

KONKUSSION

PROTECTING BRAINS - ONE ATHLETE AT A TIME



“Let them play. Let our team protect them.”

*- Dr. Neilank K. Jha, Neurosurgeon, Spine Surgeon
Chairman and Founder, KONKUSSION*

WELCOME TO KONKUSSION

Welcome to KONKUSSION, protecting brains one athlete at a time.

Concussions have become a hot topic in recent months. While concussion awareness has rapidly increased amongst sport communities, our team continues to notice that concussion education has not reached the level of concussion awareness.

Unlike a wrist fracture where an x-ray is performed to diagnose the fracture and establish an effective treatment regime, there is no CT scan, MRI or laboratory test that can conclusively diagnose a concussion.

A large number of concussions go unrecognized and undiagnosed. However, a concussion may be as serious as a heart attack or stroke, if mismanaged, given the risk for irreversible brain damage.

In fact, 15%-20% of recreational athlete's will sustain a concussion this year. Up to 20% of athletes who sustain a concussion will experience significant symptoms that persist beyond three months. Multiple mismanaged concussions can lead to long term impacts that include depression, Alzheimer's, Parkinson's, ALS, and suicide. A second concussion prior to recovering from the first may lead to a 'Second-impact syndrome' which can result in irreversible brain damage and permanent disability.

Our team encourages you to take a few moments and review the documents presented herein to educate yourself regarding the brain health of your child. Topics covered include concussions in hockey, complications arising from multiple mismanaged concussions, case studies, sideline assessment tools, and the requirements for comprehensive concussion management.

We look forward to a safe and healthy 2013-2014 hockey season.

Sincerely,



Neilank K. Jha, MD., FRCS(C)

Founder, KONKUSSION

Neurosurgeon and Spine Surgeon

CONCUSSIONS IN HOCKEY

There are many existing misconceptions regarding concussions in hockey, including rate of incidence, the impact of gender, elite versus non elite athletes, and style of play.

Concussion Incidence in Hockey

Existing literature reports that the incidence of concussions in hockey is approximately 15% to 20% of athletes per year. However, recent studies of high school and college level hockey players have shown higher concussion incidence of 40% to 50% of athletes per year.

Elite vs. Non Elite Athletes

A common misconception is that elite athletes are more susceptible to concussions than non elite athletes.

A 2006 study pertaining to injury rates in minor hockey reported that concussion incidence per athlete-exposure where highest amongst 11 to 16 year olds.

On a per exposure basis, non-elite, recreational hockey players may be over twice as likely to sustain a concussion than their elite counterparts.



Gender

A Medicine and Science in Sports and Exercise study found that girls who played hockey sustained concussions 14% more frequently than males. The study also reported that concussions comprised 6.8% of total injuries for female hockey players, compared to 3.9% of total injuries for male hockey players.

Style of Play

Studies have shown that a subset of hockey players may sustain white matter changes in the brain, overtime, accompanied with impaired performance on cognitive and balance tests.



MULTIPLE CONCUSSIONS

Best Predictor of a Concussion

The best predictor of a future concussion is a prior concussion.

In fact, an athlete who has previously sustained a concussion is 3 to 6 times more susceptible to a second concussion than another athlete who has not previously sustained a concussion.

Post Concussive Syndrome

Post Concussive Syndrome (PCS) is a set of symptoms – such as headaches, dizziness, cognitive impairments, sleep disturbances, and balance, fatigue and mood disorders – that are experienced following a concussion.

In the majority of concussions, symptoms will resolve after 7 to 10 days. However, in approximately 20% of concussions, symptoms persist for 3 months, or longer.

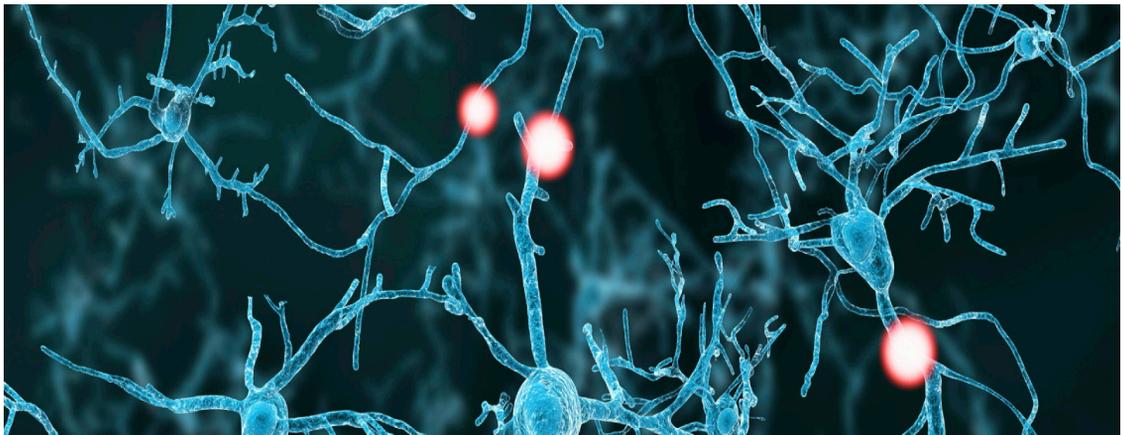
A second concussion prior to resolution of a first concussion increases an athlete's susceptibility to prolonged PCS symptoms and irreversible brain damage

Second Impact Syndrome

Second-impact syndrome (SIS) is a condition where the brain rapidly swells after an athlete sustains a second concussion prior to recovering from the first concussion.

Given the vulnerable state of the brain, it takes only a minimal force to cause irreversible damage, and in some cases, brainstem herniation, permanent disability and death.

Most cases of SIS occur in children and youth, who are particularly vulnerable, given their developing brains.



CASE STUDY I

A 12-year old female, named "Sarah" presented to one of the KONKUSSION clinics with complaints of headaches, dizziness and irritability.

Sarah had recently sustained two suspected concussions.

The first suspected concussion occurred four months earlier when Sarah struck her head after tripping during hockey practice. After complaining of a headache following the practice, Sarah's parents transported her to the ER. However wait times were long and Sarah's mother decided to take her home unseen by a physician. She read that rest was prescribed after head trauma.

A few days after sustaining her first suspected concussion, Sarah's symptoms improved and she decided to play in her following hockey game. During the game, she collided with another player and struck her head on the ice. She was examined subsequently by her family physician with symptoms of severe headaches, dizziness and irritability and was instructed to rest.

Since her second concussion, Sarah has missed a number of weeks of school and her academic performance has been significantly impaired.

CASE STUDY II

A 14-year old male, named “Andrew”, presented to one of the KONKUSSION clinics with complaints of severe headaches and dizziness.

Andrew had a past history of concussions.

In October 2011, he sustained one suspected and one diagnosed concussion while playing recreational hockey. His parents brought him to the ER after the diagnosed concussion where he received standard hospital care.

Following the first suspected concussion, Andrew took a computer specific neurocognitive test and was managed back to play by his team trainer. No concussion management by a head injury specialist was received. After sustaining the second concussion in 2011, Andrew experienced severe headaches, dizziness and mood disorders and missed nine weeks of hockey. He also experienced declining school performance.

In December 2012, Andrew sustained a second diagnosed concussion within 14 months. Following the concussion, he immediately presented to the KONKUSSION clinic on Christmas Eve. Andrew received clinical management by one of our Neurosurgeon's and state of the art treatment via intracranial stimulation and supplementation. Jonathon's post concussive symptoms resolved within 10 days at which time he returned safely to sport.

LESSONS LEARNED

A few of the learning lessons from these two case studies are presented below:

- Neither patient received early assessment by a brain trauma specialist following his/her first head injury. An opportunity for early intervention in the form of counselling was missed. In both cases irreversible brain injury may have been avoided.
- Sarah had not received a baseline assessment prior to her injuries, despite being at a high risk for concussions. The lack of baseline neurocognitive or neurophysical testing would have made it difficult to assess her pre-injury level of function, diagnose her concussion, and manage her return to play with a high level of precision.
- Andrew had carried out a computer based neurocognitive test online. These baseline tests have a substandard concussion sensitivity of 79% and have in some cases proven to return athletes to play too early.
- Neither patient had proper management by a clinical team highly experienced and specialized in the management of concussions, nor the ongoing support and education required to help them through their recovery process.
- It may be noted that Andrew received comprehensive concussion management and treatment following his third concussion, enabling his responsive and safe return to sport and mitigation of Post Concussive symptoms.

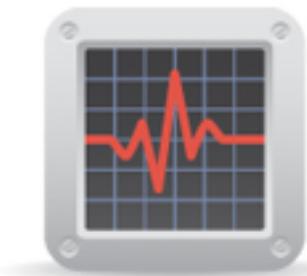
A concussion may be as serious as a heart attack or stroke, if not properly managed, given the risk for irreversible brain damage.

KONKUSSION PROGRAM

KONKUSSION was founded by Ontario Neurosurgeon and Spine Surgeon, Dr. Neilank K. Jha, MD., FRCS(C) to revolutionize the management of concussions and address the lessons learned in the previous case studies by offering:

- Annual baseline testing under the supervision of a healthcare professional to facilitate an objective pre and post-injury comparison of neurological function.
- Twenty-four hour access to an experienced clinical team highly specialized in the diagnosis and management of head injuries.
- Clinical appointments with a Neurosurgeon or Neurologist, commencing 24 to 48 hours after sustaining a head injury or concussion.
- Ongoing treatment and management from a multidisciplinary clinical team until concussion resolution and safe return to activity and sport.

This complete concussion management program sets a global standard of care.



BASELINE TESTING

No athlete should play a sport without a baseline test.

Baseline testing enables objective evaluation of when an athlete's post concussion level of function has returned to the pre injury level for safe return to activity and sport.

All KONKUSSION athletes will participate in an annual baseline test administered by a member of our professional healthcare team in a mobile onsite baseline testing clinic.

The comprehensive baseline test includes computer based neurocognitive and neurophysical tests, and a rigorous fitness assessment to simulate playing conditions. In select high risk athletes, brain physiological tests may be carried out using Near Infrared Spectroscopy (NIRS) technology.

KONKUSSION mobile teams will test athletes at convenient locations in the vicinity of their athletic district or club. Baseline tests are carried out on a pre designated date and timeslot, selected as part of the KONKUSSION registration process.



24 HOUR ACCESS TO CARE

Concussions require immediate care.

Upon completing an annual KONKUSSION baseline test, each parent, guardian or athlete – and team official - receives a KONKUSSION information package. This information package includes a membership card and 1-800 number to call in the event of a suspected head injury.

The KONKUSSION Clinical Team is accessible twenty-four hours per day, seven days per week, 365 days per year.

After calling the KONKUSSION 1-800 number, the parent, guardian or athlete receives a return phone call within 60 minutes from a KONKUSSION trained healthcare professional.

A detailed pre-screen of the athlete's condition is carried out.

Based upon the pre-screen results – reviewed by a Neurosurgeon or Neurologist – the KONKUSSION member is scheduled to see a Neurosurgeon or Neurologist within 24 to 48 hours. No referral from a family doctor or pediatrician is required.



ONGOING CONCUSSION MANAGEMENT

In the event that an athlete has sustained a concussion, the KONKUSSION team offers state of the art concussion management through clinical appointments or teleconferencing with a Neurosurgeon or Neurologist.

Teleconferencing appointments can be carried out at 1,600 Ontario Telemedicine Network (OTN) sites across Ontario. A KONKUSSION member may alternatively opt to schedule a clinical visit with a Neurosurgeon or Neurologist at one of our GTA clinics.

Clinical appointments follow medically validated rehabilitation stages. These six graduated stages include no activity, light aerobic exercise, sport-specific exercise, non-contact training, full contact practice, and return to play.

The KONKUSSION multidisciplinary medical team offers detailed head injury treatment, diet, supplement and lifestyle regimes to help athletes expedite recovery, return to play in a safer and more responsive manner, and minimize the short and long term health impacts of head injury.

The ultimate clearance for an athlete to return safely to school, work, physical activity or play requires a Neurologist or Neurosurgeon, as these decisions can ultimately prevent permanent brain damage.



KONKUSSION FAQ's

What is KONKUSSION?

KONKUSSION is a team led by neurosurgeons and neurologists providing athletes with mobile on-site comprehensive baseline testing and subsequent 24/7/365 complete concussion care and safe return to play.

How does KONKUSSION work?

All athletes undergo an annual Baseline test administered by a healthcare professional. Upon completing the baseline test, each athlete, parent or guardian receives a membership card and 1-800 to call in the event of a head injury.

KONKUSSION clinical care is accessible 24 hours per day, 7 days per week, 365 days/year. Members receive a phone call back within 60 minutes from a healthcare professional to facilitate a detailed pre-screen of the athlete's condition.

If necessary, KONKUSSION athletes are scheduled to see a specialist (Neurosurgeon or Neurologist) within 24 to 48 hours, anywhere in Ontario.

In the event of a concussion, the diagnosis is confirmed by comparing the post-injury measurements to the athlete's baseline levels.

A graduated return to activity, return to play protocol is followed under the expertise of our clinical team with multidisciplinary head injury treatment, diet, supplement and lifestyle regimes to expedite recovery.

The ultimate decision on clearance to return safely to play is made by a Neurosurgeon or Neurologist in consultation with our entire healthcare team.

Why become a member of KONKUSSION?

Concussions require immediate care.

Parents and athletes concerned about a possible concussion have immediate access to our clinical team and will be scheduled to see a Neurosurgeon or Neurologist within 24 to 48 hours, anywhere in Ontario.

How is KONKUSSION's baseline testing different from others?

Firstly, our neurocognitive test is administered by a healthcare professional at the beginning of each sport season.

Secondly, our baseline testing incorporates features of previously validated tests and further dimensions of cognition, including visual memory, balance, reaction time and working memory.

Thirdly, our rigorous fitness assessment simulates playing conditions.

Finally, each concussed athlete undergoes a comprehensive review by our team of Neurosurgeons and Neurologists.

All of the above enables KONKUSSION to make return to play decisions with a higher level of efficiency, precision and safety.

Is Baseline testing only for athletes above they age of 10?

No. KONKUSSION has modified its baseline test for younger athletes and continues to follow their sporting career.

What happens when an athlete returns to play too soon after sustaining a concussion?

The athlete will become more susceptible to a second concussion, post concussive syndrome and irreversible brain damage.

Short-term consequences may include impaired school performance, debilitating headaches, dizziness, nausea, vomiting, and sensitivity to sound and light. Long-term effects may include depression, Alzheimer's, Parkinson's, ALS and suicide.

Will KONKUSSION delay a player's Return To Play?

No, quite the opposite. Due to immediate access to care with KONKUSSION baseline testing, athletes will return to play as soon as safely possible.

Why do my kids need to register with KONKUSSION each year?

Given the developing brain, it is important to establish an up to date baseline test.

PARENT REGISTRATION

KONKUSSION does not recruit individual athletes or teams, only entire sport organizations.

KONKUSSION is currently working with organizations in the OMHA and GTHL to make comprehensive concussion management widely available to elite and non elite athletes of all ages.

For additional details regarding the KONKUSSION baseline testing and concussion management program, please visit your clubs website, or speak directly to your trainer, coach, or club administrator.



SIDELINE ASSESSMENT TOOL

While KONKUSSION and select OMHA and GTHL organizations continue to work hard to implement comprehensive concussion management, it is important that parents, trainers, and coaches have a tool for assessing when an athlete should be removed from play as a result of a suspected head injury.

The following sideline assessment tool provides a list of symptoms or signs of disorientation that if experienced by an athlete following a suspected head injury should lead to their immediate removal from play and evaluation by a Neurosurgeon/Neurologist to ensure proper concussion management and avoid the short/long term complications of mild traumatic brain injuries.

Symptoms

- Loss of consciousness
- Alteration of consciousness
- Headache
- Neck Pain
- Nausea
- Dizziness
- Blurred vision
- Balance problems
- Sensitive to light
- Sensitive to sound
- Don't feel right
- Difficulty concentrating
- Difficulty remembering
- Confusion
- Drowsy

Orientation

- What month is it?
- What is the date today?
- What is the day of the week?
- What year is it?
- What time is it right now?

If this is a medical emergency, please proceed to your nearest emergency room.