Computers as a Complement to Diagnosticians

To the Editor:

The multitesting screening and automatic sequential testing protocol for initial abnormal test results advocated by Larson and Toren (1) is indeed a provocative and debatable subject. Larson and Toren consider this protocol analogous to a complete history and physical examination and recommend its acceptance. They contend that physician interaction merely creates a "ping-pong" effect (2) between laboratory and physician.

It is doubtful, however, for two reasons that their program would be adopted by hospital medical staffs.

First, it is an improbable premise that a defined battery of primary screening and secondary sequential laboratory tests would satisfy the numerous protocols physicians themselves use to diagnose disease. It must always be remembered that laboratory tests are not ends in themselves; they are merely tools and, like all tools, they reflect only the skill of the user (3). Furthermore, results are meaningful only when one has a clear understanding of the underlying assumptions of the test (4).

Second, the Blue Cross and Blue Shield Associations have recommended that their member plans discontinue providing benefits for routine diagnostic tests (biochemical screening) for patients admitted to hospitals for medical treatment. This action is probably in part a reflection of the concern that routine diagnostic testing has unwittingly become an expensive substitute for judicious history-taking and physical examination.

Diagnostic testing, computer directed, can complement but can never replace the time-honored value of the history and physical. Perhaps there is a place for automatic-sequential testing, but we do not believe it is within the hospital environment. A more likely area would be within industry as a part of a preventive-medicine program. In such a setting large segments of a population presumed to be normal could be screened for subclinical disease. With appropriate application of statistical analysis, automatic-sequential testing might be beneficial in helping to establish latent disease in the asymptomatic individual, with obvious potential benefit to both employee and employer.

Paul Pottgen
E. R. Davis
Med-Chek Laboratories Inc.
Pittsburgh, PA 15238

An author of the paper in question responds as follows:

To the Editor:
The work to which Pottgen and Davis refer was reported by Cembrowski et al. (1), who described an analytical system controlled by a small computer that would provide sequential testing; each successive test was selected on the basis of the outcome of the previous tests. To a large degree, it was based upon the Pathologist-Assisted Laboratory Investigation (PALI) system described by Altshuler et al. (2) (St. Joseph's Hospital, Milwaukee, WI). Contrary to Pottgen and Davis' contention, PALI has proved to be quite popular among members of the hospital medical staff.

The practice of referring a patient to a specialist and expecting him or her to proceed along a course determined by the consultant's initial findings is not unusual in medicine. It is, in fact, quite the rule. It would be wasteful were such specialists to send the patient back with the initial abnormal findings and then ask the referring physician what to do next. In clinical pathology, a part of a patient—that is, serum or blood cells—is sent to specialists who are asked to use their expertise to derive useful information from the specimen. If something is abnormal that requires further testing to define it, it seems reasonable to make the appropriate studies then and there rather than to report the abnormality and await further directions from a physician who may know less about the meaning of the abnormality than does the pathologist. What Altshuler et al. propose (and do) is common practice in microbiology. If a blood culture is positive, the microbiologist proceeds to test the organism for antibacterial agent sensitivity. Of course, he may be directed to do so or not to do so by the physician ordering the request. This option is included in the PALI system. What Cembrowski et al. suggest in their paper is that, to the extent that these decisions can be made by a computer, they should be. The answer is provided sooner and at less expense. The assumption is that the sooner a diagnosis is made the sooner treatment can get under way and the more effective it will be. Far more should be done in this area of investigation, and I expect will be.

It is true that Walter McNerny has recommended that the Blue Cross and Blue Shield Associations discontinue payment for screening tests. He made this announcement through the news media, including an interview on the McNeil-Lehrer television program. I wrote him challenging the wisdom of this action and received a reply that in my view was not at all convincing. It cited the Australian study (3) previously referred to in this exchange of correspondence and the opinion of the American College of Physicians (ACP).

I am not sure that the results of the Australian study can be extrapolated to our nation. I understand that hospitalization in that country is "free." There is less pressure to shorten the hospital stay, the reverse being increasingly the case in the United States. No well-controlled study has been completed regarding this question and I doubt if it is possible today to do one. One must proceed on the basis of pure reason.

With respect to the ACP, I am not sure how that organization (or any other) can have an opinion. I am a Fellow of the American College of Physicians. I wasn't asked to express my opinion nor do I know a member of the ACP who was asked. I am not aware that they have a "panel of experts" to whom to turn to answer questions regarding laboratory use. McNerny is concerned with charges, not partly, but entirely. Those who understand the economics of hospital financing realize that this is a phony issue. There is very little relationship between charges and the cost of performing laboratory procedures. Clinical laboratories are hospital revenue centers, a circumstance forced upon them by previous attempts to control costs of hospitalization by controlling per diem bed rates. Unlike almost everything else, laboratory costs have decreased substantially in the past 20 years, largely due to automation.

We have not suggested that laboratory testing should replace history-taking and physical examination. We agree it should complement these "time-honored" diagnostic techniques. I will, however, suggest that these classic ap-

References

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