

The History of Anaesthesia in Hamilton, Ontario, Canada

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October 1977

The intention of writing the history of Anaesthesia in Hamilton is to give a picture of progress and personnel involved with this specialty during the past fifty years.

The introduction of this article will deal with the progress and gradual changes in anesthesia which previously was often a frightening experience; to the present where it has become a more comfortable and safe procedure for the patient facing the surgeon's knife. Anaesthetic agents and techniques will be mentioned without discussing the details. The second part of this study will deal with the personnel involved, as near as possibly chronologically, with an available biography of each person.

From the time the first anaesthetic agents were introduced to the Medical Profession, nitrous oxide (1844), ether (1846) and chloroform (1847) respectively, the use of these agents in surgery and obstetrics gradually became universal.

Historical facts reported in writings and autobiographies tell of the use of these agents in Canada from 1848. It is assumed that these agents were used in Hamilton about the same time.

As there were no special centres for training in the art of administering anaesthetics, medical students received anaesthetic information as part of the general medical course. The administration of anaesthetics, therefore, became part of the practicing physician's daily chores.

As more surgical procedures were introduced and performed, physicians who were interested and experienced in the use of these agents were called upon to give this service. Consequently, the only anaesthetists available were general practitioners or part-time anaesthetists who spent part of the day in the hospital.

Many minor surgical procedures such as the removal of tonsils and adenoids, as well as obstetrics were performed in the home. Interns, especially those on the surgical services were trained by the staff anaesthetists, so many of the general anaesthetics were administered by interns under the supervision of the staff anaesthetist. Staff anaesthetists were also responsible for lecturing to the nursing staff on anaesthesia.

In Hamilton prior to and following the First World War most of the obstetrics were performed in the home. Only the most difficult and serious cases were sent to the hospital. The obstetrical service at the Hamilton General Hospital was contained in an old residence at the rear of the H.G.H. called the Southam Building. The obstetrical service at St. Joseph's Hospital was contained in an old residence next to the main part of the hospital facing Charlton Avenue East, called Casa Maria. The H.G.H obstetrical unit was moved to a new building on the mountain in

1938, adjacent to the convalescent wing. In the early 40's, Casa Maria was torn down and a new obstetrical wing added to the main building. A third maternity hospital flourished during this period, owned and administered by the Salvation Army. In 1898, the Salvation Army obtained an old residence on Mountain Avenue in the west end of Hamilton and converted it into a small hospital with one well equipped case room. This hospital was used primarily for the assistance and care of unwed mothers, but in the 30's it was popular with other than the unwed mothers for their deliveries because of the excellent care and attention given to the patients. Graduate nurses and a physician on call attended the maternity unit. In 1950, the Mountain Avenue hospital was moved to a more central area on James Street South. A few years later the maternity unit was discontinued because of the modern facilities in other hospitals.

This article would not be complete if mention was not made of the nursing profession and the valuable assistance they gave to the medical profession especially in home obstetrics.

In 1899, Mrs. Adelaide Hoodless of Hamilton formed a district nurses association which was later known as the Victorian Order of Nurses. On July 26th, 1899, the first nurse, Miss Emily Dakin, arrived from Halifax to assume her duties in Hamilton. By 1948, there were 18 full-time nurses on staff and the case load for that year was 29, 415 home visits and a large number of these were for obstetrical service. A gauze mask and a tin of ether were among the necessary items the V.O.N. carried in her bag. The physician depended on the V.O.N. being present to care for his patient prior to and following the confinement, besides acting as an anaesthetist during labour and delivery. Some physicians preferred a two to one mixture of ether to chloroform for deliveries because of the more rapid action and depth of anaesthesia, but in the hands of nurses and inexperienced physicians ether was much safer.

Before the introduction of gas machines in the early 20's in Hamilton, the only method of administering a general anaesthetic was the dropping of ether or chloroform on a gauze face mask and asking the patient to breathe deeply. This induction sometimes took a long time before the patient became unconscious, and more than occasionally became excited with considerable muscular activity. Because of this disagreeable and frightening experience and the post-operative nausea which sometimes occurred, many patients avoided having surgery performed. A rapid and pleasant induction to anaesthesia was indicated to assure a better anaesthetic for the patient, surgeon and a more successful outcome for the surgical procedure.

Nitrous oxide became this agent. Although nitrous oxide was discovered and prepared by Priestly in 1772, its use as an anaesthetic was not realized until 1844 when a dentist, Horace Wells of Hartford, Connecticut demonstrated its anaesthetic properties. However, it was almost 20 years later before mention was made of its use in general surgery. Nitrous oxide could not be used without oxygen and both gases had to be contained under pressure in metal cylinders. To use these gases necessitated special equipment, thus the gas machine was invented. Special training became necessary for physicians wishing to use nitrous oxide. One of the training centers of note was in Toledo, Ohio, where Dr. E.I. McKessen, a physician interested in anesthesia, developed the use of the nitrous oxide in surgery. In 1910, Dr. McKessen perfected the first intermittent flow nitrous oxide and oxygen anaesthetic apparatus with accurate control for the two gases. The machine was named after him. From that time, many changes and improvements were introduced to the anaesthetic apparatus by others such as Heidbrink, Foregger, etc. Many Canadian physicians including some Hamilton dentists received their training in the use of this new anaesthetic apparatus in Toledo.

During the First World War, Dr. Heurner Mullin, a general practitioner in Hamilton, was the first physician to use nitrous oxide in this city. Following 1918, Dr. Mullin discontinued the administering of anaesthesia to specialize in internal medicine. Later he was appointed Chief Coroner for Hamilton and district and held this office until a few years before his death in 1956. During his tenure as coroner, Dr. Mullin was a welcome friend to the anaesthetist. He routinely requested a thorough investigation of all operating room deaths especially those which appeared to be due to anaesthetic. Many of these were proven to be due to other causes and not the anaesthetic.

Dr. W.M. Cody was the first full-time anaesthetist in Hamilton, a staff appointment as anaesthetist to the Hamilton General Hospital was given to him in 1917. Dr. D.A. Warren was appointed to the anaesthetic staff of H.G.H. in 1922. There were no further appointments until 1937 when Dr. R.M. Stringer, a part-time general practitioner was the third physician appointed to the H.G.H. anaesthetic staff. At this time, a department of anaesthesia was not thought of or considered. Anaesthesia was a section of surgery and the surgeon was responsible for the anaesthetic and the anaesthetist giving that anaesthetic. It was not until 1950 that a department of anaesthesia was set up at the H.G.H. Anaesthetists were required to purchase their own gas machines and anaesthetic equipment in each hospital. It was also necessary to have a portable

machine which was usually kept in his car for calls in the home or to the smaller hospitals in the Hamilton area such as Simcoe, Dunnville, Brantford and Grimsby. It was not until several years later that the Hospitals supplied this equipment to the staff anaesthetists. Mention should be made also that some members of the dental profession in the early 20's became interested in the use of nitrous oxide especially for extractions. Among some of the dentists in Hamilton who used this procedure were Drs. S.C. Watters, G. Everett, R. Davis, Wm. Schwet, R.F. Flack, C. Moyle and E. Dore.

In the early 20's and 30's, most of the anaesthetics were administered by general practitioners, interns and nurses. It became the responsibility of the staff anaesthetists to train the interns in the art of "pouring ether". Many general practitioners gave the anaesthetic to their own patients when admitted for surgery. Because of the reluctance of some patients to take general anaesthesia, due to the unpleasant reactions, spinal and block anaesthesia became popular. During this period, a large percentage of anaesthetics were blocks of this type and until the late 50's, from the H.G.H. records, over one third of anaesthetics administered were spinals. As special skill and training were required for this technique many surgeons gave their own spinal anaesthetic and proceeded to the surgical procedure with an intern or nurse monitoring the patient. Novocaine (procaine) was the agent used at that time but several years later other agents were introduced with longer action and more profound blocking effect. Two of the agents used were pontocaine (tetracaine) and nupercaine (dibucaine), the former slightly heavier and the latter lighter than spinal fluid. It was evident that in the use of these drugs, the choice depended on surgical procedure. Pontocaine became the agent of choice locally and was used for several years with satisfactory results. Spinal anaesthesia, with its good points regarding safety and good relaxation, had two undesirable features; namely, lowering of the blood pressure and sometimes causing post-operative headaches.

As hospital beds increased, surgical procedures increased and more trained anaesthetists were needed on hospital staffs. Between 1941 and 1950, nine trained and full-time anaesthetists were appointed to the H.G.H. and three to St. Joseph's Hospital, although all anaesthetists had privileges to both hospitals. In 1960, these dual privileges were discontinued and the anaesthetic staff separated. The anaesthetists appointed to the H.G.H. were Drs. F.G. Ruston, H.L. Foster, L.S. Bartlett, O.R. Bartlett, R.I. Probert, R.H. Holbrook, J. Kyles, T. McConnachie and Marion Morgan. Appointments to St. Joseph's Hospital were Drs. R.J. Fraser, E. Jones and K.A. Kraft.

At the onset of the Second World War, Drs. Warren and Ruston were called into service and obtained leaves of absence from their hospital appointments. After four years as an anaesthetist in the Canadian Forces Overseas, Dr. Ruston returned to Hamilton in 1946 and continued his duties as staff anaesthetist at the H.G.H. Dr. Warren returned to Hamilton three years later to continue anaesthesia doing mostly private work in both hospitals.

To indicate the importance for physicians to have proper training and experience in anaesthesia, a situation occurred in Hamilton during the 1939-1943 period. A physician came to Hamilton and established himself as an anaesthetic specialist. Because of the War and shortage of medical personnel, he became quite busy. It was soon realized, however, that he was inexperienced and with inadequate anaesthesia training because of several unfortunate operating room deaths proven to be due to anaesthesia. There was an open Coroners Inquest which indicated this fact and he was forbidden to administer any further anaesthetics until properly trained and experienced in this specialty. This physician eventually returned to the United States where he had previously held the office of hospital superintendent.

Prior to 1947, some of the Hamilton anaesthetists were non-resident member of the Section of Anaesthesia of the Toronto Academy of Medicine, attending the section's monthly meetings in Toronto. In March 1947, a Section of Anaesthesia was formed in Hamilton as a section of the Hamilton Academy of Medicine. The initial members were: Dr. W.M. Cody (Chairman), Dr. R.M. Stringer (Secretary-Treasurer), Dr. D.A. Warren, Dr. F.G. Ruston, Dr. H. L. Foster, Dr. L.S. Bartlett, Dr. R.J. Fraser, Dr. K. Kraft, Dr. J.N. Kyles, Dr. R.I. Probert, Dr. R.H. Holbrook, Dr. H. E. Peart (Hamilton, Sanitorium) and Dr. G.N. Black (Port Colborne, Ontario).

For the first several years, monthly meetings of the Section were held in the member's home. These meetings were very popular and well attended. The group discussed their anaesthetic and hospital problems and usually a paper was presented either by a member or an invited guest. Following the business period, the wives were invited to a social hour with food and drinks provided by the host member. During the summer months, a picnic was organized for the members and their families at one of the summer cottages of Drs. Fraser, Holbrook and Stringer and a Christmas party was usually held at the home of Dr. Best in Burlington. As the number of anaesthetists increased, the home meetings decreased so eventually all meetings were held in the board rooms of the hospitals or the Academy.

In the middle thirties, a major advance in anaesthesia came to pass with the introduction of cyclopropane. This new agent, an odourless non-irritating gas, considerably more potent than nitrous oxide but compatible with both nitrous oxide and ether, became widely used in general anaesthesia. It provided a pleasant induction for the patient with better relaxation for the surgeon.

An interesting note regarding cyclopropane which has been recorded and mentioned in other articles perhaps should be repeated. Cyclopropane was first discovered in Toronto by two researchers, Drs. Lucas and Henderson in 1929. During their investigation, its effect on animals as an anesthetic proved very favourable but up to this time had not been given to a human. Dr. Eason Brown, a staff anaesthetist at the Toronto General Hospital using this gas anaesthetized Dr. F. Banting, a research physician working on diabetes at the University of Toronto. The results were spectacular and very satisfactory but the hospital authorities would not allow it to be used clinically. Dr. Banting was later known around the world as Sir Fredrick Banting, the discoverer of insulin. It was not until 1933 that Dr. Ralph Waters, of Wisconsin, wrote the first paper on cyclopropane and its important contribution to medicine. Dr. D. A. Warren introduced cyclopropane as an anaesthetic in Hamilton in 1935, in the first open chest surgery performed by Dr. E.C. James at the Hamilton Sanatorium. For several years, cyclopropane appeared to be the ideal anaesthetic agent for all general surgery. As electrical equipment such as cautery, cardiac monitors and x-ray machines were brought into the operating rooms, cyclopropane became a problem because of its inflammability. Cyclopropane, an inflammable gas when combined with oxygen resulted in an explosive mixture, so extreme caution was necessary when it was administered. Rules were made that the gas machine and the anaesthetist must be grounded against static electricity. In 1958, halothane, and later methoxyflurane, being vaporous and non-inflammable, replaced cyclopropane. In special cases, however, cyclopropane was allowed to be used if all precautions were followed such as grounding the anaesthetist, the gas machine and no electrical equipment in the operating room. The H.G.H. reported two operating room explosions during this period. The first in 1946 when an ether-oxygen anaesthetic was being administered for an adult tonsillectomy but without serious consequences. Several years later, a cyclopropane explosion occurred during an orthopedic operation with fatal results to the patient. Both of these cases occurred during winter months using electrical equipment when the operating room

atmosphere was quite dry. The hospital compiled by introducing more moist air into the operating room during the winter months to maintain a humidity of 40-50%.

Following cyclopropane, a further advance in anaesthesia during the middle thirties was the introduction of an intravenous induction agent, a short acting thio-barbiturate, pentothal sodium. This was an almost ideal anaesthetic agent because of its fast action and without any of the disagreeable side effects to the patient. In 1935, Dr. J. Lundy of the Mayo Clinic reported using this anaesthetic agent in more than a thousand surgical procedures with most satisfactory results. Pentothal sodium was first used in Hamilton in early 1938. At the present time, it is used as an induction agent for most general anaesthetics. Several years later, another agent was introduced in the form of a muscle relaxant called curare. Dr. Harold Griffith of Montreal began using this drug under the name of intocostrin in 1944. Since then several synthetic preparations of the original curare have been introduced to medicine, with either short or long acting effect. A short acting drug, succinylcholine, a depolarizing muscle relaxant became available during the early 1950's.

For many years, people living in the Niagara Penninsula came to Hamilton for surgery as the small hospitals in this area were not equipped or staffed for major surgical procedures. The West Lincoln Memorial Hospital in Grimsby, about 18 miles south east from Hamilton, preferred to have these cases operated on in their own hospital.

On January 29, 1948, the Grimsby Hospital, formerly the Deer Park Golf Clubhouse was destroyed by fire. A new larger hospital was built and opened on November 3, 1949. This new unit was equipped for major surgery, with adequate post-operative facilities. Dr. W.O. Stevenson, a Hamilton surgeon, was asked to perform the elective surgery in that hospital. For several years, he spent one day a week in Grimsby taking with him a Hamilton anaesthetist to administer the anaesthetics. Following his retirement in the middle of the fifties, Dr. Gardiner Cooper of Hamilton continued this service. Dr. Cooper, who later became Chief of Surgery at the H.G.H., discontinued this commuting service when the Grimsby Hospital was able to add specialists in surgery and trained practitioner-anaesthetists to their hospital staff.

Anaesthesia booking became an important factor to Hamilton anaesthetists. The surgeon usually called the anaesthetist at his home or office making this appointment. In the late thirties, an arrangement was made with the Medical Arts Building in Hamilton to maintain an anaesthetic booking service with the switchboard giving 24 hour availability. This proved quite satisfactory

to the surgeon and anaesthetist. Although the surgeon would not always have the anaesthetist of his choice, he was supplied with an anaesthetic specialist including emergency coverage. This arrangement continued until 1960 when the hospitals closed anaesthetic staff appointments to each hospital and a new booking policy was set up in each hospital. At the H.G.H., the anaesthetist on call for the day was responsible for making the anaesthetic assignments for the following day. An anaesthetist was appointed to an operating room and expected to administer all the anaesthesia for the surgery allotted to that room.

The anaesthetist on call was responsible for the anaesthesia coverage in other areas such as fracture, emergency, x-ray and obstetrical units. In the early fifties, Dr. Cody initiated a policy of retaining an anaesthetist in the obstetrical wing commencing from noon to the following noon giving complete service for the 24 hours. At St. Joseph's Hospital, the Chief of the Anaesthetic Department was responsible for the anaesthetic listings.

A safety measure in anaesthesia is the use of an endotracheal tube. This tube inserted into the trachea allows a free airway to the lungs and protection from laryngeal spasm and regurgitation of stomach contents especially in emergency cases. Dr. D.A. Warren first introduced this technique in Hamilton in the early thirties. The first tubes were McGill tubes of pliable red rubber about twelve inches long with a bevel at one end. When first used, it was introduced blindly through the nose into the glottis, on a cough, with the patient lightly anesthetized. Some anaesthetists became so adept that successful introduction occurred in 80% of the cases on the first try. In the early thirties, during a polio epidemic in the Hamilton area, Dr. Miles Brown then Assistant Superintendent of the H.G.H. used this technique and saved many lives when these cases arrived at the hospital. Since the introduction of the laryngoscope, modern anaesthetic agents and muscle relaxants, intubation technique has improved considerably so at the present time its use is almost routine during general anaesthesia.

In 1950, expansion of the H.G.H. and St. Joseph's took place with addition of more surgical beds and several more operating rooms in each hospital. A small recovery room was included at the H.G.H. accommodating about six stretchers or three beds. It soon proved its value to the surgical unit. In 1960, a larger area was built on the same level adjoining the operating theatre which could accommodate twelve beds for recovery. Adjoining the recovery room was added a large area equipped and staffed for intensive care. An anaesthetist was on call and available at all times for these units.

Between 1950-1960, new appointments to the anaesthetic staff at H.G.H. were: Drs. J.E. Marshall, R.G.M. Harvey, D.C. Aikenhead, V.L. Politi and D.K. Morgan. Appointed to St. Joseph's staff were: Drs. J.N. Kyles and L.S. Bartlett both former staff members of H.G.H.; W.S.D. Best, Wm. Bota, J.K. Moss, J.P. Rado and M. Bazoian.

With the increase of available anaesthetists, other areas in the hospitals were opened to this service. In 1951, the Hamilton Ontario Hospital (Hamilton Psychiatric Hospital) commenced active surgical treatment of many chronic patients. This new approach to treating chronic mental patients entailed a surgical procedure called lobotomy, a delicate operation severing certain nerve tracts in the frontal lobe of the brain. A prominent neuro-surgeon, Dr. Kenneth McKenzie, came to Hamilton once a week to perform these operations. Previously, the anaesthetic used for this procedure was fairly deep general anaesthetic with intubation. Due to the poor physical condition of many of these patients, and the risk of a long recovery period this procedure was considered a major operation. Dr. J.E. Marshall, a member of the H.G.H. anaesthetic staff, was appointed to give these anaesthetics. He introduced a technique with Dr. McKenzie using a local block supplemented with pentothal sodium without intubation. With this technique, all patients were awake and conscious immediately following the procedure. Dr. Marshall later presented a paper describing over 300 successful cases. In 1954, the Hamilton Psychiatric Section introduced an added procedure to psychiatric therapy, namely electroshock therapy. This procedure necessitated a short anaesthetic deep enough to ease pain with relaxation of the muscles which go into a sharp contraction when shocked. Dr. G.C. Beacock, Chief of the Department of Psychiatry at both hospitals, initiated an anaesthetic procedure with Dr. Vince Politi, a staff anaesthetist at H.G.H. The anaesthetic chosen was a measured amount of pentothal sodium followed by a short-acting muscle relaxant (succinylcholine) given intravenously. These treatments were in the Outdoor Departments as most of the patients were ambulatory and allowed to return home shortly after. This anaesthetic procedure appeared to be ideal to facilitate E.C.T. and all staff anaesthetists became involved in assisting at these clinics.

Following Dr. Cody's retirement as Head of Anaesthesia at the H.G.H. in 1946, R.M. Stringer was appointed Chief of the service. In 1950, anaesthesia became a full department at the H.G.H. On November 26th, 1948, the H.G.H. received its initial approval for the residency training in anesthesia by the Royal College of Physicians and Surgeons of Canada and was specifically designated for two clinical training years. St. Joseph's Hospital received approval

for one year resident training by the College on June 4th, 1952. These approvals remained in effect until 1970 when the two hospitals became integrated into the McMaster training programme.

Prior to 1940, Novocaine (procaine) was the anaesthetic agent used mostly for local and spinal blocks. This drug however was unpredictable, because of the lack of potency, causing at times only partial blocking and of short duration. During the middle forties, several new blocking agents were discovered and introduced to the profession with considerable advantages. Two of these agents we began using were pontocaine (tetracaine) and nupercaine (dibucaine), the former slightly heavier and the latter lighter than spinal fluid. The choice of drug depended on the surgical procedure and the experience of the anaesthetist. Pontocaine became our drug of choice and was used for many years with very satisfactory results. Spinal anaesthesia with its good points as to safety and relaxation had two undesirable features; lowering the blood pressure and sometimes post-operative headaches. In the early fifties, a new blocking agent was introduced to the profession, lidocaine (xylocaine). This agent was less toxic and longer acting than the drugs currently used and proved ideal for the epidural technique of blocking spinal nerves. The epidural technique allows the blocking of sensory nerves outside the spinal dura without interfering or disturbing spinal fluid, hence diminishing the unfavourable side effect of spinal anaesthesia (headache).

Dr. Frank Ruston, staff anaesthetist at H.G.H., following the successful experience of this technique with adults, began using epidurals on infants. He designed a special infant epidural and set up a dosage chart indicating the amount of xylocaine in cubic centimeters per pound weight of the infant. Dr. Ruston presented papers describing successful results on infants from a day to over a year old.

Dr. Russell Fraser appointed Head of Anaesthesia at St. Joseph's Hospital in 1945 was a firm advocate of spinal anaesthesia and for many years used this technique whenever possible. In the late forties, he began experimenting with local anaesthetic agents. He eventually obtained a lighter than spinal fluid solution prepared in 20 c.c ampules called westocaine. For some years, this agent was used in his hospital for spinal anaesthesia. Later, Dr. Fraser presented a paper describing his technique and results. Dr. Fraser was forced to retire as chief due to illness which eventually lead to his death on February 10th, 1969.

Obstetrical anaesthesia differs somewhat to surgical anaesthesia because of the added risk of the baby. Sedation and anaesthesia to the mother presents a risk to the baby by depressing the respiratory and circulatory systems. For this reason during the thirties spinal anaesthesia was used here in both obstetrical units in a large percentage of deliveries and caesarian sections. For deliveries a very satisfactory saddle block was obtained by introducing a minimal amount of the agent into the fourth lumbar space with the patient in the sitting position.

In the early forties at the H.G.H. obstetrical unit continuous caudal block using metycaine (piperocaine) was tried on a series of cases. This at first seemed to have considerable advantage over spinals but later it was discontinued because of infection developing in cases, one of which was fatal. During the forties because of the lack of anaesthetists, trilene (trichloroethylene) inhalers were given to the patients during the second stage of labour. The patient was instructed to breathe into this apparatus during her contractions until ready for the case room. When a general anaesthetic was indicated a fairly safe and satisfactory anaesthetic was the mixture of cyclopropane, nitrous oxide and oxygen in the ration 3, 5, 7. Given intermittently, it almost always produced a crying baby. With the establishment of 24 hour anaesthesia coverage, Hamilton became one of the first centers to have this anaesthetic service for obstetrics and set a precedent for other hospitals. In the middle sixties, Drs. Fred Wright and Don Catton introduced continuous epidural anaesthesia to the H.G.H. obstetrical unit. This continuous sensory nerve block to the uterus had proven ideal for the mother and baby and has generally replaced spinal and general anaesthesia for routine obstetrical cases.

More anaesthesia appointments were made to the Hamilton Hospitals between 1960-1970. Additions to the H.G.H. were: Drs. G.H. McMorland, E.J. Ashworth, Deane Morgan, D.V. Catton, W.R. Roberts, D.L. Boyd, F.J. Wright, R.A. Browne, Rose Miron, T.H. Witton and N.C.H. MacDonald. Dr. R.M. Stringer retired as chief in 1960 with the appointment of Dr. R.I. Probert as Head of the department. Appointment to the anaesthetic staff at St. Joseph's Hospital were: Drs. H.P. Andry, S.H. Stolar, P.R. Dyckhoff, J.M. Farrell, W. Leong, F.F. Lepinskie, W.P. Bota, D.M. Lopez and F.J. Wright (a former member of H.G.H. staff). Dr. Karl Kraft appointed Chief of anaesthesia at St. Joseph's following the retirement of Dr. Russell Fraser, died on May 10, 1964. He was succeeded by Dr. J.N. Kyles to head the department.

With 1960, a large increase in population in the Hamilton area stimulated hospital expansion and construction. There was expansion of both H.G.H. and St. Joseph's Hospitals. At

H.G.H., two large operating rooms for cardio-vascular and neuro-surgery were equipped as well as a large wing for recovery and intensive care. At St. Joseph's, a Regional Dialysis Center was instituted for kidney disease with a Kidney Transplant Unit and a Regional Respiratory Unit. Beds were also increased to bring St. Joseph's Hospital capacity to over 700 beds plus 102 bassinets in the maternity ward.

A new hospital was built on the mountain close to the old Mount Hamilton Hospital and the maternity unit. This new building (part of the Hamilton Civic Hospitals) was named the Nora Frances Henderson but later changed to the Henderson General Hospital. This unit was named after a very prominent and well thought of lady member of the Hamilton Board of Control. In December 1964, the Department of Gynecology of the H.G.H. moved to the Henderson, and in January 1965 the unit was opened to the Department of Surgery. The operating room suite included ten operating rooms with a large recovery and intensive care area. The Regional Cancer Treatment Center for Hamilton and area was moved to the Henderson unit which included one operating room under the direction of Dr. Lloyd Green. The bed capacity of the mountain hospitals was in excess of 700 plus 108 bassinets and 18 neonatal beds in the obstetrical wing. Although the mountain hospitals are some distance from the H.G.H., they are part of that institution and come under the name of the Hamilton Civic Hospitals, constituting a medical complex in excess of 1245 beds. Dr. William Noonan is the Executive Director of the Hamilton Civic Hospitals with two Administrators, Drs. E. Wilson (Henderson Unit) and G. Woodward (Barton Unit). This expansion of surgical services made it evident that anaesthetic coverage posed an added problem. Because of the distance between the mountain units and the H.G.H., commuting of anaesthetists between these units was impossible. The anaesthetist on call at the H.G.H. maintained the responsibility for anaesthetic coverage for both hospitals by designating anaesthetists to each unit for the following day. Since the McMaster University Medical Center came into being, the clinical training of anaesthesia residents has been shared among the H.G.H., St. Joseph's and M.U.M.C.

From 1970 to date, further appointments to the H.G.H. anaesthetic staff were: Drs. G.R. Heinrich, G.R. Gerula, Paul A. Grant, and P.L. Philips. To St. Joseph's staff: Dr. K.Y. Tse. Dr. John Kyles retired as Chief and Dr. S.H. Stolar was appointed to head anaesthesia.

Chedoke General Hospital was constructed in 1960 at the site of the Hamilton Sanatorium, situated on the mountain brow, west of the Henderson General. This unit contains

all facilities for general surgery with over 200 beds but does not contain a maternity unit. Dr. Deane Morgan was appointed Chief of anaesthesia with a staff of Drs. Marion Morgan, Charles Waller and M. Bazoian. Drs. Deane Morgan and Marion Morgan, Charles Waller and M. Bazoian. Drs. Deane Morgan and Marion Morgan were former members of H.G.H. anaesthetic staff.

Still another new hospital was opened in the Hamilton area in Burlington, a few miles east of Hamilton, the Joseph Brant Memorial Hospital. This hospital was named after a famous Indian chief who resided near that location. For the first year or so Hamilton anaesthetists were called upon to provide their service until a permanent staff was appointed.

In the late thirties and early forties, several centers in Canada were set up for anaesthetic training. Among the more prominent areas were Toronto, Montreal, and London. Some of the outstanding anaesthetists appointed to these centers were: Drs. Harry Shields, R.A. Gordon, Stan Campbell at the University of Toronto; Drs. Harold Griffith, Wesley Bourne at the University of McGill, Montreal; and Drs. John Blezard, W.E. Spoerel at the University of Western Ontario, London.

With the opening of McMaster Medical Center at Hamilton in 1970, an additional excellent anaesthetic training center is available for Canadian doctors. McMaster Medical Center has facilities for Medicine, Surgery, Maternity and medical research with over a 400 bed capacity.

Dr. D.V. Catton, a member of the H.G.H. anaesthetic staff, was appointed Professor and Chairman of the Department of Anaesthesia of McMaster University in 1971. The anaesthetists on Dr. Catton's staff are: Drs. J.M. Thislewood, J.R.A. Rigg, D.A. Morison, J.B. Forrest, G.L. Dunn, R. Rajagopalan.

On October 12, 1972, the first surgery performed at the McMaster University Medical Center was a gynecological procedure by Dr. F.L. Johnson, Professor of the Department of Gynecology with Dr. R.M. Stringer administering the anaesthetic.