

Classic Paper Selection*

Historic landmark paper selected by Morris Collen for the 2006 IMIA Yearbook of Medical Informatics

I have selected the paper by Robert S. Ledley and Lee B. Lusted 'Reasoning foundations of medical diagnosis' which appeared in the journal *Science* 1959; 130: 9-21, as a landmark paper. On studying computer-aided diagnosis programs and clinical decision-support systems, I was most impressed by this paper. I consider this to be the most important medical informatics paper I have ever read since it had such a great influence on stimulating the development of computer-based, clinical-decision support that should be a major goal of every comprehensive medical information system.

Excerpt from the article

Ledley RS, Lusted LB. Reasoning foundations of medical diagnosis. *Science* 1959; 130 (3366): 9-21.

The purpose of this article is to analyze the complicated reasoning processes inherent in medical diagnosis. The importance of this problem has received recent emphasis by the increasing interest in the use of electronic computers as an aid to medical diagnostic processes (...) Three factors are involved in the logical analysis of medical diagnosis: (i) medical knowledge that relates disease complexes to symptom complexes; (ii) the particular symptom complex presented by the patient; (iii) and the disease complexes that are the final diagnoses. The effect of medical knowledge

is to eliminate from consideration disease complexes that are not related to the symptom complex presented. The resulting diagnosis computed by means of logic is essentially a list of the possible disease complexes that the patient can have that are consistent with medical knowledge and the patient's symptoms. (...) The mathematical techniques that we have discussed and the associated use of computers are intended to be an aid to the physician. This method in no way implies that a computer can take over the physician's duties. Quite the reverse; it implies that the physician's task may become more complicated. The physician may have to learn more; in addition to the knowledge he presently needs, he may also have to know the methods and techniques under consideration in this paper. However, the benefit that we hope may be gained to offset these increased difficulties is the ability to make a more precise diagnosis and a more scientific determination of the treatment plan.

Historic landmark paper selected by Hans Peterson for the current IMIA Yearbook of Medical Informatics

I have selected a paper, which was first published in Swedish in *Läkartidningen* 1968;65:3196 - 3203 and the English version was published in *Computers and Biomedical Research* in 1970: Abrahamsson S, Bergström S, Larsson K. The Danderyd Hospital Computer System. A total regional system for medical care. *Comput Biomed Res* 1970; 3: 30 - 46.

This paper was the signal to me to switch from Ophthalmology to Medi-

cal Informatics. The late Professor Sixten Abrahamsson was professor in Computer Crystallography at the University of Gothenburg, the late Professor Sune Bergström was Rector at the Karolinska Institute and later got the Nobel price in Medicine and Prof Kåre Larsson became professor at the University of Gothenburg. These were the persons from which I took over the lead of the development in 1971.

Abstract of the article

Abrahamsson S, Bergström S, Larsson K. The Danderyd Hospital Computer System. A total regional system for medical care. *Comput Biomed Res* 1970; 3: 30 - 46.

The greater Stockholm area constitutes a medical region serving about one and a half million people. All hospital resources of the region will be under one administration in 1971. An optimal public health service in such a region can hardly be obtained without a computer system. A real time medical information system has, therefore, been designed at the Computing Center of the Stockholm County Council which will provide means of continuously following total medical picture of the whole region and control the utilization of the available resources. The system is centred around a direct-access file containing administrative and medical data for the total population. These data are rapidly available via terminals to all users in the region within their spheres of authority. The article describes the basic philosophy of the system and the first implementation phase - the creation and operation of the total population file.

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