Clinicals skills training: two generations and two worlds apart
Part One

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Objective. Here, we compare clinical skills training in the 20th and 21st centuries in two different countries, in order to underline advancements and principal obstacles. **Methods.** The clinical training of medical students in the nineteen-sixties at the Sarajevo School of Medicine, Yugoslavia, and contemporary training at one of Europe's prestigious medical schools at Heidelberg University, Germany were analyzed with respect to the organization of training, teaching tools, methods, and staff. Several issues were defined as unimproved over the course of time, and we suggest that they present the core of the current problem. **Results.** Considerable advances have been made in teaching methodologies, tools and assessment of students. The major remaining obstacles are the institutional value system, poor motivation of teaching staff, curriculum structure, timing, and placement of training in the curriculum, as well as the patients' attitude towards participation in the training. **Conclusions**. In the process of bettering the existing training models we suggest acting along several lines. Increased institutional awareness of obstacles, as well as willingness to develop the ways and means to increase the motivation of the faculty, is imperative. Furthermore, it is necessary to introduce changes in the structure and timing of training and to complement it with a Catalogue, Practicum and Portfolio of Clinical Skills. We believe that recognizing the impediments and employing the proposed solutions could significantly improve the quality of clinical skills training.

Key words: Clinical skills, Medical education, Curriculum reform, Catalogue, Portfolio.

Introduction

The majority of authors dealing with curriculum reform in medicine agree that substantial progress in the training of undergraduates in clinical skills is still to be achieved. In spite of radical changes and improvements in medical education, in-hospital hands-on training remains the weakest link in many curricula (1-6). In comparison with clinical medicine and biomedical research, which have both made unbelievable progress over

the past several decades, the progress made in training of medical students seems to lag behind. Teaching proper is still to be recognized as a complex art, which should be learned and permanently improved, alongside with clinical competencies and research activities. From a financial standpoint, teaching is in most cases an orphan, usually supported by the teacher's primary activities as a clinician or investigator (7, 8).

Although medical students reported many examples of positive role models as well as effective and approachable teachers, they also described a hierarchical and competitive atmosphere in the medical school, in which haphazard instruction and teaching by humiliation occur, especially during the clinical training years (9,10). Today, mastering of a significant number of clinical skills cannot be achieved during undergraduate training; this task has shifted to residency programs, which is certainly not the preferable option.

There are many tangible and less tangible reasons for the suboptimal condition of clinical skills training: conceptual, cultural, financial, legal, and prejudicial in nature. Here we have attempted to identify the prominent problems by comparing the distinct features of clinical skills training over a 40 – year span.

Methods

We opted for an approach based on the personal experiences of both authors, who underwent medical training over a span of forty years, in two different countries. We recalled the essential features of clinical training in the nineteen-sixties at the Medical School in Sarajevo, ex-Yugoslavia, and a contemporary one, 40-years later, at Heidelberg Medical School, Germany.

We anticipated that by comparing two approaches and two models we would be able to identify major changes, improvements or standstills. Presumably, if the same obstacles are present and unresolved after 40 years, they could easily be the root of the problem.

Training of Clinical Skills Forty Years Ago, Sarajevo, ex-Yugoslavia

The setting

The senior author (VJS) started his clinical training at the University Hospital in Sarajevo, the principal health facility in Bosnia-Herzegovina (BH). This hospital, a complex built at the end of the 19th century, with pavilions for each clinical discipline, was surrounded by parks, lawns and trees. It was constructed in accordance with the Austro-Hungarian understanding of good hospital design and patient care, which relied primarily on sunshine, fresh air and repose. Rooms for patients were large, sometimes accommodating 20-plus patients; a room with eight patient beds was frowned upon as a luxurious commodity.

Teaching Staff and Teaching Methodologies

Introducing us to the secrets of medicine was the responsibility of *professors,* who were assisted by a number of *assistants.* The professors, who headed the departments as well, were mostly educated at the beginning of the 20th century in Vienna and German was still the *lingua franca* in our part of the world. Information from the West was sparse (rarely anybody spoke English), information from the East (Russia) was frowned upon. The medical community in BH enjoyed its blessed seclusion and ignorance, mostly unaware of developments in the outside world. Patients were discussed rarely, if ever: there was no need to plan different diagnostic or treatment strategies, because the Professors had a ready answer for any kind of medical mystery. Seeking a second opinion was un-

thinkable; confrontation of Herr Professor's *Dictum* unheard of.

The clinical skills teaching was organized in three forms: in classical *ex cathedra* lectures, clinical rounds and through *clinical* exercises, practical clinical training under assistants' guidance.

Grand rounds (also known as the Professor's visit) were the highlight both of the hospital routine and of teaching, held once a week. On this holy day, patients were attacked in their rooms before sunrise by a battalion of junior nurses and cleaning ladies with an important task - to shine and polish the floors, night stands, chairs and beds; even the chamber pots had to shine with a pleasant glow. The principal duty of senior nurses was to adjust the bed clothes, which had to be spotless, snow white and starched stiff. At that time the concept of quality assurance was not as ubiquitous as today and the whiteness of sheets, along with the amount of applied starch, reflected the quality of nursing care.

The show used to start at eight sharp; leading the cortege first came *Herr Professor*, half a step behind his *Matron*, carrying soap and a towel, followed by a fair number of staff: docents, assistants, residents and interns. Ward nurses were expected to stand by the head of the patients' beds, in the posture of the guard of honor at Lenin's Mausoleum. If the reader adds ten or fifteen students to this scene, the picture is complete.

Herr Professor was an undisputable authority, and when he showed interest in a patient who happened to have, e.g., stenosis of the mitral valve, the poor '*stenosis*' (patients were invariably referred to by the diagnosis, never by name) was, without delay, positioned in a sitting position, the responsible nurse tearing off his (or better to say its) pajama top and the stethoscope's bell glued on '*stenosis*' chest. After listening for a minute or less the great man washed his hands using the soap and towel provided by his Matron, and exclaimed, with the finality of a lynch judge handling a case of horse theft, "This is a classic example of mid-diastolic rumbling murmur". Next came the *Herr Dozent* with the remark, "The first heart sound is beautifully accentuated" and another overambitious doctor added, "What a terrific textbook example of a snapping sound." The majority of the entourage preferred to hold back, still and quiet. In short, everybody was attuned and enchanted with such a clear demonstration of the highest possible diagnostic clinical skills, only '*the mitral valve stenosis*' and we, students, were not able to understand what was so beautifully accentuated and why all of this was so terrific. Occasionally, some deflections from this straight and well-paved road occurred. "This is a classic case of liver cirrhosis in an alcoholic. It is a terrible burden for our society and economy, that so many of our people in Bosnia drink," declared *Professor* who, besides medicine, had a broad understanding of philosophy, sociology, economics and the fine arts. Everybody around him was nodding sadly, deeply disappointed with such unreasonable habits and behavior by the common Bosnian people. The mutiny erupted when least expected: "I am not an alcoholic," *the cirrhosis* declared resolutely, "I am a devoted Muslim faithful and I never drunk a drop of alcohol in my life!" Everybody was stunned with such insubordination: the ultimate authority had given the verdict and some half-literate '*cirrhosis*' questioned it. The *Matron* was the first to start the salvage operation: "Well, my dear, but from time to time, just a little. Even I drink a little wine for Christmas." However, *'the cirrhosis'* kept his ground, supported by the highest spiritual authority, "Never, never and never have I touched the substance, I swear to Allah the Merciful." What a stubborn man, still so persistent, even when all pieces of the diagnostic puzzle fitted so well.

The teaching assistants were supposed, during '*the clinical exercises',* to teach us to

take histories, physical examination methods, and to allow us to feel, touch, palpate, percuss and auscultate whatever happened to be on the menu for the day. Assistants were junior doctors at the very beginning of their academic career, but not necessarily: among them one could find less ambitious individuals close to retirement age, who spent their entire working lives in such honorable positions. There was not much glory and money in this position, just a vague promise and hope that, if one remained quiet, obedient and patient over many years, one could, far away in the future, progress and be promoted to *Dozent*. As a consequence, their enthusiasm and motivation for teaching was close to non-existent. When the absence of any control of their performance or results is added, it becomes easy to imagine the quality of teaching they delivered.

In addition, everybody at the hospital held students to be a nuisance and burden, and everyone looked upon us as the lowest form of living creatures in the hospital hierarchy. We used to attack the wards in groups of 10, 15 or 20 students, depending on the number of *assistants* at our disposal. Often, when an assistant forgot his obligation, or was occupied with some real or invented emergency, two groups were joined together. Cleaning ladies cursed us because they had to clean up after us, nurses frowned and swore because they could not approach the patients and do their job. The patients did not complain aloud, they tried to run away and hide in bathrooms or similar hideaways instead.

If they showed up, the assistants were rarely on time, and usually half of our time scheduled for practice passed in waiting. When we finally located and surrounded our *assistant*, they would roll their eyes up to Heavens looking for rescue, and, as the Heavens usually remained silent, took us to patients' room, where only the immobile and terminal were still lying, abandoning themselves to their inevitable fate.

"Take a detailed history of this fellow's illness, and I will come back in half an hour," instructed our tutor, disappearing at the speed of light. We were on our own again, with the patient who also looked to the Heavens in quest of mercy, uttering: "Please, I explained ten times so far, I have never had a Penicillin shock nor a sexually transmitted disease in all my life. I am a respectable married man with six children; I have no time for that." And so, time went by. On rare occasions, some very young and still ambitious assistant was willing to show us something tangible. "Here, my dear colleagues, in this patient you will find, if you listen carefully, the classic sound of succussion, first described by the great Hippocrates, father of the medicine."

We approached, shook vigorously the poor '*classical example*' and confirmed (what else could one do) that this is indeed a beautiful example of a clear sound of succussion. At the same time, in the vicinity, the cleaning ladies operated the vacuum cleaner at full blast, nurses yelled at disobedient patients, patients were discussing last Sunday's football match and hospital food, and less enthusiastic students were flirting with shy female colleagues. I doubt that even our father, the great Hippocrates, would have been able to recognize his own sign under such circumstances.

Teaching tools

Textbooks were rare, expensive and of poor quality. Even if the student had the means to buy the textbook (which only a few did), its procurement was as complicated as procurement of plastic explosives. Rare decent books I remember from this period of my education were the translation of Guyton's "Medical physiology" and an old, well-used 25th edition of Gray's Anatomy, published in

1948 and supplemented by a Hungarian anatomical atlas. In the given conditions certainly nobody bothered to introduce the students to the universe of medical journals.

To enliven their teaching, the professors had mainly two tools. Anatomists used to bring a box of chalks in different colors and drew anatomical schemes on the blackboard during the lectures. Why they did that remains unclear to this day – decent anatomical atlases were available even then. Technically more advanced teachers used slide projectors to present transparencies, which were the last word in modern technology, and many years were to pass before we were introduced to overhead projectors. And that was it, if we overlook the human bones held in the anatomy department crypts and other hardly recognizable human organs held in jars filled with formalin. I prefer to skip the gruesome collection of nooses, knives, axes and all other imaginable tools of human destruction and self-destruction, in the possession of the Department for Forensic Medicine.

Training of Clinical Skills Forty Years Later, Heidelberg, Germany

The setting

The medical campus of Neuenheimer Feld in Heidelberg, Germany, where the junior author (FS) underwent his clinical education, is a vibrant place where the basic sciences and clinical practice are intertwined in a motivating manner. The recent award of the 2008 Nobel Prize to Prof. Harald zur Hausen of the German Cancer Research Institute in Heidelberg could serve to illustrate the productivity of this environment. At this point, most hospitals are modern functional facilities, geared toward the fast and high turnover-driven health care of the 21st century.

Teaching Staff and Teaching Methodologies

The hospital military-like hierarchy is one of the many persisting and culturally transcending aspects of medicine, at least in the Old World. Professors are also heads of departments and masters to be respected and not to be questioned too often. The several Docents (clinicians with academic appointments), their second-in-commands, were followed by senior doctors and specialists, and lastly by assistants (or residents). The clinical hierarchy was reflected in the teaching tasks: the Professors and Docents gave lectures, other senior clinicians were responsible for seminars, and residents were responsible for clinical skills training.

The nature of lectures has not changed much, apart from the introduction of multimedia projectors and power-point presentations. Seminars, as opposed to lectures, were based on interaction of the specialist-presenter with students, which attended in smaller groups.

The variety of our time spent together with assistants increased significantly over the last forty years through the introduction of various novel forms of teaching, most notably: problem based learning (PBL) sessions, demonstrations in the clinical skills lab, standardized patients sessions, bedside teaching and clerkship. Only the latter three deal with clinical skills *per se* and they will be discussed in this text, whereas PBL teaching has been extensively discussed elsewhere (11).

Learning in the **Clinical skills lab** in Heidelberg comprised of practicing, roughly speaking, various manual techniques on mannequin bodies or body parts. Models were subject to great diversity. At one end of the scale were true pieces of art, which simulated complex clinical situations and enabled the students to do much more for the '*patient*' than they would have dared to in a real setting. At the other end one could find, for example, unimaginative pieces of

rubber resembling an extremity, with a thick blue line denoting a vein. Exercises with the former type of sophisticated equipment lend us greater confidence through affirmation of our skills or through underlining of our faults, while the latter type of contraptions were, as one can imagine, difficult to profit from.

Models and mannequins are a useful novelty, but one that needs to be enjoyed with a grain of salt. They are excellent for introducing students to the respective technique (e.g. blood sampling, palpation of the prostate, chest auscultation, palpation of the breast) but they can take a student only half way to mastering a skill. Palpating an extended liver on a plastic model of the abdomen is like regarding a map of high waters without ever setting sail – you will never feel the scent of the salty wind.

In the exercises involving **standardized patients**, students were confronted with actors which were trained to present a set of complaints pertinent to common conditions. Our task was to take a complete medical history and to conclude with a number of differential diagnoses and a sketch of a diagnostic and therapeutic protocol. Some actors were professionals and they truly did an amazing job in mimicking homeless alcoholics, concerned mothers or irritated businessman who wanted to get treated and leave as soon as possible, as well as a whole array of other characters. The interviews were sometimes videotaped and examined at a later point by the whole group, led by a psychologist and a doctor who would then comment on our performance from a medical and psychological (or 'communication skills') viewpoint. In our opinion, the usefulness of the standardized patients is similar to that of mannequins in the clinical skills lab. They are useful at the beginning of clinical education, when the junior students are confronted with history taking for the first time.

Last but under no circumstances least; we finally set sail in the so-called **bedside teaching** sessions. In spite of the modern name, they were dauntingly similar to '*clinical exercises*', as described in the previous part of this article. A significant difference was (due probably more to the different mentalities of Germanic and southeast European peoples than to a concrete improvement in teaching) that our assistant almost never failed to show up for the exercises. Clinical routine is by its nature unpredictable and we would sometimes have to wait for our teacher, but generally we were treated with reasonable respect and teaching was done according to schedule.

Apart from that little had changed. Teaching students remained a tedious and unrewarding task for the resident who had to bear the functioning of the ward on his shoulders. Some possessed an innate love for teaching, and some enjoyed displaying their battle-tested competence and knowledge, but there were also those who were simply apathetic, and our time together on the ward was spent in an atmosphere of fake politeness and barely concealable impatience. I recall a neurology resident, whom we physically had to shake back to receptiveness from a daydreaming haze.

Almost invariably our collective task was to take a patient's history and to examine him, with the goal of '*presenting the case*' to the clinical instructor. In spite of the obvious inconsequentiality of our endeavor, patients were in most cases receptive and talkative, eager to share their story with us. It was possible to practice history taking and examination, and a willing resident was able to do a good job in connecting what we experienced with theoretical background. Sometimes, if the moment was right, we could do a minor procedure under guidance. In conclusion, this form of teaching had fabulous and useful moments, but only when both,

the instructor and the students, happened to be eager and enthusiastic.

During the three years of the clinical curriculum, we were expected to complete four months of **clerkship** (or *famulatur*, in German) in the departments of our choice. This was the least structured form of clinical training I received, and by far the most rewarding. The idea was that a student (alone, without a group of peers) joins the dynamics of a ward on a full time basis, and helps his seniors by conducting certain basic tasks, such as taking histories at patient admissions, drawing blood, placing i.v. lines or assisting surgery. In addition, the student was welcome on departmental rounds, conferences and seminars with the clinical staff. Often someone would find time to discuss a case or a technical or theoretical detail with me. Many times I earned the trust of junior doctors who showed me a more advanced procedure such as lumbar puncture or wound suturing, which I would next time conduct under their supervision and assistance. For me it was important to feel that I was actually contributing, even with my modest skills and knowledge, to the functioning of a real ward, instead of playing games in virtual reality with mannequins or hired actors.

Teaching tools

Teaching resources, as everything else at the present time, are over-abundant, which could have negative connotations; the inability to choose between various books for the same subject frequently leads to frustration. Also the variety of the learning materials has greatly expanded to include the Internet and various kinds of interactive software. A student thirsty for knowledge and willing to learn can nowadays really complain about only one thing: lack of time to digest all that is at his disposal. In addition, two more skills are necessary: to surf cyber space and to critically appraise the thousands of *hits*.

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