Prospects for the Health Care System in the 21st Century
—Suggestions on the importance of risk management—

Takahiko NAGAMINE

Director of Internal Medicine, Seiwakai-Kitsunan Hospital

Abstract: This paper constitutes considerations on methods of bringing the health care system of the 21st century to a state of maturity by posing the issues surrounding the high frequency of medical accidents and the growing prosperity of alternative medicine. There is a tendency to stress only the remarkable aspects of modern medicine, however, it harbors another aggressive, invasive side. This offensive is not only directed at the bodies of patients, but can at times be both a psychological and financial assault. Risk management is crucial to addressing this aggressive side of medical care. Studies in support of forefront medical science are necessary if medical technology is to be safely employed. This is linked to the establishment of the safety sciences in modern medical care. Moreover, medical professionals need to endeavor to ease the financial and psychological burdens of medical technology by making commonsense judgments from the perspective of those on the receiving end of such technology (the patient side). This paper presents examples of methods for lessening the three aggressive aspects of modern medical science (physical, financial, and psychological) that can be established within the health care system, in what can be referred to as the work of causing the tree of modern medical science to put down firm roots.

Key words: Health care system; Aggressive; Biomedical model; Risk management; Safety science

Introduction
—Outbreak of Medical Accidents—

The health care system of Japan, with its system of universal insurance, benefits in kind and free access, is a superlative system that is unparalleled the world over.1) Even the World Health Report (WHO) 2000 acknowledges Japan to have the world’s longest life expectancy. Accordingly, one would expect to be able...
to state that the country’s health care system is completely problem-free.

Unfortunately however, a spate of medical blunders at medical institutions has filled the pages of the newspapers. Medical incidents that run counter to all wisdom, such as the patient misidentification at Yokohama City University Hospital and the accidental injection of a patient with disinfectant at Tokyo Metropolitan Hiroo Hospital, have been occurring repeatedly at forefront medical institutions. According to a report compiled in 2001, among national university hospitals, which are vanguard providers of health care, a mere two hospitals were not embroiled in medical malpractice litigation. Medical blunders have become so commonplace that the health care system is undoubtedly being dogged by “shadows.” It is ironic that whilst Japan’s state-of-the-art health care system has boosted life expectancy in this country to the highest level in the world, it is, on the other hand, engendering numerous medical accidents.

This paper presents the issues surrounding these medical blunders and considers methods of resolving them via an analysis of the current health care system from the standpoint of scientific philosophy. Key words in this discussion are aggressive and risk management.

The Modern Model of Medicine
—Aggressive—

Modern medical science affords tremendous benefits. On the other hand, it is also becoming a hotbed for medical mishaps. What type of model then is modern medicine, which incorporates these two aspects, based upon? This can be considered in terms of scientific philosophy.

As in other scientific fields, the foundations of modern medicine are reflected in the paradigm of elemental reductionism. Elemental reductionism can be understood as the breaking down of matter or phenomena into the component elements for analysis. This philosophy was triggered by the mechanistic worldview originating in Decaull’s rationalism and the classical dynamic model of Newton. The form of elemental reductionism that is applicable to medicine is the biomedical model. Engel offers the following explanation of this model. “The dominant model of disease today is biomedical, with molecular biology its basic scientific discipline. It assumes disease to be fully accounted for by deviations from the norm of measurable biological (somatic) variables.”

In modern medicine, digitized laboratory data is unquestionably given precedence over analog data, and diseases are diagnosed on the basis of quantitative deviations from the standard values yielded by a comparison with such digital laboratory data. Even psychiatry, the medical field employing the most analog approach, has been subject to digitization. In psychiatry, which deals with the human mind, the biomedical model requires that the causes of mental disorders be explained in terms of abnormalities of the neurotransmitters within the brain as opposed to a diagnosis encompassing the variability of the mind as a whole. It goes without saying that phenomenological psychiatry and dynamic psychoanalysis are also being studied, nonetheless, the mainstream at universities is the study of biopsychology. Meanwhile a succession of new serotonin-dopamin antagonists and selective reuptake inhibitors has been introduced in the receptor

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Note 1) Model A model uses a compound system of meanings to examine, explain, and comprehend reality. In other words, it provides a theoretical framework for the ethical handling of various social phenomena.

Note 2) Paradigm Originating from the Greek paradeigma meaning pattern, and referring to a consistent theoretical system (theoretical framework).

Note 3) Biopsychology Falling within the domain of psychiatry, biological psychiatry is a discipline used to explain mental disorders by way of biology and natural science. Psychoneuropharmacology, imaging diagnosis, molecular genetics are currently attracting attention in this field.
theory of psychiatric medication. Although this is conceptualized in terms of the derangement of neurotransmitters, it is in fact none other than the paradigm of elemental reductionism. Engel offers the following sardonic explanation of the role of medical practitioners in terms of the biomedical model.

“Under the biomedical model, the human body is a piece of precision machinery and disease a malfunction of this machinery. Accordingly, the duty of medical practitioners is to repair the machinery”.

If medicine is perceived in metaphorical terms as the maintenance or repair of machinery, then disease is necessarily based on the law of causality and can be reconciled by the removal of such causative factors. Modern medicine therefore seeks a comprehensive triumph over disease by ascertaining said causative factors. In this instance, the targets of such attacks are pathogenic microorganisms or cancer lesions. Furthermore, although this is an issue of medical terminology, expressions such as killer T-cells are disturbing. Jargon such as “cancer missile treatment” from a decade ago, are personifications of warfare terminology, and infer the powerful stance of disease as the enemy of modern medicine to be smashed by a single blow. Surgical maneuvers likewise. Like surgery, physical examinations also represent an invasion of the human body. The more spectacular the surgery, the greater the offensive on/invasion of the living body. In this sense, forefront medical institutions resemble a war zone and the doctors valiant soldiers.

In short, it is necessary to recognize this aggressive aspect as one of the characteristics of modern medicine. No consideration of the health care system in the 21st century can afford to refute this reality, and it is essential that we formulate countermeasures to address this aspect whilst continuing to receive the benefits.

The Boom in Alternative Medicine

While investigating the issue of mushrooming medical accidents in modern medicine, I came to the realization that aggression lies at the heart of the models of scientific philosophical theories. An examination of the aspects of aggression and invasion that are inherent to modern medicine from a different perspective that focuses on the health seeking behavior of patients, reveals that beneath the surface of modern medicine a large number of patients are using alternative medical therapies.

Alternative medicine is a generic term for traditional medicine that has been derived from folk remedies and unique (healing) theories. The opportunity for discussion of alternative medicine to take center stage was generated by a 1993 article published by Eisenberg. The paper revealed an estimated 34% of Americans to be using alternative medical therapies at their own expense at the time of reporting. Of these, approximately 70% of patients who acknowledged using alternative therapy never mentioned it to their attending physician. In the US, an entirely different system of medical treatment is being practiced behind the scenes of modern medicine. In Japan also, much has been made of various folk remedies in recent years, and dozens of ‘such and such’ new health cultures have emerged. Moreover, there is marked interest in health foods among patients, with numerous dietary fads emerging including the ‘wine boom’, the ‘cocoa boom’, and the ‘mushroom boom’, to name but a few.

The term alternative refers to a substitution. It goes without saying that in this instance it is
modern medicine that is being substituted. If we examine the etymology of the word ‘alternative’ in terms of scientific philosophy, it becomes clear that the word was born out of the New Science movement\(^{Note 5}\) of the 1970s. In consequence, aside from its meaning of substitution, the term ‘alternative’ also refers to more ecological practices. For example, when discussing alternative energy sources, this is not a reference to finding alternatives to fossil fuels or nuclear power, but to energy sources whose use encompasses environmental considerations such as wind power and solar energy. By the same token, alternative medicine refers to ecological treatments that take the manifest power of natural healing into consideration as opposed to mere substitutes for modern medical treatments.

The problem of soaring health care costs has additionally helped to focus attention on alternative medical therapies. The development of increasingly sophisticated diagnostic equipment in modern medicine has sent costs skyrocketing. Pressure on health insurance resources has exposed the necessity of conducting research into non-invasive treatments which have low unit costs, and it is this medical economics aspect that has served as the driving force behind the flourishing research into alternative medicine therapies in the US in recent years.

Does alternative medicine thus have the leverage not just to replace modern medicine but to transform the health care system? In the final analysis, alternative medicine therapies and modern medicine are not in confrontation, instead the relationship should be seen as one of complementarity or supplementation. That is why the practice of alternative medicine has essentially continued unbroken beneath the surface of modern medicine. The reason that the spotlight has suddenly been turned on the field of alternative therapies in recent years can be perceived as a reaction to the aggressive nature of the modern health care system. As medical professionals, we need to adopt a humble attitude to the current interest in alternative medicine, and to consider methods of easing the aggressive/invasive aspects of modern medicine.

**The “Tree” of Modern Medicine**

To summarize the discussions cited above, modern medicine can be compared to a tree; a large tree that has grown concomitantly with the history of modern medicine. A large tree has a trunk, flowers and leaves; it also has roots, though these are concealed. When all is said and done, the brilliance of state-of-the-art health care is equivalent to the beautiful flowers and leaves of this tree. These have served to support the trunk of medical science in the past. The flowers, leaves, and trunk of a big tree are immediately visible. However, the roots that are crucial to sustaining this tree are hidden from view. If these roots are not strong, the tree cannot take sufficient nourishment and will be unable to provide sustenance to the flowers and leaves. Moreover, a tree with weak roots is liable to topple over in strong winds.

When compared with the brilliance of the flowers and leaves, the roots of the tree of modern medicine have failed to keep pace with the rapid growth of medical science. The health care system of the 21st century calls for the creation of sturdy roots to support the organ-specific departments of medicine (the flowers and leaves). In short, it is now necessary to enrich the areas of the health care system that are out of sight in the earth. The 20th century was an era of specialization in the field of medicine. As is shown in the table, medicine in the 20th century was a vector that aimed to reach the frontiers of medical science through the

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\(^{Note 5}\) **New science**  Falling under the domain of scientific philosophy and embracing the series of social movements that occurred in the United States in the 1960s and 1970s, the return to Eastern thought and the post-modern movement. The philosophy of the new scientist advocates a paradigm shift from competition to symbiosis, from stratification to interdependence, and from atomic theory to contextual understanding.
elemental reductionist paradigm, which was in turn based on the law of causation. It emphasized direct vision and experimentation, and required constant proof and authentication (evidence).

Against this, the 21st century must be an era that advances learning in support of forefront specialist fields. It is necessary to build this learning to support forefront medical care, integrating a more ecological perspective and which incorporates sensitivity and the ‘stories’ of individual patients in evidence. This is a low-key process that has none of the brilliance of state-of-the-art medical science. It is, nonetheless, essential to stabilizing the health care system. In this sense, it can be likened to the tree of medicine putting down roots into the ground as it grows. So, what are the aspects of health care that can be considered to correspond to its roots? If forefront medical science is considered in terms of its aggressiveness, then in order to alleviate that risk its roots must surely be in risk management. If the tree of modern medicine is to be nourished then the role of the health care system of the 21st century must be to put down roots in risk management.

Risk Management

The Japan Medical Association (JMA) was quick to adopt risk management into the health care system. In 2001, the JMA started offering a training course on medical safety promotion recommending the widespread application of risk management practices within the health care system. The following is an excerpt from the outline for prospective students.

“Jobs in the medical field require the constant acquisition of new knowledge. Advances in medical science have expanded the scope of diagnostic treatment, whilst progress in the highly sophisticated information society has led to increasing diversification of people’s needs. Under such circumstances, the need to find ways to ensure patient safety has become an urgent task for medical institutions. The aim of this course is to promote the establishment of systematic safety management systems within medical institutions by cultivating/training personnel to be able to take appropriate measures in dealing with the cardinal background issues of medical accidents and medical disputes.”

This course advocates the necessity of the safety sciences as a way of protecting patients from the aggression that lies in the background of modern medicine.

Specifically, those involved in the promotion of medical safety have the following four duties: (1) planning safety measures for patients and medical professionals; (2) imple-
Errors and Rule Violations

The ultimate goal of medical risk management is to eradicate accidents. Thus, it follows that if problem staff can be removed from the site of medical practice then dangerous errors will no longer occur. Are medical accidents in other words caused by “problem” practitioners? In the past, attempts were made to reduce the incidence of medical accidents in the US, by using disciplinary measures to rid the system of the doctors responsible for such accidents. This represents the so-called method of weeding out bad apples (bad apple picking). However, the incidents continued to occur despite the elimination of culpable individuals because the average doctors make numerous errors as opposed to such being caused only by the doctors who can be pinpointed as poor (bad apples). The aggressive nature of modern medicine, the result of its increasing complexity, means that the average doctor is the culprit in medical accidents.

Leeson explains the risk-taking behavior that results in errors as falling into two categories, “errors” and “rule violations.” Errors include oversights, mental blocks, and mistakes, and their occurrence at a certain level of probability is inevitable. Rule violations are the result of procedural decisions and represent deliberately aberrant behavior. Endeavors to minimize the probability of errors being generated are essential. In the case of rule violations, since such are willfully undertaken, it is protocol and psychology that are deemed to be involved as opposed to the theory of probability. Accordingly, I intend to divide medical accidents into “errors” and “rule violations” and to offer concrete proposals on countermeasures to prevent their occurrence (the work of putting down roots for the tree of modern medicine).

Reducing Errors
— The Necessity of the Safety Sciences —

Errors will occur at a fixed probability. Those occurring in state-of-the-art medical practice are liable to have far-reaching consequences. For example, advances in respiratory management mean that artificial respirators are used frequently, even in general hospital wards to treat various pathological conditions. However, a single circuitry leak will have lethal consequences. Incidents involving artificial respirators continue to occur despite the existence of alarms and back up systems. The need for learning to support the introduction of highly sophisticated technologies and equipment is increasingly palpable.

Forefront medical care can be supported “within the framework of medical science” or “outside the framework of medical science”. Both will reduce the incidence of errors, both contribute to the establishment of the safety sciences in the medical domain. The JMA training course on medical safety promotion may be cited as an example of the latter type of support. By providing interdisciplinary knowledge through introductions to the law, data, and risk management, all outside the field of medicine, the course is helping to reduce the incidence of error in the modern health care system.

Developments in anesthesiology can be cited as an example of support for forefront medicine from within the framework of medical science. Safe invasive surgical operations are possible largely as a result of developments in general systemic management technologies within the field of anesthesiology. Moreover,
this direction has also been applied in the fields of emergency and critical care medicine and intensive care, resulting in the development of organ-specific fields. In the 21st century it will be necessary to create learning (within the framework of medical science) in support of organ-specific medical technologies in various clinical settings.

The treatment of mental disorders, for example, has expanded variously to encompass psychotherapy, pharmacotherapy, and electroconvulsive therapy. Each of the techniques is in its own way physically or mentally invasive, and general systemic management is indispensable if the numerous patients with psychological disorders are to be able to undergo such therapies safely. This is not limited to the patients with mental disorders accompanied by somatic diseases (psycho-somatic). In terms of reducing invasive surgery and adverse drug reactions (the aggressive aspect), and of mitigating the probable occurrence of unforeseen situations, this includes all patients with mental disorders. However, current treatment of mental disorders continues to stay within the domain of internal medicine such as consultation, and is essentially no more than external support for psychiatric treatment. In some instances, it is not possible to indicate a satisfactory somatic treatment because the patients have mental disorders.

Internally, namely in psychiatric hospitals, the study of somatic management to facilitate effective psychiatric treatment has yet to be conducted systematically. The necessity for such systemization is based on (1) the singular relationship between patient and psychiatrist, (2) the singular nature of the setting, and (3) the singular nature of the pathology and technologies involved. In psychiatric treatment, an “intersubjective relationship” between the patient and psychiatrist is crucial, with this relationship of mutuality between the two parties being more significant than in any other branch of medicine. Accordingly, under somatic management, when a non-psychiatric physician is added to the equation ideally, there should be no adverse impact on the dynamics of this relationship between patient/psychiatrist. Instead of entering the relationship between patient/psychiatrist, the physicians in psychiatric hospitals are required to use advanced techniques to treat somatic disorders and manage adverse reactions whilst behaving as a separate entity.

Regarding the singular nature of the setting, the press frequently reports mass outbreaks of tuberculosis or influenza resulting from the living habits in closed hospital wards. It is important to understand the singularity of the clinical setting and to implement care in consideration of the prevention of infection and environment management. Moreover, it is necessary to provide knowledge and technology to reduce the adverse reactions induced by electroconvulsive therapy and pharmacotherapy, and to develop techniques to facilitate this. Adverse reactions such as water intoxication and malignant syndrome, that are characteristic of psychiatry, need to be detected in the early stages and treatment management techniques must be developed. The issue of obesity and hyperlipidemia apparently caused by long term administration of psychotropics is poorly understood and only serves to increase the significance of somatic management.

In forefront psychiatry, there is marked indifference to the above-mentioned physical and environmental conditions, and psychiatric care is frequently disrupted as a result. In order for psychiatrists to be able to look at the overall picture of patients’ minds with confidence, it is necessary to promulgate specialized study of the health problems that arise due to somatic management and the environment/habits of psychiatric hospitals. This will be difficult to accomplish, however, if the three singular characteristics of this field outlined above are simply given somatic applications, such as internal medicine. If psychiatric care is compared to a surgical operation, in order for it to be implemented safely and successfully, it needs to be studied in an equivalent way to anesthesiology.
as providing general systemic management.

Anesthesiology and novel somatic practices in psychiatric hospitals are merely examples. If new medical fields can be created in various clinical settings in support of spearheading medical science then this will facilitate the development of the safety sciences within the health care system of the 21st century.

**Becoming Sensitive to Rule Violations —The Importance of the Untrained Eye—**

To protect patients from the aggressive/invasive aspects of modern medical practices it is necessary to reduce the incidence of errors and to introduce the safety sciences. Considered within the context of the framework of medicine, the safety sciences should be developed as a specialist branch of medicine in support of forefront health care. However, this in isolation will not be sufficient to eliminate medical accidents. It is also necessary to contemplate countermeasures to address an additional factor, rule violations.

Since rule violations are undertaken consciously it is not possible to interpret them through the development of learning. Leeson points out that “behind the scenes of a medical incident rules will have been broken or procedures deliberately omitted.” This would seem to imply that specialist medical professionals willfully break the rules. On the contrary, it is the psychological makeup intrinsic to specialists that permits rule violations to be easily undertaken.

Experience is a formidable thing. The gap between qualifying as a doctor and being able to go out after operating on a colon cancer patient and devour guts at a Korean barbecued beef restaurant is not as long as one would imagine. In order to become a medical specialist it is necessary to learn to close one’s eyes to the accepted norms and perspectives of society. This isolation is effectively a psychological defense mechanism. The process of acquiring expertise requires that you become able to trust in the group to follow established routines, closing oneself off from one’s surroundings in order to avoid mental confusion. In one sense, the process of becoming a leading medical practitioner is the process of learning to avert one’s eyes from accepted perspectives (sensitivities) and accept, without question, the norms of the specialist group (which may not always be correct/standard). Leading medical specialists who work continuously in an environment that is far-removed from the generally accepted norms of society are prone to violate the rules without thinking, and to do so repeatedly. It is precisely because they are specialists that they do not follow accepted procedures and commit rule violations. This psychology is linked to the occurrence of numerous medical incidents.

It is for this reason that it is important for medical practitioners to pause for breath occasionally, and take the time to reconsider forefront medical technologies from the perspective (position) of patients (amateurs). If, for example, the world of doctors were to be ranked, the doctors of the 20th century regrettably paid little regard to humanity and common sense. This is summarized in the review of Mizuta as follows.

“After qualifying, even if a doctor does not study ethics and philosophy, their reputation as a doctor will not change. Doctors are currently evaluated in terms of how many scientific reports they have published.”

How many doctors recognize the need to prevent their own cultural and social background from becoming an absolute standard? The ability of medical practitioners to liberate their minds from their experience as specialists is the key to their potential to becoming sensitive to the simple rule violations that are the main culprits of medical accidents. If the process of becoming a specialist involves the work of closing one’s eyes, then the work of opening one’s eyes wide is necessary after achieving that goal. This is the process of becoming sensitive to the perspectives of amateurs.
In the state-of-the-art medical practice, a doctor will assign all patients with the same pathological condition to a patient group for that disease and will erase all individual patient factors. The doctor will then provide each of the patients in this group with the same protocol. Naturally enough, however, the personal pain experience of a disease is unique to each patient and will have its own background of despair, pessimism and/or moral pain (existential pain).8) It would not be excessive to state that the ability to handle the suffering of individual patients will determine the success of the health care system of the 21st century.

Conclusion
— Aggression Does Not Stop at the Body —

I have emphasized the aggressiveness of the forefront medical technologies that were developed in the 20th century. This aggressiveness can justifiably be considered as being virtually synonymous with invasiveness. Aggressiveness within the context of health care is generally understood to be aggression against the body. However, in the case of the state-of-the-art medicine, this aggressiveness does not just stop in the physical domain.

Within the frame of reference of reproductive medicine, for example, recent developments in this field have been astonishing. One of the biggest advances in IVF in recent years has been the introduction of a technique called ICSI — intra-cytoplasmic sperm injection, which is a microsurgical procedure involving injecting a sperm directly into an egg to achieve fertilization. It has brought good news to many couples who were previously unable to conceive. Oocyte retrieval (OPU) is achieved via the method of hormone stimulation or through paracentesis under ultrasonography. This is a highly invasive technique. In certain cases, the hormone stimulation is excessive and results in retention of peritoneal fluid, or may induce lung edema. Accidental puncture of the bladder may result in complications. Ectopic pregnancy may be induced leading to an emergency laparotomy. The technique brings joy to otherwise infertile parents, but the treatment method comprising hormone adjustment therapy for OPU is physically invasive and is followed by the microscopic injection of a sperm into the ovum thus retrieved. In short, the ovum is pierced by a needle, and if the ovum is anthropomorphized, this technique can be said to be highly aggressive/invasive to the ovum.

This technique also involves the following psychological problems. The ICSI technique has a success rate of around 20%, however, if the treatment is undertaken repeatedly the success rate is said to approach 100%, without exception. It has been branded as the ultimate infertility treatment; i.e. if you don’t utilize ICSI you are not undergoing infertility treatment. In addition, the couples introduced to this method are liable to become psychologically mesmerized, unable to abandon the quest until success is achieved. However, even if the technique results in successful conception, the cost of the treatments accumulates and considerable sums are involved. This technique is also financially (economically) invasive. Moreover, for all the couples who have achieved success, several, if not dozens have abandoned ICSI without their wishes being fulfilled despite having invested both time and money into the process. It is also said to be an exceptionally invasive treatment in emotional terms and in certain cases, patients can undergo trauma (mental injury), or lapse into psychological conditions such as depression, nervousness or anxiety.

There is a tendency to stress only the remarkable aspects of modern medicine, however, it in fact harbors another aggressive, invasive side. The significance of risk management to forefront medicine can be understood by way of this bilateral character of state-of-the-art medicine. In the first instance, studies in support of forefront medical science are necessary if medical technology is to be safely employed. This is linked to lessening the physically aggres-
sive aspects of modern medical care. Moreover, those engaged in the provision of health care need to make efforts to ease the financial and psychological burdens of medical technology by making commonsense judgments from the perspective of those on the receiving end of such technology (the patient side).

This paper has presented examples of methods for alleviating the three aggressive aspects of modern medical science (physical, financial, and psychological) that can be established within the health care system, in what can be referred to as the work of causing the tree of modern medical science to put down firm roots.

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