

## Training the gastroenterologist of the future: A different mix of knowledge, skills and attitudes is needed

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In the United States, the declining interest of residents in gastroenterology is thought to be the result of the specialty being too procedure driven and not intellectually challenging. It is clear that the growth of technology and excessive demands for procedures have forced the curtailing of clinic time, erosion of clinical skills, distraction from scholarly pursuits and a decrease in the intellectual content of our training programs. In order to attract the 'best and the brightest' and to better prepare gastroenterologists for the future, trainees will require more knowledge and experience in nutrition, genetics and the evaluative sciences. Furthermore, they need to realize that the main responsibility of clinicians is problem solving. This can be learned only through personal clinical experience and teaching by clinicians with good analytical and intuitive skills. Quality care requires the integration of the needs, means and preferences of patients with evidence-based medical practice. Finally, new physicians should be imbued with the concept that an empathic relationship with patients is crucial for the accurate collection of information and plays an important therapeutic role.

**Key Words:** *Clinical skills; Endoscopy; Evaluative sciences; Genetics; Nutrition; Professionalism; Teaching; Training*

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*"Le problème de notre temps est que l'avenir n'est plus ce qu'il était" – Paul Valéry*

I am grateful to the Canadian Association of Gastroenterology (CAG) for creating the Education Excellence Award and am humbled to be its first honouree. The creation of this award confirms the long term commitment of the CAG to the training of the next generation of gastroenterologists and to the continuing education of its members. It is also an indication that the CAG understands the importance of maintaining the close link between education and research, during an era in which it is often suggested that research should not be linked to the training of physicians (1). The anti-intellectual arguments supporting the separation of research from education include that:

- physicians should be content with using knowledge generated by others;
- the sophistication of modern science makes it impractical for clinicians to become scholars;
- it is expensive to prepare physicians to undertake research; and

## La formation du gastroentérologue de demain : Un mélange différent de connaissances, d'aptitudes et d'attitudes s'impose

Aux États-Unis, on pense que la baisse d'intérêt des résidents envers la gastroentérologie résulte du fait que la spécialité est trop orientée vers les interventions et pas assez stimulante d'un point de vue intellectuel. De toute évidence, la croissance de la technologie et les demandes excessives d'interventions ont forcé les gastro-entérologues à comprimer leur temps de clinique, ont érodé leurs aptitudes cliniques, les ont distraits des recherches universitaires et ont réduit le contenu intellectuel des programmes de formation. Afin d'attirer « les meilleurs et les plus intelligents » et de mieux préparer les gastroentérologues de demain, les résidents auront besoin de plus de connaissances et d'expérience en nutrition, en génétique et en sciences évaluatives. De plus, ils doivent prendre conscience que la principale responsabilité des cliniciens demeure la résolution de problèmes, qu'on ne peut apprendre que par une expérience clinique personnelle et par l'enseignement de cliniciens possédant de bonnes aptitudes analytiques et intuitives. Des soins de qualité exigent l'intégration des besoins, des moyens et des préférences des patients à une pratique médicale fondée sur des faits probants. Enfin, les nouveaux médecins devraient être animés par le concept qu'une relation d'empathie avec les patients est essentielle pour colliger de l'information précise et qu'elle joue un rôle thérapeutique important.

- medical education and clinical work are professional and not scholarly activities.

### THE DETERIORATION OF ACADEMIC CLINICAL MEDICINE

During the three decades of my academic career, there have been dramatic changes in medicine and the environment in which it is practiced (Table 1) (2). There is plenty of evidence that these changes have resulted in decreased career satisfaction. A survey of more than 12,000 American physicians found that decreased career satisfaction is due to the loss of professional autonomy (3). The same disenchantment has been expressed in surveys in the United Kingdom (4). Respondents were concerned with the decreased ability to provide high quality care in view of limited resources, difficulties in establishing and maintaining patient relationships in the context of the team system, and finally the decreased capacity to shape health care policy and to participate in the allocation of resources (3,4).

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**TABLE 1**  
**Contrasting characteristics of the medical environment over time**

20th century	21st century
Autonomy	Team work/system
Solo practice	Group practice
Continuous learning	Continuous improvement
Infallibility	Culture of blame
Knowledge	Problem solving

*Modified from reference 2*

**TABLE 2**  
**Closing the gap between what society expects and what it is getting**

Care based on continuous healing relationship
Customization of care
The patient as the source of control
Shared knowledge and free flow of information
Blend art with science in decision-making
Primum non nocere (First, do no harm)
Transparency
Anticipation of needs
Cost containment
Cooperation among clinicians

*Modified from reference 2*

Academic clinical medicine is ill. It is no longer recruiting the best and has narrowed its professional identity to an ethic of competence rather than one of scholarship. Training has become divorced from research (5). This makes no sense in an era in which new discoveries are introduced into practice very rapidly.

Too often our medical leaders have limited creativity and scholarly productivity. Outstanding clinical leaders are needed to develop a new working relationship among the medical profession, other health care workers, employers, patients and society. This new relationship should aim to restore the public's faith in medicine and to bridge the gap between what society wants and what it is getting (2). It should also rebuild the morale of the profession, which is vital for an effective and compassionate health care system, and dedicate itself to maintaining the professionalism of medicine (6).

It is clear that there is a very real possibility that medicine will degenerate from a profession to a trade (7). By definition, a profession holds a specialized and otherwise inaccessible body of knowledge that it employs to advance the public interest. It is committed to effective self-regulation. A profession must ultimately assume responsibility, not only for the integrity of its knowledge base, but also for its expansion through research and its application while adhering to the highest standards (8). As pointed out by several authors (7), we need to be reminded of the importance of fostering professionalism in ourselves and in the next generation of physicians. The future of gastroenterology rests on the shoulders of those who are involved in the training of the next generation (9,10).

Before describing the changes that should be made in our training programs, it is appropriate to reflect on a survey of factors affecting the subspecialty choices of 592 Internal Medicine residents from 60 American medical centres (11). The two subspecialties that involve the most procedures, namely gastroenterology and cardiology, were not considered

intellectually stimulating compared with infectious diseases, nephrology or rheumatology. Another survey involving research fellows in gastroenterology and cardiology found that, during their final year of training, research fellows spent 25% to 30% of their time conducting research, compared with 40% to 50% for other medical subspecialties (12). How should we respond to concerns that could mortgage our future?

## IS GASTROENTEROLOGY TOO PROCEDURE ORIENTED?

In 1982, Ivan Beck noted that, in most hospitals, the patient population requiring endoscopy was not overwhelming (13). This is no longer the case. Gastroenterologists are now being used as mere technicians and the situation will get worse (14). The problem is not that we are doing too many procedures; in fact, a well-conducted study, using the strict Rand/University of California, Los Angeles criteria for appropriateness, concluded that both upper and lower endoscopies are underutilized (15).

As a result of the escalation in the legitimate demands for endoscopic techniques, gastroenterologists are increasingly likely to undertake these procedures without prior consultation. Two reports suggest that this practice is not bad for patients, in that it has proven to be cost-effective, and involved indications that were usually appropriate (16,17). In the past decade in the United States, an increasing proportion of gastrointestinal (GI) fellowship programs, particularly those that are associated with physician assistant and nurse practitioner programs, utilized paramedical personnel for screening endoscopy (18,19). The only other alternative to endoscopy without prior consultation is to increase the Canadian GI workforce, which, a decade ago, stood at 1.1/100,000 compared with 0.7/100,000 for the United Kingdom, 1.7/100,000 for Europe and 3.1/100,000 for the United States (20). We cannot continue to be defensive about endoscopy without prior consultation; it is time for the CAG to draw up guidelines.

## EROSION OF CLINICAL SKILLS

It has recently been pointed out that excessive endoscopic demands on gastroenterologists lead to a reduction in clinic time, with the eventual result that clinical skills might erode and the quality of care might suffer (14). Another inevitable consequence is the decrease in the time available for scholarly pursuits and a deterioration of the intellectual content of our training programs.

As is the case with all branches of medicine, we no longer have control over information (21). It is flowing freely and is exerting an enormous influence on the physician-patient relationship, as well as on patient preferences and compliance. Our previously inaccessible body of knowledge is now only one click away for patients. However, the process of pursuing a diagnosis, which is central to the practice of medicine, will remain inaccessible to those outside of our profession.

Clinical problem solving is our undisputed role and responsibility, and cannot be shared the way knowledge is. Unfortunately, "the siren song of technology" (14) has proven to be a strong distraction from our central mission and is a juggernaut threatening to overrun other components of the diagnostic process. Medicine has not outgrown history taking and physical diagnosis (22,23). For all their wonders, diag-

nostic tests should only supplement clinical skills and not replace them. As pointed out recently, the more complex technology becomes, the more basic skills are needed, and the more difficult it will be to restore them once they are lost (24).

There are several studies showing that gains in technology have not been accompanied by an enhancement of clinical skills. In fact, the opposite is true: technology has replaced clinical skills (25,26). Those of us involved in GI speciality examinations would agree that the majority of candidates who fail do so because of inadequate clinical skills.

### DISCONNECTION BETWEEN RESEARCH AND CLINICAL EDUCATION

The growth of technology-based diagnosis has led to profound changes in the training syllabus of gastroenterology. As more time is spent on acquiring technical skills, knowledge has become more practice-relevant and less associated with basic science.

Over the past 50 years, the academic 'heart' of North American teaching hospitals has been a core of full-time physicians who have assumed the major responsibility for teaching and research, in addition to sharing in patient care (27). The most successful health science teaching institutions have been able to integrate all three activities by relying on a group of highly skilled individuals who function as clinician scientists.

Unfortunately, the clinician investigator is becoming an endangered species (28). There is growing disaffection for research, because it is more competitive and entails longer training and a greater time commitment compared with clinical medicine. As pointed out by Goldstein and Brown (29), "young physicians are forced to choose between performing research and practising medicine but not both." Because trainees are less exposed to the frontiers of knowledge and less instilled with the passion for research, a vicious circle is created that endangers the future of our speciality. I contend that the future of gastroenterology lies in the arena of research and depends on our ability to reconnect research and education (30). The previous United States administration said it all: "...science cannot live by science alone. Research needs education, just as education thrives when it is conducted in an atmosphere of inquiry and discovery. In fact, the separation of education and research makes no sense intellectually" (5).

### HOW COULD OUR TRAINING PROGRAMS BETTER PREPARE GI FELLOWS FOR THE FUTURE?

We should make four essential modifications to our training programs:

- encourage the pursuit of new knowledge;
- return to clinical problem solving;
- customize evidence-based medicine (EBM); and
- close the gap between what society expects and what it is getting.

#### Pursuit of new knowledge

It is clear that the paradigm of organ-based specialities, such as gastroenterology, is changing with the emergence of disciplines such as nutrition, genetics and the evaluative sciences. These disciplines have distinct bodies of knowledge that overlap with

those of other biological and social sciences, and are relevant to many medical specialities.

**Nutrition:** Gastroenterology has always maintained a unique and fundamental relationship with the study of nutrition. It was, therefore, appropriate that, in the 1980s, nascent nutrition support programs were under the auspices of GI services. With time, gastroenterology frequently became hyphenated with nutrition. I contend that the hyphen has become largely symbolic, however, and that nutrition training is often limited to the technical aspects of delivering enteral and parenteral nutrition.

I do not believe that nutrition should be a self-standing subspecialty of Internal Medicine or Pediatrics. It is an integrative science that should involve all specialities. Every GI training program should have personnel with a special interest in nutrition research and education. All trainees should have six months of formal clinical training in nutrition, targeted at assessment of nutritional status, knowledge of nutrient needs in various diseases, and physiologic and metabolic considerations underlying customized nutrition support (31). Finally, trainees should be familiar with current frontiers in both laboratory and clinical nutrition research. Trainees who are interested in nutrition as a subspecialty of gastroenterology (hopefully there would be some) should be required to undertake MSc or PhD level course work.

There are urgent academic priorities in this field. For example, we need to elucidate the influence of nutrition on gene expression, immune modulation, transport systems and the microflora. Clinical research is badly needed to confirm or invalidate short term physiological and epidemiological studies that too often have yielded mixed messages and broken promises to a society that has grown mistrustful of the science of nutrition but, at the same time, is bewitched by food faddism.

**Genetics:** We are living in a 'genocentric' era. Genetics permeates all system-, organ- and age-based specialities. Recent surveys suggest that practising gastroenterologists are generally ignorant of the tests for determining the risk of colorectal cancer (32). Genetic testing has not been integrated into practice. Furthermore, as of April 2001, there were only 42 physicians certified in medical genetics by the Royal College of Physicians and Surgeons of Canada, and most of these were pediatricians (33). The needs of the adult population are enormous in the following areas:

- identification of families with disease-susceptibility genes;
- evaluation of risk associated with disease-susceptibility genes;
- understanding of the basis for the genetic response to treatment or to a nutrient (ie, pharmacogenomics and nutrigenomics); and
- first line counselling and surveillance.

**Evaluative sciences:** Modern biology has profoundly changed the way we practise medicine. The era of scientific medicine is said to have arrived, even though there are inadequate data about the effectiveness of many of our diagnostic, therapeutic and preventive interventions (34).

Until recently, medical research was focused exclusively on the biology of disease. The other two pillars of the Canadian Institutes of Health Research, namely research on population health and health services and examination of the nonmedical determinants of health, were largely neglected. Evaluative sciences, including statistics, epidemiology, decision analysis, cost effectiveness analysis and economics, had been relegated to the periphery of academic medicine.

However, the evaluative sciences movement has gained momentum in the context of health care reform, the resurgence of primary care, the emphasis on self-care and increased concerns about quality of life and ethics issues. Gastroenterology has some catching up to do to make use of advances in this area, which would result in improved patient outcomes and quality of care.

### Back to problem solving

Intervention and diagnostic testing may eventually be delegated to others but clinical problem solving will always remain our undisputed role and responsibility. Advances in medicine depend on the linkage between technological expertise and the art of clinical reasoning. Although the modern gastroenterologist swims in a river of clinical evidence that is unprecedented in its depth, velocity and turbulence (35), much decision-making must be made without scientific support. Clinical medicine still consists of a few things we know, a few things we think we know and lots of things we don't know at all (36).

There is no doubt that over the past two decades our trainees have spent more time on diagnostic and bedside skills. The core knowledge that they must acquire has grown exponentially but their capacity to use it has lagged behind. Clinical reasoning involves more than knowledge, including:

- **Productive and empathic patient interactions:** These are required to collect all of the relevant information through the interview and physical examination.
- **Experience:** On reviewing the literature, it is clear that experiential learning requires not only the acquisition of relevant clinical experience but also adequate time for reflection and a receptive mind. Limiting work hours and giving priority to educational rather than to service needs have certainly been a step in the right direction (37).
- **Analytical skills:** We have all come across residents and fellows who have a reasonably good fund of knowledge and who have adequate clinical skills, but seem to lack the analytical skills required to define the problem and the information that is necessary to solve it. Trainees need to interact with strong clinicians who are superb at breaking a problem into its components, organizing clinical data, interpreting evidence and reflecting on subjective probabilities (38).
- **Intuition:** Intuitive decision-making is part and parcel of clinical medicine, and is greatly envied by trainees (38). Intuition has recently been defined as the ability to translate our experience into action (39). It lets you recognize what is going on (making judgements) and how to react (making decisions). Intuition should direct analysis but both are dependent on experience, which provides a basis for recognizing important clinical cues. Over the years, I found that coaching trainees to develop strong intuition was very challenging, because it is "knowing without knowing how you know" (39).

### Customizing EBM

The outcomes movement, which is a product of evaluative sciences, is having a great impact on clinical medicine. There is no doubt that physicians whose practice is based on an

understanding of the underlying evidence will provide superior care. However, we should not jump on the bandwagon of EBM without remembering that good clinical medicine will always blend the art of uncertainty with the science of probability. EBM enthusiasts state that impersonal knowledge of the probability of a given result is the only real requirement for effective clinical practice (40). On the other hand, clinical reasoning with its reliance on experience, analogy and extrapolation must be applied to the many grey zones of medicine (36).

A dose of doctor is always salutary because consensus statements often pool ignorance rather than distil wisdom, and because practice guidelines fail to incorporate patient needs and preferences. Our trainees buy into EBM with fervour and inflated expectations, while forgetting that good evidence can lead to bad practice if applied in an unfeeling way. Our ability to help patients cope with uncertainty remains an essential part of medical practice (40).

### Closing the gap between what society expects and what it is getting

A gulf has developed between the medical profession and the population it serves. Consumerism, patient empowerment and autonomy result from cultural change and better education of the public. Medicine has become a commodity for the well-informed and discerning patient. In this context, the physician has become a provider of 'boutique medicine', in which knowledge and skills are defined by what the consumer demands (41). At the same time, there has been a progressive deprofessionalization of medicine through public access to a previously inaccessible body of knowledge, greater involvement of paramedical personnel in health care, loss of the autonomy of physicians, undue attention to technology, failure to improve self-governance and failure to include in the quality of care equation how well patients are cared for (8).

Improving the quality of health care will do much to renew our position in society. It entails not only the redesign of health care along the lines recently proposed by Ken Shine (2) (Table 2) but also to include in this list a commitment to change our relationship with patients from "detached concern to empathy" (42). Empathy is critical to the accurate collection of information and plays an important therapeutic role.

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