

Screening for Better Health: Enter the Computer

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The Automated Multiphasic Examination

Second part, follows "[Screening for Better Health: Medical Care as a Right](#)"



IBM 1440 computer processing room at Kaiser Permanente, circa 1964
Last summer a major medical [news story](#) splashed across the world: "Historic Kaiser Permanente Data to Aid in Long-Term Study to Determine Extent of Ethnic Disparities in Brain Health and Dementia; new \$13 million study funded by National Institute on Aging will revisit patients who were first screened as long as 50 years ago."

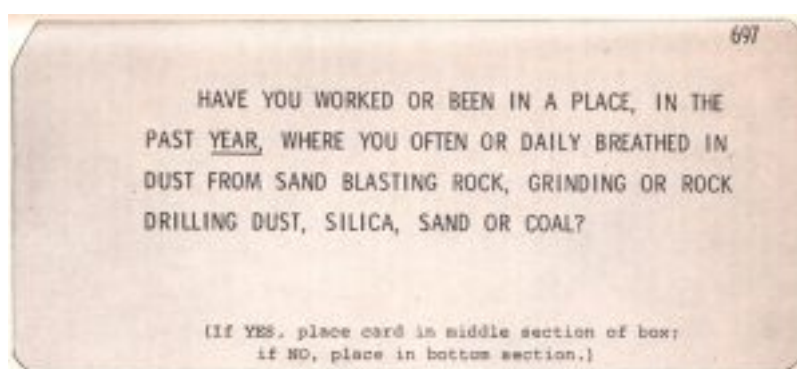
Where did this remarkable trove of data come from?

In 1961 the U.S. Public Health Service awarded the Kaiser Foundation Research Institute a grant to study the automation of the multiphasic health testing it had been conducting manually for 10 years. Members would now go through the screening stations with computer cards that got marked along the way. At the end of the session, which took a couple of hours, there would now be a computerized medical record of their current health status. The Automated Multiphasic Health Test was born.



Multiphasic stations, from "The Multitest Laboratory in Health Care," by Drs. Morris Collen and Lou Davis, *Journal of Occupational Medicine*, July 1969. The first AMHT center was at a new building on the Oakland Hospital campus at 3779 Piedmont Ave. By the end of 1966, Kaiser Permanente had enlarged and updated its testing facility and laboratories nearby at a state-of-the-art center at 3772 Howe Street, and expanded the computer center and offices in the Piedmont building. A second center in San Francisco was linked to the mainframe computer in Oakland.

Dr. Collen, in the *Journal of the American Medical Association* (1966), accurately predicted that "The advent of automation and computers may introduce a new era of preventive medicine ... [The computer] will probably have the greatest technological impact on medical science since the invention of the microscope."



AMHT questionnaire card about occupational healthThe AMHT continued to be seen as a vital tool in the diagnosis and treatment of occupational and industrial illnesses. A 1967 article in the *Archives of Environmental Health* discussed the employment data gathered, which included a list of 170 occupational titles and a battery of work-related health questions. "The computer storage of data on more than 40,000 adults annually permits extensive epidemiological research, especially directed toward the preventive aspects of chronic disease."

It wasn't just union members who benefitted. *The Modern Hospital*, May 1966 called the periodic health examinations to more than 4,000 patients monthly "... an impressive investment in the concept of ?health medicine."



AMHT station 4 skin fold thickness test, a much more accurate indicator of obesity than BMI. The test expanded to about 20 stations, measuring everything from hearing to heart function. It even went beyond mere testing ? if recommended, a patient could get a tetanus booster via the new high-pressure injector system.

A 1970 article by Dr. Garfield in the prestigious *New England Journal of Medicine* with the provocative title "Multiphasic Health Testing and Medical Care as a Right" began with this abstract:

Although no long-term evidence exists that the course of disease is influenced by multiphasic health testing, this is largely irrelevant. Such programs are essential for other very important reasons. The existing and spreading concept of medical care as a right, with its elimination of personally paid fees, is creating a demand for periodic health checkups and health appraisals. This demand cannot be met by traditional methods totally involving the physician without great waste of doctor time.

Multiphasic health testing can help separate the entry mix of patients into the well, the asymptomatic sick and the sick. This separation makes possible optimum use of physicians' services, which can be devoted to the area where they are most needed: the care of the sick.

The efficiencies of the AMHT were sufficient that these programs were sometimes adopted

by private practice, large companies, and public health agencies. Dr. Collen remarked:

It is still of great interest to me and much personal satisfaction that the AMHT is still flourishing in Japan, Taiwan, and in China; and in the past when I visited them I found the AMHT centers in Japan to be primarily employer-sponsored for employees. I found the newest AMHT centers in Taiwan and China to be for-profit, marvels of efficiency and associated with health education centers open to the public, and with a high level of provider and patient satisfaction.



"Multiphasic Screening Comes to Portland," Healthgram, Winter 1976 But despite the AMHT's popularity, it was discontinued by Kaiser Permanente by the late 1970s when a federal grant supporting the work dried up and Kaiser Permanente declined to commit further resources.

Dr. Collen himself noted some of the challenges to quantifying the benefits of screening:

...Epidemiologists required us to report on gross mortality, and since the potentially postponable conditions comprised only about 15 percent of all the causes of death, most people died from other conditions ... some of the criticism of urging checkups is based upon the fact that one does not decrease total gross mortality. That is, everyone eventually dies from something.

Gary Friedman, MD, former director of Kaiser Permanente's Division of Research, recently explained additional medical limitations to the AMHT:



Kaiser Permanente silent film showing the Automated Multiphasic Health Test process, circa 1970. Click to play. Initial enthusiasm for multiphasic health screening was tempered by experience in using it and by scientific studies that did not confirm benefits vs. costs of specific screening tests. For example, it was initially hoped that routine chest x-rays, included in AMHT, would lead to early detection and increased curability of lung cancer. Studies did not confirm this benefit. A yes/no question about chest pain provoked by exercise and relieved by rest was included in the AMHT symptom questionnaire. Although a yes answer seemed almost diagnostic of angina pectoris, this often did not prove to be the case in the follow-up examination by the physician, who could question the patient in greater detail, consuming valuable time.

Clearly however, the value of some screening tests has been amply confirmed. Finding and treating high blood pressure in asymptomatic individuals prevents strokes. And screening for colorectal cancer by the various tests available can lead to early detection and cure, or the removal of polyps that could later progress to cancer.

Despite these issues, Dr. Collen defended the value of the AMHT in a 1986 UC Berkeley oral history by Sally Smith Hughes:

...The study [on AMHT] did clearly demonstrate that for those conditions that are potentially postponable, there is a significant decrease in mortality.

He went on to note larger policy and commercial impediments to the AMHT:

Blue Cross/Blue Shield and other indemnity insurers to this day still do not pay for checkups. They take the position that periodic health checkups are schedulable and elective, so are not insurable events. Medicare to this day does not pay for checkups. The contrast, in other countries, like in Japan and in France, their social security and governmental supportive systems pay for periodic health checkups for well people, but do not pay for sick care. Just the opposite from the U.S. So if our Public Health Service is so interested in



Dr. Morris Collen at Multiphasic registration counter, circa 1966 preventive medicine, why do

they fail to support the financing of checkups? A very key reason that multiphasic testing has not proliferated in the United States is because it is not reimbursed by any of the insuring agents. That has been reported by vendors who try to sell the systems.

I should point out that the Public Health Service had asked us to patent the system because it was an invention. Whether I was right or wrong, I refused to do so. I felt that it should be in the public domain, and it is. It's never been patented.

Dr. Collen concluded with deep pride in the accomplishments:

We actually developed the most comprehensive inpatient and outpatient medical information system in the world. And this book, *Hospital Computer Systems*, describes that. There were only a half-a dozen others in the world that were doing that.

As the 2016 medical news story about the persistent value of the AMHT data shows, this was a significant accomplishment in medical practice. Thank you, Dr. Collen.

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