

# Optimize Your Performance



Sports Science Lab



BRAIN TRAINING + 3D  
CONCUSSION ASSESSMENT



SPORTS  
REHAB



ISOINERTIAL  
TRAINING



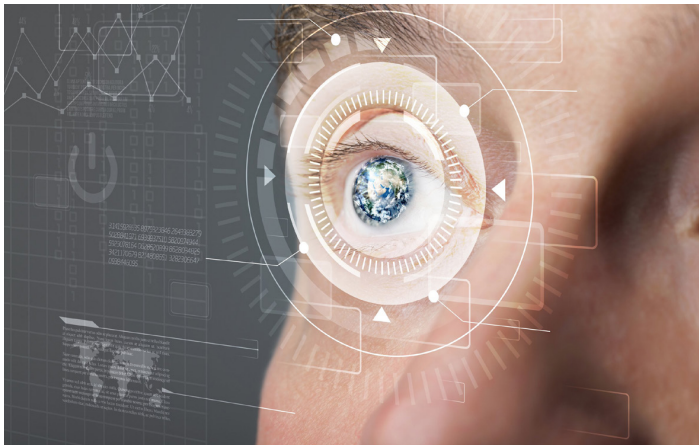
3D MOTION  
+ KINEMATIC ANALYSIS



MUSCLE RESPONSE  
ANALYSIS



ACCELERATED  
SPORTS RECOVERY



## 01/ World Class Lab

### THE LAB

The Sports Science Lab (SSL) is a world-class facility focused on optimizing performance of all athletes through measuring and quantifying the subtleties and complexities of athletic movement using state-of-the-art sports science technologies. Our mission is rooted in the philosophy that every athlete, regardless of age, body type or experience level, deserves to perform at their personal best. The SSL team of sports scientists, biomechanists and exercise scientists is led by a sports physiotherapist who is also an adjunct professor at Columbia University.

The SSL team uses the most advanced technologies to assess all aspects of athletic performance, ranging from movement patterns of a single muscle to sport-specific movements and reaction times. Results from this analysis are then used to identify areas of imbalances or weaknesses and to develop individualized protocols to maximize athletic performance, ensure faster return to play following an injury and prevent future injuries. By uncovering critical, yet overlooked, areas of athletic performance, our methods can transform a mid-level athlete to an extraordinary one. More importantly, our approach helps athletes identify muscle imbalances before they develop into more serious overuse injuries and therefore has the potential to extend an athlete's career and change the trajectory of athletic performance in the next decade and beyond. The technology at the Sports Science Lab is currently being used by leading hospitals, human performance labs, professional organizations such as the MLB, NFL, MLS, NBA, UFC, and the United States Olympic training center.

Until recently, athletes and teams with access to the latest advances in science and technology guarded these methods as secret, as they provided a competitive edge over other athletes. We believe that every athlete should have access to these methods and we therefore work with athletes of all levels and age groups, as well as their coaches, trainers and scouts who wish to identify the best athletes or build a better team. Our mobile program makes athlete care even more convenient by bringing our team of sports science experts to your facility.

## THE BENEFITS OF SPORTS SCIENCE



### MEASURE THE PREVIOUSLY IMMEASURABLE

Deepen your understanding of how your kinetic, neurological, musculoskeletal + aerobic capacity affects your performance.



### TRAIN SMARTER

Accelerate your muscle gain and improve your power, timing and speed more effectively than athletes who use conventional strength training.



### AVOID THE SIDELINES

Reduce the risk of chronic overuse injuries caused by incorrect movement patterns and physiological imbalances.



### RECOVER FASTER

Research proves that our recovery methodology results in robust increases in strength, mobility and pain reduction for pre- and post-game recovery as well as in sports-related injury rehabilitation.



### UNLOCK YOUR TRUE POTENTIAL

Transform the way you perform by correcting deficiencies + by strengthening dominant muscle patterns specific to your sport.



### GAIN A COMPETITIVE EDGE

Gain and sustain a competitive edge with our evidence-based methodology that analyzes each athlete through a scientific lens.



## OUR TEAM

“ The most successful athletes approach their sport through a combination of science, innovation and specialized training. ”

Matthew brings a wealth of experience and accomplishments to the Sports Science Lab (SSL).

Matthew earned a Bachelor of Science Degree in Athletic Training from Dominican College and a Masters of Science in Exercise Science and Health Promotion with a dual concentration in rehabilitation sciences and sports psychology from the California University of Pennsylvania. He started his professional career as an Assistant Athletic Trainer/Assistant Strength and Conditioning Coach with Brooklyn Nets, where he was appointed the youngest full-time Assistant Athletic Trainer in history of NBA at only 24 years old. His skills, expertise and dedication to athletes were widely recognized when he was named Eastern Conference Assistant Athletic Trainer for the 2008 NBA All-Star Game.

In 2013, Matthew was appointed as the Head Athletic Trainer for the MLS team New York Red Bulls. In that capacity, he oversaw the sports medicine department of the USL pro and academy teams, exhibiting a great deal of dedication to the athletes' performance and safety. He collaborated with a variety of health care professionals and diligently followed MLS concussion protocol to produce a 100% safe return to play rate following injury.

The injury prevention protocol that he created led to some of the lowest number of non-contact soft-tissue injuries per team in MLS since 2013.



**Matthew Reicher**  
**MS, ATC, CSCS, CISSN**

Head Athletic Trainer + Exercise Scientist  
Former AT, Red Bulls | Brooklyn Nets

## OUR TEAM

“ 3D Motion Analysis provides objective data on how efficiently the athlete moves to generate speed and power. ”

As Director of the Sports Science Lab, Rushi brings extensive experience in working with athletes of all ages and levels, including professional and amateur athletes. He is a clinical instructor for Columbia University and is affiliated with the Hospital for Special Surgery (HSS) as an Advanced Hip Clinician.

In 2015, Rushi was hand selected by the review panel as one of the few sports physiotherapists chosen to treat the All Star Cricket team. He has also worked extensively with professional athletes of every sport, ranging from football to golf players, for post-surgical rehabilitation, injury prevention of chronic injuries as well as accelerated recovery between games.

Trained in the Active Release Technique (ART) and IASTM (Instrument Assisted Soft Tissue Mobilization), Rushi has more than 14 years of experience working to help athletes overcome injuries. He is a certified speed, agility and fitness specialist, a golf specialist and a running specialist.

In his native India, Rushi taught a course on a multidimensional approach to treat soft tissue dysfunction, headaches, shoulder and hip rehabilitation courses through the Indian Association of Physiotherapy and Parul University.



**Rushi Shahiwala**  
**PT, OCS**

Clinical Instructor | Columbia University  
Advanced Hip Clinician | Hospital for Special Surgery  
Sports Physiotherapist | Orthopedic Clinical Specialist

## OUR TEAM

Juan Delgado brings his extensive clinical expertise and research background in sports science technologies to the Sports Science Lab. As a sports scientist, Juan's expertise is in analyzing data to help athletes identify any performance problems and in developing a customized protocol that will help maximize their potential.

Juan obtained his Medical Doctor degree from the University of Guadalajara in Mexico. He worked with Biomet Inc.'s Guadalajara division in the development of tutorials for surgical techniques and procedures for joint replacement and reconstruction that promote an accelerated recovery post-surgery and trans-rehabilitation for athletes.

Juan holds a U.S. national certification as a biomechanics specialist and a certification in neuro-cognitive performance training, a proven technique that allows athletes of all ages to improve their reaction time, timing and overall focus and attention span. He also holds a certification in using neurotechnology in hand rehabilitation, training softball/baseball players and golf players, and exercise adaptations for training tennis players. Juan received his certification in sports-related concussions from the United States Sports Academy. The International Olympic Committee also awarded Juan with a certificate in how to avoid injury and illness. Juan recently became certified as a sleep science coach.



**Juan Delgado**  
CBMS, CSSC, NCTTS

Sports Scientist + Certified Biomechanist

“ The best way to improve your performance is by training smarter. ”

## OUR TEAM

Michael Greene brings more than 15 years of experience as an athlete to his position as a Certified Biomechanics Specialist in the Sports Science Lab. After receiving multiple scholarship offers during his high school baseball career, Michael enrolled at The College of New Jersey.

As an athlete, Michael worked with renowned rehab specialists and coaches, including professionals from Hospital for Special Surgery and John Franco of the New York Mets. Now he uses this experience in advanced rehabilitation and training centers to evaluate other athletes, utilizing our state-of-the-art sports science technologies. Recently, he played an integral role in developing SSL's "5 Tools Optimization Program" for baseball players. This proprietary program optimizes baseball players ability to perfect the 5 tools: hitting for average, hitting for power, throwing, fielding, and running with efficiency, using sensory performance technology, isoinertial technology, and whole body vibration.

Michael also holds a certification in neuro-cognitive performance training, a proven technique that allows athletes of all ages to improve their reaction time, timing and overall focus and attention span. He is also a certified performance enhancement specialist.



**Michael Greene**  
CBMS, PES

Certified Biomechanist  
+ Performance Enhancement Specialist

“ Athletes often confuse muscle fatigue and physical exhaustion as a measurement of effective performance training. ”

## OUR TEAM

“ The athletes who approach their sport through a combination of sports science and specialized training have shown to outperform their peers and reach their personal best. ”

World-renowned posturologist and strength and conditioning coach Paul Gagne brings 25 years of expertise and dedication to the SSL advisory team. His whole-body approach to improving athletic performance and experience with world-class athletes makes him one of most sought-after strength and conditioning experts.

His expertise in training protocols for posture, rehabilitation, muscular balance and performance enhancement has helped many professional athletes improve performance and reach their full athletic potential. While Paul addresses individual needs of every athlete, his basic approach to training always starts with building a solid base for general conditioning, followed by improving the posture by addressing muscular imbalances and weaknesses; and then developing a strength and conditioning program. By taking this whole-body approach to training, Paul's method ensures that athletes stay on top of their game.

Paul has an impressive list of clients and has worked with world champions and top athletes from a vast array of sports, including some of the top NHL athletes for the past 25 years. His clients include Martin Havlat from Minnesota Wild, Milan Michalek from Toronto Maple Leafs, Ondrej Pavelec from Winnipeg Jets, Michael Frolik from Calgary Flames, Derick Brassard from New York Rangers, Jonathan Huberdeau from Florida Panthers, Marc-Andre Fleury from Pittsburgh Penguins and Zbynek Michalek from St. Louis Blues, and UFC World Champion Georges St Pierre.



**Paul Gagne**

Strength and Conditioning Coach, Posturologist,  
Somatotherapist, Exercise Kinesiologist,  
Member of SSL's Advisory Team

## OUR TEAM

“ What truly sets our lab apart from other facilities is that we collect and analyze data from each athlete and translate those findings into actionable training programs ”

As a former member of the 2004 Jamaican Olympic track and field team, Richard James brings a unique perspective to his role as SSL's Strength and Conditioning Coach, having the dual experience of an athlete training for the Olympics as well as nurturing and producing an unprecedented four Olympians during his decade-long tenure at Long Island University's (LIU) Division 1 Athletics Department.

Richard graduated from LIU in 2004 with a bachelor's degree in Sports Science and Exercise Physiology. He received his master's degree in Exercise Physiology from LIU in 2006. Richard has been an adjunct professor at LIU for the past 8 years in the sports science department.

As the university's head strength and conditioning coach, Richard coordinated and developed specialized workout programs specific to an athlete's sport and position. Richard oversaw all 18 sports on campus; working directly with each athlete to ensure optimal performance with an equal emphasis on injury prevention. Under his leadership, the injury prevention program that he developed led to the lowest number of non-contact sports-related injuries per team in the university's history.



**Richard James**  
MS, CSCS

Strength and Conditioning Coach  
Team Jamaica Olympic Athlete | 2004 Athens, Greece

## METHODOLOGY

### 02/ Cutting Edge Science + Innovation

The Sports Science Lab (SSL) combines science, innovation and specialized training to suit each athlete's individual needs. The one-size fits-all approach to sports performance is outdated and imprecise. Today, the best athletes and teams approach their training based on the unique needs of each athlete, which vary according to sport and position. At the Sports Science Lab, we focus on science-based performance training to enhance technical sports skills to ensure that athletes reach their full athletic potential.

After discussing an athlete's specific goals, we use the proprietary protocols developed by our sports science team, which are both sport-specific and position-specific. We look at each athlete through a scientific lens by analyzing his or her individual kinetic, neurological, musculoskeletal ability and aerobic capacity. Using 3D kinematic and motion analysis, we identify movement patterns and muscle imbalances that are specific to the athlete's specific sport and position. Our team of experts uses this information to precisely individualize training that ensures optimal performance of that athlete and improves timing and accuracy.



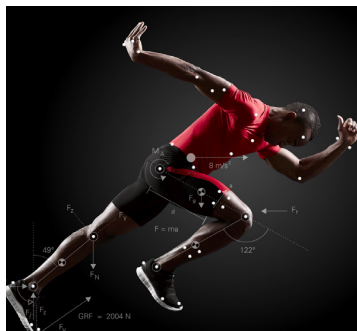


## 3D MOTION + KINEMATICS ANALYSIS

The Sports Science lab uses state-of-the-art motion tracking software to analyze sport-specific motion. This technology provides a detailed analysis of an athlete's biomechanics, which describes how the kinetic chain is functioning. Muscles, connective tissues, joints, bones, nerves, and gravity, all work together like links in a chain to create a delicate system that ideally works effectively and efficiently. Healthy biomechanics enable us to move efficiently by properly supporting all the elements of the kinetic chain.

Poor biomechanics cause the body to overcompensate for failing links, resulting in increased energy expenditure, muscle fatigue, and pain. This is what leads to poor habit formation, poor muscle memory and the continuation of poor biomechanics.

The quantitative results from the 3D motion and kinematic assessment allow our sports scientists to scientifically analyze movement patterns and to identify biomechanical inefficiencies and muscular imbalances that may be invisible to the human eye or may go undetected. Our team of experts will work closely with coaches, trainers, and parents in developing a customized formula aimed at correcting an athlete's structural deficiencies, thus ensuring that the athlete performs at their optimal level.



## EMG MUSCLE RESPONSE ANALYSIS

Electromyography Surface EMG is the only definitive tool proven to accurately assess symmetry, synergy and sequencing of single muscles and muscle groups. The technology measures small electrical impulses that are transmitted along muscle fibers during the contraction and relaxation of the athlete's muscles during sport-specific movements. These measurements are used to identify the sequence and biomechanical patterns of that muscle's activation and movement. The information obtained by surface EMG technology assists our sport scientists in determining the most appropriate prehabilitation, rehabilitation and/or training formulas to improve movement efficiency, reduce muscle fatigue, correct dysfunctions, muscle imbalances and prevent injuries.

The benefits to athletes include improved performance, injury prevention, reduced muscle fatigue, and faster rehabilitation.

Surface EMG technology is used by many professional organizations such as the Milwaukee Bucks (NBA), Houston Texans (NFL), and the United States Olympic Center.





## NEUROTECHNOLOGY: BRAIN TRAINING

The Interactive Metronome (IM) is a cutting-edge performance optimizing technology that combines principles of music, sports and neuroplasticity to improve focus, concentration, coordination and timing. It can also be used to improve language processing, reading and math fluency, and control of impulsivity/aggression. Correct timing and coordination are crucial to athletic success because even the smallest errors in timing can make a difference between victory and loss. The IM provides a training program that involves matching various motor activities with the beat of a metronome while measuring the timing accuracy within milliseconds. This technology improves connectivity and communication between the different task-oriented structures in the brain, resulting in to adapt one's movements to specific conditions, tasks, and environments, making the coordination between the mind and the muscles easier, and as a consequence, more effective.

This unique technology is used by hundreds of professional athletes such as professional golfers Vijay Singh and Glen Day, as well as professional sports teams, to gain mental precision in timing and the transmission of messages along the neural pathways, effectively gaining a competitive edge.



## ALTER G ANTI-GRAVITY TREADMILL

The AlterG Anti-Gravity Treadmill is among the most advanced next-generation sports rehabilitation technologies ever created. The system uses NASA-patented differential air pressure unweighting technology to reduce the users' bodyweight by as much as 80 percent. This reduces the risk of stress injuries caused by weight-bearing activities and helps speed up the recovery process. Particularly for users with lower extremity injuries, physical therapy and other rehabilitation methods often have to be delayed because weight bearing activities and high impact activities such as walking or running can exacerbate the injury. Since the Alter G treadmill eliminates the difficulties associated with body weight, it can be used early in the rehabilitation process to normalize gait mechanics, and safely perform aerobic conditioning without the risk of aggravating the injury.

The world's most elite athletes such as Kobe Bryant and LeBron James use the Alter G treadmill as a part of their daily in-season and off-season training regimen as it reduces the impact on their joints. Other professional organizations that use the Alter G include World Champions New England Patriots, Golden State Warriors, San Francisco Giants, and NCAA Football National Champions Ohio State Buckeyes.



## ISOKINETIC EXTREMITY TESTING + REHAB

The Isokinetic extremity machine is the ultimate tool for measuring and improving human performance in athletes. It uses 22 standard test and exercise patterns to precisely measure muscle imbalances and inefficiencies from one extremity to the other in various positions. It is so accurate that the NFL has decided to implement isokinetic strength testing as a mandatory component of the Combine. This "lie detector" of muscles and muscle groups helps our Sports Scientists uncover areas of weaknesses that inhibit performance and increase the risk of injury. The assessments performed on the Isokinetic Extremity machine are designed to quantify mobility, stability, control and strength.

Scientific studies have proven that this technology is effective at reducing pain, improving muscle strength, increasing the velocity of muscle recruitment and stabilizing the joints, all of which are essential for efficient movement and injury prevention.



## 3D SPORTS SIMULATION TRAINING

3D Sports Simulation is the only technology of its kind that can simultaneously track the integration of the brain, heart, and body while moving in free space. It uses clinically inspired models to measure various aspects of movement to evaluate sport-specific abilities. The simulator mimics the unpredictable game play by displaying visual cues that the athlete must react to while measuring moment-to-moment reaction time, acceleration, speed, distance traveled and heart rate.

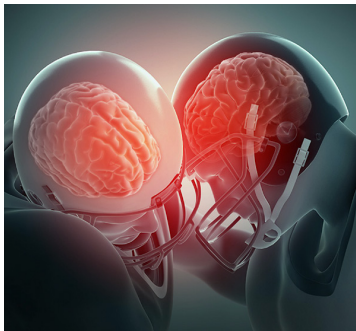
Currently, most coaches rely on a stopwatch to test for speed and reaction time. By testing the athletes' stamina, balance and coordination, visual perception and mobility, the 3D Sports Simulation Technology provides more precise and objective data, allowing coaches and trainers to design better programs that result in improved performance.

3D Sports Simulation Technology is so effective that the United States Air Force uses it to train their fighter pilots. World-renowned sport organizations such as the Cleveland Indians (MLB) and University of Alabama implement this training into daily practice and return to play protocols for their athletes. Hall of Fame and NFL superstar, Deion Sanders, has called it the "future of athlete development".



## 3D BASELINE CONCUSSION ASSESSMENT

The 3D Baseline concussion assessment is the most accurate concussion detection system in the industry. While 300,000 sports-related concussions are diagnosed annually, it is estimated that approximately one-third of athletes have suffered undiagnosed concussions. Since the effects of concussions add up over time, it is critically important to diagnose them early and ensure that athletes are sufficiently recovered before returning to their sport. The Sports Science Lab therefore provides the most accurate and sensitive method of concussion assessment. Our 3D Sports Simulation Technology, known as the gold standard of concussion assessment, immerses the athlete in a simulated environment that collects and analyzes 3-dimensional movement responses (pre and post concussion) and identifies deficits in neurocognitive testing following an injury. It looks at depth perception, visual acuity, anticipation skills, and peripheral awareness. Because movement responses and reaction times are unique to each athlete, our baseline assessment allows our sports scientists to compare the data pre- and post-concussion and determine the extent of the injury and best course of treatment for each athlete.



## WHOLE BODY CRYOTHERAPY

During intense physical activities, the joints and muscles get overused, resulting in fatigue of the joints and the tearing of muscle tissues. Cryotherapy is the perfect elixir for faster recovery after periods of physical training. Cryotherapy, translated as "cold cure" exposes the body to a controlled temperature that ranges from minus 166 to minus 274 degrees Fahrenheit for 3 minutes.

The extremely cold temperature activates the body's fight-or-flight reaction, ensuing vasoconstriction and the consequent reduction in the production of molecules that are the cause for inflammation. After the treatment, the body immediately reheats and vasodilation occurs, flushing the muscles with oxygenated blood, thus speeding up the healing process.

Cryotherapy works by the temporary numbing of the nerve endings that report to the brain that you have pain in your joints or muscles while also inducing the release of endorphins (aka. feel good hormones) that endow athletes with the mental fortitude to train harder, longer, and at a higher frequency. Elite athletes such as Floyd Mayweather, LeBron James, and Cristiano Ronaldo all implement this recovery technology into their everyday training routine.

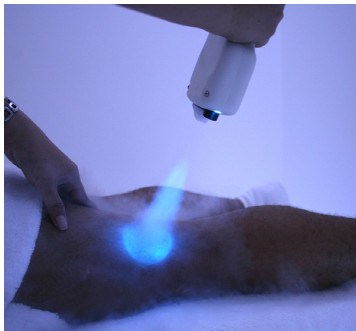


## LOCALIZED CRYOTHERAPY

Localized cryotherapy is similar to whole body cryotherapy, but it targets a specific muscle area or spasm. Therapy is applied with a localized device, which disperses cold air that reaches -25 to -40 Celsius by a precision hose, which cools the affected area. Localized cryotherapy is more powerful and effective than traditional icing and takes between 3 to 5 minutes per session, compared to 10 to 15 minutes of icing.

Localized Cryotherapy works by the temporary numbing of the nerve endings that report to the brain that you have pain in your joints or muscles while also inducing the release of endorphins (aka. feel good hormones) that endow athletes with the mental fortitude to train harder, longer, and at a higher frequency.

Professional Organizations that have incorporated this technology for their athletes include: the New York Knicks, San Antonio Spurs, Los Angeles Lakers, Boston Red Sox, Dallas Cowboys, New York Rangers, and the United States Olympic Team.



## PNEUMATIC COMPRESSION PULSE TECHNOLOGY

Pneumatic compression sequential pulse technology revolutionizes massage therapy in sports medicine. Compression massage therapy is one of the most effective recovery tools for athletes who want maximum performance and accelerated recovery. This method has been proven to increase blood circulation and lymphatic drainage, as well as to reduce both muscle swelling and fatigue. This patented device, which is based on three distinct massage techniques, stimulates blood flow out of muscles, allowing metabolites that are the cause of pain and inflammation to be flushed out of the tissue.

This device uses dynamic compression that mimics the natural flushing pulses of the muscle. These pulses move from the extremities upward to prevent the backflow of blood, speeding up the removal of waste products, such as lactic acid, that are created in the muscle during intense exercise. If the compression therapy is used before exercise or before a game, it will aid in the warm up process of the muscles, effectively helping reduce the risk of injury.

Athletes have reported feeling refreshed and less sore after using the compression, which allows them to return to training faster and, thus maximizing their performance extensively.



## POWERPLATE TECHNOLOGY

Power Plate Vibration Therapy is a futuristic whole body workout exercise machine that engages 95 percent of your muscle fibers, giving you enhanced and efficient fitness workouts. Some of the wide-ranging effects of this stimulation are weight loss, core conditioning and strengthening, improved balance and coordination, and enhanced bone density.

Drawing upon the science behind a body's natural response to vibration, Power Plate's patented dual-synch driven vibrating platform triggers up to 50 reflexive muscle contractions per second. As the user's body works to regain stability, up to 95 percent of the body's muscle fibers become engaged in any single movement, significantly amplifying the effectiveness of any exercise performed on the plate. Research also shows that whole-body vibration stimulates the body's natural production of the regenerative growth hormone that maintains tissue repair, muscle growth, brain function, energy and metabolism, all contributing factors to enhanced athletic performance and recovery.

More than 100 professional sports teams around the world, including 75 percent of the four major sports franchises in the U.S., and scores of collegiate sports programs and Olympic training facilities worldwide, currently use Power Plate.



## ISOINERTIAL TECHNOLOGY

Isoinertial training is a revolutionary resistance training technology that uses the principles of strength training, but uses a flywheel, which allows the muscles to work through a wider range of motion at the maximum capacity than traditional weight training.

Flywheel training maintains a constant inertia throughout the range of motion, allowing the muscles to work at the maximal force at every angle. Flywheel training also allows the muscles to work under eccentric overload, or the downward portion of an exercise. Eccentric exercises are often under utilized by athletes, but provide great benefits for muscle strength, as muscles are approximately 30% stronger in the eccentric phase than in the concentric phase (the upward motion of the muscle). Eccentric exercises also strengthen the connective tissue around the muscles, improve flexibility and reduce muscle soreness in the future.

Scientific studies have shown that this type of training stimulates more muscle growth and strength and results in a higher degree of muscle activation by the nervous system compared to traditional weight training. This technology therefore helps athletes improve their strength and flexibility and results in optimal performance while reducing the risk of injury.



## HUBER MOTION 3D EXERCISE TECHNOLOGY

From simple warm-up exercises to intensive muscular strengthening and reconditioning, the state-of-the-art Huber Motion 3D exercise technology is equipped with highly perceptive sensors that precisely isolate muscle groups to strengthen areas of weakness or instability. It is unique in its ability to strengthen and condition 180 deep spinal muscles and their surrounding joints, improving mobility and fluidity of movement.

Huber Motion Technology was designed and developed by leading European physicians, physical therapists, strength and conditioning coaches and experts in biomechanics to offer the most state-of-the-art three dimensional rehabilitation/exercise equipment in the world today.

Huber Motion has developed a conditioning protocol for various sports, including golf, baseball, or tennis. The customizable routine function on the machine allows you to target whatever weakness you have, which will produce a positive difference in your training.



## FORCE PLATE

Force plate analysis measures ground reaction forces generated by the body. The force plate has been clinically proven to quantify balance, gait, and other parameters of biomechanics. In addition, force plates have been regularly used in research and clinical studies, in examining balance, gait, and sport performance.

Force plates are being used as measuring instruments for leading professional sport teams, such as the Atlanta Falcons. In measuring athlete's explosiveness, the force plate calculates acceleration, work, power output, jump angle, and jump distance. The data provided from the force plate can determine the torque, work, and power of each joint.

Most recently, the force plate has been used at the NFL Combine in analyzing player's vertical jump. By jumping as high as they can while standing on the platform, the plate determines how much force is being exerted. This analysis can be the difference in selecting one player over another, as it provides important information about a player's athletic abilities. The force plate analysis also identifies players whose body composition and dynamics suggest that they will be able to play NFL football at a high level for an extended period of time.



## CARDIOPULMONARY VO2 MAX

The VO2 Max Assessment is the ultimate indicator of cardiovascular fitness and has been used for decades to determine aerobic capacity. The test is based on the premise that the amount of oxygen used by muscles is relative to the intensity of exercise.

The technology used by the Sports Science Lab is at the forefront of cardiopulmonary exercise testing and utilizes a new approach in the measurement of oxygen consumption during and after exertion. This test aids in the uncovering of fitness deficiencies by analyzing expired gases during exercise, allowing our sports scientists to customize training plans and formulas aimed to improve aerobic endurance and ensure optimal performance while reducing the risk of injury.

The VO2 max test has been used for decades by professional organizations such as the NBA, MLB, NFL, NHL, and UFC. ESPN's Sport Science has recently analyzed former UFC Welterweight Champion, George St. Pierre, to determine if his anaerobic threshold gives him an edge during competition. During the assessment, host Jon Brenkus discovered that GSP had an anaerobic threshold 15% greater than his competitors. These data show that when GSP's opponents have reached their cardiopulmonary limit, he is only at 85% of his max, proving how important cardiovascular fitness is in gaining an edge over the competition.



## SUPER PULSED LASER TECHNOLOGY

Super Pulsed Laser technology is among the most advanced technologies in sports rehabilitation. This technology is designed to get athletes back in the game quickly following an injury and has been scientifically proven to be effective in treating sports injuries. Trauma from sports injuries and intense exercise stimulates the release of chemicals that cause inflammation, which in turn, may cause damage in the long term to soft tissues and may predispose athletes to develop early-onset arthritis and degenerative damage in the joints. Super Pulsed Laser emits brief pulses of light onto damaged cells, where photons of light stimulate a series of cellular reactions to produce enzymes, increase blood and lymphatic flow and stimulate collagen production, which in turn, accelerates tissue healing, reducing inflammation, thus shortening the rehabilitation time from injuries, as well as the recovery time between workout sessions.

For the past decade, this technology has revolutionized treatment in the professional sports training rooms including the NBA, NHL, and USA Cycling, Ironman, and the United States Olympics. It has been clinically proven to be an effective treatment for pain associated with tennis elbow, golfer's elbow and plantar fasciitis.





## MARC PRO MUSCLE RECOVERY

The Sports Science Lab uses the most effective muscle stimulator that reduces muscle fatigue and soreness, speeds up recovery and results in a faster return to play. The developer of this technology, MarcPro, used 30 years of scientific research to develop a device that improves physiological function of muscles. This technology is unique in its ability to stimulate muscles that are difficult to contract while preventing discomfort and fatigue.

The device works by applying small electrical currents to the muscle, which stimulate muscle contractions. Unlike most other muscle stimulators, which cause quick and strong muscle contractions that are often painful, MarcPro uses scientifically backed settings to comfortably contract and then slowly relax muscles in a manner that simulates active recovery. These gentle muscle contractions improve blood and lymph flow, deliver nutrients to the muscles, remove waste products and stimulate tissue repair after intense exercise.



## SENSORY PERFORMANCE

The Sensory Station is a cutting-edge technology that uses principles of neuroscience to assess and train an athlete's sensory system and improve performance. Coordination between the sensory and motor systems is essential for athletic performance. An athlete's ability to assess his or her environment, estimate distance and perceive objects in the peripheral vision can make the difference between winning and losing.

The Sensory Station assesses ten visual and sensory-motor skills, including depth perception, eye mobility, peripheral and central vision, reaction time and eye/hand coordination. The station also measures the speed at which visual information is acquired and how quickly attention can shift from near to far objects. These measurements are then compared to a large database, which includes information from athletes of all levels and abilities, to identify any weaknesses that may exist.

The SSL team of experts analyzes the results and devises a training program to improve any deficiencies. Studies have shown that this science-based approach to visual training not only improves sports performance, but can also reduce the risk of concussions. The SSL uses this advanced technology to ensure that each athlete reaches their full potential and reduces the risk of injury.



## DYNAMIC VISUAL STIMULUS TECHNOLOGY

Dynamic visual stimulus technology is a unique motion simulation device that utilizes sequential LED lights to both assess and train an athlete's depth perception, focus, concentration, eye/hand coordination, eye/foot coordination, reaction time, stimulus anticipation, and timing during sport specific movements.

Using visual stimulus at different speeds up to 100 mph and configurations while collecting real-time data, SSL's sports science experts incorporate this innovative technology by creating customized measurable routines both on an individual and team basis. At SSL, this system is used as a powerful training technology device for a wide range of reaction time/anticipation response training, vision training and numerous other cognitive and technical skills training that traditional training cannot replicate. Utilizing a combination of patent pending hardware, software and electronics the user's development in all areas allows each athlete to set a personal benchmark based on tangible feedback at every training session.



## SENSORY GOGGLES

Visual acuity is essential for athletic performance. We use visual information to form a picture of our surroundings, to estimate distance and speed of objects and to coordinate movements. Even small deficiencies in vision can have an impact on athletic performance. Despite the common perception that our senses are fully developed in childhood and decline later in life, recent research has shown that the brain has a remarkable capacity to train and improve our senses.

Strobe goggles are designed to train the connections between the eyes, brain and body. This advanced technology uses liquid crystal technology that allows lenses in goggles to alternate between clear and opaque states several times a second. These brief periods of blocked visual input result in improved vision, attention and the ability to anticipate the timing of moving objects.

By improving visual abilities, strobe goggles can improve athletic performance and reduce the risk of injury. NBA's Stephan Curry, who is known for his speed and precision in shooting, wears strobe goggles to enhance his training.



## QUICK BOARD

The Quick board is the ultimate agility trainer. The Quick Board is scientifically proven to increase agility, quickness, and reaction. It provides real-time feedback via the iPad using objective data, which results in significant performance increases. This feedback enhances the proprioceptive benefit of exercises by performing tasks with the head up in order to fully restore pre-injury communication. In addition, the Quick Board is the only device that provides the capability and method to test + train lower extremity coordination, which can reduce exposure to injuries.

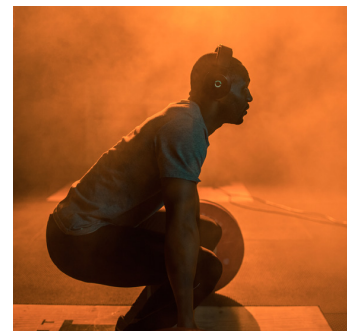
The Quick Board Bilateral React Drill is vital in tracking an athlete's speed by monitoring for over training. The testing portion of the Quick Board highlights asymmetry due to dominance or previous injury. It is also captures baseline data for critical return to play decisions. Additional benefits include increased bilateral reaction and proprioception.



## HALO SPORT

The Halo Sport is a wearable fitness device that works through a process called Neuropriming. Neuropriming is the process of using neuro-stimulation during athletic training to build stronger, more optimized connections between the brain and the muscles. Neuropriming introduces a state of hyper-learning or "hyperplasticity" in the brain, which refines the brain's ability to learn and adapt to athletic training. This allows athletes to see better results, faster.

Athletes wear Halo Sport before or during training, and the device's soft foam primers deliver electrical stimulation to the brain's motor cortex. This increases neuroplasticity, which accelerates the optimization of neuromuscular circuitry through training. Improved neuromuscular output leads to more precise, coordinated, and/or explosive movement — whichever the athlete targets during training. Currently, Cleveland Browns linebacker Demario Davis, Philadelphia Eagles defensive end Marcus Smith, Browns center Gabe Ikard, New England Patriots linebacker Trevor Bates, and, Oakland Raiders cornerback T.J. Carrie are all using Halo Sport and have all reported seeing improvements to their overall performance. As a result of Halo Sport, Carrie has seen his vertical jump increase by six to eight inches and he has added 80 pounds to his squat. Halo Sport builds on decades of academic research surrounding tDCS, TES, and other types of non-invasive brain stimulation. Over two thousand peer-reviewed papers speak to the efficacy, reliability, and safety of Halo Sport.



## VISUAL STIMULUS TECHNOLOGY

The FITLIGHT Trainer™ system is a unique wireless reaction training system comprised of LED powered lights. The lights act as targets for the user to touch and can be adapted and configured for all sports specific exercises. This training system is designed to capture human performance, targeting reaction time, speed, agility, and coordination.

Using real-time data, SSL performance training program incorporates Fitlight technology by creating customized measurable routines both on an individual and team basis. At SSL, the fitlight is used as a powerful training technology for a wide range of physical conditioning, reaction/response training, vision training and numerous other physical and cognitive skills training.

The FITLIGHT Trainer™ utilizes a combination of patent pending hardware, software and electronics to rapidly drive the user's development in all areas with tangible feedback for a personal fitness benchmark. Designed for both outdoor & indoor use, the FITLIGHT Trainer™ is water and impact resistant, meaning it can be hit and touched with great power.

Professional athletes and teams such as the Toronto Raptors and Stephen Curry incorporate the Fitlight in their training sessions to slow the game down. The Fitlight is also being used as a military training device for snipers and marksmen as performance measurements.



## ALTITUDE TRAINING SYSTEM

The Altitude Training mask is designed to simulate low-oxygen altitudes. This technology can mimic altitudes up to and beyond 15,000 feet. This system is great for athletes that are currently injured or rehabbing, as it allows for a proper cardiovascular workout. By maintaining and increasing aerobic capacity levels while injured, SSL's exercise scientists, strength and conditioning coaches, and performance enhancement specialists can focus on reconditioning and work on sport-specific skills. This makes the transition back to the field much easier. Most importantly, it allows the athlete to train harder and recover faster.

The system can also be used for weight training, as the altitude environment will increase their muscle mass, strength and endurance. Combined with the Alter G Anti-Gravity Treadmill, the Altitude Training Mask can significantly increase cardiovascular output, while reducing the impact on the body and joints. This allows for improvement in fitness levels, while rehabbing at the same time. This can also benefit athletes by preparing them in competitions at specific altitudes, all while simulating the oxygen environment. This will provide a competitive edge for their upcoming game or match. Currently, this system is being utilized for rehab/cardiovascular strength at the pro and college level. The Falcons, Jets, Steelers, and Miami Heat all have implemented this system in their clubhouses/training areas. Elite athletes like LeBron James and Julio Jones have also incorporated this system into their training routines.





## SPORTS PERFORMANCE TRAINING



### ISOINERTIAL TRAINING

Isoinertial training increases strength training efficiency by applying the inertia of a flywheel to create optimal resistance. Designed for resistance training in space, this exercise device maximizes performance while reducing the risk of injury.



### ISOKINETIC TESTING REHAB

The isokinetic machine uses tests and exercise patterns to identify muscle imbalances that inhibit performance and increase the risk of injury. This technology also improves muscle velocity and shoulder strength in baseball players.



### 3D SPORTS SIMULATION TECHNOLOGY

3D Sports Simulation Technology mimics game play while measuring reaction time, acceleration, speed, distance traveled and heart rate. The system benefits athletes by improving performance, reaction time and hand-eye coordination.



### SENSORY PERFORMANCE TRAINING

Sensory performance training uses principles of neuroscience to train an athlete's sensory system. It tests and improves an athlete's visual and sensory-motor skills. This technology develops better hand-eye coordination, depth perception and a faster reaction time.



### NEUROTECHNOLOGY

This cutting-edge performance technology works by improving connectivity and communication in the brain, resulting in improved focus, concentration, coordination, decision-making and reaction times, better decision-making and reaction time.



### BALANCE + FOOTWORK TRAINING

Balance and footwork training includes drills and exercises aimed at creating a more stable body, improved coordination, agility, reaction time and proprioception, helping athletes become faster, more efficient, and less prone to injuries.

## 5 TOOL PLAYER OPTIMIZATION



### HITTING FOR AVERAGE

Improve your batting average, consistent contact, and get on base more using Sensory Strobe Training + Eye Hand Coordination Training



### HITTING FOR POWER

Train using state-of-the-art Isoinertial technology to develop maximum rotational torque capability throughout the swing phase, driving the ball in the gaps with authority



### FIELDING

Develop involuntary fielding mechanics and fast hands producing less errors and an increased fielding percentage by footwork, agility, sensory strobe, and eye hand coordination training



### THROWING

Eliminate shoulder instability + strengthen the throwing arm for maximum velocity and endurance throughout the season using Isokinetic Extremity Strengthening exercises



### RUNNING

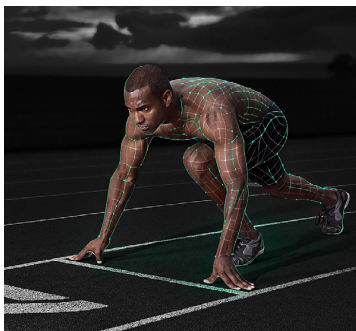
Enhance sprinting kinematics for optimal running mechanics and efficiency using clinically proven Whole Body Vibration + 3D Sports Simulation



## ATHLETIC GLOBAL ASSESSMENT

Reviewing game and match tape will only reveal your superficial performance. The Sports Science Lab Athletic Global Assessment begins with an athletic body assessment to identify inefficiencies and imbalances that are invisible to the human eye. This assessment allows our team of sports scientists to quantify your athleticism by analyzing your physical structure and mechanics using our 3-D motion and kinematic analysis, surface EMG muscle response, and cardiopulmonary and VO2Max analysis. These extremely precise assessments will help to uncover areas of weakness, prevent injuries, and improve performance.

All athletes know that their performance doesn't just depend on their physical condition; it also requires a sharp and focused mind. The Sports Science Lab Athletic Neurocognitive Assessment uses cutting-edge technology like 3D sports simulation technology and neurotechnology to analyze your cognitive ability. By better understanding how you recognize, process, interpret and respond to stimuli specific to your sport, we can create a custom roadmap to improve your motor control, coordination, attention, concentration, impulsivity, focus, and reaction time, making you a better-rounded athlete and improving performance.



## COACHES: BUILD A BETTER TEAM

The Sports Science Lab's "Build A Better Team" program is designed for Coaches, Athletic Directors, Trainers and Scouts who want to identify the best athletes or build a better team, one athlete at a time. The Sports Science Lab can act as an extension to your athletic department by providing our global, objective assessment, which is the most accurate assessment available and uncovers areas of inefficiencies, weaknesses and underlying injuries.

Our team of experts will come to your facility or school, and analyze your athletes using our sports science technologies.

We can test up to 200 athletes within a 3-hour period, developing a customizable protocol for athletes that are at high-risk of injury. Athletes will be given corrective exercises which serve to address imbalances or weakness and reduce their chance of injury. By working with your athletes on an individual level, you have the opportunity to build a better, stronger team.





## 13–16 DIVISION 1 PREP

To help you prepare for competition at the Division 1 level, the Sports Science Lab Division 1 Prep Program is designed around sport-specific training to assess and improve your biomechanical and cognitive weaknesses. In conjunction, accelerated recovery technology allows you to optimize your performance while reducing fatigue and risk of injury.

Genetic testing can identify genetic variants that predispose an athlete to tendon injuries (including Achilles tendonitis), as well as ligament, cartilage, and bone pathology. Not only does this data give us an in-depth picture of an athlete's genetic profile, but it also can be used to further modify our approach through a combination of proactive pre-habilitative exercise, nutrition, and recovery methods to mitigate risk in young athletes and to maximize performance levels. This unique, multi-faceted approach to Division 1 Prep will help you reach your goals to compete at the highest collegiate level.



## PRE-SEASON PREP

The off-season is an opportunity for athletes to recover from the previous season and prepare for the upcoming one. The SSL's Pre-Season Prep Program helps athletes prepare mentally and physically for the upcoming season and address any problems that may have arisen during the previous season.

Our multifaceted, comprehensive approach incorporates scientifically proven training, recovery and performance protocols to help athletes break through barriers in performance. Along with physical preparation, we use neurotechnology and sensory performance training technology that improve mental sharpness, visual acuity, reaction times and reflexes and help athletes mentally prepare for the season.

This program focuses on developing structural and functional foundations for athletes, so that they maintain peak performance. This program was developed with professional athletes in mind, offering the latest technology for pre and post-game routines.



## IN SEASON ATHLETE

Throughout their season, athletes must respond to a constant stream of stressors – from maintaining and improving conditioning to preparing for games and matches to dealing with injuries. The Sports Science Lab has developed the In Season Athlete program to help athletes cope with these stressors while maintaining peak mental and physical performance. Our programs are tailored to meet each athlete's unique needs and take into account an athlete's gender, sport and position. We focus on improving performance and optimizing recovery while reducing the risk of injuries.

Our team of sports science experts use the most advanced technologies available, including cryotherapy, pneumatic compression pulse and super-pulse laser technologies, as well as traditional recovery modalities such as massage therapy and active release techniques. By improving recovery from intense training sessions, our program allows athletes to spend more time on technical training, maintain peak performance and reduce the risk of injuries.

### Benefits to athletes:

- > Faster recovery
- > Reduced risk of injury
- > Optimized athletic performance
- > Tailored to your specific needs



## MOBILE SPORTS SCIENCE LAB

Mobile Sports Science Lab brings the world's most advanced assessment, rehabilitation, and accelerated recovery technologies to your door. Operating as an extension of your athletic department, the Mobile Sports Science Lab comes to your facility with our team of Sport Scientists, Exercise Scientists, Sports Physiotherapists and Certified Biomechanics Specialists to collaborate with your coaches, athletic directors and high school-college-university-training staff to enhance the level of athlete care. Any coach or trainer who supervises athletes understands the importance of precise and objective analysis, speedy recovery modalities, and proper rehabilitation techniques. These technologies are essential components to professional sporting organizations because they have been proven to help win games, improve team weaknesses and keep athletes safe and in top form.

The technologies at the Mobile Sports Science Lab is currently being used by top level hospital and university research centers as well as professional organizations such as the MLB, NFL, MLS, NBA, UFC, and the United States Olympic training center for recovery, assessment, training, rehabilitation, and sports injury prevention.

- > On-site event, game or competition first responders
- > Team pre-season athletic analysis/baseline assessments
- > Post-season athletic analysis/baseline assessments
- > Team In-season athletic analysis
- > Team In-season concussion management
- > Team recovery post event/game/competition



## SPORTS INJURY PREVENTION + REHAB

The Sports Science Lab's Sports Injury Prevention + Rehab program is designed for in-season athletes who need to maintain physical health and preserve the gains achieved during the off-season training.

The program is tailored to the athlete's sport and position to ensure that each athlete maintains their peak performance and remains injury free during the season. The program focuses on maintaining appropriate movement patterns of muscle groups needed for the athlete's sport, improving mobility, and maximizing recovery, while minimizing inflammation and other damaging effects of intense athletic performance. Athletes also have access to evidence-based sports physical therapy and rehabilitation via SSL's Sports Physiotherapist, Rushi Shahiwala, who is affiliated with the Hospital for Special Surgery, and is a clinical instructor for Columbia University.

For injured athletes, the program provides effective rehabilitation and enables a fast, but safe return to play. After an injury, our team of experts isolates and protects the injured area, while focusing on strengthening the surrounding muscles, thus ensuring that there is no disruption to the athlete's performance training during the rehabilitation phase. Our sports physiotherapist and sports scientists analyze the athlete's movement patterns in order to detect any deficiencies that may have led to the injury and correct them to minimize the risk of future injuries.



## YOUNG OUTLIERS: IQ + ATHLETICISM

The SSL team uses a combination of brain training and specialized training to develop a foundation for sport-specific preparation and to optimize athleticism. The program develops key aspects of athleticism beyond the children's sport, from the body's core to the extremities. This program aims to develop a good foundation for sports, including multi-directional movement skills, balance, agility, vertical and lateral movement, muscular endurance and strength, both aerobic and anaerobic energy systems, increases rotational inertia, while reducing the risk of injury.

In addition to physical training, timing and accuracy are important features of athleticism. Fast reaction times and ability to make decisions can be critical during a game and can make the difference between victory and loss.

### Benefits to children and young athletes

- > Improved foundation for sport-specific preparation
- > Improved reaction time, focus and spatial awareness
- > Improved proprioception (awareness of limbs in space)
- > Injury prevention





## SPORTS RECOVERY + REHAB



### WHOLE BODY CRYOTHERAPY

Whole body cryotherapy is one of the most effective recovery technologies available. It exposes the body to extremely cold temperatures for 3 minutes to reduce inflammation and promote regeneration of muscle tissue between training sessions.



### PNEUMATIC COMPRESSION PULSE

Pneumatic compression pulse is a revolutionary massage therapy technology that stimulates blood flow out of muscles and flushes out waste products. This device accelerates recovery and reduces the risk of injury.



### 3D CONCUSSION TECHNOLOGY

3D concussion assessment analyzes movement patterns and identifies deficits in neurocognitive functioning after an injury to ensure safe return-to-play. It is the most precise technology available on the market.



### SUPER PULSED LASER TECHNOLOGY

Super-pulsed laser helps athletes get back to their sport quickly after an injury. The laser stimulates damaged tissue to promote the healing process, reduce inflammation, and shorten rehabilitation time.



### ALTER G ANTI-GRAVITY TREADMILL

This system uses NASA-patented unweighting technology to reduce the users' bodyweight by as much as 80 percent, allowing training after injuries that usually prevent athletes from weight-bearing activities. It is used to improve gait mechanics, and to safely perform aerobic conditioning during recovery from injury.



### PHYSICAL THERAPY / REHAB

The Sports Science Lab specializes in the diagnosis, treatment, and prevention of sports-related injuries. We use injury- and sport-specific methods to improve strength and range of motion in the affected area, helping athletes get back to the game faster after an injury.

# Perform Better + Recover Faster



ISOINERTIAL  
TRAINING



SENSORY  
PERFORMANCE  
TRAINING



BRAIN TRAINING  
+ 3D CONCUSSION  
ASSESSMENT



WHOLE BODY  
CRYOTHERAPY



ALTER G  
ANTI-GRAVITY  
TREADMILL



PNEUMATIC  
COMPRESSION  
SEQUENTIAL PULSE

AS FEATURED IN:

GEAR PATROL



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Men'sFitness

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