

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

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.



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



*“Objective **balance assessment** is recognized as part of ‘best practice’ for concussion assessment and management.”³*

– International Symposium on Concussion, Consensus Statement

Baseline Testing for Concussion Management

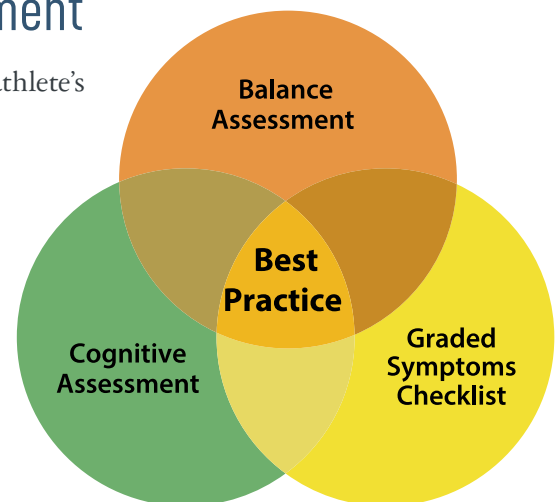
Preseason tests are performed on athletes to establish an individual athlete’s preinjury performance levels.

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.

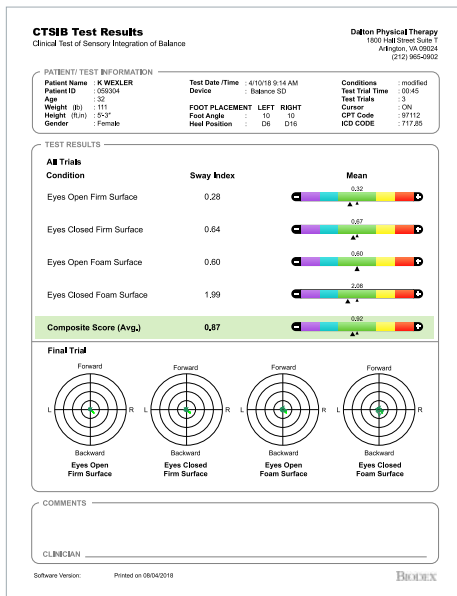


Objective Documentation

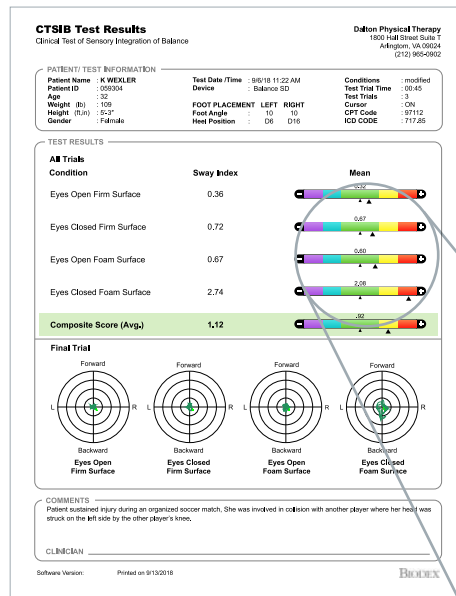
Data from objective measures of postural stability is a crucial component in determining severity of injury and postinjury recovery. Featuring extensive comparative reporting capabilities, both the Biodex Balance System SD and the portable BioSway compare preseason baseline and postinjury balance assessment

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.

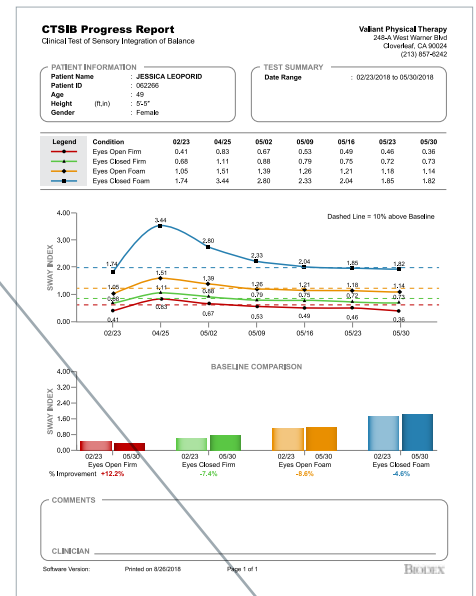
Demonstrate need, progress and outcomes of balance tests



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

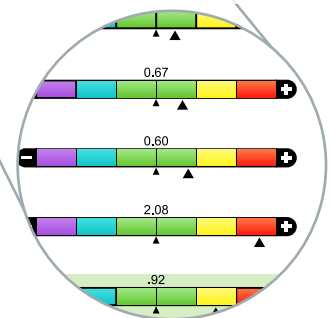


Postinjury test results show increased postural sway with greater variance from normative data.



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

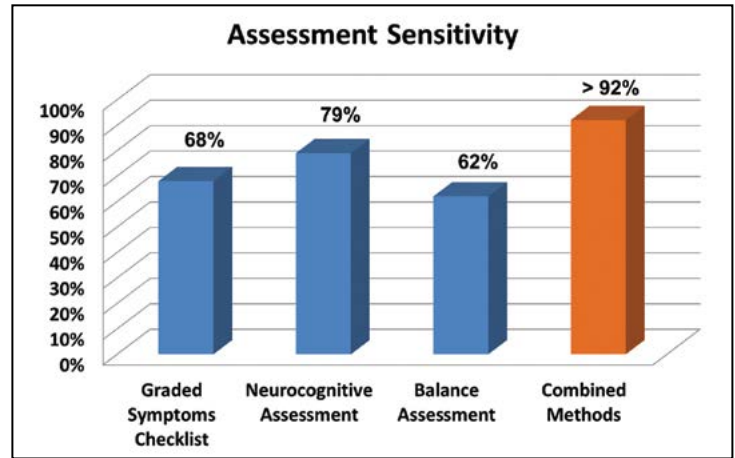
Put athletes back in play with confidence.
Based on Science. Backed by Studies.

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

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

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 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 management.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.

NEW FreeSway Handles



FreeSway Handles provide security for athletes during CTSIB - on unstable surfaces, or with eyes closed.

Especially useful for the various sensory conditions of the CTSIB, Biodex offers the option of FreeSway Handles for the Balance System SD. Understanding that the most accurate balance test occurs when an individual is not holding on, the handles “float” securely within support rings that catch the handles if a user sways too far or loses their balance. The FreeSway Handles are the only balance assessment option that allows users to feel stabilized and secure without impeding postural sway.



BioSway (Static platform)



Balance System SD with optional FreeSway Handles (Static and Dynamic platform)

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.

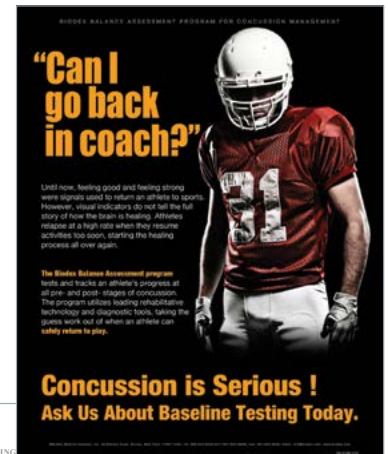
Clinical Brief, providing the physician with a technical understanding of the Clinical Test of Sensory Integration of Balance, the value of measuring postural sway and the underlying objective technology.

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.



MARKETING

For Immediate Release:

Concussion...When is it Safe for Sports Again?
[Facility Name Here] has the answers through testing to keep kids healthy

(Town, State) — (Month, Day, Year) — [Facility Name Here] now offers Biodex Balance Assessment as part of a Concussion Management Program. Balance testing is a key component of best practices for concussion management, available at [Facility Name Here] centers and national sports centers.

The Centers for Disease Control and Prevention (CDC) estimate that 1.6 million sports-related concussions occur annually in the U.S., with school-aged children making up the majority of these cases. The rate of recurrence is just as concerning.

[Facility Name Here] now offers a Biodex Concussion Management Program and we would like the opportunity to enroll your patients with a simple baseline test of balance and cognitive assessment. In the event of an injury, return to play decisions are made based on objective baseline data as well as compared to age- and gender-specific normative data. All data is stored per athletic with the ability to generate HIPAA-compliant reporting.

The test takes only minutes but will provide valuable information in the event a patient sustains a concussion. High school athletes engaged in contact sports are experiencing concussions at an alarming rate. The Centers for Disease Control (CDC) estimate up to 3 million sports-related concussions are happening in the U.S. with school-aged children making up the majority of these cases. The rate of recurrence is just as concerning.

When a concussion protocol is followed, kids usually recover within a week or two. Without a protocol, however, the risk of long-term and possibly lasting effects. Each concussion is different, and using objective-baseline and data-driven support is essential for those who sustain a concussion.

Concussion Management Program for your patient athletes, you can invite them to visit our facility and understand the benefits of the Balance Assessment Program.

7 FREE vouchers for baseline testing to the partners of local [Facility Name Here] sports teams. Each voucher is good for one patient. Use one voucher per athlete base in your practice.

Concussion Management Program is used by local and professional sports teams.

BIDEX
 Concussion Management Program
 Marketing Support

BALANCE ASSESSMENT

CONCUSSION MANAGEMENT

CLINICAL VOUCHER

This Voucher is valid for ONE FREE Baseline Screening as outlined in the Biodex Concussion Management Program.

Patient Name: _____ DOB: ____/____/____

Referring Physician: _____ Team: _____

or Referring Athletic Trainer/Coach: _____

Headline: Baseline Screening involves a Biodex Assessment and a Cognitive Screening. Results are available the next day or in 48 hours. Concussion management will be compared to this baseline result for objective, data-driven decisions for the athlete.

FREE Preseason Baseline Balance Assessment

Concussions can be serious!

To enhance concussion evaluation and aid with return-to-play decisions, every athlete should have a baseline balance assessment before they begin the season.

Call today to schedule an appointment for this FREE evaluation.

Clinic Name and Contact Information

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

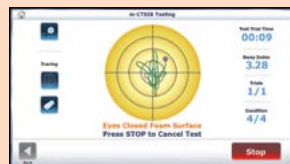
Balance Technology

Beyond Assessment

The Balance System SD and BioSway are powerful rehabilitation tools offering multiple 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
- **NEW** Single- and Dual-Task Games
- **NEW** Recovery Rapids Game



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
950-450 FreeSway Handles
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 Officejet Compact Printer
950-467 HP InkJet Full Size Color Printer
950-466 Printer Stand

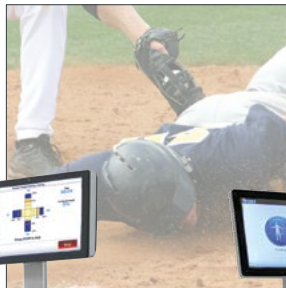
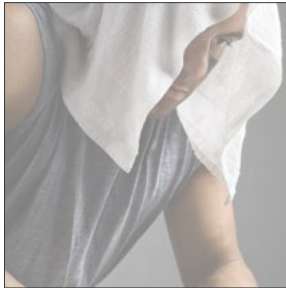
DISCLAIMER: The information provided is not intended to be a substitute for professional medical advice but as a guideline to assessing athletes following a concussion. Always seek the care of a physician or other qualified healthcare provider with any questions or concerns you may have about a medical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

References

1. 2011-12 NCAA® Sports Medicine Handbook, National Collegiate Athletic Association, July 2011
2. Guskiewicz, KM, et al (2004). National Athletic Trainers' Association Position Statement: Management of Sport-Related Concussion. *Journal of Athletic Training* 2004;39(3):280-297
3. McCrory P, Meeuwisse W, Johnston K, Dvorak J, Aubry M, Molloy M, et al. Consensus statement on concussion in sport the 3rd International Conference on concussion in sport, held in Zurich, November 2008. *J Clin Neurosci*. 2009;16:755-63.
4. Guskiewicz KM. Balance assessment in the management of sports-related concussion. *Clin Sports Med* 30 (2011) 89-102.
5. Guskiewicz, KM, et al, Postural Stability and Neuropsychological Deficits After Concussion in Collegiate Athletes (*Journal of Athletic Training* 2001;36(3):263-273
6. Valovich McLeod T, The Value of Various Assessment Techniques in Detecting the Effects of Concussion on Cognition, Symptoms, and Postural Control. *Journal of Athletic Training* 2009;44(6):663-665
7. Broglio SP, Macciocchi SN, Ferrara MS. Sensitivity of the concussion assessment battery. *Neurosurgery*. 2007;60:1050-1057; discussion 1057-1058.
8. Broglio SP, Guskiewicz KM, Concussion in Sport: The Sideline Assessment. *Sports Health*. 2009; 1:361
9. Finnoff, JT, et al (2009). Intrarater and Interrater Reliability of the Balance Error Scoring System (BESS). *PM&R*, Volume 1, Issue 1, January 2009

BIODEX

Balance Assessment for Concussion Management



www.biodex.com/concussion

BIODEX

Biodex Medical Systems, Inc.

20 Ramsey Road, Shirley, New York, 11967-4704, Tel: 800-224-6339 (Int'l 631-924-9000), Fax: 631-924-9241, Email: info@biodex.com, www.biodex.com