"spaghetti" or "dog's breakfast" programs. This criticism of the unrestricted GoTo statement led to the development of structured programming (also known as step-wise refinement and top-down programming) as a method for solving problems and for producing well structured programs. In a well structured program one section of the program is protected from other sections and has a precise and concise interface with the rest of the program. This allows sections to be modified or replaced without catastrophic repercussions elsewhere in the program. To permit this type of programming various "structured" control statements such as the IF-THEN-(ELSE), REPETITIVE and WHILE statements were developed and stressed.

How does this justification of structured programming lead to a damning of low-level flow charts? In the translation of a low-level flow chart to a coded program it is natural to represent the arrows of the flow chart by GoTos in the program, which leads to the "spaghetti" program. Furthermore, it is very difficult and unnatural to translate a low-level flow chart into the structured control statements mentioned. This failure of the flow chart has led to its fall from favour as a method for problem solving, especially as related to programming. In conclusion, we again stress the legitimate uses of flow charts: to represent the flow of information and to provide a high-level or macroscopic description of a program.

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Use of computers in medical practice

To the editor: The views expressed in the article entitled "Can the computer ever take over the practice of medicine?" (*Can Med Assoc J* 121: 1113, 1979) must have been comforting to the medical profession; however, I believe Jim Garner has missed the point when it comes to computer applications. Medical software has been designed not to replace physicians but to aid them in deciphering the complex mountains of information that may be generated in an attempt to diagnose and treat a patient.

As a laboratory technologist I have become acutely aware of the vast numbers of laboratory tests now available to physicians. McConnell and colleagues[1] have stated: "The proliferation of tests and the continuing refinement of their meaning now confront physicians with such large and complex arrays of results and shades of meaning that it is difficult to grasp their implications in a reasonable period of time, without lengthy study. It may now be easier to obtain test results than to understand them, and it is no wonder that physicians might fail to respond properly to, or even notice, important laboratory findings, much less realize their full implications."

In an attempt to relieve this information overload, protocol-based computer reminder systems have been developed to alert physicians to critical values that indicate that further diagnostic study or a change in the therapeutic regimen is required. In a controlled clinical study at Indiana University's school of medicine nine medical residents responded to twice as many clinical events when given computer recommendations as when not.[2]

Computers may be programmed to easily handle complex cost-benefit analyses, which, given the spiralling costs of medical care, must become a significant factor governing the choice by physicians of diagnostic measurements and treatments.

Medical decision analysis also lends itself to computer application. As the hazards of obtaining laboratory data become more evident, decision analysis gives a systematic exposition of clinical management and lessens, if not eliminates, the influence of biased and unreliable intuition, which may lead to faulty judgement.[3]

In a recent study at Stanford University in California a computer-based consultation system was evaluated on its ability to prescribe an antibiotic regimen for 10 test cases of meningitis.[4] The computer system outscored five faculty specialists, never failed to cover a treatable pathogen and demonstrated efficiency in minimizing the number of antimicrobial agents prescribed.

Computer applications in medicine will come of age in the 1980s. Despite resistance of many doctors to the use of these machines, the computer will lead to a new era in medical care. With the cooperation of physicians, computers may become to the medical system what the wheel was to mankind.

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Activation of latent tuberculosis by nonsteroidal anti-inflammatory agents

To the editor: I am writing to report a patient in whom latent pulmonary tuberculosis flared up following treatment with nonsteroidal anti-inflammatory agents.

Case report

A 64-year-old woman had rheumatoid arthritis and mild hypertension controlled with hydrochlorothiazide, 50 mg/d. In June 1977 treatment was started with ibuprofen, 600 mg four times a day, and indomethacin suppositories, at bedtime. When the patient was seen in November 1978 her weight was

62 kg and her height 156 cm. She later complained of weight loss, poor appetite and weakness, and by March 1979 she had lost almost 20 kg. A chest roentgenogram revealed a granulomatous lesion at the left apex unchanged from that seen in 1976. Attempts to collect sputum for cytologic examination and to search for acid-fast bacilli were unsuccessful as no sputum was being produced. Her chest was clear at that time and she was found to have iron-deficiency anemia. In June 1979 *Mycobacterium tuberculosis* was cultured from the sputum.

Discussion

The relation between the administration of corticosteroids and the reactivation of latent tuberculosis is well established,[1] and is thought to be the result of the anti-inflammatory, immunosuppressive actions of these agents. Since the nonsteroidal anti-inflammatory agents have similar immunosuppressive properties it is surprising that the strong theoretical probability that these agents may also activate latent tuberculosis has not been publicized. While it is obvious that many factors are involved in such cases, the one I have reported suggests that the relation between anti-inflammatory agents and the activation of latent tuberculosis may be more than theoretical.

I would be grateful for any further documentation of this problem.

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Identification of impaired hearing in early childhood

To the editor: I congratulate Drs. Daniel Wong and Chandrakant P. Shah on their excellent review article regarding identification of impaired hearing in early childhood (*Can Med Assoc J* 121: 529, 1979). The Canadian Advisory Coalition on Childhood Hearing Impairment, of which I am a member, has recently been addressing itself to a number of the issues raised in this article.

As Wong and Shah mentioned, one of the definite requirements is increased awareness by primary care physicians of the extreme importance of early diagnosis and of the methods involved in establishing the diagnosis. Probably the most important single tip is to pay attention when a parent suspects a hearing loss in his or her child.

Also vitally important is the establishment of a high-risk registry in all provinces to identify children who should receive extra follow-up and testing. This appears to be under provincial jurisdiction; therefore, pressure will have to be applied in each province for such a system.

My only criticism of this article involves the comments by Wong and Shah on the management of hearing-impaired children. They have stated that the "auditory" approach, which relies completely on the child's residual hearing, produces the best speech and language development. More recent studies, however, have shown this not to be the case; the "total communication" approach, which uses all available means of communication — residual hearing, lip reading, finger spelling and sign language — has been shown to produce equally good speech development and, in fact, superior language development.[1-6]

The statement that "Each child should be given the opportunity to learn how to communicate by the most suitable method; rigid insistence on one method is not recommended" is extremely significant. Many professional and volunteer organizations for the deaf (including most of those mentioned in the article) are in favour of a single approach (usually the "auditory" or "auditory–oral" methods). It is of utmost importance that the parents of a deaf child be given the factual unbiased information regarding the various forms of management and education as soon as the diagnosis has been made. Failure to do this can have very serious consequences on the child's development as well as on the family as a whole.

Two sources of relatively comprehensive information are the Canadian Co-ordinating Council on Deafness (55 Parkdale Ave., Ottawa, Ont. K1Y 1E5) and the International Association of Parents of the Deaf (814 Thayer Ave., Silver Springs, Maryland 20910).

I again compliment Wong and Shah on their article; I hope every primary care physician in Canada reads it.

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