



**BRAIN INJURY
ASSOCIATION
OF LONDON
AND REGION**

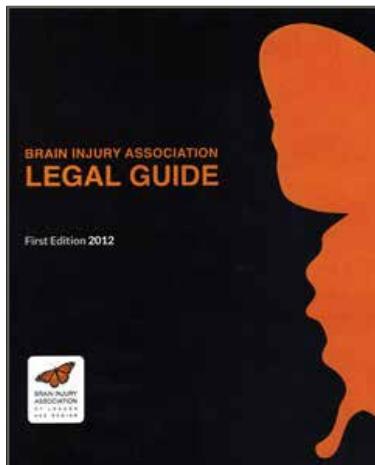
Fall Issue September 2015

THE MONARCH

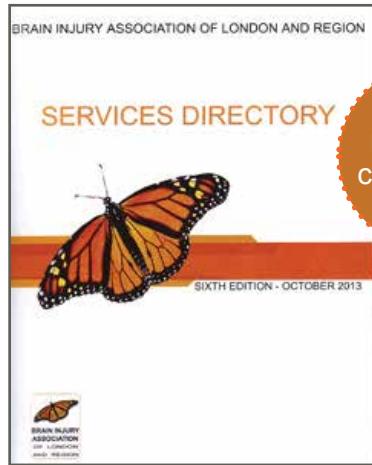
Exploring the Different Forms of Brain Injury



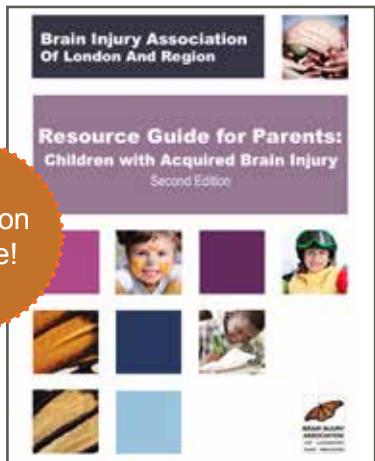
Check Out These Great Resources!



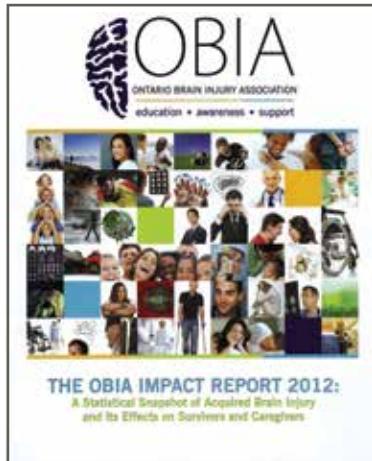
This legal guide is published by BIALR, in collaboration with Harrison Pensa, and is in its first edition. It is designed to provide straightforward accessible explanation of key legal issues and fundamental legal rights of those who have suffered brain injuries and their support teams. Print copies are available from the BIALR office and electronically on the website.



This directory is published by BIA London and Region and is in its 6th edition. It is designed to help individuals suffering from the effects of a brain injury identify and locate the services in London and Region. (Print copies are available from the BIALR office and electronically on the website.



This resource is published by BIALR and is in its first edition. This compilation of articles is designed as an informational resource for parents of children who are suffering from the effects of an acquired brain injury. Print copies are available from the BIALR office.



The OBIA Impact Report 2012 is published by the Ontario Brain Injury Association (OBIA), with support and funding provided by the Ontario Neurotrauma Foundation. It is designed as an easy to read statistical snapshot of acquired brain injury and its effects on survivors and their caregivers. Electronic copies are available on the OBIA website.

Online Resources:

- Brain Injury Association of London and Region - braininjurylondon.on.ca
- Ontario Brain Injury Association - obia.ca
- Brainline.org, preventing, treating, and living with traumatic brain injury - brainline.org
- Brain Injury Association of Queensland - synapse.org.au
- National Resource Center for Traumatic Brain Injury (Virginia Commonwealth University) - www.tbinrc.com

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We Need Your Help!

Volunteer Opportunities Available

If you or someone you know is interested in volunteering, we are looking for energetic people to join our team!

We are currently seeking volunteers to assist us with various support groups, charitable events and committees.

Board Directors

- Email info@braininjurylondon.on.ca

Support Group Leaders and Speakers:

-For all 5 counties: London/Middlesex, Perth, Elgin, Oxford and Huron

Committee Members:

- Community Awareness
- Fundraising
- Support Services
- Conference
- Editorial

50/50 Ticket Sellers:

- Nationals Hockey Games



If you are interested in volunteering or have questions please email:

volunteer@braininjurylondon.on.ca





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Letter from The Executive Director

Whether a brain injury is caused by a traumatic or non-traumatic event, the symptoms are often quite similar. This issue of the Monarch is dedicated to exploring the different types of brain injury.

With revisions earlier this year and impending changes to the Statutory Accident Benefits, along with the overall economic downturn, we are noticing a gradual decline in financial support. This is not surprising, as individuals and corporations are forced to make difficult budgetary decisions. Education dollars, financial support and sponsorships of charitable events are often the first items to be cut. Recognising this as a reality, the Association is taking a pro-active approach to working within a reduced income, while at the same time experiencing a greater demand for our services. This summer, we have been very busy with downsizing and making several organizational changes. In July, we said goodbye to Jessie Dougall, Services Coordinator and downsized our physical office space. Our move to 341 Talbot Street was completed for August first.

At the Annual General Meeting, we said goodbye to several key board members. Both Mary Carter and Gary Phelps reached their 10 year limit of serving on the board. Their combined contribution to the board is invaluable, as they helped guide the organization to where it is now. Other exiting board members include Nancy Robinson, Julia Armstrong, and Christopher Collins. We will miss each of the outgoing board members and wish them all the best in their future endeavours. The Association welcomed Carla Shaw, John Shamoon, Nicole Murray and Jim Mays to the 2015/16 Board of Directors. We are currently seeking representatives from Perth, Huron and Oxford counties.

Although the new board faces many challenges finding innovative ways of continuing to provide programs and services with the decline in funding, I am confident they will be up for it!

This fall is shaping up to be quite busy. Camp Dawn is in their final preparations for this year's camp, beginning on September 17. Also on that day the London Brain Injury Golf Classic will be teeing off at Greenhill's Golf Club. The second Annual Bikes n Brains Bike Ride & Symposium will be underway on September 26. The Fundraising Committee is in the process of planning the first annual 'Boots & Brains' Barn Dance & Country Market at the Plunkett Estate on October 3, 2015. Tickets are available online and sponsorship opportunities are still available. Mark your calendar and save the date for our popular Casino Night at West Haven on November 14.

As the committees are gearing up to begin their work in September, we are seeking volunteers to join us. Contact Stephanie McGill @ admin@braininjurylondon.on.ca to discuss volunteer opportunities.

Donna Thomson

Highlighting Our Volunteers

Just A Note To Say Thank You!



Nikki Fodor

Tell us a little about yourself?

I was born in Saint John, New Brunswick and ironically enough, as I begin to fill out this questionnaire I am back visiting this old town yet again. I really adore the beauty of the rocks and water. Although I must admit I do not adore the hills. I moved to London because of a military posting as a young child and have resided in London here ever since. I am now in my early 30's with my own family and love to write, read, cook, take photos and well, just stay busy.

How long have you been volunteering with the Brain Injury Association?

I began volunteering with the Brain Injury Association last September.

Why did you choose to volunteer with the BIA?

I have an ABI that I acquired in 2007. It was bad; really bad. I mentioned above that we moved to London because of a military posting. I mentioned it for a reason. I truly feel that because of his military background, it is why I am alive. As mentioned above I stay busy. I am the type that needs to stay busy. BIA does this for me. There is always something to do and sometimes it can be really busy and I love that!

What makes you come back to BIA year after year?

The people and the busyness it can sometimes entail. I love it when there is a conference coming up and there is a lot to do. I love the friendly atmosphere. I love that they don't judge if a mistake is made and that any volunteer is welcome with open arms

Do you have a favorite moment from your time here that you would like to share?

I'm not sure I have a specific one but I have a few. My favourite moments are seeing the team come in and work together in such events like the Helmets on kids or seeing the committees like Year of the Brain or the Margaritaville all come together and being able to participate at the event. Once the events are in true action and watching people enjoy themselves. I love that moment and I love taking pictures of that moment!

What would you say to someone that is considering volunteering with BIA

Do it! Whether you want to enjoy the fast paced like me or simpler things. There is always a lot to do and the people you will meet and work with are fabulous. Best caring, understanding, non-judgmental people I have ever met!
The People. Wonderful, generous, strong, caring People.

Brain Injury Support Groups

If you or someone you know has experienced a brain injury, you may benefit from participating in one of our many support groups. Groups meet either monthly or weekly and offer you the chance to learn more about living with ABI. Discuss common issues and problems or have fun in a positive environment.

<p>Huron County Support Group Meets the second Monday of the month OMAFRA Office 100 Don Street Clinton ON 6:00 - 8:00pm</p> <p>SISKINDS THE LAW FIRM</p>	<p>London Social Leisure Group Sponsorship Available This group has been cancelled until further notice</p>
<p>Perth County Support Group Meets the last Tuesday of each month Zehrs Markets 2nd Floor Community Room 865 Ontario Street Stratford, On 7:00 - 9:00pm</p> <p>SISKINDS THE LAW FIRM</p>	<p>Oxford County Support Group Meets the First Tuesday of each month Dundas United Church 285 Dundas Street Woodstock, On 6:30 - 8:30pm</p> <p>SISKINDS THE LAW FIRM</p>
<p>Perth County Social Leisure Group Meets every Wednesday of each month Central United Church 194 Avondale Avenue Stratford, On 1:00 - 4:00pm</p> <p>SISKINDS THE LAW FIRM</p>	<p>Elgin County Support Group Meets the second Monday every month Community Room at the Elgin Mall 417 Wellington Street St.Thomas, On 6:30 - 8:30pm</p> <p> NOVUS REHABILITATION LIMITED</p>
<p>London/Middlesex Support Group Meets the last Thursday of each month First Baptist Church London 568 Richmond Street (parking in rear) London, On 7:00 - 9:00pm</p> <p> Cohen Highley LAWYERS</p>	



JOINT MEMBERSHIP PROGRAM

Brain Injury Association of London and Region & The Ontario Brain Injury Association

Invite you to belong to both organizations
for one low fee!

Further information and the application form can be found at

www.braininjurylondon.on.ca
under "How to help"



We want to hear from you!!

Do you have a suggestion for the Monarch magazine? Let us know!

We would love to hear your feedback.

email your suggestions to
editorial@braininjurylondon.on.ca



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Making Numbers Make Sense

DISCLAIMER:

The Monarch is published by the Brain Injury Association of London and Region.

Opinions expressed in the articles are those of the authors and do not necessarily reflect the opinion of the Board of Directors.

All articles remain in their submitted un-edited form to preserve the original views and intent of the author.

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Editors: Editorial Committee

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Stephanie McGill**

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Peer Support Coordinator's Report

When I was “promoted” to the role of Peer Support Coordinator back in 2007 I created a Facebook brain injury support group to promote the Peer Support Program. As more and more people joined, I soon noticed that there was a major difference between what America and Canada classify as traumatic brain injuries and acquired brain injuries (TBIs and ABIs respectively) America uses the term traumatic brain injury (TBI) to refer to most brain injuries that are not acquired naturally and Acquired brain injuries to refer to what we call non-traumatic brain injuries (diseases of the brain such as meningitis, encephalitis, aneurysms, tumours, etc).

In Canada we use Acquired Brain Injury as an umbrella term for both traumatic and non-traumatic brain injuries, but regardless how the brain injury happens, I think it’s safe to say, it wreaks havoc not only on the person, but those around him or her, so I can understand how Americans want to use the term traumatic to describe all brain injuries because that’s what brain injuries are; they’re no less traumatic whether you had a brain tumour or were in a motor vehicle accident; had meningitis or fell and hit your head.

That is the theme of this Monarch: the different forms of brain injury. The brain injury awareness campaign of June 2012 was everyone affected by brain injury to wear a T-shirt that said on the front ‘Making Invisible Visible’ with, ‘You Cannot see a brain injury” on the back of the shirt and below that, my saying taken from my Facebook support group, “Brain Injuries Don’t Discriminate” The Peer Support Program is open to all forms of brain injury because it is an issue-driven program. No matter how a person received a brain injury chances are they face similar issues that another person in a similar situation is facing. It is the job of the thirteen Peer Support Coordinators across the province to interview and assess each participant to find them the best match.



Jamie Fairles
Peer Support Coordinator
519-642-4539
editorial@braininjurylondon.on.ca

Looking To Get Involved?

We are looking for individuals to become mentors in our Peer Mentor Program. Mentors provide support and share information and resources with partners who are coping with a similar ABI-related situation. We are in particular need of mentors who are family members and caregivers. Visit our website or contact our Peer Support Coordinator for more information.

www.braininjurylondon.on.ca



PARKWOOD INSTITUTE Medical Driving Assessment Program

The medical driving assessment program has two options:

Driver Assessment Rehabilitation Program

Driver assessment and rehabilitation services for those:

- whose health status has changed due to trauma, illness and natural aging
- with physical disabilities who may require equipment and/or modifications
- wanting to learn how to drive who need special instruction or vehicle adaptations

DriveABLE

- A driving assessment program for older drivers with a confirmed or suspected cognitive impairment such as dementia or Alzheimer's.
- Outcomes for a DriveABLE assessment include pass (an individual is safe to continue driving) or fail (it is no longer safe for that individual to drive)

One easy referral number for both options: **519-685-4070**

Parkwood Institute is an approved Ministry of Transportation Driving Assessment Centre

Parkwood Institute, Main Building, 550 Wellington Road London, ON N6C 0A7

For more information: www.sjhc.london.on.ca/darp

NEUROTRAUMA REHAB AT PARKWOOD INSTITUTE

Access resources of a well-respected rehabilitation, research and teaching centre – Parkwood Institute.

- ◆ Our team of rehab specialists helps those injured in car or work-related accidents.
Our expertise is in neurological trauma including spinal cord and brain injuries.
- ◆ Please call us if you, your family member or client needs help:
 - Returning to work or school
 - Organizing their day
 - Finding joy in accomplishments of all kinds
 - Exploring strengths and learning new strategies

More information about our fee-for-service program offered throughout Southwestern Ontario:

Phone: 519-685-4061

Fax: 519-685-4066

Toll Free: 1-866-484-0445



Jocelyn: A Stroke Story

Everyone has a story to tell, and mine is about the stroke I suffered when I was 54 years old.

Doctors never figured out why I had a stroke. When I arrived at the hospital, my blood pressure was over 220. I knew that something was wrong but didn't know what. Even the ER staff misdiagnosed my condition originally. The nurse who attended me told the ER doctor that I was most likely suffering from vertigo, and the doctor simply assumed she was right.

Earlier that day, the only symptom I felt was extreme dizziness. I tried to lean over to do something but I fell in the closet instead. Later, when I went to water my flowers, I fell onto the brick wall. As far as I knew, this symptom was not a sign of stroke. I lay down to rest, but it only got worse. So I decided to go to the emergency, just in case.

After the ER's vertigo diagnosis, another doctor attended me in order to sign off the hospital discharge. However, upon examination, the doctor immediately recognized signs of a stroke. I was eventually admitted and remained in the hospital for six weeks.

Strokes really do take a toll on you. It affects the way your brain functions. What was once easy and taken for granted before, is not anymore. I'm not the same person I used to be. One of my major problems is memory. For example, this morning, while washing dishes, I realized that I had left yesterday's groceries in the car. I had totally forgotten to bring them home. It gets trickier when I go shopping: I can never find my car in the

parking lot because I can't remember where I parked it. I actually don't even know where to start looking! When I go to the mall, I can't remember through which door I get in and, once I'm done shopping, seeing all the different exits, I can't recall which is the right one. Noticing this loss of memory, I started to take precautions, such as putting a sign on my front door to remind me to actually shut the door, because I would forget to do that. I also had to get a new type of stove, which switches off on its own, because I almost burnt the house down, twice!

Another consequence of my stroke is apraxia and aphasia. This translates into having a hard time talking when you get excited or feel pressure. I also cry at the drop of a hat! I have initiative problems: I can only accomplish things someone else starts, but I am unable to start anything myself. Sometimes I sit somewhere, and a whole day passes without me even realizing it!

Three years after the incident, I learned that sometimes my brain would only retain information regarding the beginning and the end of a particular story or conversation, and that my brain would automatically "fill in the in-between" details. I finally understood why sometimes I could swear on my life that facts were true when, in reality, it was just this "automatic filling" function of the brain. This is why when I tell a story, details may be very different from someone else's. It's difficult to trust yourself once you know that your brain tricks you in this way. Struggling to continuously live a normal life after surviving a stroke, with all these

residual effects, leave me exhausted most of the time. Just accomplishing a couple of tasks a day, will drain me out for the next day or two! These limitations affect every aspect of my life. I sometimes feel depressed, agitated and with no energy.

Being a totally different person today, after a stroke, I decided to celebrate two birthdays: one, on my natural birth date, and another, on the date I suffered the stroke. I mourn the death of the person I was, and I am now learning to live with the person I have become today. I am lucky and thankful to have a wonderful husband, and amazing family and friends. I would be lost without them.

If you ever meet someone who has suffered a stroke and who needs understanding and help, please watch the series from Parkwood. This would be best watched with family and friends, so that everyone can understand what you are really going through.

Knowledge is the key to be able to give proper support to someone who suffered a stroke. If you have questions, need general information, or support, contact Parkwood Institution by visiting <https://www.sjhc.london.on.ca/abi>, but if you have an emergency dial 911.

Take Care of yourself: your health is what allows you to do your day to day activities

Concussion



Krysten Howell's Story

Ever since I can remember sports were everything to me. I would wake up and go to sleep thinking about what practice or game I had coming up the next day. Sports were more than a passion for me, they were my life and identity. I was that one girl who played with all the boys on the playground, and wasn't afraid of taking them down because I wanted to be the one to score the goals or make the big play. As a kid I enjoyed everything from basketball to volleyball, but my one true love has always been soccer. For me soccer was and continues to be more than a game. There was no better feeling in the world then putting on cleats and that uniform and stepping onto the field, looking up in the stands and seeing and hearing people cheering for you and your teammates. For an hour and a half nothing mattered in the world except for what was on that field. Playing was a way to escape everything going around me, a way to release my anger, and most importantly a way to express my emotions through something I loved beyond words. Not in a million years would I think that my whole way of life would come crashing down on me so fast in one instant.

In my grade 12 year of high school I was lucky enough to receive a Division 1 scholarship offer to play soccer down in New Jersey for the following year. This might have been the most exciting news I have ever had because this was always my dream growing up. The day finally came where I had to pack up my life in the car and make the drive down to New Jersey, where I would live for the next 4 and a half years. I was terrified to move to a new country away from my family, but all of those feelings would quickly change after getting there and meeting my new roommates and teammates, that I would live and play with for the next 4 years. Everything was going exactly how I imagined. For those first two weeks we were on that field more than we weren't. Then finally it was time to play, the feeling I lived for. Nothing brought more joy in my life then stepping on that field. That was until a few games in when I received an elbow to the head mid-way though the game. I remember having an instant headache and my head was pounding. Being who I am nothing would hold me back and I wanted to continue to play, the last thing I was thinking about was staying off the field. Lucky for me one of my coaches had an awful experience herself with concussions, so going back in before I was cleared was not even an option. That next week was the longest week of my life. It was filled with tests, and building up activity level without headaches. After about a week I was cleared to get back out there. The rest of the season was smooth sailing, until the last game of the season at our conference tournament in Utah, half way across the country. This time is a bit foggy for me, but I was told I got tripped at centerfield and hit my head on the ground. The next day was filled with a hospital trip for an x-ray, MRI. Thankfully for me the season was over and I could worry about just relaxing and recovering on my time, without having to worry about rushing back into playing. It was the same recovery as the first except now the headaches were a bit worse and for longer. I was finding it hard to fall asleep and stay asleep through the night, and being out in the sun was impossible without sunglasses on. After a few weeks all was good again, and my activity level back was too normal.

That next season I was moved positions from inside midfield to striker in order to avoid excessive heading of the ball and body contact. It didn't bother me too much as long as I was on the field. Through my second season it seemed to be the same routine as the first year. Hit in the head somehow, x-rays, MRI's and a few weeks of recovery, then back in the game. This was the case until what would be my last and worst concussion I would receive from playing soccer. The only way I remember this concussion was from the game video I was shown a few weeks later. I came in for a tackle on the defender and when I got about 5 feet away she went to kick the ball down the field and of course the ball headed right for my face. After this concussion is where things changed for me. Those few days of headaches was now weeks of headaches, and not sleeping through the night became not being able to sleep much at all. For almost two weeks I couldn't leave my pitch dark room because any light made the headaches a million times worse. If I did leave my room I always had to wear sunglasses. It was after this concussion where I got referred to a Neurophysiologist. The next few months consisted of weekly trips to her office to do computer tests showing any progress by testing short and long-term memory, reaction times, mental processing and concentration. It was a few weeks where we were talking where I was told going back to playing soccer would not be a smart idea. At first this sentence didn't sink in.

I could not process the idea of not playing and calling it quits, especially at the age of 20. I knew eventually this day would come where playing competitively would no longer be an option, but I never thought that this decision would be made for me. It was a few days until the reality sunk in. By this time I was alienating myself from people who I cared about, and instead of going out like I used to, my days and nights consisted of staying in my room. I found myself not wanting to go to soccer, and just didn't care anymore. If I couldn't play I wanted nothing to do with the sport. By this time my school work load was piling up as I was not able to concentrate on school work for long periods of time. Going to class for more than an hour at a time was impossible without getting a massive headache, reading textbooks was useless because even if I was able to read for a good period of time, I couldn't remember what I read a few hours later. I ended up having to drop a few courses to lessen the work load, and with the amazing help from my professors and neurophysiologist I was able to do exams in a take home or essay version. Without that help in school I don't know how I would have passed my classes. This went on for a while until something in me just clicked. Why was I giving up on something that made me who I was for my whole life? I couldn't play anymore but there was so many other ways I could be involved.

Going into my forth year at school, I started taking on more of a coaching role, working on stats, and learning the game from a whole new perspective. That year was a reality check for me and would change my life for the better. I did return for a fifth year to catch up on courses I dropped previously and this time taking on even more responsibility in the coaching role. I fell completely in love with coaching. I couldn't play anymore but I could share my knowledge with players coming up in age. After I graduated that winter, I moved back to Canada, where I now help coach an under 9 girls soccer team in London. Every time I step onto that field as a coach I get the same feeling as I did stepping onto that soccer field in New Jersey for the first time. Nothing makes me prouder than seeing these young girls succeed at goals we set out each time they step onto the field. I realize I can't play anymore, but teaching these up and coming players is so much more meaningful to me now. I have the ability to share everything I have learnt over the years playing to hopefully be able to give them the right tools and guidance in order to make them the best player they can or want to be.

Concussions have been a major part of my life for the last 6 years, and will continue to make an impact on my life for many more years. As much as it sucks not being able to play soccer any more, or having to wear sunglasses all the time, short term memory issues, or constantly being careful about the surroundings as to not hit my head, I have learnt a lot about myself after the last time I was able to play. I have had the opportunity to tell people my story, and help spread the word about the dangers of concussions in sports, especially sports like soccer that they are not commonly known for head injuries. Being able to see the signs and symptoms early can make a huge difference when it comes to head injuries and I think that those are important for youth coaches and parents to understand. My situation could have been a lot worse if it wasn't for coaches and doctors who knew what to do, but many people have lasting symptoms for most or the rest of their lives. I was lucky, and I hope in the future with education and awareness that concussions in sports is no longer a pressing and dangerous issue as it is today.



Brain Injury? Think Brainworks

(519) 657-1180 ext. 0
info@brainworksrehab.com www.brainworksrehab.com



Cornerstone Clubhouse
Supporting Success

A Dale Brain Injury Services day and evening program for adults living with the effects of an acquired brain injury.

781 Richmond St.,
London, On. N6A 3H4
Tel: 519-679-6809
Fax: 519-679-6988
cornerstoneclubhouse@rogers.com
www.cornerstoneclubhouse.com
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Cornerstone Clubhouse

- A place to come and belong
- The opportunity for meaningful work
- The opportunity for meaningful relationships

Supporting Success



Dale Brain Injury Services
We build futures



Cohen Highley^{LLP}
LAWYERS

Suffered a serious personal injury?

Contact a specialized Personal Injury Lawyer:

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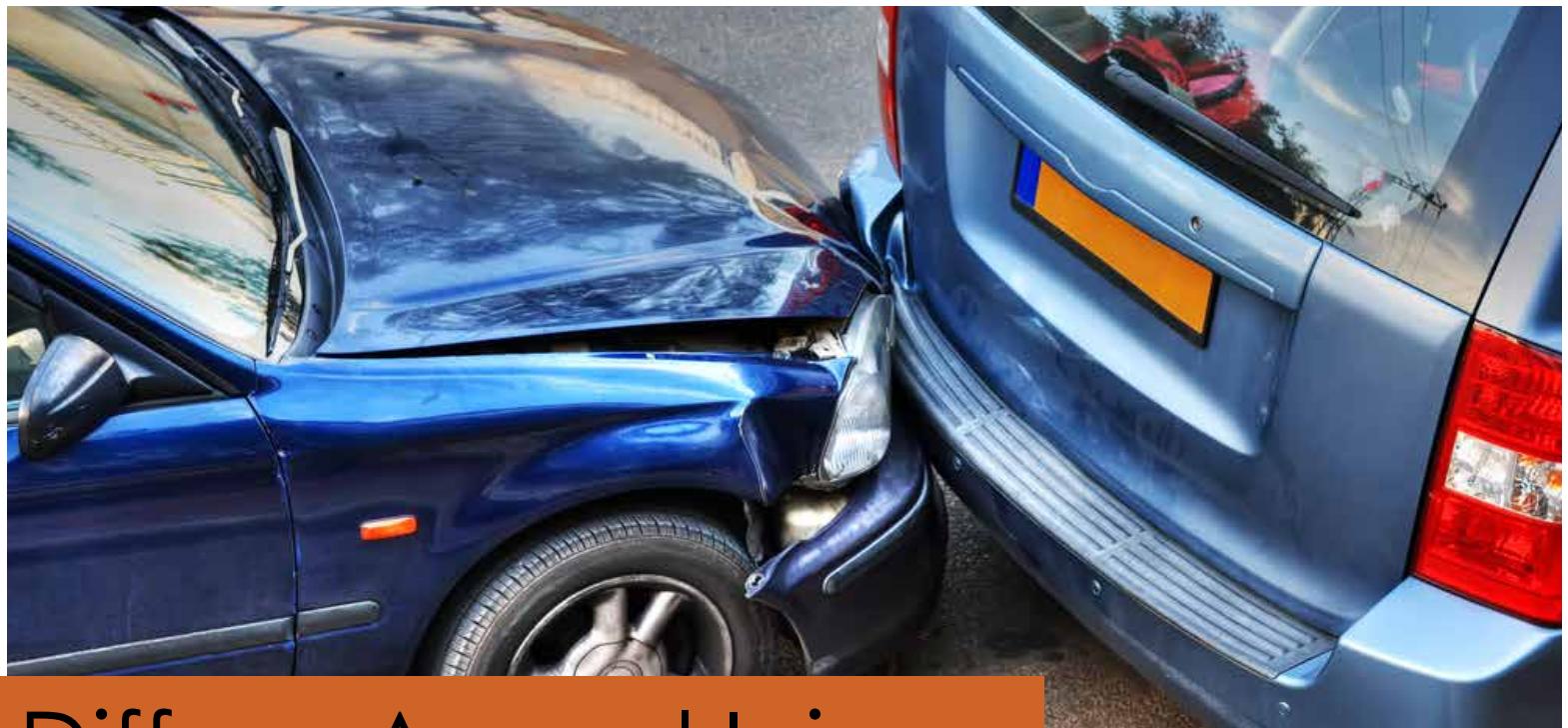
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Diffuse Axonal Injury

Diffuse Axonal Injury (DAI) is a type of brain injury occurring over a widespread area, as opposed to one specific location. The injury itself occurs to the axons of the neurons (brain cells) or the white matter of the brain, through a shearing force often caused by a rapid acceleration-deceleration force (ie. as in whiplash). This force results in the axons of the neurons, the parts responsible for communication, to disconnect from other neurons. This disconnection can result in cell death and a poor signal between brain cells. DAI can present from mild to very severe and can result in lost consciousness, vegetative state, and brain death.

With brain injuries that are more focal, a healthcare provider is able to see specific impairments based on where the injury is located in the brain. This allows a provider to know what to expect when seeing a client, and what challenges that client may face in their recovery. However, with DAI there are no specific impairments to be expected as every client presents in a different way depending on which

areas of their brain are damaged. Unfortunately, DAI is not easily detected by medical imaging, so healthcare providers must utilize their observation and problem solving skills to determine what areas of the brain have been impacted by injury. Once the impairments are identified, therapists can then tailor their treatment strategies to be client centered. Oftentimes, individuals with DAI present with poor judgment, difficulty with planning and initiating tasks, memory issues, concrete thinking, impulsivity, and may ride an emotional rollercoaster.

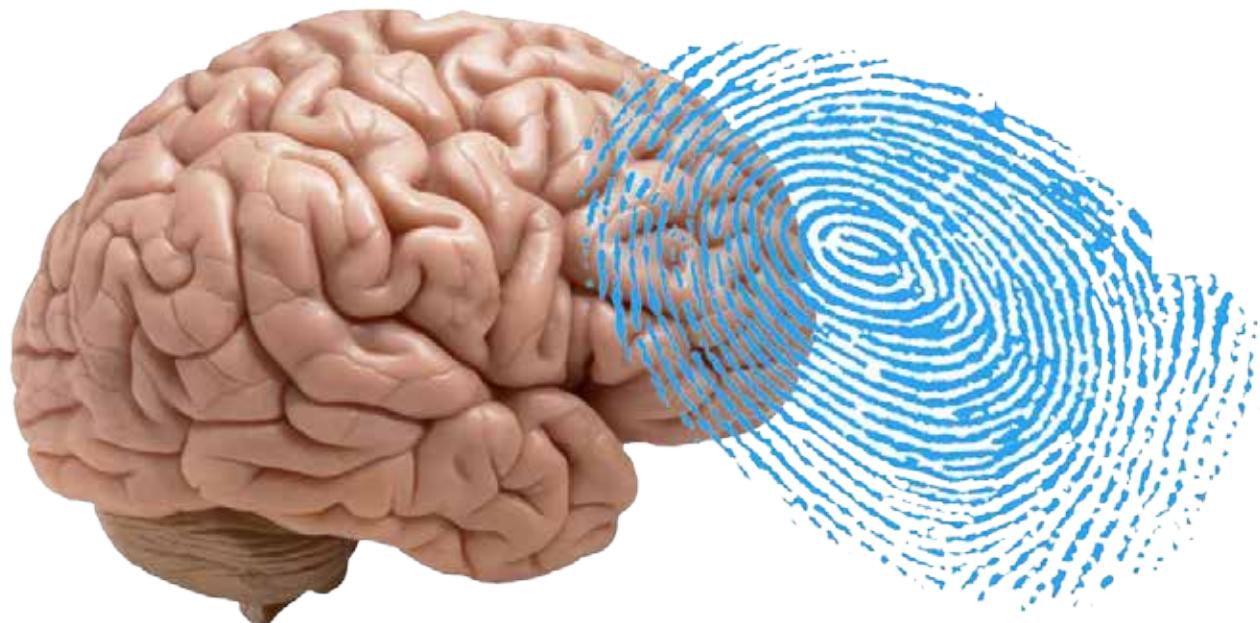
As a healthcare practitioner working with clients with acquired brain injury (ABI), treating clients with DAI presents unique challenges. As the deficits are more widespread, and most often affect the cells of the brain that are responsible for communication within the brain (ie. the auditory system communicating with the visual system to know someone is talking) it can be difficult to target treatment specifically. Rehabilitation often involves being very repetitious and setting up

strict routines and schedules, which allow the brain to map out new ways of completing tasks. The healthcare provider becomes the GPS for the person stuck in traffic looking for a detour. Care providers must provide the strategies for re-learning tasks like walking, talking, brushing teeth, and eating meals. As the old route is under construction, and may even be completely demolished, it often takes a lot of repetition, strategizing, and getting lost, to find the new route. This re-rerouting of neurons is called neuroplasticity.

Fortunately, many advances in brain injury treatment and rehabilitation are being made, making positive outcomes for individuals with DAI more likely. The study of neuroplasticity has allowed for advances in rehabilitation that were never thought possible. This opens new doors for individuals surviving with DAI and the healthcare providers that treat them.

Resources:

Lundy-Ekman, L. (Ed.). (2002). *Neuroscience. Fundamentals for rehabilitation* (3rd ed.). St. Louis, MO: Saunders, Elsevier Inc.



Research Update: Fingerprinting Brain Tumour Cells

Written by: Dr. Tamra Ogilvie

When you think of fingerprinting, CSI and other crime shows might be what come to mind. But it's the idea of this forensic practice (identifying individuals by the distinctive make-up of their prints) that plays a major role in Dr. Tamra Ogilvie's work.

Tamra was a recipient of a 2011 Brain Tumour Research Grant from Brain Tumour Foundation of Canada for her project that explores the relationships between different types of tumour cells in pediatric medulloblastoma, the most common form of childhood brain cancer. The two varieties of cells included in Tamra's study are stem (cells involved at the start of tumour development) and invading (cells that infiltrate the normal tissue around the tumour).

"By looking at stem and invading cells we can determine their 'fingerprints,' essentially identifying cell types by the unique characteristics on their surface,"

she explains. "We can then better assess how different combinations of these markers can select cells that impact the growth and spread of the tumour."

In her Winnipeg, MB lab, Tamra grows clones of tumours from large cell populations as well as recent patient-tissue derived stem cells. She then screens the clones for biomarkers to determine the difference between the most and least invasive cells, and if there were specific markers that could predict their behaviour.

Since her research began, Tamra has identified a combination of three biomarkers within medulloblastoma that mark a particular cell type. This is a critical finding that further progresses her study as Tamra's team is now looking at how different combinations of these markers impact the growth pattern of medulloblastoma and how future treatment options can better target tumours that have a mix of these markers.

"Since chemo only targets growing cells, some stem and invading cells are resistant because they aren't dividing as quickly. We have a lot of variability with medulloblastoma and need more than one drug to attack these cells."

When asked what she hopes her research will lead to in the future, Tamra says it's the prospect of novel treatments that helps drive her study, treatments that will be more effective than traditional chemotherapy or radiation since the future therapies would be more individualized. "We want to use this cellular fingerprinting to improve drug screening and discovery, pinpointing treatments that better target the specific mix of cells within the tumour,

leading to better quality of life for the patient." Brain tumors are among the most common forms of childhood cancer. Medulloblastoma is the most common malignant primary pediatric brain tumor and recent evidence has demonstrated that there are 4 very distinct subtypes that will likely require different treatments. Despite a 5-year survival rate of 60-70%, these tumors are highly aggressive and frequently recur following chemotherapy or radiation resulting in a poor prognosis.

We have recently identified a "marker", called CD271, on the surface of medulloblastoma cells that help define the most immature tumor-maintaining cells called "stem cells". Using these cellular "fingerprints", we were able to pluck the stem cells from a larger, more diverse cell population in a dish. Our results also suggest that this marker may be specific to one of the medulloblastoma subtypes. Now, we are investigating whether other markers, in addition to CD271, can be used to select for medulloblastoma cell populations that will both initiate and maintain tumor growth in a dish and a mouse model of the disease. In addition, we would also like to identify fast moving cells that escape current treatments and contribute to tumor recurrence.

This will enable us to move forward with drug discovery studies where we hope to target cells with a stem cell or fast moving, mobile cell signature in a more specific manner. Concurrent targeting of multiple cell types would make medulloblastoma and other pediatric brain tumours much more manageable, thereby lessening the impact of harsh, toxic therapies such as radiation and chemotherapy on the developing nervous system of child patients.

About Dr. Tamra Ogilvie

Tamra is an assistant professor in the Regenerative Medicine Program in the Department of Biochemistry & Medical Genetics at the University of Manitoba in Winnipeg. Tamra pursued her neuroscience studies at McGill University following completion of her undergraduate degree at the University of Western Ontario in London, ON. At McGill University in Montreal, QC, she received her post-graduate degree under the tutelage of her advisor, Dr. Rolando Del Maestro. Following her PhD, Tamra went to McMaster University in Hamilton, ON for her post-doctorate work, where, under the supervision of Dr. Mickie Bhatia, Tamra studied human embryonic stem cells and characterized cells that took on cancerous features.

- See more at: <http://www.braintumour.ca/4348/research-update-fingerprinting-brain-tumour-cells#sthash.xAsglHNy.dpuf>





ANOXIC AND HYPOXIC BRAIN INJURY

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Although only two percent of our body weight, the brain consumes 20% of the body's oxygen supply. Brain injury can occur quickly once there is insufficient oxygen being supplied.

Hypoxic brain injury is caused by a reduction in oxygen supply to the brain and Anoxic brain injury when there is a complete lack of oxygen to the brain. Both conditions can occur despite sufficient blood supply to the brain. Some causes include stroke, near drowning, heart attack, drug overdose, strangulation, sever asthma event/s, accidents involving anaesthesia, carbon monoxide inhalation and poisoning. Hypoxia can also occur as a secondary injury following a traumatic brain injury, for example, when there is serious blood loss resulting in low blood pressure or as a result of brain swelling that restricts oxygen supply to areas of the brain.

Oxygen is crucial to the brain as it is used to metabolise glucose, which provides energy for all body cells. Most of the brain's glucose is used to send impulses and keep cells alive. Brain cells are sensitive to the effects of restricted oxygen supply and may begin to die within minutes of oxygen restriction. The immediate outcome of severe oxygen restriction is often coma and in very severe cases brain death. Long term outcomes can be problems with cognition, emotions and movement.

Anoxic Anoxia - inadequate oxygen to be breathed in and absorbed by the body, for example altitude sickness or suffocation in a non-ventilated space.

Anaemic Anoxia - inadequate oxygen supply to the brain resulting from a decrease in total haemoglobin or change in the haemoglobin's ability to carry oxygen.

Stagnant (ischaemic) Hypoxia (or hypoxic-ischaemic injury) - inadequate oxygen supply to the brain due to reduction of Cerebral blood flow or blood pressure. Injury can be localised or generalised, but typically causes general, diffuse damage to the Cerebral Cortex and Cerebellum. Causes of this type of brain injury include stroke, heart attack and brain haemorrhage. Pressure on the brain caused by hydrocephalus or brain haemorrhage can also be a cause of stagnant hypoxia.

Toxic Anoxia - toxins or substances that interfere with oxygen utilisation. Also known as histotoxic anoxia. Carbon Monoxide poisoning also falls into this category, but the classic example is cyanide poisoning. Toxic anoxia can also be caused by exposure to narcotics, alcohol, formaldehyde, acetone, toluene, and certain anaesthetic agents.

How Long Before Injury Occurs?

Generally speaking, injury will set in after a lack of blood flow to the brain for around three to four minutes, with longer restriction of oxygen leading to more severe brain damage. This is why it is so important the emergency medical team quickly re-establish normal oxygen supply to the brain upon contact. Later a ventilator may be used to maintain breathing and oxygen in the intensive care unit.

What are the possible effects of a hypoxic brain injury?

The overall effects of a hypoxic/anoxic brain injury vary depending upon the the severity of damage. Areas of the brain particularly vulnerable to lack of oxygen include the Purkinje's fibres of the cerebellum and the parieto-occipital cortex, which play a large role in coordination and movement, and the hippocampus which is one of the major structures responsible for memory. A significant hypoxic brain injury may result in coma and possibly post-coma unresponsiveness. Symptoms following return to consciousness may include cognitive deficits, specifically memory difficulties, abnormal movements, weakness in arms and legs, lack of coordination and visual problems. Movement disorders are quite common, including lack of coordination, Spasticity (involuntary muscle tightness), tremors and impaired ability to adjust the body's position.

As with other types of brain injury, challenging behaviours may be presented. Individuals may also experience emotional problems including, depression, agitation and a reduced ability to tolerate stress and frustration.

Outcomes and recovery

Recovery is similar to that of other types of brain injury, however because a hypoxic injury usually results in diffuse damage to the brain, the outcome may not be as good. However, the level of recovery can not always be predicted, as some patients make a better recovery than expected, despite serious injury.

A number of factors can provide an indication of the level of recovery to expect following a hypoxic injury. Such factors include how long oxygen supply to the brain was restricted, age of the person and the severity of the resulting brain damage [6]. If someone only experiences a brief duration of unconsciousness, generally a good outcome can be expected. Other strong indicators of severity of the injury and therefore outlook for the individual include duration of coma and post-traumatic amnesia following hypoxic brain injury. One study found length of coma and post-traumatic amnesia to predict daily life functioning and quality of life 2-7 years after hypoxic injury caused by cardiac arrest.

Length of time in rehabilitation will depend upon the issues that are identified. To maximise recovery it is important that the individual receives a holistic level of support, meaning that all areas of the person's functioning are being assisted in the recovery process. This means having help from a physiotherapist and occupational therapist for movement disorders, speech pathologist for communication difficulties, and a neuropsychologist to assess for cognitive deficits and how rehabilitation can be provided for these problem areas. Support from a good team of specialists and family and friends will mean an optimal recovery.



Occupational Therapy

Submitted by: DMA Rehabilitation

Occupational therapists work with individuals with brain injuries for the purpose of assisting an individual in returning to his/her meaningful activities of daily living.

Compensatory Strategies for Memory Difficulties

Given memory difficulties are a common issue for individuals with brain injuries, regardless of the type of brain injury, focus has been placed on how to address cognitive issues through compensatory strategies. Although an occupational therapist will be able to provide formal treatment in this regard, many of these strategies may be implemented independently if one does not have access to occupational therapy treatment. Improving memory is often a significant focus of occupational therapy treatment as with memory difficulties, an individual may have difficulty completing tasks as he/she will not be able to remember to complete the task altogether, or may forget items required to complete a task

.The following are a list of compensatory strategies to assist with memory difficulties. Please note, this list is not meant to be exhaustive, rather a starting point:

- Make a “To-do” list and place the list in an accessible place. Place boxes beside each item on the list to enable you to check off each task once it has been completed.
- Carry a day planner/organizer. You can record activities which need to be completed in the planner/organizer for specific dates and times. You can also take a planner/organizer to all of your medical and rehabilitation appointments and have your health care providers record upcoming appointments and information you will be required to remember at a later date.
- Utilize a digital voice recorder. A digital voice records allows an individual to instantly record short messages. You can record your own messages of tasks to complete or have members of your health care team record important information.
- Use a timer to remind yourself to check your memory aids. A timer may be set to go off every 15 or 30 minutes to remind you to check your “To-do” list and/or planner/organizer.

- Use verbal and written instructions when completing a task. For example, preparing a hot beverage requires multiple steps. Take pictures of each step of the task and place in a binder on the kitchen counter. Flip through the pictures as you complete each step. It is also helpful to have verbal cuing provided throughout a task simultaneously.

- Keep your belongings in the same place. For example, place a small bowl near your entranceway as a cue to place your keys in the bowl each time you return home.

- Label doors, drawers, cabinets, and dressers to help in remembering what items are placed in different locations.

In addition, while completing tasks, try to avoid distractions. It is recommended tasks be completed in quiet areas with little clutter. It is difficult to remember things when distracted. It is also important to build in rest breaks at specific times each day, throughout each day, as fatigue impacts one’s ability to remember.



The Healing Hormone

Submitted by: Tina Lojpur

For decades researchers have tried to develop an acute treatment for TBI with little success stories. After all the failures; a success story has risen, led by Donald Stein. Despite all the negativity with his work, he continued to strive to make the lives of people living with TBI more fulfilling. The neuroscientist spent a long two decades researching progesterone as a treatment for traumatic brain injury. This pursuit seemed like a dead end for most; as progesterone is a naturally occurring hormone, making it too easy of a solution to a complex problem.

After decades of unsuccessful treatments; why is it that a hormone that is naturally occurring in the human body is just now being discovered as a possible treatment for TBI? Stein admits that every single drug has failed because we have been trying to target a single gene, single pathway, single receptor; instead of looking at the bigger picture. A brain injury inevitably results in a systemic disease. When a treatment is trying to target one single function, you'll result in failure. Stein figured that every organ in the body is affected when dealing with TBI.

The use of progesterone allows for a bigger picture approach to solving such a complex problem. This hormone works at multiple genes, multiple pathways, and multiple receptors. The body's response to TBI is a surging release of inflammatory factors that result in swelling, tissue breakdown, and programmed cell death. With the multi-use of progesterone, it can help deal with the inflammatory cascade and repair the damage caused by the TBI. The ability for progesterone to act in this way is because it is a hormone involved in the gestation of the fetus.

Over the course of trials and patient testing, it was found that there was a 50% reduction in death in the treatment group. With such great results, Stein concluded that these positive findings must be taken to other conditions. The main focus is looking at progesterone in anything that has to do with brain injury; such as, head trauma, stroke, or a tumour. There is work currently being done for TBI in children. There are very little options for children with brain injury and even with progesterone we have to insure that this powerful developmental hormone is going to be safe and effective in kids.



Further research is looking into using progesterone to treat stroke victims. Results have shown that when rats were given progesterone after having an induced stroke significant decrease of brain damage was found, around 70% less. Another incredible finding is the timing of progesterone administration. Currently the only drug approved for strokes is not very convenient or safe. The drug must be given within 3-1.2 hours of the stroke, meaning less than 5% of the stroke population actually get it. In the laboratory with the treatment of animals it was found that progesterone proved effective even after a 24 hour delay. These findings give hope for a much safer treatment for many more people who are victims of stroke.

Stein's lab has also seen some hope in treating tumor cells. While the lab was making a synthetic version of progesterone that could be more effective in treating brain injury than in its natural form; tumour cells were used in the testing process. It was found that high doses of progesterone were toxic to the cells. Findings have confirmed that mice treated with high dosage resulted in a 50% reduction in neuroblastoma tumour size after only eight days. Progesterone appears to have no side effects and specifically kills the cancer cell, leaving very hopeful results.

Lastly, Stein's work is being put in the field, specifically in combat situations. In this field, a high percentage of injured people are going to need a medicine that can act fast be reliable, and convenient. They are trying to modify progesterone that can be used in all conditions, and does not have to be replaced often. This will be beneficial for an injured person who can't get to a hospital immediately.

Overall, Stein's work with progesterone is impactful. This work will change the treatment of brain injury, emergency care, and in general it will change the standard of care around the world. The great benefit of progesterone is it's cheap to make, and doesn't require a lot of technology. Therefore, progesterone can be available all over the world, improving well-being for everyone.

Resource: <http://healthcaresolutionsplus.org/healing-hormone-provides-hope-for-brain-injury/>



Preventing Secondary Impact Syndrome

Written By: Brent Lovell

In today's day and age, there has been a drastic improvement in society's awareness, knowledge, and treatment of concussions in sport and everyday life. This has resulted in the development of policies and procedures which aim to (a) reduce the probability of athletes and individuals sustaining concussions and (b) prevent athletes and individuals from worsening their injury. Although these policies and procedures are accessible to the public, they are sometimes overlooked or avoided altogether. It is important to emphasize that the repercussions of these actions can be fatal.

Secondary Impact Syndrome begins with the sustainment of an initial concussion. This may be characterized by a loss of consciousness, visual or auditory disturbances, changes in behaviour or cognition, nausea and vomiting, headaches and fatigue, or slurred speech. Secondary Impact Syndrome occurs when a person sustains a second concussion before the initial concussion has fully resolved. This secondary impact results in swelling and/or rupturing in the brain which can lead to loss of consciousness, respiratory failure, or death.

Typically, this type of scenario affects young athletes that have unknowingly sustained a concussion or those that have knowingly sustained a concussion and prematurely

return to sport or activity. In the media, we are often reminded of the moral and ethical struggles that owners/managers, coaches, and athletes face when athletes are returning to sport after an initial concussion. In those cases, owners/managers may lose revenue, coaches may lose valuable team players, and athletes may become deconditioned over time. However, one could certainly argue that no amount of money, success, or fitness is worth risking your own well-being or life.

As healthcare providers, family members, spectators, and coaches it is our responsibility to remain vigilant for initial signs and symptoms of concussion. It is also our responsibility to provide a non-biased opinion about the suitability of returning to activity. If there is any concern about an individual's well-being, it is better to err on the side of caution rather than to risk further injury or death. This is especially important for young athletes and vulnerable populations that may not recognize the severity of their injury and/or lack the ability to advocate for themselves. The easiest way to prevent Secondary Impact Syndrome is to follow established concussion protocols and only return to activity when it is absolutely safe to do so.

For more information about return to activity guidelines please visit: http://www.health.gov.on.ca/en/public/programs/concussions/docs/mtcs_concussion_guide_en.pdf



Brent T. Hodge
Legate And Associates

Ask A Lawyer

How long is a lawsuit?

The length of a lawsuit can vary greatly with the complexity of the case. A straightforward case may take three years or less from the date of loss to trial. Conversely, a complicated case, especially one involving minors or persons lacking mental capacity, can take ten years or more from start to finish.

There are three, sometimes four, main stages to any lawsuit.

The first stage is the investigation. During the investigation, the injured party and his or her lawyer will acquire information to determine the likelihood that their case will be successful. Typically, this period last no more than two years from the date of loss, meaning the date of the accident or event which will be the focus of the lawsuit. The reason the investigation stage lasts no more than two years is because, in Ontario, there is a limitation period that usually requires parties to start a lawsuit within two years of the date they were injured, otherwise they will lose the right to sue. Once a party has enough information to start the lawsuit, they do so by issuing a Statement of Claim, which is a document outlining what they are claiming and the basis of their claim. The defendant then has the chance to respond by delivering a Statement of Defence.

Once the claim and defence, also known as the pleadings, have been exchanged, the second stage, which is known as discovery, begins. The discovery stage is designed to allow the parties to know all the materials facts of the case so they can evaluate whether they want to settle or go to trial. There are two parts to discovery. The first part is written discovery, meaning the exchange of all documents relevant to the matters in issue. The second part is oral discovery, which is an opportunity for each party to examine the other under oath and ask questions about the lawsuit. Between the pleadings and the end of discovery is usually less than one year, but can be longer, especially if there are many parties.

After discovery, the third stage is trial preparation. The parties agree that they would like to proceed to trial and ask the court to schedule a trial date. In busy courts, like London, it can take as long as two years to schedule a trial. During that time, the parties will continue to build their cases and it is often during this period that lawsuits are settled. If the lawsuit cannot be settled, a trial will be held and judgment given. Following judgment there can be a forth stage which is an appeal. Appeal courts are very busy, so again, it can take as much as two years to have an appeal scheduled.

The litigation process can seem quite slow, and it is, but with good reason. Unlike American television, the intention of the court process is not to surprise one another, but rather to make sure all parties are fully informed of the facts so they can make a decision as to whether to settle or go to trial. Trials are very expensive and happen in only about 10% of cases. In the other 90% of cases, the parties are able to reach a resolution on their own without the need for a judge.

By: Brent T. Hodge

Please e-mail any questions, comments, or suggestions for future articles to the writer,
Brent T. Hodge, at b.hodge@legate.ca.

Fall Soups

Pumpkin Curry Soup



- 2 tablespoons margarine
- 1 cup onion, chopped
- 2 cloves garlic, crushed
- 2 teaspoons curry powder
- 1/2 teaspoon salt
- 1/2 teaspoon pepper
- 3 cups chicken broth
- 1 (15 ounce) can pumpkin
- 1 1/2 cups evaporated milk

Melt margarine and cook onion and garlic.

Stir in the curry, salt, and pepper and cook for one minute.

Add the broth and pumpkin, bring to a simmer, and cook uncovered for 20 minutes.

Stir in evaporated milk just before serving.



Creamy Turkey Soup



- 1/4 cup butter
- 1 cup chopped green onion
- 2 cups frozen sliced carrots, thawed and drained
- 1/4 cup flour
- 5 cups turkey broth, divided (or chicken bouillon)
- 2 cups milk or 2 cups cream
- 2 teaspoons salt
- 1/2 teaspoon white pepper
- 1/8 teaspoon cayenne pepper
- 1 teaspoon dried parsley
- 3 cups chopped cooked turkey
- 8 ounces noodles (fusilli, rotini or similar)

Saute onions and carrots in butter until soft, not brown.

Add flour and mix well.

Gradually add 2 cups broth and milk.

Cook and stir until it thickens.

Stir in remaining 3 cups broth, and all remaining ingredients.

Simmer 10-12 minutes until noodles are tender, stirring occasionally.

Stay warm this fall with these delicious soups



Acorn Squash Soup



- 2 acorn squash, cooked
- 2 tablespoons butter
- 1 small onion, diced
- 1/4 teaspoon salt
- 14 ounces vegetable broth or 14 ounces chicken broth
- 1/4 teaspoon nutmeg
- 1/8 teaspoon cayenne

Melt butter in a saucepan and sauté the onion. Add squash pulp to onion. Add broth, nutmeg and cayenne. Bring to a boil. Reduce heat and simmer, uncovered for 10 minutes.

Puree with a hand blender (or in batches in a regular blender). Serve hot.

Chicken Broccolii Alfredo Soup



- 1/4 cup chopped onion
- 3 large garlic cloves, minced (or 1/2 Tbsp Minced Garlic)
- 3/4 cup butter
- 3/4 cup flour
- 4 cups low sodium chicken broth
- 1 quart half-and-half cream
- 1 1/2 cups freshly-grated parmesan cheese
- 2 cups water
- 1 bunch broccoli (tops only, cut into bite-sized pieces)
- 3 cups boneless chicken breasts, cooked and diced
- 1 1/4 teaspoons white pepper
- 1 1/4 teaspoons salt
- 1 dash nutmeg
- 6 ounces farfelle bow tie pasta, cooked according to package directions

In a heavy stockpot over medium heat, sauté onion and garlic in butter for 2-3 minutes; add flour and cook, stirring, for another 2-3 minutes until bubbly; gradually whisk in chicken broth and half & half; cook, stirring frequently, until thickened.

Meanwhile, in a separate pan, add water to broccoli and bring just to boiling (the broccoli should be only partially cooked and not soft) then remove from heat; do not drain cooking water from broccoli.

Add parmesan cheese to soup-base in stockpot; cook over low heat, stirring, just until cheese is melted; add cooked broccoli along with its cooking water, chicken, seasonings, and bow tie pasta to the stockpot; heat through.

NOTES: 6 ounces bow tie pasta equals 2 1/4 cups before cooking and 3 cups diced chicken breast equals 1 1/2 pounds before cooking. Also, decrease the salt by half if you happen to substitute full-sodium chicken broth in this recipe.

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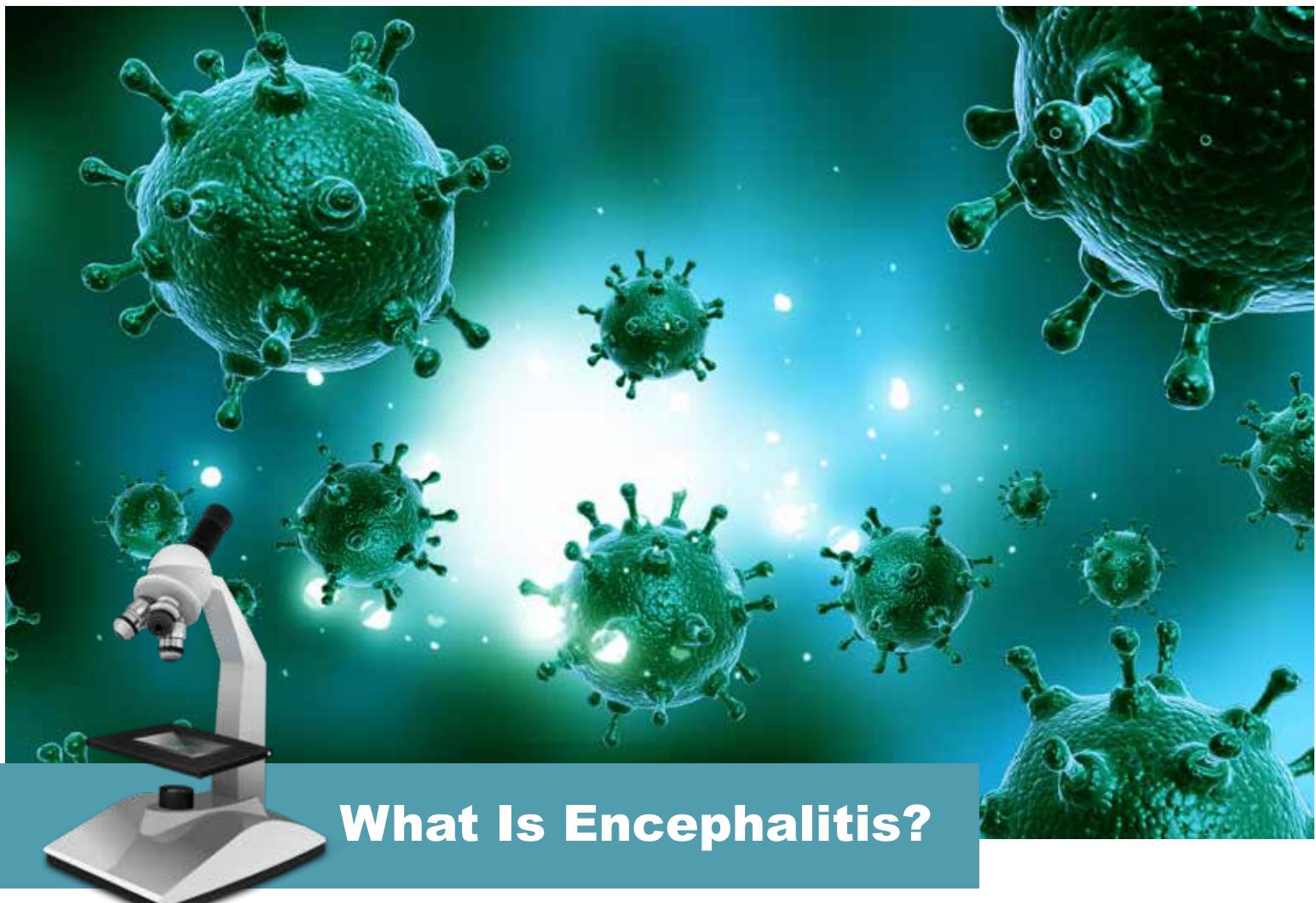
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What Is Encephalitis?

The simplest way to describe encephalitis is that it is a swelling or inflammation in the brain. It is, however, far from simple. It is difficult to diagnose and treat and it can occur at any given time and any given place. Those who survive can have long lasting and devastating effects.

The inflammation in the brain is most commonly caused by a viral or bacterial infection directly entering the nervous system. Another cause can be an indirect inflammation caused by a brain injury, drug reaction, bite from a tick or mosquito or even an immune response triggered by a common disease.

Milder cases might produce flu-like symptoms such as fever and severe headache. If the case is more moderate symptoms might include confusion, seizures, muscle weakness, loss of sensation, double vision or speech problems. Severe cases, although rare, can be life threatening.

Brain imaging such as CT scan or MRI is often used for diagnostic purposes to reveal swelling and inflammation. Examination of cerebral spinal fluid by lumbar puncture may reveal increased proteins and white blood cells suggesting the infection.

Treatment with antiviral medication, if caught early, can be effective. Corticosteroids can also be used to reduce brain swelling and inflammation. Depending on severity, one might require further therapies such as physiotherapy, occupational therapy, speech therapy and psychotherapy.

Treatment will often help as most cases are mild, but prompt diagnosis is critical. A good medical history along with description of symptoms and risk factors is paramount.

Encephalitis is an unpredictable condition and should be regarded as such.

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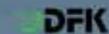
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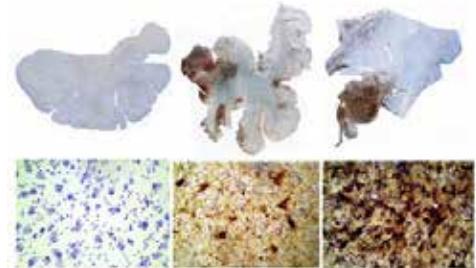


What is Chronic Traumatic Encephalopathy?

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Chronic Traumatic Encephalopathy (CTE) is a result of repeated blows to the head. It is seen most often in boxers and athletes who play contact sports like football and ice hockey.

More specifically, CTE "... triggers progressive degeneration of the brain tissue, including the build-up of an abnormal protein called tau. These changes in the brain can begin months, years, or even decades after the last concussion or end of active athletic involvement. The brain degeneration is associated with memory loss, confusion, impaired judgment, paranoia, impulse control problems, aggression, depression, and, eventually, progressive dementia."¹



The syndrome was originally described in 1928 as dementia pugilistica (also "punch drunk") — a condition first noticed in boxers who suffered repeated blows to the head. As they aged, they would manifest tremors, slowed movement, confusion, speech problems, and declining cognitive ability or dementia.

Bringing CTE to light

CTE remained under the radar until a Pittsburgh medical examiner named Bennett Omalu identified CTE in two former Pittsburgh Steelers. These two football players died in his jurisdiction in 2002 and 2005. He published his findings, drawing the attention of Chris Nowinski, co-founder of The Sports Legacy Institute (SLI), who worked with families to deliver more cases that Dr. Omalu and others diagnosed with CTE.

In 2008, the co-founders of SLI — Nowinski and Dr. Robert Cantu — partnered with Dr. Ann McKee and Dr. Robert Stern. They created The Center for the Study of Traumatic Encephalopathy (CSTE) at Boston University School of Medicine, the world's first center dedicated to studying CTE.²

In 2009, research spearheaded by Dr. Ann McKee and her colleagues provided the first pathological evidence that repetitive head trauma experienced in collision sports is associated with CTE.

"It doesn't take an expert, a doctor, or a pathologist ... anyone can see that they don't want those brown, ugly spots on their brains," says Dr. McKee, a neuropathologist and one of the world's foremost neurodegenerative disease experts.

And in August 2010, new findings from Dr. McKee and her colleagues suggested that brain trauma in sports may cause a new disease that mimics amyotrophic lateral sclerosis. ALS, or Lou Gehrig's disease, is a neurological condition that affects voluntary muscle movements.

Tau immunostained sections of medial temporal lobe from 3 individuals -- Top left: Whole brain section from a 65 year old control subject showing no tau protein deposition; Bottom left: Microscopic section from 65 year old control subject also shows no tau protein; Top middle: Whole brain section from NFL great John Grimsley showing abundant tau protein deposition in the amygdala and adjacent temporal cortex; Bottom middle: Microscopic section showing numerous tau positive neurofibrillary tangles and neurites in the amygdala; Top right: Whole brain section from a 73 year old world champion boxer with severe dementia showing very severe tau protein deposition in the amygdala and thalamus; Bottom right: Microscopic section from a 73 year old world champion boxer with severe dementia showing extremely dense tau positive neurofibrillary tangles and neurites in the amygdala. (Courtesy of Dr. Ann McKee.)

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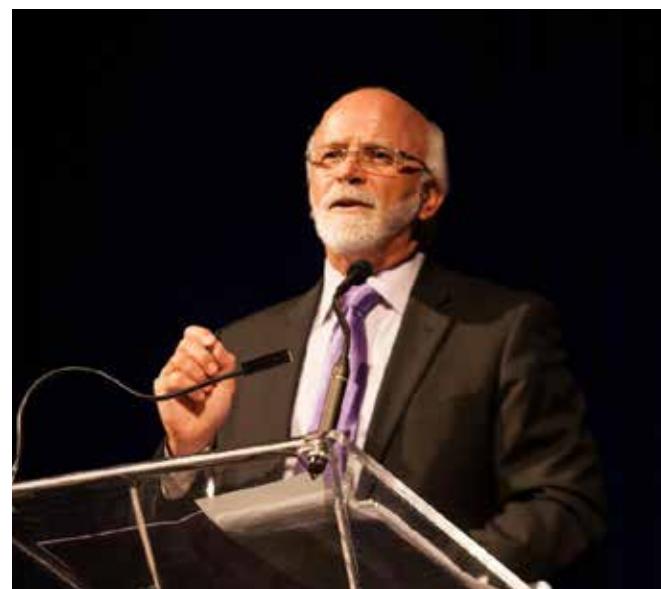
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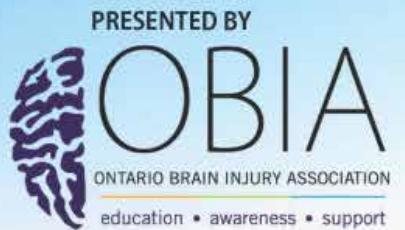
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September 26, 2015

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All submissions must be received by the first Wednesday of the month prior to publication.

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