Education and its evaluation after graduation*

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The Training of Doctors

In my opinion and firm conviction, the medical education that takes after graduation is the most important. It is three decades since I heard Miller Guerra, a great clinician, a clear thinker and an exemplary citizen, say the fascinating phrase: "a person who finishes the course in medicine is ready to begin his medical training." This phrase accurately summarizes the distinction between finishing a course, and being trained.

In fact, doctors are not trained on the day they graduate - not even those with the most innate ability. The course may have provided a good foundation, but the training will only come later.

To understand the circumstances in which the new graduates will become doctors, I would say that the most favorable environment is the hospital, and the agents of the "transmutation" are more experienced doctors.

It should be clarified that the hospital clinic essentially has two missions, one assistential, which involves treating patients, and the other didactic, which involves helping train new doctors. These functions have been inherent to the nature and purposes of medicine since its very beginnings, and coexist side-by-side in the activity of many hospital doctors. However, there are those who are almost exclusively dedicated clinicians, and there are also teachers who carry out very little assistential activity. Either way, treating infirmities and teaching colleagues are valences that are part of being a doctor. Afterwards the doctor may move on, either in combination or exclusively, to a basic research career – a more logical progression in the academic centers and institutions, or a particular line of clinical investigation – possible in any hospital.

The great error of vocations

I use this expression to describe the poor use of doctor's predominant aptitudes, a frequent phenomenon, particularly in teaching hospitals, namely, the lack of coherence between teaching, investigation and clinical assistance.

Needs for career placements and imperatives are the main reasons why the natural tendencies of many professionals are thwarted, giving rise to poor positioning in the dominant activity. This fact has been commented on by celebrated thinkers:

Teaching is done by those who lack pedagogical ability – "Those who can do, those who can't teach" (George Bernard Shaw);

Research and publishing are done by those who lack the spirit of a researcher, or literary talent – "doctors have the strange pleasure of publishing nonsense" (Elysio de Moura);

Those who have much more ability for teaching or research are forced into clinical practice – "He was one of those doctors who know everything, but are terrified when they find themselves in front of a patient" (Aquilino Ribeiro, mentioning Fialho de Almeida).

Clearly, I refer to cases in which there was no major error of professional guidance in the choice of medicine, but everything became complicated afterwards, in the selection of the activities actually carried out in practice.

The two cycles of medical education

After a prologue, consisting of the three last years of secondary education, the learning of medicine is processed in two cycles: basic education, given by the medical school, and clinical education, which starts in the final years of the course, but goes beyond medical school and is ministered mainly in another type of institution – hospitals, in particular.

The basic cycle should assume a predominantly

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scientific nature. Clinical teaching is essentially practical in nature, and has much of the artistic. To use a metaphor, I'd say that in the basic cycle, the clay is prepared, and in the clinical education, it is molded, baked and decorated to form the pot.***

School and hospital together

Among us, as in many other countries, it is common for a school of medicine and a hospital to exist together in the same building, under a single roof, our "within a single egg". This twinning is difficult, everybody knows, but successive generations of new doctors have survived the institutional conflicts, although they are harmful from a pedagogical point of view.

Teaching versus assistential care

Hospital doctors are currently going through a major, deep-rooted conflict; to be able to bend over backwards and properly serve the two functions, teaching and assistential. The problem is worse in some hospitals than in others, but it is growing worse in Portugal in general.

In a survey concluded in 1991, carried out by the Robert Wood Johnson Foundation of Princeton, NJ, USA with a sample of 4756 young doctors, eighty percent of those questioned believed their training had been excellent or good (JAMA, 1993;270:1035-1040).

These American results contrast with the opinions that have been repeatedly communicated to me by interns and students over the last five years. They complain about the lack of attention, lack of availability and in short, lack of teaching by many of their "assistants" in the clinical disciplines and the practices of the intern. I believe they are right, because I observe that the tendency is towards less teaching of clinical practice. The problem with this conflict that it now occurs between the assistential and pedagogical duties, as doctors of various central hospitals become increasingly fewer in number, older, and overburdened with work.

In fact, the time of the best, most experienced and dedicated hospital clinicians is currently taken up by direct assistential acts, excessive and multiple services, and even bureaucratic functions that rob them of teaching time for interns and students.

Teaching is deteriorating, because: the medical staff of hospitals are suffering from excessive workloads generated by technological progress; the central hospitals are being plundered of mature clinicians, in the name of a territorial redistribution of highly debatable advantage; the need to guarantee the nursing service, consultancies and emergencies exhausts those who remain; the practical help of the interns has decreased dramatically, as the increasingly difficult access to medical schools has drastically reduced their numbers.

I know well that the current guideline is the decentralization of medical care.

But I think stripping the major hospitals, those with multiple valences of high technological capacity, is an ill-advised course of action. The fact is that the lack of hospital clinicians is becoming more and more apparent.

A real lack of doctors in hospitals

When it is said that a particular central hospital has two doctors per patient, this is a fallacy, because this figure includes: doctors who do not have clinical functions – radiologists, clinical pathologists; anatomopathologists; managers, etc.; doctors who are on sick leave or academic leave to complete their PhDs, those dedicated exclusively to basic education, those who are abroad for prolonged training programs, those on sabbatical leave, etc.; it even includes interns working for brief periods only!

The truth is that the central hospitals, purged of interns by the exaggerated "numerus clausus" of access to the course, with increasingly older staff having to cope with multiple functions, have few clinicians. As the priority is nursing, the time and availability for teaching the few interns and students that are still "trickling in" cannot help but be resented. Pure elementary arithmetic!

Imagine, there were just over fifty graduates in medicine in the academic year 1993-1994, at the Lisbon School of Medicine. If this is going to continue, why maintain two medical schools in the capital?!

In 1973, the hospital where I work had an average of four doctors (one assistant and three interns) for every six patients in the medical wards. Twenty years later, the same six beds are served by one or two doctors. This includes shift services, external consultations and follow-up of discharged patients, the practice of techniques and doctors who are absent for various reasons. The conclusion becomes irrefutable: there are not enough clinicians, even though the total

number of doctors – clinical and non-clinical, acting or absent, appears high.

And, we could reach a ridiculous situation where the central hospitals do not have enough doctors to care for the patients referred to them in a continuous flow, by the district hospitals, due to a lack of technical conditions for semiologies and therapeutics that require large teams and multiple valences.

In the second fortnight of August 1993 alone, the Hospital Garcia de Orta, in Almada, sent 172 patients to the Santa Maria emergency unit (an average of 10.7 per day) and in the same period, the Hospital de Torres Vedras sent 92 (an average of 5.7 per day). In all, forty-one hospitals sent patients to this central hospital during that fortnight!*

These significant numbers support my argument!*

Returning to the question of basic education in Medicine

I hope the virtual reader will forgive these digressions on the problems of work overload among the hospital clinicians who also teach. Let us forget those for the moment, returning to the theme in hand: recent graduates in training.

The young doctors generally lack education in the basic cycle, and what is worse, it is generally that of a more practical nature.

I recall the Victorian teaching that took place in the practical classes of the basic disciplines on my course back in 1962/68. Thirty something students, bending over a cadaver that was so preserved in formol and so old and dissected that it looked like a mummy that had already been analyzed by the Egyptologists, was anatomy class. A preparation of muscle linked to a hundred-year-old Marey drum, in the time of the polygraphs, was physiology. Explanations like how to divide a decigram of strychnine sulphate by a hundred liquorice tablets, and how to make a mercury yellow oxide anti-venereal, at the height of the emergence of antibiotics, was pharmacology…

I have observed that some of the tenured professors in basic science do away with practical classes altogether, replacing them with practical themes. This is unfortunate, because a "touch" of experimentation, even practical, has training value, and because it pains me to see laboratories of institutes that display designations like pharmacology and physiology being transformed into offices, where articles are written and doctorate theses typed, where slides are prepared and propedeutic steps taken in the cybernetic of the "curious".

However, it should be recognized, that a poor, even non-existent basic teaching does not prevent the training of clinicians. I recall Miller Guerra once again, and his statement that the medical training only starts after graduation.

Incidentally, if this question of basic education were made more crucial, there would be no false doctors practicing successfully. One of the most infamous, Frederick Waldo Demara Jr., even managed to become a surgeon with the Canadian Navy…

In any case, it would be good if graduates entered hospital practice with a solid basic preparation, not least because this would greatly facilitate the subsequent work of true training.

Clinical Education

Clinical Education presupposes two conditions: the availability of a clinic with reasonable pedagogical talents, and the "delivery" of a disciple who is not totally void of vocation. Geniuses are not made. Ribeiro Sanches, William Osler, Gregorio Maranon and Pulido Valente were all naturally gifted. They would still have been great doctors even if they had had a deplorable education. But the majority are not geniuses. Human material of average quality does not give rise to medical geniuses. It produces decent clinicians, of value to society and with good prospects for personal achievement, when they receive a competent and inspired clinical education. As in the arts, there can be only one Velasquez, only one Mozart, but lots of artists who have produced paintings; lots of composers of agreeable tunes.

Does clinical education have its own method?

In my opinion, yes! The method of clinical education consists of a day-to-day co-existence between the patron and his disciple (master and apprentice), working side-by-side, in tandem, with time and perseverance.

There are certain analogies with the learning of a craft, such as shoemaker, potter, or cook. For these professionals, as in medicine, the education given must be highly personalized, practically tailor-made to the individual. A good teacher simultaneously prepares two disciples, while a great teacher can mould

four or five.

This need for master and apprentice to work alongside each other in the day-to-day routines of the clinic, examining the patient, inquiring, seeing, hearing and feeling, or involved in the analysis of written records of the clinical process, represents a high degree of individualization of teaching. This is difficult to achieve, mainly due to limitations of availability, which perhaps this explains why so many masters in medicine leave "school".

All this talk of individualized, clinical, paternal education has an archaic resonance, a Hippocratic tone.

What place is there for internships in the "specializations", visits to research centers, the practice of state-of-the-art techniques, mathematization and computerization?

I accept that these experiences and differentiations are of great interest, but they are merely complementary.

First, one has to learn to be a doctor. The method I recommend is precisely that attributed by Hippocrates (460-370, A.C.) and which he would have practiced in his clinical center on the Island of Kos: to evaluate a candidate, judge him – which means the commitment of accepting the professional rules – and teach him, through the day-to-day practice.

I accept that other pedagogical methods may be good. They have been used successfully for twenty-five centuries.

And I do not believe, in any case, that it is possible to learn medicine by correspondence, or by distance learning.

Evaluation

The evaluation of clinical education – and I see a certain underlying correlation between education and hospital internship – is essential. We must know whether the person to whom we entrust our patients is, in fact, qualified.

In my opinion, the opinion of the patron, master or training supervisor – call this figure what you will – is the fundamental criterion. But it must be an explicative partnership, with a solid base, explained clearly and in detail. The master is also judged based on what he makes of his disciple.

Next, I understand that a clinical test is indispensable. This may be the classic study of one or more patients, or it may assume other forms: a visit to a ward with commentary (an idea given by L. Garcia e Silva), an interview and examination of a patient in the presence of evaluators, with their simultaneous criticism, the practice of semiological acts, the interpretation of complementary tests, etc.

All this advises that the tests be hospital-based, ending the specialization internship, in the presence of a broad hospital-based bank of examiners, perhaps consisting of five members including the candidate's patron and, possibly, a representative of the Order dos Médicos (Medical Association).

The Curriculum Vitae (CV)

I relegate curricular analysis to a secondary role in the evaluation of the postgraduate education. This raises many problems, starting with the name: should we translate to the legitimate Portuguese word curriculum? And the plural? Maintain the affected Latin barbarism curricula, or have the courage to pronounce the unhappy sound of curriculums?!...

I do not reject curricular analysis altogether, but I would much prefer to see the curriculum reduced to a straightforward list of activities, possibly preceded by a small conceptual preface, and I would be even happier if the evaluations of interns were not based on this document at all.

In fact, the curricular evaluation gives very vague information of doubtful benefit.

The tendency is to generate, in a nightmare of sheets of paper, a work of fiction that can vary from being an epic poem to a historical novel. Human, understandable, but unacceptable!

Those who are called upon to evaluate, generally faced with lists of courses that may have been nothing more than means of obtaining diplomas; with numbers of congresses where the candidate's presence may have been purely as a tourist; the statement of communications which are often repetitively listed with just small and strategic variations in detail and co-authors; articles that are rarely good, and more often than not, are merely based on the same, flimsy work; with letters of guarantee that actually guarantee very little, since it is common for a respectable medical personality to think nothing of stating, and guaranteeing, that a near-illiterate can speak and write like Padre António Vieira.

Finally, a recent fashion in Internal Medicine, the curriculum presents nosological statistics that are generally poor.

Nosological statistics

Throughout the internship of a medical intern, the contentious candidate deals with all the current nosology and comes across some rarities. It is the same for them all, why specify whether there were 187 or 154 patients with cardiac insufficiency, 133 or 151 with chronic pulmonary obstruction, or 216 or 289 with cerebral vascular accidents?!

In other specializations, the small number of cases is of great significance; the curriculum vitae of a general surgeon that shows that he has done 3 gastrectomies is quite different from one who has done 54, or that of a cardiologist which shows he has done 2 haemodynamic studies, or 110.

But in internal medicine, at the end of 5 years of hospital specialization (internship), the numbers of major and frequently treated pathologies are always more or less the same; they do not express a manual training of utmost importance; in short, they are less relevant.

Exacerbating my discredit on the importance of nosological statistics in internal medicine, the fact is that many of these lists are extractions of computerized data on the casuistic of service, not necessarily services personally carried out. And in the statistics there are almost always patients who were neither studied nor treated by the candidate. They include patients of close colleagues, hospitalizations during holidays and congresses, etc. Hence the almost systematic confusion of patients and diagnoses. Practically nobody specifies one thing or another.

Two thousand, five hundred diagnoses will correspond, potentially, to 650 patients. This leads to various confusions, exacerbated by the fact that there are patients who are included in more than one nosological group. For example, a case of profusely bleeding peptic ulcer may be included under the headings "peptic ulcer", digestive hemorrhage", acute hemorrhagic anemia" and "hypovolaemic shock"; and a case of rheumatoid arthritis may be classified as "connective diseases", "complaints of the locomotor apparatus" or "chronic rheumatisms".

This problem could be avoided if the nosological nomenclature of the World Health Organization were more widely applied, no matter the defects we point out, and if the computerization programs were designed by experts in the subject, duly instructed by clinicians with some specialization in statistics.

While this is not widespread practice, we continue to recognize in many computerizations, the wise saying "garbage in … garbage out!**

Reading dozens of curriculum vitae, I am puzzled to see that there are never any patients without a diagnosis, or mentions of diagnoses that were incorrect. By contrast, the first lesson of the course given to be by Eduardo Coelho was entitled: "Errors of diagnosis in my Service, in the last couple of years."

More sophisticated statistics

Some more elaborate and complex statistics go beyond mere nosological lists and cater for the institutional desire for favorable numbers, statements of the quality of the healthcare.

The big question is the yield.

Yield is a rule calculated based on the average time in hospital. I should state that I considered this parameter to be very weak. In defense of my assertion, take a hypothetical hospital in which it is agreed that all patients who at 72 hours of hospitalization were not in adequate condition for discharge would be immediately assassinated, there would be a very good average time in hospital of just three days…

The average bed occupancy rate also tells us very little. In medicine, it is generally very high, over 100%,*** due to the mobilization of extra beds that do not officially exist, and stretchers serving as beds, to deal with the large inflows of patients on "black" days in the emergency services, particularly during November and April. In general surgery, the average bed occupancy rate is generally good, or too low, but this fact, in itself, is not necessarily positive. It merely represents a long waiting list for optional/elective operations, as a result of multiple determining factors such as the non-availably of an operating room, anesthetist, material, nursing staff, etc etc. The criteria of result on day of discharge are also open to interpretation. A complete, subsequent follow-up consultation would be necessary, to systematically define the real result. It is not unusual to discover, by chance, that a patient who was discharged with a diagnosis of better, or cured, has died after a few days at home, or been re-admitted in critical condition.

The "Crown of laurels" of the curriculum vitae

Two activities that generally persuade the jury as to the merits of the candidate deserve special consideration. The first is the subsidized line of research.

Far be it from me to suppose that there are no lines of research of great merit, benefit and profit, on every subject!

But we need to recognize that many of them are merely cover-ups for a large number of people who do nothing, justifying their absence from work under the shadow of one or more people who, as Amadeo de Souza-Cardoso wrote "walk in a delayed routine".****

Despite some honorable and deserving exceptions, medical research in Portugal consists mainly of replications. There are many reasons for this, and there is no room to analyze them all here.

The illustrious pharmacologist Fernando Peres Gomes affirmed, with his pessimism that was famed, but well-document by names, dates, places, numbers and exhibition of undeniable documents, that "the medical research that is done in Portugal belongs, in more than 90% of cases, to one of three categories:

• Unnecessary reproduction of what is done and redone;
• Plagiarism, disguised to a greater or lesser extent;
• Pure falsification.*****

I myself have felt the disgust of reading, in a Portuguese journal, an excellent article on the organization of a curriculum, but which was nothing more than a literal translation of a chapter from a little-known North American textbook, which I recognized by mere chance.

I have also had the opportunity to read an experimental "work" supposedly carried out on dogs, in a laboratory where the bioterium housed only rats.

Obviously, falsifications are universal. I recall the recent embroilment in which the great scientist E. Braunwald was involved, dragged through a torrent of articles made up by an ingenious collaborator.****** And the unclear case of Montagnier versus Gallo relating to the discovery of the human acquired immunodeficiency agent.******

The majority of these lamentable occurrences result in a poor understanding of the value of a medical publication and the pressures on doctors to "publish or perish".

The fact is that writing and publishing high volumes has nothing to do with being a doctor. Elysio de Moura hit the nail on the head (previous citation).

The doctorate degree

This is another crown of laurels in the curriculum vitae.

In many, commendable cases, it is the embracing of an academic career by a brilliantly gifted person, or the natural culmination of a notable medical life; a just distinction conferred on someone who is exceptional.

But it can also be a useful way of cutting short a difficult hospital career, a maneuver for overtaking colleagues whom it would never have been possible to out-rank through the work in hospitals and other institutions, even an escape from civic obligations of another nature, such as compulsory military service.

For this reason, I liken doctorate degree to a leap year: "either very good or very bad" (to cite a popular Portuguese aphorism).

Internships in "specializations"

This is an element of the curriculum that raises the most difficulties of evaluation.

Internships at good centers of "specialization "(sensu restrictu) and the high-quality courses of accredited institutions are of great didactic interest. But there are some painful exceptions: it is rare to know what in fact happened.

For example, in 1975 I proposed to take my internship for two months in a department of complementary tests which I judged important for my training. Having obtained all the necessary authorizations, I went to speak to the director of the service in question, who more or less told me the following:

- You know, things around here are very confused… I won't bother going into details… I might as well just sign the data sheet now, with very good and save you the bother of coming in.

I did not accept his offer of a fictitious classification, neither did I take the internship, which annoyed the director of course!

Another exception is the time stolen from clinical education.

The multiciplicity of training courses in various disciplines greatly shortens, sometimes terribly so, that Hippocratic learning, that experience of the daily routines of the clinic by the supervisor and by the intern, which I understand as a method specific to and selected by medical education.

I recall the case of an intern whose training I was supervising. Of the thirty-six months of the complementary internship in this period, twenty-four were spent in internships (six months at an intensive

care unit; four in nephrology; four in diabetology; four in immunology; three in neurology; and three in rheumatology). Adding two months of vacation and two months of preparation for the "final exam", its is seen that a mere eight months were left for the clinical learning in internal medicine, adding two months of vacation and two months of preparation for the "final examination", its is seen that a mere eight months were left for the clinical learning in internal medicine, which were further obstructed by being divided by small periods of intervals among those internships!

Improving postgraduate education and its evaluation

To my shame and anguish, having written so many disparaging and negative things above, I now confess that I do not even have the redemption of offering miraculous solutions to improve postgraduate education in internal medicine and make its evaluation more correct, and more rigorous.

I set down in writing here some vague and randomly-ordered hypotheses (or proposals) which at present, seem to me opportune:

• To increase the "numerus clausus "of admission to the course in medicine.

• Include, in the admission exams, tests by experts, designed for minimum definition of the "medical potential" of each candidate.

• Accompany the students psychologically throughout the course, in order to make the selection of vocations more visible, i.e. clinical, pedagogical or research.

• Provide conditions for clinical education based on the "patron - disciple" (or supervisor - intern) model

• Schedule the internships and training courses during the internship on a floating basis, according to the needs of the institution and the intern, and according to a well-planned, realistic calendar that gives the intern reasonable time to learn what is essential.

• Evaluate based on:

a)Information from the training supervisor/ "patron".

b) Hospital exam, consisting of a brief evaluation of a succinct curriculum, and in particular, clinical tests. The exam and the board of examiners should come from within the hospital, with one of the members being the candidate's patron and another a representative of the Medical Association. The approval should, in my view, be valid for career promotion in the hospitals and for integration in the Order's college of specialization.

These hypothetical solutions have some basic premises or conditions.

The need is emphasized for good professionals, in sufficient number, in the central hospitals; those with greater teaching capacity. This in no way contradicts the appropriate team of doctors in the peripheral hospitals!

But there should always be the a last resort in the curative healthcare chain, and it makes no sense for all the districts that have hospitals with costly equipment and highly specialized teams in the various medical valences to treat a case every six months. Portugal is a country with 500 Km in the latitude direction and 200 Km in the longitude direction (in rounded off figures), plus two small Atlantic archipelagos. It has a total population of around ten million inhabitants. Three, maybe four multivalent medical centers (the Algarve probably deserves the fourth) and two hospitals with differentiated media for the Azores and Madeira, served by good road and air connections, would certainly be sufficient. It would obviously be ridiculous to create an LDL-apheresis unit in Bragança, or an organ transplant center in Portalegre.

It would also make no sense to send, to Bragança, a doctor with specialization in LDL-apheresis, or move to Portalegre, a surgeon specializing in heart transplant, where logically there is no need for them. Or to place, in municipal headquarters, other specialists who will only be of benefit if they are part of a medical team that does not exist in these places, supported by nursing, also non-existent, and without the necessary instruments and complementary techniques that the health structure, health center or small hospital certainly does not have. It would be far preferable to guarantee that these locations can provide emergency care and treatment of multi-traumatized patients, assist in childbirth, support certain chronic and dependant diseases, and monitor the development of children and the care of the elderly.

The central hospitals, in turn, should have the multidisciplinary conditions and the equipment to deal with the large ward and the trauma unit, receive patients via rapid transport in appropriate vehicles, with follow-up indicated. For the central hospitals to fulfill these functions of final link in the curative

chain, it is essential not to deplete the clinical staff. It is they who guarantee assistance and teaching of future staff, if the "clausus" does not reduce, within in a few years, the numbers of new doctors to tiny numbers.

Another basic premise for good education is the continuity of the study of vocations within the wards, during the internship itself, to gain the most benefit from doctors with an assistential profile, and from those with a pedagogical profile.

Finally, it is fundamental not to send to peripheral hospitals, whose teaching aptitude is not defined, recent graduates who need supervised clinical training, nurturing. That would be, I can safely say, a poor service to public health in the medium to long term.

It is also an open invitation for the degradation and demotivation of young talents, likely leading to feelings of giving up or even desperation. Not to mention discussion that could be made of the extent to which compulsive placements represent a violation of the freedom guaranteed by the fundamental law, the Constitution of the Republic. ■

*Statistical data of the Central Emergency Service of the Hospital de Santa Maria (Director: Prof. Manual Barbosa).
**Attributed to A. Feinstein and others. The free translation of this maxim on poorly designed computer programs could be "if you input poorly analyzed data to the computer, your final output will be of little interest. Or, literally put "garbage in – garbage out".
***Data published by the author. O Médico, 1983;106: 658-669.
****Cited by José-August França. In "A Arte em Portugal no Século XX", 2nd edition, page 77.
*****Personal communication
******Various references in the medical and non-medical press.