Canadian Surgery Measured by British Standards

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From a visit to 10 centres in England, Scotland and Ireland, the author assesses Canadian surgery by British standards. Canadian manpower and British manpower in general surgery are similar in number when British registrars are included. However, in Canada, manpower is distributed uniformly as hospital-based firms, vertically structured from houseman to registrar to consultant. Apart from teaching centres, the structure in Canada is horizontal. Most general surgeons are hospital-based, working independently and have no help from fellows or residents.

Canadian training is of short duration, highly co-ordinated and non-competitive, and learning is focused on a large extent by a tough final examination. In contrast, British training is long, at co-ordinated, competitive, and learning is focused by clinical experience and research as there is no final examination.

Research in general surgery in Canada seems to be more difficult to generate and support than in Britain. Factors that stimulate research in Britain and do not exist in Canada are the professorial unit concept, the longer training and competition for positions, and possibly greater funding by government and private industry.

A la suite d'une visite dans 10 centres d'Angleterre, d'Écosse et d'Irlande, l'auteur évalue la chirurgie canadienne selon les normes britanniques. Les effectifs canadiens et britanniques sont similaires si on inclut les "registrars" britanniques. Toutefois, en Grande-Bretagne, les effectifs sont distribués uniformément selon les établissements hospitaliers et possèdent une structure verticale allant de l'internes (houseman) au "registrar" et au médecin consultant. A l'exception des centres universitaires, la structure canadienne est horizontale. La plupart des chirurgiens généraux n'est pas affiliée aux hôpitaux. Ils sont indépendants et ne reçoivent aucune aide des internes et résidents.

Au Canada, la formation de durée courte, hautement coordonnée et non compétitive, et l'enseignement est en grande partie dirigé par un examen final difficile. En comparaison, la formation britannique est longue, incoordonnée et compétitive, et l'enseignement est orienté vers l'expérience clinique et la recherche puisqu'il n'y a pas d'examen final.

Au Canada, la recherche en chirurgie générale semble plus difficile à démarrer et à soutenir qu'en Grande-Bretagne. Les facteurs qui stimulent la recherche Grande-Bretagne et qui n'existent pas au Canada sont le concept de l'unité professorale, la durée de la formation et la concurrence pour les postes offerts, et une meilleure possibilité de subvention de la part du gouvernement ou de l'industrie.

The James IV Association of Surgeons, Inc. was founded for the purpose of fostering the exchange of knowledge among surgeons of English-speaking countries. Surgical Travellers spend 6 weeks visiting various centres abroad, where they present their work and learn about the work their hosts are doing. I visited British surgeons in 10 cities in England, Scotland and Ireland, exchanging knowledge about clinical surgery and research and observing various aspects of the British health care system such as surgical care delivery, manpower, training and research. It is impossible to avoid comparing the Canadian and British systems. Both have strengths and weaknesses. I intend in this report to discuss concerns about some aspects of Canadian surgery that arose from my observations as the Canadian Surgical Traveller for 1978.

Manpower in Surgery

Many people have noted the striking numerical difference between Canadian general surgeons and British consultant general surgeons. In Canada, there is one general surgeon for 11,000 to 13,000 persons and our national manpower study suggests that this ratio is ideal. Rough calculations from centres I visited in Britain suggest that the ratio there is between 1:30,000 and 1:60,000. Canadian surgeons, therefore, carry a smaller caseload than British consultant surgeons. Why are the numbers so different? Most surgeons in Canada practise outside university centres where there are no house officers or registrars (residents) as there are in Britain. Thus, outside the teaching centres, Canadian general surgeons do the work of three levels of surgeons in Britain—house officer, registrar and consultant. Further, the Canadian surgeon is much more independent of the hospital than his British colleague. He works in two places, the hospital and an outside office, a direct contrast to the hospital base of the team of house officers, registrars and consultants that provides surgical care in Britain. If registrars are included in calculations, surgical manpower is probably similar in Canada and Britain. The difference is not in numbers but how the systems use the manpower. In Britain, surgical manpower is stratified vertically from house officer to registrar to consultant, but includes all levels. In Canada, surgical manpower includes only consultants (certified surgeons). Residents are counted only as future manpower; they never provide services outside the university centres. The system in Canada does not encourage surgeons to be fully hospital-based and does not allow the team approach as in Britain.

My hosts in Britain and their registrars found it hard to believe that a community hospital could function adequately without a house staff, particularly large hospitals treating patients with multiple trauma and other major emergencies. In virtually all British hospitals, the duties of specialist manpower are delineated vertically, so that those in the lower echelon (many of whom would be fully trained by Canadian standards) perform resident work. It is this tight ranking of specialist manpower that provides coverage at all levels in large hospitals in Britain. The Canadian system of training, certification and hospital appointment, whether intentionally or not, has long bypassed any such possibility for Canada. The
Royal College of Physicians and Surgeons of Canada defines a surgical specialist by a finite length of approved training (4 years minimum) and a successful examination. Community hospitals have used the Royal College definition of a specialist and granted appropriate privileges (consultant status) to all certificants. In Canada, there is no vertical ranking of specialist manpower, and levels of duties cannot be specified by the hospitals or the health care system. Our surgical manpower, which is adequate, consists of specialists. We cannot now establish residency positions in community hospitals because of the massive excess of specialist manpower that would be created.

Although lack of house staff in nonteaching hospitals may be a disadvantage, there are offsetting benefits in our system. Canadian community hospitals have been able to appoint surgical consultant staff without governmental restraints—unlike their British counterparts, whose consultant posts are limited. In Canada, certified surgeons do not work as residents until a consultant position becomes available. This freedom has given Canadian hospitals great flexibility in meeting the needs of rapidly growing communities. A multilevel bureaucratic system like the National Health Service of British Columbia would almost certainly have impeded the development of hospital and specialist care in Canada.

The Training of Surgeons

During my trip, I was fortunate in having time to talk to senior registrars, often at informal gatherings, away from any inhibiting presence of their consultants. Their responsibility is somewhat greater than that of the Canadian chief resident. But in most ways their positions are similar in that there is responsibility for the care of a large number of patients pre- and postoperatively. The senior registrars were envious of our more structured training, which is planned for 4 years in advance, but they questioned that a surgeon could be adequately trained in that time. They thought their preconsultant time should be shorter, but they were quick to point out the advantages of their wide clinical experience. The registrars also thought their experience in nonuniversity centres was valuable in that they were exposed to a wide range of diseases requiring surgical treatment and had a lot of operative experience. In Canada, experience outside a teaching centre is not counted towards certification and, for the reasons previously cited, there are few opportunities for residents to work in community hospitals. Our surgical training is totally centralized due to manpower considerations. The British system should remind us that work in nonuniversity centres can be a valid educational experience and that it can be combined with provision of service—enough to be counted as surgical manpower. We should not rule out forever the possibility of training in community hospitals, nor the possibility of including such trainees in manpower calculations.

The fellowship examination in Great Britain is usually passed long before a trainee becomes a senior registrar. It is taken before the trainee has had the majority of his operative experience and clinical responsibility. In Canada, the fellowship examination can be taken only after completion of the chief residency year (i.e., the year with the most major operating experience). Thus, during the years of the most senior responsibility, the Canadian resident is studying his books and journals as well as running his ward. Although some British consultants believe that senior registrars were less motivated to read because their examinations were over, I found very little difference between Canadian chief residents and British senior registrars in their keenness to read and investigate. In Canada, there are more highly organized schedules of seminars (many, no doubt, examination oriented) whereas in Britain, learning tends to be motivated by clinical case experiences and research projects. Thus, both systems stimulate the young surgeon, the Canadian approach being examination oriented and the British, research dependent. The shorter length of training in Canada is another factor that forces "exam type" learning, whereas the prolonged preconsultant time in Britain is more conducive to learning from clinical experience, research projects and time spent in other centres at home or abroad. Britain and Canada obviously have very different views on the value of examinations in the education of surgeons. Can they then be that important? My observations led me to conclude that they are not a necessary end point in the longer British program, but in Canada, final examinations are necessary to ensure competence of candidates completing our shorter training program. In other words, the shorter the training program, the more important and

Pyopen* (carbenicillin)

CONTRAINDICATIONS: Carbenicillin should not be used in patients with a history of penicillin allergy. Precautions: Carbenicillin is hydrolized by staphylococcal beta-lactamase and is, therefore, contraindicated in infections caused by beta-lactamase-producing staphylococci. PRECAUTIONS: The same as for penicillin G. Antibiotic resistance in the patient organism section is being carried out. One g of PYOPEN contains 6.25 mg of sodium ion. Therefore, large doses of the drug should be administered with caution to patients with congestive heart failure, severe hypertension, or edema.

ADVERSE REACTIONS: Similar to those reported with penicillin G. Also reported: pain and rashes at site of i.m. injection; thrombophlebitis after prolonged i.v. administration; pruritis; eosinophilia; nausea; occasional rise in SGOT and alkaline phosphatase levels; anicteric hepatitis; one case of an unexplained drop in hemoglobin level; one case of seizure in a hemiplegic patient on high doses and one case of increased muscle weakness in a patient with myasthenia gravis have been reported. Prolonged bleeding time has been reported in 22 of a series of 30 patients receiving between 500 and 100 mg/kg daily of PYOPEN during 14 days (bleeding levels of 200-400 mg/ml). Aggregation of platelets by adenosine diphosphate was decreased in all 30 patients. The effect appeared within 24 hours after starting therapy and took from 3 to 7 days to disappear after discontinuing the drug. Two women receiving 30 g of PYOPEN daily developed hypokalemia after 7 and 9 days respectively. Potassium levels were 2.0 and 1.5 mEq/l. Oral potassium chloride rapidly corrected the electrolyte disorder.

DOSAGE: Relatively high doses of carbenicillin are required in the treatment of severe Severe infections. ADULTS—Severe and overwheLMING infections (septicemia, extensive burns and wounds, pneumonia, meningitis, peritonitis): 12 to 30 g daily intravenously or by infusion with or without 1 g of probenecid orally 3 times daily. In moderate infections: 1 g every 4 hours for 5 to 10 days. CHILDREN—Dosage, according to weight, age and severity of infection, may vary from 100-300 mg/kg body weight.

AVAILABILITY: Vials containing 1 g or 5 g carbenicillin.

Complete prescribing information and references available on request.
comprehensive the examinations should be; the longer the program, the less important the final examinations. Some in Canada would abolish the final examinations and allow the university to have the final say as to the competence of the candidate. Others favour abolishing only the oral portion. My observations suggest that we should not consider abolishing or softening the final examinations without a corresponding lengthening of training. A "soft exam" or none at all at the end of a short period of training such as we have (one of the shortest in Europe and North America) would surely lower our standards.

The training of surgeons has implications regarding the delivery of surgical care. In Canada, the education and training of surgeons in teaching hospitals exclusively has resulted in an ever-increasing narrowness of the surgeons' skills and knowledge. University hospitals are highly specialized and have divided surgery into tightly defined divisions. The divisions are responsible for training and tend to train surgeons in their own image, that is to do both the minor and most major surgery of their field. Although ideal for the university surgeon and his department, such specialization is not always ideal for the community surgeon who finds that he must provide a wide range of skills to his community. The Canadian community surgeon does provide a wide range of skills, but only by learning on the job the skills he did not acquire from his training program at the university.

Trainees perceive this problem with greater clarity than their teachers. Some try to tailor their training to the future community needs. Others broaden their skills on their own by taking extra training in vascular or chest surgery. Community surgeons and most residents would likely support a return to broader training. Many communities would be better served medically and economically by surgeons trained to handle a wide range of conditions, although not the most complex problems of each specialty. For example, some communities would be better served by surgeons trained in general and orthopedic surgery or general and urologic surgery rather than general surgery, urology or orthopedics alone. Broad training in surgery could again be achieved by increasing the training period and coordinating programs so that trainees rotate as senior or chief residents (not as junior residents) through more than one specialty.

Surgical Research

After my first few visits to professional units, I was impressed by the high level of financial and personnel support these units receive from their universities. The units were often housed in older buildings, but they were well equipped and had two or three—indeed, up to eight—full-time technicians (not including secretarial staff) supported by "hard" university money. Some received university money for research supplies as well. Research fellows from Britain and foreign countries were present in great numbers and research was flourishing. When I asked specifically, as I always did, about adequacy of research funding, the answer was, with one exception, that funding was not a major problem. The answer was given, more than once, that getting surgeons to do research was harder than finding money to support it. None complained about poor funding from the British Medical Research Council and many received excellent funding from private industry, including drug companies.

In Canada, there is concern about the quality and quantity of surgical research. There is scarcely a department of surgery that has not had the criticism of "too little research" levelled at it by various surveyors. Most would agree that, unlike Britain, our problem is not in getting surgeons who wish to do research, but in finding funds for long-term support. My trip gave me the strong impression that surgical research in Canada is not as strong and as well supported as it is in Britain. There are, I think, differences in the British system that are important in this regard. University funding of Canadian surgical departments is probably better than that in Britain, when one considers that entire departments, including all divisions, are supported rather than a single professional unit as in Britain (usually a general surgery unit). However, the support in Canada is almost entirely for salaries of geographic full-time (GFT) surgeons and their secretaries. Its purpose is to free time from practice for teaching, administration and research. The universities' intent with regard to the priority of research is unclear. To do research, GFT surgeons must be successful in receiving money from outside granting agencies to pay for all their research costs. The recent trend in Canada is that despite an increasing number of GFT appointments, the number of GFT surgeons who are involved in research has remained the same. Surgery's share of the Canadian Medical Research Council's budget has decreased in real dollar funding over the past 5 years. Thus, for various reasons, the relatively large budgets of Canadian surgical departments are supporting and encouraging teaching and administration more than research. By contrast, the British professional unit has a limited number of surgeons (usually three or four) but this unit is granted money for research technicians and some supplies as well as surgeon's salaries. The budgeting of hard money exclusively for research makes the universities' intention with regard to the priority of research loud and clear. A minimum research effort is assured by this policy. In the British centres I visited, this basic support was usually supplemented by sizeable grants from outside agencies. But some research was being done from university research funds alone.

The system of surgical training in Britain, whether by intention or not, encourages registrars to spend time doing research. There is, of course, ample time to do research in the British system, as the length of training is great. Further, a productive research year gives one a very definite edge in the keen competition for senior registrar and consultant posts. The system of training in Canada is the exact opposite. Our residents are generally accepted for a full 4-year training period. The chief residency year is guaranteed if reasonable progress has been made, and there is minimal competition. In some Canadian centres, a research contribution gives the good resident an edge with regard to university appointment. In others, the superior resident is offered a university appointment on the basis of clinical ability and then may be asked to do a year of research training. Since training programs are short, many residents regard a year of research as a disadvantage, believing that such time is better spent in acquiring more clinical skills. Thus, in Canada, the shorter minimum training requirements, the final examination and the guaranteed senior resident year, are factors that tend to dissuade or discourage youngest surgeons from doing research. The factors that encourage research in Britain and are conducive to a higher level of surgical research than we have in Canada are the system of training, the strong push for research from the university through the professional unit and an apparently
satisfactory flow of research money to surgeons. I am sure these are aspects of the British system that merit consideration in future Canadian planning.

**Future Concerns from Recent Developments**

Two characteristics of our system, the minimum 4-year training program terminated by a tough examination and unlimited consultant positions, have set a reasonable standard of specialist care and have made it available without restriction as the populations of our young cities and towns grow. Indeed, our open system attracts many foreign-trained specialists because they are able to meet our standards and practice opportunities as consultants are not limited. Recently, our governments (mainly provincial) have sharply curtailed budgets for health care. They have chosen to control costs not by limiting the numbers of positions for consultants, but by restricting immigration and decreasing the numbers of training positions. Thus, for those who are left to meet our specialist criteria, opportunities will become increasingly abundant. If such restraints are increased, Canada will experience a shortage of consultants. This situation will be an even greater stimulus for trainees to take the minimum time to become certificants of the Royal College. In surgery at least, a short training period does not encourage research and results in a narrow range of skills. These trends in Canadian surgery are surely not desirable for our universities or our communities. Further, we are likely to suffer by comparison with British and American surgery where training programs are broader in scope and 1 to 5 years longer. We should give consideration to lengthening training programs with the aim of encouraging broader training and more research. Many of our brightest residents of the past and present have perceived these problems and altered their programs accordingly.

I thank my many hosts in Britain and the James IV Association of Surgeons for making my trip possible.

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same manner throughout the world. Why for instance do the Japanese have such high resectability and cure rates compared with North Americans? Why does neurosurgical yield such excellent results in Scotland, but not in Canada? Are we dealing with the same disease, or does the disease act differently and according to the local carcinogenic factors? Comparison of the racial groups in South Africa provides fertile ground for investigating these problems.