OMB No. 0925-0001 and 0925-0002 (Rev. 03/2020 Approved Through 02/28/2023)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Mark Giles Hamilton

eRA COMMONS USER NAME (credential, e.g., agency login):

POSITION TITLE: Professor of Neurosurgery, University of Calgary

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)

| INSTITUTION AND LOCATION | DEGREE(if applicable) | Completion DateMM/YYYY | FIELD OF STUDY |
| --- | --- | --- | --- |
| University of Toronto, Toronto, Ontario, Canada | BSc | 06/1979 | Biology/Zoology |
| McGill University, Montreal, PQ, Canada | MDCM | 06/1983 | Medicine |
| Rotating Internship, St. Paul’s Hospital, Vancouver, BC, Canada | Internship | 06/1984 | Medicine |
| Canadian Military Service, National Defense Medical Centre, Ottawa, Canada  | N/A | 06/1987 | Cardiology/Surgery |
| University of Calgary, Calgary, Alberta, CanadaBarrow Neurological Institute, Phoenix, AZ, USA  | FRCSCN/A | 06/1992 12/1993  | NeurosurgeryFellowship |

**A. Personal Statement**

My involvement in hydrocephalus care started during my training and increased through my years as a pediatric Neurosurgeon leading ultimately to a major involvement in adult hydrocephalus care. I established and lead the Calgary Adult Hydrocephalus Clinic and have created a local registry. I developed and lead an international registry (The Adult Hydrocephalus Clinical Research Network). I hosted an international Hydrocephalus meeting in Calgary/Banff in 2015. I am involved as a Board Member of the Hydrocephalus Association in the USA and Hydrocephalus Canada. I have recently established the Canadian Hydrocephalus Study Group to promote the development of clinical care pathways and advocacy for Canada. I have been a local, national, and international advocate for improving research and clinical care for patients with hydrocephalus.

The Calgary Adult Hydrocephalus Clinic is the largest adult hydrocephalus clinic in Canada and one of the largest in the world. The goal of the clinic is to provide and improve care for all adults suffering from hydrocephalus. The clinic has developed and evaluated protocols for patient assessment and management and utilizes a Quality Improvement (QI) methodology to improve care. We have undertaken longitudinal care, longitudinal clinical research and participate in international clinical trials.

My Clinical practice and clinical research are now almost exclusively related to what happens with the Calgary Adult Hydrocephalus Clinic and the participation of the clinic in a research network and clinical trials. I will be able to easily incorporate the efforts required as part of the Steering Committee for the proposed PENS randomized clinical trial into my clinical and academic commitments.

Manuscripts:

1. Hamilton MG. Adult Hydrocephalus. Seminars in Pediatric Neurology 16: 34-41, 2009
2. Williams M van der Willigen T, White P, Cartwright C, Wood D, Hamilton MG. Improving health care transition and longitudinal care for adolescents and young adults with hydrocephalus: report from the Hydrocephalus Association Transition Summit. J Neurosurg 131:1037–1045, 2019 [November 23, 2018; DOI: 10.3171/2018.6]`
3. Isaacs A, Jrahn D, Walker AM, Hurdle H, Hamilton MG. Transesophageal echocardiography-guided ventriculoatrial shunt insertion. Operative Neurosurgery doi: 10.1093/ons/opz353, 07 December 2019
4. Hamilton MG, Urbaneja G, Isaacs. Laparoscopic-guided Distal Ventriculoperitoneal Shunt Insertion Improves Shunt Outcome in Adult Patients: Results of a Cohort study with 218 Patients. Platform Presentation at Hydrocephalus 2018 Meeting, Bologna, Italy, October 21, 2018. Abstracts from hydrocephalus 2018: the tenth meeting of the International Society for Hydrocephalus and Cerebrospinal Fluid Disorders. *Fluids Barriers CNS* 15, 35 (2018). https://doi.org/10.1186/s12987-018-0119-0

**B. Positions and Honors**

**a) Position**

1. Professor University of Calgary (April 1, 2012-present)
2. Associate Professor University of Calgary (April 1,1999-March 30, 2012);
3. Assistant Professor University of Calgary (January 1,1994-March 30,1999)

**b) Academic achievements and honors**

1. Diplomate of the American Board of Neurological Surgery, May 1998
2. Division Head Pediatric Neurosurgery, Division of Pediatric Surgery, Alberta Children’s Hospital, University of Calgary (2002-2011)
3. Canadian Neurosurgical Society (CNSS) President (2004-2006)
4. Canadian Neurological Sciences Federation President (2005-2007)
5. Director of Calgary Adult Hydrocephalus Clinic & Program (2008-present)
6. Canadian Journal of Neurological Sciences: Editorial Board (2008-present)
7. Adult Hydrocephalus Clinical Research Network (AHCRN: Founding member and Chair; 2012-present; www.AHCRN.org)
8. Hydrocephalus Association (HA): Board of Directors (2014-present); Medical Advisory Board (Vice Chair)
9. Congress President 2015 ISHCSF (Hydrocephalus Society) Meeting: Hydrocephalus 2015: Banff, Alberta, September 18-21, 2015 (International Meeting with 300 attendees)
10. Hydrocephalus Society (Previously known as The International Society for Hydrocephalus and Cerebrospinal Fluid Disorders (ISHCSF)): Secretary-Treasurer (2014-2016); President Elect (2016-2018); President (2018-present);
11. Neuro-Research Brain and Mental Health Clinic: Executive Committee (2015-present)
12. Hydrocephalus Canada: Board of Directors (2017-Present)); Medical Advisory Board (2020-present)
13. International Hydrocephalus Imaging Working Group (2012-present)
14. Brain and Mental Health Research Clinics, Hotchkiss Brain Institute: Executive Committee (2015-present)
15. Department of Clinical Neurosciences Quality Council (2019-present)
16. Fluids and Barriers of the CNS: Editorial Board (2015-present)
17. Journal of Neurosurgery: Editorial Board (2018-present)
18. International Idiopathic Normal Pressure Hydrocephalus Guidelines Group Co-leader (2019-present)
19. Canadian Hydrocephalus Study Group Founder (2019-present)

**C. Contributions to Science**

**1) Established the Adult Hydrocephalus Clinical Research Network (AHCRN;** [**www.AHCRN.org**](http://www.AHCRN.org)**)**

There is an abundance of single center, retrospective publications dealing with hydrocephalus in the adult patient. Few multicenter projects exist. To deal with this, I approached the Hydrocephalus Association (HA) in the USA in late 2012 and initiated/founded the Adult Hydrocephalus Clinical Research Network (AHCRN). I am the Chair of AHCRN and responsible for its functions. The AHCRN is now comprised of 8 clinical sites across 3 countries and a data center that is located in Salt Lake City at the University of Utah. The AHCRN has a prospective core registry with standardized assessments and has enrolled approximately 1700 adult patients with all the different subtypes of hydrocephalus. We have published one paper, have 2 under review and are completing a pilot randomized clinical trial (PENS) dealing with the efficacy of surgical treatment for patients with idiopathic Normal Pressure Hydrocephalus (iNPH). The PENS RCT is blinded to the patient and the assessor. This pilot trial has allowed us to approach NIH and we are submitting a U01 grant in October 2020.

**Manuscripts:**

1. Williams MA, Nagel SJ, Luciano MG, Relkin N, Zwimpfer TJ, Katzen H, Holubkov R, Moghekar A, Wisoff JH, McKhann GM, Golomb J, Edwards RJ, Hamilton MG. The clinical spectrum of hydrocephalus in adults: report of the first 517 patients of the Adult Hydrocephalus Clinical Research Network registry. J Neurosurg. 2019 May 24:1-12. doi: 10.3171/2019.2. JNS183538. [Epub ahead of print].
2. Zwimpfer T, Hamilton MG and the AHCRN. Improvement in Gait and Cognitive Function 3 Months after endoscopic Third Ventriculostomy (ETV) in Adult Obstructive Patients. Platform Presentation at Hydrocephalus 2018 Meeting, Bologna, Italy, October 21, 2018. Abstracts from hydrocephalus 2018: the tenth meeting of the International Society for Hydrocephalus and Cerebrospinal Fluid Disorders. *Fluids Barriers CNS* 15, 35 (2018). <https://doi.org/10.1186/s12987-018-0119-0>
3. Nunn AC, Jones HE, Morosanu CO, Singleton WGB, Williams MA, Nagel SJ, Luciano MG, Zwimpfer TJ, Holubkov R, Wisoff JH, McKhann GM 2nd, Hamilton MG, Edwards RJ. Extended lumbar drainage in idiopathic normal pressure hydrocephalus: a systematic review and meta-analysis of diagnostic test accuracy. Br J Neurosurg. 2020 Jul 9:1-7
4. Isaacs A, Williams M, Hamilton MG. Current Update on Treatment strategies for idiopathic normal pressure hydrocephalus. Curr Treat Options Neurol (Dec 2019) 21: 65. https://doi.org/10.1007/s11940-019-0604-z.

**2) Established the Calgary Adult Hydrocephalus Clinic**

While working as Neurosurgeon in Calgary through my first 10 years, I was doing a combination of pediatric and adult neurosurgery and began to assume more of the ongoing care for adult patients with hydrocephalus. My experience in pediatric hydrocephalus involved a significant experience in hydrocephalus treatment and I determined that there was a need to develop a more organized approach to care in the adult patient. I formally established the Calgary Adult Hydrocephalus Clinic in 2008. The clinic now has a full time Clinical Assistant, a full-time research coordinator, and a clerk. The clinic manages >4000 patients, has 1400-1500 clinic visits per year and coordinates 150 hydrocephalus surgeries, and approximately 120 other clinic/hospital procedures specific to hydrocephalus diagnosis. This Calgary Adult Hydrocephalus Clinic serves as a model for hydrocephalus care in Canada and the US. The clinic has an international reputation and is the largest contributor to the AHCRN Registry. In addition to improving diagnosis and care, the clinic has gained national exposure on the CTV News (<https://www.ctvnews.ca/health/little-known-disorder-looks-just-like-dementia-but-can-be-reversed-1.3373866>). I edited an issue of Neurosurgical Focus dealing with adult hydrocephalus and I am currently co-leading an international group to revise the guideline for diagnosis and treatment of idiopathic normal pressure hydrocephalus.

**Manuscripts:**

1. Hamilton MG. Adult Hydrocephalus. Seminars in Pediatric Neurology 16: 34-41, 2009.
2. Hamilton MG, Yong H, Urbaneja G, Koshy D, Isaacs A. Endoscopic Third Ventriculostomy (ETV) for Treatment of Hydrocephalus in Adults: Outcomes and long-term followup in 163 patients. Neurosurgical Focus, September 2016.
3. Isaacs A, Riva-Cambrin J, Yavin, Hockley A,4, Pringsheim T, Jette N, Lethebe C, Lowerison MN, Dronyk J, Hamilton MG. Age-specific global epidemiology of hydrocephalus: Systematic review, metanalysis and global birth surveillance. PLOS ONE | https://doi.org/10.1371/journal.pone.0204926, October 1, 2018: 1-24.
4. Isaacs AM, Bezchlibnyk YB, Dronyk J, Urbaneja G, Yong H, Hamilton MG. Long-Term Outcomes of Endoscopic Third Ventricle Colloid Cyst Resection: Case Series with a Proposed Grading System. Oper Neurosurg (Hagerstown). 2020 Aug 1;19(2):134-142.
5. Keough MB, Isaacs AM, Urbaneja G, Dronyk J, Lapointe AP, Hamilton MG. Acute low-pressure hydrocephalus: a case series and systematic review of 195 patients. J Neurosurg. 2020 Jul 31:1-9.

**3) Improving Treatment of Pediatric and Adult Patients with Brain Tumor**

I have had a significant involvement with the management of pediatric and adult patients suffering with brain tumors. I have had major involvement in Phase 1 trial in Calgary evaluating a viral vector, have acted as the Canadian principal investigator for an international Phase 3 trial of brain tumor vaccine and done local work evaluating the treatment and predictive aspects associated with brain tumor.

**Manuscripts:**

1. Forsyth P, Roldan G, George D, Morris D, Cairncross G, Vallee Matthews M, Markert J, Gillespie Y, Coffey M, Thompson B, Hamilton MG. A phase I trial of intratumoral administration of reovirus in patients with histologically confirmed recurrent malignant gliomas. Molecular Therapy 16(3): 627-632, 2008.
2. Levy R, Cox R, Hader W, Myles ST, Sutherland G, Hamilton MG. Application of high-field intraoperative magnetic resonance imaging in pediatric neurosurgery. J Neurosurg Pediatrics 4:467–474, 2009 (Editorial response 4: 465–466, 2009).
3. Hamilton MG, Parney I, Roldan G, Magliocco T, Easaw J. Determination of methylation status of MGMT within different regions within glioblastoma multiforme. Journal of Neuro-Oncology 10.1007/s11060-010-0307-5/ 102:255–260, 2011.
4. Weller M, Butowski N, Tran DD, Recht LD, Lim M, Hirte H, Ashby L, Mechtler L, Goldlust SA, Iwamoto F, Drappatz J, O'Rourke DM, Wong M, Hamilton MG, Finocchiaro G, Perry J, Wick W, Green J, He Y, Turner CD, Yellin MJ, Keler T, Davis TA, Stupp R, Sampson JH; ACT IV trial investigators. Rindopepimut with temozolomide for patients with newly diagnosed, EGFRvIII-expressing glioblastoma (ACT IV): a randomized, double-blind, international phase 3 trial. Lancet Oncol. 2017 Oct;18(10):1373-1385.

**4) Improving Management of Cerebrovascular Disease**

I have had a major involvement with the management of adult patients suffering from cerebrovascular disease. I co-edited a textbook entitled “Neurovascular Surgery”. Early in my career, I had received a Heart and Stroke grant undertook animal model research in cerebral ischemia. I no longer do this work as my focus deals primarily with Adult Hydrocephalus.

**Manuscripts:**

1. Hamilton MG, Spetzler RF. The prospective application of a grading system for arteriovenous malformations. Neurosurgery 34:2-7, 1994
2. Hamilton MG, Tranmer BI, Auer RN. Insulin reduces cerebral infarction due to focal transient ischemia in the rat. J Neurosurgery 82:262-268, 1995.
3. Lawton MT, Hamilton MG, Spetzler RF. Multimodality treatment of deep arteriovenous malformations: Thalamus, basal ganglia, and brain stem. Neurosurgery 37:29-36, 1995.
4. Lawton MT, Hamilton MG, Spetzler RF. Revascularization and aneurysm surgery: Current techniques and outcome. Neurosurgery 38:83-94, 1996.

**Complete List of Published Work in MyBibliography:** [**https://www.ncbi.nlm.nih.gov/myncbi/1Z9ZvLMRDMJQ6/bibliography/public/**](https://www.ncbi.nlm.nih.gov/myncbi/1Z9ZvLMRDMJQ6/bibliography/public/)