

BIODEX BALANCE ASSESSMENT FOR Concussion Management aids in Return-to-Play Decisions

■ SPOTLIGHT ON: db ORTHOPEDIC PHYSICAL THERAPY

When 19 year old Brookdale Community College soccer player Devin Hope stepped into db Orthopedic Physical Therapy in Lincroft, NJ last September, little did she realize her visit would help prove a point, Dr. David Bertone, PT, DPT, OCS had been trying to hammer home to his local sports communities.



Dr. David Bertone
PT, DPT, OCS

"Adding a balance baseline to the preseason medical data gathered on athletes involved in contact sports is absolutely vital," stated Bertone. "For concussion patients, it's a real, objective component that can play a pivotal role in determining post-injury status and a safe point for return-to-play decisions."

Hope, an aggressive defensive player, had been diagnosed with a concussion after taking a shot off her temple during a game. She displayed all the typical concussion signs including nausea, excruciating headaches and lack of appetite. Her pediatrician instructed her to refrain from physical activity and to return for a checkup when her head stopped hurting.

Hope followed the doctor's advice, but her school also had a progressive concussion management program and referred her to Bertone, who had used the Biodex BioSway to complete a baseline balance study of the college's men's and women's soccer teams before the concussion occurred.

"After several days," explained Bertone, "Hope's headache and obvious concussion symptoms had subsided and she passed her post-concussion IMPACC test. Normally, that would be enough for return-to-play. When she came into the clinic post-injury, however, her numbers were way off in the BioSway testing. It was obvious from the data that she simply wasn't ready to get back on the field."

ONE IN TEN!

Dr. Bertone sent Hope's BioSway results to her physician to let him know the baseline data indicated she still had a vestibular system impairment resulting from the head injury. Based on this information, her return was delayed for a few more days until her sway numbers came back into alignment with the baseline readings. Today, she's playing at full speed.

"Examples like this have me convinced the Biodex Balance Assessment for Concussion Management and BioSway work," continued Bertone. "Had this athlete gone back sooner, there would have been greater risk of second impact



injury, and that can be devastating for a young athlete. Having the baseline data, and being able to compare it to real-time post-injury results in a comprehensive report, made a big difference in this case."

"Those at highest risk for {second impact syndrome} are athletes under the age of twenty."

Second impact syndrome is the most dangerous consequence of returning to play before an athlete has fully healed from concussion. The second impact can cause brain swelling and bleeding, possibly resulting in death. Those at highest risk for this syndrome are athletes under the age of 20.

Continued on pages 2 and 4.

■ OBJECTIVE BALANCE ASSESSMENT

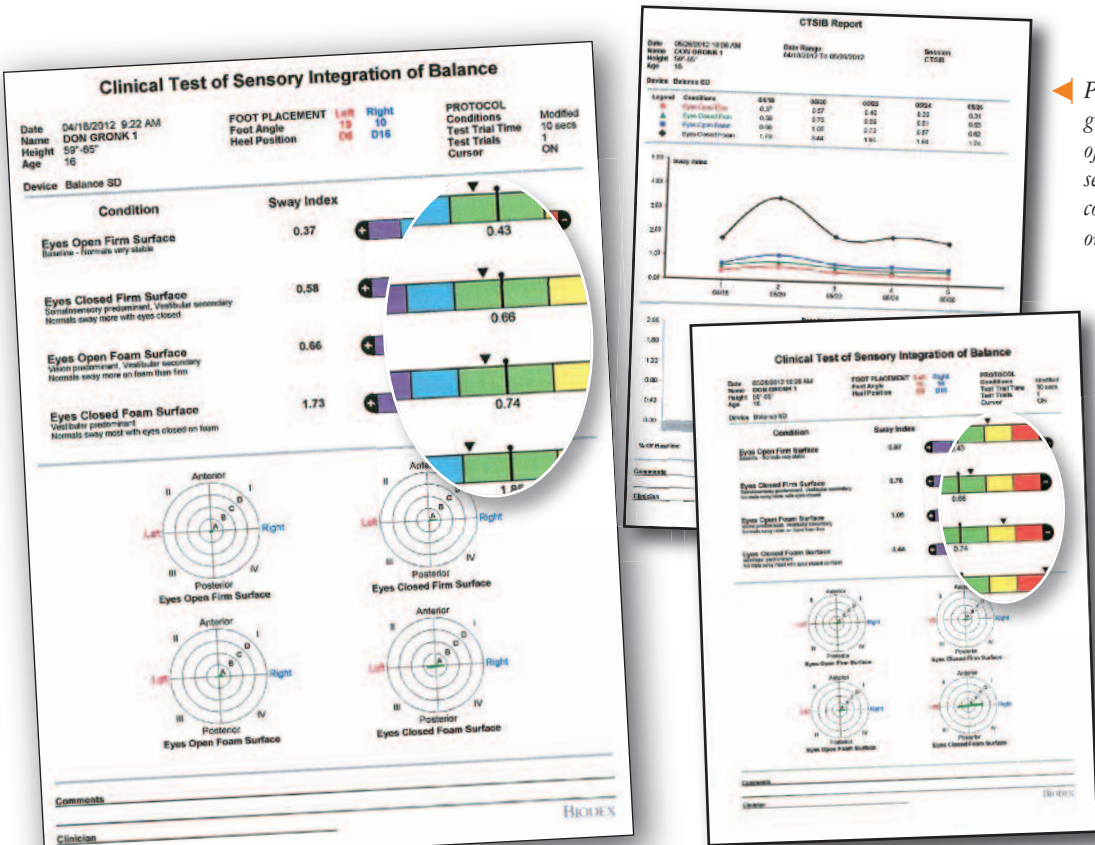
Biodex Balance Assessment for Concussion Management

Biodex Balance Assessment for Concussion Management adds an objective neurophysical component that gives clinicians the ability to quantify the elements of balance before and after an injury occurs. The program takes you through baseline testing, to sideline assessment, through post-injury evaluation and rehabilitation.

Using the Clinical Test of Sensory Integration of Balance (CTSIB), Biodex Balance Assessment can independently test all three sensory feedback systems (visual, vestibular and somatosensory).

The objective data provided by the Biodex Balance Assessment tool provides a performance baseline against which post-injury performance can be compared. In addition, a healthy population of student-athletes is stored on the system for general normative data comparison.

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



▲ Baseline Assessment ▲ Post-injury Assessment

"The Clinical Advantage"™

Balance Assessment for Concussion Management

A decreased ability to maintain balance is one of the hallmark signs of concussion.

Best practices for Concussion Management include Balance Assessment which adds the objective, neurophysical component for the management of concussion. Clinicians can quantify the elements of balance before and after an injury occurs.

The objective data provided by Biodex Balance devices provides a performance baseline against which post-injury performance can be compared.

BEST PRACTICES FOR CONCUSSION MANAGEMENT

Visit our website to learn more about adding Balance Assessment to your concussion management program.

www.biodex.com/concussion

BIODEX
www.biodex.com
1-800-224-6339
Int'l 631-924-9000

■ SPOTLIGHT ON: **db ORTHOPEDIC PHYSICAL THERAPY**

Continued from front cover.

"I really think we need to educate the public more about the signs and symptoms of concussion," stated Bertone. "And I think all sports leagues should have access to a practice using a comprehensive concussion program, which includes Biodex Balance Assessment with baseline balance testing using a device like the BioSway.

"Medical attention should be the rule, not the exception."

"According to Bertone, after an injury occurs where there is no loss of consciousness, a sideline cognitive and functional assessment can be critical in a return-to-play decision. Kids often complain of concussion symptoms but coaches and parents aren't aware of the signs, so injured athletes are rushed back too quickly. The most prudent point that parents and coaches need to understand is that kids must sit out if there is any doubt."

BIODEX BRINGS IT ALL TOGETHER
Once a determination has been made to seek therapy for a concussion, Biodex Balance

Assessment for Concussion Management, when used in conjunction with accepted neurocognitive testing programs, adds the vital vestibular and objective balance assessment now considered so important in concussion assessment.

Bertone has found his local sports leagues, high schools and colleges open to the idea of incorporating baseline balance testing and a concussion management program into their standards, and he would like to see more clinicians and physical therapists approach these groups to offer such services.

GRATIS IS GOOD
Bertone offers BioSway baseline testing free to local high schools, sports leagues and colleges. Then, since he has the data on file, athletes are logically referred to him when a concussion is diagnosed. At that point, he retests the athlete on the BioSway and uses Biodex Balance Assessment to help evaluate the patient's condition. The results are passed along to the physician to help aid in determining an appropriate return-to-play date.

Progress Report graphs result of the four sensory conditions over time.

The Importance of Combined Assessment

Biodex Balance Assessment adds the *objective*, neurophysical component for the management of concussion. The benefit is that clinicians are able to *quantify* the elements of balance - before and after an injury occurs.

The objective data provided by the Biodex Balance Assessment tool provides a performance baseline against which post-injury performance can be compared. In addition, a healthy population of student-athletes is stored in the system for general normative data comparison.

The Importance of Measuring Balance

Research shows that athletes often demonstrate decreased stability post-concussion.¹ 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.² Difficulty in postural sway control can persist even after signs and symptoms of concussion reside.³ Or, 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 go otherwise undetected without a balance assessment.

Measuring Postural Sway

Postural stability testing is an accepted objective measure in the evaluation of athletes with acute cerebral concussion. Large negative effects in postural sway are often identified at both immediate and follow-up assessment points, demonstrating the need for assessment of postural control as part of a concussion protocol. Biodex Balance Assessment goes beyond objective balance testing for changes in postural sway. Using the Clinical Test of Sensory Integration of Balance (CTSIB), independent testing of all three sensory feedback systems can determine the individual's reliance on the visual, vestibular and somatosensory systems.

“The time invested in the baseline balance testing and marketing is really quite minimal,” points out Bertone. “The beauty of the BioSway is that it is so easily portable and it takes only three minutes to perform four tests on each athlete. By offering this as a free service, I’ve gained access to more physical therapy patients. The program introduces new patients to my practice, increases my brand in the community and helps improve the safety of everyone involved. It’s really a win/win scenario.”

Recently, Bertone has begun marketing to the parents of young athletes so they can have access to both the cognitive and balance testing that is not being provided below the high school level. Participants pay for this service, adding another positive element to the program from a business standpoint.

“I’ve been marketing specifically to sports leagues for travel and peewees with good success,” confirms Bertone, who explains to parents and league administrators that their kids are not getting the baseline services now provided in

some high schools and colleges - but they are getting the same number of concussions. He stresses the importance of knowing when the time is really right for return-to-play and that, without such baseline balance testing, anyone making the return-to-play decision is doing so without objective criteria.



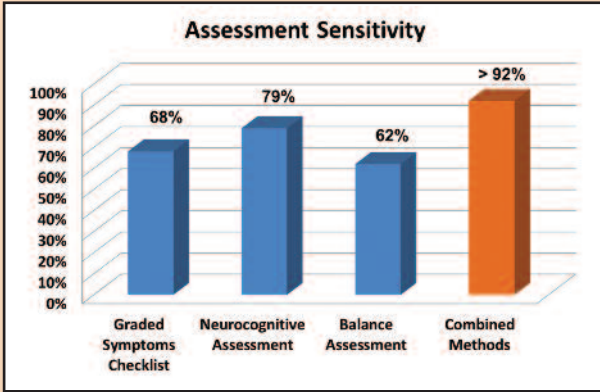
Dr. David Bertone shown testing Devin Hope on the Biodex Portable BioSway.

If you are serious about concussion management, Biodex Balance Assessment for Concussion Management and Biodex BioSway are two tools that will help ensure you'll do the most good.”

The Value of Measuring Balance

Balance Assessment, in combination with Cognitive Testing and a graded Symptoms Checklist increases overall assessment sensitivity to greater than 90%⁴. Each on their own tells an incomplete story.

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.⁴



Clinical Test of Sensory Integration of Balance

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, this test provides the sports medicine community with a more accurate and objective assessment tool for evaluating postural stability.



▲ CTSIB On-Screen Report

1. Broglio SP, Guskiewicz KM, Concussion in Sport: The Sideline Assessment. Sports Health. 2009; 1:361
2. Guskiewicz, KM, et al, Postural Stability and Neuropsychological Deficits After Concussion in Collegiate Athletes (Journal of Athletic Training 2001;36(3):263-273
3. 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
4. Broglio SP, Macciocchi SN, Ferrara MS. Sensitivity of the concussion assessment battery. Neurosurgery. 2007;60:1050-1057; discussion 1057-1058.

Biodex Balance Assessment for Concussion Management

The Importance of Biodex Balance Technology

Biodex Balance Assessment is conducted using either the versatile **Balance System™ SD** or portable **BioSway™**. The Biodex 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 limited 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.



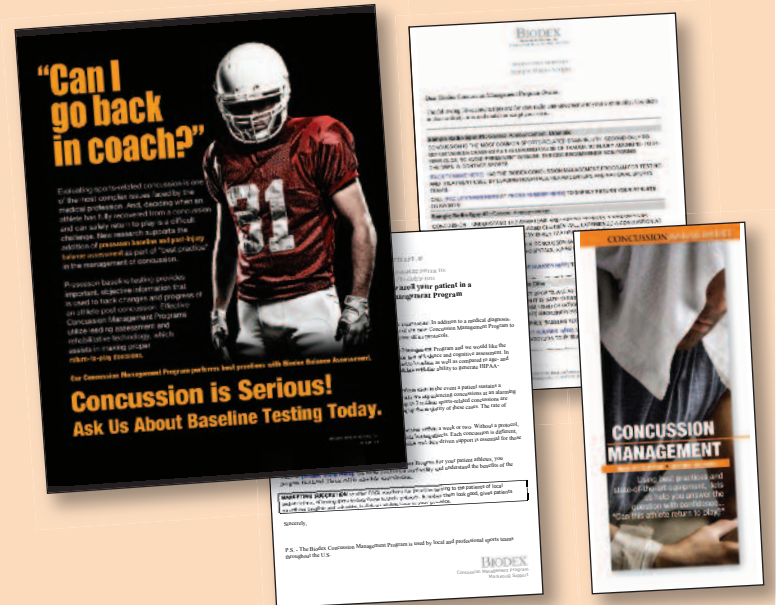
*Biodex Balance SD
(Static and Dynamic)*



*Biodex BioSway (Static)
shown with optional Printer*

Marketing Support

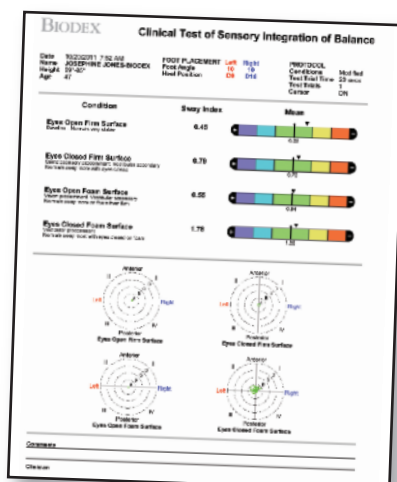
Available exclusively to our customers using Balance Assessment in support of a concussion management program, Biodex provides an assortment of marketing materials to attract athletes, parents, community sports teams, school coaches and athletic directors, as well as referring pediatricians. Materials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



- Sample Letters • Sample Press Release
- Sample Advertisements • Educational Brochure
- Clinical Voucher • Awareness Poster

A decreased ability to maintain balance is one of the hallmark signs of concussion.¹

Objective Documentation



▲ CTSIB Progress Report

Data from objective measures of postural stability is a critical component in determining severity of injury and post-injury recovery. Both the Balance System SD and BioSway provide postural stability/balance testing with objective documentation including detailed baseline and post-injury summary reports, progress reports with comparison to baseline or normative data. Reports are used to track recovery and can be forwarded to doctors, coaches, parents or athletes to provide quantitative data that substantiates return-to-play decisions.

Extensive Normative Data

A healthy population of student-athletes is stored on the system for general normative data comparison.

Workshops & Education

Biodex University and co-sponsored balance assessment workshops are scheduled regularly. www.biodex.com/concussion-workshops



Whatever the Sport...
Biodex Balance Assessment
for the management of concussion.

IN THE NEWS...

■ REPORTED CONCUSSION ON THE RISE

Through better diagnosis and greater public awareness, the incidence of Concussion has grown at an alarming rate.

There has been a 60% increase in the estimated number of concussions and other traumatic brain injuries (TBI) seen among young athletes during the past decade, according to the CDC.

While most athletes make a smooth recovery from a single concussion that is recognized and treated properly, mounting evidence shows that repetitive head injuries can cause serious, permanent brain damage. Every year, athletes in the United States suffer serious injury or death as a result of a concussion in sports and recreational activities.



Don't let your institution become the next statistic...

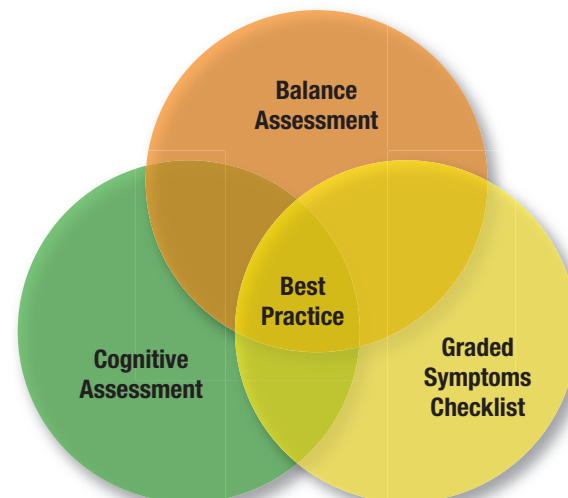
Are you Championing Best Practice in the Management of Concussion?

Importance of Preseason Baseline Balance Testing

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. Quantitative Assessment tools which detect physical and cognitive impairment have become increasingly important in sports medicine.

Today, the proper management of concussion should include baseline **Balance Assessment**, **Cognitive Assessment** and **Symptoms Checklist**.

BEST PRACTICES FOR CONCUSSION MANAGEMENT



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

When combined, these preseason 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 which post-injury assessments are compared, providing the objective data necessary to track recovery for safe return to play.

TEAMS AND SCHOOLS WHO BENEFIT FROM BIODEX BALANCE ASSESSMENT

Abbreviated listing

Professional Teams/Notables

Atlantic Health (NY Jets)
Boston Red Sox
Calgary Flames
Calgary Stampeders
Carolina Panthers
England RFU
Green Bay Packers
Houston Texans
Johannesburg Golden Lions
Methodist Sports Medicine
MLB Umpires
Naval Station Op's DFAS-Rome
New Zealand All Blacks
Rothman Institute
Tennessee Titans

Colleges/Universities

Appalachian State
Armstrong State Univ.
Bethel University
Boston Univ.
Broome Comm. College
California State University – Fresno
Campbellsville Univ.
Central Conn. State Univ.
Elon Univ.
Florida Gulf Coast Univ.

Georgia State Univ.
Indiana State Univ. (KIN)
Ithaca College
Kent State Univ.
Menlo School
Messiah College
Middle Tennessee State Univ.
Mississippi State Univ.
Northern Arizona Univ.
Ohio State (KIN)
Oregon Health & Science Univ.
Ouachita Baptist University
Penn State Sports Medicine
Penn State University
Richard Stockton College of NJ
Rutgers Univ.
Saint Scholastica
Salisbury University
Sewanee State Univ.
Springfield College
St. Edwards Univ.
Stony Brook Univ.
SUNY Cortland
The Citadel
Troy Univ.
Univ. of Buffalo - Ortho & Sports
Univ. of the South, Sewanee
Univ. of Akron (KIN)
Univ. of Alabama

Univ. of Arkansas
Univ. of California, Berkeley
Univ. of Colorado
Univ. of Maryland, College Pk
Univ. of Nevada, Las Vegas
Univ. of Notre Dame
Univ. of Pennsylvania
Univ. of Regina
Univ. of Rochester
Univ. of S. Carolina, Lancaster
Univ. of S. Carolina, Columbia
Univ. of South Florida
Univ. of Tampa
Univ. of Texas
Univ. of Tulsa
Winona State Univ.
Wright State Univ.
Xavier Univ. (KIN)

Medical/Clinics

Kern Medical Center
North Shore Long Island Jewish
Health Systems
Oswego Hospital
Penn State Milton S. Hershey
Medical Center
Sports Concussion Institute
The Methodist Hospital

BIODEX BALANCE ASSESSMENT FOR CONCUSSION MANAGEMENT RESOURCE CENTER



Biodex has compiled a library of educational material including Concussion Management guidelines, position statements, balance assessment education, case studies, research studies, and more.

Visit the Resource Center today!
www.biodex.com/concussionresources

Objective Balance Assessment for Concussion Management

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BIODEX

CONCUSSION **NEWS**

PUBLISHED BY BIODEX MEDICAL SYSTEMS, INC.

Objective Tools for Balance Assessment and Rehabilitation

ISSUE #20

**Increase the
sensitivity of your
concussion
evaluations by
adding objective
Balance Assessment
- from baseline to
post-injury.**

Balance assessment gets thumbs up from High School Athletic Director



*Scott Stein, Athletic Director
Sun Valley High School, NC*

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. 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."

**"Balance testing
is going to be a
big part of
keeping our kids
safe and healthy."**

www.biodex.com/concussion