Esej
Essay
Acta med-hist Adriat 2007;5(1);117-124
UDK: 614.253
174:61

ETHICS AND MEDICINE: THE CHALLENGE OF TECHNOLOGICAL EVOLUTION

ETIKA I MEDICINA – IZAZOVI TEHNOLOŠKOG RAZVOJA

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Summary

Ethics and morality define professional practice just as strongly as expertise.
Principle-based ethics dominate ethical thinking in medicine, and much has to be done to help medical practitioners to think in ethical terms.
Ethics is still too rare in medical thinking, and the advancement of medical technology is a challenge to the medical practice of today and tomorrow.

Key words: *Ethics, morality, medical technology, medical practice*

As a consequence of the enormous progress in science, medical specialization is inevitable and justified by success in so many different areas. Moreover, the speed with which new achievements are accomplished has increased, compelling medicine to one great cooperative effort.

Unfortunately, a homogenized, image-dependent health culture has arisen as a result of the new hi-tech industrial transformation, based on mass communication, computer technology and information manipulation.

In contrast to market-supremacy, medical humanities propose to reconstruct the roots of knowledge and scholarship to build post-modern medicine. In a world where freedom and peace seem to have lost their promise, who is taking the advantage in a marketplace where patients are

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labelled as health care consumers and physicians are health care providers?

Current social changes make it possible to predict many of the opportunities and challenges which the immediate future is likely to bring, not only for world cohesion and order but also for medicine. It is probable that the most important achievements of the third millennium will be in the field of life sciences; they will contribute to our knowledge of the processes that control normal and pathological development of living organisms and the development of controlled biological systems for producing consumer goods in industry, agriculture and medicine.

Unlike physics and chemistry which, in the second half of the nineteenth century and the first half of the twentieth, had an extraordinary social and technological impact and led to the great Industrial Revolution, it did not seem that life sciences could go beyond mere description or be of interest to anyone not directly involved. And almost none imagined that life sciences would ever be of economic industrial interest. Only recently it became clear that scientific knowledge obtained from biological experimentation and observation of nature could not only explain the processes that give rise to life, but could do much more. Life sciences could create a new science to help to alleviate hunger and diseases caused by misuse of natural resources and by aberrations in human metabolism and development. Life sciences could also enhance the quality of life to reach almost utopian dreams where diseases would be drastically reduced or eliminated and all human beings adequately fed.

In 1953 three science technologies of the modern age saw the light of day: biotechnology, bioagriculture and biomedicine. Although these sciences had existed before the modern era, their renaissance was due to the discovery that genetic information, which determines normal or abnormal functioning of biological processes, was contained in chemical molecules and that this basic material was deoxyribonucleic acid or DNA.

This biological breakthrough, was so important to twentieth-century cultural tradition that the revolution it has caused has been termed in many circles the last Cultural Revolution in modern history; revolution because it was thought that life science could unravel the most intimate mechanism of the origin of life, explain the biological evolution of the universe, and because the discoveries could change accepted sociological parameters and come into conflict with dogmatic technological assumptions and beliefs. In fact, life sciences have now unified all branches of sci-

ence: much of the content of physics and chemistry has become biophysics and biochemistry and these sciences are serving human medicine in its effort to enhance the quality of life.

Human and life sciences cannot be studied without knowledge of the laws governing their biological development and the interactions between their molecules and other elements.

Fundamental discoveries have occurred within the field of genetic or molecular biology, comparable to Mendel's and Darwin's, which have given us a direct insight into the origin of life, the evolution and the reproduction of species at the molecular level. The DNA spiral and the genetic code are not only the basic elements of the biological structure of our lives and all other living creatures in nature but also crosslinks towards innovative cloning.

Fundamental sciences and big-scale technologies explore these discoveries to produce new biochemical and biological materials. Biotechnology is being developed on an industrial level. Going deeper into the innermost structure of matter which was previously hidden within the nuclei of atoms, we have discovered that this ultimate primitive form consists of quarks and not, as one previously thought, of atomic nuclei and other nuclear particles. We could easily continue this survey over the last forty years of science recalling the tremendous implications which this scientific progress has had on Technology, Industry, Society and Culture.

In Laplace's view, knowledge can only come close to the truth, but it can never possess it definitively, as truth is an indivisible entity at the extreme reaches of human knowledge which man can never hope to fully unveil. This theory was to lead to a new and dynamic outlook of the way man comes about his knowledge of the surrounding physical world, an outlook that does not take for granted that which is known. Moreover, it allows for a certain degree of fuzziness.

The theory of probability is undoubtedly the fundamental turning point for scientific inquiry. But the probabilistic approach to knowledge has also affected other areas of human inquiry and activity, especially the development of technology and consequently the rise of modern industrial processes. After Laplace's seminal contribution it was no longer possible to continue speaking of certainties in relation to the mechanisms and characteristics of any particular natural event, but only of a greater or lesser degree of probability of it occurring, given certain favourable conditions. The deterministic model, which had made for absolute statements

about the physical world and had been seen as underlying all natural relationships and man's position to them, had thus been seriously challenged and there was no turning back.

Of course it would be quite misleading to reduce various methodological strategies employed in approaching the problem of knowledge to any one strict, schematic model or rigid framework of inquiry. In fact, we are confronted with a multitude of fascinating proposals which emerge whenever the issue of humankind's progress and its relationship to human knowledge and to the physical world of nature is tackled.

Clearly these innovations have cast a shade of doubt on steadfast and luminous certainties which guided the development of science and technology and consequently, man's position in relation to his knowledge of the world had to undergo a profound change. In the process, the Galilean method of inquiry, consisting of progressive segmentation of a problem into manageable and observable units, has reached exasperating proportions. Together with this breaking down of wider issues into smaller and separate areas of study, there has also been a growing awareness that results of an inquiry no longer had a universal value. Once again this awareness contributed to a widespread general attitude which is characteristic of the culture of our times and which philosophers call "conventionalism". This approach shows a tendency to define, for any one specific area of knowledge, a particular set of hypotheses and to give an approximate description of the basic characteristics of the phenomena being studied, or to set up principles limiting the field of inquiry and methodology to be adopted. In other words, knowledge of an event, or even the very boundaries which serve to delineate the event, are based on a set of conventions which have limited validity yet open possibilities of concrete application. The ever increasing ramification of scientific knowledge, and especially of technology, is also the result of an almost natural process whereby every solution to a specific problem generates a chain of other problems in search of specific solution. A sort of multiplier effect is thus constantly being put in motion for every problem which finds a solution.

Two fundamental strategies adopted by conventionalism in its approach to knowledge are, first, to break down the problem into a multitude of separate and specific areas and then to proceed with inquiry starting from an initial set of operational propositions of limited hypothetical range which, being by definition "conventional", are subject to frequent changes and revisions. The outcome of all this is a diffuse and obscure sense of the provisionality and uncertainty of our explanatory models and concepts

which in turn encourages viewing changes or innovations positive, regardless of their true merits and contribution, to our general knowledge and understanding. Another result is the ever increasing isolation of those engaged in research in highly specialized groups, each separately pursuing its own form of inquiry into its own limited area of knowledge, according to its own particular conventions, which can ultimately lead to two apparently contradictory states of mind: conceit and frustration.

When considering the relationship between medicine and technology, a convenient starting point is to keep in mind the basic proposition that a technological process is set in motion in the course of a complex set of natural events being modified by a direct, self-conscious and deliberate intervention of man so as to guide the outcome to the accomplishment of predetermined goals. Therefore, while on the one hand the man of science basically aims at acquiring knowledge of the physical world, on the other, the purpose of technological man is to act upon nature with a view to directing it to his chosen ends; that is to say, his intent is to design a set of practical operations in order to achieve practical results in relation to man's practical needs and requirements. Of course, technology presupposes science and, even though it has distinguished itself from science, it completes and extends science's range of inquiry and operations, acquiring in the process – because of its intrinsic association with man's needs and requirements – a profound pragmatic connotation. Moreover, technology's domain of application is practically boundless, as it can be called upon to modify and direct all natural events, whether animate or inanimate, so that considerably large areas of medicine and economics involve technology no less than engineering.

For a long time many scholars were of the opinion that science were to be kept distinct and separate from technology with the latter strictly subordinate to former. Suffice it here to recall the very resolute and uncompromising stand taken over the issue by Aguste Comte, the redoubtable framer and promoter of French social positivism.

With time the more controversial and extreme positions have been softened and the subsequent spread of the conventionalist mode of inquiry in particular has radically altered the relationship between science and technology, linking the two much closer together.

Many educational systems in Europe, and in particular in Italy, have for a long time been guided by a philosophical approach which has always looked upon "real" knowledge as being something different and distinct

from that afforded by scientific inquiry and technological enterprise. In the view of this prevailing current of thought, which has always met with a favourable reception in our country owing especially to the commanding influence of Crocean idealism, scientific activity, and therefore even more so research prompted by technological issues and problems, do not represent intellectual pursuits liable of yielding any authentic form of knowledge. Consequently, critical investigation of culture and ethics has by tradition exclusively belonged to various schools of philosophy. To be honest, this attitude has also been determined by the lack of interest in physicians for any philosophical activity.

Health is but one in a mix of interrelated social problems, few of which can be tackled in isolation, and which call for broad-based interdisciplinary and intersectorial responses. Success will depend to a significant degree on small, discrete, sometimes apparently unrelated efforts of individuals, community groups and governments, all of whom have roles to play.

International medical community should also play a role in providing an action model that other governmental or non-governmental groups could follow worldwide in confronting national social and health challenges.

What might these roles be? Recognition, treatment, and prevention of diseases should only be a part of the remittal; nor can this remittal be limited geographically.

"Medicine is international. The fight against disease and, more important, the securing of good health, cannot be confined within national boundaries" (Pitt, 1983).

While "modern" bioethics tries to keep pace with evidence-based medicine, algorithmic decision making, and learning by problem-solving, every physician must turn resolutely to the history of ideas before discussing so-called synthetic womb or stem cell transplant.

In sharing certain basic interests, values, educational standards and goals, medicine has no inherent barriers. It can help to strengthen and harmonize the already unifying influences of the first of the two words, ethics and to lessen the tensions and divisions of the second word, medicine. It can move people toward a wider sense of social identity and interaction on the basis of mutual benefit and respect. It is medicine's aims throughout the civilized world, its methods and its work that constitute its global homogeneity. It is a guild or brotherhood, where members can take

up their calling in any part of the world and find colleagues whose traditions, methods, and objectives are identical to their own.

This privileged position in society calls for assuming responsibilities. The profession has tended to be reactive, by concentrating on cure and care in the presence of ill health. Jointly and individually, members of the profession worldwide now need to become proactive in promoting and maintaining good health. This involves identifying and mitigating the causes of ill health and pathocenosis. Watt (1996) observed that there was a clear relationship between the social and economic exclusion of substantial proportions of population and low health status. He invited physicians to speak up about the wider aspects and implications of poverty and deprivation.

Human values and human needs must become centrepieces of the world's strategy for medical progress in the new millennium. Personal consultation between the patient and doctor must remain the bedrock of medical practice, and the ethics of the profession calls for restoring the emphasis to competence, caring and compassion, respect for human life and service to patients. "It is important for medicine to take the lead, for all members of the medical profession to combine and to develop their core values, or ancient virtues, which have been distilled over time from the practice of medicine at its best". (Shock, 1994)

Medicine's will lose its leading role in the 21st century if it does not act now to secure not only its scientific and technological, but also its social and human future. Many of the most intractable health problems that we confront today are neither technical nor scientific, but social, ethical, behavioural or moral. It is more on such values than on the assurances of contemporary scientific technology that the future of world health will depend. The perception of human behaviour and human values as fundamental elements in the practice of medicine is essential for progress.

Adapting to and participating in change requires a radically new approach to the education of the next generation of physicians. A carefully planned and executed education will provide not only profession-specific skills, but also a set of generally applicable skills, such as critical reasoning, life-long, self-directed learning, and team collaboration and communication skills, including negotiating and counselling (Engel, 1995). This kind of education will have to pay as much attention to personal as to professional development.

World Society and World Medicine need to pause to reflection on earlier achievements, current issues and future goals. The social and medical contradictions and tensions might otherwise be carried forward unaddressed.

The corrective action that is called for is both simple and difficult – a change of our fundamental angle of vision. Many of the most intractable problems that our world confronts today are not technical or scientific, but social, ethical, behavioural or moral. It is in the area of human behaviour that these issues must be tackled. The essential emphasis must be on education.

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Sažetak

Medicinska praksa jednako je određena etikom i moralom koliko i stručnošću.
Etika utemeljena na moralnim načelima prevladava u medicinskim etičkim promišljanjima te valja učiniti još puno toga da se liječnicima u praksi pomogne promišljati etički.
Etika je slabo zastupljena u medicinskim promišljanjima, a napredak medicinske tehnologije donosi nove izazove sadašnjoj i budućoj medicinskoj praksi.

Ključne riječi: *etika, moralnost, medicinska tehnologija, medicinska praksa*