

THE GORDIE HOWE INITIATIVE

ProMedica and Stemedica Cell Technologies are collaborating to advance innovations in the treatment of traumatic brain injury (TBI). The GORDIE HOWE Initiative (GHI) is a three-year effort to raise awareness about, collect data for, and bring potential advances forward for those suffering from traumatic brain injury. The Initiative will place a particular focus on war veterans, victims of motor vehicle accidents, and sports-related traumatic brain injury.

A GROWING ISSUE GAINING ATTENTION: Traumatic Brain Injury (TBI)



Do you know someone who has served in the military? Played a contact sport like soccer, hockey or football? Or has been in a motor vehicle accident?

If you answered yes to any of the questions above, you probably know someone who has experienced a **traumatic brain injury (TBI)**.

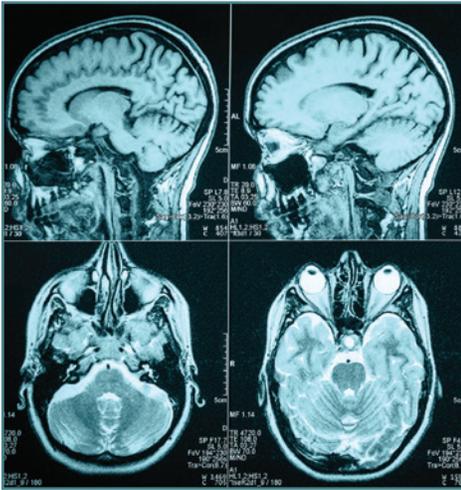
According to the Centers for Disease Control and Prevention (CDC):

- TBI is a major cause of death and disability in the United States, contributing to nearly 30 percent of all injury deaths.
- Every day, 138 people in the United States die from injuries that include TBI.

- Those who survive TBI can face effects lasting a few days to disabilities which may last the rest of their lives.

- Effects of TBI include impaired thinking or memory, movement, sensation (e.g., vision or hearing), or emotional functioning (e.g., personality changes, depression).

These issues not only affect individuals but also have lasting effects on families and communities.



WHAT IS TRAUMATIC BRAIN INJURY?

According to the CDC, TBI is caused by a bump, blow, or jolt to the head or a penetrating head injury that disrupts the normal function of the brain. Not all blows or jolts to the head result in TBI. The severity of TBI may range from “mild” (i.e., a brief change in mental status or consciousness) to “severe” (i.e., an extended period of unconsciousness or memory loss after the injury). Most TBIs that occur each year are mild, and they are commonly known as concussions.

While military combat and contact sports are widely recognized causes of TBI, most TBIs are the result of everyday activities and accidents such as falls and motor vehicle accidents. *This means you do not have to be an elite athlete or a member of the military to be at risk for TBI.*

How many people have TBI?

It has been estimated that 1.7 million people in the United States sustain TBI annually. Of those:

- 52,000 die (138 die per day),
- 275,000 are hospitalized, and
- 1.365 million (80 percent) are treated and released from an emergency department, only to worry about the possibility of long-term consequences.

What are the long-term consequences of TBI?

The direct medical costs and indirect costs, such as lost productivity, from TBI totaled an estimated \$76.5 billion in the United States in 2010.

It is estimated that at least 5.3 million Americans currently have a long-term or lifelong need for help to perform activities of daily living as a result of TBI.

TBI can cause a wide range of functional changes affecting thinking, language, learning, emotions, behavior, and/or sensation. It can also cause epilepsy and increase the risk for conditions such as Alzheimer’s disease, Parkinson’s disease, and other brain disorders that become more prevalent with age.

TBI is currently a condition with no solution.

What are stem cells?

Stem cells are unique. They are considered the repair and rejuvenation cells of our bodies because they can self-renew (multiply) almost without limit. They also have the potential to become *any other type of cell in the body*. This means a stem cell can develop into a blood cell or a brain cell, for example, and then multiply to replenish cells in that area.

Additionally, there is significant anecdotal evidence that stem cells may have a positive impact on enhancing the quality of life for those suffering from TBI.



A POWER PLAY FOR THE FUTURE OF TBI: THE GORDIE HOWE INITIATIVE

While there is no viable solution currently available for treating TBI, the good news is that stem cell research is advancing rapidly within the neurodegenerative field and treatments seem to hold great promise for patients suffering from TBI.

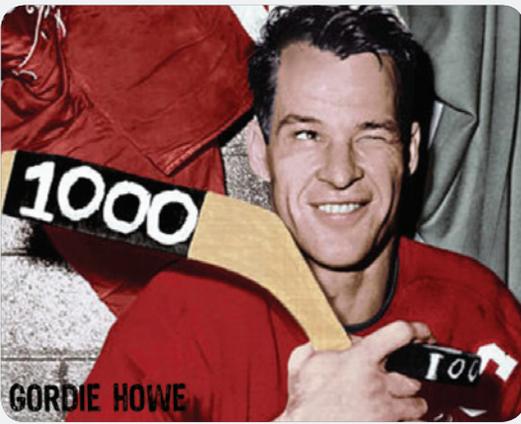
Unfortunately, due to budgetary constraints and other priorities, it is increasingly challenging to obtain federal or private sector funding for early stage clinical trials *even if there is promising evidence that such trials have the potential to advance medical science.*

As a result, organizations like ProMedica and Stemedica are forming unique public/private collaborations and joining forces with concerned citizens like Gordie Howe and his family to find new approaches to supporting important research.

The GORDIE HOWE Initiative has been formed to fund a series of studies to investigate innovative technologies in the treatment of TBI.

The results of the first safety and efficacy trial will inform any decisions or next steps the Initiative might take.

While there are different types of stem cells, the Initiative will begin work with *mesenchymal stem cells (MSCs)*. MSCs have been shown to stimulate cell growth and may work to help repair or replace lost or damaged cells in the body due to damage caused by the effects of TBI. The MSCs to be used in the study were obtained from the bone marrow of a healthy adult volunteer through an FDA-licensed bone marrow donor program.



MEET MR. HOCKEY

He gave back to the sport of hockey. Now he wants to give back to medical science.

GORDON "GORDIE" HOWE (born March 31, 1928) is a Canadian-born, retired professional ice hockey player known to the world as "Mr. Hockey." From 1946 to 1980, Gordie played 32 professional seasons, 25 with the Detroit Red Wings and the remainder with the Houston Aeros and the Whalers in Hartford.

Considered by many to be the greatest hockey player of all time, Gordie is most famous for his scoring prowess, physical strength, and career longevity. He was in the top five in scoring for 20 consecutive NHL seasons, earning six league MVP and leading scorer titles. He is the only player to have competed in the NHL in five consecutive decades (1940s through 1980s), the only player to play professionally with not one but two of his sons, and the only player to play in the NHL as a grandfather. He won the World Hockey Association league MVP at the age of 45, leading the team to two consecutive league championships.

He was the inaugural recipient of the NHL Lifetime Achievement Award in 2008. Prolific as a player, Gordie was also known for his toughness, considered the league's undisputed heavyweight champion his entire career. Mr. Hockey became known for the **Gordie Howe Hat Trick**: a goal, an assist, and a fight in the same game!

Gordie was an innovator in professional hockey for 32 years and he left behind a tremendous legacy. After undergoing stem cell treatment to combat a stroke in 2014, Gordie has since become an innovator in another field – as an advocate for innovative treatments for devastating neurologic injuries, including traumatic brain injury. It is a powerful and profound final legacy.

The **GORDIE HOWE Initiative** will put an exclamation point on Mr. Hockey's most valuable hat trick: his quintessential example as a gracious human being, his contributions as a legendary ambassador to the world of hockey, and his courage to inspire this landmark initiative for the benefit of all.

THE GOALS AND INVESTMENT NEEDS OF THE GORDIE HOWE INITIATIVE

ProMedica, Stemedica, and the Howe family are leading a three-year effort to advance innovation in the treatment of TBI.

This dynamic partnership will leverage the strengths of several partners and supporting organizations to focus on funding clinical trials, educational outreach, and the creation of a North American registry for TBI patients.

TOTAL 3-YEAR INVESTMENT:
\$22M – \$32M

While the beloved Gordie Howe is at the center of this Initiative – inspiring and driving us to consider every possibility and never stop trying – *the advancements we make here are for everyone, everywhere, suffering from TBI and other neurological conditions.*

GOAL #1: Stem Cell Research through Human Clinical Trials **\$12M – \$19M**

To advance multiple clinical trials to evaluate stem cell efficacy in treating TBI.

GOAL #2: Creation of a First-Ever North American TBI Registry **\$3M – \$4M**

To catalogue and track all who suffer from TBI and analyze treatments and medical applications in order to identify therapies of value in finding breakthrough treatment solutions for TBI.

GOAL #3: TBI Awareness and Education Campaign **\$3M – \$4M**

To form a coalition to increase public awareness of TBI. Honorary co-chairs to include Brianna Scurry, USA World Olympic Cup Goalkeeper; Bob Fallen, U.S. Hockey League Commissioner; Retired Brigadier General John Pray; and Merrill Hoge, ESPN sports analyst and former NFL player.

GOAL #4: Expanding the Neuroscience Institute for TBI Treatments **\$4M – \$5M**

Upon "proof of concept" and related findings, ProMedica will broaden the scope of its Neuroscience Institute to include TBI treatments and therapies for the region and serve as a "TBI Solutions Showcase" to the world.

WE ARE ALL GORDIE HOWE | Meet the GHI Team

SCIENTIFIC ADVISORY BOARD

The clinical trials advanced by the Gordie Howe Initiative will be overseen by an elite scientific advisory board (SAB) comprised of some of America's very brightest TBI researchers as well as representatives of the U.S. Department of Defense and experts from the sports industry.

The SAB will be involved in all aspects of the research and help validate the safety and efficacy of the trials. Additionally, this powerful coalition is dedicated to human-level investigations with a commitment to safety and minimal invasiveness to the patient.

Roger J. Kruse, MD

Principal Investigator

Recognized physician to the US Olympics, Division I NCAA sports team physician and ProMedica's leading practitioner in regenerative medicine.

Mouhammad Jumaa, MD

Sub-investigator

Published researcher and expert practitioner in neurology and stroke-specific medicine.

SCIENTIFIC ADVISORY BOARD

Roger J. Kruse, MD

Principal Investigator
Medical Director of Sports Care
Head Physician, University of Toledo

Mouhammad Jumaa, MD

Sub-investigator
Assistant Professor of Neurology,
University of Toledo

David Brody, MD, PhD

Professor of Neurology,
Washington University School of Medicine

David Howe, MD, MBA

Clinical Trial/Medical Monitor/Consultant,
Stemedica

Murray Howe, MD

Director of Sports Medicine Imaging,
ProMedica
Gordie Howe's son

Michael Levy, MD, PhD

Chief of Neurosurgery,
Rady Children's Hospital (San Diego)

Joseph Maroon, MD

Professor of Neurosurgery and
Vice Chairman of Dept. of Neural Surgery,
University of Pittsburgh

David Okonkwo, MD, PhD

Professor of Neurological Surgery,
University of Pittsburgh

Craig Salt, MD, FACS

Ex-Officio, Dept. of Defense Representative

John Trafeli, MD

Official Navy Liaison, Gordie Howe Initiative

GHI INITIATIVE LEADERSHIP TEAM

HONORARY CO-CHAIRS

Bob Fallen

Commissioner,
United States Hockey League

Merril Hoge

ESPN Analyst
Former NFL player

John Pray

Retired Brigadier General
CEO, Operation Home Front

Briana Scurry

Former Soccer Goalkeeper, USA World
Cup and Olympic Soccer Teams

INITIATIVE GOVERNANCE

Darrin Arquette

ProMedica, President of Defiance Hospital

Lee Hammerling, MD

ProMedica, Chief Medical Officer

Maynard Howe, PhD

CEO and Vice Chairman, Stemedica

Murray Howe, MD

Director of Sports Medicine Imaging,
ProMedica

Gordie Howe's son

David McGuigan

Vice President of Marketing and
Business Development, Stemedica

PROMEDICA AND STEMEDICA

With this Initiative, ProMedica and Stemedica have formed a unique public/private collaboration that could serve as a national model for the advancement of future clinical trials.

The ultimate goal of the **GORDIE HOWE Initiative** is to complete the work needed to bring TBI stem cell technology and potentially other breakthrough innovations to the general public in the United States. The first stage of the Initiative will include the launch of a U.S.-based clinical trial using Stemedica manufactured MSCs in treating 24 TBI patients. The clinical trial will be conducted at ProMedica locations in Ohio.

This effort will leverage Stemedica's experience in stem cell manufacturing, its early investigational knowledge of treating head trauma, its existing relationship with the FDA, and the strong safety profile of its products currently being used in investigational trials. These strengths will be combined with ProMedica's wide network of facilities and providers, reputation for high-quality care, and neuroscience leaders with pioneering credentials.

Potential future partnerships with national innovative centers of excellence in research, education and treatment will amplify the initiative's research and development capacity.

Exclusive Donors Sought for the GORDIE HOWE Initiative

ProMedica, Stemedica, and the Howe family are excited about this Initiative and welcome you to join their efforts to advance stem cell research, trials, treatments, and care.

Interested supporters may **donate to the ProMedica Foundation Neurosciences Advancement Fund** where their tax-deductible gift will be dedicated to the Gordie Howe Initiative.

To find out if this Initiative aligns with your charitable goals, please contact **Gary Cates**, Chief Philanthropy Officer for ProMedica, at 419.291.0136 or gary.cates@promedica.org.

We are all Gordie Howe. Join Gordie's team to advance innovation in the treatment of traumatic brain injury.