"The Clinical Advantage"™

Balance Assessment for Concussion Management

Consistent with NCAA and NATA Guidelines






They're depending on you...

...to get back in the game

*"At a minimum, the **baseline assessment** should consist of the use of a symptoms checklist and standardized cognitive and balance assessment."*[1]

– 2013-14 NCAA® Sports Medicine Handbook

*"Formal cognitive and **postural-stability testing** is recommended to assist in determining injury severity and readiness to return to play (RTP)."*[2]

– NATA® Position Statement on Sport-Related Concussion

BIODEX

Leader in objective Balance Assessment for Concussion Management

BIODEX

Balance Assessment for **Concussion Management**

As research continues to demonstrate the potential long-term impact of concussion in sports, the importance of objective assessment in the management of concussion has become vital.

Biodex Balance Assessment is used by high schools, college and professional sports teams as an integral part of their concussion management programs. Programs that bring together best practices of cognitive testing and a graded symptoms checklist in combination with objective data provided by Biodex technology.

Biodex Balance Assessment for Concussion Management adds the objective neurophysical component that gives clinicians the ability to quantify the elements of balance before and after an injury occurs. Using the Clinical Test of Sensory Integration of Balance (CTSIB), Biodex Balance devices can independently test all three sensory feedback systems (visual, vestibular and somatosensory).

The objective data generated by either the **Balance System™ SD** or the portable **BioSway™** provides a baseline against which postinjury performance can be compared. In addition, test results from a healthy population of student-athletes are stored on the system for general normative data comparison.

Detailed test and progress reports track recovery and provide the medical team with quantitative data to help with the return-to-play decision.

> *"Objective **balance assessment** is recognized as part of 'best practice' for concussion assessment and management."* [3]
>
> *– International Symposium on Concussion, Consensus Statement*

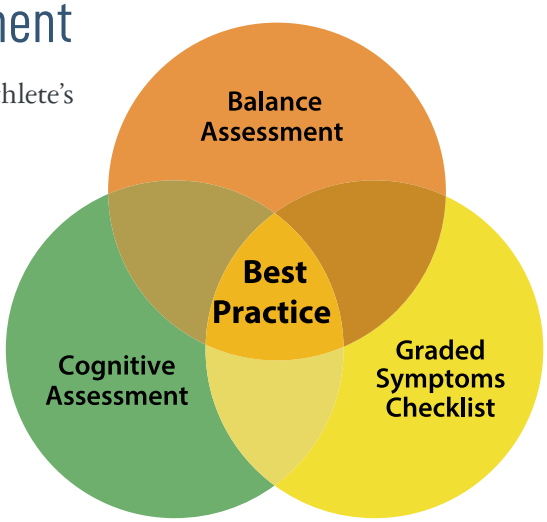
All test results and training sessions can be stored and printed. Comparison to normative data helps communicate need, progress and outcome.

Baseline Testing for Concussion Management

Preseason tests are performed on athletes to establish an individual athlete's preinjury performance levels.

The proper management of concussion should include baseline of the following:

- Balance Assessment
- Cognitive Assessment
- Graded Symptoms Checklist



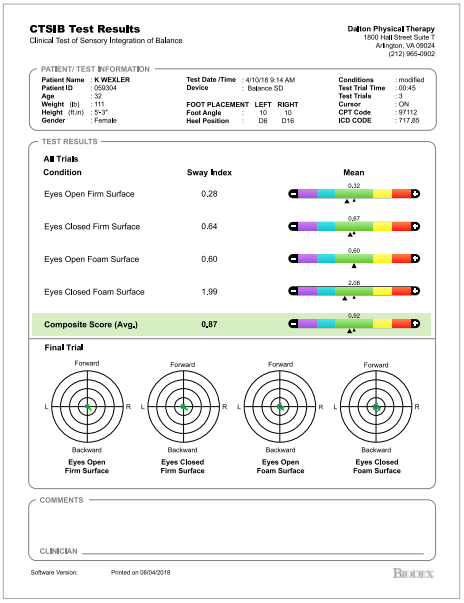
The NCAA® and NATA® have identified these as the three essential assessment pillars.

When combined, these baseline tests can provide a comparison point for cognitive function and objectively quantified balance for athletes. In the case of a suspected concussion, it is these baseline tests to which postinjury assessments are compared, providing the objective data necessary to track recovery.

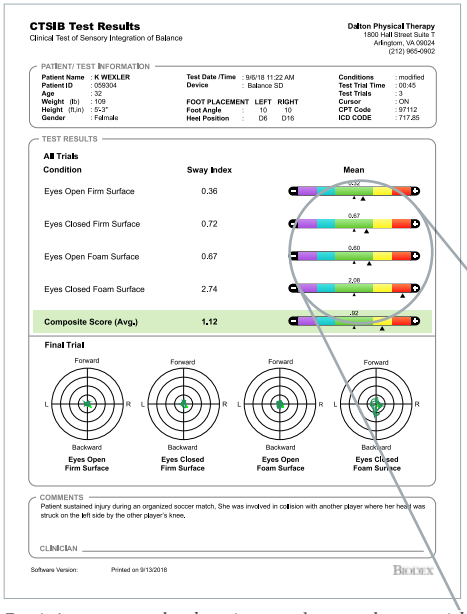
Objective **Documentation**

Data from objective measures of postural stability is a crucial component in determining severity of injury and postinjury recovery. Featuring extensive comparative reporting capabilities, both the Biodex Balance System SD and the portable BioSway compare preseason baseline and postinjury balance assessment to **normative data** of a healthy student-athlete population stored on the system. Reports can be forwarded to doctors, coaches, parents, or athletes to provide quantitative data that substantiates return-to-play decisions.

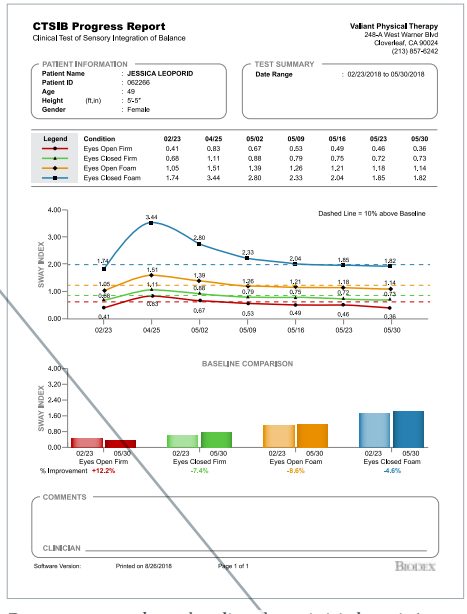
Demonstrate need, progress and outcomes of balance tests



Test results of a preinjury baseline assessment using the Balance System SD's integrated Clinical Test of Sensory Integration of Balance (CTSIB).

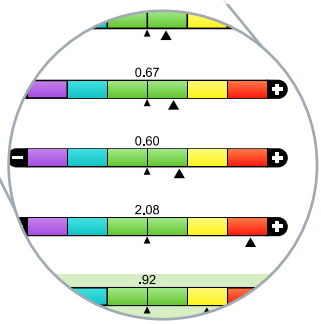


Postinjury test results show increased postural sway with greater variance from normative data.



Progress report shows baseline data, initial postinjury assessment and change over time, providing crucial data for postinjury return-to-play decisions.

The objective measure from postural stability/balance testing provides clinicians with an important additional piece of the concussion puzzle and assists them in determining readiness for return-to-play.[4]



Arrows graphically represent increased postural sway in relation to normative mean postinjury.

System 4

Put athletes back in play with confidence.

Based on Science. Backed by Studies.

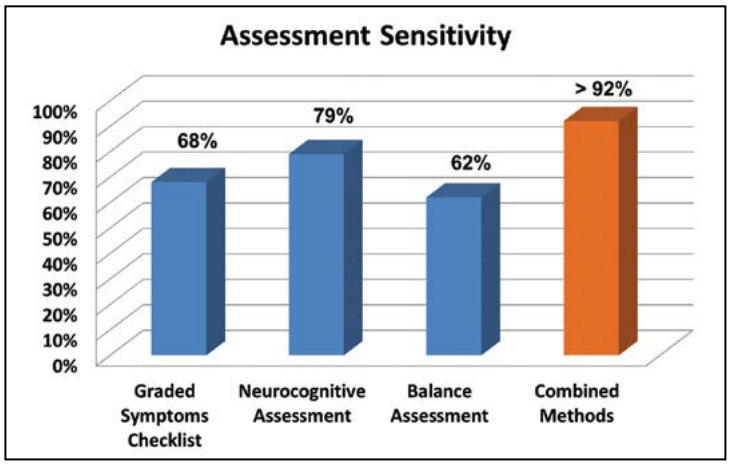
Premier multi-joint system for objective testing. Isolate muscle-performance data for:
Knee • Hamstring • Shoulder • Hip • Ankle • Wrist • Elbow • Forearm • Lumbar

www.biodex.com/s4

Measuring **Balance**

Research shows that athletes often demonstrate decreased stability post-concussion.[5] The postural stability deficit can best be explained by a sensory interaction problem that prevents concussed athletes from accurately using and exchanging sensory information from the visual, vestibular, and somatosensory systems.[5] Difficulty in postural sway control can persist even after signs and symptoms of concussion subside.[6] More simply stated, the athlete may appear asymptomatic and even pass a computerized cognitive test. However, the lingering effects of a balance disturbance from head trauma would otherwise go undetected without a balance assessment.

In fact, research has shown that balance assessment, in combination with cognitive testing and a graded symptoms checklist, increases overall sensitivity to greater than 90%.[7]



Concussion should be approached through a multifaceted assessment, and each component of the assessment process should focus on distinct aspects of an athlete's function.[7]

> *"A decreased ability to maintain balance is one of the hallmark signs of concussion."* [8]
>
> *– Broglio SP, Guskiewicz KM, Concussion in Sport: The Sideline Assessment, Sports Health.*

Clinical Test of Sensory Integration of Balance (CTSIB)

The Biodex default four condition CTSIB test quantifies postural sway under the following sensory conditions:

Eyes Open, Firm Surface	Provides a baseline. Information available by all three sensory inputs: Somatosensory, visual and vestibular.
Eyes Closed, Firm Surface	Visual not available; somatosensory and vestibular are available. If the athlete performs poorly, the vestibular or somatosensory may be compromised, with an increase in visual dependency.
Eyes Open, Unstable Surface	Somatosensory compromised; visual and vestibular are available. If the athlete performed poorly, visual or vestibular may be compromised, with an increase in somatosensory dependency.
Eyes Closed, Unstable Surface	Visual not available; somatosensory compromised, only vestibular available. Concussed athletes are most likely to present problems in this condition. If performance is reduced beyond normal or baseline readings, the vestibular system may be disrupted.

The Clinical Test of Sensory Integration of Balance (CTSIB) is the accepted standardized assessment that identifies and tracks disturbances in balance and the three associated sensory systems.

Combined with today's technological advances, the CTSIB provides the sports medicine community with a more accurate and objective assessment tool for evaluating postural stability.

Testing **Balance**

Biodex Balance Assessment is conducted using either the versatile Balance System SD or portable BioSway. The Balance System SD is a sophisticated measuring and training device for static and dynamic balance testing and training. The BioSway is a portable balance device, with a static-only platform.

The CTSIB can be performed on either Biodex balance device, designed to systematically test the sensory selection process by compromising available somatosensory, visual and vestibular senses while measuring an athlete's ability to minimize postural sway.

The Sway Index is an objective quantification of postural sway and is measured during the CTSIB. The test provides a generalized assessment of how well an athlete can integrate various senses with respect to balance, and compensate when one or more of those senses are compromised. A higher Sway Index indicates a reduction in the athlete's ability to remain steady during the test.

BioSway (Static)

Balance System SD (Static and Dynamic)

The Balance System SD and BioSway include a preconfigured four condition CTSIB test and a modified version of the Balance Error Scoring System (BESS) test of postural stability, both popular for concussion managment.[9] Both tests can easily be customized to include up to six conditions. In addition, the software features the ability to create custom sensory integration balance tests, allowing for the creation of entirely new protocols.

Peer Perspective

Balance assessment gets thumbs up from High School Athletic Director

Scott Stein is the athletic director and head football coach at Sun Valley High School. "The baseline testing that we've done in the last couple of years has been excellent for us as athletic directors and coaches in understanding our kids. The new information that we're getting – from concussion screening to the equipment that they're wearing – allows us to get more involved in protecting the lives of the student-athletes that are playing sports for us," said Stein.

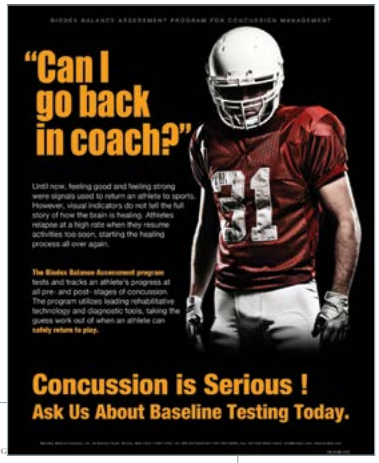
> *"The Balance testing for concussion is a big part of understanding when a student-athlete can come back to play safely."*

"The Balance testing for concussion is a big part of understanding when a student-athlete can come back to play safely. It's come all the way down from professional sports and is now at the high school level. In Union County, balance testing is going to be a big part of keeping our kids safe and healthy."

Scott Stein, Athletic Director
Sun Valley High School, NC

Marketing Support **Materials**

Available exclusively to our customers using Balance Assessment in support of a concussion management program, Biodex provides an assortment of marketing materials to attract athletes, parents, community sports teams, school coaches and athletic directors, as well as referring pediatricians. Materials can be customized to reflect your facility and used to broadcast the role of Balance Assessment in the management of concussion.



Materials include:

Sample letters to coaches and athletic directors, pediatricians or referring physicians and to the parents of local team athletes.

Tri-fold brochure, customized with your facility contact information, to use in the waiting room, as a follow up to letters, or sent to anyone that would benefit by learning about your program.

Sample press release for local newspapers to help promote balance assessment, position your facility as a premier center for concussion management and to draw media attention.

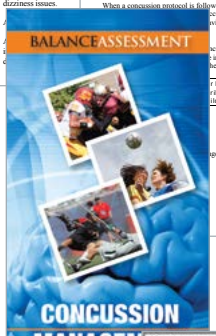
Clinical Brief, providing the physician with a technical understanding of the Clinical Test of Sensory Integration of Balance, the value of measuring postural sway and the underlying objective technology.

Clinical Voucher, customized with your facility contact information, to send to partnering physicians directing athletes to your facility for baseline testing.

Ads for local print publications designed to drive student-athletes to your facility for a baseline balance assessment and to position your facility as a leader in the community.

Concussion Posters to display in your own facility or with partnering physicians, alerting patients to your Balance Assessment Program.

Scroll Sign Graphic assists facilities to create signage that can be used at community events, school functions and educational forums in order to generate interest and build a relationship for future physical therapy requirements.



Resource Center

To learn more about balance assessment for concussion management, access guidelines, tips and research, visit our Resource Center.

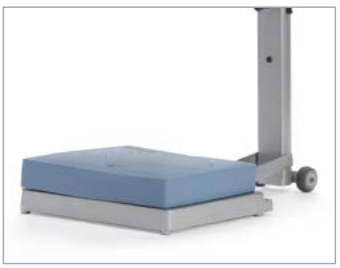
www.biodex.com/resource/concussion

Beyond Assessment

The Balance System SD and BioSway are powerful rehabilitation tools. Both devices not only provide a balance assessment program for concussion management, but also offer multiple rehabilitation training protocols that can be used across a broad scope of athletic populations for general orthopedic and neuromuscular rehabilitation and athletic conditioning.

Test/training modes include:

- CTSIB
- BESS
- Postural Stability
- Fall Risk
- Bilateral Comparison
- Limits of Stability
- Percent Weight Bearing
- Motor Control
- Weight Shift
- Random Control
- Maze Control



CTSIB Indexed Pad for the Balance System SD (left) and BioSway (right) provide consistent surface for unstable test conditions.

Balance System SD

Features static and dynamic balance testing and training. The Balance System SD not only serves your concussion management needs, but standardized athlete knee injury screening tests, plus six interactive training modes to provide valuable and effective proprioceptive and neuromuscular training.

950-440 Balance System SD, 15.6″ Display, 115 VAC
Includes: Printer, printer stand, and CTSIB Indexed Pad.
Export models available.

Optional
950-306 Step Stool, Balance System SD

BioSway

For therapists in the clinic or on the go, the portable BioSway utilizes a static platform for balance assessment for concussion management. It features a lightweight instrumented platform, intuitive navigation, 15.6″, touchscreen display, standardized testing, interactive training, plus a hard shell travel case.

950-460 BioSway 15.6″ Display with Tabletop Stand and Case, 115/230 VAC 50/60 Hz
Includes: Instrumented platform, CTSIB Indexed Pad, tabletop stand/wall mount bracket, AC adapter for 100/240 VAC input, and two blindfolds.

Optional
950-465 Adjustable Height Stand for 15.6″ Display
950-464 HP Office Jet Printer (compact portable printer)
950-467 HP InkJet Printer (full size color printer)
950-466 Printer Stand

DISCLAIMER: The information provided is not intended to be a substitute for professional medical advice but as a guideline to assessing athletes following a concussion. Always seek the care of a physician or other qualified healthcare provider with any questions or concerns you may have about a medical condition. If there is any question/concern about the athlete's status then recommend not returning to play.

References

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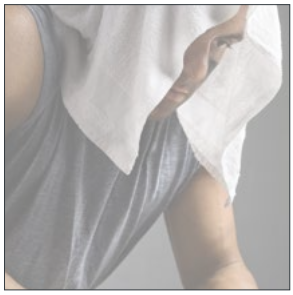
Concussion Management







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