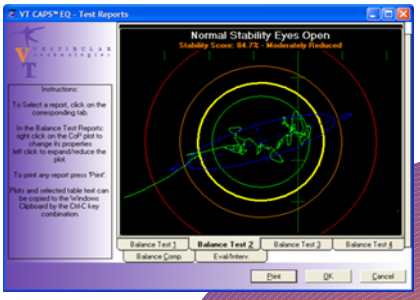
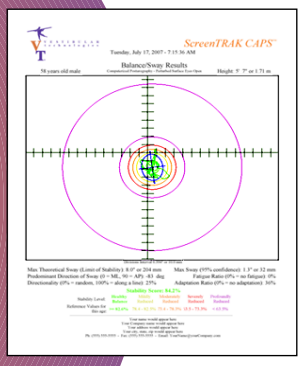
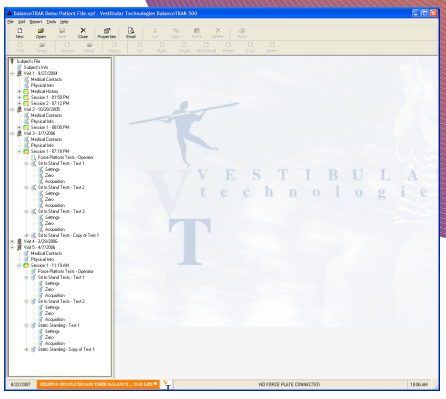
VESTIBULAR technologies



CAPS®

Comprehensive Assessment of Postural Systems





PRODUCT CATALOG AND INFORMATION

HELPING PEOPLE REGAIN THEIR BALANCE … FOR LIFE®

Vestibular Technologies, LLC

Who we are

Since 1996 we have been helping doctors recognize patients with balance problems. From the elderly at risk of falling to the athlete with a possible concussion, our CAPS® systems can help identify a problem when, in many cases, other methods cannot.

Our history

We started in 1996 as a medical products distributor, marketing products manufactured by others. In 2001, having realized that better products were needed, we decided to shift our focus to the research, development and manufacture of our own innovative, patented products - products that would offer significant advances and that would not be available anywhere else in the world. In 2002 we obtained our Establishment Registration from the U.S. Food and Drug Administration (FDA) and began manufacturing our new series of FDA Listed, USB powered products, the CAPS® systems. And in 2003 we relocated our headquarters, R&D, and manufacturing services to Wyoming.

Our Innovations

Since we had to start from scratch to design our own products, we decided we were going to make sure they took advantage of cutting edge technology. These are just some of the few aspects we decided to incorporate:

- having a true portable solution, including a custom made carrying case for everything needed to run the system;
- using the computer to provide power to the device via standard USB cable: no more brick transformers or the need to find an additional power plug to run the system, with the additional advantage of being able to use it “off the power grid” if the computer is a laptop with enough battery power;
- having a self-leveling solution: our CAPS® systems contact the ground only in three points guaranteeing that they will always be level, without the need for an adjustable foot;
- having electronics and transducers sensitive and accurate enough to detect the minute changes induced in a subject's posture due to the heart beating and the breathing cycle.

And our innovations are not limited to our products. We also are the first one in the industry to listen to the needs of our customers and provide them with:

- rental programs that allow customers to try out our products before committing to buy them;
- financial programs that feature no credit check and no prepayment penalties.

Posturography

What is it

Posturography is a general term that covers all the techniques used to quantify postural control in an upright stance, in either static or dynamic conditions. Among those techniques is computerized dynamic posturography (CDP), also called test of balance (TOB). CDP is a non-invasive specialized clinical assessment technique used to quantify the central nervous system adaptive mechanisms (sensory, motor and central) involved in the control of posture and balance, both in normal (such as in physical education and sports training) and abnormal conditions (particularly in the diagnosis of balance disorders and in physical therapy and postural re-education).

Due to the complex interactions among the sensory, motor, and central processes involved in posture and balance, CDP requires different protocols to differentiate among the many defects and impairments which may affect a subject's postural control system. CDP challenges that system by using several different combinations of visual and support surface stimuli and parameters. It has been proven effective in assessing vestibular as well as some neuromuscular disorders affecting balance.

How it works

Static posturography is carried out by placing a subject in a standing posture on a fixed instrumented platform (force plate) connected to sensitive detectors (force and movement transducers), which are able to detect the tiny oscillations of the body.

Dynamic posturography differentiates from static posturography in that it usually involves perturbing the subject’s posture by means of a foam cushion or a special apparatus with a movable horizontal and tilting platform. As the subject makes small movements, the sensitive detectors transmit this time-varying information in real time to a computer. Thus, the dynamic posturography test protocols can quantify the ability of a subject to maintain balance in non-static conditions. Usually coupled with the ability to test the subject either with or without visual references (eyes open or closed) or with a moving environment that gives conflicting visual information, dynamic posturography makes it possible to quantify a subject's vestibular functions. This is because, in certain testing conditions, the visual and proprioceptive systems cannot be used, and the subject must rely only on the vestibular system to maintain balance.

J.E. Visser et al. stated that the terms static and dynamic do not refer to the fact that the platform is movable, rather to the presence or absence of a perturbation [*J.E. Visser et al. "The clinical utility of posturography", Clinical Neurophysiology 119 (2008) 2424–2436*]. Hence, the testing on a foam cushion as is done with the CAPS® system is considered dynamic posturography.

On systems like the CAPS® it is possible to "emulate" the tilting board approach used in other systems by using a wobble board, especially one with adjustable "wobble", such as those with an inflatable bottom.

However, the foam provides a better perturbation than a tilting/wobbling platform. "The BalanceTRAK 500 [the predecessor of the CAPS®] has several advantages over its predecessors. First, the foam used for testing is a medium that more accurately simulates conditions that may be encountered in daily life. It simulates thick, plush carpeting; rough, uneven terrain (encountered in thick grass on hiking trails and in the rough on golf courses); and even certain types of heavily padded shoes. Second, unlike a platform, which tilts only forwards and backwards, the foam also assesses a patient's ability to maintain balance in the lateral plane. The ability to assess an individual's response to lateral perturbations is especially important because many falls occur laterally" [*M. Amin et al, "A Comparison of Electronystagmography Results with Posturography Findings from the BalanceTrak 500", Otology & Neurology 23(2002) 488-493; M. Girardi et al. "Predicting Fall Risk in an Elderly Population: Computer Dynamic Posturography Versus Electronystagmography Test Results" The Laryngoscope 111 (2001) 1528-1532*].

Some systems can "force" an external perturbation to the balance in a predictable or unpredictable way. For instance the moving platform models from NeuroCom® (not their fixed force platform ones) allow the platform to translate or tilt forward/back in a controlled way to perform what NeuroCom® calls "Motor Controlled Test" (translations) and "Adaptation Test" (tilt). However, the movement of the platform is also likely to introduce issues in the quality of the measurements.

Standards

In 2013, the International Standardization Committee for Clinical Stabilometry of the International Society for Posture and Gait Research (ISPGR) recommended for the CoP measurements an accuracy of 0.1 mm and a precision and resolution of 0.05 mm [*F. Scoppa, R. Capra, , et al. "Clinical stabilometry standardization: Basic definitions - Acquisition interval - Sampling frequency", Gait Posture, vol. 37, no. 2, pp. 290-2, 2013*]. Since its introduction to the market in 2002, our CAPS® has satisfied these requirements!

And these requirements are important since measurements obtained from force and balance platforms are ultimately used to make clinical decisions. In research if the instruments used are not accurate and precise enough it is possible that effects that are actually significant will be hidden by the instrument's errors and even the best statistical analysis tools will not be able to compensate for that. But in clinical practice the issue is even more important, since the clinician cannot use statistical methods to reduce the errors caused by the instruments.

In posturography attention has been focused on the measurement of the location of the point of application of the ground reaction force, known as the Center of Force or Center of Pressure (CoP), since correct quantification of the CoP location and its movements is paramount in both gait and posturographic investigation. The CoP is a derived measure obtained from the individual forces, and its quantification is affected by errors in the measurement of the vertical force (Fz), of the two horizontal moments (Mx and My), and in some instruments, of the two horizontal forces or shears (Fx and Fy).

The movement of the CoP during a posturography test when the subject is standing erect on a fixed rigid surface can be as low as 2 mm in patients with moderate Parkinson's Disease [*J. Browne, N. O'Hare, "Development of a Quality Control Procedure for Force Platforms", Physiological Measurement, vol. 21, no. 4, pp. 515-524, 2000*]. In an ongoing survey consisting so far of 3287 balance tests on stable surface and 6224 tests on a perturbed surface (foam cushion) of both healthy and pathological subjects, we found that the sway in some directions can be less than 1.5 mm on both surfaces [*E. Oggero, F.R. Carrick, G. Pagnacco, "Frequency content of standard posturographic measures", Biomed Sci Instrum, vol. 49, pp. 48-53, 2013*]. Furthermore, it has been reported in the literature that the Coefficient of Variation of sway amplitude can be about 10%, meaning a a change of about 20% in the sway can be significant [*M. Moghadam, H. Ashayeri, et al., "Reliability of center of pressure measures of postural stability in healthy older adults: effects of postural task difficulty and cognitive load.", Gait Posture, vol. 33, no. 4, pp. 651-5, 2011*]. This means that a change in sway as little as 0.3 mm is potentially of clinical and research interest.

Therefore choosing an instrument that allows clinicians to accurately measure these parameters is the first step in guaranteeing an accurate evaluation of a subject's posture, especially when clinical decisions depend upon that evaluation.

Medical Devices vs toys

Posturography relies heavily on devices to acquire and analyze the physiological data needed to understand and model postural control. Therefore, the results of the investigations, clinical or academic, depend heavily on the instrumentation used. Unfortunately, all too often the users do not understand their instruments and end up compromising the results of their investigations by choosing an inadequate instrument or by not using it appropriately.

Because the results of any posturography investigation are so dependent on the instrument used, there is no consensus on what posturography can really contribute. As Ruhe et al. found out [*A. Ruhe, R. Fejer, B. Walker, "The test–retest reliability of centre of pressure measures in bipedal static task conditions – A systematic review of the literature" Gait Posture Vol. 32, pp. 436–445, 2010*], "there is relatively little consistency in the methods employed and measurements selected when using a force-platform". An example of how the instruments used are often not understood and are inadequate for the task at hand is a paper [*R.A. Clark et al., "Validity and reliability of the Nintendo Wii Balance Board for assessment of standing balance." Gait Posture. Vol. 31, pp. 307-10, 2010*] suggesting that clinicians can use a "toy" (the Nintendo Wii Balance Board), instead of an instrument grade force platform to acquire posturographic data.

It is vitally important for the clinician to be aware of the characteristics of the device being used to acquire any signal. In certain fields of balance assessment, even differences of a few percent can be significant, and it is important to be sure that such differences can only be attributed to the subject being tested and not to the inaccuracies of the device being used.

Legal ramifications

Devices used for medical applications are under the jurisdiction of regulatory agencies such as the FDA in the U.S.A. Even non-invasive, Class 1 devices, such as the force platforms used for assessing balance, require extensive documentation and testing before they can be distributed in the open market. Each such device is approved only for a specific "intended use". It is illegal for any clinician to use, as a clinical device, a tool that has not been approved for such use. Nintendo is well aware of these requirements and, indeed, it does not make any claims on clinical measurement capabilities of its device. Only the manufacturer can define the intended use of a device. It is preposterous and most likely illegal for anybody else to make such a claim, and in doing so such claims expose unaware clinicians and researchers to the possibilities of severe criminal and civil legal actions in most countries where medical devices are regulated.

Cost issues

Regulatory and compliance issues significantly increase the raw cost of the devices, but buying a device from a registered medical device manufacturer selling approved medical devices is an intrinsic guarantee that the device in question will meet the published specifications and that it can be used with confidence by the end user to do what it was advertised to do.

The CAPS®

(Comprehensive Assessment of Postural Systems)

Since the beginning, we have been helping doctors recognize patients with balance problems. From the elderly at risk of falling to the athlete with a possible concussion, the CAPS® systems can help identify a problem when, in many cases, other methods cannot.

The CAPS® systems have always satisfied the stringent requirements set in 2013 for posturographic measurements by the International Standardization Committee for Clinical Stabilometry of the International Society for Posture and Gait Research (ISPGR): an accuracy of 0.1 mm, and a precision and resolution of 0.05 mm [*F. Scoppa, R. Capra, , et al. "Clinical stabilometry standardization: Basic definitions - Acquisition interval - Sampling frequency", Gait Posture, vol. 37, no. 2, pp. 290-2, 2013*].

Our products provide the ability to quickly and objectively quantify a person's balance and risk of falling. We have been recently granted a U.S. patent on our process of testing and assessing a person's balance in less than 60 seconds. In the time it usually takes to weigh a person, we can provide not only that person's weight but also their Body Mass Index (BMI) and an objective measurement of their balance. This is extremely important because most persons with balance impairments do not even realize they have any impairment because they compensate for their deficit. And in most cases it is virtually impossible to accurately detect changes in a person's balance with the naked eye. The fast assessment made possible by our CAPS® products is also essential for providing the ability to easily monitor and document the changes in a person's balance resulting from the treatments provided by the clinician using our CAPS®. Our product line also provides medical practitioners with specialized diagnostic testing to help them identify the cause of balance and/or vestibular problems, and well as with biofeedback rehabilitation exercise protocols that can be used in the effective treatment of most balance disorder patients.

To better serve our customers' needs we have developed two different posturography products:

CAPS® Lite

A complete solution designed for ultimate portability, usability, compactness and low cost, the CAPS® Lite is our entry-level computerized posturography balance and fall risk assessment line of products. The CAPS® Lite is the perfect tool for clinicians who only need to screen and test for falls-risk, measure therapy progress, and document treatment outcomes.

CAPS® Professional

Many providers need to be able to do more than just evaluate a subject's balance in static conditions and in a "feet-together" or "feet at shoulder-width" position as can be done with the CAPS® Lite or other products on the market. That's why we manufacture the CAPS® Professional, our unique and advanced computerized posturography balance and fall risk assessment and treatment line of products. But the CAPS® Professional is not just a posturography product: it is also an extremely advanced physical performance testing and rehabilitation tool that can be used for a variety of applications besides assessing balance and dizziness, and for fall prevention. In fact, in addition to what you can do with the CAPS® Lite, the CAPS® Professional allows you to obtain a subject's detailed medical history, with special emphasis on falls, balance disorders, hearing and tinnitus; to test your subject's balance in every possible combination of head, arm, leg, body and force platform positions; to get sit-to-stand analysis data far superior to anything else available anywhere else; to test the explosive strength of leg and arm muscles of subjects of all ages; to test your subject's Limit of Stability (LoS) in eight (not just four) positions; and to improve your subjects' lower extremity strength, reaction time, stamina and more with our unique "body saccades" targeting modality.

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HELPING PEOPLE REGAIN THEIR BALANCE...FOR LIFE®

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info@vestibtech.com
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HELPING PEOPLE REGAIN THEIR BALANCE...FOR LIFE®

CAPS® Lite System

(U.S. Patent 7,163,516)

The CAPS® Lite System offers you the perfect solution for providing your patients with balance screenings and assessments

Although there are other systems on the market today, none are as truly portable as our CAPS® Lite system – not even our own CAPS® Professional system.

But the best feature of all is the patented 60 second falls-risk identification and objective quantification of that risk that you get with our proprietary CAPS® software.

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Applications

CLINICAL

Remember - most persons are unaware of their risk of falling, and even if they are aware they will not report their symptoms to their physician. That is why experts recommend the routine screening of patients.

With the CAPS® Lite you can:

- Screen your own patient population and also perform community screenings to identify the large number of subjects with abnormal balance who are at higher risk of falling. A large percentage of them will be candidates for further assessment, testing or treatment.
- Evaluate and document in “real time” the results of your interventions with the patient, allowing you to get the information you need in order help you make the proper treatment decisions for every patient.
- Replace your old scale because the CAPS® Lite gives you the patient’s weight and BMI at the same time our specialized software is evaluating their ability to maintain their balance and avoid a dangerous fall.
- Obtain useful diagnostic information as well as objective and documented evidence to help establish medical necessity for further testing and for treatment.
- Effectively document treatment outcomes with objective textual and graphical results that can facilitate reimbursement.

ATHLETIC/SPORT

In addition to being an exceptional clinical tool, the CAPS® Lite has many applications in athletics and sports medicine.

The CAPS® Lite allows you to easily identify the effect balance has on the physical performance of your patients, then accurately track their training progress.

Packages

PKCL-St: the Screening Package

Our ScreenTRAK™ software makes this the perfect system for basic balance screenings and assessments, as well as weight and BMI calculations. It is designed for clinicians who just need to know whether or not their patient’s balance is affected in any way. It also simplifies compliance with the Medicare requirements applicable to new enrollees, as well as with the practice guidelines issued by medical experts and respected professional associations.

PKCL-Eq: the Testing Package

This system is ideal for practitioners who want to delve a little deeper into their patients’ balance problems. With this system you receive not only the basic testing capabilities of ScreenTRAK™ but also the more extensive testing protocols found in our new CAPS® EQ software.

NOTE:

CAPS® packages include the CAPS® Lite Hardware (force platform, perturbing foam cushion, carrying case) and the indicated software applications:

	ScreenTRAK™	CAPS® EQ
PKCL-St	✓	
PKCL-Eq	✓	✓

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CAPS® Professional System

(U.S. Patents 6,510,749; 7,163,516; and D447,968)

Your "all-in-one" solution for screening, assessment and treatment.

Whether you are a Primary Care Physician, Chiropractor, Physical Therapist or Audiologist, it is the best piece of equipment you could ever own.

With the CAPS® Professional, not only you can identify new balance disorder/falls-risk patients with our patented screening process, but you can also thoroughly assess and treat them.

- Quick easy, patented process
- Accurate, objective results
- Age-based reference values
- Unique, specialized assessment protocols

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Applications

CLINICAL

The CAPS® Professional's unique patented hardware design and versatile, flexible software make it possible to perform a number of different tests - for screening, assessment/diagnostics and treatment.

The CAPS® Professional lets you obtain essential information about your patient's balance system, neuromuscular control and physical performance that has never before been available to you.

The CAPS® Professional allows you to easily document diagnostic testing, treatment progress and outcomes using a large variety of metrics that are applicable not only to balance disorders but also to a large number of neurological and neuromuscular pathologies.

With the CAPS® Professional you can observe and evaluate in "real time" the effects of the treatments you provide.

ATHLETIC/SPORT

In addition to being an exceptional clinical tool, the CAPS® Professional has many applications in athletics and sports medicine.

The CAPS® Professional allows you to easily identify many different performance limiting factors and their effects on physical performance, then accurately track your patient's therapy progress.

And because the CAPS® Professional is both portable and rugged, you can use it on or off the field.

Packages

PKCP-Eq: the Basic Package

Our basic system for balance screenings and assessments, this package includes not only our patented ScreenTRAK™ screening software, but also our more flexible CAPS® EQ testing software.

PKCP-In: the Intermediate Package

The package that gives you the greatest possible flexibility, putting you in control of what you get: in addition to the basic package, you get three modules of our advanced testing, rehabilitation and therapy software, BalanceTRAK®. And the choice is all yours, to make it best suited for your practice setting and personal preferences. For example, if you are a physical therapist, you might select the Sit-to-Stand, Limit of Stability and Targeting modules. If you are a chiropractor, you might select the Static Balance, the Limit of Stability and the Targeting modules. If you are into sports medicine, you might select the Limit of Stability, the Targeting and the Power modules. If you are a physician willing to provide fall prevention services to your patients, you might select the Medical history, Evaluation and Intervention, the Limit of Stability and the Sit-to-Stand modules.

PKCP-Cp: the Complete Package

This package is geared towards those who want to do everything, from screening to assessment to therapy and rehabilitation. This "ultimate" package includes:

- Our ScreenTRAK™ screening software
- Our CAPS® EQ intermediate testing software
- Our BalanceTRAK® advanced testing, rehabilitation and therapy software

NOTE:

CAPS® packages include the CAPS® Professional Hardware (force platform, perturbing foam cushion, carrying case)

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CAPS® Lite Hardware

The CAPS® Lite force platform is the perfect tool for fall risk assessments and balance disorder screenings.

- Lightweight
- Portable
- Highly accurate
- When combined with CAPS® software, an indispensable tool for every clinician

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CAPS® Lite Three-Component Force Platform

SENSITIVE

- You can see forces as little as 0.1 N (0.4 oz f). That means you can see your weight change as your heart beats!
- Signal to Noise Ratio of 106 dB or four parts per million
- Electronics are low power and provide truly simultaneous data acquisition of all three load cells, eliminating timing errors
- The digital signals go directly to the computer for processing through the USB connection

LIGHTWEIGHT AND PORTABLE

- Lightweight
- Will not rust or corrode
- Maximum static load capacity of 1.5 kN (350 lbf)
- Because the calibration matrix and other parameters are stored in the electronics, you can always be certain to have the right calibration matrix, even if you have multiple CAPS® force platforms or use multiple computers with one CAPS® force platform

SAFE

- It cannot conduct electricity, making it intrinsically safe from electrical shocks

CONVENIENT AND EASY TO USE

- Measures the vertical force and the two horizontal moments from which the Center of Pressure and the sway are calculated
- The unique triangular shape limits the contact with the ground to only three points, making it self-leveling, with no need for an adjustable foot to prevent rocking
- Because it is USB powered, it requires no external power adapter, so you can even use CAPS® Lite with your battery powered laptop
- Truly Plug-&-Play
- Requires no lengthy warm-up
- Designed to be used on any hard surface

ACCESSORIES

- ➢ Foam Cushion - Used as a compliant surface for testing
- ➢ Carrying Case - Used to store and transfer the force platform and its accessories

TECHNICAL SPECIFICATIONS*

Property	Typical Value
Mass	4.7 kg [~10 lb]
Overall dimensions	0.457x0.508 x0.045 [18 x20x1.75"]
First natural frequency	60.2 Hz
Overload capacity in Fz	2.2 kN [500 lbf]
Range in Fz	0-1.5 kN [0-~350 lbf]
Resolution in Fz	0.1 N [0.02 lbf]
Accuracy	2 N [0.45 lbf]
Linearity	0.2%

* have always satisfied the stringent requirements set in 2013 for posturographic measurements by the International Standardization Committee for Clinical Stabilometry of the International Society for Posture and Gait Research (ISPGR)

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HELPING PEOPLE REGAIN THEIR BALANCE...FOR LIFE®

CAPS® Professional Hardware

(U.S. Patents 6,510,749 and D447,968)

As with our CAPS® Lite, the CAPS® Professional lets you quickly screen your patients for balance and equilibrium disorders and assess their risk of falling.

But it doesn't stop there!

With the CAPS® Professional force platform you can perform much more advanced testing and assessments.

PLUS, you can provide highly beneficial rehabilitation and therapy services using the same CAPS® equipment you use for screening.

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CAPS® Professional Three-Component Force Platform

CONVENIENT AND EASY TO USE

- Measures the vertical force and the two horizontal moments from which the Center of Pressure and the sway are calculated
- The triangular shape limits the contact with the ground to only three points, making it self-leveling, with no need for an adjustable foot to prevent rocking
- USB powered, it requires no external power adapter, making it possible to use it with your battery powered portable computer
- Truly Plug-&-Play
- Requires no lengthy warm-up before use
- Designed to be used on a hard surface
- **Provides a larger surface for positioning the subject's feet in a variety of configurations, including the standard Romberg heel-to-toe stance as well as wide feet stances**
- **Can be used with wobble boards, stools, steps and other devices for testing and rehabilitation purposes**
- **The perfect match for our advanced testing and rehabilitation software BalanceTRAK®**

SAFE

- It cannot conduct electricity, making it intrinsically safe from electrical shocks

SENSITIVE

- You can see forces as little as 0.1 N (0.4 oz f). That means you can see your weight change as your heart beats!
- Has a Signal to Noise Ratio of 106 dB or four parts per million
- Electronics are low power and provide for truly simultaneous data acquisition of the three load cells, eliminating timing errors
- The digital signals go directly to the computer for processing through the USB connection

STRONG, DURABLE AND PORTABLE

- Lightweight
- **Made with composite material so it is splash-proof and can be used outside**
- Will not rust or corrode
- **Maximum static load capacity of 10 kN (2250 lbf) (over one ton!)**
- **Rugged design makes it well suited for moving it from location to location**
- Because the calibration matrix and other parameters are stored in the electronics, you can always be certain to have the right calibration matrix, even if you have multiple CAPS® force platforms or use multiple computers with one CAPS® force platform

TECHNICAL SPECIFICATIONS*

Property	Typical Value
Mass	**7.3 kg [16 lb]**
Overall dimensions	**0.746x0.850x0.038m [29.4x33.5x1.5"]**
First natural frequency	**92 Hz**
Overload capacity in Fz	**20 kN [4500 lbf]**
Range in Fz	**0-10 kN [0-2250 lbf]**
Resolution in Fz	0.1 N [0.02 lbf]
Accuracy	2 N [0.45 lbf]
Linearity	0.2%

The differences between the CAPS® Lite and the CAPS® Professional Hardware are shown in **Bold.**

ACCESSORIES

- Foam Cushion - Used as a compliant surface for testing
- Carrying Case - Used to store and transfer the force platform and its accessories

* have always satisfied the stringent requirements set in 2013 for posturographic measurements by the International Standardization Committee for Clinical Stabilometry of the International Society for Posture and Gait Research (ISPGR)

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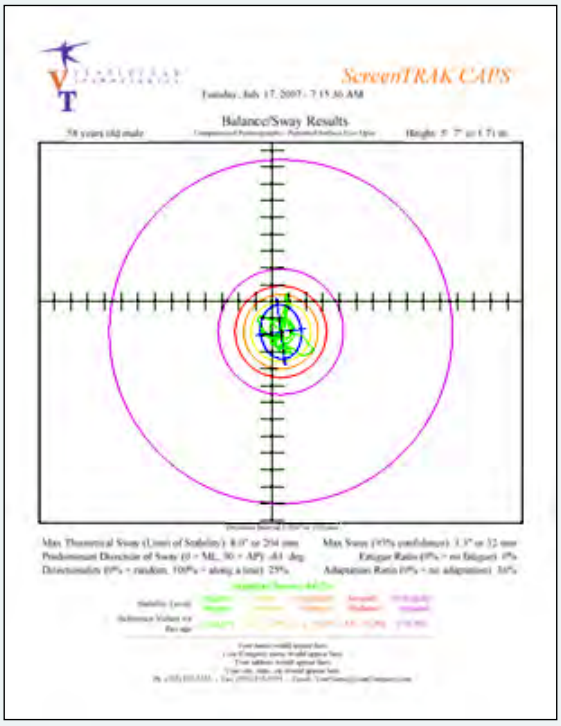
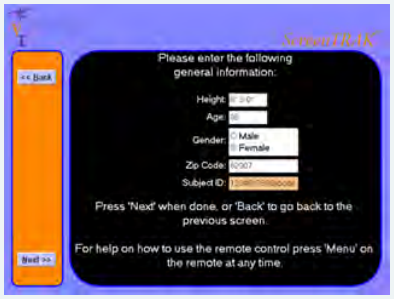
ScreenTRAK™ software

(U.S. Patent 7,163,516)



The unique software that replaces conventional subjective balance assessment protocols with a patented, fast and easy test that can be done by entry level personnel



- A powerful, easy to use, flexible software for basic balance screenings using any CAPS® force platform
- All that has to be entered in order to perform the tests are the subject's height, age and gender
- So simple to use that the entire process can be controlled via a palm size remote control (included with any CAPS® system)
- ScreenTRAK™ simplifies compliance with HIPAA because no subject's or test data are saved. Record keeping is accomplished by sending test results to a printer or to a file

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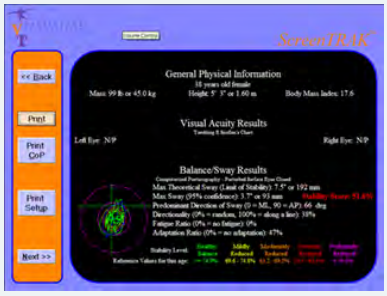
Applications

CLINICAL



- ScreenTRAK™ was designed to let you quickly and easily screen subjects to identify who has abnormal balance and who is at higher risk of falling
- For in-patient facilities, clinics and medical offices, ScreenTRAK™ makes it easy to perform tests in less than a minute so that you can establish a fall risk evaluation and fall prevention program in compliance with JCAHO and other regulations
- ScreenTRAK™'s detailed, easy to understand reports make a great tool to explain balance impairment to a person, especially to those who have abnormal balance. The reports also provide the objective, documented evidence that many health insurers now require
- ScreenTRAK™ is a valuable treatment aid, since the ability to quickly perform additional tests lets you evaluate in "real time" the effect of the interventions you use with your patients
- ScreenTRAK™ can also be used to document outcomes, providing insurers with objective results that can facilitate reimbursement

ATHLETICS/SPORTS

- A quick ScreenTRAK™ balance test can be used to evaluate athletes on the spot by comparing their results with their previously established baselines, letting you quickly detect sub-par performance - or dangerous concussions … even directly on the sidelines
- With ScreenTrak™ you can make instantaneous decisions regarding training or tactics. You can also quickly see if an athlete has suffered any trauma from a violent contact or other event that might have caused neurological or physical injuries, even if those injuries are not readily apparent

Screening Protocols

Balance

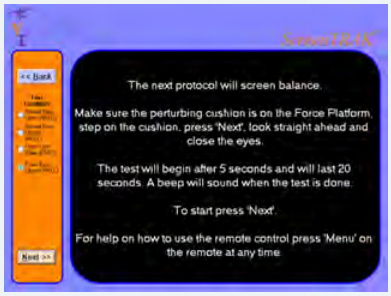
The balance screening protocol measures the subject's sway by means of a computerized posturography test lasting just 20 s. The standard test is conducted on a perturbed surface (foam cushion) with eyes closed, since tests performed in these conditions have been statistically shown to have the best correlation with conventional fall risk (subjective) assessment protocols.

Multi-Balance

The Multi-Balance option allows you to test in any of the four mCTSIB conditions (eyes open or closed; with or without perturbing foam cushion). The testing protocol is always the same, you just select the test condition you want, and the appropriate age-based reference values are automatically incorporated into the reports.

Weight/BMI

Effectively replacing a standard physician's scale, the subject's weight and body mass index (BMI) can be automatically calculated while doing the balance screening.



No additional, time wasting steps are needed!

Vision

Maybe you routinely test your patients' far (6 m or 20') and near (30 cm or 14") vision, but those tests don't tell you whether your patients can see what is under their feet when they take a step. That is why ScreenTRAK™'s special "tumbling E" Snellen test modality gives you a much more effective tool to detect your patients' risk of falling because it lets you test their intermediate distance (2 m or 6') vision, scoring the results in the customary fashion.

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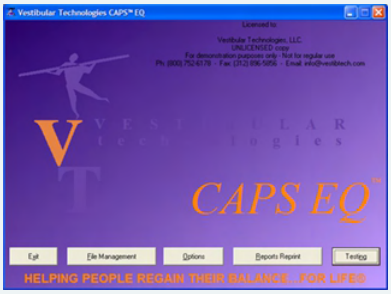
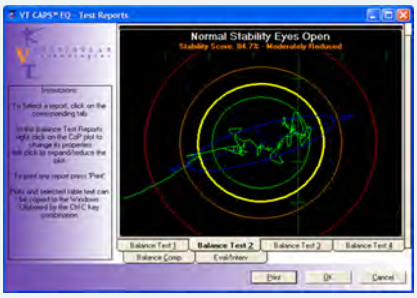
CAPS® EQ software

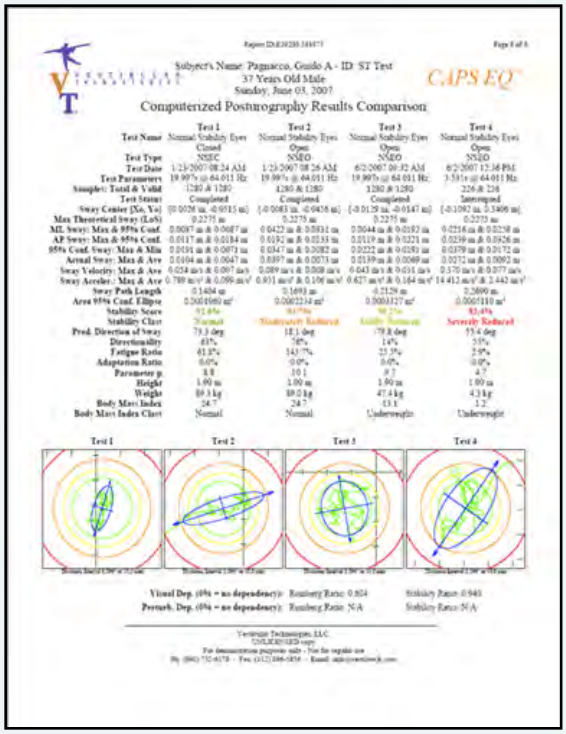
(U.S. Patent 7,163,516)

The unique, specialized software that pairs with the CAPS® hardware to make it simple and easy to test static balance and equilibrium.





The easy to use CAPS® EQ software gives you the flexibility to select different testing protocols (either predefined or user-defined), to perform extensive data analysis, to generate and print customized reports and to automatically print additional documents (such as referral forms, flyers, brochures or letters).



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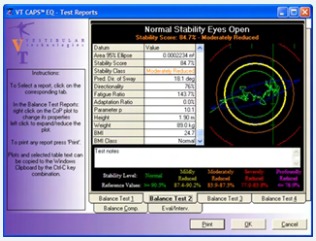
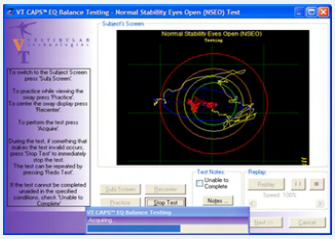
Testing



The CAPS® EQ interface for performing vision and balance testing.

The CAPS® EQ's many features include:

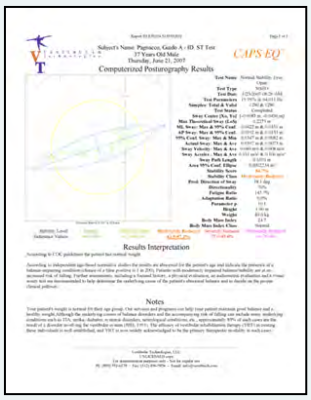
- Selecting the testing template you want to use
- The ability to print up to four different test results so that the results of different tests may be easily viewed and compared

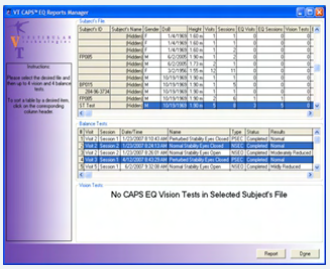


- Automatic generation of internal, external and patient reports
- Entry of evaluation and intervention notes
- Saving all test data for later viewing and comparison
- Choosing the order in which tests are done
- Instantly replaying the test to better view and analyze it
- Automatically printing additional documents such as advertisements, brochures or flyers whenever specified test results are obtained
- "Just click Enter" simplicity of conducting the mCTSIB test battery
- File compatibility with BalanceTRAK®, eliminating double entry of data

Report Reprinting

With CAPS® EQ there is no need to print the test report immediately - you can do it at your convenience by using the Report Reprinting interface.
Included features are:



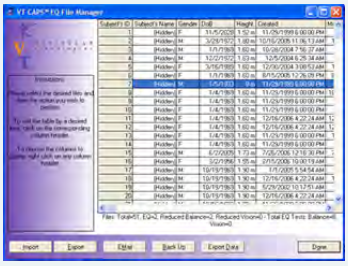


- Automatically generate internal, external and subject reports
- Print additional documents such as ads, brochures, flyers or referral forms depending on the test results
- Review and compare tests from different sessions, so you can easily monitor therapy progress and document outcomes

Subject File Management

The CAPS® EQ uses a unique "Patient-Centric" way of handling data files – one file per patient.
Among its many features are:

- Easy export of CAPS® EQ data files
- Easy import of CAPS® EQ and BalanceTRAK® data files
- Simple email of CAPS® EQ data files

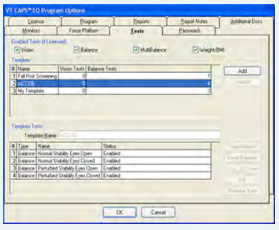


- Auto backup of CAPS® EQ data files by just clicking your mouse
- Sort data by over 100 different criteria
- Quickly view a snapshot summary of the persons tested and cumulative data about the number who passed and failed the tests

Options

CAPS® EQ lets you take full advantage of its many features by allowing you to customize it according to your needs, including:

- Changing the acquisition parameters to better fit your patients and your testing protocols
- Using a separate monitor for you and your patients
- Customizing testing templates
- Customizing the notes and comments on the printed reports
- Selecting additional documents to be printed with the reports, depending on specific test results
- Using two level password protection to restrict access to the software and data



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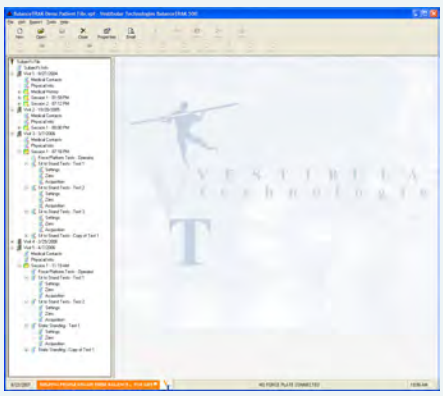
BalanceTRAK® software

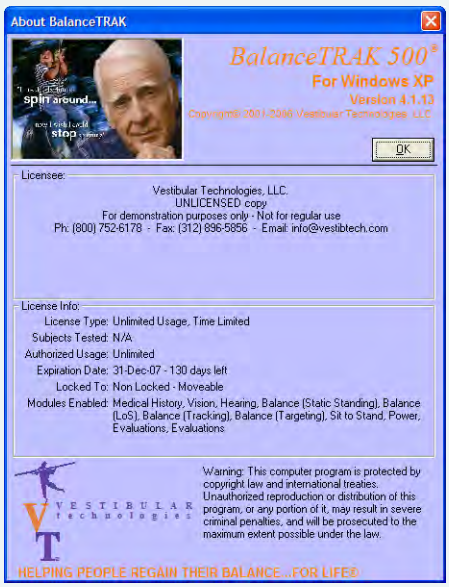
(U.S. Patent pending)



User friendly but extremely powerful, BalanceTRAK® offers you the latest in cutting edge technology for

- advanced balance testing
- physical performance testing and treatment

Using the CAPS® Professional Force Platform, BalanceTRAK® lets you perform several specialized tests with unparalleled flexibility and control of test parameters, allowing you to obtain essential information about your subject's balance system and physical performance that was never before available to you.



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Applications

CLINICAL

BalanceTRAK® lets you easily document diagnostic testing, therapy progress and treatment outcomes.

It facilitates compliance with JCAHO and other bodies regarding fall prevention and provides the objective and documented evidence that many health insurers are now requiring.

Because BalanceTRAK® lets you test subjects in an unprecedented variety of test conditions, it can be a very beneficial tool for you to use in the diagnosis of balance and other disorders.

Remember, too, that BalanceTRAK® and the CAPS® Professional Force Platform can be used not only with fully ambulatory subjects, but also with subjects using support aids such as canes or walkers – even with subjects that are completely unable to stand.

ATHLETICS/SPORTS

Although originally conceived as clinical tools, the various BalanceTRAK® modules have many applications in athletics/sports medicine.

With BalanceTRAK® you can not only identify and evaluate factors limiting the subject's balance, you can also put the subject through a number of specialized physical performance tests, then measure, quantify and document the subject's progress while engaging in valuable biofeedback exercises tailored to the individual subject.

Plus, BalanceTRAK®'s rugged portability lets you use it not only in well controlled environments, but also directly on the sidelines.

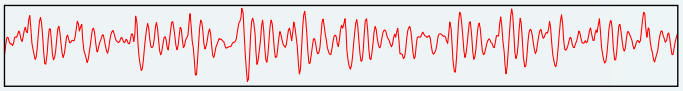
Modular Configuration

Although BalanceTRAK® consists of a collection of different modules working in a single unified framework, each module operates independently so you can purchase only the modules you need for your particular setting.

Available modules include:

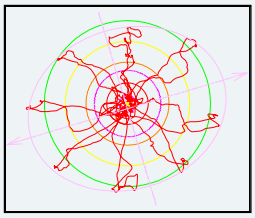
Medical History

To get all the crucial medical information with special emphasis on dizziness, balance disorders, falls, near-falls, hearing and tinnitus



Static Balance

To perform static balance/sway tests

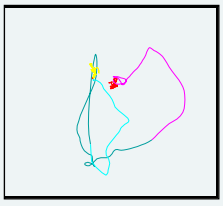


Limit of Stability

To perform limit of stability tests

Targeting

To perform sway targeting testing and exercises

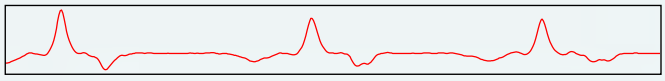


Sit-to-Stand

To evaluate physical performance using the classic sit-to-stand test

Power

To perform a variety of physical performance tests



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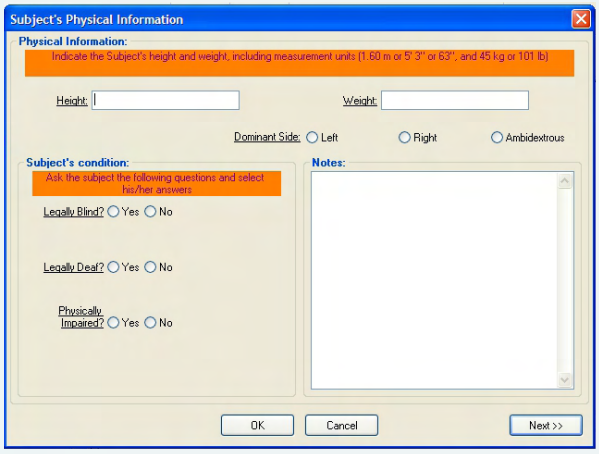
(U.S. Patent pending)

BalanceTRAK® software

Medical History Module



It is designed to quickly collect a subject's medical history, focusing on the factors that are often present in connection with balance disorders, hearing loss, dizziness, tinnitus, falls and near-falls.

Unlike any other product on the market, this module allows a complete medical history to be taken by entry level personnel who have had only minimal training. Intuitive instructions guide the user through the simple interface screens where a series of questions are presented in a logical and comprehensive way, with immediate checks to ensure that all important information has been collected before proceeding to the next screen.

Because it is tailored to health problems like dizziness and balance disorders and is designed to be used by untrained personnel, it is much more comprehensive than any general medical history collection software or paper product.

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Applications

CLINICAL

BalanceTRAK® Medical History Module simplifies and streamlines the often complex process of obtaining an effective anamnesis from a subject.

Based on the subject's responses, the module uses an intelligent built-in decision tree to dynamically present only those questions that are appropriate for that specific subject's medical history and symptoms.

After all information has been recorded, a detailed summary of the data gives the health care provider a comprehensive picture of the health and well-being of the subject, allowing the clinician to better formulate appropriate diagnosis and treatment.

Since BalanceTRAK® supports multiple visits, it is possible to use this module not only to collect the medical history as part of an intake visit, but also to collect the initial history during subsequent visits. It is also possible to collect and update an old history or to collect and record changes at various stages of the subject's treatment.

The fact that the medical history information is stored in the same file as the subject's BalanceTRAK® test results simplifies record-keeping. It also allows clinicians to easily transfer all the subject's information to other medical personnel for consults or for treatment without having to transmit numerous paper forms and without incurring the risk that some important information might be lost.

ATHLETICS/SPORTS

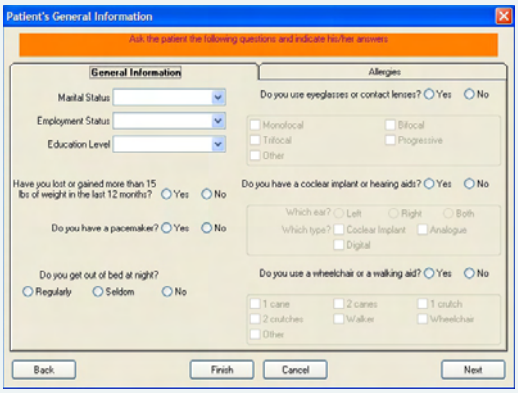
Although originally designed as a clinical tool, this module also has athletics and sports applications since it allows personnel to collect an athlete's medical history to identify possible causes of poor performance or to identify conditions that might be a counter-indication to the practice of some sports.

General information

- Subject's Information
- Clinical Contacts
- Physical Information
- Preliminary Screening
- General Information
- Dietary and Other Habits

General health and medical history

- Family Health History
- Personal Health Problems
- Symptoms
- Risk Factors



Summaries

- Pathologies
- Surgeries
- Hospitalizations
- Doctors
- Medications

Additional Questionnaires

- Falls/Near Falls History and Description
- Fear of Falling
- Hearing Loss Questionnaire
- Tinnitus Questionnaire
- Dizziness Questionnaire
- Lifestyle Questionnaire

Reports

It is possible to generate a comprehensive report that includes all the information collected with this module or to generate condensed reports containing only the information contained in specific questionnaires.

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SW_2PD_BTHistoryModule-Flyer – Issued by Sales – Date: 01/01/2014 – Rev. B

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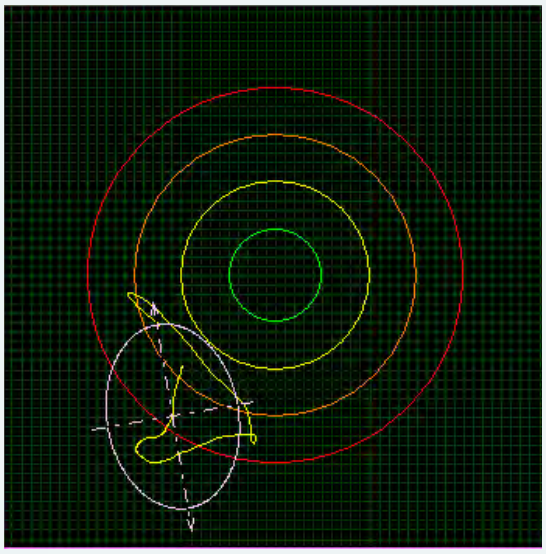
BalanceTRAK® software

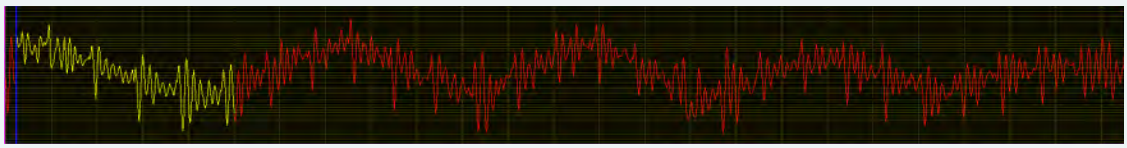
Static Module



It is designed to quickly quantify the subject's ability to minimize and control his/her sway as well as the symmetry of weight-bearing.

Unlike any other product on the market, this module not only allows you to perform a standard static balance test, but offers you unparalleled flexibility and control of test parameters.

The effects of vision, stance, head and arm positions, footwear, gaze, mental tasking, and breathing regimen on the subject's ability to minimize and control his/her sway can all be assessed using this module.



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Applications

CLINICAL

The primary objective of the Static Test is to establish and document if a subject is at increased risk of falling.

The Static Test can also be used to monitor in real time and record the dynamic balance of a subject while he/she is performing a specific movement in slow motion, allowing the clinician to determine if the subject's balance is worse in any specific position. This can be of great help in identifying balance problems triggered by specific positions/activities and that would otherwise go undetected.

Once the diagnostic determination has been made, customized rehabilitation protocols may be employed to improve the subject's balance, and this module, as well as other BalanceTRAK® modules, can be used to monitor the subject's progress.

The real-time capabilities of this module can also be used to provide biofeedback weight-bearing training in subjects with pathologies, whether neurological or of other origin, affecting the symmetry of weight-bearing, as is often the case with subjects suffering from stroke or peripheral neuropathies.

ATHLETICS/SPORTS

Balance is an important aspect of many sports. This module allows you to observe, in real time, what is happening to the stability of a subject while he/she is performing a specific maneuver in slow motion, making it very useful for testing athletes whose performance has been below par when they were in a specific body configuration.

Testing Protocol

The Test

The test can be performed on the force platform alone, or with any specialized surface that will fit onto the force platform (wobble board, foam cushion, etc.).

The force platform is zeroed and the subject steps onto the force platform or other surface (perturbing foam may also be used) and assumes the position specified in the test settings.

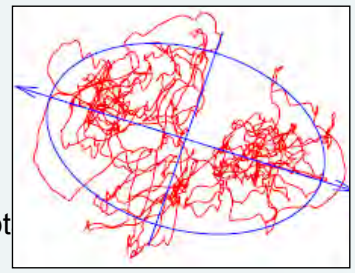
Clinicians interested in the effect of a transient movement may give the subject the command to execute the movement in question (for example, to open or close his/her eyes) at the end of the pre-test sequence.

If performing the test in static conditions, the subject maintains the specified position for the entire duration of the test. If performing the test in dynamic conditions, the subject does the desired movement in slow motion while the operator observes the real time screen, to identify the positions in which the sway significantly increases.

The Numerical Results

These are some of the numerical results available:

- Average Vertical Force (weight):
- Average Center of Pressure Location
- Predominant Direction of Sway
- Directionality
- Length of the Sway Path
- Sway Velocity
- Fatigue and Adapt
- Stability Score



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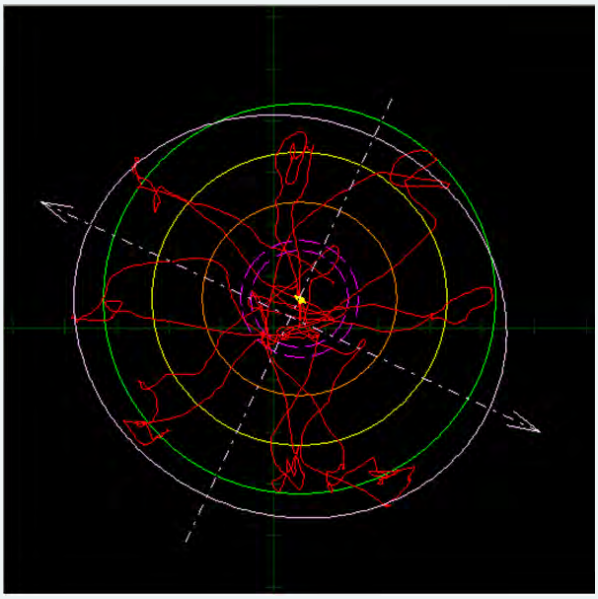
BalanceTRAK® software

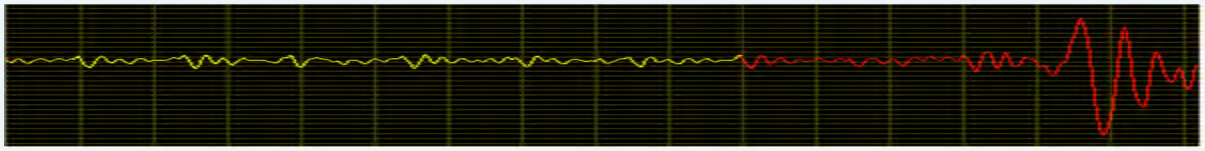
Limit Of Stability Module

It is designed to quickly quantify the subject's usable area of support, i.e. his/her ability to sway in any direction



Limit of Stability (LoS) test results are extremely important because a person's risk of falling depends not only on his/her ability to control sway (as tested using the BalanceTRAK® Static Module) but also on how large the usable area of support is.

This module allows you to perform a test that measures the actual maximum possible excursion of the subject's sway, not just the ability of the subject to sway a predetermined amount.



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Applications

CLINICAL

Muscular strength in the legs and feet, somatosensory feedback from the feet regarding the actual position of the center of pressure, as well as psychological aspects related to fear of falling, are all important factors affecting the ability of a person to sway in any direction.

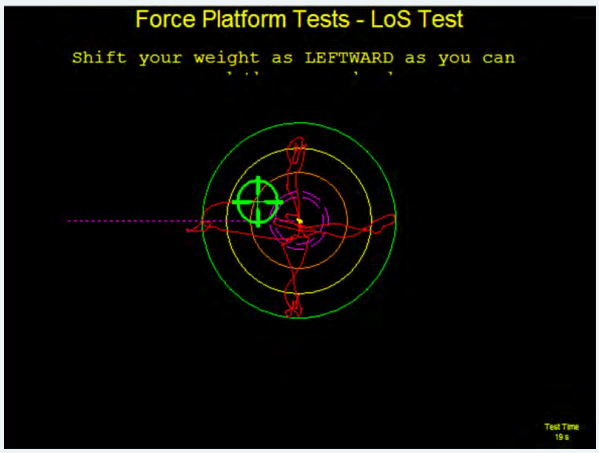
With the Limit of Stability module you can:

- Evaluate the effects of drugs, orthoses, neurological stimulations, manipulations and others
- Use it as a biofeedback rehabilitation tool for subjects with pathologies affecting somatosensory feedback (such as stroke, peripheral neuropathies and others) to improve proprioception by giving them feedback about the location of their center of pressure and how they can affect its position by shifting their entire body weight
- Show the difference between using an ankle strategy or a hip strategy to maintain balance
- Use it to get biofeedback from exercises involving ankle strategy in order to increase the muscle tone in the lower extremities
- Use it to reduce a subject's fear of falling
- Improve weight-bearing symmetry and posture
- Determine progress during the exercise as the subject increases his/her range of sway in the desired direction

ATHLETICS/SPORTS

The BalanceTRAK® Limit of Stability Module makes it possible to identify deficits in a subject's ability to fully use his/her available area of support. This is important because such balance deficiencies can reduce their ability to withstand the perturbations to their balance that are an inherent part of their sport.

Once eventual deficits are identified, the biofeedback functions of this module can be used in conjunction with a customized training or rehabilitation regimen to improve the subject's ability to fully use his/her area of support, which will result in better overall athletic performance.



Testing Protocol

The subject is instructed to lean as far as he/she can in a specific direction (four orthogonal or eight 45° angle directions, with the eight directions providing the more complete and accurate results), without losing his/her balance.

Visual feedback can be provided so the subject sees on the screen the direction in which to move, four limit of stability thresholds, a marker representing his/her current position and a trace following the movements already done.

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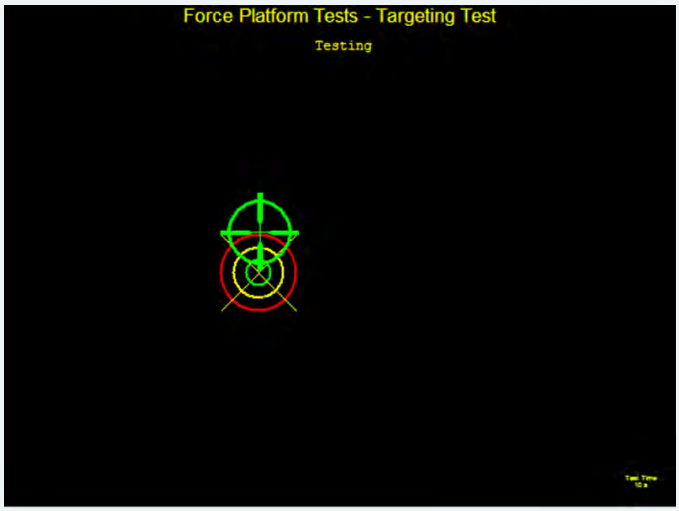
BalanceTRAK® software

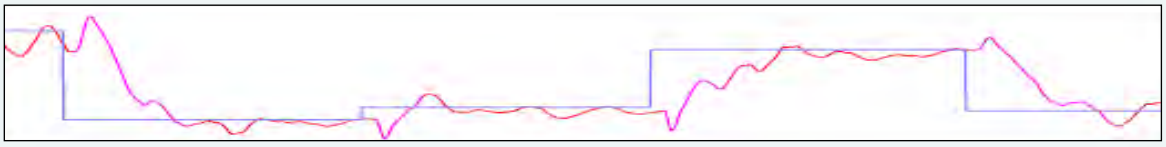
Targeting Module

It is designed to quantify the subject's ability to quickly and accurately shift his/her body weight to the desired position.



Unlike any other product on the market, the timing and geometry of the movement can be completely randomized to prevent the subject from using a preprogrammed movement strategy to reach the target, making it possible to evaluate not only the subject's weight-shifting abilities, but also his/her reaction time.

This module is a great tool for those who work with athletes because an athlete's ability to shift his/her body quickly and on cue is essential in almost all sports.



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Applications

CLINICAL

This test can be used to identify the subject's ability to control his/her center of pressure while doing a weight shifting movement.

It can be used to aid in the detection and diagnosis of motor coordination as well as neuromuscular pathologies. The ability to present targets whose movements is constrained in specific directions also makes it possible to use this module for vestibular and neurological disorders that tend to manifest themselves as a reduced ability to control movements in specific directions.

Because of its interactive nature, this module is a great rehabilitation/exercise tool to improve the subject's ability to perform weight-shifting movements, with an increased level of difficulty both in range of motion (larger movements) and in time (faster movements).

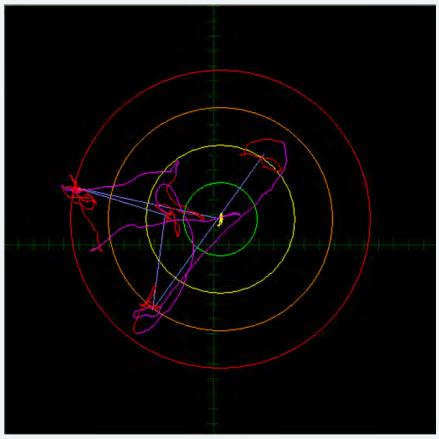
Progress during exercises is easily determined as the subject should be able to increase his/her speed, reaction time, accuracy of movement and range of sway in the desired directions if the exercises are done correctly and are actually effective for that subject.

ATHLETICS/SPORTS

Performance requiring fast and accurate movements is essential in many activities. The BalanceTRAK® Targeting module makes it possible to evaluate a subject's weight-shifting abilities. Movement reaction time and accuracy are then used to score this ability.

The BalanceTRAK® Targeting module is very useful in identifying unilateral weaknesses or conditions that limit an athlete's performance in only certain directions or conditions.

And it can be successfully used as part of customized training or rehabilitation regimens to improve weight shifting and reaction time performance, as well as to monitor the subject's progress during treatment.



Testing Protocol

A series of targets are shown to the subject who has to shift his/her center of pressure to match the position of the target (the process is similar to the Saccade test that is done with the eyes, but because of the inertia involved, the timing and amplitude are much larger).

The position of the targets is defined with respect to the theoretical limit of stability of the subject, making the test more or less difficult depending on how far from the center of the limit of stability the targets appear.

Biofeedback is provided in real time by showing on the screen both the target and the instantaneous center of pressure of the subject (identified by a specific marker).

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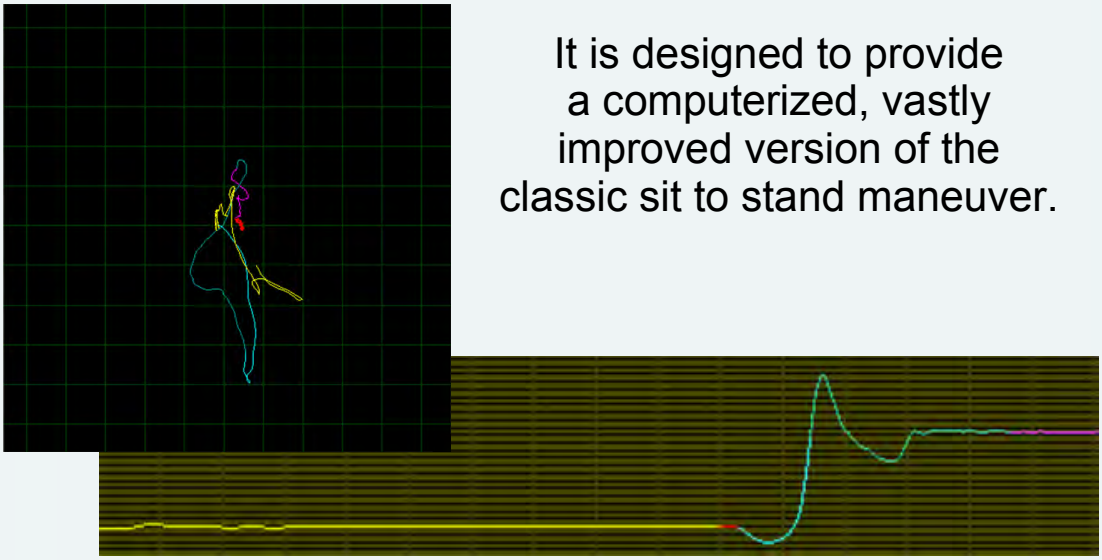
(U.S. Patent pending)

BalanceTRAK® software

Sit to Stand Module



It is designed to provide a computerized, vastly improved version of the classic sit to stand maneuver.

The use of a force platform and specialized software allows clinicians to obtain not only an accurate and objective measurement of the time it takes a subject to perform the movement, but also provides a great deal of additional information that would otherwise be unavailable.

Biofeedback is provided in real time by showing on the screen the trace of the subject's center of pressure during the entire movement – an invaluable tool for clinicians treating elderly patients or patients with a muscular pathology.

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Applications

CLINICAL

Because the sit to stand maneuver is recognized as a valid and useful measure of physical performance as it relates to daily living activities, this module can be invaluable in helping to objectively measure and document all the parameters of the standard sit to stand maneuver. It can also establish if the subject is at risk of losing his/her balance once he/she reaches a fully erect position after rising from a sitting position.

As a rehabilitation tool, it can be used to improve the subject's ability to perform a controlled sit to stand maneuver that is accompanied by a stable upright posture.

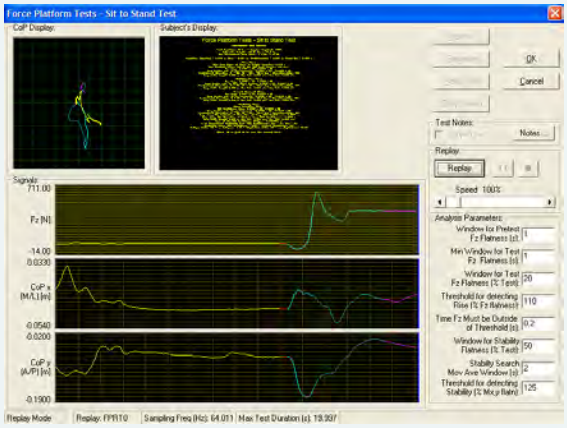
With this tool you can also teach different strategies to perform the sit to stand motion. Sit to stand is a common, very simple daily task, yet one that can often result in a fall, strained muscles, or increased pain from osteoarthritis or other muscular or joint pathologies.

As a biofeedback rehabilitation tool it can provide invaluable training in terms of optimizing the maximum load on the subject's lower extremities during this common daily activity.

ATHLETICS/SPORTS

Although not particularly geared for these kinds of applications, this module can be used to measure the subject's whole body reaction time, and as a low intensity physical performance test, measuring such quantities as the maximum force generated, maximum vertical acceleration, movement time and stabilization time. These measures can be used to monitor the effects of training regimens and subject's progress because, in general, smaller values directly correlate with improved performance.

Where this module excels is in determining if the subject is suffering from conditions such as postural hypotension or other conditions whose onset is triggered by large postural changes that can cause temporarily reduced performance and poor balance.



Testing Protocol

The test is performed by placing a chair as close as possible to the CAPS® Professional force platform without touching it. The subject then sits on the chair with his/her feet resting comfortably on the force platform. Then when instructed by the BalanceTRAK® software, the subject stands up, reaching the upright position and holding it until the end of the test. The subject should maintain the upright position without losing balance or needing to take a step to stabilize him/herself after the sit to stand maneuver. This allows BalanceTRAK® to calculate where the sit to stand maneuver ends and to accurately measure and quantify the subject's subsequent stability.

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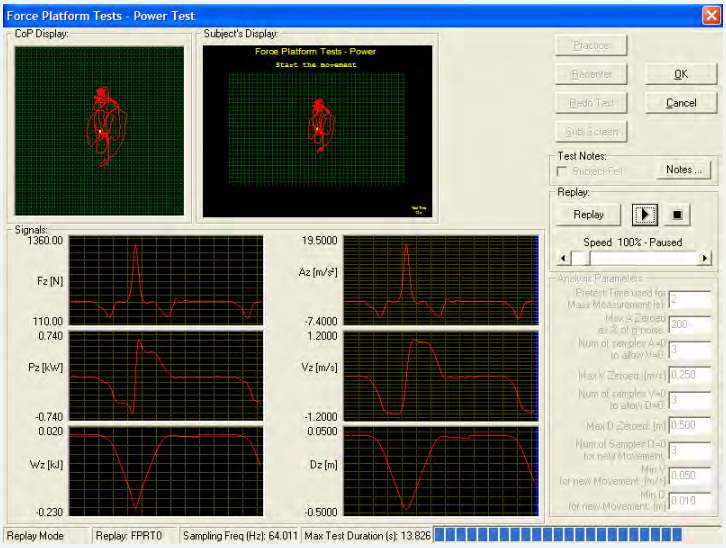
BalanceTRAK® software

Power Module



This module is an
absolute necessity
for anyone working with athletes.

This module is designed to quickly estimate force, power, and energy, as well as acceleration, velocity and displacement for any movement in the vertical direction that a subject positioned on the CAPS® Professional force platform is able to perform, from squatting to jumping (landing outside the force platform), and from push-ups to weightlifting.

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Applications

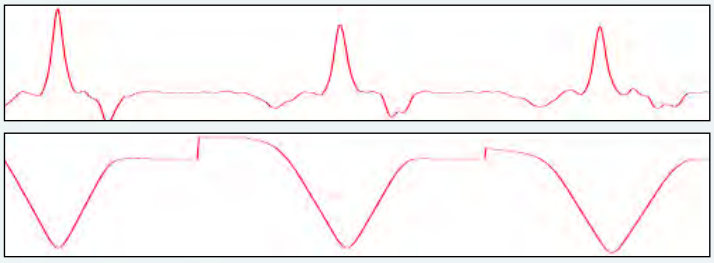
ATHLETICS/SPORTS

This module is uniquely suited for athletics/sports applications. The ability to measure force, power, and energy, as well as acceleration, velocity and displacement of various movements makes this a great training tool as well as an invaluable aid for monitoring and evaluating exercise and training regimens.

The ability to evaluate multiple repetitions of the same movement makes it possible to determine important aspects like fatigue thresholds that let you optimize the training regimen for the subject's condition, avoiding the risk of over-training and its negative consequences.

The subject's progress during training can be easily quantified by repeating testing over time, allowing you to detect when the training is no longer improving performance, so you can make a decision regarding the usefulness of altering the training regimen.

The unique ability to show in real time not only the movement's variables, but also the center of pressure and the sway, are also very useful as a biofeedback training tool to improve the subject's technique in a variety of movements such as power squats, weightlifting and jumps (landing outside the force platform).



CLINICAL

This module can be used to evaluate non-isometric muscular activities of the lower limbs as well as of the torso or upper extremities. Limbs can be evaluated together or the movement and the set-up can be altered so that each side of the body can be tested separately. The results may then be compared in order to uncover unilateral weaknesses.

It can also be used as a rehabilitation tool to monitor rehabilitation progress while restoring the subject's ability to perform specific movements in the vertical direction after injury, surgery or illness. This is done by checking to see if the subject is able to generate increasing power, energy or force, and can perform the movement faster or with an increased range of motion. As such, it can also be used to document functional progress and outcomes.

Testing Analysis

Comparing the same value for different repetitions can give an indication of the repeatability of the movement (how well the subject is able to perform the same movement over and over again), as well as whether there is any effect of fatigue (the movements are slowing down, or becoming smaller, or the subject is exerting less force, power, or energy) or training (the movements are becoming faster, larger or stronger, or the subject is exerting more force, power, or energy).

All the measured variables, as well as the subject's sway can be monitored in real time, allowing the use of this module not only for testing but also for advanced training.

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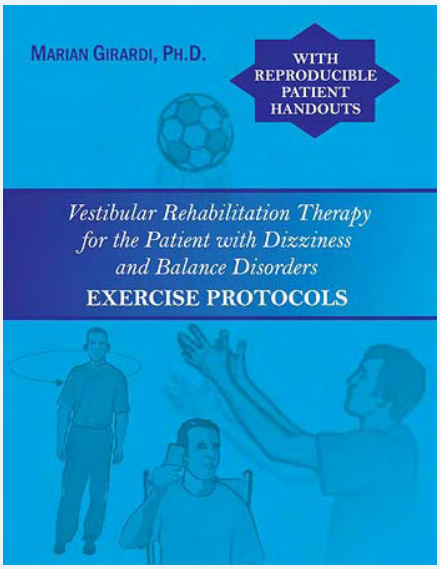
Literature

Are you interested in providing balance therapy?

Are you already providing balance therapy?



Either way, you'll really appreciate the book we publish:

it's been called "the best book ever written on the subject"!

"Vestibular Rehabilitation Therapy

for the Patient with Dizziness

and Balance Disorders"

by Marian Girardi, Ph.D.

(ISBN 0-9767593-8-1)

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What the book is all about

Every clinician who deals with patients who have dizziness and balance disorders will find this book to be an invaluable aid not only in the diagnosis of dizziness and balance disorders, but in the treatment of those conditions as well.

Features include:

- A brief summary of the anatomy and physiology of the vestibular system
- How to identify the patient with vestibular problems
- Assessment tools for vestibular diagnosis
- Risk and safety factors for falls
- An overview of Vestibular Rehabilitation Therapy (VRT)
- VRT treatment protocols
- Eye, head and body exercises to both improve balance and gait and then maintain them throughout life
- 22 reproducible patient handouts that include exercises and easy to follow procedures your patients can use to continue their therapy at home *(copyright has been waived on the patient handouts so they may be freely reproduced and distributed to your patients. The 22 patient handout pages are perforated to facilitate removal from the book for copying.)*

This is the one reference work that everyone who is interested in diagnosing dizziness and balance disorders or providing effective treatment for those conditions should have.

About the Author

Marian Girardi tested and successfully treated many thousands of dizzy and balance disorder patients during her distinguished career. It was her fondest wish to share her knowledge with others through the publication of this book. Unfortunately, she did not live to see her dream come true. She passed away suddenly in January 2005, shortly after approving the cover design for her book. She will be sadly missed by all who knew her.

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