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RESEARCH ARTICLE

In Medicine, is the Professor Necessary in View of the Wonderful Online Information?

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ABSTRACT

Advances in technology and the media have favored that knowledge can be obtained quickly and completely for all sciences; so, students can get information in this way; now you can complete professional careers "online", therefore. Is the presence of a professor necessary to study medicine and specialties?

In this paper, the forms of learning at the different levels of professional training, objective learning (learning they should know), the objectives pursued with learning, the role of culture and humanism in medicine are analyzed; they must learn the study of the techniques of evidence-based medicine and the clinical guidelines. The exam preparation courses, the objectives of how the learning of medical education should be structured are analyzed; how the medical attitude towards the patient should be individualized, what role does the clinical judgment play in the doctor, the terminal efficiency, all this in the university career of medicine and specialties in tertiary hospitals and in conclusion: The physical presence of the expert professor is important to carry out a tutorial teaching with direction in the academic and ethical evolution of the doctor in training throughout his career, in order to achieve an excellent clinical doctor who dominates the wonderful modern technology that he uses.

Keywords: subliminal learning, physician judgment, culture, evidence, individualization, experience.

INTRODUCTION

Since the last 30 years, both the media and technology have grown exponentially to the extent that knowledge in all areas of human activity is within the reach of a growing and ever-increasing number of the world's population. In this new environment, it is possible to take "online" courses, even today there are technical and professional careers with this method, to such an extent that it is no longer necessary to learn many courses on different topics with the presence of a teacher. With respect to the study of medicine today students or doctors already turn to acquire their knowledge to the study of clinical guidelines or evidence-based studies, and my experience of the last 40 years as a cardiologist and as Director of Teaching for 17 years, I have observed the deterioration of the doctor from the professional point of view of the doctor/patient relationship and the lack of depth in the medical knowledge that is now observed to be very superficial and incomplete, when obtained in a partial way and without applying it accurately to the individual patient, resulting in frequent and significant misapplication of medical treatments and surgical indications.

In this study we analyze the aspects in which the professor is essential to direct medical education and thus obtain doctors with solid professional knowledge, who have a more human treatment for the patient and who are highly prepared to application the high new technologies they will use.

SUBLIMINAL LEARNING (Table 1)

The teacher must start teaching from aspects that are apparently imperceptible to the student or to the doctor in training (Table 1).

| SUBLIMINAL TEACHING (Table 1) |
|---|
| <ul style="list-style-type: none"> • Image • Diction • Use of language • Writing • Patient treatment • Treatment of students • Interpersonal skills • Resident treatment • Postgraduate courses • Culture |

When the professor presents himself before a group of students, he will necessarily always have a neat personal image, with a dress

according to his professional level; in the understanding that this image is the one he has to project to a patient and to a community¹. Doctors transmit a lot of confidence to the patient with an impeccable presence. When, on the other hand, the doctor presents himself untidy, with a bad body odor, with an unkempt or unshaven hairstyle, with dirty shoes; this aspect alone instills mistrust in the patient. If this unwashed doctor tells the patient that he is going to perform surgery, the patient will feel insecure about who is going to intervene directly on his body and the fear may force him to refuse the treatment that the doctor indicates. If, on the other hand, the doctor shows up poorly dressed in a scientific meeting, it will show an attitude of contempt to the audience he is addressing to, and that he considers the listeners have a lower social, intellectual or academic level, isn't this unrespectful?

Diction

The doctor must show a clear diction, speak correctly, as well as avoid vulgarities because in this way, in a subliminal way, this learning is understood by the student or the doctor in training and will be reproduced before the patient or before a scientific community. If you make a joke, you should avoid jokes in bad taste, you should be subtle in that aspect, so as not to fall into vulgarity and not to offend or belittle the audience that listens to you.

Treat to the patient

When medical students, undergraduate interns or residents do rounds with the attending physician who is tutoring them, he or she subliminally teaches by his or her attitude how to treat the patient correctly. The patient will always be treated respectfully, by name, the doctor's voice will be slow and calm. The physician should not suggest the symptoms but wait for the patient to explain his disease in his own words. If the physician notices that the patient does not know how to refer them, he/she should indirectly help the patient to clarify them. When performing the physical examination, care should be taken not to violate the patient's dignity, especially if the patient is a woman or even more so if she is an adolescent or a child. When dealing with anesthetized patients, it is not correct for the body to be completely uncovered when no procedure is being performed, it is an attitude of respect to keep him covered, the same can be said of corpses². When dealing with children and adolescents, the approach should be gentler, achieving more confidence in the patient and better communication.

Treat to the Medical Student

When dealing with university students, the doctor should be cordial and respectful, avoiding mockery or ridicule. On the contrary, attention will be given to what the student manifests and interest in what the student says. The doctor's answer will always give the explanation of the doubt that the student has without any offensive treatment (mocking tone, ignorant or unintelligent treatment) and offer the source of consultation for his doubt. The professor must establish an academic exchange between the student's questions and the answers where good communication about the theme will prevail. The professor will be strict but not aggressive, again teaching by example⁽¹⁾. Likewise, he/she will respect their rights, but it is necessary to emphasize that the student also has responsibilities. Indeed, the first obligation of a medical student is to prepare himself to provide tomorrow a highly qualified service, or to serve his patients and later his country and contribute to leave a better world. This is because the university is not for any student, but for the one that fits the best. This is so that the country does not waste its limited resources. So that those who have the optimal preparation to learn and later teach others and make science their own, get this invaluable opportunity. For this reason, this right is not universal, the University is not a factory of degrees without responsibility³.

On the other hand, there is no need to instill fear with the questions the doctor asks. These will have the purpose of exploring the knowledge that the student has acquired or, alternatively, should draw attention to some detail that is important and that goes unnoticed by the student.

If the question is not answered by the student and the doctor offers the answer, he/she generates new knowledge that the student retains, and this is called subliminal teaching.

It is also not correct to instill fear when doctors take a test, for that, the test has to be designed by the doctor to ASSESS the knowledge that the student should have.

For this reason, the exam has to be conducted with perfectly structured questions. When the course has been conducted by competent teachers and has followed the teaching objectives offered, the result obtained usually follows a Gaussian curve, I.E., a percentage of students leave with excellent grades, with the majority obtaining passing grades and only a small part of the group obtaining a failing grade. The important thing is not how much the professor teaches, but how much the student learns. When a test is failed by the majority of the group, it usually indicates that it is unanswerable and this may be

because the doctor is trying to prove himself and make the students feel that the professor knows a lot, or that he is a great doctor, a great specialist. But the reality is that the doctor has been unable to teach his subject, in other words, the one who fails is the professor, not the students, therefore this person is not a good teacher. When the course has been excellent, the students have been interested by the teacher's motivation and the exam has been well structured, it is usual that most of the group approve with good grades, this is very gratifying for the student and this fact will motivate him to learn more about the subject and improve it.

On the other hand, when the professor is kind, it does not mean that the student deserves that everything is given to him by right. He has to show interest and effort to learn and be better. Since sometimes the student feels that he deserves that the professor or the University is obliged to give him the knowledge or the grades, without him making any effort³. In this relationship, limits and objectives must be set, and as Professor Chavez said: "The professor/student binomial must work together, some studying to teach and others studying to learn", knowledge is not received, it must be conquered⁴.

Treat to the Undergraduate Internships

The medical internships who is at the end of his career, is already practically a doctor. To this student, the professor must motivate him and show him the way to reach his goals. With this, it is very possible for the doctor to successfully complete his career, without any obstacles. It is not uncommon for the young, brilliant and studious young doctor to question his professors. Not in order to challenge them, but to show his interest in what he has been studying and to show them the fruits of their efforts. When a mediocre physician encounters a brilliant student, it is not uncommon for the student's question to be answered aggressively, sometimes because the physician himself does not know the answer and with the violent response tries to hide his ignorance. The mediocre physician usually tries to discourage and minimize or block the good student.

Treat to the Medical Residents

The physician who has reached this level has usually done so because he or she has a vocation in his or her career. He has the desire to know and the desire to help⁵. In the first years of his residency, the physician is discreet, withdrawn and does not speak or communicate easily. However, overtime, as he moves up in his medical training, he becomes more confident and at this point the

professor has to treat him as an accomplished physician with discussions at the same level as the specialist, allowing his ideas to flow in order to establish a scientific discussion in which the truth prevails. On some times, the resident's up-to-date preparation will be right, however, on others, the experience and a more global view of the problem will be the field of choice of the more experimented professor. In every case, discussions should be mature and should accomplish the objectives. It will be a big mistake that the professor always tries to demonstrate he or she are accurate, truth should always prevail.

Treat to the Postgraduate Medical Doctors

The way doctors at this level of preparation are treated is the same as a doctor at the same level or perhaps sometimes higher than a doctor studying a postgraduate degree, so the exchange of knowledge must be equal, always with an open mind to accept a concept or a fact that the professor may ignore and therefore must calmly accept as new knowledge. This does not mean that the student is superior to the professor, simply means that nobody has all the knowledge and it only means that the postgraduate physician has achieved the dream of his vocation, which is the beginning and the culmination of an accomplished professional career.

Culture

The learnings of those who have gone before us, have place in a relevant level the aspect of culture⁶ that a physician must have. Medicine is a humanistic discipline, in such a way that it is an indispensable ingredient for the physician not only to concentrate on his science, but also on culture, because this makes him even more human.

It is unacceptable that a physician does not know what world he lives in, where he comes from, what his achievements are in art, science, humanism. The wider the knowledge of his world, the more humane he will always be. But especially the doctor, in front of the student, the professor must show certain glimpses of his cultural activity without this meaning that he flaunts his cultural heritage at all times and becomes an "intellectual like".

"Humanism means culture, understanding of man in his aspirations and miseries, valuation of what is good, what is beautiful and what is just in life". (Ignacio Chávez)⁷

KNOWLEDGE GOALS

(Table 2)

- Knowledge of the subject
- Teaching techniques
- Knowledge progress from basic to complex
- Bibliographic orientation
- **Individualization of the knowledge: (*, **, ***)**
- Evidence-based medicine*
- Guidelines**
- Experience***
- Terminal efficiency
- Final objectives of medical education

KNOWLEDGE GOALS

Knowledge of the subject

To teach requires as a first instance that the doctor masters must know the subject to will teach be taught to the student; the more expert professor is required, who can start teaching from the simplest knowledge that is understandable for those who have never been in contact with the subject. With these firm bases, the student can progressively ascend in knowledge and as he/she conquers knowledge of greater complexity, he/she will be more passionate about continuing in this process and this generates great personal satisfaction. For this group of students, the less prepared the professor is, the less understandable the subject matter will be. It is not uncommon for the inexperienced physician to look for the latest journal paper published on the topic he/she is going to teach. Most of the time, this professor does not even understand the article he/she has read, which breaks the teaching. That is why it is said: "if you want to know if you understand something, try to explain it, if you can't, means that you don't understand it"⁸.

Learning techniques

The teaching of medicine is complex, since the human being is a whole macro and microscopic universe, which is impossible for any human being to know in its entirety. The only way to teach this wonderful science of medicine is to begin with the basic sciences, and then move on to physiopathology and thus understand the clinical, diagnostic and therapeutic aspects, always proposing preventive medicine. Wanting to learn medicine through simplifications and algorithms only leads to error and iatrogenesis.

In medicine, students or already trained physicians must have a solid foundation in anatomy,

physiology and biochemistry, because only then will they be able to understand how the interruption of the Krebs cycle is capable of producing myocardial ischemia, among many other pathologies that can occur in a patient, when a coronary artery is blocked; On the other hand, he will not be able to understand a complete A/V block if he does not know the electrical conduction of heart, and even less will he be able to understand why the corrected transposition of the great arteries does not produce cyanosis.

Thus, the learning of any medical specialty would be given to physicians who already have the medical a basic science background, of the cardiovascular system.

The basis of any study of a patient is the correct taking of a clinical history⁹. The teaching of auscultation of the heart, which is not easy and can be compared to learning to play a musical instrument, should be privileged, so the teaching must necessarily be tutorial with the guidance of an expert cardiologist and on a patient, explaining what the doctor hears. When this is the case in a hospital with a sufficient number of cardiac patients, it takes 2 or 3 years to master this art¹⁰. Learning under the guidance of the professor is easier and more pleasant the more original, competent and humanly understanding the doctor is. This makes the student's learning more rewarding and solid¹¹.

Postgraduate short medical courses

Refresher courses or exam preparation courses are only useful for students or residents who have already assimilated the entire course, and therefore function as a review of what should already be known. The "exam preparation courses", "Update courses" or "Guideline courses" they are very useful for doctors who have fully studied their medical career, their specialty course or therapeutic guides in medicine for all doctors or specialists.

The "Exam preparation courses". These courses are useless for those who have not followed or have not understood the topics during their medical professional studies these systems are totally inadequate, because the doctors will not learn medicine in 6 months but they learned it in 6 years. "Update courses". These courses are useful for specialists who finished their specialty a few years earlier and require updating on their subject, or for recently graduated specialists who are going to take a specialty exam.

This not courses are not useful the specialists will not learn in 2 years the specialty and in 6 months or but they assimilated their study time.

"Guideline courses", and they serve to reinforce knowledge that they already have or to consult the opinion of the greatest experts on the subject, but the doctors who made a career in medicine without a vocation or the specialists who try to learn what they did not assimilate during their specialty or the doctors who consult the guides without knowing medicine, and finally, doctors will misuse clinical guidelines if they do not know medicine.

Progressive knowledge

The complexity of medicine necessarily obliges to offer a gradual teaching, always starting from the simplest to ascend progressively to the most complex, because only in this way the acquired knowledge is assimilated and will be lasting. This knowledge allows to assemble it with other knowledge linked to the first concept, thus building solid medical knowledge that allows to practice the profession more effectively.

It is never desirable that the teaching pretends to offer the student the practical forms of the terminal concept without understanding what gave rise to the conclusion. That is why in many modern medical communities, algorithms are used as sequential lists, forgetting how the conclusion was built. This leads the physician to use algorithms as "cookbook"¹².

Currently, the most frequent causes of diagnostic errors are the absence of the ability to recognize specific clinical signs (hemiplegia, splenomegaly, interpretation of heart murmurs, etc.) the doctor will need diagnostic techniques with higher expenses (echocardiography, nuclear medicine, tomography, magnetic resonance imaging) for them to guide them in a diagnosis that they do not have.

In contemporary medicine, it is now common for the physician not to know how to make a diagnosis with the heart murmur he hears, and so he waits for the echocardiogram to be sure of the diagnosis. It is also not uncommon, for the physician who performs an echocardiogram not to be fully trained and to make an erroneous diagnosis and, upon receiving it, for the attending physician to make a wrong surgical indication. This fact is a very frequent cause for requesting a second opinion when the patient doubts the judgment issued by the physician or when another physician gives an opinion on the matter. In this way, indications and treatments, even high-risk ones, are wrongly indicated and may lead to unnecessary surgery or to more serious complications.

In conclusion, the only way to learn medicine IS TO STUDY IT and it can only be done when it is understood, after having studied it and assimilated it⁸.

Individualization of the knowledge (*, **, *)****Evidence-based medicine***

Evidence-Based Medicine has revolutionized medical knowledge and care so that this act is carried out in a more scientific and less superficial way. Indeed, randomized multicenter studies, when following the guidelines of the scientific method with adequate statistical studies, have given great knowledge to the physician and from many of these studies, scientific truths have emerged that can be applied in clinical practice for the greater benefit of the patient. An infinite number of studies can be mentioned that have given unobjectionable therapeutic guidelines in the treatment of various diseases. We can cite the spectacular effects of statin use in reducing mortality from ischemic heart disease¹³ and, better still, in preventing its onset (primary prevention)¹⁴ and its consequences (secondary prevention)¹⁵, and its unquestionable benefit in the regression of atherosclerosis¹⁶. Similarly, they have shown the benefit of ACE inhibitors, beta-blockers and digitalis medication in reducing mortality in patients with heart failure¹⁷⁻¹⁹.

On the other hand, evidence-based medicine has not always been used to know a clinical truth, but it has also been used to study drugs with new pharmacological actions. For example, to find out if digitalis reduced mortality in heart failure, 8000 patients were studied (DIG study)²⁰ and it was found that this drug had no effect in reducing mortality. This study was the reason why digitalis was discontinued practically all over the world because it did not demonstrate a beneficial effect. However, when this study was carefully analyzed, it was found that 1000 of these patients had no or very mild heart failure (LVEF >45%). This skewed the statistics and thus the difference between placebo and digitalis was insignificant. Years later, Gheorghiade et al,¹⁹ demonstrated that from the same DIG study, a substudy was made of the most severe patients (functional class III-IV, EF < 20% and > 55% cardiothoracic index) and in them digitalis was effective even in the most severely affected patients with heart failure. Now, Gheorghiade and Braunwald recommend the use of digitalis in patients with acute heart failure²¹. As can be seen, only the careful analysis of the DIG study was able to motivate studies that were able to demonstrate the real effect of this drug on cardiac failure. This case exemplifies why the physician should be prepared to carefully analyze studies based on evidence that many times may not have true results.

In general, the results of evidence-based medicine studies are usually reproduced in clinical practice. However, evidence-based medicine has limitations, as the scrupulous selection of patients who enter these studies and with whom certain results are obtained are not necessarily applicable to the patient in front of us, because the biological variability of the human being does not necessarily allow this patient to have the same characteristics as those studied in large multicenter investigations. Therefore, when treating an **individual patient**, the knowledge from the evidence-based study should be applied to the patient, bearing in mind that the evidence obtained in the study may not be fully applicable to the patient. This point should be discussed with young physicians so that they learn to individualize treatments and to be aware of the limitations that evidence-based medicine may have. Hence the importance of the **CLINICAL JUDGMENT**: *"Logical reasoning has been its best support to elaborate a diagnosis, for this, the intelligence is the basis and the brain its best instrument, Ignacio Chávez"*²². This is the greatest virtue a physician must have to exercise his profession in the highest being of creation which is the HUMAN BEING.

The better prepared the physician is, the better he/she will apply this instrument for the benefit of the patient.

Guidelines**

The major medical societies of each specialty have designed clinical guidelines for the diagnosis and treatment of the various diseases of man. These guidelines are based on the evidence demonstrated by scientific studies and analyzed by highly trained physicians; it is important to take into account that each result should be a guideline and not a standard, so that the **individualization** of the guidelines for each patient's situation should be carried out according to his or her specific conditions¹².

The clinical guidelines are very useful because they have been prepared by the leading experts in the field and are based on scientific studies, but it is precisely the most experienced physicians who use them best.

Experience***

Experience in medicine is very important, because it is precisely through experience that data for the **individualization of medical knowledge** can be discriminated with greater precision.

The physician's experience should not replace evidence-based medicine, but it should be analyzed and evaluated by the critical vision of an

expert physician according to his or her clinical judgment^{5,10}.

Terminal efficiency

The objective of all the points previously analyzed constitutes the reason to train new physicians with great scientific and ethical preparation who can replace us and that each generation is better professionally than the previous one.

The objectives of medical education

- Pedagogically, it should be based on observation and experimentation.
- Technically, scientific medical programs should not stifle clinical medicine.
- Culturally, medical education should not impede cultural preparation.
- Ethically, the interest in science should never surpass the interest of the patient.

- Socially, the physician's training should include a concern to serve and promote the development of the community.
- In the community, therapeutics should be mastered and prevention should be privileged⁶.

CONCLUSION

The professor plays a transcendental role in the perpetuation of medical quality by imprinting a defined identity on the well-prepared physician. The self-teaching of medicine, using only the online technics without professor's orientation, may produce **an expert technician in medicine**, but not **an expert physician who master in the individualized clinical science in medicine and also the knowledge in the use and interpretation of technology**¹⁰.

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