



10:30am – 12:00pm

Fake news, fake therapies: Upping the ante in the fight against unproven stem cell therapies in Canada

*Panel Organizer: Lisa Willemse
Stem Cell Network*

Proving Treatments: The Role of Clinical Research

Dr. Harold Atkins

“Fake news, Fake Therapy: Upping the Ante in the Fight Against Unproven Stem Cells Therapies in Canada”

Canadian Science Policy Conference, Ottawa
8-November-2018

Stem Cell Network
Réseau de cellules souches

Our people...our strength



What is a clinical trial?

- It is **RESEARCH!**
- It involves human subjects,
- It has a defined goal,
- It examines one or more aspects of a health-related intervention,
- It can be ***observational*** or ***interventional***,
- It can be ***retrospective*** or ***prospective***,
- Some are ***regulated***,
- All require participants to provide ***informed consent***,
- All are governed within an ethical and legal framework,





TRI-COUNCIL POLICY STATEMENT

Ethical Conduct for Research Involving Humans

2014

Canadian Institutes of Health Research
Natural Sciences and Engineering Research Council of Canada
Social Sciences and Humanities Research Council of Canada

Stem Cell Network
Réseau de cellules souches

Our people...our strength



MSBMT: Targeting Multiple Sclerosis as an autoimmune disease with immunoablative therapy and immunological reconstitution

Start with a hypothesis:

'Multiple sclerosis is an autoimmune disease that can be cured by immuno-ablative therapy'.

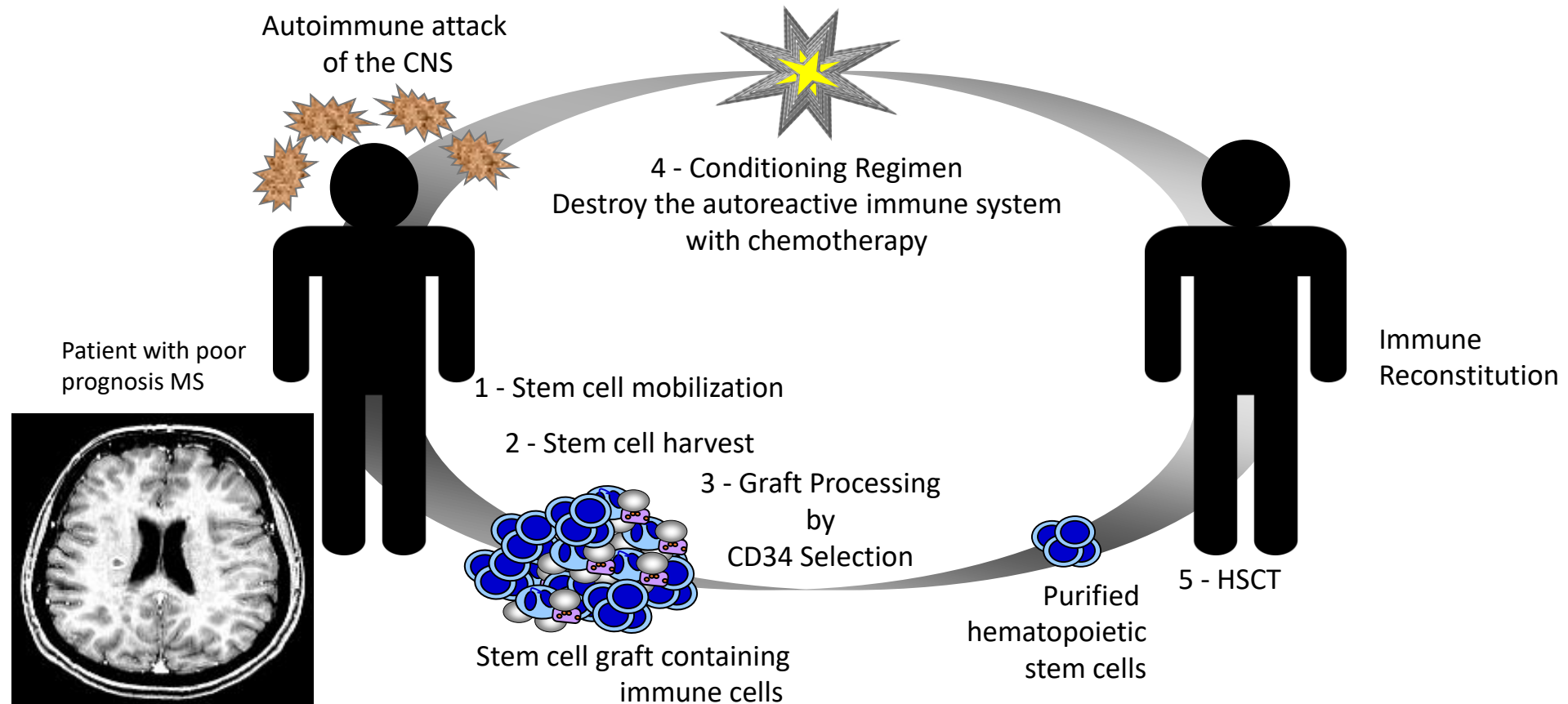
Define objectives:

'To establish whether immuno-ablative therapy will induce a long-lasting MS progression free response for patients with active and progressive disease who are predicted to have a poor prognosis'.

Explain and Justify the Rationale for this experiment



MSBMT: Define the study population & the intervention.

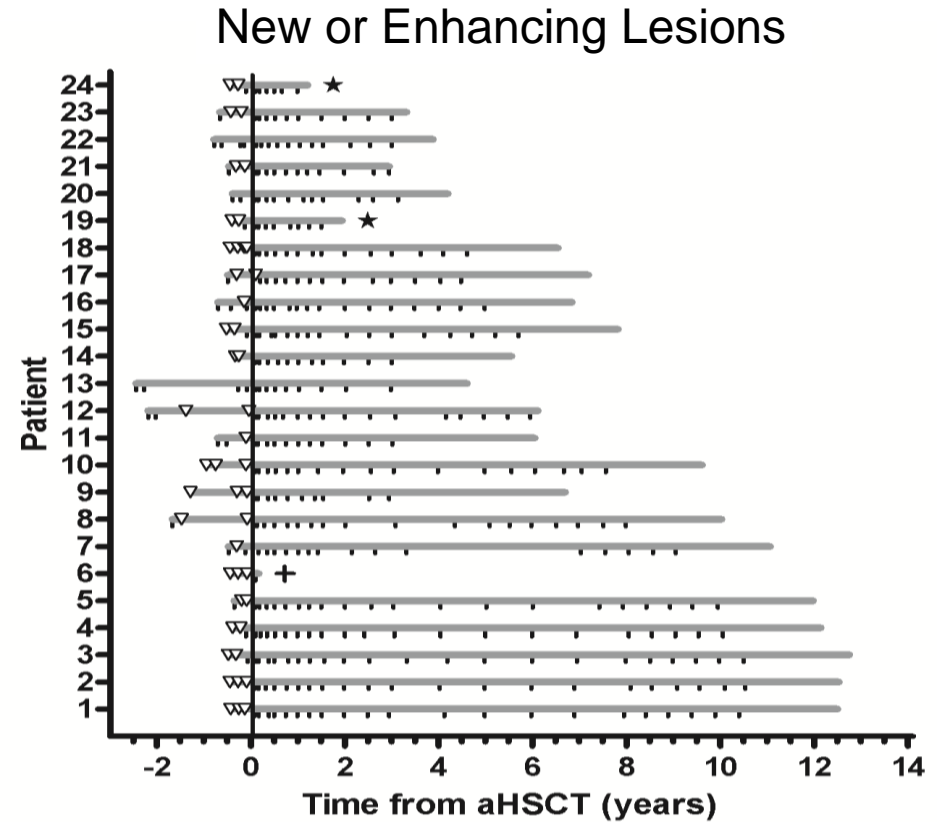
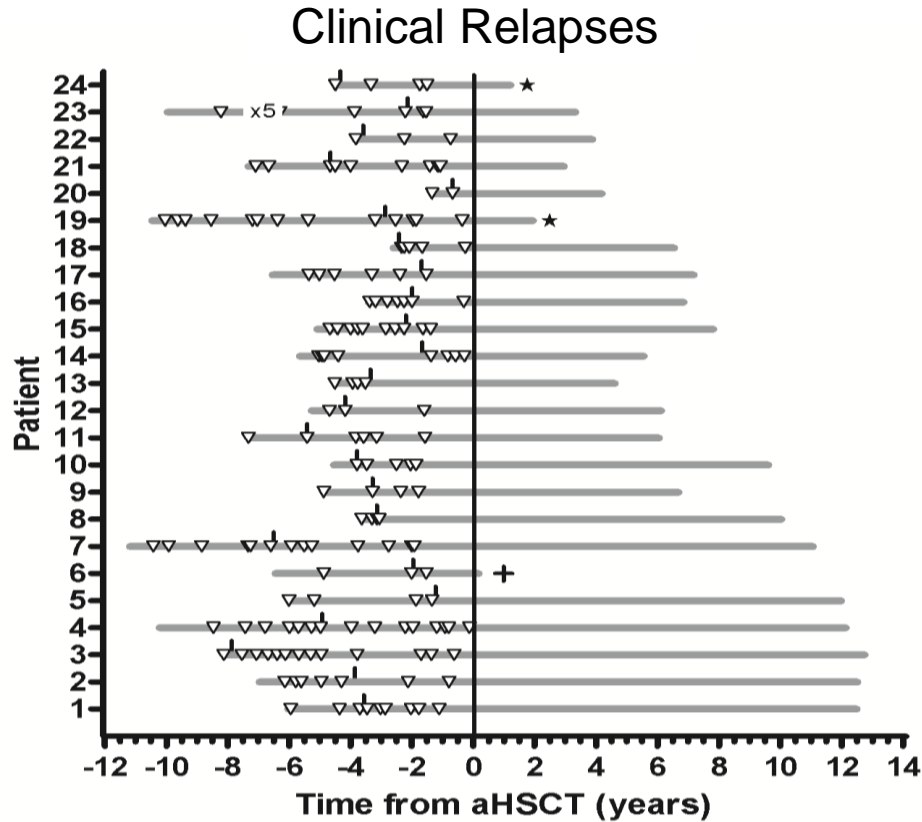


- Build in mechanisms for patient safety and quality of care and data collection,
- Seek Approval by Research Ethics Board,
- Informed consent from each participant,



MSBMT: Endpoints, Evaluations and Analysis.

Clinical Relapses, MRI changes, Disability, Survival, QoL, Biochemical endpoints



Disseminate the knowledge.



Immunoablation and autologous haemopoietic stem-cell transplantation for aggressive multiple sclerosis: a multicentre single-group phase 2 trial

Harold L Atkins, Marjorie Bowman, David Allan, Grizel Anstee, Douglas L Arnold, Amit Bar-Or, Isabelle Bence-Bruckler, Paul Birch, Christopher Bredeson, Jacqueline Chen, Dean Fergusson, Mike Halpenny, Linda Hamelin, Lothar Huebsch, Brian Hutton, Pierre Laneuville, Yves Lapierre, Hyunwoo Lee, Lisa Martin, Sheryl McDiarmid, Paul O'Connor, Timothy Ramsay, Mitchell Sabloff, Lisa Walker, Mark S Freedman

Summary

Lancet 2016; 388: 576–85

Published Online

June 9, 2016

[http://dx.doi.org/10.1016/](http://dx.doi.org/10.1016/S0140-6736(16)30169-6)

[S0140-6736\(16\)30169-6](http://dx.doi.org/10.1016/S0140-6736(16)30169-6)

Background Strong immunosuppression, including chemotherapy and immune-depleting antibodies followed by autologous haemopoietic stem-cell transplantation (aHSCT), has been used to treat patients with multiple sclerosis, improving control of relapsing disease. We addressed whether near-complete immunoablation followed by immune cell depleted aHSCT would result in long-term control of multiple sclerosis.

Stem Cell Network
Réseau de cellules souches

Our people...our strength



Evaluate all the evidence (knowledge synthesis)

Systematic Reviews

- Collate all evidence for a specific research question using explicit reproducible methodology
- Assess quality, biases & thus validity of each study

Meta-analysis

- Statistical method to combine results of independent studies to give a more precise estimate of health care effects

<https://canada.cochrane.org/>



Autologous hematopoietic stem cell transplantation in multiple sclerosis

A meta-analysis



Maria Pia Sormani, PhD
Paolo A. Muraro, MD
Irene Schiavetti, PhD
Alessio Signori, PhD
Alice Laroni, MD
Riccardo Saccardi, MD
Gian Luigi Mancardi, MD

Correspondence to
Dr. Sormani:
mariapia.sormani@unige.it

ABSTRACT

Objective: To summarize the evidence of autologous hematopoietic stem cell transplantation in multiple sclerosis (MS).

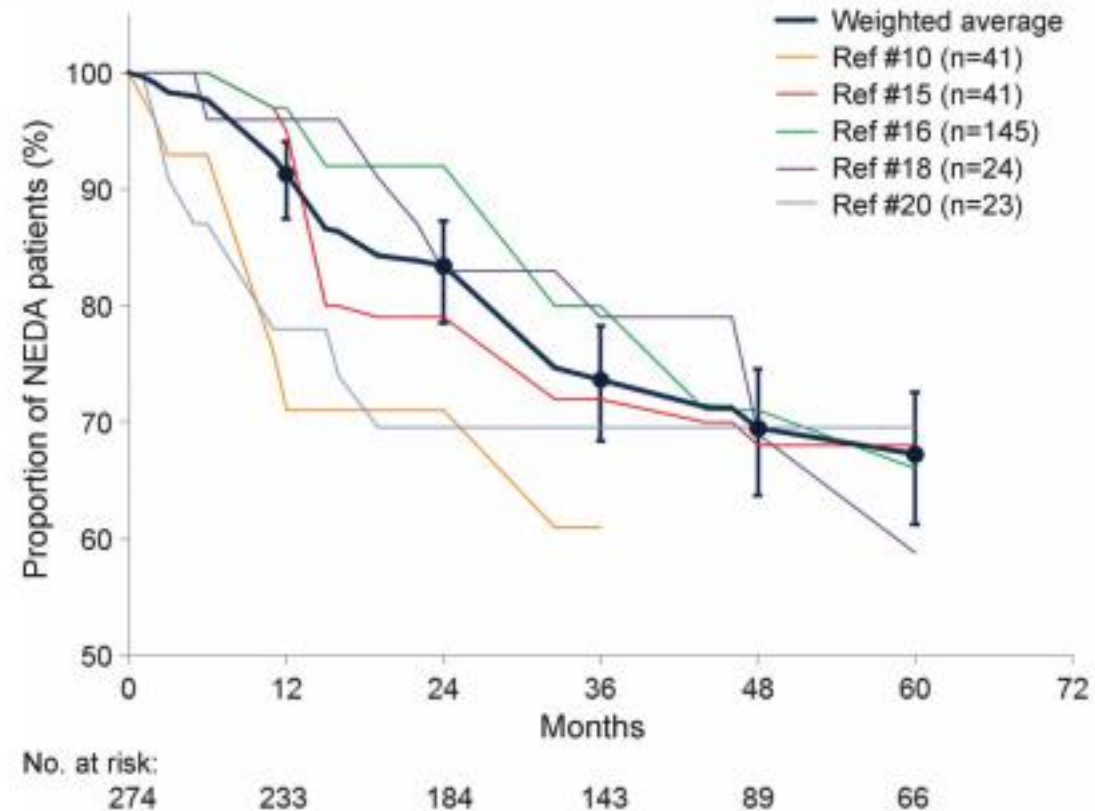
Methods: We collected all the publications carefully excluding reports that were related to mortality (TRM), rate of disability status. A weighted meta-regression was performed for study-specific characteristics.

Results: Fifteen studies including 1,145 patients were included. The pooled estimate of TRM was higher in older studies ($p = 0.001$). Relapsing-remitting MS (RRMS) ($p = 0.013$) was also significantly associated with TRM. Lower 2-year progression rate was observed with RRMS ($p = 0.004$). The pooled 2-year progression rate was 6.7% (95% CI 4.7%–8.7%) and at 5 years was 17.1% (95% CI 12.1%–22.1%).

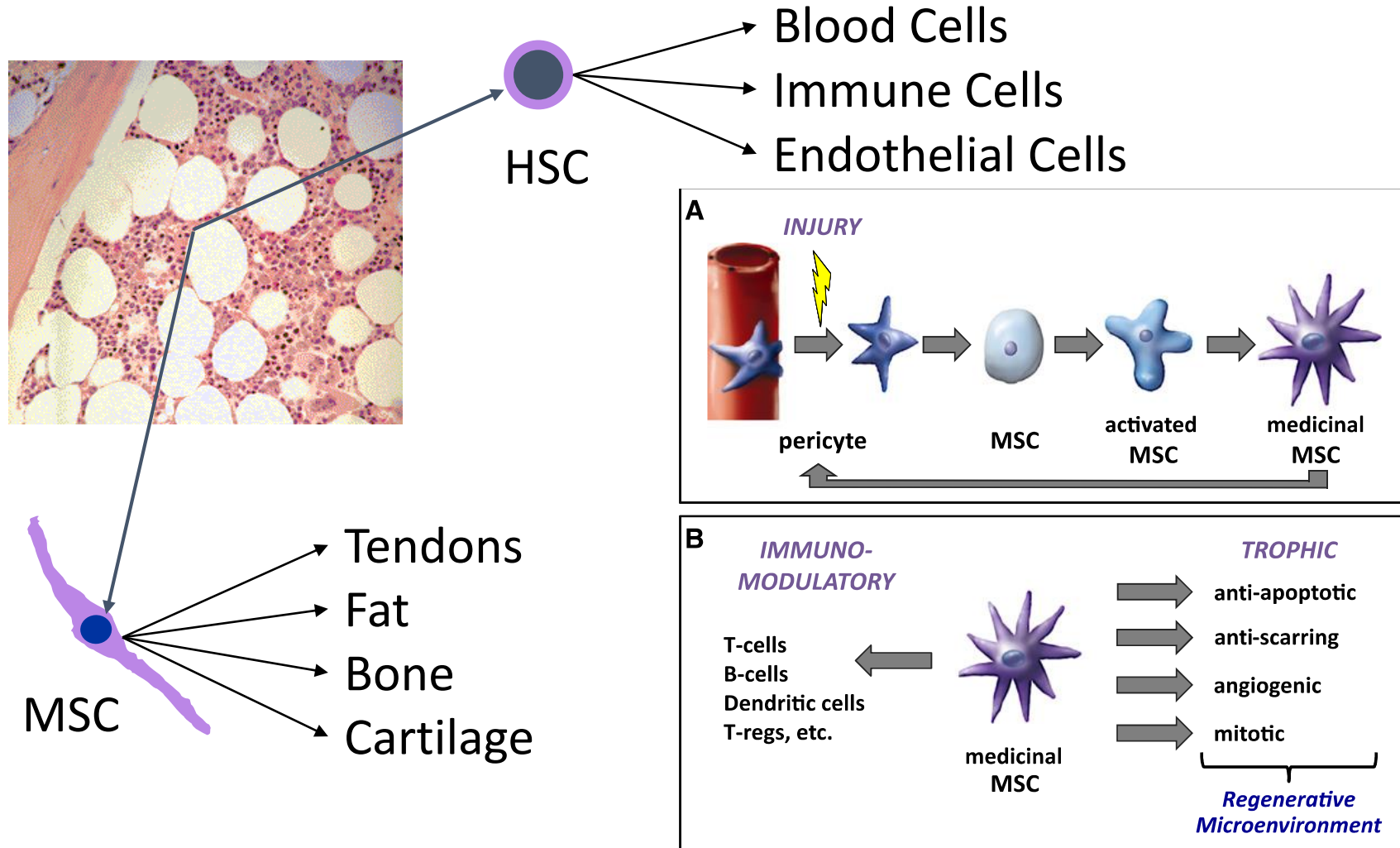
Conclusions: The emerging evidence suggests a benefit/risk profile from this therapy with a relapsing-remitting course.

Neurology® 2017;88:2115–2122

Figure 4 Proportion of patients with no evidence of disease activity (NEDA) over time in single studies and as a pooled estimate



MSC: A second marrow stem cell!



Caplan & Correa, Cell Stem Cell 2011 v9 pg 11-15

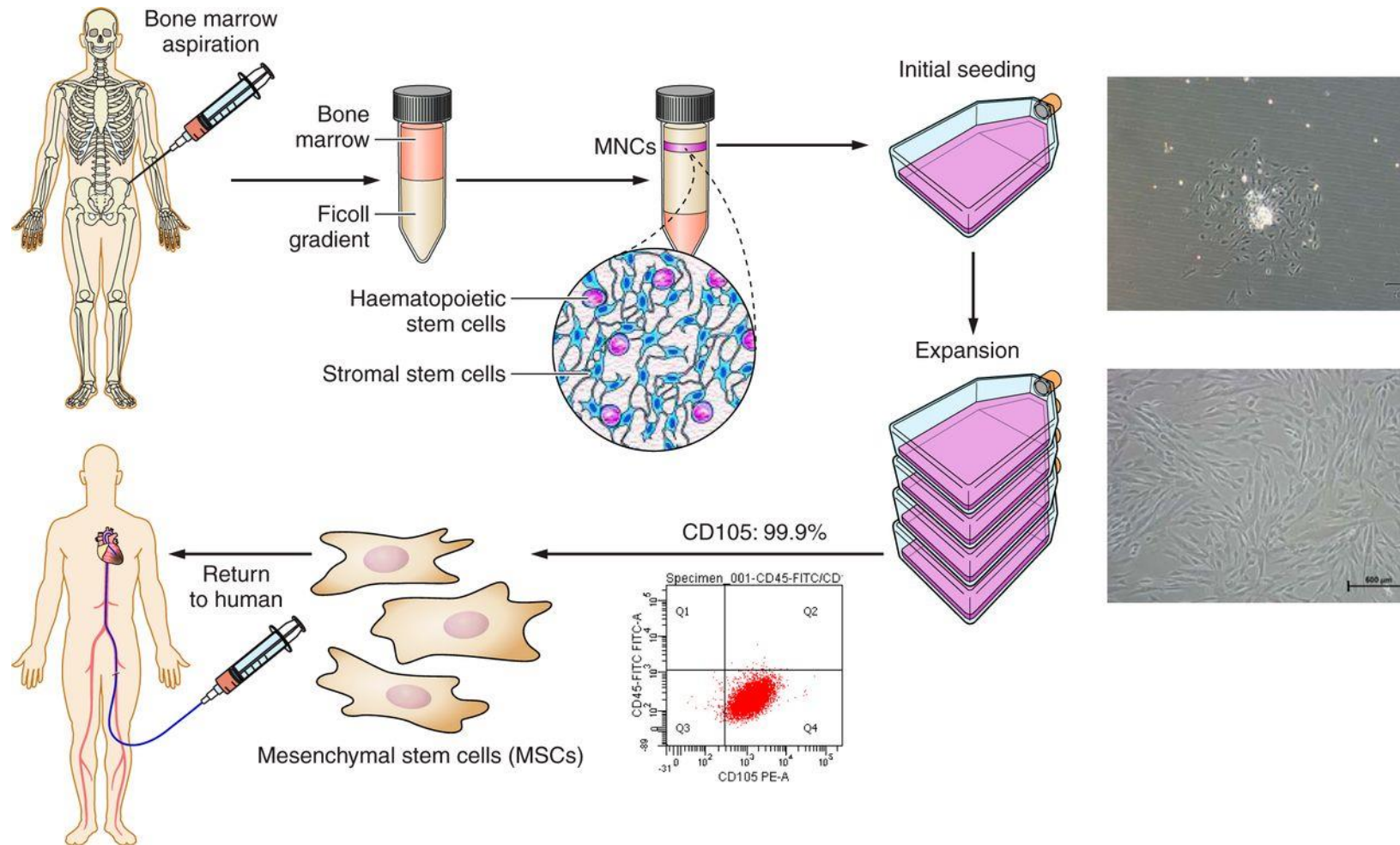
Stem Cell Network
Réseau de cellules souches

Our people...our strength



Process derived Product \neq Starting Product

Good Manufacturing Practices (GMP)



Samuel Golpanian et al. *Physiol Rev* 2016;96:1127-1168

©2016 by American Physiological Society

Physiological Reviews

Stem Cell Network
Réseau de cellules souches

Our people...our strength





FUNDING BODIES		
Agencies supporting core activities and coordination		
<p>multiple sclerosis international federation Multiple Sclerosis International Federation (MSIF)</p>	<p>ECTRIMS EUROPEAN COMMITTEE FOR TREATMENT AND RESEARCH IN MULTIPLE SCLEROSIS European Committee for Treatment and Research in Multiple Sclerosis (ECTRIMS)</p>	<p>SCLE ROSI MULT I PLA fondazione italiana un mondo libero dalla SM Fondazione Italiana Sclerosi Multipla (FISM)</p>
Agencies supporting national studies		
<p>SCLE ROSI MULT I PLA fondazione italiana un mondo libero dalla SM Fondazione Italiana Sclerosi Multipla (FISM)</p>	<p>fondazione CARIGE Fondazione CARIGE- Italy</p>	<p>MS The Danish Multiple Sclerosis Society - Denmark</p>
<p>UK STEM CELL FOUNDATION UK Multiple Sclerosis Society</p>	<p>UK CLINICAL RESEARCH COLLABORATION UK Stem Cell Foundation</p>	<p>MS Multiple Sclerosis Society UK Clinical Trials Network</p>
<p>arsep ARSEP Association pour la Recherche sur la Sclérose En Plaques</p>	<p>Vetenskapsrådet Vetenskapsrådet, Sweden</p>	<p>Karolinska Institutet Theme Center for Regenerative Medicine, Karolinska Institute, Sweden</p>
<p>KAROLINSKA University Hospital Neurology Clinic, Karolinska University Hospital, Stockholm</p>	<p>Institute of Health Carlos III (Badalona)</p>	<p>FIMABIS FUNDACIÓN PÚBLICA ANDALUZA PARA LA INVESTIGACIÓN DE MÁLAGA EN BIOMEDICINA Y SALUD FIMABIS (Andalusian Public Foundation for Health and Biomedicine Research in Malaga)</p>
	<p>andalusian initiative for advanced therapies Andalusian Initiative for Advanced Therapies - Health and Progress Foundation</p>	

MESEMS: Project stem cells in humans



Hot Topics > Stem Cells > MEsenchymal Stem cell therapy for CANadian MS patients (MESCAMS)

13 sites in 8 countries
Italy, Denmark, UK, Sweden,
France, Spain Canada,
Australia

Stem Cell Network
Réseau de cellules souches

Our people...our strength



Maritime man living with MS believes stem cells will slow progression



<https://atlantic.ctvnews.ca/maritime-man-living-with-ms-believes-stem-cells-will-slow-progression-1.3889243>

Stem Cell Network
Réseau de cellules souches

Our people...our strength





Stem Cells & Unproven Therapies in Canada

Canadian Science Policy Conference

November 8, 2018

Cate Murray, Executive Director

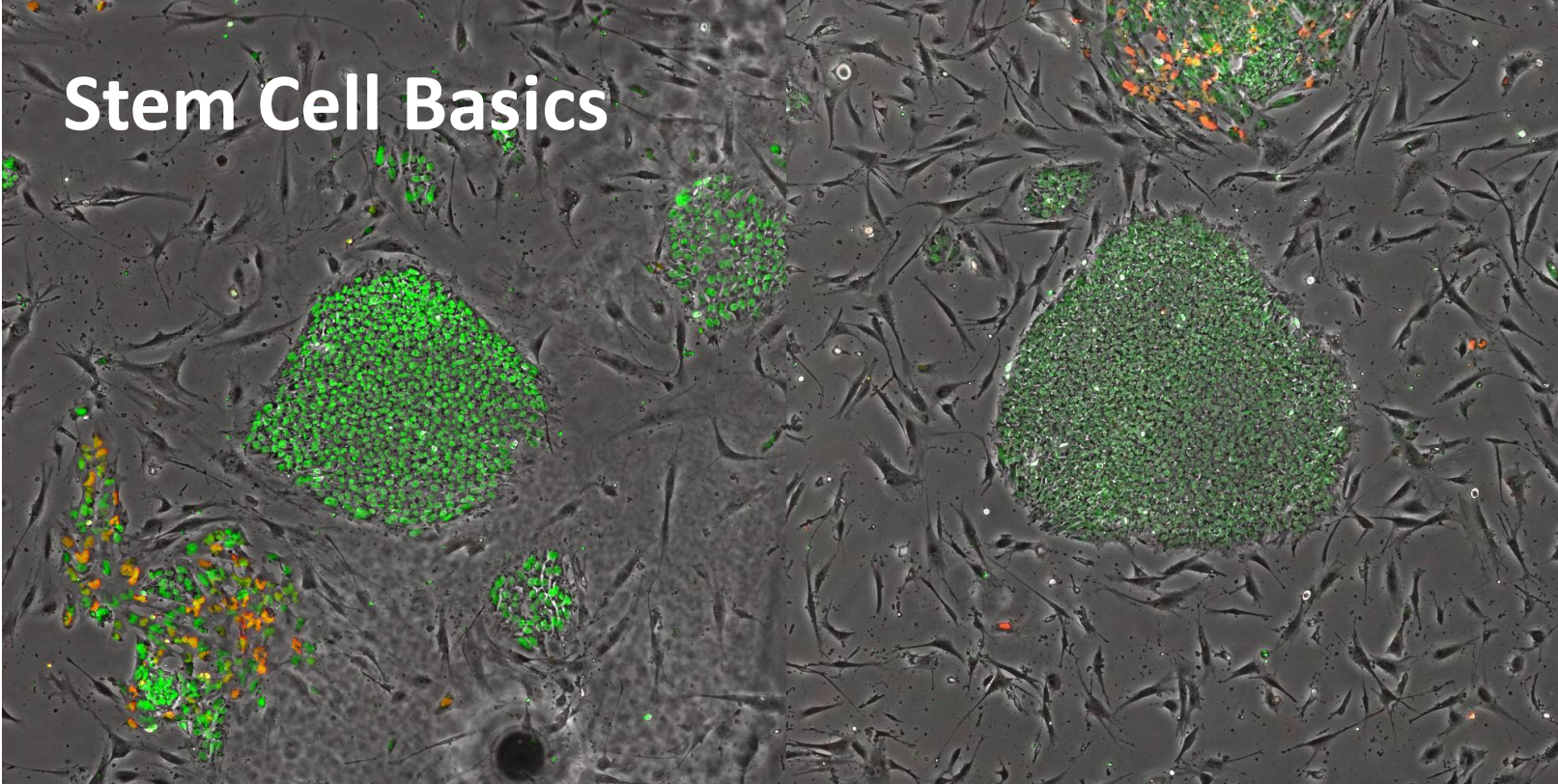
Stem Cell Network

Stem Cell Network
Réseau de cellules souches

Our people...our strength



Stem Cell Basics



- Discovered by 2 Canadians in early 1960s
- Key properties are self-renewal and ability to create more specialized cells needed for growth or repair
- Found in nearly every organ/tissue in the body
- Potential as treatments for chronic disease



What are Clinical Trials?

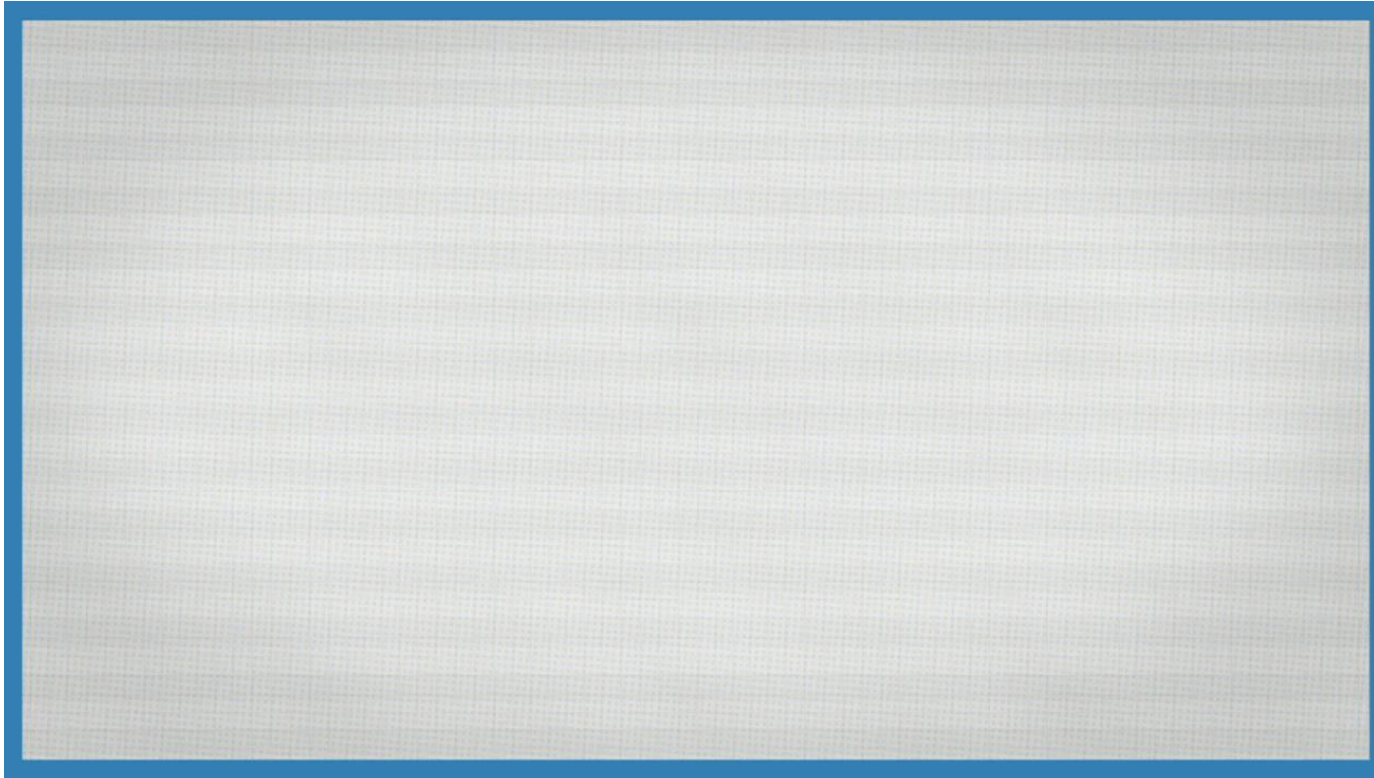
- A research study designed to answer specific questions about a new treatment
- Set up in phases:

PHASE	GOAL	# PARTICIPANTS
1	IS IT SAFE?	<20
2	IS IT SAFE TO CONTINUE & DOES IT WORK?	<100
3	DOES IT WORK IN LARGE GROUPS?	>100
CLINICAL APPROVAL		
4	WHAT ARE LONG TERM BENEFITS & RISKS?	Varied populations

- Conducted within the health care system



What are Unproven Stem Cell Therapies?



- Not offered through health system, no published record
- Inadequate consent & disclosure of type of cells/procedure
- Patients pay out of pocket for treatment; no follow up
- Not just international: many clinics in Canada



The Fight Against Unproven Stem Cell Therapies

With few regulations, stem cell clinics booming



Public personalities who use stem cell treatments lend credibility to unproven therapies.

Most providers in Canada are physicians. They provide mainly adult autologous stem cell transplants.

Unlicensed clinics offering stem cell treatments across Canada: study

By **SHERYL UBELACKER** The Canadian Press
Wed., Sept. 26, 2018

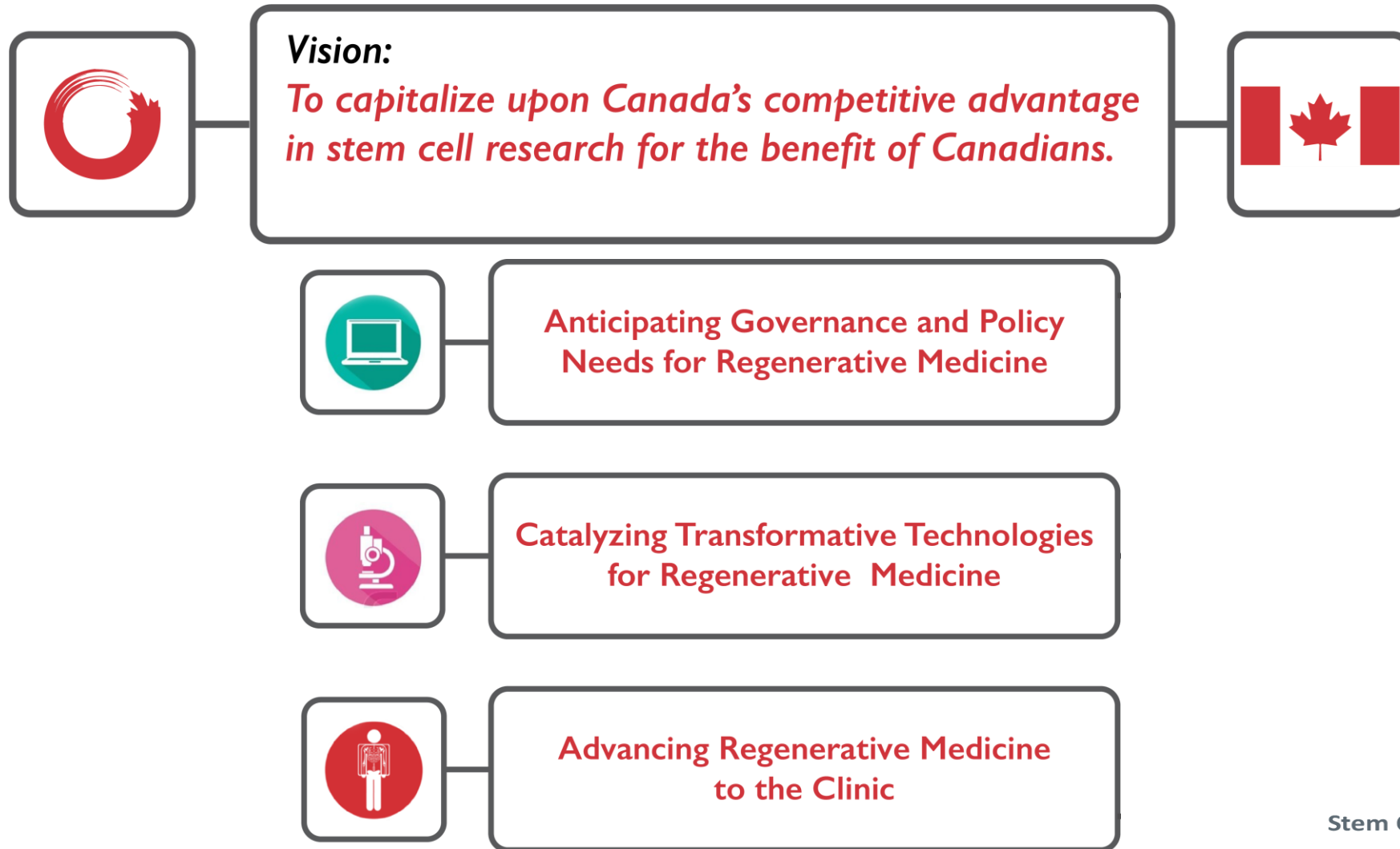


Stem Cell Network
Réseau de cellules souches

Our people...our strength



The Stem Cell Network



Stem Cell Network
Réseau de cellules souches

Our people...our strength



Unproven Therapies: Understanding & Advising

- Facilitating research and providing fact-based information for public, media, patient groups
- Workshops to bring stakeholders together
- Working with international community to make policy recommendations

Stem cell therapies: medical experts call for strict international rules

Experts from 15 countries say regulation needed to prevent vulnerable patients pursuing unproven and potentially deadly treatments

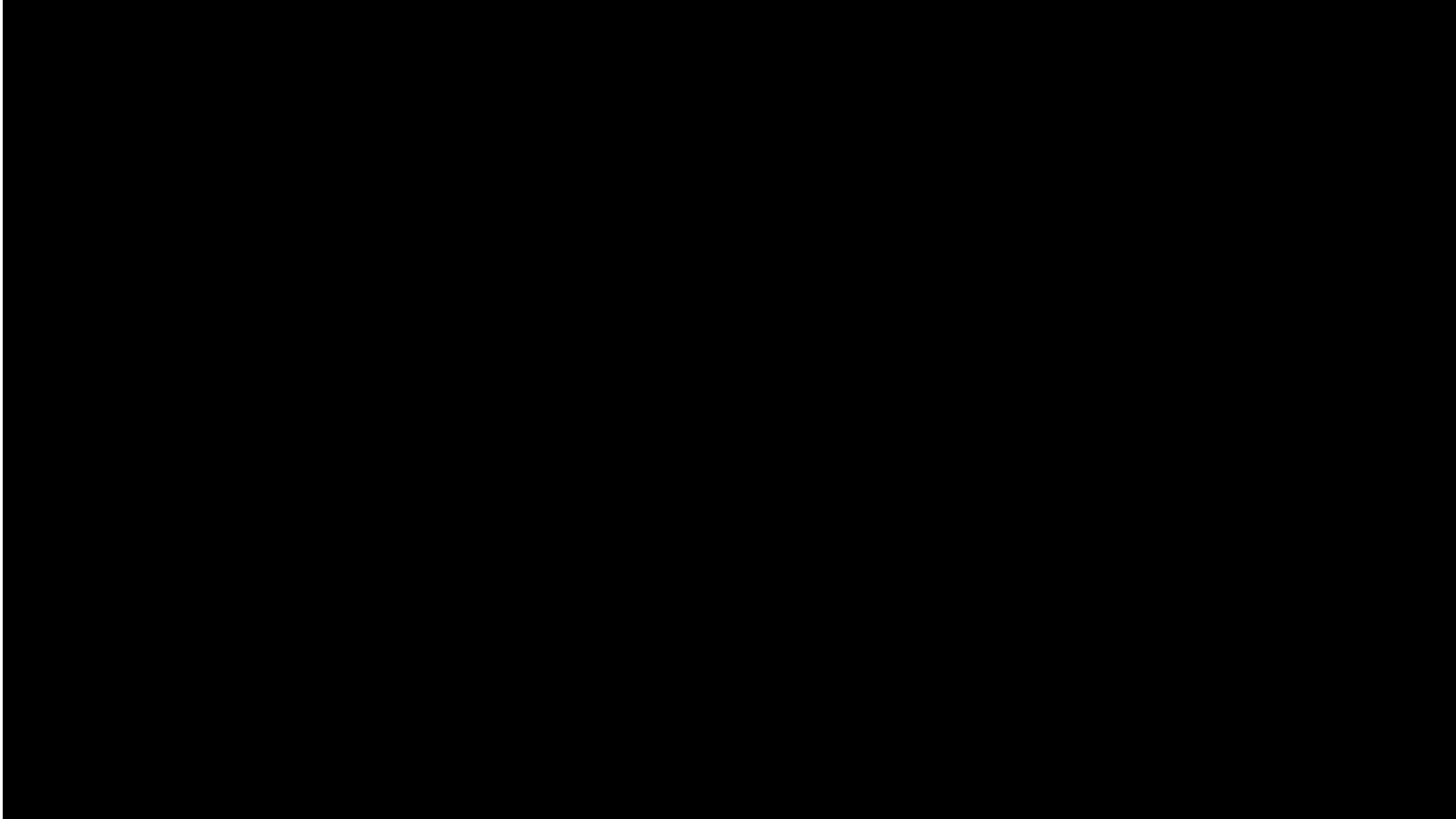


work
de cellules souches

Our people...our strength



SCN: Bringing Together Canadian Excellence



Stem Cell Network
Réseau de cellules souches

Our people...our strength



Policy Options – A Balancing Exercise

- Information
- Hard Law – Federal Regulation
- Common Law Remedies
- Consumer Protection
& Truth in Advertising Regulation
- Professional Regulation



Stem cell tourism and Canadian family physicians

Timothy Caulfield LL.M. FRSC Amy Zarzeczny LL.M. Toronto Stem Cell Working Group

THE POWER OF INFORMATION

Stem Cell Therapies: Now and in the Future The Australian Stem Cell Centre Information Handbook

What you should know about experimental therapies
overseas and what is happening in your country

April 2011



STEM CELL RESEARCH AND PARKINSON'S DISEASE

This document has been prepared to help you become more informed about stem cell research. It is designed to answer questions about the status of stem cell research in Parkinson's disease and what is currently known about therapies.

Parkinson's disease: symptoms and treatment

Parkinson's is a disorder of the brain. Movement is controlled by dopamine, a chemical that carries signals between nerves in the brain. When cells that produce dopamine die or are damaged, Parkinson's symptoms appear. The loss of dopamine can cause a variety of symptoms, including tremor, muscle stiffness, slowness of movement, and impaired balance. Non-motor symptoms also develop, such as constipation, sleep disturbances, bladder dysfunction, depression, and memory problems. (See PSC Information Sheet on Progression of Parkinson's disease at www.parkinson.ca.)

Currently there is no cure for Parkinson's. Many of the motor symptoms can be treated with medications that either replace the lost dopamine or mimic the action of dopamine in the brain. Medications can alleviate the symptoms, but do not slow the progression of Parkinson's disease. Some people may benefit from brain surgery (often known as deep brain stimulation, or DBS).

Who discovered stem cells?

The first stem cell discovery was made by Canadian scientists James Till and Ernest MacFarlane in 1961. These were stem cells of the blood system, but provided a foundation to understand other stem cells from other tissue, such as the brain.

What are stem cells?

Stem cells are defined by two properties. First, they can 'self-renew,' that is, they can give rise to more stem cells of the same kind. Second, they can mature or 'differentiate' into specialized cells that carry out a specific function.

There are many different types of stem cells. These include embryonic stem cells that are at the earliest stages of development; and types of 'tissue-specific' stem cells (referred to as 'adult' or 'somatic' stem cells) that are found in various tissues in our bodies.

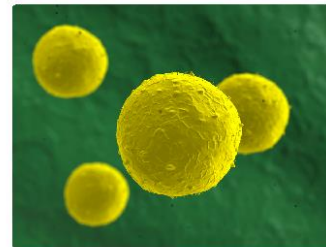
What are embryonic stem cells and why are they important?

Embryonic stem cells are pluripotent, meaning they are capable of generating most cell types in the body. Since pluripotent cells self-renew easily in the lab, they have been instrumental in the study of human development and disease modeling.



FDA Warns About Stem Cell Claims

Stem cell therapies offer the potential to treat diseases or conditions for which few treatments exist.



Researchers hope that stem cells will one day be effective in the treatment of many medical conditions and diseases.

Stem cells, sometimes called the body's 'master cells,' are the precursor cells that develop into blood, brain, bones and all of your organs. Their promise in medical treatments is that they have the potential to repair, restore, replace and regenerate cells that could then be used to treat many medical conditions and diseases. But the Food and Drug Administration (FDA) is concerned that the hope that patients have for cures

are illegal and potentially harmful. FDA cautions consumers to make sure that any stem cell treatment they are considering has been approved by FDA or is being studied under a clinical investigation that has been submitted to and allowed to proceed by FDA. FDA has approved only one stem cell product, Hemacord, a cord blood-derived product manufactured by the New York Blood Center and used for specified indications.

Regulation of Stem Cells

FDA regulates stem cells in the U.S. to ensure that they are safe and effective for their intended use. "Stem cells can come from many different sources and under many different conditions that give rise to many different cell types," said Stephanie Simek, Ph.D., deputy director of FDA's Office of Cellular, Tissue and Gene Therapies.

Stem cells that come from marrow or blood are routinely used in transplant procedures to treat patients with cancer and other disorders of the blood and immune system.

Umbilical cord blood is collected from a placenta with the birthing mother's consent. Cord blood is then isolated, processed, and stored in a cord blood bank for future use. Cord blood is regulated by FDA and cord blood banks must follow regulatory requirements.

But there are many other cell products, including blood-derived products, that have not been reviewed by FDA. Investigational studies require a thorough review by FDA of the sponsor's preparation, safety, and effectiveness data, and the results of human studies (clinical trials).

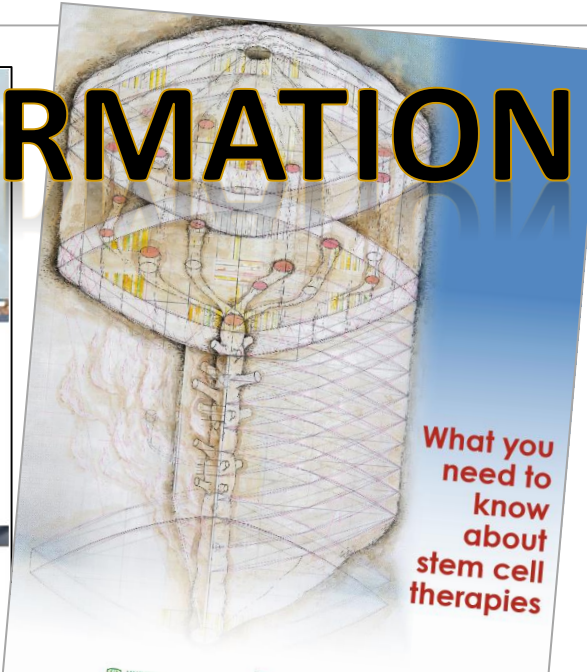
As part of this review, FDA must show how the product will be manufactured, how it will be made certain that it is safe, and how it will be used. FDA also requires that the sponsor provide sufficient data to support the use of these products. Consumers should be aware that at present—

Stem cell therapies in MS

ISSCR International Society for Stem Cell Research

Patient Handbook on Stem Cell Therapies

Appendix I of the Guidelines for the
Clinical Translation of Stem Cells
December 3, 2008



stem cell interventions for spinal cord injury



The Potential Power of Social Media (... and its limitations)

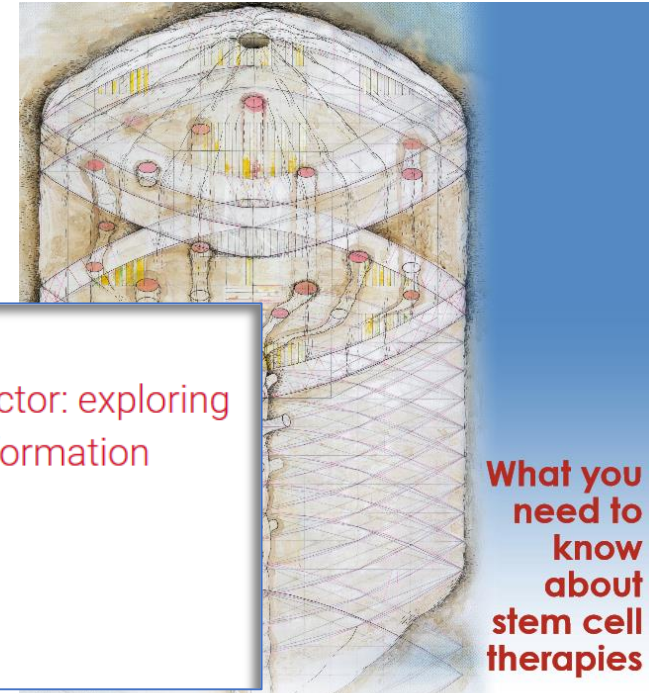


REGENERATIVE MEDICINE, VOL. 12, NO. 7 | RESEARCH ARTICLE

Leveraging social media in the stem cell sector: exploring Twitter's potential as a vehicle for public information campaigns

Kathleen McNutt & Amy Zarzeczny

Published Online: 8 Nov 2017 | <https://doi.org/10.2217/rme-2017-0055>



Organization	Items Tweeted	Mentions	Impressions	Retweets (Reach)	Favourited (Reach)
Org 1	13	13	1503	67	5
Org 2	9	14	271	17	22
Org 3	15	15	10355	78	60
All others	0	6	N/A	7	2

Hard Law – Federal Regulation

Cytotherapy, 2017; 19: 1400–1411

International Society for Cellular Therapy
ISCT



MEETING REPORT

Workshop to address gaps in regulation of minimally manipulated autologous cell therapies for homologous use in Canada

JOLENE CHISHOLM¹, BARBARA VON TIGERSTROM², PATRICK BEDFORD³
JULIE FRADETTE⁴ & SOWMYA VISWANATHAN^{1,5,6}



"Health Canada continues to assess the information gathered from the clinics to determine whether the specific activities being conducted are compliant with federal regulatory requirements," Gagnon said.

Food and Drugs Act

R.S.C., 1985, c. F-27

More Canadian clinics are offering unproven stem cell therapies, study finds

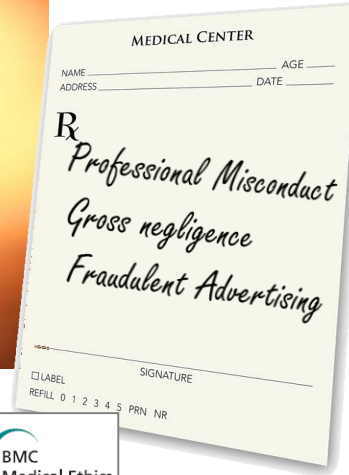


New report identifies unlicensed clinics advertising their services online

The Canadian Press · Posted: Sep 26, 2018 11:06 AM ET | Last Updated: September 26



Professional Regulation - Providers



Zarzeczny and Clark *BMC Medical Ethics* 2014, 15:75
<http://www.biomedcentral.com/1472-6939/15/75>



RESEARCH ARTICLE

Open Access

Unproven stem cell-based interventions & physicians' professional obligations; a qualitative study with medical regulatory authorities in Canada

Amy Zarzeczny^{1*} and Marianne Clark²

Stem Cell Reports

Perspective

ISSCR

OPEN ACCESS

Professional Regulation: A Potentially Valuable Tool in Responding to "Stem Cell Tourism"

Amy Zarzeczny,^{1,*} Timothy Caulfield,² Ubaka Ogbogu,³ Peter Bell,⁴ Valorie A. Crooks,⁵ Kalina Kamenova,⁶ Zubin Master,⁷ Christen Rachul,⁸ Jeremy Snyder,⁸ Maeghan Toews,⁶ and Sonja Zoeller¹

The Telegraph

Home News World Sport Finance Comment Blogs Culture Travel Life Women Fashion
Women Motoring Health Property Gardening Food History Relationships Expat
Health News Health Advice Diet and Fitness Wellbeing Expat Health Pets Health

HOME » HEALTH » HEALTH NEWS

Stem cell doctor Robert Trossel struck off

A doctor who charged vulnerable multiple sclerosis patients thousands of pounds for "pointless" and "unjustifiable" stem cell treatments was struck off today by the General Medical Council.



Dr Robert Trossel arrives at the General Medical Council Photo: CENTRAL NEWS

Print this article

Share 29

Facebook 15

Twitter 14

Email

LinkedIn 0

+1 0

Health News

News » UK News »

In Health News

Regulatory Body: General Medical Council

Charge: Professional misconduct

Sanction: License revocation

"Public confidence in the good name of the medical profession is likely to have been damaged by your behaviour." ~ Fitness to Practise Panel Hearing

Consumer Protection & Truth-in-Advertising



N S O N
O Y A M A



False or Misleading Representations and Deceptive Marketing Practices

False or misleading representations and deceptive marketing practices under the *Competition Act*

The *Competition Act* contains provisions addressing false or misleading representations and deceptive marketing practices in promoting the supply or use of a product or any business interest. All representations, in any form whatever, that are false or misleading in a material respect are subject to the Act. If a representation could influence a consumer to buy or use the product or service advertised, it is material. To determine whether a representation is false or misleading, the courts consider the "general impression" it conveys, as well as its literal meaning.

"These treatments
are legal, safe, and
effective"

"Our adult stem
cell therapies are
safe, simple, and
non-invasive"

"...the technique is safe
and there are no side
effects"

"This "liquid gold" is then
injected in the area of
concern. These platelets
stimulate growth factors to
regenerate ..."

"cellular therapy is a
simple but powerful
procedure that uses
your naturally
occurring stem cells
to allow your body
to heal"



Terminology Tensions

+

A Murky Market

=

Policy Challenge

The Stem Cell Market & Policy Options: A Call for Clarity

3 Key & Interconnected Areas:

- I. Clear and comprehensive regulation that is enforced in a consistent and robust manner
- II. Scientific and clinical transparency
- III. Patient communication and engagement strategies that prioritize informed decision-making, accurate representations and realistic expectations



Zarzeczny, Atkins, Illes, et al. "The Stem Cell Market & Policy Options: A Call for Clarity" (2018) Journal of Law and the Biosciences (accepted)