

THE NOVA SCOTIA MEDICAL JOURNAL

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Women in Medicine — A Celebration

Jean Gray,* MD, FRCP (C)

1990 marks the one hundredth anniversary of the enrollment of the first woman at Dalhousie Medical School. The Faculty of Medicine will be celebrating this important anniversary with an entire year of events. A scholarship will be set up in the name of Dr. Annie Hamilton, to be awarded to one or more second year medical students (of either sex). Almost all of the major guest speakers at the medical school in 1990 will be distinguished female clinicians and scientists. We hope to convince Dalhousie Senate to award honorary doctorates at the Medical Convocation to outstanding women graduates of Dalhousie medical school. And the highlight of the year will be a two-day symposium on October 12 and 13, celebrating women's contributions to medicine, and considering the future of the profession now that women play an increasingly pivotal role.

This issue of *The Nova Scotia Medical Journal* marks the first event in "Women in Medicine — A Celebration". Women associated with Dalhousie Faculty of Medicine, either as graduates or faculty, were invited to contribute. To ensure a comprehensive viewpoint, other articles were solicited from acknowledged experts in the field (please see contributions by E. Ryten and Rev. D. Mott).

The first two articles provide an historical context for what follows. Dr. R. Gill has outlined the story of the "first woman", Dr. Annie Hamilton, whereas Drs. Szuler and MacLeod have added to the tapestry by highlighting the stories of the early female Dalhousie graduates who made their careers in the medical missionary field. Eva Ryten, the director of research for the Association of Canadian Medical Colleges, provides an historical overview of the entry of women into medicine across the country.

Drs. C. Lazier and S. Salisbury are the next two authors in our series. Dr. Lazier is a member of the Department of Biochemistry at Dalhousie, and is world recognized for her work on steroid

* Professor, Department of Medicine and Associate Professor, Department of Pharmacology, Dalhousie University, Halifax, N.S.

hormone receptors. Dr. Salisbury is appointed in both Pediatrics and Medicine, and has contributed extensively to the field of endocrinology during her time at Dalhousie. The development of a program dealing with sexually abused women was spearheaded by female members of the Department of Family Medicine, and Dr. Jan Boxall has reviewed this area for us.

Finally, the Journal focuses on some issues associated with being a "woman doctor". Dr. Frances

Rosenberg highlights the concerns the modern woman physician faces today, whereas Rev. Mott tells us of the position of the "physician's spouse". The last article considers the current situation faced by couples with two professional careers.

I would be remiss if I didn't spotlight the immense help I received from Mrs. Lil Mallett in assembling these papers. Welcome to the year of "Women in Medicine". Please come and help us celebrate! □

EMERGENCY MEDICINE COURSE

SATURDAY APRIL 07, 1990

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- [5] Gynecological Emergencies
- [6] Pneumonia

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- [1] Radiology — Practical Head to Toe
- [2] Dermatology
- [3] Cardiac Life Support Update
- [4] Casting of Common Fractures
OR
- [1] Traumatology — Tubes and
line placement
- [2] Survival School
(Extreme Cold Exposure Treatment)

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HOWARD M. EPSTEIN

THE MEDICAL SOCIETY'S NEW EXECUTIVE DIRECTOR

Howard M. Epstein, the new Executive Director of The Medical Society of Nova Scotia admits that some people may wonder why a lawyer would be want to focus his attention on medical issues rather than legal ones. He says the answer is simple. He feels his new role comes at an exciting and very challenging time for doctors in this province. In his own words, "I am very happy to be here at a time when the Royal Commission on Health Care Report has just been released. I believe it brings in an era of dramatic change that shouldn't frighten the medical profession in Nova Scotia. Physicians are an enduring profession and although their functions have changed over many centuries, their role won't be diminished. My goal is to educate doctors about the political context within which they work and to make them much more sensitive to the importance of prevention as well as cure." Mr. Epstein hopes he will play a major role in this challenge.

What is quite clear about the new Executive Director's experience is the fact that at only 41, he has an impressive background in many areas of the law and management which more than adequately prepares him for the challenges he now faces. A Haligonian, he received a B.A. from Carleton University and in 1973, graduated from Dalhousie University's Law School. Following graduation, he worked for three years with the Department of Justice in Ottawa. He has also been a lecturer at Carleton University, Osgoode Hall Law School and St. Mary's University. In 1981, he became Executive Director of the Nova Scotia Confederation of University Faculty Association position. Three years later, he assumed the same position with the Ontario Confederation in Toronto.

Law, management skills, and writing have always been very important to Howard Epstein but he has another significant commitment. He is a dedicated social activist. This on-going concern is clearly demonstrated by his involvement with a variety of community groups. For a number of years, he served on the Board of the North End Community Health Association. (He was Chairman from 1982-1984.) During the same period he also found time to be a member of the Board of St. Joseph's Children Centre in Halifax. In Ontario, he was a member of a provincial government Advisory Committee that dealt with an important issue affecting mentally incapable people. Membership in the Ecology Action Centre and the Canadian and N.S. Civil Liberties Association also reinforce the evidence that Howard Epstein is a man who has always worked hard to improve the lives of others.

Now, as Executive Director of the MSNS, he expresses the conviction that doctors of Nova Scotia will endorse his belief that they must assume an even



greater responsibility for the well-being of the people of this province. He says, "Doctors are highly educated people with a lot of talent and extensive knowledge of their community, and who have the potential for leadership in the health area because of the faith the general population have in them. All that is necessary is for them to take an active part in the social area."

There is little doubt that Howard Epstein will challenge the membership of The Society. It is also equally clear that the members of The Society will respond to his challenge by once again proving they are committed proponents of the highest quality of health care and preventative medicine. Their new Executive Director is now ready to offer them the guidance and counselling they will need to cope with the changing face of medicine. As Howard Epstein says with great enthusiasm, "It is an exciting time and one doctors should anticipate with vigor, not fear." □

Dorothy Grant

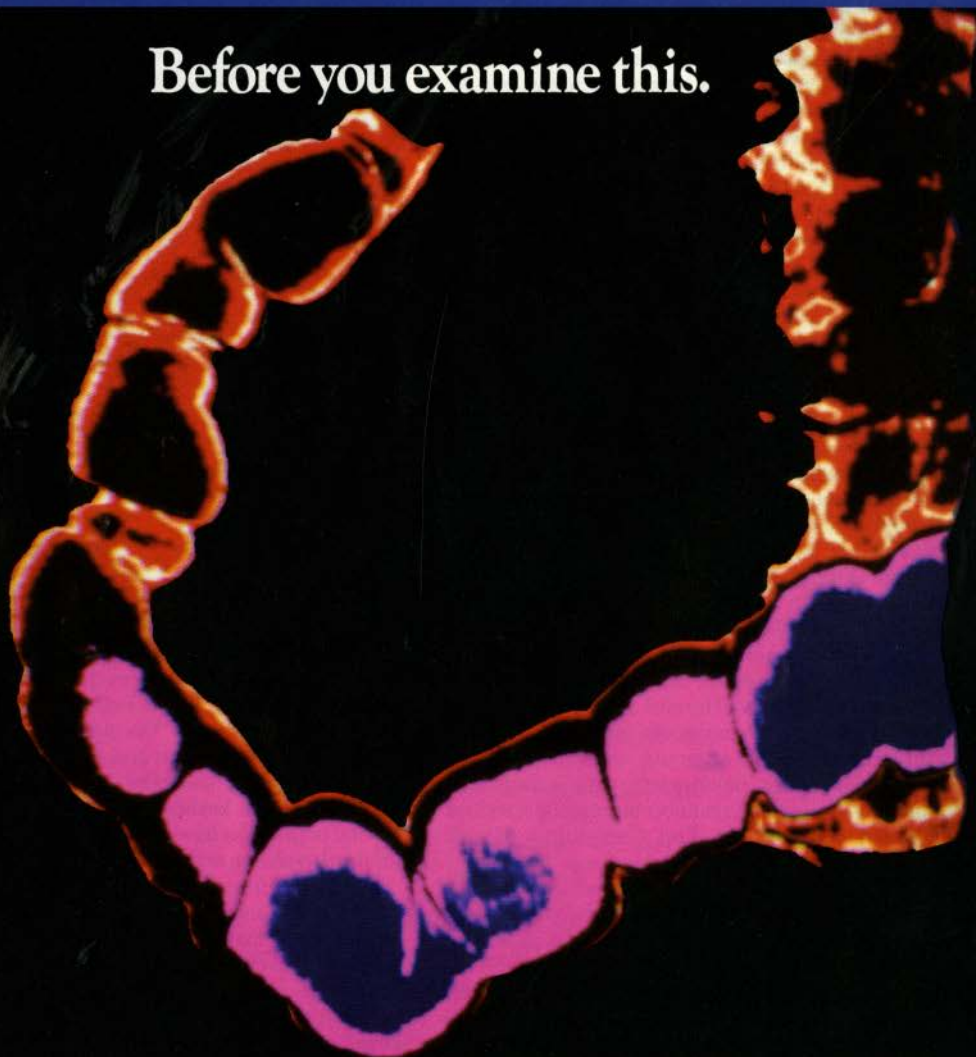
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The New England Journal of Medicine

Genetic Alterations during Colorectal-Tumor Development 52

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Against Great Odds

Rosemary Gill, MD

Halifax, N.S.

One hundred years ago last Fall, Dalhousie Medical College admitted its first woman student. This was about twenty years after Dalhousie first began accepting women students to non-degree programs in Science and the Arts. Her name was Annie Hamilton and, by all accounts, she spent a very active four years at Dalhousie. Not only was she a good student, but she also found time to develop an interest in the Chinese language and culture. Among her classmates she was well known for her views on the need to emancipate the social status of women, and for her campaign against the use of alcohol and tobacco.

Annie Hamilton was born on March 17, 1866, in the tiny township of Brookfield in Colchester County, Nova Scotia. On both sides of her family tree her ancestors were toughly individualistic men and women, who belonged to a prosperous farming community that traced its roots back to the first settlers in that area. Her paternal grandfather was known as a man of learning, and possessed a significant library. This may have served as the genesis for many of the ideas which took shape in the young mind of Annie Hamilton in the period 1872 to 1880. Her father was known as "Queer Bill", which in those days was an unabashed reference to the fact that William Hamilton marched to his own drummer. Her brother, Henry Hamilton, left for Utah at an early age, and combined a paying career as a self-taught electrical engineer with a strong interest in poetry. This second interest culminated in a collection of posthumously-published works. Curiosity and a sense of adventure was apparently a strong trait in all of William and Mary's children. A second brother also moved to the United States, and pursued a career as an engineer. A third brother wandered far and near for many years, and then came home to Brookfield to die. Annie's only sister, Florence, emigrated to Idaho Falls, where she married an American, and together they operated a florist shop for several years.

While not a great deal is known about Annie Hamilton in her very early years, it seems likely that she, like her siblings and father, possessed a very independent spirit, and this clearly manifested itself in her later life. She was raised with strong religious beliefs, and in an age when the life of a missionary abroad had considerable romantic appeal. At the age of fourteen she



Annie Hamilton

distinguished herself as a collector for the Home and Foreign Missionary Society of Brookfield (having collected \$12.63, or one-third of the total in 1880), and it seems reasonable to suppose that this experience helped set the stage for a life-long commitment to the poor and disadvantaged.

Annie Hamilton was somewhat of a misfit. She spent little time cultivating her feminine image, and shortly after medical school opened, the boys sent a paper around the class to get her "(one) of the affairs the other girls wore — a bustle". One classmate described her as being "very plainly dressed — rather colorless, with straight, thin hair, and not very attractive". Yet a girl who went with her to Pictou Academy for two different sessions, and later to Dalhousie, wrote fifty years later, "I knew her very well and loved her, all her good points were not outward they were in her head and heart, the night before her graduation, a girl who boarded in the same house put her hair in curl papers and she appeared on the platform with curls all over her head. To me it was no improvement, Annie needed no curls." Whatever the merits of the case, history shows that the men in her class were no more successful in persuading her to wear more feminine attire than she had been in her attempts to win them over to her strong temperance and feminist views.

Records of the time indicate that Annie Hamilton

*Director, Dalhousie University Health Services, Dalhousie University, Halifax, N.S.

Correspondence: Dr. Rosemary Gill, Dalhousie University Health Services, Dalhousie University, Coburg Road, Halifax, N.S. B3H 4J5

graduated from the Normal School in Truro in 1882, and the Pictou Academy in 1884, where she received a gold medal.

One can only surmise the forces which propelled the young Annie Hamilton into an academic career, where a more likely course would have been a life as a farm wife and mother. We do know that none of her siblings remained "down on the farm", and that her parents died within two weeks of each other, when Annie was only twenty years old. We know, as well, that after 1884 her work as a teacher, and contributions from her expatriate brothers, allowed her to pursue a medical career.

Little is known about her life at medical school, as the only woman in a class of fifteen, except that she was unsuccessful in her efforts to prohibit smoking in the operating theatres.

In 1894 Annie graduated from Dalhousie College as a Doctor of Medicine and Master of Surgery, the first woman graduate in Medicine in Nova Scotia. Thereafter, she set up a practice amongst the poor and working classes in the north end of Halifax, where few others had ventured. She was popular in various neighbourhoods, although regarded as an eccentric by those who chronicled the events of the day, because she made house calls in culottes and on a bicycle.

In 1903 Annie Hamilton linked up with the Presbyterian Mission of the United States, and after spending some time learning the Chinese language, like several of her female contemporaries, went to China to work as a teacher and medical missionary. She spent the rest of her life in China, returning overseas only once, in 1936, to see her siblings and to meet with church officials. A letter to her brother "Bennie", in 1931, indicated that she intended to return to Nova Scotia. She wrote, "I am saving up my pennies now, in the hope of visiting my kith and kin". But in the same letter she referred to her financial woes, and wrote that "there has been such a slump in silver that a Chinese dollar now is worth less than twenty-five Canadian cents. So, you see, I cannot afford to pay my proper debts" (she owed her brother \$100.00). A letter to her cousin Carrie, in the same period, also hints at her impoverished state, and shows a singular preoccupation with the cost of goods. She wrote, "I bought these embroidered goods in Mookan-shan and was going to mail them from there when I was next door to the post office; but on account of the zonal system for parcels I should have paid more so I brought them down with me to Shanghai". In any event, we can assume that her financial situation did not improve in the intervening period, because she did not visit her "kith and kin" in Brookfield in 1936, or at any time thereafter.

There is very little known about Annie Hamilton's work and life in China between 1903 and 1920. We can assume, from the accounts of her colleagues in China, that she worked under very difficult social conditions, with limited medical resources, administering to the ailments of the poor and abused women and children of her district.

After 1920 her health began to deteriorate, from her many years of hard work. She had various ailments, including arthritis, and as a result she devoted her time to teaching and writing. In this period she wrote a number of textbooks on the English language for her students at the university. She was apparently a regular contributor to the *Montreal Witness* (a publication of the Presbyterian Mission), and she chronicled the social events in China (i.e., Bolshevism, the war in Manchuria) in letters to her cousin Carrie, and presumably, as well, in letters to her siblings and to the *Montreal Witness*.

In 1931 she wrote, "this is the third year that I am teaching in the preparatory [sic] department of the SUN YAT SEN University, one of the important universities of China. Altho [sic] I was engaged to teach in the preparatory [sic] department I was loaned to the science department and the agricultural department for a year and a half to teach English. There, I was teaching in the Shanghai YMCA High School. When you last heard from me, since than [sic] I taught in a municipal council school in Shanghai and afterwards was a science teacher in the Shanghai High School which is the largest high school in Shanghai. It was also under good discipline but when the Bolshevists [sic] got the upper hand of the students, formerly well behaved students were turned into fiends. So I left that school after four and a half years."

Dr. Annie Hamilton died in Shanghai on December 21, 1941, at the age of seventy-five. In her final years she continued to correspond with her cousin Carrie, in Brookfield, but she never showed any interest in returning to Canada. To the end of her life she was passionate about her missionary work. She remained outspoken about her beliefs and the need to help the disadvantaged. She brought a religious zeal to all aspects of her life, but according to her nephew, Leonard Hamilton, who later told the story to Ada Spidle (the daughter of Carrie Hamilton), she always considered herself to be at home with the Chinese. Annie genuinely believed that "they were her people", and that they would always need her. The enduring interest in her mission is difficult to fathom in our liberal, secular age, and no doubt her assumptions about the backwardness of the Chinese society would be questioned today. But, in the final analysis, her life-long contribution to the alleviation of suffering and poor hygiene amongst the Chinese transcended ideological values. This was her bequest to the people of China.

One hundred years have passed since Annie Hamilton crossed the threshold into the exclusively male preserve of what was then the Dalhousie Medical College. Today, we can be certain that her entry into the ranks of the medical school took considerable courage and determination. Her success there and in her later life was against all odds. When one considers that it was not until 1968 that Dalhousie Medical School graduated more than a token number of female doctors, our admiration of and indebtedness to Dr. Annie Hamilton is considerable. □

Medical Missionaries of the Early Female Medical Graduates 1894-1929

G. Enid MacLeod, MD, CM and Irene M.J. Szuler, MD, FRCP(C)

Halifax, N.S.

Although a resolution was passed by Dalhousie University in 1881 permitting registration of women, it was not until nine years later that Annie Hamilton began her studies at the Halifax Medical College. Early women graduates made up only a very small percentage in any given class, and they often found themselves the single female classmember. Moral support of their families in such an undertaking was critical, as well as financial support. However lacking such, these women often found it necessary to support themselves, prior to entering medical school, by teaching, and a few became nurses.

After graduation these women faced other obstacles to a successful practice, primarily in obtaining a local internship, and community resistance to female physicians. It is unfortunate that due to societal pressure some never did practise. However this was infrequent. Most were clearly aware of their career aspirations, and this article will review a number of those who chose to become medical missionaries.

All of the major churches in Canada and the United States were heavily involved with missions in China and India, and to a lesser extent, Korea. Figure 1 highlights the places where our early female graduates lived and worked.

CHINA

During the period 1899-1900 the Chinese Government, under the Empress Dowager, attempted to oust foreigners completely. She ordered a revival of the local militia to assist her, often topped up with "roughnecks", who practised rites which they felt made them invulnerable to bullets. These groups were dubbed "Boxers" by the foreigner — a loose translation for the Chinese name of the bands — "Righteous Harmony Bands/Fists".

The area along the Yangtze Valley and the south of China opposed the Boxer uprising of 1900. The viceroys of these areas attempted to remain neutral, and endeavoured to repress antforeign outbreaks within their jurisdiction. The antforeign sentiment and slaying of foreigners, especially Roman Catholic and Protestant missionaries, along with thousands of Chinese Christians, was confined to Northeastern China. Foreign governments signed formal settlements in 1901, to guard against a recurrence of such an

outbreak. From this, China appreciated substantive and tangible changes in its economy. Foreign commerce more than doubled in the decade after 1901, and foreign merchandise penetrated to the remotest hamlets. The numbers of missionaries rapidly increased, and both the Catholic and Protestant communities showed a phenomenal growth.

Chengtu, the two thousand year old capital of Szechwan province (currently referred to as Chengdu, Sichuan province), lying near the centre of the province on a plain of remarkable fertility, is and was Sichuan's largest metropolis. The Women's Hospital was part of a university, built by the combined efforts of the Canadians, French, German and English, all under the auspices of the Methodist Church. It was to this centre that **Florence Maud O'Donnell** arrived.

Florence O'Donnell was born in Halifax, Nova Scotia, on August 4, 1877. Her father, John O'Donnell, was born in Ireland in 1840, and arrived in Halifax at the age of fifteen, an orphan of the 'Potato Famine'. Her mother, Mary Ann Laurillard, was a direct descendant of original settlers who arrived in Halifax in 1749. After obtaining her medical degree in 1901, Florence interned in Halifax for one year. The following year she began her trip to Chengtu, where she worked as a medical doctor for the Women's Missionary Society of the Canadian Methodist Church for six years. She arrived in Shanghai by ocean liner. However getting from Shanghai to Chengtu was to prove an astonishing adventure. As small steamers could only navigate the Yangtze River to Nanking, Hankow, and as far as Ichang, it was necessary to transfer passengers to small houseboats. These had to be towed from the river bank by seventy-five "trackers", who strained against long ropes to pull the boats all the way up river, against the rushing gorges. It took two months to complete the journey to Hosham, at which point the Ming River made for easier passage to Chengtu. The last two weeks of this incredible journey were made by sedan chair, sleeping at inns (where available) and hiring armed guards for security. The entire trip, from Shanghai to Chengtu, took over six months, and could only be done in winter, during the low water period.

Very few details are known of Dr. O'Donnell's six years in Chengtu. She was instrumental in organizing a training school, and the hospital was enlarged during her time. One source of insight into her medical challenges was from a report to the Methodist Conference in 1907. An excerpt reads as follows:

Correspondence: Dr. I. Szuler, Room 406 Gerard Hall, Halifax Infirmary, Halifax, N.S. B3J 2H6

"To the Hospital comes this little slave girl, sometimes almost murdered by ill-treatment and neglect; the childless wife begging to be helped as her husband is about to discard her; the thirteen year old daughter-in-law whose mother-in-law has beaten her eye out; the weak and the puny child whose poor little inflamed and suppurating feet testify to the cruel practice of foot binding; the thin emaciated wreck in the bondage of opium; and in the midst of it all the call comes to go out at once to an opium suicide".

Dr. O'Donnell returned to Halifax, to marry, after her term, with as long and hazardous a journey. She had met her fiance, Mr. William Harrington Piers of Halifax, in Montreal, on her way to China, and accepted his marriage proposal with the understanding that she would fulfill her contract in China. She did not practise medicine after her marriage. She had three children, to whom she passed on a number of Chinese artifacts. One such legacy was an attractive scroll of Chinese characters, which her son (then Commodore Piers) hung in the library of the Commandant's House at the Royal Military College in Kingston, Ontario. One evening, when members of the new Canada Council were being honoured at a reception, the Dean of Oriental Studies from the University of Toronto asked if the scroll pertained to a family member. When informed by Commodore Piers that no one in the family was aware of the significance of the scroll, the professor translated it. It was a most laudatory tribute from a high-ranking Mandarin lady "to the wonderful white lady who came from far away across the oceans to heal all our illnesses. She saved the life of our daughter, and when asked what reward would she accept, the lady doctor humbly requested that our daughter's feet should be unbound and never be bound again". The ornamental cloven foot shoes which were removed from the feet of this child are still in the family possession.

Chengtu's Women's Hospital benefited from other Dalhousie graduates over the next several years. **Dr. Martha Agnes Philp** (Class of 1902) married a missionary (Bradshaw), and spent many years there before moving to Burbank, California. **Dr. Minna May Austen** (Class of 1902) went to Chengtu in 1902 for a year, then transferred to the Women's Hospital in Kiating, however returned to Chengtu in 1909. She remained there until 1917, when she was forced to return due to poor health. Her services were appreciated during the Halifax Explosion, when she volunteered for special services in the Halifax Dispensary.

INDIA

Six women combined medical careers with missionary work in India. Their stories, which follow, clearly document the cultural, economic and medical challenges they faced, along with the personal hardships and immense satisfaction that they reaped from their work.

Jemima MacKenzie (class of 1904), the youngest of

twelve children of Simon and Ann (Murray MacKenzie), was born on August 18, 1872 at Waterside, Pictou County. While studying Grade XI, she taught school to help her family financially, and came home during weekends to help her ailing mother with household chores. She was twenty-six years old when she completed Grade XII at Pictou Academy.

From her early childhood Jemima MacKenzie had wanted to be a medical missionary in India, and she worked determinedly toward that goal. She taught to finance her tuition and board while attending Dalhousie, and financially helped her older sister, Mary (Mollie), complete her final year of medical school. Jemima's internship was in Boston, where she obtained her appointment under the Women's Union Missionary Society of America, New York, to medical work in Cawnpore (Kanpur) India.

Upon arrival in Cawnpore, she was given a charge position in an orphanage and girl's school of 170 students. At the recommendation of the American missions and the British colonial administrators, she went to the Allahabad-Fatehpur district near the Ganges River, a densely populated area without a hospital or treatment facility of any type. For the first month she lived in a tent, learned the language, and soon rented a house to be used as a hospital. Dr. MacKenzie travelled on foot, by horseback, on elephant or camel, or was carried on a two-wheeled, bumpy cart, to visit patients in the countryside. As a deeply religious person, she had a strong belief in the virtues of prayer, to guide and protect her through the threatened and real dangers and emergencies which she faced. Her courage and good sense were complementary. There were threats from bandits and wild animals, and she once took the reins from a hysterical driver and drove her cart through a jungle where panthers had been seen from the road. Twice she shot deadly snakes with a revolver which she carried for just that purpose.

In 1907 Jemima took over a dispensary at Fatehpur, which had been established by monetary gifts from Americans. Every day she managed clinics, and each and every patient was given teaching sessions on the Bible. With aid from the British, a sixty-bed hospital was opened in 1911. Six dispensing buildings were rented in villages. One of these, thirty-five miles distant, was named for her mother (Ann Murray), who had died the year of her graduation. Her out-patient duties took her fifty miles from the main base, and it was not until 1926 that she had an automobile. Yearly, she cared for six hundred in-patients and some twenty thousand dispensary out-patients. With the opening of her hospital, a training school for nurses was established in 1911, and Dr. MacKenzie played the major role in this training program. Other than the nursing staff whom she had trained in the early years, she had no experienced help with this workload. Today, the institution at Fatehpur continues to provide service.

Dr. MacKenzie left India in 1921 on a well-deserved furlough, during which she cared for her aged father.



Florence M. O'Donnell



Martha A. Philp



Minna M. Austin



Jemima MacKenzie



Blanche M. (Munro) Crawford



Mary (MacKenzie) Smith



Minnie G. Spencer



Elizabeth H. Thurrot



Marie J. Whittier



Florence J. Murray



Rebecca (Walker) Campbell

Unaccustomed to being idle, she directed a mission school in the family home at Three Brooks during this time. In 1923 she returned to India, under the auspices of the Canadian Presbyterian Church, and until her retirement in 1939 she was in charge of several hospitals, one of which was also a leprosarium.

Although she never married, Dr. MacKenzie adopted forty-five abandoned children (ten of them legally) while in India. The practice of abandonment, especially of female infants, on the banks of the sacred Ganges River, touched her. She had her children educated, and started them on careers as useful members of society. Three of her boys became missionaries, and several of her girls became nurses. When Dr. MacKenzie retired, in 1939, she brought two of her adopted sons (ages four and six) with her to Pictou. In Pictou she carried on a medical practice for some years, until health considerations restricted her, and she died on January 27, 1957, at the age of eighty-four.

Dr. MacKenzie was honoured in 1919 for risking her life and checking the spread of the outbreak of Asiatic Cholera, by being given India's highest award for public service, the Kaiser-I-Hind Medal, on order from the King and Emperor, H.M. George V. In 1940 she received an honorary doctorate of laws degree at Dalhousie University, and became an honorary member of The Canadian Medical Association.

As on the Chinese "frontiers", many other classmates followed Dr. MacKenzie to India. One of these, **Blanche Margaret Munro-Crawford** (class of 1904), a classmate of Dr. Jemima MacKenzie, was the daughter of a clergyman. After returning on furlough from India, she married a minister from Scotland who was preaching at River John, and did not continue with her medical practice.

Mary MacKenzie-Smith "Dr. Molly" (class of 1905), a sister to Dr. Jemima MacKenzie, followed her sister to Cawnpore, and remained there for five years, carrying out medical and Bible work. She then went on to do postgraduate work in eye, ear, nose and throat in London, England, before returning to Canada. She married a minister and moved to Verchoyle, Ontario, where she was the first doctor to do medical inspections in rural and urban schools in Ontario, working under the Women's Institute.

Minnie Grace Spencer (class of 1910) also went to India with the American Missionary Board, and remained there for twelve to fifteen years. However poor health forced her to return to Halifax.

Elizabeth Hope Thurott (class of 1922), the fourth of thirteen children, was born in Newcastle, New Brunswick of staunch Presbyterian stock, and knew early on in life that she wanted to be a medical missionary in India. She was also recruited to India by the call sent out by the Women's Union Missionary Society of America (WUMS), an interdenominational and international society with headquarters in New York. The slogan of this group, as they sought women doctors for India, was "Women's Work for Women by Women". Bessie, as she

was known, knew this call for her, but felt she could not go until her debts were paid. An aged and supportive doctor paid her debts, on learning of this, and she sailed for India in 1925.

For six years Dr. Thurott was in charge of a sixty-bed hospital in Jhansi, the WUMS hospital. She learned the language, and also something of the character, disposition, outlook and mental attitudes of the people among whom she lived. She grew to love the people of India, and became very supportive of the poor, the illiterate and the despised, low-caste villager. In Jhansi there was one physician per nine thousand people. In the villages there were thousands who were only visited by missionaries occasionally, and there were no villages where a missionary actually lived.

When her furlough came due she resigned from the WUMS, returned to Canada, and took a course at the Moody Bible Institute. She then accepted an offer by the Women's Missionary Society of the Presbyterian Church, and returned to India in 1932. For two years she travelled from one village to another by bicycle, and in 1934 she persuaded the mission to let her live in Babina, a village nineteen miles south of the mission station in Jhansi. Babina was the market town of that section, and had a population of over three thousand. She was determined to be an evangelist first and a doctor second. She gathered the people together by singing, and then after preaching and praying she would tend the sick who were brought to her. She provided medicine for the medical cases, and the surgical cases were sent to hospital. The Hindu people seemed to resent her at first, but later became friendly, and she became known as the "Babina Missionary Lady". After her furlough, in 1939, she asked John and Samuek Kashi Nath (two sons of an evangelist who were themselves trained evangelists) to join her, and they accompanied her in her travels. She travelled to outlying villages, within a radius of six miles, always by bicycle.

During the Second World War, Babina was one of the camps in India to instruct in the use of long-range guns, and became a training camp for African and Indian pioneer corps, and the military school of hygiene and antimalaria. They had no padre for these thousands of troops, so Dr. Thurott and her co-workers carried on services. In 1946 they built a small church, financed entirely from local funds.

In 1966 Dr. Thurott officially retired, but returned to India with Samuel as her right hand, and continued to work among the villagers, independently, until 1979, when she had a stroke in her 87th year. She returned to her birthplace, where she died from a malignancy the following year.

Jean Whittier (class of 1929) grew up on a farm in Rawdon, Nova Scotia. Her mother died when she was fifteen, so her father's sister took care of her, her sister, Catherine (M.D., Tor., 1927), and a brother, Ralph. "Auntie" went everywhere with her, including to India, and kept house for her after her father died. Jean was found to have "early tuberculosis" during her second

year at medical school, but this did not deter her in her studies. It did, however, deter her internship, as she felt she might not be able to cope with the demands on her health. She considered research work, but the only opening was in the Maritime Home for Girls in Truro, where she did some medical work and taught Algebra and Geometry. Three years later she interned in The Women's College Hospital, in Toronto, for one year, and then completed one year at the United Church Training School. Her sister had gone to India as a medical missionary in 1927, and Jean was anxious to join her. She was accepted, and when Catherine returned on her first furlough, Jean and Auntie went with her.

Following a year of language study, Jean was appointed to the hospital at Banswara. Her major work was in this hospital, but she also served in Neemuch, Ratlam and Indore before returning to Banswara. By the time she retired the hospital had grown from one small bungalow to a 120-bed hospital, with a dispensary and a training school for nurses. She stated that at one time she was "Chief of Surgery, Chief of Medicine, Chief of Obstetrics and Gynecology, Chief of Pediatrics, and Head of the tuberculosis wards". One of her most frequent tasks was delivering babies, many by Caesarean section. She taught a midwifery program, and the students were required to deliver twenty babies and attend five difficult births, "So I did the abnormal and they did the others", said Jean. It was during her first term in India that a little baby girl was left at the hospital — one of the many "unwanted" children in India. This child was adopted by Jean, and was named Lolita. Until she became a toddler she was allowed to run around the hospital, but was later placed with a family where she was cared for and educated. When Lolita married, it was Jean who played "Mother of the Bride".

In 1966 Jean retired, and lived in Toronto. She spent her summers in the family home in Rawdon. There she wrote her autobiography, under the title *My Life's Tapestry*. In 1979 she received an honorary Doctorate of Letters at Dalhousie University, and was named Alumnus of the Year in 1984. She died in April 1987.

KOREA

One well recognized alumna ventured to Korea, where the political centrifuge would take her through internal uprisings and two major wars. We are fortunate that Florence Murray was able to document her experience so clearly in her book *At the Foot of Dragon Hill*. In this book we are lead to see history from the Halifax explosion to modern times through her eyes, and can draw our own conclusions as to the character, capability and compassion of this remarkable lady.

Florence Jessie Murray (class of 1919) was born in February 1894, at Pictou Landing, Nova Scotia. She was the daughter of a Presbyterian minister, and had her imagination and career aspirations stimulated by stories of visiting missionaries from Korea and other countries, and especially the story told by Dr. Kate MacMillan of

treating patients in a two-room mud home. Florence originally wanted to be a minister, and her father took her to church headquarters in Halifax. She stated, "The official there was sympathetic, but told me kindly that the Presbyterian Church wasn't ready to accept women ministers". With a promise of support from her parents, she then decided to become a doctor, and when she joined the Medical College in 1914 was the lone female in a decidedly small class of ten (shrunk by the loss of students to the Armed Forces). Prior to graduation, this class (and Florence in particular) were tested by the 1917 Halifax explosion, followed by a Spanish influenza epidemic. The Halifax explosion occurred on December 6, 1917, during her fourth year in Medicine, and resulted in the death of fifteen thousand people, with thousands injured. As senior medical students, they were called in to help. Florence reported for duty at a military hospital, and was assigned to giving anaesthetics. She had never done this before, and was terrified. Recalling the lectures on the subject, she knew she would have to watch the eye reflexes. Her first patient, a six-year-old child, had lost both eyes! However, she did so well that the following day she was appointed 'official anaesthesiologist' to the hospital.

Only a few weeks later, her skills were again tested in a second emergency. This took the form of Spanish Influenza, which had killed twenty to thirty million people during and after the First World War, and had now struck the Maritimes in full force. She was sent to Lockeport, a small fishing village, where twenty-five people had died and the doctor had come down with the disease. She had informed the public health official who had called her that she had neither equipment nor a licence to practise. He stated that he was aware of this, but that there was no one else to send. He told her that she could use the doctor's equipment. She set up an emergency hospital in the public hall, and phoned to request some nursing help. Two nurses arrived, however one became her first patient, having contracted the disease along the way. Florence, however, was equal to the situation, and even managed one citizen who swore that he would have "no petticoat doctor fiddling with me". When he caught the disease himself, he soon changed his mind.

After graduating in 1919, Florence was in need of some money to pay her college bills. The only Nova Scotia hospital where interns were paid was the Victoria General Hospital, but the superintendent was a businessman who had little use for women. She went to Long Island Hospital, in Boston, and was paid \$11.00 per week, plus room and board. However she was so distressed by the standard of medical care and lack of consideration for the patients that she took a weekend off and returned to Halifax to seek advice from Dr. J.G. MacDougal, with whom she had worked in her final year. She was offered, and accepted, a position as his assistant, and was able to take private patients as well. Shortly after this she accepted a position as Demonstrator in Anatomy in the Medical School. Within a short

time she had repaid her debts, and informed the Mission Board that she was ready to go overseas. Dr. Kate MacMillan had requested a woman doctor to assist her, and Florence was happy to do so. Hence Dr. Florence Murray went to Korea.

When Florence arrived in Korea she set about to learn the language. But before she had completed her language study she was sent to a mission station in Yongjung, as the resident missionary doctor, Dr. Martin, was ill and was going on furlough. At the time, Manchuria was a mad mixture of ethnic settlements. Many Koreans had settled there in 1910, after being forced from their land by the Japanese. There were Chinese and Japanese and an influx of Russians who had fled their homeland at the time of the 1917 revolution. She was able to converse with the Koreans, Chinese and Japanese, through interpreters, but none of the Russians spoke English, and these people were undernourished, ill, and a pitiful sight to the young woman who was trying to cure them. Most of her contact, however, was with the Koreans, and Florence faced a patient load of twenty-two thousand a year. She was shocked by the primitive life of these people, particularly the women, many of whom did not even have names. Female children were of such little value that they were simply addressed as "Hi you", or as "Back Room", if they happened to have been born in a back room.

The Chinese women were crippled physically as well as socially. Although the practice of binding the feet was beginning to die out in China, it was still carried out in Manchuria, and Florence was appalled when she saw the bound feet, the toes bent under the sole and the heels forced forward, until a grown woman might have feet only four inches long. Medically, also, the scene was disturbing. Florence found many diseases rampant which were already under control in America: typhoid, typhus, diphtheria, leprosy, malaria, sprue, parasites of all kinds, and in particular, tuberculosis. Local doctors treated patients by the 'chim' and 'doom' methods. 'Chim' was a crude form of acupuncture, whereby cold or red-hot needles were inserted, often causing infections or burns that complicated the case for the surgeon. 'Doom' was carried out by placing piles of powdered leaves of certain plants on the skin over the affected area, and then igniting them. This was often repeated a number of times. Florence asked one patient how many times she had had the procedure done, and the answer was "one hundred". This was not hard to believe, as the treatment had penetrated the muscular layer.

After a few years in Manchuria, Florence was asked to take over the hospital in Hamheung, Korea. This was the area where Dr. Kate MacMillan had practised, and had been closed since Dr. MacMillan's death, from typhus. Many alterations were needed to comply with building construction laws, and this was a task for which her medical education had not trained her. She set to work, and after making scale drawings, supervised the widening of corridors, moving of partitions, installation

of wiring and plumbing, and the building of a new operating room. This completed, she sent for a graduate nurse. Shortly after her arrival the nurse had a lung hemorrhage, admitted to having tuberculosis, and returned home. The language teacher and interpreter both left to go to medical school. The language teacher replacement, Lee Sunsaing, later became Florence's secretary, purchasing agent for the hospital, business manager, and when they acquired a sterilizer, he ran that too. "As language study and surgery didn't mix, I decided to have Lee Sunsaing give the anaesthetic, while I operated. The first time I explained what to do, and what to look out for, since he had never seen an anaesthetic administered. I started the anaesthesia myself, and when the patient was well under the influence, I turned him over to Lee Sunsaing. Then I scrubbed up and did the operation, with one eye on the surgery, the other on the anaesthetic. Both were successful, and Lee became the official anaesthetist for the hospital. During the twenty years he acted in that capacity, he never had a fatality".

There was a time, in Hamheung, when Florence was not only struggling with such things as lights which failed during an operation, but with traditional forms of therapy. Chinese doctors were found carrying out their practice in her hospital. Patients arrived who had been treated by the mudang (sorceress), who specialized in exorcising evil spirits, as well as those who specialized in chim and doom. "The torture meted out by travelling old cronies who professed to cure women suffering from neglected complications of childbirth was barbarous. Subjected to unwise treatment by ignorant midwives, these women were expected to get up as soon as the baby was born, and go to the river to wash the soiled clothing. The heavy uterus often sagged down into the dilated birth canal which resulted in permanent displacement, and which in turn lead to other difficulties. Some victims could neither sit nor walk comfortably. Too modest or too impecunious to go to a hospital, they patronized the ignorant creatures who preyed upon their misfortune. Usually, only after much suffering and further complications, did they finally seek sensible treatment".

On two occasions, Florence brought girls who had been sold to a brothel by distant relatives to her hospital, in order to save them from their fate. They both went to Salvation Army Homes, where they were taught to read, write and sew, as well as the Christian way of life.

With the coming of the Great Depression, the home churches were unable to send more missionaries, and had to cut the salaries of those already in the field. In spite of this they carried on, supported by a loyal staff.

In 1935 Florence returned to Canada for a year's furlough. On her return to Korea in 1936 she found a new assistant surgeon, who had had no experience in surgery, in her hospital. In 1937 Japan provoked war with China, and conditions in Korea became very tense. Every house and institution was required to black out all windows and doors. They carried on in the hospital, and with difficulty, continued home visits to the sick.

However on December 7, 1941, they were all put under house arrest. Dr. Murray and her nurse were permitted to continue to go to the hospital, which now had one hundred beds (ten times what it had twenty years previously). Toward the end of May 1942, they were told to prepare to leave for Tokyo by the first of June, as they were to be exchanged for Japanese, and repatriated. On June 1 they were put on a ship and taken to Japan. They had been allowed to take only what they could carry, and all printed matter was to be left behind. Florence had written the story of her life in Korea and Manchuria, as well as many other articles, but she never saw them again. They spent the following two weeks in Japan, eating raw fish and cabbage and spending most of the time lining up to be counted. They were then put on a boat with diplomats, internees and prisoners of war, and were taken (via Hong Kong, Saigon, Singapore) to Lourenco Marques, Portugese East Africa. Here the Swedish liner Gripsholm welcomed the fifteen hundred passengers, and served them bread, butter, fresh fruit and vegetables, and to their great delight, roast fowl. Five days later they sailed, arriving in New York Harbour on August 25. A sealed and guarded train took sixty-nine repatriated Canadians to Montreal that night.

Florence spent the remainder of the war practising in Halifax and Kentville. In 1947 she was allowed to return to Korea, to be Associate Dean of the Women's University Medical Faculty in Seoul. She was again forced to leave in 1950, because of the Korean War. She returned the following year to find the port of Pusan swarming with sick refugees. The stores had been turned into military hospitals for wounded soldiers, and there was no place for the sick civilians. Dr. Murray found one nurse caring for sixty patients, under the most primitive conditions. In port there was a Danish Red Cross ship, with four hundred wounded soldiers. Dr. Murray went aboard and discovered two hundred empty beds. They had no difficulty taking the civilians, although there was no one aboard who spoke Korean. Dr. Murray visited the ship daily — "I was doctor, interpreter, errand boy and grandmother to the boys".

In 1961, after forty years of service in Korea, Dr. Murray retired from the United Church Overseas staff. But this was not the end of service in Korea for Florence Murray. She had always wanted to do something for those who had leprosy, and their families. She visited a patient in a village who asked her to cut off his foot. She refused, and asked him to try her method of treatment for ten days, and if his foot was not better, then she would discuss amputation. In ten days he was able to walk, and told his friends. "That old grandmother knows something". As the word spread, the victims of leprosy asked for a clinic. An old army tent was set up, and the first clinic was started. One night, however, it was blown down in a windstorm, and they moved to an old storehouse. The U.N. Army came to the rescue, and building materials were donated. The patients built their own clinic, and from the left-over materials they built a little chapel. Later they erected a monument to

Dr. Florence Murray beside the chapel.

In 1965 Florence went to Severance Hospital in Sinchon, Seoul, to reorganize the medical records department and to train people to carry on the records work. She writes, "The out-patient records numbering over 40,000 a year had never been filed away, and they went back to 1954, all previous to that date having been lost in the communist war". She stayed there to finish the job, and to train others to keep proper records. In 1967 she retired, and came home. Here she re-wrote the story of her first two decades in Korea, and this was published under the title *At the Foot of Dragon Hill*. She received many well-deserved honours: Honorary degrees included D.D. from Pine Hill College and L.L.D. from Dalhousie University; in 1956. The President of Korea awarded her the Order of Civil Merit, and for her service aboard the Red Cross Hospital Ship, she received a gold medal from the King of Denmark.

For the last time Florence returned to Korea in 1974, this time to visit her old friends, at the age of eighty. In 1975 she died, very unexpectedly. She was a great lady, a dedicated servant to mankind, and a magnificent doctor. She once said, "I want to use my life where it will count most". She accomplished that, and more. Her modesty is evident in these words: "such a checkered career surely makes one a jack-of-all-trades and master of none, but no one has had more satisfaction from it than I".

On a summer evening in early September, 1989, Rebecca (Becky) Walker Campbell (class of 1976), a nephrologist/anaesthesiologist, her husband, James Campbell, a recently certified general surgeon, their son John (20 months), and my family were dusting off old maps to see where they would be working in Kenya. They were shortly off for language courses, before departing for Kikuyu, Kenya, to work at a mission hospital. The hospital was modestly supported, and though husband and wife would be able to handle most emergencies, the one x-ray machine had been inoperable for a year, but repair was promised. The adjustments from academic medicine to real-life issues, the cultural changes, the anticipated birth of their second child were all expected "frontiers". Though we sometimes think the frontiers of medicine have narrowed to certain areas of research, or to the exploration of space, the frontier of medical care amongst the poor remains open to solution and action.

Dalhousie's legacy of medical missionary work has been passed on to another generation, and history repeats itself as others, such as Becky and Jim move on to work . . . where they are needed. □

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We gratefully acknowledge the letters, photographs and phone calls which assisted us in compiling information on each of the graduates from 1894 to 1929.

References on page 30.

A Brief Statistical History of the Enrollment of Women in Medicine in Canada

Eva Ryten*

Ottawa, Ontario

In order to understand the present it is useful to have some knowledge of the past. For this reason, most readers interested in the wide range of issues involved in a review of the current status of women in medicine in Canada will find even a brief history of the enrolment of women in medicine quite pertinent.

HISTORICAL BACKGROUND

The first degree in medicine awarded by a Canadian university was awarded by McGill University in 1833. Since that time, nineteen institutions have had the right to award degrees in medicine. In the early years of medical education in Canada, a degree in medicine could be earned either through course work organized and offered by the university itself or through attending a proprietary, non-degree granting medical college and taking the examinations of the degree-granting institution.

Table I summarizes as succinctly as possible the history of undergraduate medical education at institutions in Canada, with particular emphasis on the access of women to medical education in Canada.**

To understand Table I, some supplementary information is necessary. In the early 1880s, pressure by women for admission to medicine led to the founding of two medical colleges for women — both in 1883. They were the Woman's Medical College, Toronto, affiliated with the University of Trinity College and the University of Toronto, and the Women's Medical College, Kingston, affiliated with Queen's University. The dates for medical degrees first awarded to women by examination refer to the women who studied medicine by attending the colleges for women. The medical degree was awarded by the University with which the college was affiliated. The years of operation of these colleges were:

Women's Medical College, Kingston operated from 1883 to 1895 (affiliated with Queen's)

Woman's Medical College, Toronto operated from 1883 to 1895 (affiliated with Toronto and Trinity)

Ontario Medical College for Women operated from 1895 to 1906 (Students could take examinations of any Ontario University which had the right to award

degrees in medicine; closed in 1906 when the University of Toronto agreed to accept women in course). This college was the successor to the Woman's Medical College of Toronto.

From the Table, it will be seen that all the major universities offering medical education in the last century excluded women, some for inordinately long time periods. Of particular note:

McGill: Women campaigned to gain admission for a very long time. McGill finally relented in 1918.

Toronto: The University of Toronto agreed to accept women in a coeducational program in 1906. Admission of women to medical studies in course only came about as part of a deal to arrange the federation of the Faculty of Medicine of Trinity University with that of the University of Toronto. Something had to be done about the Ontario Medical College for Women, most of whose students took the examinations and earned the degree of Trinity.

Queen's: Queen's made a brief attempt at medical coeducation in 1881, which was promptly abandoned following pressure from the male students. Queen's did not admit women to study medicine in course until 1943.

Laval & Montréal: French language institutions were very slow in considering women for admission to higher education at all. Although French language medical colleges started operations in the 1840s in the cities of Québec and Montréal, it was not until 1925 that the first woman commenced medical studies at Université de Montréal and not until 1936 at Université Laval.

Bishop's: Bishop's Faculty of Medicine is important in this story because it was the only institution in the province of Québec where women could get a medical education. In 1890, after nearly twenty years of operation, Bishop's admitted women. In 1900, Bishop's refused once more to take female medical students, thus leaving the Province of Québec with no medical school where women

*Director of Research, Association of Canadian Medical Colleges, Ottawa, Ontario.

**For a more detailed outline of these matters, see "The Changing Demographics of Physician Supply in Canada: How did we get where we are and where are we going? Does it matter?" by E. Ryten, published in *Physician Manpower in Canada: Proceedings of the first and second annual ACMC Physician Manpower Conferences* (ISBN 0-88953-106-4)

TABLE I

**INSTITUTIONS THAT HAVE EVER AWARDED DEGREES IN MEDICINE IN CANADA:
DATES WHEN FOUNDED, WHEN FIRST MEDICAL DEGREE AWARDED TO MEN AND TO WOMEN**

| University Medical degree granting institutions listed by year M.D. first awarded | First Organized | First M.D. Awarded | Women First Admitted In Course | Women First Awarded M.D. | | Notes |
|--|--------------------|-----------------------|--------------------------------------|-----------------------------|--------------|--|
| | | | | In course | By Exam | |
| McGill University | 1829 | 1833 | 1918 | 1922 | — | First degree ever awarded in medicine by McGill was in 1833. |
| Université de Montréal | 1843 | 1843 | 1925 | 1930 | — | Original institution founded in 1843. Several affiliations including Victoria Univ., Cobourg and then Univ. Laval up to 1919. No women earned degree through attendance at what is now the Faculté de médecine de l'Univ. de Montréal prior to 1930. Univ. de Montréal awarded its own medical degree from 1920 onwards. |
| University of Toronto | 1843 | 1845 | 1905 | 1906 | 1889 to 1905 | Until 1905, women could earn a degree at Univ. of Toronto by studying at Woman's Medical College, Toronto to 1895 and then Ontario College for Women in 1905. |
| Université Laval | 1848 | 1854 | 1936 | 1940 | — | |
| Trinity University* | 1850 | 1854 | — | — | 1887 to 1905 | See note to Univ. of Toronto. The medical faculty of Trinity amalgamated with Univ. of Toronto in 1903. Last medical degree was awarded in 1905. |
| Victoria University* | 1854 | 1855 | — | — | 1883 | First medical degree awarded to a woman in Canada was in 1883 by Victoria Univ. She attended the Toronto School of Medicine and received M.D. by examination from Victoria Univ. Victoria Univ. entered into confederation with Univ. of Toronto in 1891. |
| Queen's University | 1854 | 1855 | 1943 | 1947 | 1884 to 1904 | Women could earn a Queen's degree by attending Women's Medical College, Kingston from 1884 to 1895, and from 1895 to 1904 by attendance at Ontario Medical College for Women. |
| Dalhousie University | 1867 | 1871 | see notes | 1894 | — | Decision taken to admit women in 1881. |
| Bishop's University* | 1871 | 1872 | 1890 | 1891 | — | Last degree in medicine awarded in 1906. Merged with the faculty of Medicine of McGill University in 1906. Women denied admission in 1900. |
| University of Western Ontario | 1881 | 1883 | 1919 | 1924 | 1898 | One degree awarded in 1898 to a woman who attended Ontario Medical College for Women. |
| University of Manitoba | 1883 | 1886 | 1888 | 1892 | — | |
| University of Alberta | 1913 | 1925 | ** | 1925 | — | Coeducational from the beginning. First Canadian university to award M.D. to a woman in its first graduating class in medicine. |
| University of Ottawa | 1945 | 1951 | ** | 1951 | — | Coeducational from the beginning. |
| University of British Columbia | 1950 | 1954 | ** | 1954 | — | Coeducational from the beginning. |
| University of Saskatchewan | 1926 | 1957 | ** | 1957 | — | Coeducational from the beginning. |
| Université de Sherbrooke | 1961 | 1970 | ** | 1970 | — | Coeducational from the beginning. |
| McMaster University | 1965 | 1972 | ** | 1972 | — | Coeducational from the beginning. |
| University of Calgary | 1965 | 1973 | ** | 1973 | — | Coeducational from the beginning. |
| Memorial University | 1967 | 1973 | ** | 1973 | — | Coeducational from the beginning. |

SOURCE: Compiled by author

*Institutions that ceased awarding degrees in medicine **Women admitted from beginning of operation
In universities where the name has changed one or more times since foundation, only the current name is shown in this chart.

could study until McGill finally opened its doors in 1918. During its decade of acceptance of women, Bishop's awarded twelve M.D. degrees to women, who studied in coeducational classes alongside the men in most subjects.

Dalhousie & Manitoba: Of the early faculties of medicine, these two universities admitted women to the study of medicine on a coeducational basis almost from the beginning.

Univ. of Western Ont: Western University (as it was called) admitted women to the study of medicine at the close of WWI in 1919.

All eight of the faculties of medicine that started operations in this century have admitted women from the beginning. Seven out of eight of them awarded the M.D. for the first time after 1950.

The University of Alberta awarded its first M.D. in 1925 and there was one woman in the 1925 graduating class . . . thus making the University of Alberta the first Canadian university to have a woman in its inaugural graduating class in medicine.

These facts concerning when and where women were allowed to study medicine are essential to understanding the numbers of medical graduates and the numbers of physicians in Canada since early confederation days.

Table II gives a numeric history of the number of medical degrees earned in Canada by both men and women from the time the first one was awarded in 1833 to the present day.

The data in Table II cover nearly one hundred and sixty years, divided into sixteen ten-year periods. A glance at these numbers makes it clear how very, very slow the access of women to medical education was. In the first five decades, no women at all graduated in medicine. In the decade of the pioneers, 1880 to 1889, only one in a hundred medical degrees was earned by women. A fair spurt took place in the decade 1890 to 1899 as 3.4% of the medical degrees were earned by women. The first two decades of this century saw a drop from 3.4% to 2.3% and 2.0% respectively. After WWI, in the two decades 1920 to 1939, 4.4% of the medical degrees were earned by women. From 1940 to 1959, 6.0% of the medical degrees were earned by women. It was only in the 1960s that the number of women graduating in medicine really began to grow quite rapidly. Even so, from 1960 to 1969, women earned only 10.1% of the medical degrees in Canada. In the last two decades, movement has been much faster. In the decade of the 1970s, women earned 22.4% of the medical degrees awarded. In the decade 1980-1989 women earned 38.4% of the degrees in medicine awarded by Canadian universities.

This information regarding the rates of graduation of women in medicine from the earliest times to the present underlines that what happens in medical schools is the most important determinant of the sex composition of

the practising physician population. As far as women are concerned, it has been a long story of outright refusal of admission followed by another long period of grudging acceptance followed by quotas and finally during approximately the last twenty-five years, admission policies not based on sex discrimination. It is quite impossible to say what the proportion of women in medicine would have been had such discrimination not existed or been removed earlier. All we can say is that it underlies the figures presented in Table II.

TABLE II
STATISTICAL HISTORY OF DEGREES
AWARDED IN MEDICINE IN CANADA
1833 TO 1989

| Year | Medical Degrees Awarded | | | % Women |
|--------------|-------------------------|-------|-------|---------|
| | Men | Women | Total | |
| 1833 to 1839 | 11 | 0 | 11 | 0.0% |
| 1840 to 1849 | 77 | 0 | 77 | 0.0% |
| 1850 to 1859 | 314 | 0 | 314 | 0.0% |
| 1860 to 1869 | 988 | 0 | 988 | 0.0% |
| 1870 to 1879 | 1085 | 0 | 1085 | 0.0% |
| 1880 to 1889 | 2061 | 25 | 2086 | 1.2% |
| 1890 to 1899 | 2718 | 97 | 2815 | 3.4% |
| 1900 to 1909 | 3290 | 77 | 3367 | 2.3% |
| 1910 to 1919 | 2528 | 51 | 2579 | 2.0% |
| 1920 to 1929 | 4287 | 193 | 4480 | 4.3% |
| 1930 to 1939 | 4574 | 213 | 4787 | 4.4% |
| 1940 to 1949 | 5499 | 372 | 5871 | 6.3% |
| 1950 to 1959 | 7964 | 518 | 8482 | 6.1% |
| 1960 to 1969 | 8123 | 911 | 9034 | 10.1% |
| 1970 to 1979 | 11510 | 3327 | 14837 | 22.4% |
| 1980 to 1989 | 10907 | 6789 | 17696 | 38.4% |

1989 Figures are preliminary

SOURCES: Series compiled by author using and comparing all data sources that could be traced. Minor changes made when obvious errors contained in data (e.g., *JAMA* shows 6 female grads in 1922 at U. de Montréal. As the first woman to earn a degree in medicine at U. de Montréal earned it in 1930, this is clearly an error). Table shows ten year aggregates based on single year series from 1833, when first degree in medicine awarded in Canada, to end of the decade of the 1980's.

1833 to 1919: Data series from R. Harris, *A History of Higher Education in Canada*.

1883 to 1923: (Women graduates) C. Hacker, *The Indomitable Lady Doctors*, Appendices II and III.

1920 to 1939: Issues of the *Journal of the American Medical Association (JAMA)* — one issue yearly.

1940 to 1989: Association of Canadian Medical Colleges, Canadian Medical Education Statistics, revised series based on retrospective survey of Canadian faculties of medicine, conducted in 1984 and subsequent annual surveys.

Also consulted Part II Results from the *Biennial Survey of Education in Canada* (Dominion Bureau of Statistics), 1920 onwards. Series used to compare with *JAMA* series. Based on consistency and other factors, decided to rely on *JAMA* series.

As the barriers to the acceptance of women in medicine crumbled, so gradually the number of female applicants for admission to Canadian faculties of medicine also started rising. This final section will dwell

in greater detail with enrolment trends in the most recent time period.

The best leading indicator of levels of female participation in medical education is the number and proportion of first year students who are women. The number of graduates each year reflects admission levels approximately four years earlier; the total number of students enrolled reflects admission levels of the most recent four years. First year enrolments reflect the most recent application and admission trends and provide a means of accurately forecasting graduation rates of women and men four years hence. Table III provides the data on first year enrolment by sex in programs of study leading to the award of the M.D. degree from 1964/65 to the current academic year that started in September 1989.

The data from Table III enable us to trace changes in overall levels of provision of places for the study of

medicine in Canadian universities and to see how women have fared in securing these places.

The twenty-six year period includes a roughly twenty year period of overall enrolment increases followed by enrolment reductions in the last six years, brought about by perceptions that Canada has or will soon have enough or perhaps too many physicians. However, for women the entire time period has been one of vastly increased presence in the classrooms of medical schools. Proportionately, there are four times as many women enrolled in medicine today as there were a quarter century ago. From 10.9% in 1964/65, women make up 43.2% of the first year students enrolled in medicine this year, 1989/90. For men, the story is the mirror image of that of women. As the presence of women in medical school classes has increased, so the presence of men has declined. In faculties with limited enrolment, it is impossible for one group to increase its representation without this being accompanied by a decline in numbers of members of other groups. For men, first year medical school enrolment peaked in the academic year 1972/73 and has been declining ever since. For women, first year enrolment peaked in 1987/88, when women made up 46.7% of first year medical students. In the two most recent years, just over 43% of first year medical students have been women.

Although the data are not shown here, the presence of women in Canadian faculties of medicine during the last quarter century has very closely matched their presence in the applicant pool. Contrary to what is widely believed, the principal reason why there are so many more women enrolled in medicine is because there are so many more qualified female applicants for admission.* Removal of artificial barriers such as quotas or denial of admission has played little if any role. What has changed is attitudes . . . attitudes of women with respect to preparing for and wanting professional careers and the attitudes of members of admissions committees who now accept that it is just as legitimate for women to seek higher education in any domain as it is for men.

Finally, as this decade closes, it should be noted (see Table I) that more women have earned degrees in medicine in this decade of the 1980s than in the one hundred and fifty years during which medical degrees have been awarded by Canadian universities. The impact of this dramatic change is just beginning to make itself felt. However, what the social impact of change of this magnitude is likely to be cannot be covered in a short article of this nature. □

TABLE III

FIRST YEAR ENROLMENT IN CANADIAN FACULTIES OF MEDICINE BY SEX
1964-65 — 1989/90

| Year | Men | Women | Total | % Women |
|----------|------|-------|-------|---------|
| 1964/65 | 1009 | 124 | 1133 | 10.9 |
| 1965/66 | 985 | 143 | 1128 | 12.7 |
| 1966/67 | 1040 | 152 | 1192 | 12.8 |
| 1967/68 | 1054 | 179 | 1233 | 14.5 |
| 1968/69 | 1134 | 243 | 1377 | 17.6 |
| 1969/70 | 1189 | 274 | 1463 | 18.7 |
| 1970/71 | 1159 | 293 | 1452 | 20.2 |
| 1971/72 | 1242 | 359 | 1601 | 22.4 |
| 1972/73 | 1318 | 445 | 1763 | 25.2 |
| 1973/74 | 1288 | 485 | 1773 | 27.4 |
| 1974/75 | 1263 | 516 | 1779 | 29.0 |
| 1975/76 | 1211 | 596 | 1807 | 33.0 |
| 1976/77 | 1225 | 594 | 1819 | 32.7 |
| 1977/78 | 1224 | 602 | 1826 | 33.0 |
| 1978/79 | 1164 | 665 | 1829 | 36.4 |
| 1979/80 | 1171 | 683 | 1854 | 36.8 |
| 1980/81 | 1133 | 754 | 1887 | 40.0 |
| 1981/82 | 1144 | 737 | 1881 | 39.2 |
| 1982/83 | 1072 | 810 | 1882 | 43.0 |
| 1983/84 | 1067 | 820 | 1887 | 43.5 |
| 1984/85 | 1077 | 781 | 1858 | 42.0 |
| 1985/86 | 1016 | 796 | 1812 | 43.9 |
| 1986/87 | 1023 | 780 | 1803 | 43.3 |
| 1987/88* | 929* | 815* | 1744* | 46.7* |
| 1988/89 | 1010 | 776 | 1786 | 43.4 |
| 1989/90 | 1012 | 768 | 1780 | 43.1 |

Includes repeaters

*In 1987/88 the University of Saskatchewan did not admit any students, as it phased out its five year program. In 1988/89 a four year program was started that enrolled the usual U. of Saskatchewan quota of 60 students.

*For data related to applicant trends, see *Canadian Medical Education Statistics*, an annual publication of the Association of Canadian Medical Colleges.

Steroid Hormone Receptors and Mechanism of Action

Catherine B. Lazier,* PhD

Halifax, N.S.

Recent progress in recombinant DNA technology has led to profound advances in our understanding of the structure of steroid hormone receptors and their mechanism of action. Receptors for estrogens, progestins, androgens, gluco- and mineralcorticoids, as well as for retinoic acid, vitamin D₃ and thyroid hormone, belong to a superfamily of related proteins. All these receptor proteins are characterized by a C-terminal ligand-binding domain and by a highly conserved central domain that has a zinc-coordinated finger-like structure reminiscent of certain transcription factors. In the absence of hormone, the receptor resides either in cytoplasm or loosely bound in the nucleus. Hormone binding results in tight nuclear association through the receptor zinc fingers which bind distinct DNA sequences called hormone response elements (HRE) in the upstream regulatory region of hormone-responsive genes. Receptor binding to an HRE results in altered transcription of the neighbouring gene. The hormone specificity is dictated by the amino acid sequence of the receptor zinc fingers and by the 15 base pair sequence of the HRE. Faulty zinc finger-HRE interaction may be the site of action of some steroid antagonists and also may underlie certain genetic hormone-resistant states.

For the past twenty years, endocrinology and biochemistry textbooks have shown a deceptively simple model for steroid hormone action.¹ The lipophilic steroid hormone enters the cell by diffusion and in target cell cytoplasm encounters a receptor to which it binds with high affinity and specificity. The hormone-receptor complex undergoes a conformational alteration (often termed transformation) that enables it to enter the nucleus and bind to certain regulatory sites in the chromatin. Binding to the regulatory sites then turns on or off the expression of adjacent genes and sets in motion the physiological response to the hormone. The central feature of the model is the interaction of the hormone-receptor complex with the regulatory regions of the affected genes. Recent discoveries in receptor-DNA interactions and transcription regulation have greatly illuminated this aspect of the mechanism of steroid action.² However, the intracellular localization of unbound receptor has become the focus of controversy.³ A new school of thought is that steroid receptors largely reside in the nuclear fraction, even in the absence of hormone.

In the following sections I will discuss recent advances in our understanding of the structure and intracellular localization of steroid hormone receptors, their role in steroid hormone action in health and disease and in the actions of certain steroid antagonist drugs. My own work has largely been with estrogen receptors and, naturally, I will tend to choose examples from that field.

STEROID RECEPTOR STRUCTURE AND FUNCTION IN TRANSCRIPTION ACTIVATION

When I started working on estrogen receptors in the '70s all we knew was that they were proteins which bound estradiol with very high affinity (Kd 0.1-1nM) and that there were only about 2-10,000 receptors per cell in a typical target organ.⁴ Receptor purification would be a major enterprise requiring at least 100,000 fold enrichment of the protein.

The techniques for affinity chromatography, monoclonal antibody generation, molecular cloning and detection of complementary DNA and DNA sequencing all had to be developed before a steroid receptor protein sequence could be deduced. Once the technical feats were accomplished, progress in dealing with receptors was staggering rapid. By the mid '80s it became clear that receptors for all of the major classes of steroid hormones had similar structural organization, with a hydrophobic steroid-binding domain at the C-terminal of the molecule and a DNA-binding domain in the central region.⁵ (Fig.1). The DNA-binding domain was very highly conserved in the different receptors and showed a surprising similarity to the *v-erb A* oncogene. An even bigger surprise came with the demonstration that the thyroid hormone receptor has the same domain structure as the steroid receptors and that the thyroid receptor is identical to the *erb A* protooncogene.⁵ Thus, two structurally unrelated classes of hormonal ligands bind to similar receptors. These receptors now appear to be members of a very large family of ligand-binding proteins involved in transcription. Evans has proposed the term "ligand-responsive transcription factors", or LTFs.⁵ Besides steroid and thyroid receptors, the LTF family includes distinct receptors for retinoic acid, Vitamin D₃, dioxin and other toxins, possibly the insect hormone, juvenile hormone, and a group of "orphan receptors" for which the ligand is unknown. This family thus encompasses an astonishingly broad group of ligands which have key roles in the development, growth, maintenance and reproduction of the organism.

The DNA-binding domain of receptors in the superfamily has a double finger-like structure due to conserved cysteine residues which coordinate with zinc.⁶

*Professor, Department of Biochemistry, Dalhousie University, Halifax, N.S.

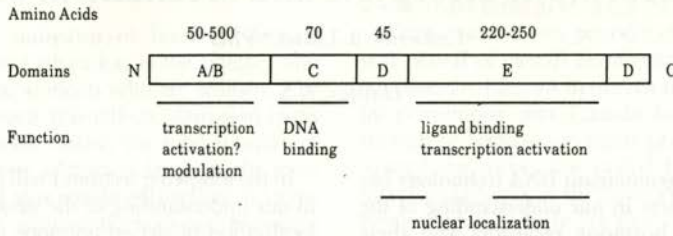


Fig. 1 Structure of receptors in the steroid receptor superfamily. Adapted from reference 2.

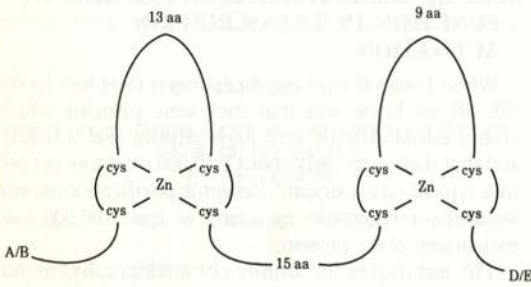


Fig. 2 Zinc fingers in the receptor C domain. Based on the human estrogen receptor (5).

(Fig. 2). These "zinc fingers" are important in recognition of the regulatory DNA sequences, or "response elements", which are usually located 50-1000 base pairs upstream of each hormone-inducible gene. The typical hormone response element (HRE) sequence is a 15 base pair palindrome to which receptor dimers bind with high affinity and specificity. This specificity can be clearly and elegantly demonstrated in "finger swap" experiments.⁷ Expression vectors encoding hybrid receptor with the hormone-binding domain from the human estrogen receptor and zinc fingers from the glucocorticoid receptor were transfected into cells which contained vectors with either glucocorticoid or estrogen response elements linked to a reporter gene. On binding estradiol, the hybrid receptor turned on glucocorticoid responses but not estrogen responses. Altering response elements can also alter specificity.⁸ For example, an estrogen response element can be changed into a glucocorticoid response element simply by substitution of two of the bases at corresponding positions in the palindrome (Fig. 3). Thus, specificity in hormone responses is linked both to the sequence of the receptor zinc fingers and of the response elements.

How the binding of receptor to response element DNA actually stimulates or inhibits transcription is just beginning to be understood. Zinc fingers alone do not stimulate transcription: sequences in the A/B and E regions are required as well. Also, whether or not the hormone must remain bound to the E-region is

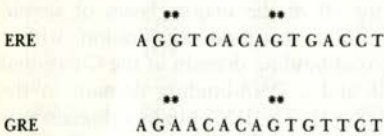


Fig. 3 Changing an estrogen response element (ERE) to a glucocorticoid response element (GRE). The horizontal arrows highlight the palindromic nature of the response elements to which receptor dimers bind (adapted from reference 8).

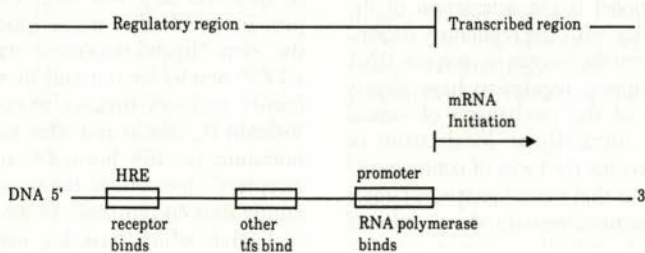


Fig. 4 Hormonal regulation of transcription: receptor binding to the hormone response element (HRE) affects activity of other transcription factors (tfs) and RNA polymerase in transcription complex.

uncertain. The simplest model for transcriptional activation is that HRE-bound receptor interacts with promoter-bound RNA polymerase II, but probably other transcription factors are required as well to make a stable transcription initiation complex (Fig. 4). In the case of steroid inhibition of transcription, the HRE-bound receptor could interfere with binding of other essential transcription factors.²

INTRACELLULAR DISTRIBUTION OF STEROID RECEPTORS

Early investigations of the intracellular localization of receptors were based to a large extent on so-called "grind and bind" methodology.¹ A target tissue was homogenized, the cell fractions separated by centrifugation into nuclei and a high speed cytosol, and receptor binding to ³H-labelled steroid was measured. If the target tissue came from animals that had no endogenous hormone, most of the receptor was found in the cytosol. If the tissue came from an animal that had been hormone-treated, most of the receptor was found in the nuclear fraction.

The presence of hormone was thought to be associated with translocation of receptor from cytoplasmic to nuclear fraction. It was quite a surprise when two groups reported in *Nature* in 1984 that the estrogen receptor was located in the nucleus, even in the absence of estradiol and concluded that cytosolic receptor was an artefact of homogenization.^{9,10} This conclusion was reached using two distinct methods of investigation. First, immunocytochemistry showed that anti-estrogen receptor antibody bound only within nuclei in target tissues, even from immature or ovariectomized animals.¹⁰ Second, enucleation of cells from a cultured pituitary cell line resulted in removal of most of the receptor whether or not the cells had been grown in the presence of estradiol.¹⁰ Similar results were reported for progesterone receptors. However, for the glucocorticoid receptor the story is not so clear. Hormone-free receptor in the cytoplasm has been visualized using antibodies.¹¹ Treatment with a glucocorticoid agonist is thought to dissociate the cytoplasmic receptor from a complex with heat shock protein 90, unmasking "nuclear localization" (NL) sequences in the receptor D and E regions (Fig. 1). These sequences target the receptors to the nucleus, probably by binding a site in the nuclear pore complex. It is possible that the NL sequences on the estrogen receptor are never masked, so that the receptor can be targeted to the nucleus in the absence of hormone. Only in the presence of hormone would tight nuclear binding to the response elements take place.

Phosphorylation of steroid receptors may play a role in nuclear localization and receptor turnover.¹² There is no simple unitary picture yet, but in the case of the estrogen receptor, it appears that a specific tyrosine is phosphorylated in nuclear receptor isolated in the presence of hormone. Removal of the phosphate results in loss of receptor activity.

STEROID RECEPTOR ANTAGONISTS

The broad topic of antisteroid drugs and their numerous clinical applications is beyond the scope of this article. In a more limited context, studies using antisteroids have often provided valuable insights into the properties of steroid receptors and *vice versa*, knowledge of the receptor structure and function has often helped in the design of better antagonists.

A general hypothesis for antisteroid action is that the drug binds the steroid receptor at the same site as the natural hormone, but that the receptor-drug complex is unable to produce efficient transcriptional activation. This could be because the drug as ligand does not induce the appropriate conformational alteration in the receptor so that the drug-receptor complex fails to bind properly, if at all, to the response elements associated with regulated genes.

We have had a long-term interest in the triphenylethylene nonsteroidal antiestrogens, the best known of which is tamoxifen (Nolvadex[®]) which is widely used in treatment of estrogen-dependent breast cancer.¹³ Its metabolite, 4-hydroxytamoxifen, has particularly high affinity for the estrogen receptor, higher even than estradiol in some systems.¹⁴

The behaviour of tamoxifen as an estrogen agonist or antagonist depends upon the system under study. In rats and humans the drug acts as a partial agonist, in mice it is a pure agonist, in chickens a pure antagonist.¹⁴ This is puzzling in view of the structural similarity of the estrogen receptor in the different species. Indeed, the estrogen receptor may not be the entire focus of tamoxifen actions. Several groups (including ours) have shown that ³H-tamoxifen binds with notably high affinity to sites that are quite distinct from the estrogen receptor. These "antiestrogen binding sites" are principally localized in microsomes, especially in liver, and show binding specificity to a fascinating array of compounds including calmodulin antagonists, cytochrome P450 antagonists and certain oxysterol metabolites.¹⁴ Ether extracts from liver nuclei or serum will compete for tamoxifen binding, suggesting the presence of an endogenous ligand. Fractionation of the serum extracts resulted in separation of two active components, one of which remains unknown and the other of which appears to be 7-ketocholesterol. Since this compound has long been thought to be important in regulation of cholesterol biosynthesis, Carl Breckenridge and I investigated the effect of tamoxifen on serum lipid profiles in cockerels.¹⁵ Not only did a single high dose of tamoxifen give decreases in cholesterol, phospholipid and triglyceride levels, but also DPPE, a tamoxifen analogue that does not bind the estrogen receptor, produced similar decreases. This suggests that the effects of tamoxifen on serum lipids are not mediated by the estrogen receptor. They could take place through interaction with the antiestrogen-binding sites or other estrogen-independent loci.

Many groups have suggested that cytotoxic or growth-inhibiting effects of high doses of tamoxifen in human

breast cancer cell lines are estrogen-receptor independent.¹³ Support for this theory comes from a variety of experiments including some in which the specificity of tamoxifen and analogues for growth inhibition was shown to differ from their specificity for estrogen receptor binding. On the other hand, other workers feel that the high dose growth inhibitory effects are "suprapharmacological" and that the estrogen receptor is required for antigrowth effects. It is relevant that concentrations of tamoxifen in human tumors do reach very high levels (in the μM range).

Another steroid antagonist of particular contemporary interest is the antiprogesterone, RU 486, that has been widely tested in France for early pregnancy interruption.¹⁶ RU 486 binds both the progesterone and glucocorticoid receptors with high affinity although, oddly enough, lower doses are required to give the antiprogesterone effect of endometrium shedding than are required for an antiglucocorticoid effect such as increased plasma cortisol and ACTH concentrations. The mechanism of action of RU 486 is not yet clear: some studies suggest that the receptor-antagonist complex is imperfectly transformed and thus does not bind HRE. Other studies however, suggest that the RU 486-receptor complex can recognize the appropriate HRE but still fails to activate transcription.^{16,17}

It is also worth mentioning on the subject of steroid antagonists that some of the actions of the notorious anabolic steroids may be mediated through antagonism of glucocorticoid receptor responses in muscle rather than through androgen agonist actions.¹⁸ Indeed, it has always been difficult to understand why the drugs should have much effect at all in normal men, whose androgen receptors would already be occupied by endogenous dihydrotestosterone. Stimulation of glucocorticoid receptors would normally tend to inhibit protein synthesis, therefore inhibition could have a net anabolic effect. An excellent review of this controversial topic was published recently by Wilson.¹⁸

RECEPTOR DEFECTS IN HUMAN DISEASE

The new technology is just now permitting detailed analysis of genetic defects in steroid receptors. An excellent recent example of the approach is given by Hughes *et al.* who have delineated point mutations in the human vitamin D receptor gene associated with two kindreds with hypocalcemic vitamin D-resistant rickets.¹⁹ Here the receptor binds 1, 25-dihydroxy vitamin D₃ normally, but poorly to DNA. In one kindred, a point mutation was found near the tip of the first zinc finger and in the other, the mutation was at the tip of the second finger. In both cases the mutations involve a change in the net charge of the zinc finger and loss of the ability to bind to vitamin D response element.

Deletion mutations in steroid receptors could also have profound effects. Loss of the E region might produce a non-steroid binding variant which could bind the response element and block the functioning of

normal receptors. There is some evidence for this sort of alteration in estrogen receptors in breast tumors.²⁰

I anticipate that the next meeting of the Endocrine Society will have many reports on the molecular genetics of steroid receptor defects in human disease. The lag time between the basic discovery of receptor structure and the application to clinical understanding promises to be impressively short. □

ACKNOWLEDGEMENTS

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Central (Hypothalamic) Precocious Puberty Manifestations and Management Options

Sonia Salisbury,* MD, FRCP and Susan Baker,** RN, BN

Halifax, N.S.

The purpose of this article will be to review the differential diagnosis of central (hypothalamic) precocious puberty and to examine the consequences of arresting its progress by treatment with LHRH analogues. The physical features are almost shocking in the very young child. The deleterious effect on adult height and the psycho/social turmoil have led endocrinologists to examine the experimental use of these agents, with informed consent of the parents.

CASE REPORTS

Case 1:

This child was born at term after a normal pregnancy and had an uneventful neonatal course. She was first noted to have early breast development at the age of 10-12 months, then vaginal secretions but no menses and beginning around 15 months, the appearance of gradually increasing amounts of pubic hair. She became fretful, moody and difficult to console.

Initial investigations (Table I) at the age of 20 months confirmed the diagnosis of central precocious puberty due to a hypothalamic hamartoma. She was treated with a trial of medroxyprogesterone acetate to suppress the pubertal changes but this was poorly tolerated.

When she was 2.4 years, an LHRH agonist (Buserelin®) was started. At this time her breasts were 5-6 cm in diameter (Fig. 1), the nipples were mature in appearance, and she had increased vaginal secretions (Fig. 2). Her growth velocity was greater than the 97th percentile for age.

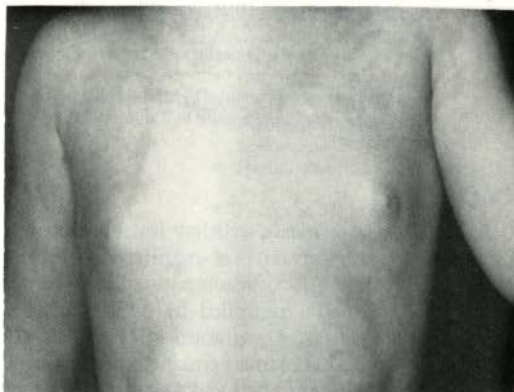


Fig. 1 Case 1 Age 2.4 years

* Associate Professor, Department of Pediatrics, Dalhousie University, Halifax, N.S.

**Izaak Walton Killam Hospital for Children, Halifax, N.S.

| | |
|-------|----------------------------------|
| LHRH | — Luteotropic Releasing Hormone |
| LH | — Luteinizing Hormone |
| FSH | — Follicle Stimulating Hormone |
| DHEAS | — Dehydroepiandrosterone Sulfate |
| TSH | — Thyroid Stimulating Hormone |

TABLE I

PRETREATMENT DATA

| Case | 1 | 2 | 3 |
|--|----------|----------|----------|
| Chronological age (years) | 2.3 | 7.1 | 7.7 |
| Bone age (years) | 5.0 | 7.8 | 13.0 |
| Height age (years) | 3.8 | 7.3 | 10.6 |
| Height (cm) | 98.6 | 120.1 | 139.6 |
| Growth velocity (cm/year) (normal for age) | 15 (8.7) | 13 (5.7) | 12 (5.6) |
| LH basal (IU/L) | 40 | 4 | 6 |
| LH peak after LHRH (<10 IU/L) | 258 | 39 | 29 |
| 17-beta estradiol (pMol/L) (<44 pMol/L) | 170 | 172 | — |
| Testosterone (nMol/L) (<0.69 nMol/L) | — | — | 10.4 |
| DHEAS (µMol/L) (0.3-1.6 µMol/L) | 1.1 | 1.4 | 0.6 |

Case 2: (Fig. 3)

This girl has always been smaller than her peers but was noted at age 6 to quite suddenly increase in height and weight, and to develop both breasts and pubic hair. Her first menstrual period occurred at age 6.

When first seen at age 7.1 years, her height age was 7.3 (on the 50th percentile for age 7.3 years), and the bone age was still normal at 7.8 years. However, on physical examination she had very advanced pubertal changes (Tanner Stage IV) with large breasts, an almost mature pattern of pubic hair, and mature vaginal introitus.

volume (adult 15-25 ml), and a penis which was 10.5 cm in length. A CT scan demonstrated a large hypothalamic hamartoma.

DIFFERENTIAL DIAGNOSIS

The differential diagnosis of precocious puberty, defined as the appearance of secondary sexual characteristics before age 8 in girls and age 9 in boys, is outlined in Table II. There are two components to puberty, a central hypothalamic-pituitary-gonadal component and an adrenal component.

Central stimulation begins with increasing hypothalamic pulsatile secretion of LHRH, resulting in increased pulsatile secretion of gonadotropins, particularly LH from the pituitary, and a gradual gonadal awakening with subsequent secretion of gonadal hormones. During antenatal life, this axis is hormonally active and plays an important role in development. However, during postnatal life until the onset of puberty, there is a postulated inhibitor of the hypothalamic LHRH pulse generator which holds things back.¹ Before normal puberty, there is strong inhibition of LHRH secretion with small amounts of LH and FSH secreted by the pituitary, thus this axis is easily suppressed by small amounts of estrogen. Patients with precocious thelarche have breast tissue, usually appearing between the ages of 12-24 months, but not associated with any other secondary sexual characteristics. This condition, which is much more common than true precocious puberty, may represent an earlier stage in the continuum of pubertal axis development but demands no treatment.² Occasionally, large non-neoplastic ovarian cysts are found in prepubertal girls with precocious breast development. Estrogen levels are higher than normal but FSH and LH are completely suppressed and do not increase after giving LHRH

TABLE II

CAUSES OF PRECOCIOUS PUBERTY

| | |
|-------------------|---|
| Central | <ul style="list-style-type: none"> • Idiopathic • Hypothalamic Hamartoma • Germinoma (pinealoma) • Other cerebral tumors or malformations • Hypothyroidism |
| Gonadal | <ul style="list-style-type: none"> • Precocious Thelarche (? central) • Ovarian cysts, benign • McCune-Albright Syndrome (Polyostotic fibrous dysplasia of bone, ovarian cysts, large irregular cafe-au-lait spots) • Leydig Cell Hyperplasia (Familial testotoxicosis) • Gonadal tumors (male and female) |
| Adrenal | <ul style="list-style-type: none"> • Precocious Adrenarche • Congenital Adrenal Hyperplasia • Adrenal tumors |
| Iatrogenic | <ul style="list-style-type: none"> • Exogenous sources |

because the hypothalamic-pituitary axis is immature and is very sensitive to estrogen inhibition.

The adrenal component to puberty, reflected by serum DHEAS levels, is an independent event, although the central and adrenal components usually occur more or less at the same time. This process may be precocious as in the common benign condition precocious adrenarche, characterized by the early appearance of pubic and axillary hair. The mechanism of regulation of increased adrenal androgen stimulating activity is not known but a pituitary adrenal androgen hormone has been postulated.

INVESTIGATION OF CENTRAL PRECOCIOUS PUBERTY

Not every case of possible central precocious puberty needs the extensive investigation outlined in Table III. Documentation of the bone age provides a baseline for future comparison and is helpful in gauging how rapidly the child is advancing towards a mature adult height. In cases of early breast development not accompanied by vaginal secretions and where the vaginal epithelium and labia minora remain pink and thin, a bone age and repeat measurement for calculation of growth velocity over time may be sufficient.

TABLE III

TESTS TO INVESTIGATE CENTRAL HYPOTHALAMIC PRECOCIOUS PUBERTY

-
- Bone age
 - Calculation of growth velocity
-
- DHEAS
 - 17-beta estradiol or testosterone levels
 - Baseline FSH and LH
-
- LHRH stimulation (test) of FSH and LH
 - Prolactin
 - TSH
 - Beta subunit-HCG
-
- CT scan
 - Pelvic ultrasound
-

The second tier of investigation involves ascertaining the baseline gonadal sex steroid production, adrenal androgen output (DHEAS), and baseline FSH and LH. When the gonadal hormone levels are elevated, further testing is required to rule out hypothyroidism (TSH), germinoma (beta subunit-HCG), benign ovarian cysts or gonadal tumors. If the gonadal precocity is driven by an increase in LHRH, either due to premature loss of inhibition or to the presence of a hamartoma, there is a dramatic increase both in baseline FSH and LH and their response to LHRH administration. This response will be absent when gonadal steroid output is due to causes unrelated to central precocity.

Precocious adrenarche is identified clinically by the absence of virilization. Although pubic and axillary hair occur in girls and boys with this condition, there should

be no clitoral hypertrophy or increase in penile or testicular size. In both sexes, the DHEAS will be elevated for age but unaccompanied by a rise in testosterone. When there is virilization, congenital adrenal hyperplasia or an androgen-secreting tumor must be ruled out by further testing.

As the diagnosis becomes more clearly suggestive of central precocious puberty, a head CT scan is then, and only then, required. Although most cases of central precocious puberty are idiopathic, hamartomas, central tumors such as those associated with neurofibromatosis, germinomas, or malformations such as hydrocephalus, must be considered.

TREATMENT OF CENTRAL PRECOCIOUS PUBERTY

Not all children require treatment. It becomes less imperative as the child's chronological age advances towards eight at the time of diagnosis. Some parents prefer not to interrupt a normal process of maturation. They are able to deal effectively with their children who must cope with both the mental and physical changes of puberty while still childish in their mental development.

Medroxyprogesterone acetate, used in the past to suppress the secondary sexual characteristics, is no longer recommended because of side effects, but also because of the availability since the early 1980s of LHRH analogues. These analogues are derived from the native 10 amino acid LHRH. By substituting the amino acid in position 6, agonists are produced which have much longer half-lives than LHRH.³

In puberty, LHRH, secreted in pulses, stimulates the pituitary to produce LH in pulses which increase in both amplitude and frequency as puberty progresses. The seemingly paradoxical use of an agonist to suppress LH secretion is dependent upon increased affinity of these long-acting LHRH agonists for the LH receptor. After an initial increase in LH production, there follows a profound suppression due to receptor occupancy and loss of pulsatile stimulation.

The LHRH agonists must be administered either intranasally several times daily, subcutaneously daily, or more recently by once monthly depot injections.⁴ They are effective in suppressing further central pubertal development. There is no alteration in the appearance of adrenarche which is under separate control. They are safe to use in that there is no alteration in hematological, hepatic or renal function. When discontinued, normal pubertal activity reappears within months.

Although there is an improvement in adult height prediction, these predictions are made on the basis of data from normal children, and final adult statures are still unknown. The effects upon fertility, though not expected to be deleterious, are not known.

RESULTS OF TREATMENT

At the Izaak Walton Killam Hospital for Children, we

have treated eight children with LHRH agonists (five with Buserelin, [D-Ser(tBu)⁶-GnRH-EA¹⁰], kindly provided by Hoechst Pharmaceuticals, and three with Lupron (D-Leu⁶, des Gly-NH₂¹⁰-L-proethylamide). Four of the children in the Buserelin group have been treated for 4 years or longer. Their mean pretreatment age was 4.27 ± 1.96 years, and their growth velocity averaged 12.42 ± 3.4 cm which was significantly above normal. After 4 years, there was a significant decrease in their growth velocity to 4.7 ± 2.02 cm, similar to that noted by Styne *et al.*⁶ When the bone age and the chronological age are expressed as a ratio, the average before treatment, 1.72, fell after 4 years to 1.36. This confirms the observation that the speed of advancement of bone age has been slowed but not halted.⁷ Evidence exists suggesting that the acceleration of growth during puberty is at least partially mediated through sex steroid enhancement of growth hormone secretion⁸.

Studies in children treated with LHRH agonists have also shown a possible correlation between bone age advancement and rising adrenal androgen output which occurs independently during treatment.⁷

CONCLUSIONS

The greatest benefit from treatment with the LHRH agonists is the halting of further secondary sexual development due to suppression of sex steroid secretion. The attendant effect on mood and aggressivity is perceived by the parents as the most important change in their children.

It was originally hoped that there would be an improvement in final adult height. As these children are followed, the enormous gains in predicted height calculated during treatment may be overly optimistic. □

ACKNOWLEDGEMENT

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Sexual Violence: Care for Victims in Nova Scotia

Janice Boxall, MD, CCFP (EM)

Halifax, N.S.

Sexual assault is a legal term not a medical diagnosis, nor is it an adequate description of the experience. Canada's criminal code separates it into sexual assault, sexual assault with a weapon or causing bodily harm, or aggravated sexual assault. Differentiating sexual assault from assault depends partly on the evidence that "if the motive of the accused is sexual gratification, to the extent that this may appear from the evidence, it may be a factor in determining whether the conduct is sexual".¹ But sexual assault is not a sexual act; it is a crime of violence, and one where society still expects the victim to show evidence of resistance.

Stephanie Clark has collected many more accurate descriptions of sexual assault. In her article, *Perspectives on Sexual Assault*², she quotes Notman and Nadelson:

"The rape experience is depersonalizing and dehumanizing. The woman is often a faceless object for the rapist's expression of hostility, and the victim feels degraded and used."³

She also quotes Metzger:

"Rape is the act by which a woman is known without knowing anything herself, the means by which knowledge and therefore presence is bypassed, and nonbeing . . . becomes permanent. The only knowledge she gains is the knowledge of her lack of self."⁴

In 1988, in Nova Scotia, there were 48 reports of sexual assault. This is not the true incidence of assault in Nova Scotia, as it is estimated that only one in ten incidents are reported, and this does not include child abuse.

To provide medical care for victims, it is necessary to have a system in place in the community which allows the physician uninterrupted time with the patient. It is also necessary to be knowledgeable about the sexual assault examination kit which is provided by the R.C.M.P. The first half of this article describes the Sexual Assault Assessment Service of Halifax, and suggests how it might be modified for other communities. The second half is a brief description of the examination kit, with special reference to two areas which are commonly misunderstood — the emotional response of the victim, and what the presence or absence of sperm might mean.

*Assistant Professor, Department of Family Medicine, Dalhousie University, Halifax, N.S.

Correspondence: Dr. Janice M. Boxall, 33 Abbey Road, Halifax, N.S. B3P 2M6

SERVICES FOR SEXUAL ASSAULT VICTIMS

Halifax is fortunate in having a volunteer service for sexual assault victims. The Service for Sexual Assault Victims (SSAV), incorporated in April 1984, provides crisis intervention that is designed to prevent future long-term emotional consequences of sexual assault by providing support and counselling at the time of acute crisis.

It fulfils this function by a 24-hour crisis line, counselling, appropriate referrals and volunteers who will meet with victims in the emergency department. These volunteers remain with the victim through the medical examination and police inquiries, and later accompany the victim to court. What began with 42 calls a year has grown to 380 calls in 1988. The service depends on successful yearly applications for grant money. Its role in the community speaks for itself, considering only the increase in calls and the service provided.

In 1983 Carol Wackett, Executive Director of SSAV, found that victims were facing waits of up to eight hours in the emergency department. At the same time, the physicians required emotional support after performing assault examinations. Dr. Fionnella Crombie's assistance was solicited to develop a roster of interested and specially trained physicians to perform these examinations. The initial request was to provide only female physicians.

SEXUAL ASSAULT ASSESSMENT SERVICE

The Sexual Assault Assessment Service, established in January 1987, continues to work out of the Halifax Infirmary Emergency Department. The objective of this service is to provide a co-ordinated, efficient response for the victims of rape by decreasing the waiting time in emergency, providing examiners who have special training and an interest in treating victims of sexual assault, and avoiding interruptions during the examination by using a physician who is not responsible for the rest of the emergency department.

The system requires co-operation among the physicians, nurses, volunteer SSAV workers and the police. The care by the physician and accompanying SSAV volunteer continues from the time of the assault through to the court appearance. It is designed to provide care to both male and female victims.

The physicians involved in this service have attended workshops on the short and long-term effects of assault, and the follow-up and counselling needs of the victims. They have been taught to use the R.C.M.P. kit, and to provide special aspects of the examination, in particular, the pelvic exam. A video tape was made by Dr. David

Maxwell and Dr. Fionnella Crombie, to aid in this teaching. Information was given about the role of the police and lawyers, and how to prepare for court. Reading material was provided, and the group continues to meet every second month for professional support and upgrading.

The roster continues to operate in Halifax, but what about the rest of Nova Scotia? Dartmouth established a similar roster in January 1987, but has since switched over to a call-back list for the emergency department. This list includes both male and female physicians, and does not account for interest, training or ongoing education and support. Other areas of Nova Scotia do not have any special system in place. In fact, few places in Canada do. Family physicians in Vancouver set up a system in 1981 (upon which the Halifax system was modeled), and in its first four years has treated 353 patients.⁵ Hamilton has a system which involves the emergency department physician on duty, with back-up Family Medicine residents.⁶ Not all centres are fortunate enough to have a liaison with volunteer workers.

All Family Medicine residents receive formal teaching on sexual assault. In addition, female residents have the opportunity to observe the examination in the emergency department. As the duty physicians gain more experience, it is anticipated that further teaching can be done, and that male physicians could become involved. Preliminary discussions have taken place with regard to how a similar system might be integrated into emergency care of adolescent victims of sexual assault who are seen at the Izaak Walton Children's Hospital.

CARE FOR THE VICTIM

How does the system work? The victim arrives at the hospital, either on her own or in the company of an SSAV volunteer or police. Upon her arrival, a nursing intake is carried out to ensure that the patient is hemodynamically stable, and that no life-threatening injuries require immediate attention. This nurse will remain with the victim throughout the entire examination, providing emotional support, as well as assisting the physician. It will be necessary that she be relieved of any other emergency department duties during this time. The doctor on call is then notified. Simultaneously, the SSAV worker is notified to come in. The police also need to be notified, and are asked to come in once the examination is complete.

When the doctor arrives, the victim is asked if she wishes the volunteer worker present during the examination. Most women appreciate this support, especially during the pelvic examination. The physician carries out the examination, as outlined in the R.C.M.P. kit. If the woman is unclear as to whether or not she wishes to press charges, it is probably just as well to collect legal evidence. This evidence cannot be collected at a later date, but can be discarded if she does not proceed with charges. Once the examination is complete (which takes approximately one and one-half to two hours, even for an experienced physician), the

police are called back, and the evidence signed over. The physician is then free to go, and the victim and volunteer meet with the police. The physician provides medical follow-up, and provides evidence in court. The physician must ensure that the chain of evidence is not broken. The evidence cannot be left unattended, so the physician cannot leave the room once the examination has begun, and the evidence must be turned over directly from the physician to the police officer. Following this protocol means that nurses do not need to go to court, and this greatly facilitates their cooperation during the examination.

Some modifications can be made in this protocol for communities without sexual assault rosters or volunteer workers. The back-up physician on call for emergency would be called in. A nurse could be the major support person, and it may be necessary to assign two nurses to the case, to provide adequate support and assistance to the physician.

SERVICE PROVIDED IN HALIFAX 1987-1988

In 1987, there were 37 examinations for sexual assault at the Halifax Infirmary; 28 included forensic exams. 59% of these took place on Saturdays and Sundays, and 67% between the hours of 8:00 p.m. and 8:00 a.m. in 1988, 30 assaults were documented, 57% on Saturday or Sunday (64% between Friday and Sunday). 60% were from midnight until 8:00 a.m., and 67% between 8:00 p.m. and 8:30 a.m. 83% of the examinations took place within twenty four hours of the assault. 73% of the examinations were completed within two hours.

Multiple assailants were involved in 9% of assaults. Descriptions of physical trauma included: bruising 47%, abrasions 40%, lacerations 13% and fractures 3%.

There were no sperm identified on "wet mount" (vaginal pool washings) in 63% of the cases.

ASSESSMENT OF THE SERVICE

From all points of view, the system is a success. The victims have relayed back to SSAV, as well as to individual physicians, how it had helped to have a physician who had the expertise, and who took the time to help them after their assault. The physicians' willingness to go to court, and the solid preparation for court, has been favorably commented on. SSAV volunteers have noticed a vast improvement in the care given to victims since the system has been in place, and for the most part feel part of the team, although they remain surprised at how long the examination takes. The problem of long waits in emergency has been addressed, and the emergency physician is no longer being called away from his/her primary duties. The physicians involved still find the examinations emotionally difficult, but have gained experience and confidence in doing them. They feel they are making a valuable contribution with their time. The regular meetings for educational update and support have been a key factor in the success of the system.

THE EXAMINATION

The role of the doctor is *not* to prove that a sexual assault took place, but as with any patient, to identify and treat any physical and psychological trauma. A second role is to obtain medical-legal evidence.

The examination itself includes essential elements of the history, physical and gynecological forensic examination, and treatment is well described in several articles to which the reader is referred.^{6,7}

There are two elements of the examination which continue to provide difficulty to physicians who are unfamiliar with assault victims. These also require clarification in court. The first of these is the emotional response of the victim, and the second, the significance of sperm.

Emotional Response

Thirty percent of patients seen in Halifax in 1988 were in a controlled emotional state. Other emotions include crying (33%), being upset (33%), anger (13%), being frightened (10%), withdrawing (10%), and smaller numbers were confused, drowsy, nervous or suicidal. In only 10% of the time were patients seen as being hysterical.

Thirty-one percent of patients seen in Vancouver from 1982-1985 were described by the physician as "controlled".⁵ Forty-one percent were crying or anxious, but none were considered hysterical. The range of emotions is more variable, and more controlled than initially might be expected. Burgess and Holmstrom describe the "rape and trauma" syndrome, which is now recognized as a form of post traumatic stress disorder.⁸

Rape Trauma Syndrome

The "Rape Trauma Syndrome" is broken down into the acute phase (or phase of disorganization), and a second phase, two to three weeks later, of reorganization. The woman is in the acute phase when first seen in the emergency department. At this stage many women are very practical, are simply glad to be alive, but concerned about pregnancy, sexually transmitted diseases, and the risk of HIV transmission. Their emotions may be expressed or controlled. Somatic reactions include soreness from physical trauma, symptoms of muscle tension, gastrointestinal irritability and genitourinary irritation. Emotions vary from fear, humiliation and embarrassment, to anger, revenge and self-blame. Blaming herself is easier than accepting how vulnerable she is to being attacked.

The second phase is the long-term reorganizing phase. This includes changes in motor activity (including moving residence), nightmares, phobias, and difficulties in re-establishing previous sexual relationships. The phobias are usually specific to where the attack took place.

It is important to be aware of the number of emotions that can occur, both for long-term counselling, and to be able to explain, in a court room, that a controlled

manner is still in keeping with the emotional reaction to sexual assault.

Significance of Sperm

The presence of sperm is not necessary to prove that sexual assault took place, although their presence can be very helpful as evidence.

Sexual dysfunction, with impotence or retarded or premature ejaculation, occurs in 34% of convicted offenders.⁹ There is also the question of the length of time which has elapsed since the assault, and detailed charts of likelihood of spermatozoa being present at different times are available.¹⁰ What do the clinical audits show? In the Halifax audit, penetration of the vagina occurred in 43%, with another 7% attempted, but ejaculation occurred in only 23%. Condoms were used in 7%. Sperm were found in 17% of cases where a microscopic exam of a "wet mount" of the vaginal washings was carried out. In Vancouver, sperm were found in 22% of cases.⁵ If motile sperm are not seen, the slide needs to be air dried and sent to a forensic laboratory where, with staining, sperm may be seen. A physician should be prepared with the data on the frequency with which sperm are seen in assault cases, and with tables of likelihood of sperm at different time intervals, for the use of the court when presenting evidence.

CONCLUSIONS

Who, in the community, should be doing the examination? All family physicians should be able to care for the sexual assault victim, and take the time to learn to do so. Although the initial request was for female physicians, it is the ability to provide nonjudgmental, unhurried, compassionate care that is important, not the sex of the physician. Referral should only be necessary if the patient suffers dysfunction in her job or activities of daily living, a psychotic breakdown or severe phobias. The continuity of followup with short, frequent visits, is more important than extensive counselling at a few sparse visits.¹¹

Communities throughout Nova Scotia should be encouraged to set up an appropriate response system to sexual assault. Physicians interested in this area can contact the Service for Sexual Assault in Halifax (455-4240) or the Sexual Assault and Assessment Service (current director Dr. Joyce Curtis, 424-2171). The video tape on the pelvic forensic exam is also available for teaching purposes through the Sexual Assault and Assessment Service. Dalhousie Family Medicine provides seminars every four months, to which community physicians are invited (Dr. Marilynne Bell, Dr. Cathy Cervin, 424-7010). □

ACKNOWLEDGEMENTS

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PRESCRIBING INFORMATION

ZANTAC TABLETS (ranitidine hydrochloride)

Pharmacological Classification

Histamine H₂ - receptor antagonist

Indications and Clinical Use

Zantac Tablets are indicated for the treatment of all conditions where a controlled reduction of gastric secretion is required for the rapid relief of pain and/or ulcer healing. These include duodenal ulcer, benign gastric ulcer and reflux oesophagitis.

Contraindications - Zantac is contraindicated for patients known to have hypersensitivity to the drug.
Warnings - Gastric ulcer - Treatment with a histamine H₂ - antagonist may mask symptoms associated with carcinoma of the stomach and therefore may delay diagnosis of the condition. Accordingly, where gastric ulcer is suspected the possibility of malignancy should be excluded before therapy with Zantac is instituted.

Precautions - Use in pregnancy and nursing mothers - The safety of Zantac in the treatment of conditions where a controlled reduction of gastric secretion is required during pregnancy has not been established. Reproduction studies performed in rats and rabbits have revealed no evidence of impaired fertility or harm to the foetus due to Zantac. If the administration of Zantac is considered to be necessary, its use requires that the potential benefits be weighed against possible hazards to the patient and to the foetus. Ranitidine is secreted in breast milk in lactating mothers but the clinical significance of this has not been fully evaluated.

Use in impaired renal function - Ranitidine is excreted via the kidney and in the presence of severe renal impairment plasma levels of ranitidine are increased and prolonged. Accordingly, in the presence of severe renal impairment clinicians may wish to reduce the dose by one half.
Children - Experience with Zantac Tablets in children is limited and such use has not been fully evaluated in clinical studies. It has however been used successfully in children aged 8-18 years in doses up to 150 mg twice daily without adverse effect.

Interactions with other drugs - Although ranitidine has been reported to bind weakly to cytochrome P450 in vitro, recommended doses of the drug do not inhibit the action of the cytochrome P450-linked oxygenase in the liver. There are conflicting reports in the literature about possible interactions between ranitidine and several drugs, the clinical significance of these reports has not been substantiated. Amongst the drugs studied were warfarin, diazepam, metoprolol and nifedipine.

If high doses (2g) of sucralfate are co-administered with ranitidine the absorption of the latter may be reduced. This effect is not seen if sucralfate is taken after an interval of 2 hours.

Adverse Reactions - Headache, sometimes severe, rash, dizziness, constipation, diarrhoea and nausea have been reported in a very small proportion of drug-treated patients but these also occurred in patients receiving placebo. A few patients on re-challenge with Zantac have had a recurrence of skin rash, headache or dizziness. Rare reports of bradycardia have occurred. Rare cases of reversible mental confusion and hallucinations have been reported, predominantly in severely ill and elderly patients. There have been a few reports of reversible blurred vision suggestive of a change in accommodation.

Some increases in serum transaminases and gamma-glutamyl transpeptidase have been reported which have returned to normal either on continued treatment or on stopping Zantac. In placebo controlled studies involving nearly 2,500 patients, there was no difference between the incidence of elevations of SGOT and/or SGPT values in the Zantac treated or placebo treated groups. There have been occasional reports of reversible hepatitis (hepatocellular, hepatocarcinoma or mixed) with or without jaundice. Hypersensitivity reactions (urticaria, angioneurotic oedema, bronchospasm, hypotension) have been seen rarely following the parenteral and oral administration of Zantac. These reactions have occasionally occurred after a single dose.

Reversible blood count changes (leucopenia, thrombocytopenia) have occurred in a few patients. Rare cases of agranulocytosis or of pancytopenia sometimes with marrow hypoplasia have been reported. Other haematological and renal laboratory tests have not revealed any drug related abnormalities. No clinically significant interference with endocrine or gonadal function has been reported. There have

been a few reports of breast symptoms (swelling and/or discomfort) in men taking ranitidine; some cases have resolved on continued treatment.

Symptoms and Treatment of Overdosage - No particular problems are expected following overdosage with Zantac. Symptomatic and supportive therapy should be given as appropriate. If, in need, the drug may be removed from the plasma by haemodialysis.

Dosage and Administration - Adults: Duodenal ulceration, benign gastric ulceration, or reflux oesophagitis: 300 mg once daily at bedtime.

It is not necessary to time the dose in relation to meals. In most cases of duodenal ulcer and benign gastric ulcer, healing will occur in four weeks. In the small number of patients whose ulcers may not have fully healed, these are likely to respond to a further course of treatment.

Patients who have responded to this short term therapy, particularly those with a history of recurrent ulcer, may usefully have extended maintenance treatment at a reduced dosage of one 150 mg tablet at bedtime.

To help in the management of reflux oesophagitis, the recommended course of treatment is one 300 mg tablet once daily at bedtime or one 150 mg tablet twice daily for up to 8 weeks.

Children: Experience with Zantac in children is limited and it has not been fully evaluated in clinical studies - see **Precautions**.

Availability - Zantac Tablets are available as white film-coated tablets engraved ZANTAC 150 on one face and GLAXO on the other, containing 150 mg ranitidine (as the hydrochloride), in packs of 30 and 60 tablets.

Zantac tablets are also available as white, capsule shaped, film-coated tablets engraved ZANTAC 300 on one face and GLAXO on the other, containing 300 mg ranitidine (as the hydrochloride), in packs of 30 tablets.

Zantac injection is available as 2 mL ampoules each containing 50 mg ranitidine (as the hydrochloride) in 2 mL solution for intravenous or intramuscular administration. Packages of 10 ampoules. Product Monograph available on request.

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Strategies for Medical Women in the Nineties

Frances Rosenberg,* MD, PhD, FRCPC

Vancouver, B.C.

The first decade following the centennial of Dr. Annie Hamilton's admission to Dalhousie Medical School will be a very critical time for medical women. We now constitute a significant presence within the profession. If we are to insure that medicine continues to be an appealing career choice we must move to a position of influence within it. There are some very significant issues that need to be addressed. Medicine has to be transformed from a masculine domain to one that includes both genders and whose practitioners are not sex-role stereotyped. Barriers to medical women's personal and professional fulfilment must be identified and removed. The environment within which these tasks must be accomplished is not a particularly hospitable one as it contains a health care industry and medical profession that are subject to increasing government and public pressure.

ERADICATE SEXISM

In the Forward to *The Nonsexist Word Finder*, Casey Miller and Kate Swift¹ remark

"Widespread recognition of the male bias of standard English is relatively new. In fact, the social illness this bias reflects and perpetuates was given a name only in the late 1960s when the word sexism was coined. Naming the disease was the necessary first step in acknowledging its extent; eradicating it involves revising our laws and customs as well as exposing and eliminating some of our most cherished cultural stereotypes. Because language screens our perception of reality, the very words we use can reinforce our sexist assumptions and attitudes. . . . Opposition to sexist language usually takes the form of ridicule. . . . that nonsexist language is politically motivated is true. Political realities have always shaped language, and English usage clearly reflects the exclusion from power of women as a class. . . . Women's historical exclusion from such philosophical constructs as the Renaissance Man, the Common Man and Mankind is a political reality that explains and underscores the sex-specific connotations man, men and mankind have acquired in modern English."

Schneider and Soto define sexist language as inherently discriminatory language, either written or spoken

*Editor, Federation of Medical Women of Canada News Letter (MD, 1966; PhD, 1971, Dalhousie University, Halifax, N.S.)

Correspondence: Dr. Frances Rosenberg, Department of Laboratories, Saint Paul's Hospital, Vancouver, B.C. V6Z 1Y6

communication that implies an unjustified sexual bias against a group or an individual, usually females, and sometimes males.² Sexist language can be divided into two types of terms: generics and stereotypes. The generic is a term that includes females as well as males in its meaning although only the male is mentioned. Sexist stereotypes are fairly easy to recognize if we recall our nursery rhymes "What are little girls made of, made of?" This exemplifies the visible side of female sex-role stereotyping. What is less readily appreciated is the significance of no females in the picture. For an illustration of this in medical literature, one has but to search textbooks, monographs and pharmaceutical advertisements for a picture of a woman with angina. One is unlikely to get the impression that coronary heart disease is the leading cause of death in women.

Neither the significance nor the difficulty of eliminating sexism from medicine should be underestimated. The full assimilation of women within the profession requires alterations in the sex-based role expectations that characterize our culture. Cooperation between the genders will facilitate the advancement of women and it is more likely to occur in an environment that portrays a nonsexist world. The elimination of sexist language within the profession would help alleviate some of the problems with self esteem that may contribute to the additional anxieties that medical women experience when compared with their male counterparts.³

Elimination of sexism from medical texts, medical publications, from the constitutions and by-laws of medical organizations and health care institutions should be pursued. The Royal College of Physicians and Surgeons should be persuaded to substitute the use of member or certificant for the term "Fellow". How many among you have the image of a woman come to mind when the expression "Fellow" is used? The addition of nonsexist writing to the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" is long overdue and should be addressed without delay. Elimination of sexist humor and sex-stereotyping from medical curricula should be advanced through the introduction of educational programs for medical faculty. Elimination of the use of "he" as a sex-indefinite singular person and a return to pre-Victorian use of "they" should be the New Year's resolution for all medical women.

The goal should be to render the profession gender neutral. This is important given the concerns expressed by Ryten over the possible impact of the increasing number of female physicians on the prestige of the profession and its vulnerability to government intervention.⁴ In addition, a nonsexist milieu would encourage

the emergence of a more androgynous female physician, and this is what will be needed if gender polarization such as exists in Russia is to be avoided.

The editorial by David Woods in the *Canadian Medical Association Journal* entitled "The Quest for a Sexless Language" is a fairly typical example of how the issue of sexism is trivialized within medicine.⁵ The use of the phrase "sexless language" tends to thwart rather than aid the reader in understanding Dr. Carole Guzman's objection to the viewpoint that "the personal pronoun ('he') does not denote gender". This, when added to the "But becoming too ardent in de-sexing the language can lead to such dreadful. . . ." and "But much more serious than the sexual abuse or words is their syntactical misuse. . . .", appearing in the second half of the piece, and effectively invalidating any supportive points made in the first half, clearly indicate that the Editor-in-Chief of the *Canadian Medical Association Journal* was not urging the readership to take the issue of sexism seriously. The Editor of the *British Columbia Medical Journal* might describe the piece he wrote on the adoption of a "nondiscriminating" language policy by the BCMA as humorous, but I found it remarkable only for its obvious lack of support for non-biased approaches.⁶

As women physicians, we need to send a clear message to our male colleagues that sexist language is not acceptable, and neither is trivializing our concern over it. We need to speak with a united voice in this matter, so that our message is unmistakable. There are some among us who think this is not important. I say that is simply because they have not had the opportunity to acquaint themselves with the impact that it has on our lives. Susan Schneider and Ana Marie Soto claim that "false generics" cause harm.²

Studies assessing the response to generic terms, which are intended to include females, reveal that the majority of respondents envision males. If that is the case, then we can begin to appreciate how the educational system and medical organizations and institutions can erect invisible barriers ("glass ceilings") to women's participation.

LAY THE FAMILY TRACK

Earlier this year when Felice Schwartz recommended that corporate mothers be placed on special lower-paid, low-pressure career tracks — the now-notorious "mommy track", furore erupted.⁷ Two points emerged from the controversy which ensued: 1) the enthusiasm with which the press publicized this recommendation and the appearance of an article so lacking in scientific merit in the *Harvard Business Review* underscores the sexism that pervades our society; and 2) women must challenge the assumptions that the policy makers use with regard to female workforce participation. As medical women we must shun any and all dual track solutions to the problems of balancing work and family life.

Let us clearly distinguish between those responsibili-

ties that women currently shoulder that are biologically determined and those that are socially prescribed. Let us see that solutions to childbearing issues are separated from those of childrearing and homelife. Let us be clear that any policy or program related to pregnancy that has a disproportionate effect on women is sex discrimination. If arrangements for maternity coverage within a residency program must be negotiated on an individual basis and perceived as a goodwill gesture at any level, this is sex discrimination. The establishment of nondiscriminatory approaches to pregnancy throughout medicine must be undertaken. Any assumptions about the timing of childbearing that run counter to the biological clock should be carefully examined.

Let us refuse to accept the assumption that the care of the home and children will continue to be primarily the responsibility of women for it is both a self-fulfilling prophecy and sexist. These issues need to be conceptualized and operationalized as family issues if women (and men) are going to find an equitable and workable balance to their family and work responsibilities. Ellen Futter⁸, the President of Barnard College, wrote

"Felice Schwartz's proposal not only institutionalizes gender stratification in the work force but also undermines the entire effort to achieve equality opportunity for women. Trying to create greater flexibility for women is important, but achieving it through structures that are, either implicitly or explicitly, for women is wrong. . . . even if the costs associated with benefits like child care leaves result in higher expenditures for female managers than for male managers, women who take them off enable male managers, the fathers, to remain on the fast track. Thus expenditures supposedly made in behalf of women alone are, in fact, also supporting male career trajectories. A more appropriate assessment of these economic issues is found on an 'all labor force' cost basis."

We must work with our male colleagues to create a new 'reality' for family life. For this to occur, medical women's groups will have to adopt this vision and pursue it with various academic and professional medical organizations.

ENROLL IN OUR OWN LIVES

How are we to progress along the avenues I mention? We must begin by acknowledging ourselves and articulating our own needs. We must begin to see that being primarily nurturers and caregivers of others is insufficient. We must stop having our lives shaped by the circumstances in which we find ourselves and begin to mould our own collective and individual lives. We need to create a vision of who we are and proceed to express that in our lives.

The expression of this idea at the organizational level is called leadership. The American Medical Women's Association has designated leadership as a major goal so as to empower women physicians and medical students

in the fulfilment of their personal and professional potential.⁹ Leadership skills are to be taught by their leadership task force at AMA meetings, conferences, and local branch programs. AMA's efforts are designed to empower leaders to change the rules of the game so that the average "nonleader" woman physician can succeed in her chosen field.

The expression of this concept at the individual level is called assertiveness. We must clarify for ourselves the distinction between aggressive, inhibited and assertive so as to begin to understand how constrained women's lives are and how they participate in the process. We must negotiate our own education in leadership and assertiveness. We must avail ourselves of the opportunities for assertiveness and leadership training that exist within and outside the medical community. We must press the medical organizations with which we are affiliated, academically and professionally, to assign a priority status to this issue.

CONCLUSION

The position of women within medicine has changed greatly since Annie Hamilton enrolled at Dalhousie and further change is both possible and desirable. There has been a definite shift in the public's perception as to who can be a doctor. Today when my credit card is returned

to me I have a better than 50 percent chance of hearing the comment "Thank you, Doctor". Twenty years ago it was almost invariably "Thank you, Mrs." The title on the card has not changed. On the other hand, when I say I work in a hospital the almost inevitable question is still "Oh, are you a nurse?" □

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AN ACCOUNT OF THE PRACTICE OF VARIOLATION

In a letter to her childhood friend, Sarah Chiswell, written from Constantinople (now Istanbul) on April 1, 1717, Lady Mary Wortley Montagu (the wife of the British Ambassador) wrote:

"Apropos distempers, I am going to tell you a thing that I am sure will make you wish yourself here. The smallpox, so fatal and so general amongst us, is here entirely harmless by the invention of engrafting (which is the term they give it). There is a set of old women who make it their business to perform the operation. Every autumn, in the month of September, when the great heat is abated, people send to one another to know if any of their family has a mind to have the smallpox. They make parties for this purpose, and when they are met (commonly fifteen or sixteen together) the old woman comes with a nutshell full of the matter of the best sort of smallpox and asks what veins you please to have opened. She immediately rips open that you offer to her with a large needle (which gives you no more pain than a common scratch) and puts into the vein as much venom as can lie upon the head of her needle, and after binds up the little wound with a hollow bit of shell, and in this manner opens four or five veins . . . The children or young patients play together all the rest of the day and are in perfect health till the eighth. Then the fever begins to seize 'em and they keep their beds two days, very seldom three. They have very rarely above twenty or thirty in their faces, which never mark, and in eight days' time they are as well as before their illness. Where they are wounded there remains running sores during the distemper, which I don't doubt is a great relief to it. Every year thousands undergo this operation, and the French ambassador says pleasantly that they take the smallpox here by way of diversion as they take the waters in other countries. There is no example of anyone that has died in it, and you may believe I am very well satisfied on the safety of the experiment since I intend to try it on my dear little son".

The Fast Lane: A View From the Other Side

The Rev. Douglas Mott, BA, MA, MDiv

Halifax, N.S.

What's it like being married to a female physician? Every physician's spouse, of course, knows what it is like to share a life that's a perpetual merry-go-round (and a fast paced one at that), of meetings, appointments, rounds and O.R.s. Yet when the physician in the family is your wife, there is still enough of a surprise element (even in today's liberated environment) to make life on that merry-go-round not only full, but at times, rather funny. At medical conferences and receptions, for instance, representatives of drug companies often come up to me with a firm handshake. "How are you doctor?" they'll say to me, as my wife looks on with a smile. Having learned, over the years, enough medical terms to sound convincing (at least for a few minutes), and with my wife's beeper attached firmly to my belt (since a beeper somehow looks out of place on women's evening wear), it's my chance to play "the great imposter". Then, of course, there are conferences where I get invited to events of interest for spouses. Invariably, these turn out to be garden parties and fashion shows — neither of which are particularly up my alley. Just once, I wish

they'd have an event for spouses that include an afternoon of fishing or tickets to a baseball game.

Yet what has impressed me most, as a doctor's husband, is the very difficult balancing act that female physicians are required to perform each day in their roles as doctor, mother and wife. A recent survey of professional couples found, time and time again, that it's the wife who ends up doing more work at home. This has less to do with an equal distribution of duties around the house than with the simple facts of life. One given fact that I have learned is that a child, who is sick at 3 a.m., wants its mother. I've jumped out of bed at the first sign of a cry, thinking I'd solve the problem, but I might as well have stayed under the covers. A father just won't do. A sick child wants its mother. And a crying two-year-old doesn't understand that Mom has to present grand rounds at 8 a.m.

So, to be a good mother, wife and doctor requires a very special person — not a supermom, superwife, and superdoctor rolled into one, but a dedicated professional, who willingly takes on roles that are sure to bring about perpetual exhaustion. It is an exceedingly difficult task such women assume, but as Arthur Meighen once put it, "Difficulties do not crush [people], they make them." And I am privileged to share my life with one who takes such difficulties in her stride. □

Correspondence: Rev. Douglas Mott, First Congregational Church of Halifax, 6680 South Street, Halifax, N.S., B3H 1V2

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Dual Careers

Jean Gray,* BSc, MD, FRCP (C)

Halifax, N.S.

Why an article on dual careers? One of the consequences of increased enrollment of women in medicine is a medical marriage in which the "spouse" is a male with a career and identity very uniquely different from the traditional medical spouse role.¹ Before writing this article, I reviewed the literature on medical marriages and, where appropriate, I will quote from these sources. But most papers refer to the more traditional marriage of a male physician and a female spouse who frequently spends her life enhancing her husband's role. As we shall see, that model is historically interesting, but distinctly unusual in 1990.

When women enter medicine, marriage is often delayed. But even that adage is no longer true, and the number of married female students has increased steadily over the last twenty years. Dr. Frances Rosenberg was the first female medical student at Dalhousie to have a child while enrolled in medical school, and that propitious event occurred a mere seventy-five years after Dr. Annie Hamilton's historic arrival.² Today, several female students choose to combine marriage, pregnancy and medical school.

What kind of pressures are experienced by a couple in which the woman elects to pursue the role of student, wife and mother? Good communication is necessary to maintain the health of any marriage, but this is even more true when the wife is away for long periods of time because of the demands of studies, presentations or on-call time. Suddenly, the male finds himself with his traditional role of wage-earner and husband, but also with a variety of new roles, ranging from child-raiser to personal psychiatrist for a wife who arrives home dead-tired and overwhelmed by emotional experiences. Pursuing his own career goals may prove very difficult during the years of medical school, and some men elect to put their own aspirations on hold during this time.

Does the situation improve during post-graduate training? Surprisingly, the answer appears to be "yes". Surveys of female internes and residents have demonstrated that "the marital state has been shown to be related to lowered levels of stress" during this period of medical growth.³ In a Canadian study, the male spouses expressed considerable gratification in seeing their mates achieve their career goals. Negative stresses were also noted, including: the fatigue of the female interne or resident, the lack of time together, and the necessity to "postpone important sources of gratification".³ The

husbands commented negatively on the amount of household duties imposed on them, and both spouses "worried about growing apart from their mates".³ Both female internes and residents are highly positive about "the emotional security, affection and intimacy provided by marriage". Having children adds to the stresses during this difficult portion of the medical career, and some women noted that their supervisors appeared to "lose respect" for them as professionals when they became pregnant.³

This study contrasts well with an earlier study of male residents and their female spouses. Male and female support roles differed; males provided more task-oriented support for their physician wives, whereas females tended to be more nurturing and emotionally supportive of the male physician.⁴ Different coping strategies are developed by female internes and male internes. And in marriages where both spouses are physicians, the stresses can be particularly high during this training period.

Marriage during or prior to postgraduate training does tend to influence career choice for a woman. The desire to finish quickly may make choices like family medicine, dermatology, and other generalist training programs more attractive. Many women who postpone childbearing until the end of their postgraduate training recognize the imperative of "the biological clock", and feel that some aspects of career development may have to be sacrificed in order to combine motherhood and career. In the day of centralized internship (and some residencies) matching services, the need to choose locations that will allow some physical closeness during the marriage precludes many choices for the female married interne. And when both spouses are entering the match, the choices are even more constrained.

Establishing a practice for the female physician is often determined by the male spouse's job location. Although attitudes are changing rapidly, the portability of a non-medical male is often less than that of the medical wife. Alternatively, choices are sometimes made to pursue the career goals of one spouse for a fixed period of time, following which the choices fall to the other. In a superb article entitled, *The Distaff of Aesculapius — the Married Woman as Physician*, Eisenberg indicates that being married is a powerful protective factor for men, but not for women. Married women have higher rates of depression than men, and professional women "exhibit a higher prevalence of affective disorder than women in the general population".⁵ The cure for this latter malady appears to lie in the recognition of career parity for women. The most successful female medical marriages appear to require an egalitarian approach, and when both spouses are

*Professor, Department of Medicine, Associate Professor, Department of Pharmacology Dalhousie University, Halifax, N.S.

Correspondence: Dr. Jean Gray, Department of Medicine, Camp Hill Hospital, 1763 Robie Street, Halifax, N.S. B3H 3G2

physicians, the physician husbands and wives take on the role of colleagues and peers.⁶ As with the female internes and residents, one of the most important costs of a dual career marriage is the "time lost to companionship", a burden borne by both spouses.

What consumes all the time? Like most couples, the dual career marriage has the burdens of household and family, as well as the "daytime" job. However, the equation must also consider time on call, time to keep up on reading, committee meetings, conferences, continuing medical education programs, and reading the journals. Social life suffers, because time together becomes so precious that the intrusion of others is often not acceptable. As well, women physicians may not be asked to share the social ambience of a male-dominated medical community. This may result in male physicians sharing friendships as well as their professional life, whereas female physicians may form friendships outside of medicine, and more aligned with the husband's professional life.

Myers has studied the female physician with a troubled marriage, and has identified the following features. The female physician tends to handle marital pathology by "denial, rationalization, and sublimation into medical work."⁷ Most female physicians in troubled marriages have difficulty finding a therapist with whom they are not professionally associated, and who has experience in dealing with medical marriages. The gender of the therapist also proves important, because although the female would have preferred a female therapist, usually a male therapist was chosen because the male spouse would not consent to treatment by a female therapist.

Some disciplines may prove more difficult for the married female physician. Psychiatry, for example, is one of several medical disciplines in which the physicians constantly "give of themselves to their patients and ignore their own emotional needs".⁸ This can result in "little or no time or energy for the married female (psychiatrist) to nurture herself", and can lead to "dissatisfaction, depression, and a sense of futility". Although there are no data to substantiate it, one cannot help wondering if the dearth of women in disciplines such as orthopedic surgery and urology may, in part, reflect the intense physical demands of these disciplines and the absence of personal nurturing time. In a study of the graduates of McMaster Medical School, Cohen, Woodward and Ferrier found that women who entered "nontraditional" female disciplines tended to be non-married at the time of entry, have fewer marriages, and (if married), have fewer children than those in more traditionally female disciplines.⁹

Who are the men who marry medical women? The majority are other physicians, with a smaller percentage other professionals.¹⁰ Those women married to other physicians tend to have more children, and also more marital satisfaction. And not surprisingly, the medical husbands tend to be much more Type A personalities than the non-medical husbands.

Dual career marriages are a challenge, particularly when one spouse is a physician with massive demands on his or her time. But the support and the communication possible in this sort of relationship can result in a very high level of satisfaction both in the professional domain as well as with life in general. When both spouses contribute to the financial support of the family, and to the chores associated with maintaining a household and the child-care needs, a very solid marital relationship will result.

But compromises are necessary. Good childcare is essential, and worth every dollar spent. The children will probably think they have three "parents" (the biological parents and the housekeeper or daycare worker), but will thrive in an environment with many exciting stimuli, not shared by their friends. At certain times of the day (that will vary according to the age of the child), the children must assume paramount importance, and there must be some protected time for debriefing and discussion between the couple. But (contrary to what I was told as a medical student), medicine and marriage are compatible (even for women) and the dual career marriage is increasingly common. Having observed the remarkable adjustments in marriage in the last twenty years, I look forward to the next twenty! □

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Current Topics in Community Health

Prepared by: Dr. Lynn McIntyre
Department of Community Health & Epidemiology
Dalhousie University, Halifax, N.S.

MEDICAL ASSESSMENT OF THE YOUNG ADOLESCENT: A Functional Inquiry for the 1990s

Current health problems of our adolescents have become of increasing concern to physicians in Canada. Although their health status as a group by traditional outcome measures is excellent, and their health-care usage is low, many problems causing disability, disadvantage and even death are related to risky behaviours and somehow should be preventable. By mid-adolescence, however, it is often difficult to effect preventive measures. By this time, peer group influences take precedence, and teenagers tend to have developed a notion of their own immortality. Crisis intervention is more often the norm in this age group.

In contrast, young adolescents may be more receptive to information that will help them make wise lifestyle decisions during the pivotal early teen-age years. Although these youngsters receive most of their information about, and attitudes toward, health matters from their parents, school and the media, the doctor is still a highly respected source of health information. The high school entrance examination, referred to as the "Grade-nine medical," offers physicians the opportunity to establish rapport, give reassurance, and provide guidance to young adolescents as they enter a period of great physical, and sometimes turbulent, psychological change.

However, this opportunity can be easily lost. Many physicians do not feel comfortable talking to teenagers about sensitive adolescent issues. Similarly, most young people are self-conscious and inexperienced in dealing with doctors. Talking about feelings is difficult for many adolescents, especially with a relatively unfamiliar adult. Given such mutual discomfort, the temptation is strong for the physician to quickly screen for physical problems and to use the time to get caught up on a busy day.

The purpose of this paper is to help clinicians deal effectively with adolescents by providing an outline of:

- a) issues of adolescent development; and
- b) the objectives and content of an office visit.

DEVELOPMENTAL ISSUES

At times, the teenager's world is full of turmoil. The jumble of emotions is often not well articulated by the adolescent and, even then, is usually poorly understood by adults. The physician may find it helpful to consider these communications in the overall context of the developmental tasks of adolescence.

The young adolescent is embarking on a process of emancipation whose eventual goals are autonomy and self-determination. The process will involve experimentation, risk-taking and, at times, denial of consequences. The major developmental tasks include:

- expansion of relationships outside the home in which peer influences and pressures assume primacy over parents' wishes;
- control over, and expression of, sexual urges, and the resolution of anxieties associated with physical maturation;
- development of an individual identity distinct from the role in the family, and assumption of responsibility for personal decisions; and
- development of a personal value system and vocational ambitions.

OBJECTIVES AND CONTENT OF THE OFFICE ASSESSMENT

Although time constraints will limit the accomplishments of an office assessment, the broad objectives are as follows:

1. Establish rapport, reassure and provide anticipatory guidance

Perhaps the most important function of the visit is to establish a climate of trust and thus lay the foundation of a therapeutic relationship. The adolescent, nervously awaiting the physician before the visit, should leave the office feeling comfortable that he or she can return for advice on a wide range of issues. A relaxed smile and gentle bit of humour may do more than anything to put the teenager at ease, and reflects the physician's comfort with the situation. While this cannot be taught, there are several techniques which can be practised and which may help physicians build their interviewing skills (Table I). Reassurance and guidance can be provided as a series of simple, brief messages throughout the assessment geared to the adolescent's own agenda. Preaching and information overload on the other hand will result in minimal retention. Some teenagers may feel awkward discussing their new adolescent worries with their traditional physician who has seen them through their childhood illnesses, and who may also look after their parents. A physician sensing this might offer the adolescent the option of choosing his or her own physician and recommend a colleague.

2. Screen for physical and mental problems and assess risk behaviours

The assessment will be guided by the physician's pre-

existing knowledge of the family, by a review of the teenager's past medical history, by his or her appearance and affect, and by an initial functional inquiry and social history. It may be impractical to do a complete investigation on the first visit depending on time and the adolescent's comfort with the process.

Mental Health Functional Inquiry

Begin with general open-ended questions to identify areas of concern.

"Would you say you are usually a happy person, do you find you worry a lot?"

"What kinds of things bother you?"

Family conflicts

Adolescent problems with parents frequently revolve around the issue of independence, with struggles over control and discipline. Some adolescents face high parental expectations, criticism and performance pressure, while other families are characterized by distant relationships and neglect. Poverty, marriage breakdown, substance abuse, and psychiatric disorders should prompt the physician to raise questions about family violence. Sexual abuse may occur independently of other profound dysfunctions.

"Are you having any hassles at home?"

"How are arguments worked out in your family?"

"Are there violence or alcohol problems at home?"

"Have you ever been sexually abused?"

School pressures

School work and performance pressure can create a great deal of stress for the achievement-oriented teenager. Significant academic failure, particularly with public exposure, is a recognized factor in teenager suicide.

"How are you doing in school?"

"Do you feel a lot of pressure to do well?"

Rejection by peers

Social isolation caused by real or imaginary rejection by peers can tip the insecure adolescent into deep despair. The break-up of a relationship is a frequent precipitating event in impulsive para-suicides, but also in completed suicides.

"Do you have a boyfriend (girlfriend)?"

"Do you worry a lot about being liked by others?"

Depression/suicide risk

Chronic physical disabilities, mental disorder, previous suicide attempts, and indications of drug and alcohol abuse should alert the physician to suicide risk. There is usually a precipitating event involving major rejection, failure, or loss. Occasionally, a rigid, highly-conforming adolescent will decide that the only way out of the pressure is suicide. A high proportion of suicide completers are not "social misfits".

"Do you find things have been getting to you lately?"

"Have you thought that you might be better off dead?"

TABLE I

TALKING TO TEENS

1. Try to become an advocate for your adolescent patient. Listen to his/her concerns and maintain non-judgemental frankness. Above all, be yourself. Teenagers are quick to detect and reject phyness.
2. Maintain a professional manner, avoid slang, and use and explain the proper terms. "Do you know what I mean by sexual intercourse?" "What term do you use?"
3. Avoid moralizing, but be firm and don't condone risky behaviours.
4. Assure confidentiality. Be mindful that disclosure of abuse in minors must be reported. If the situation becomes apparent, interrupt and explain before proceeding. It is also necessary for the adolescent to know that if he/she indicates an intention to put himself/herself at significant risk, the physician may need to involve parents or authorities.
5. Acknowledge independence and maturity by requesting permission, offering choices, and exploring the patient's agenda. "Would it be all right if I asked you some questions about your private life?" "I asked you a lot of questions, what are your concerns?"
6. Use an interactive rather than an interrogative style, progress from neutral to more sensitive topics, and use a third-person approach to delicate subjects. "Do you have a boyfriend (girlfriend)?" "Some people your age have already had sexual intercourse with their boyfriend (girlfriend). How about you?"

Risk Behaviour Assessment

Adolescents tend to participate in potentially destructive activities with little understanding, or in spite of an understanding, of the negative consequences. Problem behaviours are usually associated: alcohol use with accidental injury, and substance use with early sexual activity, for example. Peer pressure can encourage risk taking, in which the teenager participates, not so much for the behaviour itself, but for the badge of belonging it confers. Early physical maturation can also create pressure on the teenager to engage in sexual behaviours that may require interpersonal skills and emotional maturity that are as yet undeveloped. Although most adolescents will not lie when questioned about their risk behaviours, they are unlikely to volunteer such information.

General approach

"Have you ever been in trouble with the police?"

Substance abuse

"Do your parents (friends) drink (smoke)? Have you started drinking (smoking)?"

"Do you drink alcohol at parties? What about other times?"

Motor vehicle accidents

"Statistics show that at your age the greatest risk to your health is car crashes. What precautions do you take?"

"Do your friends drink and drive? Do you?"

"Do you always wear a seatbelt, even around town?"

Sexual activity

"Studies show most teenagers do not use any birth control the first time they have sex, even though they may have learned about contraception. How will you make sure you (your girlfriend) won't get pregnant?"
"Do you know how to get the Pill if you need (she needs) to go on it?"
"Do you know how to prevent catching sexual diseases such as AIDS?"

Physical Examination

Positive physical findings in an asymptomatic adolescent are unusual. Nevertheless, young adolescents harbour anxieties about their physical maturation, and the examination gives the physician an unequalled opportunity to engage in a running dialogue on topics such as acne and skin care; growth, nutrition, exercise and eating disorders; and sexual maturation and commonly-held worries about sexual orientation.

"Do you have concerns about how your body is turning out?"

"Breasts come in all sizes and sometimes teenagers worry. . ."

"At some time or other, most teenagers worry that they might be gay. Do you have concerns about how your sex life is going to turn out?"

The physical examination itself should be tailored to individual health requirements as well as the adolescent's comfort with the process, and could involve the following elements;

- appearance, dress, general affect;
- baseline height, weight, blood pressure, hearing and visual acuity;
- skin problems, dental and gingival health;
- heart sounds and murmurs and peripheral pulses, particularly given a history of exertional chest pain or syncope;
- breath sounds, hyper-inflation, prolonged expiratory phase if chronic recurrent cough, wheezing, shortness of breath;

CENTRAL (HYPOTHALAMIC) PRECOCIOUS PUBERTY MANIFESTATIONS AND MANAGEMENT Continued from page 26.

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- abdominal examination including hernias;
- musculoskeletal examination of posture, gait, joint hypermobility and scoliosis screening;
- Tanner staging, testicular examination; and
- examination for genital lesions, STD screening and PAP testing, as indicated.

Laboratory investigations that might be considered include rubella serology in young women; CBC for fatigue, poor nutrition, or menorrhagia; STD screening; cholesterol levels in those with a strong family history of coronary artery disease; electro- and echocardiography if structural heart problems are suspected; and pulmonary function testing if there are concerns about asthma.

In conclusion, this brief article is intended to provide the primary care physician with contemporary practical guidelines for assessing the young adolescent. A scheduled, properly conducted, high school entrance medical assessment provides an opportunity for valuable preventive health counselling at a time when teenagers are beginning to make important lifestyle decisions that will affect their subsequent health.

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Comment

This is one of a series of articles submitted by the Ontario Medical Association Committee on Child Welfare aimed at encouraging physicians to expand their understanding of preventive medicine as it applies to children. While its recommendations would not withstand the scrutiny of the Canadian Task Force on the Periodic Health Examination, it does provide physicians with a framework to inquire about the major threats to their adolescent patients' health: smoking, alcohol use, lack of self-esteem, motor vehicle-related accident risks, suicide potential, and sexual irresponsibility. □

SEXUAL VIOLENCE: CARE FOR VICTIMS IN NOVA SCOTIA Continued from page 29.

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CoActifed*

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Indications: CoActifed Expectorant: To facilitate expectoration and control cough associated with inflamed mucosa and tenacious sputum.

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Precautions: Before prescribing medication to suppress or modify cough, it is important to ascertain that the underlying cause of the cough is identified, that modification of the cough does not increase the risk of clinical or physiologic complications, and that appropriate therapy for the primary disease is provided.

In young children the respiratory centre is especially susceptible to the depressant action of narcotic cough suppressants. Benefit to risk ratio should be carefully considered especially in children with respiratory embarrassment, e.g., croup. Estimation of dosage relative to the child's age and weight is of great importance.

Since codeine crosses the placental barrier, its use in pregnancy is not recommended.

As codeine may inhibit peristalsis, patients with chronic constipation should be given CoActifed preparations only after weighing the potential therapeutic benefit against the hazards involved.

CoActifed contains codeine: may be habit forming.

Use with caution in patients with hypertension and in patients receiving MAO inhibitors.

Patients should be cautioned not to operate vehicles or hazardous machinery until their response to the drug has been determined. Since the depressant effects of antihistamines are additive to those of other drugs affecting the CNS, patients should be cautioned against drinking alcoholic beverages or taking hypnotics, sedatives, psychotherapeutic agents or other drugs with CNS depressant effects during antihistaminic therapy.

Adverse Effects: In some patients, drowsiness, dizziness, dry mouth, nausea and vomiting or mild stimulation may occur.

Overdose: Symptoms: Narcosis is usually present, sometimes associated with convulsions. Tachycardia, pupillary constriction, nausea, vomiting and respiratory depression can occur.

Treatment: If respiration is severely depressed, administer the narcotic antagonist, naloxone. Adults: 400 μ g by i.v., i.m. or s.c. routes and repeated at 2 to 3 minute intervals if necessary. Children: 10 μ g/kg by i.v., i.m. or s.c. routes. Dosage may be repeated as for the adult administration. Failure to obtain significant improvement after 2 to 3 doses suggests that causes other than narcotic overdose may be responsible for the patient's condition.

If naloxone is unsuccessful, institute intubation and respiratory support or conduct gastric lavage in the unconscious patient.

Dosage: Children 2 to under 6 years: 2.5 mL 4 times a day. Children 6 to under 12 years: 5 mL or 1/4 tablet 4 times a day. Adults and children 12 years and older: 10 mL or 1 tablet 4 times a day.

Supplied: Expectorant: Each 5 mL of clear, orange, syrupy liquid with a mixed fruit odor contains: triprolidine HCl 2 mg, pseudoephedrine HCl 30 mg, guaifenesin 100 mg, codeine phosphate 10 mg. Available in 100 mL and 2 L bottles.

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Tablets: Each white to off-white, biconvex tablet, code number WELLCOME P4B on same side as diagonal score mark, contains: triprolidine HCl 4 mg, pseudoephedrine HCl 60 mg and codeine phosphate 20 mg. Each tablet is equivalent to 10 mL of syrup. If tablet is broken in half, it reveals a yellow core. Bottles of 10 and 50 tablets.

Additional prescribing information available on request.

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OBITUARIES

Dr. Douglas W. Archibald (53), of Grand Pre, Nova Scotia died on November 21, 1989. Born in Campbellton, N.B. he received his medical degree from Dalhousie University in 1960 and completed his post graduate studies in psychiatry in 1971. He was medical director for 13 years at the Fundy Mental Health Centre and was administrator of the psychiatric mental health division of the Nova Scotia Department of Health. He is survived by his wife, a daughter and two sons. We offer our sympathy to his wife and family.

Dr. Sidney J. Crabtree (41) of Dartmouth, Nova Scotia died on January 2, 1990. Born in Ottawa, Ontario he received his BSc from Carleton University, his PhD from the University of Toronto and his medical degree from Dalhousie University in 1980. He is survived by his wife, and three daughters. Our sincere sympathy is extended to his family.

Dr. Thomas McKeough (67) of Sydney Mines died on January 2, 1990. Born in Sydney Mines he received his medical degree from University of Ottawa in 1951 and practised medicine in Sydney Mines for many years. He was a past president of The Medical Society of Nova Scotia and was made senior member of the Medical Society in 1987. He is survived by his wife, a daughter, and five sons to whom the *Journal* extends sincere sympathy.

Dr. Kenneth V. Gass (67) of Pugwash, Nova Scotia died on January 8, 1990. Born in Sackville, N.B. he received his medical degree from Dalhousie Medical School in 1953 and then started practice in Pugwash. He was a past president of the Cumberland Branch Medical Society. He is survived by his wife, a daughter, and a son. The *Journal* extends sincere sympathy to his wife and family. \square

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