

The clinical method and the growing technological presence in cardiology: Are they mutually exclusive?

El método clínico y la creciente presencia tecnológica en la cardiología ¿relación excluyente?

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ABSTRACT

Hippocrates was the one who gave life to the clinical method, by insisting on the supreme value of observing the patients and the accumulation of experience by the physician to make a correct diagnosis of diseases. Obtaining clinical information and its interpretation are two moments of the process of medical care, which are closely related. From them, some components are derived, such as the doctor-patient relationship, anamnesis, physical examination and medical history. Together with this, there is a technological modernism in medical sciences, which is inevitable given its progress; but it should not involve an abandonment of the clinical method, because it would violate the ethical and medical principles that have been in place since the time of

Hippocrates. Some thoughts on the components of the clinical method, the technological presence in modern cardiology and the relationship between them are expressed, based on the unquestionable validity and importance of this method and the duty of health professionals to put it into practice.

RESUMEN

Hipócrates fue quien dio vida al método clínico, al insistir en el valor supremo de la observación del enfermo y la acumulación de experiencias por parte del médico para poder realizar un diagnóstico correcto de las enfermedades. La obtención de la información clínica y su interpretación son dos momentos del proceso de atención médica que están estrechamente relacionados, de los que se derivan algunos componentes como la relación médico-paciente, el interrogatorio, el examen físico y la historia clínica. Unido a esto está el modernismo tecnológico en las ciencias médicas, el cuál es inevitable dado el avance de este, lo que no debe implicar el abandono del método clínico, pues se estarían

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violando los principios éticos y médicos, que desde la época de Hipócrates han estado vigentes. Se propone una reflexión alrededor de los componentes del método clínico, la presencia tecnológica en la cardiología moderna y la relación entre estos, a partir de la incuestionable vigencia e importancia de este método y el deber de los profesionales de la salud en su aplicación.

INTRODUCTION

The Greeks were the first to use the term “clinic”, a word derived from *Klinikos*, meaning bed; hence the relationship of the word clinical with the art of healing the sick at the bedside¹.

Hippocrates founded a medical school that contributed to separate medicine from religion. He insisted on the supreme value of the observation of the patient and the accumulation of experience by the physician to be able to make a correct diagnosis of disease. He was also the first one to keep a clinical history of patients².

Many of the great medical advances have been based on clinical practice, especially on the descriptive observational research method, the oldest of all research methods. This method led to the discovery of the vaccine, in the late eighteenth century, by the English surgeon Edward Jenner, and the consequent eradication of smallpox. It also led to the finding of the causes of puerperal fever, by the Hungarian physician Ignaz Philipp Semmelweis in the mid-nineteenth century, and, by the end of this century, to the discovery of tubercle bacillus by the German bacteriologist Robert Koch².

For the Anglo-Saxons, the founder of clinical medicine was Thomas Sydenham (1624-1689), a London physician and political leader, who is also considered the precursor of Epidemiologic Science because of his enunciation of the Theory of Epidemic Constitution, based on the Hippocratic precepts³.

In Cuba, there have been many doctors who have excelled in the practice of the clinical method (CM), among which are included Carlos J. Finlay, discoverer, in 1881, of the transmitter of yellow fever^{4,5}; Tomás Romy, introducer and propagator of smallpox vaccination in Cuba⁴; and Joaquín Albarrán, illustrious urologist, whose scientific work in his field is recognized

worldwide⁶.

Cardiology in Cuba has also had great doctors who have encouraged the practice of CM. The Cuban Society of Cardiology was founded on September 11, 1937. Its founding members included Dr. José Manuel Martínez Cañas, one of the doctors who introduced the electrocardiograph and the phonocardiography or stethography in Cuba. His scientific work includes Electrocardiography and its Clinical Value⁷, and Clinical Stethography⁸. In the scientific sessions of the nascent Cuban Society of Cardiology, on January 13, 1938, Dr. Martínez Cañas presented a relevant work: Clinical Stethography in Modern Cardiology⁹.

CLINICAL METHOD

According to José A. Fernández Sacasas, the CM is the scientific method of clinical science, which aims to study the health-disease process (Granma newspaper; Friday, January 14, 2011, year 47/issue 12). Any medical practice that is not based on the CM will be outside the clinical science and will be largely responsible for “medical malpractice”. For doctors Fidel Ilizástigui Dupuy and Luis Rodríguez Rivera, the CM is just the scientific method applied to the work with patients. No technique can replace the human mind, the intellect of man. The information obtained from the clinical evaluation of the patient is always relevant and may even help to confirm or dismiss a presumptive diagnosis. According to Evelio Cabezas Cruz, with a good anamnesis and a complete physical examination it is possible to make a correct diagnosis in most cases (Granma newspaper, Friday, October 22, 2010, year 46/issue 251). Leaving aside clinical science will significantly increase the cost of health care, also

becoming mechanical and irrational, and it could even be iatrogenic^{2,10-12}.

The patient should be individualized. The relationship between the disease and the patient is the same as the relation between the general and the singular in the dialectic.

The disease is the general, which is studied in a particular patient. Also, all known clinical manifestations of a disease are rarely present in a patient. The disease presents itself in a special way in each affected subject, which motivates the known aphorism that states "... there are no diseases but sick people".

The Ian McWhinney Centre for Studies in Family Medicine, in Argentina, carries out a patient-centered CM, which, unlike the clinical care focused on the disease, takes into account not only the biomedical aspects in the consultation, but also the human experience of illness and the subjective aspects of the doctor-patient relationship, and introduces the active participation of patients in decision-making. To implement the patient-centered CM, it is necessary to take into account, simultaneously, a number of interactive components such as²⁻⁴:

1. Exploring the ailment (human dimension of the experience of the disease) and the disease (biomedical aspects).
2. Understanding the whole person (in his/her familiar, social and biographical context).
3. Finding common ground in relation to the treatment of the problem by the doctor and patient.
4. Incorporate health promotion and prevention.
5. Strengthen the doctor-patient relationship.
6. Realistic use of time and resources, which means to focus clinical practice on priorities, needs and resources of the patient and the physician, in the context in which health care is performed.

Among the components of CM are the interview, the physical examination and medical diagnosis¹³.

The interview

The interview or anamnesis is the basic tool of the CM, and the clinical resource which is most difficult to master for the doctor. In an article published by the Granma newspaper (Granma Newspaper, Wednesday,

October 13, 2010, year 46/issue 243), research conducted between 1947 and 1993 in England, United States, Spain and other countries, showed that it is possible to make a diagnosis of the patient's disease, just with the interview, in 55-88% of cases. Dr. Alfredo Nasiff Hadad says that if a physician is able to induce and properly conduct an interview, will get the correct diagnosis in a large number of cases (Granma Newspaper: Tuesday, December 7, 2010, year 46/issue 290) and in Miguel Ángel Valdés Mier's opinion, President of the Cuban Society of Psychiatry who refers to the MC as "the sovereign", with a thorough interview with the patient and family, it is possible to get 60% of psychiatric diagnoses in a certain way (Granma Newspaper, Wednesday, November 17, 2010, year 46/issue 273). The interview provides, among other data, the symptoms, which are overt manifestations of the disease, "which they follow as its shadow", as Galen said².

Physical examination

Physical examination is essential for medical diagnosis. In order to achieve higher quality, it should always be done after the interview, meticulously, respecting a logical and predetermined sequence, and with privacy for the patient¹⁴. This examination is carried out to find physical signs of the disease, which allows the development of skills that will be increasingly improved, as they are practiced more frequently.

Medical diagnosis

In the "method of diagnosis" there is an interweaving of scientific, empirical and observation procedures with the mental process of reasoning, which are interdependent and complementary. Classically, there are four methods for searching a diagnosis: intuitive, differential (or through comparison), inductive and hypothetical; but always, the end result of medical diagnosis is a diagnostic impression or probability, which means that there are several possible diagnostic alternatives^{10,14}.

THE DOCTOR-PATIENT RELATIONSHIP

For the use of the CM during health care practice, it is essential the existence of a cordial relationship between patient and doctor. The doctor-patient relationship is the most sensitive and human side of medicine. The communication between the doctor and patient may be established verbally, using the interview as a tool, where the doctor must master the art of listening¹⁵.

The study by Beckman and Frankel in 1984 showed the unwillingness of doctors to listen to patients. According to this study, patients were interrupted, on average, at 18 seconds after beginning speaking¹⁶.

Communication starts with the look; it must be objective and cozy for signs of disease. The physician must master the use and interpretation of the moments of silence, that in some cases are not gaps in communication, but, on the contrary, spaces that are filled with expressive sense¹⁷.

Excessive use of technology in medical practice has led to a depersonalization of patients by some professionals. This is why is so important to always keep in mind the phrase, "Cure sometimes, treat often, comfort always"¹⁸.

The doctor is a "civil engineer", a builder of bridges between him/her (with his/her knowledge and context) and the patients (with their beliefs, concerns, experiences and contexts) to achieve an effective intervention¹⁹.

The American psychologist Daniel Goleman, a pioneer with regard to treatment of the concept of emotional intelligence, considered that the doctor, in this relationship, must have the ability to know what the other feels, which in no way is equivalent to practice a paternalistic medicine^{20,21}.

CLINICAL HISTORY

It is known that Hippocrates was the first physician who wrote a clinical history, and with his death, the practice of drawing up such documents began a long sleep, something that changed in the nineteenth century, when the collection of the patient's life began to be important, as the personal history could act as a determining factor for disease.

In 1931, White (1886-1973) specified the type of information to be collected by the interview, physical examination, laboratory tests and the patient's personality^{22,23}.

The clinical history may be defined as the set of documents relating to the process of health care and health status of a person by a healthcare professional. It is the basic instrument of health care, and is an essential source of information about the health problems of person^{23,24}.

According Raimundo Llanio Navarro, making a proper clinical history is not an easy task. It takes time and patience, and a good relationship between the patient and the doctor²⁵. Its features must include the truthfulness, accuracy, clarity, thoroughness and completeness in terms of the recorded data. It must be also unique, integrated and cumulative for each patient. It is not a personal document, but an institutional document, which may be accessed by other professionals²⁶.

The clinical history is generated by the need to grouped all the information on a subject, related to the condition being treated, allowing his continued attention; it also has teaching, research, judicial and administrative functions, and is a tool to assess the quality of the health care activity^{23,24}. It is a confidential document, with extreme privacy and respect for the autonomy of the individual. This is a duty of every professional who has access to the information with healthcare, teaching or research nature contained in it.

Fidel Ilizastigui Dupuy and Luis Rodríguez Rivera enunciated the requirements that the clinical history must contain^{2,27}:

1. The information collected must be real, essential and necessary.
2. Individual health problems should be well identified.
3. Diagnostic hypothesis must be well clarified.
4. The use of complementary tests must be justified.
5. The therapeutic actions taken must be justified.
6. It should refer to the information provided to the patient, regarding the medical decisions about him.
7. The assessment should be expressed expounding the scientific thinking.
8. The discharge should be a summary of each of the patient's problem, and of the medical guidance for solving them.

MEDICAL DIAGNOSIS

The diagnosis is the cognitive process developed by a professional in order to identify in an individual, or in a group of them, the essential relational components of the health-disease process²⁸.

Since the time of Hippocrates, the diagnosis of the disease, its consequence and prognosis, has been considered the core of medical knowledge. According to that philosopher, the medical pride is not so much to cure the disease, but to make an accurate forecast of it, thus the basis of a proper prognosis is a good diagnosis²⁹.

To do this, it is necessary to use cognitive methods such as analysis and synthesis, abstraction and generalization, among others; and logical forms of thought, such as concept, judgment and reasoning. The clinical diagnosis has different levels of abstraction including the symptomatic, syndromic, etiological, physiological and nosological level; the latter is considered the foundation of decisions. Expressing in synthetic terms the patients' ailment is a skill that characterizes clinical expertise^{28,30}.

The foundation of clinical diagnosis includes evidence, knowledge and reasoning; i.e. what the patient says, what the doctor knows, and the processing of the information from these two sources. Hence, clinical diagnosis has the following basic practical uses³¹: taxonomic referential or denotative, explanatory and executive.

An accurate diagnosis is needed to formulate a prognosis and adopt an appropriate therapeutic conduct, so it is necessary to spend time in the formulation and verification of the clinical diagnosis.

IMPACT OF SCIENTIFIC AND TECHNOLOGICAL REVOLUTION IN CARDIOLOGY

The impact of scientific and technological revolution has been so great that no less than 25 new ethical issues have emerged in medicine, related to genetic engineering, in vitro fertilization and embryo transfer, the discovery of the human genome, cloning, organ transplantation, doctor-assisted suicide, euthanasia, the diagnosis of death, persistent vegetative state,

remote patient monitoring and telemedicine, noise and air pollution, and many others³².

At the same time, old ethical issues reemerge with a new dimension and among them the relationship between the CM and technology.

From the 60s of the last century, with the beginning of this scientific revolution, began a process that continues today with full strength, where clinical diagnosis components have been losing ground to complementary tests. The wise and necessary balance between the CM and laboratory tests has shifted to the tests, and a large number of doctors apparently have forgotten that the word medical comes from the Latin root *med*, which precisely means meditate, think, and they order complementary tests, with the hope that these tests will give them the diagnosis and will resolve the problems.

Bernard Lown, a leading American cardiologist and Nobel Prize, wrote in 1995 that "... the patient's blood is on the way to the lab before the doctor finishes talking with him, and long before he lays a hand on the patient ..."³² and five years earlier, in 1990, the Mexican professor Hinich wrote "... the modern physician, like a sorcerer's apprentice, has ceased to be the master of technology to become its servant ..."³³.

This serious problem of technology mastering, or wanting to master, the actions of man, and of man as a mere servant of technology, which has great ethical connotation, had already been raised and analyzed more than 150 years ago by Karl Marx when referring to issues relating to the alienation of man and work and what he called "the fetishism of commodities". On this, he wrote literally in *Capital*: "(...) they, their creators (i.e., men, creators of commodities) have finally surrendered to their creatures; the products of their heads have come to take over their heads"³⁴.

There is no difference between these words of Marx and Hinich words, 150 years later. The problem is much more serious today, and the fetishism of commodities has become the fetishism of technology, which has led the doctors and health officials to believe that just medical technology is enough to solve the problems of diagnosis, leaving out the CM.

This was highlighted many years ago by the American professor George L. Engel when literally said: "The decline in attention to clinical skills contrasts with a supreme confidence in the ability of technology to solve medical problems, and is a reflection of the con-

confidence that Western society places on the superiority of technological solutions to human problems”³⁵.

Cardiology is a specialty that has always been at the forefront of technological innovation. Especially in recent years, the introduction of new technological tools has opened the door to a revolution in diagnosis and therapeutics. Cardiac imaging techniques have evolved rapidly (three-dimensional echocardiography, CT scan and optical coherence tomography, intravascular ultrasound, coronary fractional flow reserve measurement, etc.) are a cornerstone in the diagnosis. The development of new materials such as catheters and bioprosthesis, specifically designed for percutaneous implants and stents, has facilitated the development of effective therapeutic solutions with excellent risk-benefit ratio. Furthermore, these innovations enable promoting advanced basic and clinical research, as in the case of bioabsorbable stents³⁶.

Cardiovascular imaging has become an indispensable tool for the knowledge of cardiovascular disease. The discovery of new technologies has allowed extending its utility to the biological, functional and hemodynamic diagnosis of multiple pathophysiological processes. The current and future trend of imaging techniques is intended to allow an early diagnosis of the disease and promote cardiovascular health, provide support in the therapeutic decision-making process and facilitate the assessment of new treatments. Thanks to the extensive development of molecular imaging and hybrid technology, it is possible to understand from a cellular and molecular point of view multiple biological processes, which facilitates the development of new preventive therapies³⁷.

The prevalence of cardiovascular disease is expected to increase in coming decades, leading to an increase in associated mortality and morbidity, and an important economic and social spending, which will be difficult to be face by generations to come. The current and future challenge of cardiology is the detection of subclinical cardiovascular disease in order to prevent some of its manifestations and reduce its health impact. In this regard, imaging techniques may help us decisively, especially in the field of atherosclerosis and cardiomyopathies, just to mention some examples.

It is not a matter of denying the extraordinary value of complementary tests in the diagnostic process,

whose importance is given, inter alia, because they confirm a diagnosis and reject others, are involved in establishing the prognosis and evolution of disease in patients, and are essential for the staging of many diseases before deciding the treatment. They also detect adverse effects of drugs, may provide certainty in areas where the CM cannot and, in some circumstances, they have the value of reassuring both the patient and the doctor, because medicine is a human science. All physicians make daily use of complementary tests and we cannot do without them. The problem of the relationship between the CM and complementary tests is another one.

Ten years after the beginning of the scientific and technological revolution in medicine, when analyzing their impact on doctors, professor Engel said: “Before the scientific and technological revolution, part of the intellectual excitement of reasoning in doctors came from being able to anticipate, successfully, the results of the laboratory tests performed in their patients, as a result of a hard and solid reasoning which led them to certain clinical hypothesis, (...) these tests, rather than refine and sharpen observation and clinical reasoning, limited, adulterated and falsify them, by reducing them to a crude classification of patients, (...) Often, laboratory findings, which are clearly illogical, are accepted without criticism or questions and all of this is nothing more than an atavistic regression to empiricism and authority”³⁸.

In cardiology, a very sensitive issue regarding the CM is certainly telecardiology. The technological advances that have occurred in recent decades have improved the diagnosis and monitoring of patients with acute coronary syndromes and advanced heart failure.

The high quality digital records that are transmitted wirelessly through mobile networks have increased the prehospital use of portable electrocardiogram devices and implantable devices for the monitoring and treatment of arrhythmias. Their use allows a wider access to rapid reperfusion therapy, which reduces the delay of treatment, morbidity and mortality. In addition, a continuous monitoring of the electrocardiogram (ECG) has improved the diagnosis of arrhythmias and has shown that the assessment of the dynamic changes of the ST segment provides important prognostic information for patients with ST-segment elevation acute myocardial infarction.

Similarly, it appears that the recording or remote monitoring of arrhythmias and vital signs improve outcomes and reduce the need for new admissions to hospital and outpatient visits of patients with heart failure or arrhythmias. In the future, it is anticipated that telemonitoring and diagnosis will influence even more on the practice of cardiology and will provide better care for the patient with cardiovascular disease³⁹.

The use of traditional 12-lead ECG is not immune to the technological advances of our time. The lack of sensitivity is the most common limitation, in both the prehospital and the hospitalization phase. Not all parts of the left ventricular anatomy are evenly captured by conventional leads³⁹. The most common location that escapes electrical detection is the inferior-posterior area, where it is necessary to use additional leads (V₇-V₉)⁴⁰.

The actual body surface map uses an 80-lead ECG, thus improving the detectability of acute myocardial infarction and, therefore, increases the sensitivity of the electrocardiography⁴¹. In large clinical series, the 80-lead ECG contributed a 27.5% incremental increase to the detection of ST-segment elevation acute myocardial infarction compared with 12-lead ECG⁴².

Another breakthrough is telecare for monitoring patients and devices. Telecare is defined as personal health care provided at a distance; and it consists of⁴³:

- a) Data provided by the patient (e.g. blood pressure, pulse, weight, subjective health information).
- b) Electronic transmission of data from the patient to the healthcare professional.
- c) Feedback that is personalized and adapted to each individual patient.

Telecare may be based on real-time systems (synchronous), storage systems (asynchronous) or hybrid systems⁴⁴. Synchronous telecare requires the availability of the patient and healthcare professional at the same time, and a real-time processing of the data, while asynchronous telecare provides greater flexibility to both, the patient and the healthcare professional³⁹.

The technology used in telecare is a combination of portable diagnostic devices (e.g. sphygmomanometers), computer/smartphone and wireless communication infrastructure, which requires a stable network of data transmission, which may be stored in a

receiving station for immediate or subsequent processing and assessment^{37,45}.

Telecare, although is intended for a close contact between the patient and the healthcare personnel, and for a useful exchange of information, significantly diminishes the doctor-patient relationship; in fact, it may be an effective process, but it takes the place of the CM. However, its effectiveness in the reduction of morbidity and mortality in patients with heart failure has not been proven, since there are contradictory results⁴⁶.

Telemedicine has revolutionized modern cardiology and provides the opportunity for consultation between doctors located at great distances, even doctors from different continents. In the acute phase of heart disease, telemedicine helps provide optimal care more rapidly; and in the case of chronic disease the consultation between doctor and patient reduces the need for outpatient visits³⁹.

These developments affect the practice of the CM, hindering elements that are essential for a correct diagnosis, such as the doctor-patient relationship, and preventing a proper adherence of the patient and family to medical treatment.

In the document eHealth Strategy and Plan of Action, 2012-2017⁴⁷, the World Health Organization states that eHealth (also known as eHealth) consist "... in the support that the cost-effective and safe use of information and communication technologies offers to health care...".

A survey that examines the usefulness of eHealth tools, published by this organization in 2006, which was answered by 9 countries of the Region of the Americas, shows that in all cases these services are valued as useful or very useful. In 2010, the Pan American Health Organization conducted a study to determine the existence of policies, strategies and legislation on information and communication technology in health care in the Americas. This study, which involved Cuba among its 19 participants, revealed that in 68% of these countries eHealth is a priority on the agenda, and 47% of them say they have a policy or strategy for the use of information and communication technology in health.

EHealth aims to ensure improved access to medical products and technologies, as well as their quality and use, and serves to improve the quality of life of people.

Although technological progress has helped us to develop diagnoses and save lives, its abuse may harm patients and affect the competence and performance of doctors. It is necessary not to fall into the trap that it is easier, simpler and more “in accordance with development and modernity”, to order tests rather than talk, examine the patient and think².

Technology, as complementary tests, has definitely entered the CM, but it just provides additional data about the patient, it is not infallible and may cause complications. It should be clinically oriented and its results should be analyzed in the clinical context of the patient, in order to have real value. In many cases, the overuse of clinical tests arises from the lack of medical update in the field of diagnostic tools and may encourage doctors to use unnecessary and potentially dangerous treatments for the patient.

RELATIONSHIP OF CLINICAL METHOD AND TECHNOLOGY

From the very beginning of the scientific and technological revolution, it has provided diagnostic and therapeutic elements that have occupied a space in clinical practice and have been fully integrated into the CM; hence, their role is not only important, but sometimes decisive in the process of diagnosis and therapeutics. However, in the CM, it is precisely clinical practice which guides the use of technological means, and this should not be reversed; thus, medicine achieves a human character, and errors, wasted time, wasted resources and risks for patient are avoided^{48,49}.

Eugenio Selman-Housein Abdo¹³ proposes some principles for complementary tests as a form to support a diagnosis:

- Go for the simplest to the most complex tests.
- Provide sufficient clinical data when ordering some complementary test.
- Do not order any test whose result will not contribute to change the medical conduct.
- Do not make the so called “profiles”.
- Carry out interconsultations with doctors of diagnostic specialties about the desirability of conducting some complementary tests.

The rational use of diagnostic and therapeutic resources is a measure of order in these times, so it is the responsibility of the doctor to order them wisely and rationally in line with the diagnostic hypothesis. Moreover, it is necessary to educate people in this regard, because many people erroneously think that a good health care takes place when some complementary tests are used or a medication is prescribed.

According to Roberto Hernández Hernández⁵⁰, “Cuban professionals have a moral obligation to make a rational use of resources at our disposal; and, in relation to medicine, we can achieve this, more than with other alternative, through the use of the CM”.

The extraordinary advances in medicine over the last 50 years have shown no evidence that complementary tests could replace the clinical skill of the physician in patient care. Therefore, far from thinking of the death of the CM, it is believed that its relevance and importance in contemporary medicine are unquestionable².

Forgetting the use of the CM, whatever its cause, leads to moral problems in medicine: insensitivity to the suffering of the patient, caused by the distance between the doctor and the patient, and abuse of power, because of the misuse of diagnostic tools.

FINAL CONSIDERATIONS

The CM is a guide the doctor must follow in the search for a contextualized diagnosis of the patient’s disease, and the attention must be focused on the doctor-patient relationship and the drawing up of the clinical history. The intelligent, rational and pragmatic use of technology applied to cardiology, which is intended to complement the CM and not replace it, should not create any problems. There should be no contradiction between the CM and technology, and neither of them should give in to the other.

Doctors must learn and get used to acting under uncertainty, differentiate serious things from banality, determine when to seek support from other specialists, become an expert on early and timely diagnosis, and research in these fields and share their experiences. They must identify the disease and understand the inner world of the patient, their

desires, fears, hopes, sufferings, capacity and ability to comply with treatment; not only treat the disease but also the individual who has it. Their main tool is the CM based on the anamnesis and physical examination. Additionally, they must possess and exercise the most precious qualities of a good professional: listening, observing, thinking and reasoning. No technological advance can replace the good CM and the doctor-patient relationship, extended to the family and the community.

The technological development of modern cardiology, which influences a large number of doctors, could never replace the CM. Clinical judgment, rather than technology, is the basis for solving the problems.

REFERENCES

- Moreno MA. Hipocratismo, galenismo, los clínicos y el método. En: Moreno MA. El arte y la ciencia del diagnóstico médico. La Habana: Científico Técnica; 2001. p. 31-46.
- Cruz J, Hernández P, Dueñas N, Salvato A. Importancia del Método Clínico. Rev Cubana Salud Pública [Internet]. 2012 [citado 26 Dic 2013];38(3):422-37. Disponible en: http://bvs.sld.cu/revistas/spu/vol38_3_12/spu09312.htm
- de Almeida N, Zélia M. Historia de la Epidemiología. En: de Almeida N, Zélia M, ed. Introducción a la Epidemiología. Buenos Aires: Lugar Editorial; 2007. p. 21-42.
- Quijano F. Grandes progresos médicos basados en la clínica. Rev Med Inst Mex Seguro Soc. 1998; 36(4):333-5.
- López JA. La prioridad de Carlos J. Finlay en el descubrimiento del vector amarílico. ACIMED [Internet]. 2004 [citado 14 Ene 2014];12(1). Disponible en: <http://scielo.sld.cu/pdf/aci/v12n1/aci07104.pdf>
- Reinoso A, Albarrán J, González M. Pequeñas biografías de grandes cubanos. En: Roig E. Médicos y Medicina en Cuba. La Habana: Academia de Ciencias de Cuba; 1965. p. 71-4.
- Martínez JM. Electrocardiografía, su valor en Clínica. Rev Méd Cubana. 1919;(7):1.
- Martínez JM. Estetografía Clínica. Vida Nueva. 1936: 21-25.
- Hernández A. Breve Historia de la Sociedad Cubana de Cardiología: 1937-2007 [Internet]. 2007 [citado 10 Jun 2013]. [aprox. 8p.]. Disponible en: http://bvs.sld.cu/revistas/ibi/vol27_2_08/ibi01208.htm
- Ilizástigui F. El método clínico: muerte y resurrección. Rev Cubana Educ Med Super [Internet]. 2000 [citado 10 Jun 2013];14(2):[aprox. 7p.]. Disponible en: http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S0864-21412000000200001
- Monzón M, Planells MA, Merodio G, Cassola FH. La aplicación del método clínico en la investigación científica de la salud. Rev Méd Electrónica [Internet]. 2007 [citado 15 Jul 2013];29(4):[aprox. 3p.]. Disponible en: <http://www.revmatanzas.sld.cu/revista%20medica/ano%202007/vol4%202007/tema14.htm>
- Herramientas MF. Método Clínico Centrado en el Paciente (MCCP). Med Familiar y APS [Internet]. 2007 [citado 11 Jul 2013]:[aprox. 5p.]. Disponible en: <http://aequus.blogspot.com/2007/08/mtodo-clnico-centrado-en-el-paciente.html>
- Selman-Housein E. El método clínico. En: Selman-Housein E. Guía de acción para la excelencia en la atención médica. La Habana: Científico Técnica; 2002. p. 10-44.
- Moreno MA. El interrogatorio y el examen físico. En: Moreno MA. El Arte y la ciencia del diagnóstico médico. La Habana: Científico Técnica; 2001. p. 75-98.
- García JL. Relación médico-paciente en un modelo de comunicación humana. Rev Med Inst Mex Seguro Soc. 1999;37(3):213-20.
- Beckman HB, Frankel RM. The effect of physician behaviour on the collection of data. Ann Intern Med. 1984;101(5):692-6.
- Muniagurria AJ. Algunas apreciaciones sobre el Método Clínico. Rev Anuario Fundación. 2004;XII:23-5.
- Dobler L, Irving F. La responsabilidad del médico en su ejercicio profesional. Rev Med Inst Mex Seguro Soc. 2000;38(3):169-70.
- Turabián JL. El médico de familia es un ingeniero de caminos. JANO. 2003;LXIV(1465):10.
- Comas JR. La relación médico-paciente. Arch Neurol Mex. 2002;5(3):160-4.
- González R. La etapa contemporánea de la relación

- médico paciente. *Rev Cubana Salud Pública* [Internet]. 2004 [citado 10 Nov 2013];30(2):[aprox.5p.]. Disponible en: http://scielo.sld.cu/scielo.php?script=sci_arttext&id=S0864-34662004000200010
22. Alonso JL. La historia clínica electrónica: ideas, experiencias y reflexiones. *ACIMED* [Internet]. 2005 [citado 9 Sep 2013];13(5):[aprox. 7p.]. Disponible en: http://bvs.sld.cu/revistas/aci/vol13_5_05/aci02505.htm
23. Martínez J. Historia Clínica. *Cuad Bioét.* 2006; XVII(1):57-68.
24. Barreto J. La historia clínica. Documento científico del médico. *Ateneo.* 2000;1(1):50-5.
25. Llanio R. Prólogo. En: Llanio R. Historia clínica. La mejor arma del médico en el diagnóstico de las enfermedades. La Habana: Pueblo y Educación; 1987. p. 4-6.
26. Ilizástigui F. Historia clínica estructurada por problemas. En: Nassiff A, Rodríguez HM, Moreno MA. *Práctica clínica.* La Habana: Ciencias Médicas; 2010. p. 41-54.
27. Ilizástigui F, Rodríguez L. Método clínico. En: Nasiff A, Rodríguez HM, Moreno MA. *Práctica Clínica.* La Habana: Ciencias Médicas; 2010. p. 15-28.
28. Pérez NM. El diagnóstico médico: algunas consideraciones filosóficas. *Rev Ciencias* [Internet]. 2006 [citado 5 Jun 2013]:[aprox 5p.]. Disponible en: <http://www.revistaciencias.com/publicaciones/EEUpZkVIEuXvYniVfH.php>
29. Lorenzano C. El diagnóstico médico. *Subj Procesos Cogn.* 2006;8:149-72.
30. Capurro D, Rada G. El proceso diagnóstico. *Rev Méd Chile.* 2007;135(4):534-8.
31. Lifshitz A. La confianza en un diagnóstico. *Rev Med Inst Mex Seguro Soc.* 1996;34(3):183-7.
32. Moreno MA. Ética, tecnología y clínica. *Rev Cubana Salud Pública* [Internet]. 2006 [citado 5 jun 2013]; 32(4):[aprox. 4p.]. Disponible en: http://scielo.sld.cu/scielo.php?script=sci_arttext&id=S0864-34662006000400012&lng=es
33. Jinich H. Triunfos y fracasos de la medicina en los Estados Unidos de América. *Gac Méd Méx.* 1990; 126(2):72-6.
34. Marx C. *El Capital.* Tomo I. La Habana: Ciencias Sociales. 1979. p. 65.
35. Engel GL. Enduring attributes of medicine relevant to the education of the physicians. *Ann Intern Med.* 1973;78(4):587-93.
36. Avanzas P, Bayes A, Pérez L, Sanchis J, Heras M. Innovación en cardiología. *Rev Esp Cardiol.* 2013; 66(2):133.
37. Fernández L, García A, Ibáñez B. Imaginando el futuro del diagnóstico por imagen. *Rev Esp Cardiol.* 2013;66(2):134-43.
38. Engel GL. Are medical schools neglecting clinical skills? *JAMA.* 1976;236(7):861-3.
39. Sørensen JT, Clemmensen P, Sejersten M. Telecardiología: pasado, presente y futuro. *Rev Esp Cardiol.* 2013;66(3):212-8.
40. Thygesen K, Alpert JS, Jaffe AS, Simoons ML, Chaitman BR, White HD, *et al.* Third universal definition of myocardial infarction. *Eur Heart J.* 2012;33(20): 2551-67.
41. Owens C, McClelland A, Walsh S, Smith B, Adgey J. Comparison of value of leads from body surface maps to 12-lead electrocardiogram for diagnosis of acute myocardial infarction. *Am J Cardiol.* 2008; 102(3):257-65.
42. Hoekstra JW, O'Neill BJ, Pride YB, Lefebvre C, Diercks DB, Peacock WF, *et al.* Acute detection of ST-elevation myocardial infarction missed on standard 12-Lead ECG with a novel 80-lead real-time digital body surface map: primary results from the multicenter OCCULT MI trial. *Ann Emerg Med.* 2009;54(6):779-88.
43. McLean S, Protti D, Sheikh A. Telehealthcare for long term conditions. *BMJ.* 2011;342:d120.
44. Allely EB. Synchronous and asynchronous telemedicine. *J Med Syst.* 1995;19(3):207-12.
45. Anker SD, Koehler F, Abraham WT. Telemedicine and remote management of patients with heart failure. *Lancet.* 2011;378(9792):731-9.
46. Koehler F, Winkler S, Schieber M, Sechtem U, Stangl K, Böhm M, *et al.* Impact of remote telemedical management on mortality and hospitalizations in ambulatory patients with chronic heart failure: the telemedical interventional monitoring in heart failure study. *Circulation.* 2011;123(17): 1873-80.
47. Organización Mundial de la Salud/Organización Panamericana de la Salud. Estrategia y Plan de acción sobre eSalud 2012-2017 [Internet]. 2011 [citado 10 Dic 2013]:[aprox. 2p.]. Disponible en: <http://new.paho.org/ict4health/index.php?option=>

- com_content&view=article&id=54:estrategia-y-plan-de-accion-sobre-esalud-2012-2017&catid=15:ops-wdc&Itemid=44&lang=es
48. Moreno MA, Nasiff A, Rodríguez HM. Método clínico, buenas prácticas clínicas y profesionalismo médico. En: Nasiff A, Rodríguez HM, Moreno MA. *Práctica Clínica*. La Habana: Ciencias Médicas; 2010. p. 55-66.
49. Rodríguez MA. Relación médico-paciente y el método clínico. En: Rodríguez MA. *Relación Médico-Paciente*. La Habana: Ciencias Médicas; 2008. p. 10-12.
50. Hernández R. Del método científico al clínico. Consideraciones teóricas. *Rev Cubana Med Gen Integr* [Internet]. 2002 [citado 25 Nov 2013];18(2):[aprox. 6p.]. Disponible en: http://bvs.sld.cu/revistas/mgi/vol18_2_02/mgi11202.htm