History of the development of pediatric neurosurgery in Ottawa and the Children’s Hospital of Eastern Ontario (1975–2012)

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Introduction

Previous to the opening of the Children’s Hospital of Eastern Ontario (CHEO) in Ottawa basic pediatric neurosurgery procedures were carried out by neurosurgeons not specialized in pediatric neurosurgery. Patients with pediatric neurosurgical problems were admitted to the pediatric wards and nurseries of the Ottawa General and the Ottawa Civic Hospitals. Complex cases were referred out of town either to the Hospital for Sick Children in Toronto or the Children’s Hospital in Montreal.

In 1967 Dr. Leslie Ivan joined the academic staff in Ottawa. Prior to leaving his appointment at the University Hospital in Saskatoon, he submitted a paper to the Canadian Medical Association Journal on the surgical management of hydrocephalus in Saskatoon (Leslie P. Ivan, Joseph G. Stratford, John G. Gerrard, Carman H. Weder: The Surgical Treatment of Infantile Hydrocephalus Ten Years Experience in the Use of Ventriculoatrial Shunts with the Holter Valve, CMAJ 98:337–343, 1968.)

In May 1974 (Figs. 1 and 2), the Children’s Hospital of Eastern Ontario was inaugurated to serve the pediatric population of Eastern Ontario and Western Quebec. At that time, the Division of Pediatric Neurosurgery did not exist and the neurosurgical coverage was provided by most of the adult neurosurgeons working at the General and Civic Hospitals. In 1975, on the basis of his experience and publications, Dr. Leslie Ivan (Fig. 3), the Chief of Neurosurgery at the Ottawa General Hospital, was selected and became the Chief of Neurosurgery at CHEO.

First the neurosurgical patients were few and the neurosurgical equipment was limited and inappropriate. A CT scanner was not available on the premises and patients had to be evaluated by means of cerebral angiography and/or ventriculography. If the clinical condition permitted, patients admitted to CHEO were transported by ambulance to the old Ottawa General Hospital in lower town (Bruyere Street) for EMI scan examinations and then transferred back to the CHEO. Under very difficult circumstances, Dr. Ivan was able to run the Division of Neurosurgery with some help from the surgical residents and some of our local colleagues. More specifically, Drs Eric W. Peterson, Brien Benoit, Michael Richard, and Jean Dennery.

In January 1977, Dr. Enrique Ventureyra (Fig. 4) joined the Division as a Clinical Fellow. Six months later after completing a period of training at the Hospital for Sick Children in Toronto, Dr. Ventureyra was appointed to the active Neurosurgical staff of CHEO, thus, becoming the first fellowship-trained Pediatric Neurosurgeon in this region.

Shortly after his appointment to the neurosurgical staff, Leslie Ivan and Enrique Ventureyra decided that the Division should be built up from scratch and that the acquisition of modern and sophisticated equipment was required (Figs. 5 and 6).

In July 1977, the first intracranial pressure monitor was purchased with funds donated by the family of a patient who had died following a severe head injury. With the acquisition of this new equipment and a multidisciplinary approach, the management of severe pediatric head injuries was clearly defined and established in the CHEO. Since
then, the mortality rate for severe head injuries has remained comparable to most major pediatric neurosurgical facilities in Canada and the USA.

In July 1977, the Division embarked on a project of chronic cerebellar stimulation for the relief of spasticity in cerebral palsied children and completed a pilot study in 14 patients. Due to unsatisfactory results with this procedure, after publishing the data from this study, the project was abandoned.

During the first 2 years of activity (1977–1979), we found that the infection rate for CSF shunt operations was unacceptably high, with an incidence >20%! It was decided then to modify the protocol and technical details for this procedure and to concentrate all the patient material in the hands of the two full-time Pediatric Neurosurgeons. With these measures in place, the infection rate for CSF shunting procedures decreased to <5%!

In 1979, a ceiling-mounted operating microscope was installed in the Neurosurgery Operating Room, consequently micro-neurosurgery gradually developed in this institution.

In July, 1980, the first CT scanner became available at the CHEO. The availability of this modern imaging equipment improved tremendously the management of neurosurgical patients in this hospital, head injuries in particular. Dr. Ivan’s resolve and effective intervention were instrumental in the acquisition of this equipment.

In 1980, Dr. Ivan was appointed Professor and Chairman of the Division of Neurosurgery of the University of Ottawa and the University Chair of Neurosurgery migrated to CHEO. Under Dr. Ivan’s leadership, our Neurosurgical Training Program gained national and international reputation and attracted trainees from many countries (Fig. 7).

In 1981, in cooperation with the Pediatric Neurology service, a program for the surgical treatment of medically intractable pediatric epilepsy was started. Since then more than 200 procedures have been carried out successfully, without mortality and minimal morbidity. This experience
was summarized in a 20th anniversary book entitled *Epilepsy Surgery at the CHEO*.

Beginning in 1981, intra-operative urodynamics and anal sphincter monitoring was implemented and utilized routinely for monitoring during the surgical release of tethered spinal cords. This method of IOM contributed to improve the safety and outcomes of these procedures.

In 1983, with a donation from the Ontario Cancer Foundation, the first Cavitron Ultrasonic Surgical Aspirator was purchased. Consequently the operative management of pediatric brain tumors was significantly enhanced.

Early on, basic research was centered on spasticity and intracranial pressure. Resulting from these basic research projects, surgical equipment and techniques were modified and refined for the treatment of spasticity (Bischoff’s myelotomy) and fontanel pressure monitoring was developed.

During this time, numerous publications in peer-reviewed journals, books, and book chapters emanated from this Division. The CHEO Research Institute came into existence with Dr. Leslie Ivan as one of the founding members.

In January 1985, Dr. Ivan resigned his university and hospital positions and a few months later retired from active neurosurgical practice (Fig. 8).

In March 1986 Dr. Ventureyra succeeded Dr. Ivan as Chief of Neurosurgery at the CHEO.

Beginning January 1988, due to government cutbacks of residency positions in the province of Ontario, residents from the University of Ottawa Neurosurgical Training Program were not available for rotation at the CHEO. The unavailability of neurosurgical residents triggered a
manpower crisis in the Division. At that point in time, Clinical Fellows in PNS were not available at the CHEO. Consequently, Dr. Ventureyra had the responsibility of running the Division single-handedly! Thus, measures were taken to compensate for the absence of neurosurgery residents. With the assistance of General Surgery residents and some local colleagues, Drs. Vasco DaSilva and Khalil Khalaf, and the appointment of a clinical assistant to help in the operating room, Dr. Ventureyra was able to overcome the difficulties and continue the smooth running of the Division.

In September, 1989, Dr. Michael J. Higgins, a graduate from Tulane University in the USA, joined the Division of Neurosurgery as a Clinical Fellow. Subsequently, the Division continued to attract and hire national and international Clinical Fellows every year.

In 1990, the first MRI equipment became available at the Ottawa General Hospital, located in the same campus, the availability of this imaging equipment improved neurosurgical patient management at the CHEO.

In 1991, CO₂ laser equipment was acquired. In 1992, the old CT scanner was replaced with state-of-the-art equipment. With the opening of the cardiac surgery unit at CHEO, the most modern angiographic equipment became available.

In 1992, neurosurgery resident rotations resumed and one neurosurgery resident rotates at the CHEO for periods of 3 to 6 months.

In 1993, neuroendoscopy became available at CHEO with funds donated by the family of a patient born with spina bifida.

In February 1993, Dr. Michael J. Higgins joined the Division as a second full-time Pediatric Neurosurgeon.
In 1995, Dr. Ventureyra was promoted to the rank of Full Professor (Neurosurgery) in the Department of Surgery of the University of Ottawa.

In 1996, after Dr. Higgins’ departure to the USA, his position was replaced and Dr. Michael Vassilyadi, a graduate from McGill University, who joined the Division.

In 1997, Dr. Ventureyra was appointed Director of Pediatric Neurosurgery at the University of Ottawa.

In 1997, the Division acquired neuronavigation (IGS) equipment which was the first in the city. The availability of this state-of-the-art technology brought a new dimension in the management of patients requiring intracranial neurosurgical procedures.

In 2001, Mrs. Karen Dube joined the Neurosurgery Team as Nurse Practitioner. Her addition to our team contributed to the comprehensive management of neurosurgery patients and their families.

In 2002, a Plagiocephaly Clinic was created at CHEO, for the management of children with positional head deformities. Currently, this special clinic is managed by our nurse practitioners under the supervision of the neurosurgical staff.


In 2004, Dr. Ventureyra was named President of the International Society for Pediatric Neurosurgery (ISPN) becoming the third Canadian Pediatric Neurosurgeon to receive this honor in the ISPN’s 33 years history.

In 2006, Dr. Munyao Nzau a graduate of Helsinki University and former fellow from our PNS program joined the Division as clinical scientist and third full-time Pediatric Neurosurgeon.

In 2009, Ms. Gail McCartney joined the Division and the Neurosurgery team as a second Nurse Practitioner.

In 2011, a Concussion Clinic was inaugurated at CHEO, to enhance the management of patients with TBI.

On January 1, 2012, after 35 years at CHEO (Fig. 9), Dr. Enrique Ventureyra retired from neurosurgery practice at the hospital. Currently, his position has not been replaced and a search committee has been struck to identify and select a suitable candidate to replace Dr. Ventureyra’s role at the Hospital and University.