

Clinical semiology for what?

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“... The dogmas of the quiet past, are inadequate to the stormy present.... As our case is new, so we must think anew, and act anew...”

ABRAHAM LINCOLN

2ND ANNUAL MESSAGE TO CONGRESS. DEC. 01/1862

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Introduction

At the end of a semiology class, one of the students asked why we should learn the semiological maneuvers of abdominal exploration if we have ultrasound, magnetic resonance imaging, computed tomography, etc. available today.

The arguments raised by the speaker indicated that her skill and sagacity arose from the fact that she had already learned that medical semiology has limitations, of course, but that in order to establish them it must first be studied. In other words, she had studied semiology and had learned what it teaches, that is, to reflect. To reflect technically, which is what a medical semiologist does, ultimately.

Semiology and medical semiology

In general terms, semiology is defined as the *science of identifying social signs, symbols and language* (1-3). This is why *military semiology* (hymns, fanfares, command voices, etc.), *community semiology* (language and mimicry), and so many others exist, including *medical semiology*, which identifies both clinical and paraclinical signs of disease. A **clinical sign** is the way in which a disease is perceived by the patient and how he/she expresses it.

The great forgotten ones?

Pathophysiology, the science of why? and how?, involves studying disease processes and leads basic clinical research to understand the intrinsic mechanisms of disease. Unfortunately, and as occurs with medical semiology, they both lack an appropriate niche as courses in some educational institutions, and are expected to be *taught* throughout the entire career, but with no indication of how to do so. Some medical schools in Colombia have already eliminated them from their curricula and everything seems to indicate that there is no plan to integrate them into these programs in the reasonable future. The result is a constant requirement for students to be pathophysiologically and semiologically competent, using hasty and not very rigorous remedial workshops which are periodically proposed when a professor requires them.

Today these learning packages are presented using mannequins that have a heart rate of 80/min, breathe 18 times per minute and have an oral temperature of 37°C. Famous British cardiologists assert that, by learning auscultation, with expert tutor supervision, clinicians could propose reasonable hypotheses regarding heart diseases. But this learning requires a process similar to that of learning to play a musical instrument; that is, something like two to three years (4).

Pathophysiology, laboratory medicine, studies the abnormal function of organs and systems and the mechanisms to adapt to these changes, as there are those who claim that the mechanisms that keep us healthy are the same as the pathophysiological mechanisms that make us sick. It is a matter of an imbalance between the response and the context (5). Pathophysiology begins with a knowledge of cellular genetic alterations to explain

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the functional abnormalities that cause organ, apparatus and system alterations. To achieve this, it differentiates between causal phenomena, their link to pathological phenomena and the potential for early diagnoses using techniques with a high predictive value (6).

The mutation of a gene or invasion by a microorganism trigger a disease that causes molecular, cellular and systemic responses that are signs of the disease. Therefore, knowing the physiology and its signs helps in understanding the disorder, its diagnosis and its treatment.

As Sir William Osler stated, a doctor who practices with no knowledge of pathophysiology and semiology is making stabs in the dark, sometimes hitting the disease and sometimes the patient, but not really knowing which he hit.

Teaching semiological practice is easily confused with the interesting and valuable pathophysiological discourse, which is so attractive to both professors and students. Consequently, and without ignoring the importance of either, the acquisition of semiological skills and attitudes takes second place, to the point where semiological skills are not often considered. The obvious result is the typical bewilderment of students and then novice physicians when they have to percuss a lung or examine an x-ray and suddenly discover that they do not know how to do it nor why they should. But as mentioned previously, the eloquence of the pathophysiological rhetoric today easily outstrips the tenacity and persistence of those who want to be properly trained in the simple but rigorous semiological discipline which created the clinical method, but lacks the spectacular apparel of other important disciplines of medical thought.

The semiology professor's mission

Since medical semiology is the student's first contact with the patient, the following teaching objectives must be highlighted:

- To educate students in the knowledge, attitudes and skills that will enable them to consider the patient as a harmed human being, perfecting their intellectual and moral faculties for this task. Various resources are available to accomplish this, such as:
- a) Developing empathy; that is, the cognitive ability to understand the extent of the suffering due to the disease. **b)** Learning to recognize that there really are no illnesses, but rather ill people. **c)** Observing medical ethics to preserve the axioms of autonomy, beneficence and non-maleficence, as well as justice in the use of healthcare resources. **d)** Helping the student recognize that, as W. Osler said, "the education upon which he is engaged is not a college course, not a medical course, but a life course," and therefore it is necessary to accept up front that physicians are perpetual students. **e)** Learning to use the benefits of the history and physical exam. **f)** Learning to use medical reasoning to obtain the maximum yield from the information obtained. **g)** Learning that the uncertainty of medical practice can

be balanced using set techniques. **h)** Recognizing that the medical history is the best available resource for medical practice.

The medical semiologist trains students to reflect, critique and participate in learning the skills, abilities and dexterities that will allow them to problem solve through the appropriate use of the available tools for correct diagnostic and therapeutic decision making in any branch of medicine.

To achieve these results, he/she must have true autonomy, freedom of action, job and academic recognition and, above all, time (4). These conditions are notably absent in Colombia due to several factors like a) Lack of academic recognition, since medical semiology is not recognized as a specialty; and b) The fact that semiology professors, as will be seen later, are perhaps the only ones who enter teaching by appointment rather than merit.

Some facts in current medical practice

The controversy between scholarship vs. skill

The physician's mission is, first of all, to console and relieve. This is followed by curing the disease. The latter has increasingly displaced the first two. Even so, the cold statistics have shown results that are at odds with the enormous financial and administrative efforts designed for this purpose.

A recent WHO report (8) has brought the following to the forefront: a) Seven of the main causes of death are noncommunicable diseases; b) Heart disease continues to be the main cause of death worldwide (9 million deaths in 2019); c) The next most frequent causes are lung disease, diabetes, cancer and dementias; d) Life expectancy reached an average of 76 years in 2019 compared with 67 years in 2000; e) Disability has increased; f) The diseases that cause the most years of healthy life lost are heart disease, stroke, cancers and chronic obstructive pulmonary disease, which, along with trauma, caused a combined loss of more than 100 million years of healthy life; and g) The urgency of drastically improving primary health care as one of the most useful approaches for effectively combating noncommunicable diseases.

The practice of medical semiology

The medical semiologist's task is torn between orphanhood (who defends it?) and discredit, and therefore it is an almost embarrassing activity that is labeled as facile and academic "filler" by some teaching colleagues.

Medical semiologists are seen as monuments of the past, as a tradition that sometimes elicits mocking and sarcasm, something that does not seem to have a place in the grand show of medicine portrayed in soap operas and mass-appeal movies.

This situation is starting to be seen in the curricula of some schools of medicine which, as has been mentioned,

have chosen to include semiology in the so-called “horizontal programs.” In other words, it disappears as a subject to be taught and is expected to be studied throughout the whole career. This is similar to what occurs with ethics which, according to Law 23 passed in 1981, should be included as a mandatory subject, which is stated but not followed (9).

Healthcare administrators and medical semiology

The avalanche of so-called medical technology has produced many changes in healthcare organizations, but the most remarkable has assuredly been the progressive disappearance of the physician as the head of the healthcare team, giving way to the healthcare administrator filling this role.

Most healthcare administrators, whether academics or not, are very expert professionals in their work but, with notable exceptions, lack experience in direct patient contact. That is, they do not perform direct medical care with patients, but this results in the paradoxical fact that they are the ones who advocate how medicine should be practiced and taught.

This new approach to medical practice translates into several facts. The first is that the responsibility for learning almost always falls on the professors. If the student does not pass to the next year, the professor is labeled as the one “responsible,” and the student is the injured party. Second, people try to introduce the idea that learning to be a doctor is easy. Attractive proposals are designed that try to minimize the need for student effort, but they do not mention that more than a dozen years of strenuous training are required to achieve reflexive proficiency. Third, if teaching is considered to be a business act, it is almost mandatory to assume that the student is the client and, therefore, it is accepted that, as occurs with business relations, “the customer is always right” (because student dropout must be avoided at all costs...etc., etc.).

The idea that both medical practice and learning are business acts has repercussions in all areas, but especially in what relates to the professors’ treatment (or mistreatment?), since their ranking and progress, both academically and professionally, have almost completely disappeared. This translates into them being considered merely as employees without any consideration for their rank. The recognition needed to progress academically has disappeared, and therefore the terms “instructor,” “professor,” etc. are not found on the employee list, having simply been replaced with the term “teacher.” Professors make the same small wage as newly arrived employees who do not need to certify the knowledge that was previously held to be essential.

Research in medical semiology

Without getting into an analysis of the very modest results of medical research in Colombia, medical semiology

research could be described as practically null, as it has been limited to a few topical reviews.

The current practice of medicine

Its essential elements still lie in an appropriate medical history. Its tools are those used by medical semiology; in other words, a history, physical exam, clinical reasoning and decision making to help establish hypotheses that may be proven. All of this is based on an appropriate doctor-patient relationship in which medical language plays an increasingly important role.

History taking

Actually, the student’s argument was almost true, because for many years semiology, with all its term confusions, was dedicated to teaching students the techniques of inspection, palpation, etc., devoting much of the limited time to deciphering the mysteries of physical examination like detecting pulsus bisferians or performing Damoiseau maneuvers to identify “*the parabolic chest curve from the spinal column to the lateral wall which identifies the shape of the upper limit of pleural effusions, convex for exudates and concave for transudates...*” (10), as well as the famous Perthes and Trendelenburg tests and others with such low sensitivity, specificity and predictive value for identifying (?) the adequacy of venous circulation that are still part of the appalled students’ exams.

I recall, and have recounted several times, what we experienced as internal medicine residents at Hospital San Juan de Dios in Bogotá, when one of the nuns who helped in nursing at that time told us, aghast, that a patient was suggesting to her that he leave his assigned cubicle, using uncouth head and neck movements.

Our professor, Dr. Uribe Uribe, proceeded to conduct the respective exam, speaking to the patient in his usual friendly way. After about 15 minutes, he addressed us mentioning that, among other things...“...on physical exam we found a patient with a positive de Musset sign, pulsatile uvula, bounding pulse, divergent hypertension, the apex in the seventh left intercostal space beyond the ipsilateral midclavicular line, a palpable domed thrill and a decrescendo 4/6 protodiastolic murmur on the aortic area...As you can see, this is aortic regurgitation”!!!

What amazed us most was not so much the statement of the hypothesis but rather the restraint and assurance of the semiological act, performed without hesitation and with certainty in each of Dr. Uribe’s movements.

It is very likely that this professor was unaware of the usefulness of Doppler echocardiography or magnetic resonance imaging to prove the hypotheses proposed in the physical exam, and that his knowledge of the pathophysiology of the disease was limited to what was found in the textbooks of that time. But the most striking thing was his rare ability to understand the message provided by the patient; in other words, what is known as taking a medical history.

A medical history is extremely valuable for producing reasonable diagnostic hypotheses (close to 80-85%), but despite this, it is only assigned a secondary role in curricula.

A. Medical language among physicians

It appears that with the current technological subordination (*technophilia*) with all its successes and aberrations, medical language is experiencing such a disturbing devotion to abbreviations (“*abbreviatophilia*”) and acronyms (“*acronymophilia*”) that the latest editions of medical texts include a growing number of pages devoted to a list of “abbreviations,” “initials” and “acronyms.” If this happens in textbooks, it is even more prevalent in “scientific articles” that compete with the books in a game to try to eliminate the proper enjoyment of reading with an excessive typographic “fundamentalism” that is clearly unnecessary. On the other hand, it is not unusual to find texts like the following in some medical charts: “PT, ADMT, WITH CHD, EF <40”, in all caps and using abbreviations, initials and acronyms, because medical charts today disregard grammatical norms, thus contradicting the editorial rule that establishes that the text should be clear, pleasing and understandable. All of which means that the medical chart loses one of its most important characteristics, which is that of **accessibility**, understood to mean that any member of the healthcare team is able to fully comprehend it.

• Medical language when addressing patients

As will be shown further on, it appears that doctors today pay little attention to the six qualities of language when speaking to their patients, but it is worthwhile to recall them: Language should be:

Warm, Scientific, Clear, Consistent, Concise, and Brief.

B. The physical exam

There are many reasons for performing a good physical exam (11-14).

a) Effectiveness and efficiency if it is based on a well-taken medical history; b) The ability to detect important signs early, for example: systemic hypertension, diabetic foot, etc.; c) Proper guidance for an intelligent use of medical technology; and d) Physical contact with the patient, which creates an atmosphere of trust between the doctor and the patient with an evident therapeutic effect. (Table 1)

It is worth repeating that, overall, in 80% of the cases, correct diagnostic hypotheses are proposed through the medical history. The physical exam increases the likelihood of reaching the correct diagnosis by 10%. The physical exam generally has limited accuracy and, often, low interobserver reproducibility. Its findings are more sensitive than specific, and therefore its rational use and interpretation are important to avoid tests that are often alarming and costly for the patients. For this, it is important for the physician to acquire skills in using complementary diagnostic measures: imaging, endoscopy and laboratory tests, among others.

Table 1. Some very useful physical exam maneuvers.

ITEM	Usefulness 100/100
Taking the pulse	95
Weight - height – BMI*	95
Blood pressure	95
Temperature	95
Pulse oximetry	95
Rectal exam	90
Pelvic exam	90
*BMI: body mass index	

C. The new patients

The following are some of the characteristics of the new patients or *consumers*.

a) They have the best understanding of their experience with the disease and, therefore, express it in the way they consider most appropriate; b) They are autonomous in their decisions and therefore can accept or reject the medical orders; c) They can and must indicate their acceptance through informed consent; d) They can sue the physician in a court of law; e) They are the main actors and protagonists in caring for their own health; f) They have unlimited access to medical information which, with unfortunate frequency, tends toward pseudoscience; g) They are exposed to pluripathology; and h) They adopt the attitudes of consumers, critics and, almost always, judges of the medical procedures.

D. Physicians as translators

As we well know, diseases do not read medical textbooks, and therefore the development of the former lacks the structure of the latter. Thus, the disease follows its course in such a way that most times the disorder perceived by the patient is the initial element which the person experiencing this disorder expresses as he/she sees fit and according to his/her perceptual abilities. One of the physicians’ functions is to translate the patients’ verbal and nonverbal expressions (for which they generally use their own language) into medical language. This is when physicians play their role as translators. But everyone knows that translations have serious risks, as the “perfect translation” has not yet been described, one which represents exactly what has been expressed in a different language and under different circumstances.

Furthermore, it is advisable to remember again that patients have little phonetic baggage, and therefore their expression may be influenced by the severity of the disease, their capacity for stoicism and, sometimes, by the potential for secondary gain (15). This has shown that patients today are different from those in earlier times and, in turn, that today’s physicians are also different.

E. The new physicians

The following chart is anonymous and was published on the internet (Table 2).

Table 2. Definitions before and now.

Before	Now
I was a physician	I am a healthcare services provider
I used to practice medicine	I function within a managed care system
I had patients	I have a list of consumers
I diagnosed	I have to request approval
I treated patients	I have to request authorization
I was successful among people	I lack everything, even paper
I listened to my patients	I have to justify myself to administrative authorities
I was a physician	I am not sure what I am

F. Clinical reasoning

Clinical reasoning is also a basic component of clinical competence, but since it is not defined in the curricula (because it is very hard to define [16]), it is classified as “the art of medicine,” without including this topic’s concepts, and therefore disappears from university teaching programs.

The currently identified models that explain clinical reasoning can be divided into two types: *analytical* and *nonanalytical*. One of these, the hypothetico-deductive analytical model, includes the following stages: **a) Careful observation**; **b) Information gathering**; **c) Physical exploration**; **d) Generating diagnostic hypotheses**, **e) Correlating the data obtained with the proposed hypothesis(es)**, and **f) Confirming or refuting the hypothesis(es) through testing**. All of this is carried out during the semiological act, to wit: a) Systematized observation; b) Obtaining information, that is, medical history taking; c) Physical examination; d) Generating hypotheses through medical reasoning; and e) Confirming the hypotheses.

On the other hand, the *nonanalytical model* is based on the clinicians’ experience, determining the diagnosis through a “rapid pattern recognition” process which depends on previous experience. This way of reasoning is automatic and quick, which exposes it to a greater risk of error. However, it must be acknowledged that these two ways of thinking are not mutually exclusive. Medical semiology allows for a reasoned use of both methods.

The new, the old, and the recent

The proposal of the newly acquired diagnostic techniques poses several questions for today’s medical semiology. First, it is noteworthy that the use of pulse monitors, thermometers, blood pressure monitors, stethoscopes, etc., has become emblematic of instrumental medical semiology, but that over time, those who teach it have neglected learning about imaging and clinical laboratory tests which

are, as has been stated many times, undeniably valuable for detecting the signs of disease (Table 3).

The instrumentation frenzy led to the appearance of many devices, including Santorio’s *thermoscope* (1538), followed centuries later by Daniel Gabriel Fahrenheit’s mercury thermometer (1724), which was replaced around 2000 by infrared thermometers measuring heat flow and the digital thermometers used so often during the COVID-19 pandemic, as they do not require skin contact.

The Hippocratic schools emitted the theory that, along with temperature, diseases are related to the arterial pulse rate. John Floyer’s “*physician’s pulse watch*” appeared around 1710, which led to multiple modifications crystallized in the proposals by Kare, Mailer and others which, in 1935, produced digital pulse monitors and, subsequently, the current pulse oximeters which simultaneously measure heart rate and the percentage of arterial oxygen saturation, respiratory rate, electrocardiographic tracing, blood sugar, etc.

The idea of the stethoscope came from Laennec in 1819 (17), whose work is considered today to be one of the pillars of pulmonary and cardiac auscultation. Auscultation began to be used in obstetrics (Pinard) and gastroenterology, producing Cammann’s binaural stethoscopes (1851), and a century later, Rappaport and Sprague’s work led to the Hewlett-Packard model in 1940 and then Littman’s model at Harvard around 1960.

Likewise, in 1896, Riva-Rocci produced one of the first commercial mercury blood pressure monitors, of unmatched precision, followed by Vásquez-Landa-Korotbaf’s model in 1900. Subsequently, the first digital blood pressure monitors appeared around 2012, which measure blood pressure using light signals, thus facilitating its measurement, since auscultation is not required.

Furthermore, mathematicians and physiologists led by Koliber, Muellen and Manhead recorded the heart’s electrical activity for the first time in 1872, which allowed Augustus Walter to obtain the first electrocardiogram tracing in 1887. This then helped Wilhelm Einthoven in his work leading to the Nobel Prize in Medicine for describing the usefulness of the string galvanometer for this purpose.

The development of the mathematization of information provided more results. Beginning in the 19th century, university hospitals and quarantine periods were created. Vision improved with the advent of glasses, as did dentition with dental plates. The Cesarean section technique began to be taught, and then a growing stream of discoveries emerged such as vaccination, antibiotics and antivirals, the discovery of the human genome, the development of laboratory tests, the new means of infection and immunity phenomena, stem cell research, anesthesia and new surgical techniques, vitamins and nutrition supplements, along with the rapid improvement of imaging tests like computed axial tomography, Doppler, scintigraphy, magnetic resonance imaging, etc., which, together with the new genetics, have

Table 3. *Premodern and current physicians.*

Premodern or classic	Current
Analyzes test results with those who perform them	Firmly believes in the reported conclusions
Appears very rarely on television	Gives many interviews on television and broadcast media
Based on experience	Based on evidence
Gives priority to continuous self-learning	Gives attention to international congresses
Trusts in his experience	Carries out the recommended protocols
Sees the patient as a harmed human being	Sees the patient as a service consumer
Considers the patient-physician-family triad to be important	Gives importance to the insurer-consumer-physician triad
Considers his personal appearance to be important	Does not consider it important
Considers that each patient is unrepeatable	Considers that all consumers are the same
Considers that each patient is unique	Considers that all consumers are the same
Considers that the course of diseases depends on many circumstances like age, finances, the environment, etc.	Gives more credence to the theory that the course of disease is static and linear
Believes that he should always console	Believes more in efficiency
Believes that diseases are rarely cured	Believes that all diseases are or will be curable
Practices in his own office	Practices in someone else's office
Chooses the treatment recommended by experience	Demands treatment validated by academia
Is a perpetual student	Studies on the latest smartphone
Is a physician 24 hours a day	Is a physician during the contracted schedule
Is very careful when prescribing medications	Considers that all diseases are cured with several medications
Based on the detection of clinical signs	Based on tests and protocols
Maintains a healthy skepticism regarding the technological avalanche	Enthusiastically accepts technological advances
Investigates the relationship between clinical signs and diseases	Investigates the statistical relationship
Independent	Teamwork
Ingenious and skeptical	Skeptical but enthusiastic
Questions the patient	Refers for technological tests
Appeals to his distinctions	Based on competence
Likes seeing patients	Likes to wait on consumers
Likes caring for patients	Likes to study the disease
A constant reader	Reads reports, protocols and care guidelines Lee informes, protocolos y guías de atención
Reads a lot Lee mucho	Uses his cell phone a lot
Expresses interest in prioritizing experience	Expresses interest in evidence-based medicine
Does not practice treatment intensification	Is interested in therapeutic success
Paternalistic	Respects autonomy
Little interest in costs	Makes a cost-benefit analysis
Greets the patient	Delegates to the secretary
Always carries out a physical exam	Considers the physical exam to be unreliable
Conducts the medical visit personally	Delegates to his residents
Based on clinical reasoning	Based on protocols and management guidelines
Orders very selected laboratory tests	Considers that the more tests a patient has, the better care he receives
Uses the scientific method and humanism to develop diagnostic hypotheses and treatment	Uses the evidence to develop the diagnosis and treatment
Uses both subjective and objective information to develop hypotheses	Considers that only measurable things are valid
Is the head of the healthcare team	Abdicates the role of healthcare team head
Consoles and accompanies terminally-ill patients	Sometimes refers consumer to the Palliative Care Unit

contributed countless aids for diagnosing and treating many diseases.

This is one of the many facts that our intelligent detractor presented. Why do medical semiologists like paraclinical tests so little? Why, she asked, if very effective instruments can be used (thermometers, stethoscopes, ophthalmoscopes, electrocardiographs, etc.) with a high degree of efficiency, why are students not trained in the basic aspects of radiology, as well as the criteria for ordering them? This, together with learning the criteria for performing the more than 4,000 currently available laboratory tests, to be able to order the right test at the right time for the right reason (18).

Medical-surgical specialties in Colombia

In 2020, Ascofame [the Colombian Association of Medical Faculties] published recommendations for the future of medical education in Colombia (19), from which the following information is extracted:

- a) There are 63 undergraduate programs in medicine and 529 medical-surgical specialty programs in Colombia (Table 4).
- b) Conceptual aspects regarding the medical-surgical specialties. The definition of medical-surgical specialties contained in Article 2.5.3 of Decree 1330 issued in 2019 is adopted: *“These are programs that allow physicians to delve further into a specific field of knowledge in medicine to acquire the knowledge and develop advanced attitudes, abilities and skills to care for patients in different stages of their life cycle, with diseases of the different organ systems that require specialized care. Theoretical and practical teaching-learning processes are required for this level of training. The practical aspects include completing the practice time in the clinical rotations and participating in a sufficient number of cases to ensure achievement of the learning outcomes sought by the program. The students should have the required accompaniment and monitoring.”* [Translated from the original Spanish.] As was already mentioned, and without naming it, the goals of medical semiology are set out here.

The first conclusion reached from the texts above is that neither pathophysiology nor medical semiology have been considered to be specialties and, therefore, those who practice them lack their corresponding privileges and duties.

Is medical semiology a medical specialty?

In 2022, the Colombian Ministries of Education and Health once again produced a *“Consensus for the Standardization of Medical Specialty Names...”* (20, 21). This document indicates that there are 68 specialties in Colombia, but it points out that, in 2012, *“there were 138 different names for specialized medical training in clinical and surgical areas.”* [Translated from the original Spanish.] They also note that Decree 1075 issued in 2015

Table 4. Medical-surgical specialties with the most programs in Colombia.

Title	Programs
Internal medicine specialty	29
Pediatric specialty	28
Obstetrics and gynecology specialty	26
Anesthesiology specialty	20
General surgery specialty	20
Ophthalmology specialty	18
Psychiatric specialty	18
Critical medicine and intensive care specialty	16
Radiology specialty	15
Orthopedics and trauma specialty	13
Urology specialty	13
Dermatology specialty	12
Cardiovascular surgery specialty	11
Neurology specialty	11
Reconstructive and cosmetic plastic surgery specialty	10
Neonatology specialty	10

repeats that the medical-surgical specialties are *“programs that allow physicians to delve further into a specific field of knowledge in medicine to acquire the knowledge and develop advanced attitudes, abilities and skills to care for patients in different stages of their life cycle, with diseases of the different organ systems that require specialized care. Theoretical and practical teaching-learning processes are required for this level of training.”* In other words, what medical semiology is intended to do.

The extensive literature on the creation and structuring of specialties in Colombia reveals the genuine interest of Ascofame and the government entities to provide the mechanisms to enrich the information on the topic. It also shows that neither pathophysiology nor medical semiology have been considered as candidates for a specialty despite fully meeting the standards mentioned initially by Ascofame, according to the definition of specialty (22).

Medical semiology in Colombia

Medical semiology is probably the only academic activity that is exercised by appointment due to the curious custom of some healthcare administrators who consider it to be a “foster home” for their protégés until they achieve a better professional position. No prior training or evaluations are required. Once appointed, they are admitted to the Semiology Units to teach as instructors or, worse still, as “professors” but, after a few months, they migrate toward their long-awaited specialty and leave a vacancy which is rapidly covered by another protégé with the same characteristics. This explains why there is such a high rotation of teaching staff every semester.

Medical semiologists are no exception to the straitened compensation that characterizes university teaching and lack the incentives to foster their development. This may

be one of the reasons why research is notably absent and the contributions to knowledge are limited to a few publications of almost always debatable quality.

Furthermore, since they do not have the category of “specialists,” medical semiologists do not have the privileges of specialties, which healthcare administrators take advantage of to maintain the precarious conditions mentioned previously. It should be clarified here that these authorities believe that the medical semiologist’s job is to “teach class.” They believe that teaching class is an activity measured by the hour, and therefore assert that a class lasts one hour, and that this hour’s price is similar to that of other healthcare workers.

This way of thinking disregards the fact that “teaching class” is only a very small part of the educator’s true mission, which consists precisely of that: educating. There are digital resources available today for communicating scientific information that surpass the educators’ intellectual capacity and are used by them as complements and not as the goal of their work.

The diagnostic instinct

The medical act is a moral act, recognized as such by the government through the declaration of medical autonomy, with all its privileges and obligations. Consequently, physicians should make a constant effort to fulfill this contract and thus obtain the respect of the community.

One of the strategies used to achieve this goal is for physicians to be convinced that they need to become perpetual students, acquiring the necessary skills to diagnose appropriately. This is where medical semiology finds one of its clearest objectives, as identifying the signs of disease provides physicians with the information which, when subjected to synthesis and analysis, allows the most relevant diagnostic hypotheses to be proposed. Learning to obtain the information, synthesize it and analyze it scientifically (in other words, reflect on it technically), constitutes one of the goals of medical semiology.

• The instinct of wonder in physicians

If we accept one of the many definitions of “instinct” as the ability to carry out unlearned actions well, we could affirm that the instinct of wonder is present in all living beings, including humans. It consists of performing repulsion and attraction maneuvers in the face of strange facts, things that are not part of what is common or routine.

Medicine appears to have emerged as a response to the wonder of those who experienced different, anomalous and unexplainable sensations. It is similar to what happens to a medical student when she sees that her patient, the real one, the one she has in front of her, tells her that he’s “short of breath” instead of saying that he has “dyspnea.” The patient continues to express his symptom in the way and with the phonetic and verbal resources he has available because, as has already been stated, diseases do not read

medical textbooks. Therefore, the patient’s version leaves the surprised student with many gaps that are transformed into wonder, a concerning sensation that forces her to find out more about the patient’s complaint. In her search, the student notices things like the fact that the symptom never appears alone, but that through a proper technique, she can transform the instinct into a standard procedure. Thus, she begins to recognize the existence of medical semiology. This minimizes the errors already mentioned by Beckman (1984) (16) (23), Makary (2027) (24), and Cooper (2021) (25), which are ultimately summed up as the expression of errors made in patient care.

Medical semiology teaches students the importance of maintaining the capacity to wonder when faced with something strange; that there is a way of detecting and understanding since, based on pathophysiology and medical semiology, the patient’s situation can be understood in a way that is similar to what they have read in the medical textbooks. This process begins with history taking, physical exploration, medical reasoning, the development of a diagnostic hypothesis, and confirmation with complementary resources. In other words (and it must be repeated), using the scientific method (26).

As Kassirer says, the diagnostic process is an example of unstructured problem solving (27), a constantly repeatable process consisting of several stages: a) Gathering data (the symptom never appears alone); b) Deducing all you can from the information obtained (activation of the pertinent hypotheses). It must be added that any technically obtained data is able to activate a hypothesis. Therefore, many hypotheses may arise; c) Challenging or reaffirming the hypotheses obtained; d) Establishing which hypotheses have withstood the challenge; e) Proposing a list of hypotheses in descending order of importance; f) Proving the hypotheses; and g) Proposing the diagnosis as a work plan.

Medical semiology is the scientific discipline that teaches the way in which the previously outlined steps should be followed. When done in this way, the likelihood of being correct increases significantly, with an unquestionable benefit for the patient and a notable reduction in cost, because it also teaches how to use the medical technology that is so effective but so costly. To say it another way, medical semiology teaches students the process of learning to think like a physician and to identify, with at least relative ease, the sick individual.

Pathophysiology and medical semiology play a primary role since they are the proof that the medical act can be a scientific act governed by the scientific method but based on an indispensable humanism. The combination of the scientific act and humanism will result in a medical act in accord with the academic demands, that is compassionate from an ethical perspective, effective from an academic perspective, and efficient from a financial perspective (28).

In conclusion, we can say that there are very valid argu-

ments for both pathophysiology and medical semiology to be accredited as medical-surgical specialties in Colombia.

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