4th Avenue North, St. Paul, MN 55104
Phone: 651-387-4000
Fax: 651-387-4001
Email: neuro@ngh.com

Initial Impression: Patient reports dizziness and lethargy.

Patient Profile

ID: 1 | Name: Joseph Heller | Referring: Dr. Adrian Jones
Sex: Male | Birthdate: 02/17/1985 | Attending: Edwin Kowalski
Height: 71 cm | Weight: 178.57 lbs | Primary: Dr. James E. Kline
Visit Remarks:
Patient has gained 10 pounds since last visit

Test

Valsalva Test - Version Date 11/13/2014

Time: 3/5/2018 10:49 AM | Technician: Sandy Klein

Test Notes: Patient had difficulty completing the maneuver.

Analysis

Linear Analysis - Version Date 1/1/0001

Time: 6/28/2018 2:08 PM | Technician: Dr. Alan Harmon

Analysis Notes: Scatter pattern seems higher than normal, possible neuropathy.

Results

Offset 1	Source HR	Best Fit 1
Slope 0.1	r Value 0.24	p Value 0.0


TESTWORKS 3 WR TW3 Autonomic Test Suite Report

18 September, 2018 2:54:35 PM

Sweat Rates

Sweat Rate (ml/cm/S)

Time

ID: 1

ID: 2 Name: Sally Franken

TESTWORKS 3 WR TW3 Autonomic Test Suite Report

18 September, 2018 3:08:49 PM

Heart Rate Data

Heart Rate/Blood Pressure

R-R Interval

Interval (ms)

Linear Regression

Milliseconds

mmHg

ID: 1 Name: Joseph Heller Page 2 of 3

Combined Report

CUSTOMIZABLE TEST REPORTS

(Included in our Software Service Plans.)

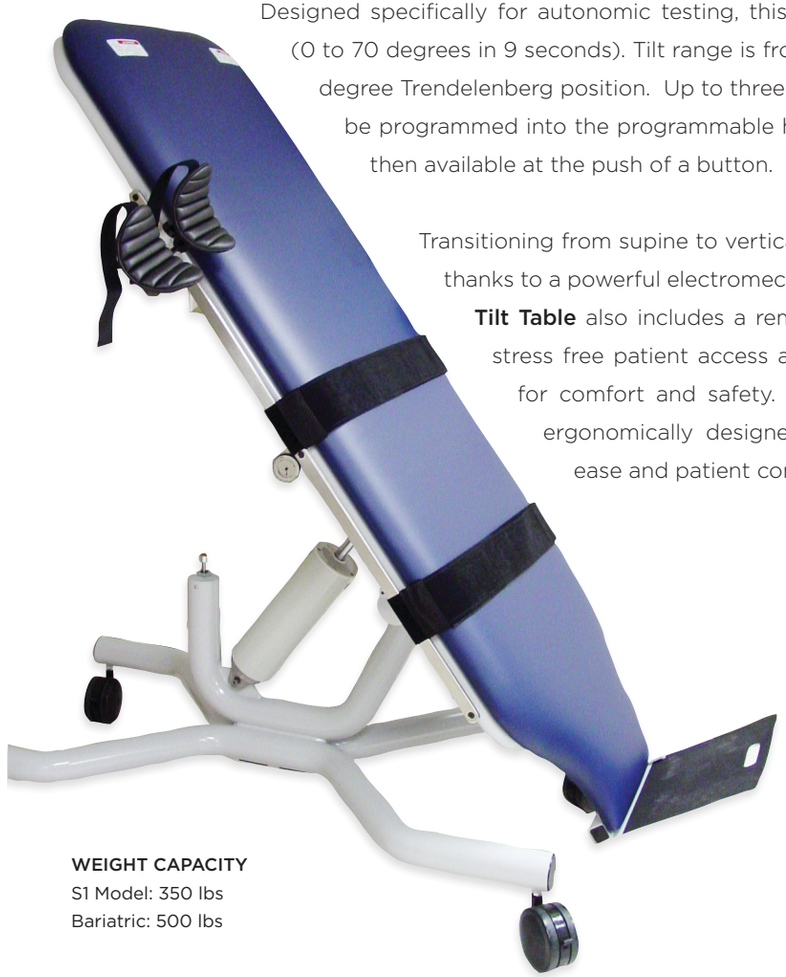
- Multiple custom report styles.
- Ability to enter custom text on reports.
- Multiple patients and multiple tests/analyses per report supported.
- Direct export to PDF, HTML, XLS, CSV, Word, and RTF.
- Ability to directly e-mail a report.
- Ability to send reports to EHR systems that are FHIR compliant.

WR Tilt Table

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). Tilt range is from 85 degrees to a -12 degree Trendelenberg position. Up to three pre-set tilt angles can be programmed into the programmable hand pieces 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.



WEIGHT CAPACITY
S1 Model: 350 lbs
Bariatric: 500 lbs

PROGRAMMABLE HAND PIECE
Preset to allow quick access to 3 different tilt angles at the push of a button!

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Setting New Standards in Hemodynamic Assessment!

CNAP®

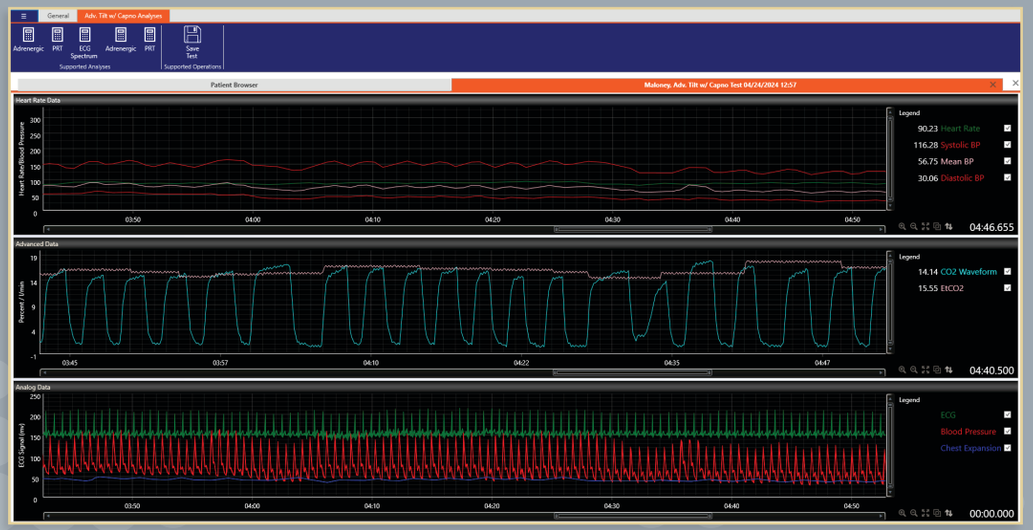
Continuous Non-invasive Arterial Pressure

WR TestWorks Cardiac Lab with integrated Task Force® CORE provides all relevant hemodynamic parameters non-invasively, continuously and completely synchronized for an early detection of rapid and short-term changes in hemodynamics and autonomic assessment.

- Finger blood pressure: CNAP® waveform, SYS, DIA, MAP.
- Upper arm NBP: SYS, DIA, MAP.
- Advanced hemodynamics (CNAP® HD): SV, SI, CO, CI, SVR, SVRI.
- 3 lead ECG, Heart Rate (HR).
- Patient cue, Valsalva and HRDB.
- Automated, efficient workflow that allowing you to concentrate on your patient.

Integrated Beat-to-Beat Blood Pressure Module

Advanced Hemodynamics



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Ionto4

Iontophoretic Stimulator

One Device, 4 Patient Sites!

Iontophoresis is a non-invasive method of delivering medications directly into a localized treatment area. It is an easy to apply, simplified, and time efficient therapeutic reagent delivery method.

The **Ionto4** Iontophoresis Device delivers a reliable dose of constant current to 4 channels at once with one click, eliminating the need to pause and resume multiple stimulators. It is designed specifically for ease of use, time efficiency and current delivery accuracy during QSART testing, and is compliant with the newest safety standards.

The **Ionto4** ships with a pre-programmed protocol that stims the patient for 5 minutes at 2mA, ramps down and then records for an additional 5 minutes for a total time of 10 minutes.

Compressed, Hand-Held Design Consolidates Treatment Space Required.

4-SITE ISOLATED, SIMULTANEOUS DRUG DELIVERY!

- Interruption-free one-click start and control of all 4 physiological sites at once.
- All 4 channels are completely isolated with no risk of interaction.
- Recalls stored custom treatment profiles for all channels.

ADDITIONAL FEATURES:

- Powered by 4 AA NiMH Rechargeable Batteries (charger & batteries included).
- Keyed connectors provide secure, reliable connections.
- Ensures complete treatment delivery by requiring sufficient battery life to operate.

ETCO2

End-Tidal CO2 Integration

Easily expand your HRV Acquire Testing options with ETCO2 Integration!

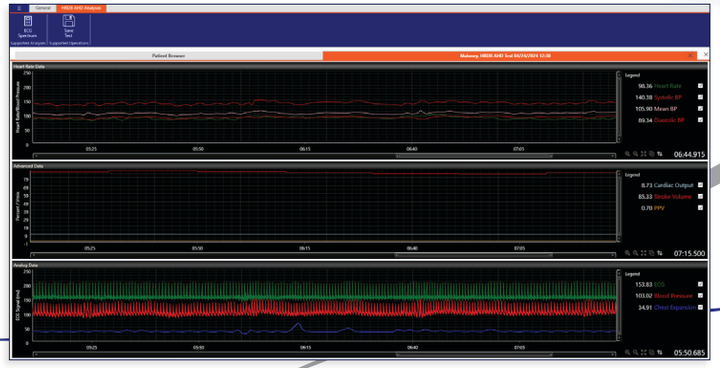
ETCO2 Data Acquisition Module

Allows acquisition of ETCO2 via nasal or sampling line.

WR TestWorks Breakout Box

Allows any 4 additional analog signals into an existing HRV Acquire Device.

ETCO2 and Raw Waveform Output



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Notes:

Help Desk

Service and Support

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.

Service and Support

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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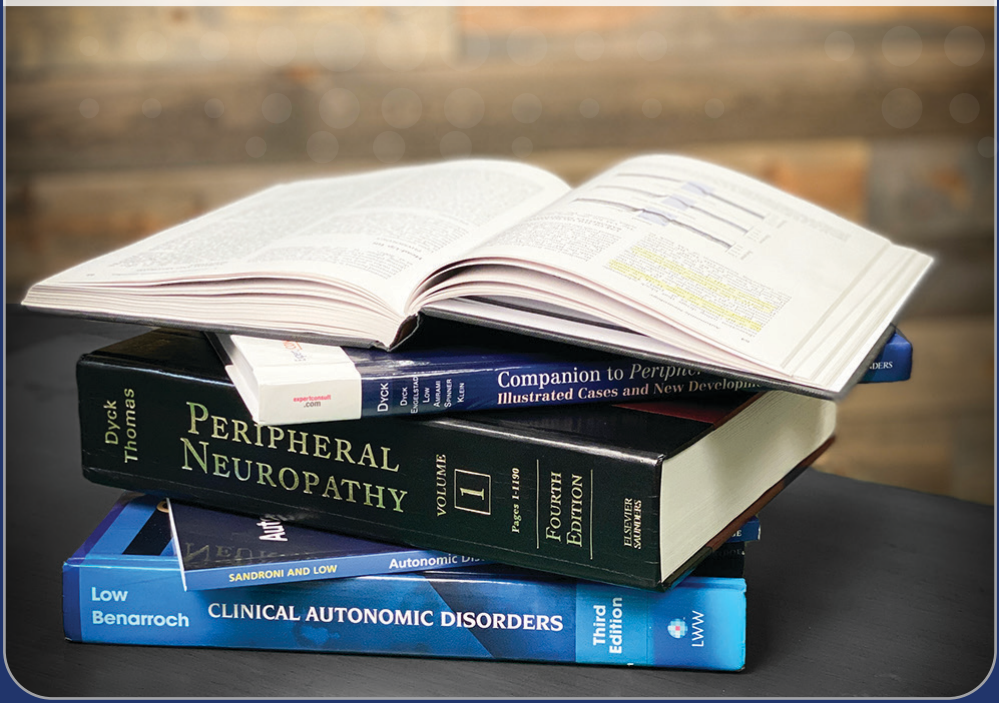
THE PUBLISHED SOLUTION

WR Medical has worked with the pioneers of Autonomic and Peripheral testing for over 30 years to develop validated, highly credible and efficient neurological testing solutions and software to meet the specific needs of Autonomic and Peripheral Neurology.



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1700 Gervais Avenue
Maplewood, MN 55109 USA
www.wrmed.com
neuro@wrmed.com

Phone: **(651) 604-8482**
Toll-free (USA Only): **(800) 635-1312**