

[www.neumed.com](http://www.neumed.com)



NeuroDyne Medical

# Electromyography & Autonomic Nervous System Monitoring

at its best

**Advanced Instruments and Software  
that are renowned for:**

**Innovation**

**Reliability**

**Ease of Use**





# sEMG and Autonomic Nervous System Monitoring

for Evaluation and Treatment of

1. Mental Health
2. Spinal Imaging & Rehab
3. Incontinence
4. Neuromuscular Rehab
5. TMJ
6. Education and Research
7. Supplies and Disposables



System/3 Series



NeuroCart™



NeuroKiosk™

NeuroDyne Medical, Corp., 186 Alewife Brook Parkway, Cambridge, MA 02138 USA  
 Phone# 617-234-1100, Toll Free from USA and Canada: 1-800-9-NeuMed  
 Fax# 617-234-1108, bio1@neumed.com  
[www.NeuMed.com](http://www.NeuMed.com)

Our customers include: Geisinger Medical Center, US Air Force, Kennedy Krieger Institute, VA Hospitals, National Rehab Hospital, Harvard University Health Services, Mass General Hospital, Spaulding Rehab Hospital, Mind Body Institute, Procter & Gamble, Mercy Medical Center, Johnson & Johnson, Suny Health Science Center, and a number of Universities, such as, Notre Dame, Texas, MIT, BU, Boston College, Brandeis and Tufts TMJ center and USA National Institute of Health.



## MEDAC™ System/3 Hardware

Photoelectric plethysmograph (PPG) for monitoring Inter-Beat Interval (IBI), heart rate, blood volume pulse wave, and relative changes in peripheral blood flow (pulse wave height), 2 channels of surface EMG, skin conductance level and response, 3 channels of skin temperature / respiration. Comes with NeuroDyne's DataWindow™ software for basic physiological monitoring.

## NeuGraph™ Software (#SW-416)

Special features include the Brief Physiological Stress Profile™ and the User Defined Profiles with both Free Form and Schedule based data collection protocols for evaluation and treatment of General Stress Management, Relaxation Training, Anxiety Management, Fear / Phobia reduction, Tension Headache, Migraine Headache, Essential Hypertension. This core package is recommended for all applications. Includes extensive report generation tools.

## NeuGames™ (#SW-443):

For pediatric patients, NeuGames adds games (Jungle game, Starlight game) and alternative graphic images (moving balloons, butterflies, etc.) in place of traditional line graph displays. Requires NeuGraph.

## HeadAche CheckList™ (#SW-414)

The Headache Checklist is a computer based, self-report questionnaire intended for use as an aid in collecting self-report information on an individual's headache related experiences. Individual item endorsement and patterns of response suggest questions that may be pursued in an assessment interview.

## EKG based Heart Rate Variability

New configuration for enhanced precision in monitoring Heart Rate Variability. Adds an EKG module to standard MEDAC (replacing one temperature channel).

## EEG Biofeedback Module

Provides one channel of EEG, more than one channel is also available.

## CPT Codes:

**96150, 96151, 95610, 90899,  
90901, 90875, 90876, 96152,  
90804, 90806, 90841, 90899,  
93920, 93921**

**Includes NeuroCart(tm), PC,  
Physician and Patient Monitors,  
Starter Supplies, Sensors,  
Charger and Cables.**



# System for Spinal Imaging and Soft Tissue Evaluation and Rehabilitation



NeuroDyne Medical

## CPT Codes:

95999-52. 97750, 97799. 96002, 96004,  
90901

## ICD-9 Codes:

728.2, 728.85, 728.9, 729.1, 735.21, 781.3

## NeuroMuscular System/3™ - 4 Hardware

Four Channels of surface Electromyography with Analogue and USB digital outputs, raw sEMG switch and E-Stim trigger option. Comes with NeuroDyne's DataWindow™ software for basic physiological monitoring.

## NeuScan™ Software (#SW-410)

Designed to work with all of our sEMG instruments to provide high quality two channel static surface EMG back scanning. The software is visually oriented to provide feedback to your patients that shows EMG levels at identified body positions and highlights left / right differences in muscle activity. Standard report includes graphic body image with color coded scan results. Report can be edited & comments added using your word processor.

## NeuGraph™ Software; Dynamic sEMG Software for Rehab (#SW-416+C&L)

Special features include Cervical and Lumbar Evaluation, automatic reports and Rehabilitation protocols and User Defined Profiles with both Free Form and Schedule based data collection protocols for evaluation and treatment.

## NeuroCart™; A cart specifically designed for the NeuroMuscular System/3

Special features include built-in PC

Includes NeuroCart(tm), PC,  
Physician and Patient Monitors,  
Starter Supplies, Sensors,  
Charger and Cables.



# System for Evaluation and Treatment of Incontinence



NeuroDyne Medical

**CPT Codes:**  
96150, 96151, 51785, 90911

## NeuroMuscular System/3™ - 2 Hardware

Two Channels of surface Electromyography with Analogue and USB digital outputs, raw sEMG switch and E-Stim trigger option. Comes with NeuroDyne's DataWindow™ software for basic physiological monitoring.

## Incontinence Checklist™ Decision Support Software (#SW-418)

The Incontinence Checklist is a computer based, self-report questionnaire intended for use as an aid in collecting self-report information on an individual's Incontinence related experiences. Individual item endorsement and patterns of response suggest questions that may be pursued in an assessment interview. The Incontinence Checklist is not a medical device and administration is not intended to provide a diagnosis.

## NeuGraph™ Software; sEMG Software for Evaluation of Incontinence (#SW-416 + dEMG)

Special features include Pelvic floor Evaluation and Lumbar evaluation protocols and User Defined Profiles with both Free Form and Schedule based data collection protocols for evaluation.

**Incontinence Protocol;**  
Voice Prompt based Incontinence protocol with Automatic reports and extensive documentation.

Includes NeuroCart(tm), PC, Physician and Patient Monitors, Starter Supplies, Sensors, Charger and Cables.



# NeuroMuscular Rehabilitation



NeuroDyne Medical

## CPT Codes:

95813-95858, 95921-95923, 95999,  
97700, 97750, 97799, 90901, 90911,  
90875, 97110, 97112, 97114, 97116,  
97139, 96002, 96004, 97750, 97799

Includes NeuroCart(tm), PC,  
Physician and Patient Monitors,  
Starter Supplies, Sensors,  
Charger and Cables.

## NeuroMuscular System/3™ - 4 Hardware

Four Channels of surface Electromyography with Analogue and USB digital outputs, raw sEMG switch and optional E-Stim triggers. Comes with NeuroDyne's DataWindow™ software for basic physiological monitoring.

## NeuGraph™ Software; Dynamic sEMG Software for Rehab (#SW-416+C&L)

Special features include Cervical and Lumbar Evaluation, automatic reports and Rehabilitation protocols and User Defined Profiles with both Free Form and Schedule based data collection protocols for evaluation and treatment.

### Includes protocols for:

- ✍ Post stroke Rehabilitation with eStim
- ✍ Functional Back, Neck & Shoulder Rehabilitation
- ✍ Post surgical Recovery (particularly post knee surgery)
- ✍ Carpal Tunnel Syndrome
- ✍ Patella femoral Knee Syndrome
- ✍ Foot Drop
- ✍ Gait Training
- ✍ Hand and Wrist Rehabilitation
- ✍ Urinary and Fecal Incontinence
- ✍ Spasmodic Torticollis
- ✍ Speech Disorders and Dysphagia

## NeuScan™ Software (#SW-410)

Designed to work with all of our sEMG instruments to provide high quality two channel static surface EMG back scanning. The software is visually oriented to provide feedback to your patients that shows EMG levels at identified body positions and highlights left / right



# Temporomandibular joint (TMJ) Syndrome Evaluation and Treatment



NeuroDyne Medical

## CPT Codes:

96002, 96004, G0195, 90901,  
97112, 97114, 97139

## ICD-9 codes:

728.85, 728.9, 735.21

Includes NeuroCart(tm), PC,  
Physician and Patient Monitors,  
Starter Supplies, Sensors,  
Charger and Cables.

## NeuroMuscular System/3™ - 4 Hardware

Four Channels of surface Electromyography with Analogue and USB digital outputs, raw sEMG switch and optional E-Stim triggers. Comes with NeuroDyne's DataWindow™ software for basic physiological monitoring.

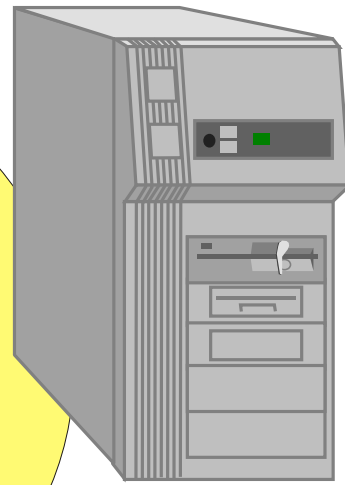
## NeuGraph™ Software; (SW-416)

Special features include Pelvic floor Evaluation and Lumbar evaluation protocols and User Defined Profiles with both Free Form and Schedule based data collection protocols for evaluation.

## TMJ Protocol;

Voice Prompt based TMJ protocol with Automatic reports and extensive documentation.





## Education and Research Applications

### System/3 Console

The console provides input for up to 8 physiological measures. More than one console can be combined together to provide up to 32 channels of Physiological measures.

For research applications System/3 is configured to provide upto 16 bit output on the USB interface at the back of the console. Researchers may also use Analog outputs from a 25 Pin DIN connector in the form of  $\pm 5$  Volts Physiological measures and therefore use their own data acquisition hardware to capture physiological data.

The System/3 research console does come with NeuroDyne's DataWindow™ software and there is ready to use out of the box. Researcher only needs to supply a desk top or laptop PC running Window Vista or Windows XP. The system comes with extensive documentation clearly defining the hardware interfaces and software operations.

The console comes complete with the optional Physiological cards, Optical Isolation scheme, USB and Analog outputs. Cost per System/3 Console

The following optional measures are available.

1. Electrodermal Response and Level (EDR, EDL)
2. Skin Temperature
3. Respiration
4. Photoplethmography (giving Inter-beat Interval and Heart Rate)
5. Electrocardiogram (ECG, EKG)
6. Electromyography (EMG)
7. Electroencephalogram (EEG)

*See list of Optional Software on the next page.*



# Optional Software for Education and Research Applications

(Ideal system for teaching is MEDAC Sys/3)

## NeuGraph™ Software (#SW-416)

Special features include the Brief Physiological Stress Profile™ and the User Defined Profiles with both Free Form and Schedule based data collection protocols for evaluation and treatment of General Stress Management, Relaxation Training, Anxiety Management, Fear / Phobia reduction, Tension Headache, Migraine Headache, Essential Hypertension. This core package is recommended for all applications. Includes extensive report generation tools.

## NeuGames™ (Optional Software #SW-443):

For pediatric patients, NeuGames adds games (Jungle game, Starlight game) and alternative graphic images (moving balloons, butterflies, etc.) in place of traditional line graph displays. Requires NeuGraph.

## NeuData™ (Optional Software #SW415):

Gives advanced options to look at physiological data, raw data and engineering data in time and frequency domains.

## HeadAche CheckList™ (Optional Software #SW-414)

The Headache Checklist is a computer based, self-report questionnaire intended for use as an aid in collecting self-report information on an individual's headache related experiences. Individual item endorsement and patterns of response suggest questions that may be pursued in an assessment interview.

## Incontinence Checklist™ Decision Support Software (#SW-418)

The Incontinence Checklist is a computer based, self-report questionnaire intended for use as an aid in collecting self-report information on an individual's Incontinence related experiences. Individual item endorsement and patterns of response suggest questions that may be pursued in an assessment interview. The Incontinence Checklist is not a medical device and administration is not intended to provide a diagnosis.

## EKG based Heart Rate Variability (Optional Software and Hardware)

Configuration for enhanced precision in monitoring Heart Rate Variability.

## NeuScan™ Software (#SW-410)

Designed to work with all of our sEMG instruments to provide high quality two channel static surface EMG back scanning. The software is visually oriented to provide feedback to your patients that shows EMG levels at identified body positions and highlights left / right differences in muscle activity. Standard report includes graphic body image with color coded scan results. Report can be edited & comments added using your word processor.

# Sys/3 Series Physiological Monitoring Hardware



NeuroDyne Medical

Products Overview

SEMG | Resp. | Temp, | EDR | EDL | PPG | EKG | EEG

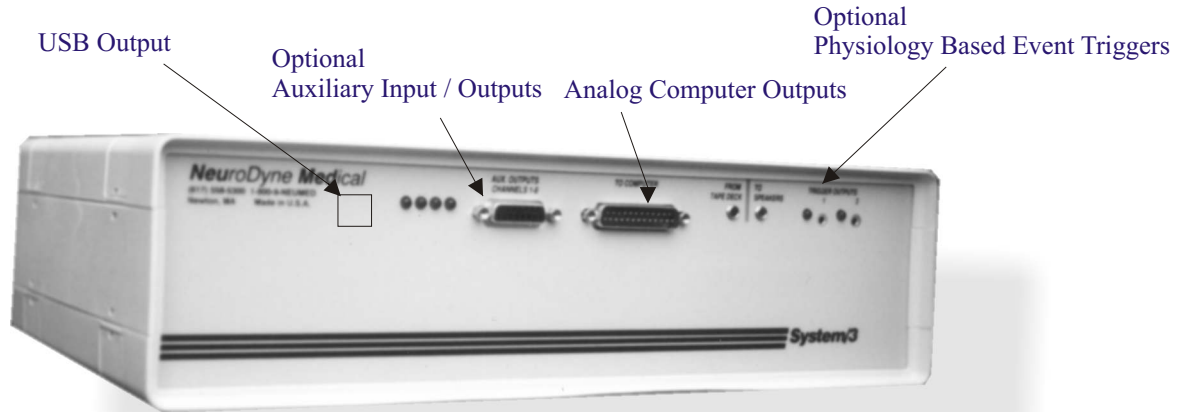
NeuroSys/3	2-16								
BioSys/3	2	1	1	1	1				
RehabSys/3	4	1	1	1	1				
MEDACSys/3	2	1	2	2	1	1	*	*	
MEDACSys/3R	4	1	2	2	1	1	*	*	

\* EKG and EEG are optional and can be added to any of systems.

MEDACSys/3's also come with Brief Physiological Stress Profile.



# Sys/3 Series Physiological Monitoring Specs



Size: 14.4"W x 10.2"D x 4.3"H; Weight: 9 lbs

- Advanced sensor technology for highest accuracy, comfort and ease of use*
- 8 channels of instrumentation in a single, compact package - expandable up to 16*
- 0-5V Analog Outputs for Interfacing to user selected DAQ's*
- User defined 8 0-5V external hardware stimuli*
- Works with Driving Simulators*
- Works with Eye Tracking Systems*
- Offered in any combination of sEMG, EEG, EKG, PPG, Temp., Resp., EDA, EDR; We configure it as needed*

**The System/3<sup>o</sup>** is an integrated instrumentation and software package for non-invasive monitoring of a variety of physiological measures. It is both powerful and easy to use. MEDAC System/3<sup>TM</sup> x is specifically designed for researchers and educators that offers mixing and matching of any of the measures offered by NeuroDyne.

**Custom Software** - Researchers have the choice to use their own software tools, such as MATLAB to interact with the MEDAC or have NeuroDyne write software for them.

**Protocol Development** - NeuroDyne offers a number of software packages and has the resources to develop protocols for specific needs of researchers.

**Research** - Flexible and easily configured data collection & reduction capabilities make the an attractive tool for psychophysiological and clinical research applications.

## Flexible Interfacing

The System/3<sup>o</sup> interfaces to desktop or laptop computers using 12 or 16 bits USB interface. Also provides Analog outputs that researcher can use for their own DAQ's.

## **Self Powered:**

Self powered by an internal medical grade dry gel cell chargeable battery that last many days once charged. Intelligent software turns system on as needed.

## **Software**

A number of software packages are available, such as DataWindow<sup>TM</sup>, NeuSoft<sup>TM</sup>, NeuGames<sup>TM</sup>, NeuScan<sup>TM</sup>

## **A Complete Package**

Sensors, sEMG supplies, audio feedback from CD or PCtunes, built-in speaker for raw sEMG sound, battery charger, software, user's guide.

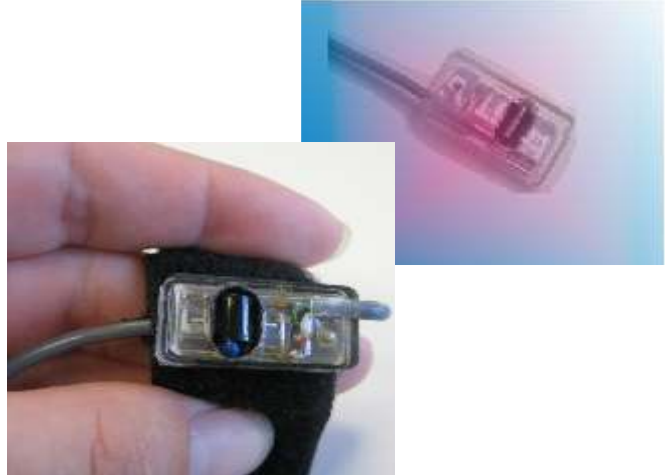
## **Support:**

# Physiological Sensor Specifications

## Photoplethysmograph (PPG):

Un-obtrusively monitors the peripheral blood flow from the tip of the finger or an earlobe, etc to give a blood volume pulse wave to track heart rate and to detect changes in peripheral blood flow and pulse height in realtime.

*The PPG sensor also has a minute temperature sensor built in to measure changes in skin temperature. See the temperature specification below for detailed specifications.*



## Surface Electromyography (sEMG):

Our sEMG sensors consist of highly accurate pre-amplifier electronics that can pick up signal down to 0.1 of a microvolt, removes artifact and can be used with or without conductive gels. sEMG processing circuitry has 25-450 Hz bandpass filter that includes 50 / 60 Hz Notch filter.

*Sensor supports 0.01 to 1,000  $\mu$ V range.  
Input Bias Current: <2.0 Picoamperes.  
Common Mode Rejection: 150 dB (60Hz)  
Noise: Less than 0.05  $\mu$ V (inputs shorted)  
Log power detector: 250 mSec true average*



## Skin Temperature (Temp):

Measured by a very small yet advanced electronics circuit. The sensor can be placed on the tip of the finger or elsewhere to measure minute changes in skin temperature.

*Calibrated Measurement Range: 60 - 100 deg. F  
Absolute Accuracy: Better than + - 0.25 deg. F  
over calibrated Measurement Range, better than +  
-0.1 deg. F @ 95 deg. F, including thermal inter-  
changeability.  
Thermal Time Constant: 320 mSec. (Standard  
sensor water plunge).*



# Physiological Sensor Specifications

## Electroencephaliogram Sensor (EEG):

Raw EEG sensor uses our Active Electrode™ technology, a pre-amplified sensor that removes artifact and which may be used with or without gel.

Features 0.1 to 90Hz bandpass filter and 50/60 Hz



## Electrocardiogram Sensor (EKG):

Our EKG sensor uses our Active Electrode™ technology, a pre-amplified sensor that removes artifact and which may be used with or without gel.



## Respiration Sensor (Resp):

Our Resp sensor is a belt attached, pressure sensitive transducer.

The sensor provides a respiration waveform for diaphragmatic breathing.



## Electrodermal Sensor (EDR):

Also known as Galvanic Skin Response (GSR) sensor. We drive two measures from this sensor, Electrodermal Response (EDR) and Electrodermal Level (EDL). Provides dynamic measure of sympathetic nervous system activity.

Calibrated Skin Conductance Range: 0.8 to 50  $\mu\text{S}/\text{cm}^2$ .  
Sensor: Gold plated brass, 2.5 cm square effective area.  
Single ended configuration.

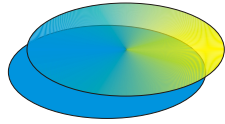
Constant Current Conductance A.C Log, 5 Sec time constant,  
3  $\mu\text{A}/\text{cm}^2$  constant current excitation.

Filters: 12 Hz Low Pass, 10 dB/Oct

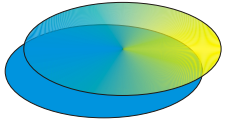




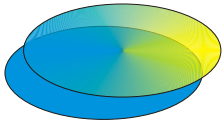
## Current Research Projects



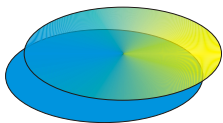
Automobile Human Factors Analysis with MIT and FORD - USA



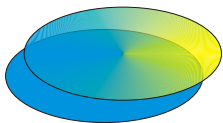
Automobile Human Factors Analysis with Hyundai Cars - Korea



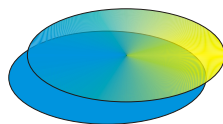
Eye Tracking and Electro-Physiological Measures - Brandies University - USA



Biomedical / Palm Secure for USA Department of Defense, Northrop Grumman and Fujitsu



Gait Analysis in conjunction with Gait Rite Devices



Autonomic Nervous System Balance for Diabetes

# Supplies and Disposables



NeuroDyne Medical

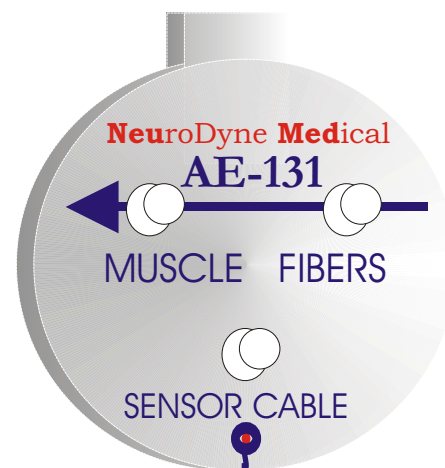
CPT Codes: 99070

## AE-131 (DriStik™)

### Circular Dry Silver sEMG Electrodes:

These 1/16" polyethylene foam electrodes attach directly to NeuroDyne / Davicon Active sEMG Sensor. These electrodes provide the following advantages over other electrodes:

- ✎ Predefined constant distance of 2 cm between the sEMG sensing elements overall diameter is 5.7 cm.
- ✎ For ease of use, it clearly labels the Direction of Muscle Fibers & sensor cable.
- ✎ "Due to its excellent chemical properties, may be used with or without gel.
- ✎ Uses nonirritating & non-sensitizing acrylic copolymer adhesive for optimum skin adhesive qualities.
- ✎ Comes in a convenient package of 100 per bag.



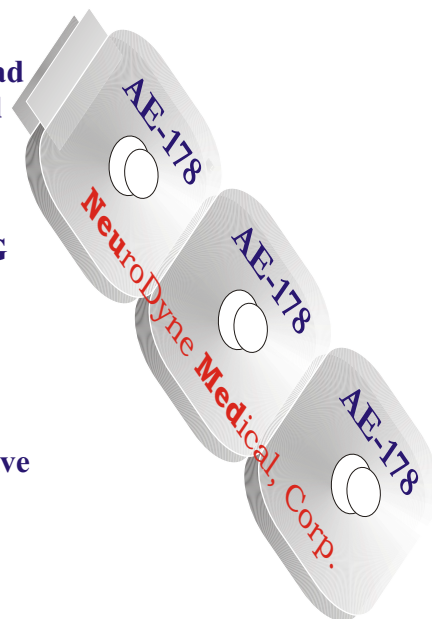
CPT Codes: 99070

## AE-178 (TripleStix™)

### Strip Style Dry Silver sEMG Electrodes:

These 1/16" polyethylene foam electrodes may be attached to NeuroDyne Active Electrode using NeuroDyne Snap Extension Lead Set AE-128L. The strip may be used as whole or may be separated for three separate placements. This electrode provides following advantages over other electrodes:

- ✎ Provides, predefined constant distance of 2.5 cm between sEMG sensing elements when used as a whole.
- ✎ Due to its excellent chemical properties, may be used with or without gel.
- ✎ Uses a nonirritating & non-sensitizing acrylic copolymer adhesive for Optimum skin adhesive qualities.
- ✎ Comes in a convenient package of 100 per bag.



# Supplies and Disposables



NeuroDyne Medical

Products Overview

**CPT Codes: 99070**

**AE-436; Scan pads, Conducive Pads.**

Absorbent scan pads hold electrolyte solution for moistening scanning contacts. 100 per Jar.



**CPT Codes: 99070**

**AE-422: Silver Coated scanning contacts:**

Snap into sEMG Sensor. Comes in a jar of 150.



**CPT Codes: 99070**

**AE-18L: Electrode Snap Leads Extension Set of 3;**

Two red and one black, 8 " long.





*As a result of major innovation in design and significant development effort we now offer you a portable solution for our Physiological Monitoring Systems. Use with our MEDAC Sys/3™, BioSys/3™, NeuroSys/3™ and NeuScan™ systems. All of our systems now ship with the NeuroCart(tm). We also have LCD Monitor and Computer Options Available.*

# Products Overview



Optional Patient Monitor

Optional Touch Screen Monitor

User adjustable height

Locking wheels

Container to keep the sensors and keyboard.



Container for supplies, PC or batteries.



## Main Features

-  Self contained and Portable
-  Ergonomic Design
-  Container for Sensors
-  Container for Supplies
-  Wheels for easy Movement
-  Keeps your Desk Clutter Free
-  Monitor & PC Options available
-  Patient Friendly



## Use it for:

- Spinal Screenings inside or outside the office
- Treatment Planning and Patient Compliance
- Patient Interaction and Education
- PI work and Billing

### Your Own Name Option



### Complete System with:

- ✍ PC
- ✍ Touch Screen Display
- ✍ Internet Port
- ✍ Voice Prompts
- ✍ sEMG Screening System
- ✍ Patient Education Software
- ✍ Patient Evaluation Software

### Patient Education Software Includes:

- ✍ Virtual De-Compression Software
- ✍ Autonomic Charts
- ✍ Patient Resource Center

### Patient Evaluation Software Includes:

- ✍ Patient Forms
- ✍ HeadAche CheckList™
- ✍ AnsPPG™
- ✍ Incontinence CheckList™

Lease it with NS-2, NS-2D or NS-4 for an extra about \$85 per month;

Includes PC and one Touch Screen Monitor

**Note: You may also lease or purchase it with Software only, call us for details.**

Products Overview



## Use it for:

- Spinal Screenings inside or outside the office
- Treatment Planning and Patient Compliance
- Patient Interaction and Education
- PI work and Billing

Your own Name option here.

### Complete System with:

- ✍ Built-In PC
- ✍ Touch Screen Display
- ✍ Internet Port
- ✍ Voice Prompts
- ✍ sEMG Screening System
- ✍ Patient Education Software
- ✍ Patient Evaluation Software

### Patient Education Software Includes:

- ✍ Virtual De-Compression Software
- ✍ Autonomic Charts
- ✍ Patient Resource Center

### Patient Evaluation and Treatment Software Includes:

- ✍ NeurGraph™
- ✍ NeuScan™
- ✍ NeuGames™
- ✍ HeadAche CheckList™
- ✍ AnsPPG™

Products Overview



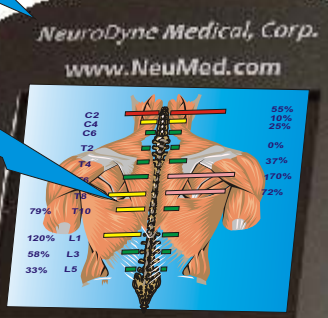
Touch Screen

Sys/3

Drawer

PC

Wheels





# Software Screens

Products Overview

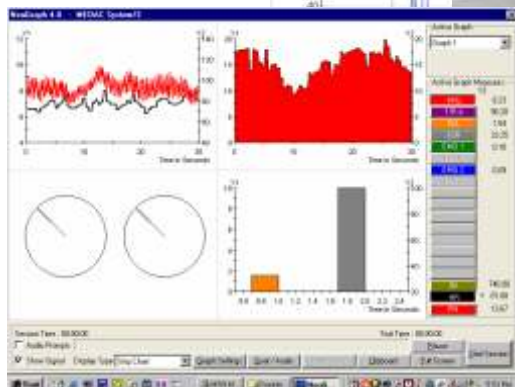
### HeadAche CheckList™



### NeuScan™ Software



### NeuGraph™ Software



### Brief PSP™



### Incontinence CheckList™

### NeuGames™ Software





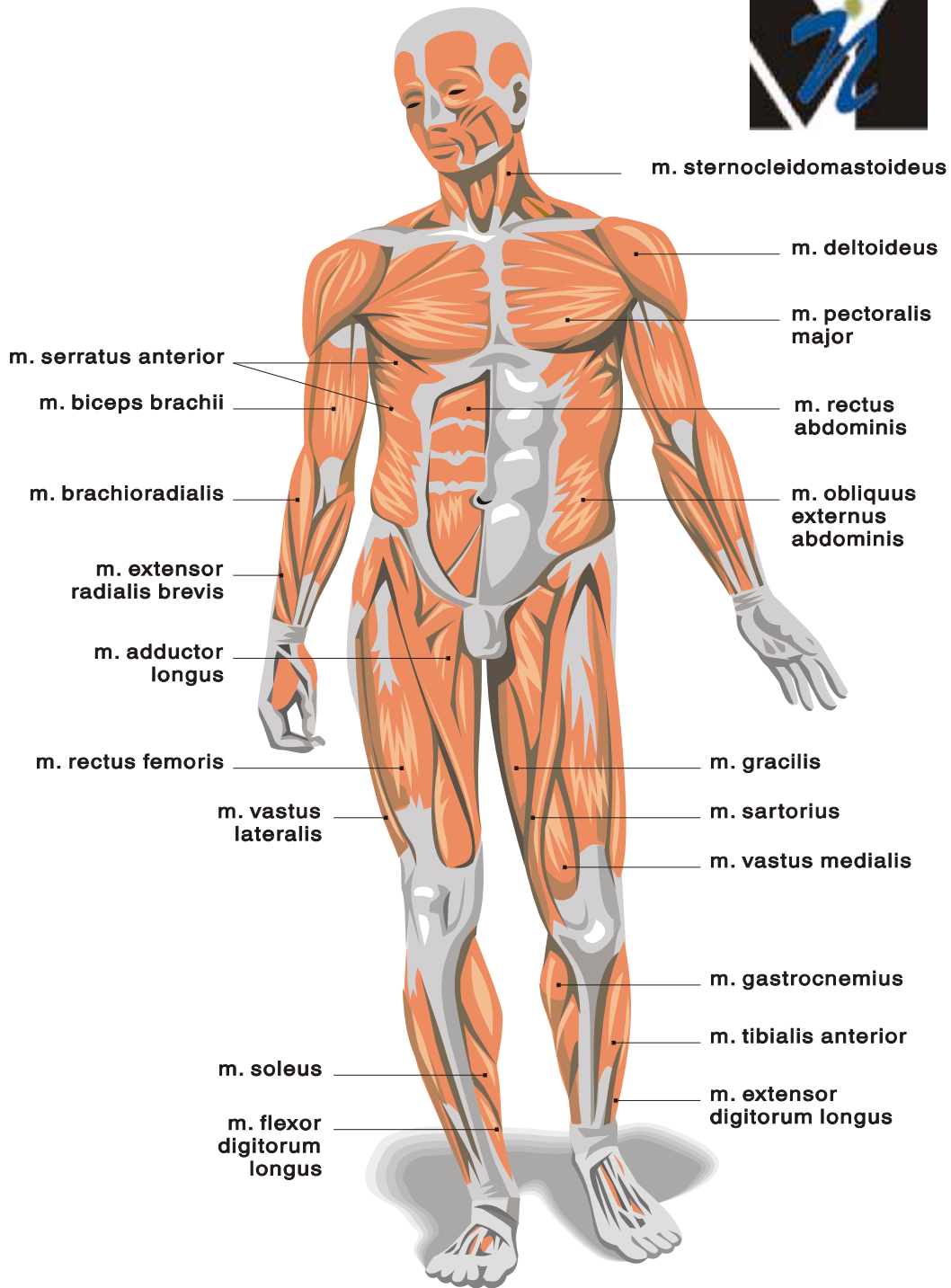
Innovative Technology



Ease of Use



Flexible by Design



## NeuroDyne Medical, Corp

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Fx# 1-877-NEUROFX or 617-234-1108