Opening Lecture

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Medical Computing as a Component of Health Care Delivery Systems

Mr. Chairman, Ladies and Gentlemen,

I feel indeed greatly honoured by the invitation to give the opening lecture at this first world conference on medical informatics. I am no specialist either on information systems, on information processing or on computer techniques. I only represent the consumer side, and I do not even master the scientific jargon which is spoken by information and computer specialists. It is however my hope that, despite all this, I shall make myself understood.

To begin with, I would say that this conference comes at the very right time. I feel that, since we have by now collected so much knowledge and experience, made so much progress and so many mistakes, evoked so much enthusiasm and caused so many disappointments, it is at this point important for us to make a survey of the present situation, to determine our position, and to establish the objectives for the future. This will be difficult with regard to the great number of specialists involved. There are specialists in information systems, in informatics and in computer techniques; there are doctors representing the most varying scientific branches, and there are public health and hospital administrators and decision-making politicians. It will be necessary that a clear picture is presented to all these groups. They will need to know:

(1) what has hitherto come out of medical computing that clearly justifies its application with regard to function, effectiveness and economy?

(2) under which prerequisites is it possible and advisable to introduce medical computing?

(3) which parts of present activities are development and research projects and therefore not as yet ready for general use?

(4) which guidelines shall be followed for development and research work?

I was pleasad to observe that all these points coincide with the intentions of this conference as pronounced in the official inviation as follows: "Medinfo 74 will cover the broad field of information processing in medicine and public health. The objective is to critically review and discuss the current status and provide guidelines for the future". It will perhaps be of interest for this audience to learn that exactly the same trains of thoughts have been discussed within the International Hospital Federation (IHF) which, at its congress in Montreal in 1973, decided to set up a study group of prominent specialists who are to give a report on these problems at the international hospital congress in Zagreb in 1975. The same needs have thus been found urgent simultaneously within the IFIP and the IHF.

In this context I would also like to convey the very best wishes from the IHF for successful and interesting work during this conference.

At the starting moment of a conference on information technology for world health there may be reason to put the question how the introduction of electronic data processing has been received and experienced within the health and medical

care section. I have already partly answered that question when talking about progress and mistakes, enthusiasm and disappointments. By and large, it could probably be said that the information needs have not been sufficiently studied and that, consequently, the information systems have not been sufficiently defined. It could also be said that there was a lack of a well-defined conceptual basis. In that situation the medical care field was not well enough prepared to enter the data age. It was taken by surprise. Some of the negative effects were difficulties in judging rightly the possibilities and limitations of the new technique, which was therefore in many places introduced insecurely and unsystematically. It sometimes happened that the computer technique too much steered the development of information systems instead of being a tool for processing ready-developed systems.

Within the medical care field we can distinguish two groups of data and information systems, that is, an administrative and a medical sector. For certain parts of the administrative sector the introduction of electronic data processing has been fairly free from complications. This is particularly true of well-defined data such as salaries, etc., whereas patient management data have caused considerably more problems. It is, however, within the medical sector that we have met with the greatest difficulties. This difference is rather natural, since the administrative sector has in many respects had fairly well defined systems and routines. One has also almost exactly known what pieces of information that should be extracted, but it created many difficulties and caused too high costs to do this with manual methods. It then became rational to take to computer techniques. The initial position of the medical sector was wholly different. We had there no solid basis for the development since we lacked logically constructed systems. But we work with lots of medical data which have not, as yet, been sufficently analyzed with respect to:

(1) the true value of information at the patient's contact with the health care system;

(2) the value of such data as future anamnestic information;

(3) the value of data as steering information within the system.

With this background, it was unfortunate that we had not sufficiently distinguished between systems development and informatics and that we started at the wrong end by introducing electronic data processing too early and before the systems had been properly defined. An uphappy confrontation, as related to time and development, between medicine and electronic data processing has in certain instances influenced patient care and its information systems, as the interest was focussed too much on the possibilities of the computer technique. This is not the right strategy to tackle the problem.

Another extreme has been to introduce electronic data processing for the information material of medical records. Most of us still think too much of the medical record as a file full of data that should be kept in order. Essential improvements have been introduced, but the medical records still vary both as regards the degree of systematization and the structuring. At first it may seem important to have such data transmitted to a big computer. But this is not the case. The road via such a material is not passable. The essential thing is to find out the logical connections and thereafter to create a logical structure.

I imagine that by now it will have appeared that I do not see future difficulties in the data processing as such but more in the development of functional and rational information systems. No one can question the needs within health and medical care for information, straight information lines, and adequate data processing. It is, however, difficult to indicate exactly which roads we shall follow in order to obtain the right answers. We will obviously have to study the whole patient care system

with respect to the application of modern electronic data processing but without letting ourselves get intoxicated by its great possibilities. The systems must not be more comprehensive, more circumstantial, or more sophisticated and expensive than they need to be. I can see four main roads to reach this goal and that is by:

basic research in medical informatics,
experimental application,
evaluation of experiments,
education.

When there have been possibilites to start from completed systems–I here mainly think of the adminstrative sector–it has been simple to estimate the costs for introducing electronic data processing and to earmark a certain proportion of the budget for the purpose. This has equally been done in a few, though narrow, medical sectors such as the laboratory services. We have here simple data and flows of information with which we have been able to make acceptable cost-benefit estimations. With such results in hand it has been possible to obtain grants both for basic research and for experimental work. Considerable amounts of money have also been invested for such purposes and the practical results must be considered as relatively good. This is however only a very small part of the whole medical sector.

Within the greater and most important part of the medical sector it has not been possible to make similar analyses and estimations as regards future development. As we all know, much money has nevertheless been invested in this field and it is here that we have met with the greatest difficulties and disappointments. I believe, however, that even those who maintain that we have wasted money and that it has cost too much on reconsideration must accept the comprehensiveness and complexity of health and medical care and also its very heavy costs. For countries like the United States, Canada, Great Britain and Sweden it is a question of costs amounting to 5–8 % of the gross national product. If we look at the problem in that perspective, we cannot deny that, so far, relatively unimportant sums have been spent on that which is basic in this context, namely the development of the medical information systems.

I would maintain that sufficient research has not been done in this field, and there is too much evidence to show that the research part has been incompletely dealt with or sometimes even totally neglected. There is definitely a need for more intensive research in order to make clear both the need for information and the relative value of varying kinds of information. This may seem to be an unreasonable project, as it would have to include health and medical care at all organisational levels and within all specialities. Quite obviously, this is comprehensive but, on the other hand, it could be easily divided into minor objects. Much also depends on the amount of data which are to be used for the computerized systems.

If we agree on this, it will be important that no one promises and that no one expects too quickly practical results in the form of rationalization gains and lower costs. Also in this domain one has to accept a basic and cost-consuming research period which does not yield instant practical results. It thus becomes more and more clear that research on information systems for health and medical care stands out as an important part of the extensive research field which is epitomized in the concept "medical care research".

It would be wrong of me to try here to indicate guidelines for such research. That is the task of this conference. But I do believe that the work will be successful, if a critical attitude is maintained when medical information systems are to defined and if more attention is paid to that which is necessary and justifiable than to that which could be carried out thanks to the great technical possibilites. We must produce a method that shows which of the data collected for in- as well as

outpatients that should go into the system, because they are needed at the time or will be so in future. You will have to put such drastic questions as how far it is worth going in details and perfection when defining the systems. I imagine that one can also shed light on these questions by studying the inconveniences appearing when patients come to newly opened hospitals and health centres which do not have any previous data about the patients, or when patients are admitted as emergency cases to a hospital where they have never been before. How important is it for the treatment of middle-aged patients' fractures or for the indication of a cholecystectomy to have quick access to information on illnesses during childhood? And how important is it within long-term care to have information about previous fractures and cholecystectomies? I believe that questions of this kind may help us to find out what logical information is needed and this should be structured, i. e., how the systems should be defined.

It is now about 15 years since the pioneers in the medical information field told us how very backward our old information systems and our data processing were. Since then the development has been uneven and in certain important sub-sections rather sluggish. But it is essential that we learn from our experiences. Some projects have been very comprehensive and have more or less aimed at complete systems, whereas others have been more modest in that respect. There is no doubt that the more extensive the efforts, the greater the difficulties. It is definitely easier to attack smaller sections, but you will then instead have to make sure that your section is so designed that it can later be incorporated in a larger system. This train of thoughts agrees with the module strategy for health and medical care information systems for which Werner Schneider has been the spokesman. As an illustration of such sub-sections, or modules, within which successful work has been carried out can be mentioned:

laboratory services,
chemistry,
bacteriology
raiophysics,
physiology,
rehabilitation,
raditherapy,
paitent follow-ups,
routine health controls.

The evaluation of the systems or the sub-systems ought to be carried out both at the international and the national level. There exist no great fundamental differences between the various countries as regards health and medical care, but there are great many differences in details. A national evaluation that I am specially familiar with is that carried out in Sweden and which was started by Spri (the Institute for the Planning and Rationalization of Health and Social Welfare Services in Sweden) in 1969. An inventory and evaluation of current projects and their results were published in 1971. It could be said that Spri has hereby given to Swedish health and medical care a consumer information that includes both economic analyses and qualitative evaluations. The latter kind of information was made available on even such complex instruments as data base management soft-ware.

A question that is both important and difficult concerns education. When it comes to introducing computer technique within health and medical care, we know from experience that we may meet with many difficulties that will cause crises within the organisation. These are mainly psychological factors connected with the level of training or lack of training and data experience among the staff concerned.

If the staff does not possess the data maturity that is required, successful cannot be expected. The fact is also that the whole group of users along th line, that is, doctors, nurses, etc., have not had any training in this field duri ordinary professional education. The very few who got some training usual attended those courses that are more oriented towards coding, machine ope etc., but not to that which is really important in this context, namely definit information, information systems, information processing, and storage and r of information. An improvement must indeed be achieved in this respec knowledge is not only necessary for introducing the systems but also a prer for continued development.

To conclude, I would like to return to this conference and its programme good omen for the future that so many specialists of varying categories and high standard have been engaged for its meetings. This warrants that the problems of medical information will be discussed on a higher profession than perhaps ever before. We are all glad that so many doctors nowadays sp in information processing and its medical applications within patient care a so many of them take part in this congress. They will be quite indispensable joint efforts for the welfare of patient care as they will no doubt work in th of one of the Swedish pioneers in this field, Gunnar Wallenius, who used to s the aim was not to computerize the hospital but to hospitalize the computer.