

Teaching ophthalmology to the medical student: a novel approach

Ensinando oftalmologia ao estudante de medicina: uma nova abordagem

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Globally, good medical education institutions fulfill their vocation with research and medical care. However, often, quantitative measures of the quality of these institutions, ponder parallel vocations preferably to the detriment of its primary mission of education. Medical research is easily measured using international impact scientific publications indices. Public or privately-sponsored research help in the construction and maintenance of laboratories and allows the recruitment of researchers maintaining the best minds in the institutions. Medical care is often an important source of extra resources to the institutions. Teaching, however, is difficult to measure and only consumes resources, which makes us question this intricate reasoning threefold. Why teach? What is the role of education in a system that has to deal with research and medical care? Students generally do not manage their time efficiently, need specific trained physicians supervising their encounters and do not have the necessary knowledge or maturity to conduct research independently. Medical teaching is expensive in nature and is part of all stakeholders: students, teachers and society, to constantly evaluate its structure and its processes (curriculum), considering mainly that time management is essential in developing an efficient medical curriculum⁽¹⁾.

We need to teach, because this is the role of educational institutions before society. We need to teach because the maintenance of tomorrow's quality in research and care depends on today's good learning. Once we understand our role in society, support from institutions and all those involved in medical education is essential and can be achieved⁽²⁾.

A curriculum that is static is destined to death⁽³⁾. Valuing exclusively scholarship, innovations in medical education, especially regarding the so-called "small specialties" (which have little participation in the medical curriculum, such as Ophthalmology) are rare.

Role model learning has a very important part in medical education and must always be consciously present in the hidden curriculum of any institution. Instructors and learners should be encouraged to appraise this method of education in order to capture the subtleties, the details and peculiarities of the case observed in person. It is hoped that the learner repeats this behavior when he or she faces similar situations to those experienced during training⁽⁴⁾. Learning is enhanced when new concepts are added to the previously established concepts, therefore, ideally, we should use instructional strategies that emphasize logical thinking in the construction clinical reasoning⁽⁵⁾ by stimulating problem solving based on role model learning.

About five years ago we noticed the obvious dissociation between immediate recollection and internalization of knowledge at the curriculum of ophthalmology for medical students at the Federal University of Sao Paulo. At that time the program was composed of a one-hour lecture, taught by a faculty of the department, on the most prevalent diseases in ophthalmology, followed by group discussion and practical activity with patients. It should be noted that our institution does not adopt the model of problem-based learning (PBL). Upon completion of his rotation of five weeks with two weekly meetings of four hours, some students of the penultimate year of medical school were interviewed freely as a means of evaluating the program, particularly for assessing the coherence between the learners' need and the content offered. In these meetings, these students made their needs very clear to us, noting that at the end of their medical course, they would deal with ophthalmological complaints only during the evaluation of patients as part of their specialties or, in some cases, when dealing with patients in the emergency room. They made us notice that, as their diagnostic suspicions should arise basically during the anamnesis and unarmed inspection, the focus of learning should be in the patient complaints related to the disarmed aspect (if any) of the eye disease in question. Considering that the current amount of information made it impossible the full knowledge of medicine or any of its subspecialties, by any student in a timely manner⁽¹⁾, we believe that the knowledge to be conveyed to medical students should include the necessary basis for problem solving as well as guidance for the higher order ophthalmological clinical reasoning. That is, our objectives for the course should meet the students' needs assessment and we should offer several basic building blocks of knowledge associated with basic eye semiology and guide them in the association of these blocks to possible diagnoses.

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We opted for an educational strategy where the assessment of performance and feedback to the student are continuous and based on the logic of the argument that each one portrays. There is no diagnostic error if the argument justifies the thought. We defined among the instructors what symptoms and signs most commonly associated with eye conditions should be addressed during the meetings (pain, foreign body sensation, itching, decreased visual acuity in different situations, visual field, metamorphopsia, scotomas, photopsia, diplopia, redness, leukocoria, leukoma, ciliary flush, fluorescein test, anisocoria, afferent and efferent pupillary defect, ocular deviation, etc...). Initial activities, including seminars prepared by students were used in the first three meetings as a way to stimulate the confidence of the students for group work. In these initial meetings, special attention was paid to signs and symptoms and how they are associated with different diseases. For example, the student must understand that decrease in visual acuity should be a consequence of changes in transparent media or neurosensory diseases; foreign body sensation is associated to ocular surface diseases; retinal changes are painless; moderate increase in intraocular pressure, in a chronic way, is painless; conjunctival alterations do not decrease visual acuity, binocular diplopias disappear when one eye becomes occluded, etc. After the second or third encounter we began discussions in the format described below.

Group discussions were carried on a retroactive approach, ie; the signs and symptoms are derived from a clinical presentation. The correct diagnosis is not important and should not be the goal. The journey is more important than the arrival.

It begins with the projection of a photo related to ocular disease: a single photo of an eye, face or altered structure, with no other information provided. Usually the professor, that in this process is called facilitator, does not know the real diagnosis and is not familiar with the clinical case presented, being able to use any public photographs from the internet to do so. From the observation of the photograph, it is proposed the construction of the whole patient's medical history, including results of basic laboratory tests, diagnosis and management.

Successive questions are made to students, following the script of a medical history. Is the role of the facilitator to ask questions like: What is the patient identification? Is this patient male or female? How old is he/she? Was he born by normal delivery? Are there any remarks on the photo that made you choose this characteristic or not? The facilitator must be trained not to answer questions from students and not allow diagnosis in their comments, adding contradictory information to the case when students demonstrate that they have decided a diagnosis. For example, in a case of hyperemia where students are certain of the diagnosis of conjunctivitis, the facilitator can add the information that the patient has significant decrease in visual acuity or no alterations in the other eye, or had a history of weight loss or metallic material handling recently. Thus the facilitator will be directing the diagnosis for something else like uveitis, tumors or surface or intraocular foreign body. This digression can and should be done several times during the session. At the end, the framework should provide consistency with the information provided. A dark limbal lesion can be just a superficial foreign body, a tumor or a perforation with uveal tissue exposure; a photo to illustrate leukocoria may represent senile or traumatic cataracts or an intraocular tumor. Note that many of the answers may not be initially thought to relate to the diagnosis, but at the end they should be consistent. An identification male provided at the beginning of the case is expected to decrease the chance of a systemic diagnosis of rheumatoid arthritis, for example. During the presentation all students have the right to discuss and possibly change the characteristics presented if a convincing argument is presented to the teacher.

The course continues with each student, sequentially, setting a stage of the medical history. If the chief complaint was defined by a student as "decreased visual acuity since three years ago in both eyes," and the other sets in the history of present illness that the patient "has always worked blowing glass without eye protection," the facilitator may add that three years ago the patient began to experience pain in the left eye with blurred vision, before asking for the third student to inform the patient's past medical history. Note that, once again, much of the information added by the facilitator objectives digression.

The facilitator should request specific information to some students during the course of the case. For example: What was patient's visual acuity (knowledge acquired in the three initial meetings)? And, then ask the student how far the patient could see the same letter that the examiner (with known visual acuity of 20/20) can read at three meters. How the pinhole changed visual acuity? Was there some damage observed at the fluorescein test? How was the confrontation visual field? How were the pupillary reflexes? How is the patient's optic nerve? Was the eye tense on bidigital palpation?

Throughout the process facilitator's role is to encourage students to exercise their curiosity, creativity and logical reasoning. The facilitator should intervene promptly when any information given will change the course of the case, warning students about the fact, but not allowing information to be changed. So that, for example, a student describes hardened eye palpation in a case that was directed to conjunctivitis, the facilitator may redirect the diagnosis of angle-closure glaucoma and question family history, refractive error, age, etc.

Sometimes the facilitator may choose to present an artistic representation of a symptom, such as a photograph simulating visual field changes, blurred vision or metamorphopsia, rather than a clinical photograph. This alternative approach is also very interesting because it makes students try to predict how a patient with this symptom would verbalize it during the clinical history.

At the end of the discussion the facilitator (or a student) should conclude with a diagnosis that, although not necessarily the actual diagnosis of photograph, is consistent with the entire framework, reviewing the main points and the line of clinical reasoning that led to its consideration.

The activity lasts approximately one hour (one case per encounter). At the end of each rotation is applied to a formal written assessment, which consists of the composition of a history and physical examination, diagnostic and therapeutic proposals, based on only one picture chosen at random from a stock photo. The evaluation is

completed in pairs for approximately one hour. Grades are assigned to the reasoning, and not only to the correct diagnosis.

The challenge of unawareness and lack of control over the conduct of the case soon takes the form of a ludic and pleasurable activity for the group and facilitator, that challenges the strategy and connects teachers and learners around the mystery of each clinical case jointly devised and justified. This change of attitude of the teacher provides a conceptual shift to learner-centered education⁽⁶⁾. Our experience shows that during the sessions is possible to realize the depth of knowledge, logical reasoning and commitment of each student. The individual engagement, questions and justifications, clearly reveal the structure of thought of each student, offering a unique opportunity to evaluate and to provide feedback to the individual student and to the group, at the same time.

This curriculum was implemented partially for about five years, being used by some of the teachers in our department. Considering that this change in educational strategy removes all participants of their "comfort zone", creating the need for new learning and change of focus, faculty development and engagement of all teachers are among the most difficult goals during the implementation of this curriculum. We believe that these observed difficulties are, in fact, one of the major gains of the implementation of this curriculum, since it lead to the necessary restlessness for innovation.

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