

Evidence and experience: what is the balance in surgeons' training? ¹

Evidência e experiência: qual o equilíbrio no treinamento dos cirurgiões?

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1. Presented at X National Congress of Experimental Surgery-Sobradpec, 2007, April 27. Cuiabá-Mato Grosso, Brazil.

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ABSTRACT

Surgeons' training requires professionalism, continuing medical education, and appropriate environment to ensure the desirable success. However, generally, this goal is pursued in an inefficient way, based upon intensive training skills founded in the age-old philosophy of "the way I have learned it". There is, usually, a lack of patient outcome evaluation, especially of long-term follow-up of surgical procedures, which in turns provide little evidence of senior surgeons for adequate training junior surgeons. On the other hand, questioning the established knowledge is not stimulated, or even not tolerated by the seniors. It seems like the "truth" is absolute and allows no change for the new knowledge, which would mean no additional progress. There is a need to significantly alter the implementation of new knowledge, if possible based on evidence, to ensure the best medical care for the surgical patient. Experimental surgery, and nowadays bench model surgery, may be useful in minimizing the predictable complications of patients under the surgeon training responsibility, while on learning curve. Surgery based on evidence should be one of the tools for improving patient surgical care, since this important branch of medical activity must rest on two pillars "art and science"; and surgeon in good training needs to be close to both.

Key words: Evidence Based Medicine. Problem-Based Learning. Education.

RESUMO

O treinamento dos cirurgiões requer profissionalismo, educação médica continuada e ambiente apropriado para assegurar o sucesso desejado. Contudo, geralmente, este objetivo perseguido, de forma ineficiente, é baseado em treinamento de habilidades que tem como fundamento uma filosofia clássica, não moderna -, "da forma como eu aprendi". Existe, usualmente, falta de seguimento, em longo prazo, dos pacientes submetidos a procedimentos cirúrgicos, oferecendo pouca evidência, aos cirurgiões experientes, bases fundamentadas para o treinamento adequado dos cirurgiões em treinamento. Por outro lado, o questionamento do conhecimento estabelecido não é estimulado, por vezes nem mesmo tolerado pelos cirurgiões experientes. Parece que a verdade é absoluta e não permite mudança para o novo conhecimento, o que poderia significar ausência de progresso adicional. Existe a necessidade de alterar significativamente a implementação do novo conhecimento, se possível baseado em evidência, no sentido de assegurar o melhor cuidado médico para o paciente cirúrgico. A cirurgia experimental, e atualmente, os modelos cirúrgicos de bancada, podem ser úteis, no sentido de minimizar as complicações previsíveis nos pacientes sob responsabilidade dos cirurgiões em treinamento, enquanto na curva de aprendizado. Cirurgia baseada em evidência deve ser uma das ferramentas para melhorar o atendimento ao paciente cirúrgico, desde que esse ramo importante da atividade médica deve se fundamentar em dois pilares -, "arte e ciência"; e o cirurgião em bom treinamento necessita estar próximo de ambos.

Descritores: Medicina Baseada em Evidências. Aprendizagem Baseada em Problemas. Educação.

Background and comments

The phrase evidence-based medicine (EBM) was developed by a group of physicians at McMaster University in Hamilton, Ontario, in the early 1990s. Currently, the practice of EBM involves the integration of clinical expertise or “professional wisdom” with the best available external clinical evidence in making decisions about how to deliver the best care to patients. As regard to surgery, nowadays, EBM is not, by any measure, adequately integrated into today surgical practice¹. Residency in Surgery for three to five years is considered the best way for training surgeons. However, in United States, Residents’ work is generally considered inefficient. In some American Surgical Services resident work hours can range from 73 to 91 hours per week. Comments by experts in surgeons’ training in USA are that the resident spends most of the workday life performing a myriad of apparently aimless tasks with little sense of accomplishment and no educational objective. Reducing work hours, especially in rounds, accompanied by work-habit reform to make the best use of residents’ training time, are considered important measures for improving the training quality of junior surgeons². There is no such evaluation in Brazil; however a non scientific observation gives the impression that this status is far worse than in United States. Training surgeons to do evidence-based surgery is a great challenge especially in non-academic environment. The first collaborative approach, in the United States, to assess the situation by three of the Accreditation Council for Graduate Medical Education, was published in 2004. It revealed that the residents’ performance on a first assignment showed specific weaknesses in use of text words and limiters. Performance was strongly related to a resident’s ability to obtain the best evidence in answer to a clinical question ($p = 0.011$). Substantial improvement was shown on a second assignment after additional training. The conclusion was that hands-on, performance-based program allows to document trainees’ progress in developing skills that will allow them to efficiently locate the best evidence available to inform their patient care decisions³. The rationale for the pedagogue process of learning evidence and practicing based-evidence surgery (EBS) has been the goal in some of the best surgical services in the world. The intrinsic objectives are to inform and convince that EBS is a method of interrogation, reasoning, appraisal, and application of information to guide physicians in their decisions to best treat their patients. Asking the right, answerable questions, translating them into effective searches for the best evidence, critically appraising evidence for its validity and importance, and then integrating EBS with their patients’ values and preferences are daily chores for all surgeons. Teaching and learning EBS should be patient-centered, learner-

centered, and active and interactive⁴. The teacher should be a model for students to become an expert clinician, who is able to match and take advantage of the clinical setting and circumstances to ask and to answer appropriate questions. The process is multi-staged. Teaching EBS in small groups is ideal. However, it is time-consuming for the faculty and must be clearly and formally structured. As well, evidence-based medicine (EBM) courses must cater to local institutional needs, must receive broad support from the instructors and the providers of information (librarians and computer science faculty), use proven methodologies, and avoid scheduling conflicts⁴. The ideal moment to introduce the concepts of EBM into the curriculum of the medical student is early, during the first years of medical school. Afterward, it should be continued every year. When this is not the case, as in many countries, including Brazil, it becomes the province of the surgeon in teaching hospitals, whether they are at the university, are university-affiliated, or not, to fulfill this role⁴. Changing physician behavior, especially in non academic environments, is particularly challenging, and there is no single method, even in an optimal environment, which could ensure its successes¹. One important roadblock for the implementation of evidence-based clinical guidelines in surgery is the fact that it is frequently confronted with skepticism by the medical staff, especially because a confinement of free decision making in therapy is expected¹. Considering that medicine is not merely natural science, but can as well be comprehended as social science or art, EBM may lead to an oversimplified and rigid standardization in medical care (“cook book medicine”). In addition, scientific progress might be prevented by inflexible guidelines. Nevertheless, it is important for surgeons to engage in the development of evidence-based guidelines in order to put forward their interests, because it is the lack of medical guidelines that might threaten free decision making in surgery - by not confronting economical pressure with decisive minimal standards in medical care. Therapeutical freedom is a substantial principle in medicine, but it should be considered that according to occidental tradition, “freedom” is necessarily involving reason and conscientiousness⁵. It is worthwhile to stress that scientific truth is relative, in a sense that even supported by biostatistics, it involves a greater or smaller probability that the answer for the formulated question could be against the odds. On the other hand, the answer can be only a mathematical truth with no corresponding biological significance. Furthermore, scientific truth can be limited by the time -, and lasting for the time elapse, when a new truth necessarily will emerge. Based on the argument that less than 5% of the surgical procedures are supported by clinical controlled randomized trials (CCRT) and the difficult task of keeping-up with the explosion of information, new technology, and advanced

new techniques¹, the same critical clinicians are prompt to speak out that surgical clinical research are of poor quality because there are few CCRT in this area⁶. It needs to be said that this type of experimental protocol comes up against many difficulties in surgery and may induce a conflict between scientific requirements and ethical principles. The useful advice is that improving the quality of observational studies, frequently performed by surgeons, with scientific simple measures may palliate the problem. Moreover, keeping national or international registries provides very useful informations⁶. On the other hand, practicing EBM requires a highly trained, astute, and experienced clinician, using insightful and objective analyses of the best clinical information available to synthesize the optimal patient care plan¹. On the surgical side, there is a consensus among the academic surgeons that new surgical techniques should only be introduced in clinical practice if evidence-based results, especially those based on CCRT are presented. It also needs to be stressed, that the surgeon responsibility frequently is far greater than those from other medical specialties. Unlike any other medical discipline, surgeons provide their diagnostic and operative skills through the surgeons' hand and the use of technical equipment, which ranges from instruments and devices employed during operation to the use of surgical robots. It needs to be stressed that the medical mandate to cure a sick patient is an individual mandate to take action. Measures, numbers, and images are only preconditions for a surgeon's action in daily clinical work; they can never replace it. The call for an ethical imperative in scientific surgery that is dependent on technology is justified when the state of science and uncritical use of surgical skills and financial constraints have major impact on providing medical care⁷. Experience of the good senior surgeons could pave the way for the junior surgeons' training. Other important issue in surgeons' training is the lack of experimental surgery in the majority of surgical services, which provides one of the best environments for improving manual as well as mental skills. There is robust evidence that surgical practice on laboratory animals and on bench model simulators can improve the acquisition of technical skills in surgery⁸. This is especially important in surgical procedures when vascular anastomosis is required⁹. In video assisted surgery, the old paradigm -, or relative truth, of "large incision associate with good vision were the basis for good decision" was broken by minimally invasive surgical (MIS) techniques. This important new tool of surgery has been learned in the environment of animal laboratory, which seems to minimize the expected human complications in the learning curve period, or in a mentorship program, which also looks like an effective strategy for safely introducing MIS into practice¹⁰. This surgical procedure can even be used as an educational tool in a web-based live teaching

environment. In this set the surgical procedures can be viewed from any computer connected to the internet. It is a new reality, where web-based broadcasts appear to be an efficient way for sharing surgical experience and a way to expand surgeon education, especially in an era of dispersal of index cases, work hour restrictions, and evolving technologies¹¹. Surgeons' training for using MIS in virtual reality is also a new tool for minimizing the complications during the learning curve, integrating visual information's with the kinematics and dynamics of the surgical tools¹². Complications using MIS approach are usually due to: inadequate normal and pathological anatomical knowledge, and incomplete learning curve, inadequate surgical technique, and insufficient compliance of the surgeon¹³. All these factors can be palliated training in the laboratories of experimental surgery, and deeply learning surgical anatomy and surgical technique. Robotic surgery is the new frontier in surgeons' future. It can increase dexterity of minimally invasive surgeon, but procedures require more time, and at the present there are no defined patient benefits. However, it creates exciting possibilities for surgeons' training, planning operations and performing surgery at great distances from the operator¹⁴. What is not acceptable is the frequent learning surgical practice, especially in public hospitals, of using poor human being patients as guinea-pigs for surgeons' training. It is even worse, when such surgical procedures are performed by junior surgeons without supervision. The medical councils are required, not only by the public citizenship, but far more important, by the human conscience to protect the patients against the medical errors, even when they are produced by non intentional purpose. Taking into consideration that in the United States post-operative complications is as high as 40%, it was created the Surgical Care Improvement Project, which goal is to reduce surgical complications by 25% nationally by the year of 2010¹. This can be done, just using the existing evidence-based knowledge. Similar Project can be done in Brazil. No matter what is the best way of the teaching – learning process in the surgeons' training and practice, there is a need for constant evaluation of long-term patient follow-up, and any surgical complication that results in morbidity or mortality should be addressed, by junior and senior surgeons, in specific meeting based on: the knowledge, the truth, the ethics, and the search for the best medical care for the patient. The professional modern academic surgeons, important part of the medical councils and surgical societies, should lead the process of producing, disseminating, and putting into practice evidence-based surgery, keeping in mind that the surgeons' activities are supported by two pillars "**art and science**", and that the commitment to continuing medical education should be forever.

Conclusion

The landmark of the modern academic surgeon should be professionalism, developing a lifetime commitment to continuing medical education. He or she should practice surgery based on evidence in balance with experience-, like a bridge between the two pillars of surgery (**art and science**). Always reading with critical mind, or skepticism, using the scientific tools for separating what is good and real, from what is apparent, with the purpose of offering the patient the best possible surgical treatment. In addition, he or she should make their contribution for training new junior surgeons, based upon: the knowledge, the ethics; the truth; and humanism.

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Conflict of interest: none
Financial source: none

Received:
Review:
Accepted:

How to cite this article

Brandt CT. Evidence and experience: what is the balance in surgeons' training? *Acta Cir Bras.* [serial on the Internet] 2007 July-Aug;22(4). Available from URL: <http://www.scielo.br/acb>
