

PROTOCOLS/ALGORITHMS

Baldwin H, Fleischer R. "Outcomes research and practice guidelines." *J Am Acad Physician Assist.* 5(7): 533-5, Jul-Aug 1992.

US Department of Health and Human Services, Public Health Service, Agency for Health Care Policy and Research. *Allied Health Perspectives on Guideline Development.* Rockville, MD: Public Health Service, Agency for Health Care Policy and Research. OM91-0507. Nov 1990.

The Agency for Health Care Policy and Research (AHCPR) was established in 1989 by PL 101-239 to enhance the quality and appropriateness of health care services and access to such services. AHCPR is responsible for facilitating the development, review, and updating of clinically relevant guidelines for the practice of health care. The voluntary practice guidelines are designed to help practitioners and patients choose appropriate health care in specific clinical circumstances. To obtain copies of published guidelines, telephone AHCPR at 800/358-9295.

Wheeler MF, Wilson LO, Wilson FP, Wood RW. "Algorithm-directed care by nonphysician practitioners in a pediatric population. Part II. Clinical outcomes, patient satisfaction, and costs of care." *Med Care.* 21(2): 138-146, Feb 1983.

Journal abstract: We compared outcome and cost of care for 2234 pediatric patients with upper respiratory tract infections cared for by nonphysician practitioners and 304 similar patients cared for by pediatricians. We found no significant differences . . . between nonphysician practitioners' patients and pediatricians' patients in the status of the original symptoms, the number of patients reporting new symptoms, the number of return visits, or the reasons for return visits. Approximately 93 per cent of both groups had no complaints about their care. Medication costs were higher for Pamosists than pediatricians, but lower labor costs caused Pamosist care to be 15.5 per cent (\$2.64) less expensive than pediatrician care in this setting, even when the Costs of Pamosist audit by computer were included. Through use of clinical algorithms with computer audit, relatively untrained nonphysician practitioners can deliver safe, cost-effective health care to pediatric patients with upper respiratory infections.

"Some X-rays, tests can be avoided in back pain therapy." *Fam Pract News.* 10(15): 42, Aug 1, 1980.

Costs and outcomes of treatment for patients seen by PAs using a clinical algorithm designed to reduce testing, such as spinal x-rays, urinalyses and urine cultures were compared with costs and outcomes for patients previously treated by PAs. Reduction of tests was successful with no adverse effects on patient outcome; quality of care by PAs was judged good and patient satisfaction was high.

"Computer medical record audit reported successful by Massachusetts HMO." *Group Health News.* Pg. 8-9, May 1980.

PAs and NPs at the MIT Medical Department record facts and procedures from a patient visit on a checklist which is then fed into a computer. The audit process checks actual care given against standards of care and corresponding checklists forms for six common medical problems. This checklist form is one component of a computer-assisted audit system which (1) monitors the work of mid-level practitioners in independent settings, and (2) gives feedback to PAs and NPs on the care they give.

Ognibene M, McNitt H, Wolcott BW. "The time relationship of performance and audit feedback on conformance with emergency department process criteria." *Ann Emerg Med.* 9(3): 123-125, Mar 1980.

Journal abstract: Adherence to physician-developed process criteria is critical to the medical and legal acceptance of algorithm-directed nonphysician care of acute non-life-threatening illnesses seen in the emergency department. It is generally assumed that adherence to prescribed medical process criteria results in acceptable patient outcomes. We evaluated changes in compliance with varying time delays in audit feedback and varying degrees of supervision. Our evaluation indicated that, under ideal circumstances of daily audit and supervisory feedback, a conformance rate of 80% was achieved. This is a 100% improvement over a group in which neither element was operative.

Wasson J, Sox H, Garcia R. "A randomized study of the educational effects of an algorithm system." *J Med Educ.* 54: 119-121, Feb 1979.

A study of use of an algorithm system as a method for teaching clinical problem-solving to PAs is described. The algorithm system incorporates clinical algorithms, a checklist form for recording clinical data, a computer program to audit performance in following the algorithm logic as documented on a carbon copy of the checklist, and algorithm logic documentation which describes the medical reasoning behind the algorithm decision points. Study results are discussed.

Grayson M, Nugent C, Oken S. "A systematic and comprehensive approach to teaching and evaluating interpersonal skills." *J Med Educ.* 52: 906-913, Nov 1977.

Journal abstract: This study addressed one problem with current methods for teaching and evaluating interpersonal skills: the failure to include a wide range of behavior reported in the literature as contributing to patient dissatisfaction and noncompliance. To address this concern, the authors developed a comprehensive interpersonal skill-training program and a pretest-posttest evaluation. The tests were administered to two student groups, one of which received the interpersonal skills instruction. The student group exposed to the training exhibited a significant positive change from pretest to posttest. Additionally, the change for this group was significantly greater than the change for the group not exposed to interpersonal skills instruction.

Andrew B. "The use of behavioral checklists to assess physical examination skills." *J Med Educ.* 52: 589-590, Jul 1977.

Describes a methodology for developing behavioral checklists to assess the techniques of physician assistants in performing physical examinations. Results of validity and reliability studies are also reported.

Charles G, Stimson D, Maurier M. "A physician extender training program based on clinical algorithms." *West J Med.* 127(1): 63-68, Jul 1977.

Journal abstract: The ability of physician extenders to provide patient care in a variety of settings has been reported widely. Less attention has been paid to training programs, especially those of short duration, for physician extenders. A three-month training program for physician extenders at a large teaching hospital was based on teaching the skills needed to run 39 clinical algorithms. The course content and the methods used to test the students during the three months may prove of value to those preparing similar programs.

Sullivan R. "Physician extenders, protocols, and quality medical care." *Bull NY Acad Med.* 52(1): 125-137, Jan 1976.

Journal summary: We are educating physician extenders in methods of assessing the process and outcome of medical care by means of explicit criteria stated in the form of protocols.... Both physicians and physician extenders will accept this approach. A substantial effect on the quality of medical care has been documented. When audit is instituted continued vigilance is required in order to give assurance that the method continues to be oriented toward education and research. It remains to be seen whether protocols will find general acceptance in the practice of medicine.

US Government, Department of Health, Education and Welfare. Public Health Service, Health Resources Administration, National Center for Health Services Research. Research Digest Series. *Program analysis of physician extender algorithm projects.* DHEW Pub. No. (HRA) 77-3160, 1976.

Summarizes a four-volume report entitled *Program analysis of algorithm projects and design of a study* by System Sciences Incorporated, 1974. Study abstract: Four programs were studied under a contract designed to define the state-of-the-art of algorithms, from development through application to health care. Baseline data was necessary prior to initiating future studies to determine the impact algorithms have on health care delivery systems. While training is structured around algorithms, it is influenced most significantly by competence of trainees and the operational mode in which the algorithm-trained physician extender is to practice. Of the 23 different algorithms at all four programs, there are three which all sites have in common. There are significant differences among the algorithms, e.g., numbers of logical branch points, physician referral points, and decision points or items of information. In conclusion, algorithms are a useful tool for training physician extenders and probably medical students; they provide a basis for standards of ambulatory care. The training and competence of extenders are critical determinants of algorithm use.

Medex Northwest Training Faculty. "Practice based protocols." *PA J.* 5(4): 197-227. Winter 1975.

Several protocols are presented along with a discussion of an approach to protocol construction and the implications of protocols from the practitioner's perspective. Protocols presented include chronic fatigue, well-child, pediatric ear pain, and unconsciousness.

Johnson J, Sparer G, McDonald M, Berkowitz A. *Algorithms—a tool for training of or treatment by physician extenders.* Presented at 103rd Annual Meeting, APHA, Nov 19, 1975. Pursuant to Bureau of Health Services Research, HRA, DHEW Contract 106-74-144. 23 p.

A review of four training/operational algorithm programs. Conclusions reveal that algorithms: (1) are potentially useful for training physician extenders, and (2) provide a basis for standards of care and are applicable for medical audit, quality of care assessment and peer review. When training and use of PEs are limited by a set of algorithms (e.g. in the Army), triaging must be of high quality. The authors conclude that medical audit should be utilized in any health care delivery system which uses algorithms. Further research into the use of algorithms is recommended.

Grimm R, Shimoni D, Harlan W, Estes E. "Evaluation of patient-care protocol use by various providers." *New Engl J Med.* 292(10): 507-511, Mar 6, 1975.

A symptom-oriented protocol was evaluated. After introduction of the protocol, performance by all providers was significantly improved in collection of medical data, utilization of laboratory tests

and appropriate use of antibiotics. Physicians demonstrated significantly lower levels of compliance and acceptance of the protocols than the graduate and student PAs. Protocols may be utilized in monitoring the process of medical care, detecting problem areas in services and providing educational feedback.

Phillips D. "Protocols for patient care." *Hospitals, J.A.H.A.* 49: 85-88, Mar 1, 1975.

Protocols or clinical algorithms may aid physician extenders by defining required skills, training assistants to acquire these skills and providing a means for auditing performance. Project AMOS, the Ambulatory Care Project, the Dartmouth-Medex Program and other settings in which protocols are being utilized are discussed. Criticisms and problems such as the complaint that protocol utilization stifles the user, legal questions, and the threat of auditing procedures are also discussed.

Charles G, Stimson D, Maurier M, Good J. "Physician's assistants and clinical algorithms in health care delivery—a case study." *Ann Int Med.* 81: 733-739, Dec 1974.

Journal abstract: During a 3-month program in a large teaching hospital physician's assistants were trained to use clinical algorithms in seeing patients in a drop-in clinic. Evaluative studies revealed that (1) clinical algorithms can be used to deal effectively with most of the presenting complaints of patients in the drop-in clinic, (2) clinical algorithms allow control over use of institutional resources, (3) physician's assistants can be quickly trained to use clinical algorithms, (4) prior collection of data by physician's assistants reduces the amount of time physicians spend with patients, (5) physician's assistants collect and record significantly more data than do physicians, and (6) patients readily accept physician's assistants. The studies also showed that effective use of physician's assistants and clinical algorithms in institutions is hampered by problems involving professional roles, organizational structure, and managerial ability.

Greenfield S, Bragg F, McCraith D, Blackburn J. "Upper-respiratory tract complaint protocol for physician-extendors." *Arch Int Med.* 133(2): 294-299, Feb 1974.

Journal abstract: A protocol for upper-respiratory tract complaints was administered to 226 patients in a walk-in clinic. The protocol, for use by a physician-extender in conjunction with a physician, specified the collection of data necessary for management. A decision-making algorithm separated the major causes of upper respiratory infection (URI) complaints and led to one of four plans: a physician referral, a culture only, antibiotic treatment, or symptomatic treatment only. Each patient was seen by a physician following the health assistant's interview. Of 226 patients, 96 (42%) would have been sent home by the protocol without seeing the physician. None of these had a complication of URI. Sixteen (7%) of the 226 had serious complications—all would have been referred to the physician. The protocol proved to be safe and efficient, acceptable to patients, and a reliable approach to physician-extender management of URI.

Komaroff A, Black W, Flatley M, Knopp R, Reiffen B, Sherman H. "Protocols for physician assistants: management of diabetes and hypertension." *New Engl J Med.* 290(6): 307-312, Feb 7, 1974.

Journal abstract: Physician assistants used problem-oriented protocols in management of patients with diabetes and hypertension. The protocols directed the physician assistant in determining what data to collect, and whether the patients required a physician's care at that visit.... On 37% of experimental visits over an 11-month period, the patients went home without seeing a physician. Physicians accepted the protocol disposition decision in 94% of the cases. Patients accepted the system, as reflected by their attendance rate at the clinic.

Komaroff A, Sherman H, Kaufman S. "Ambulatory care protocols improve efficiency and quality of care." *Hosp Med Staff.* 3(7): 1-10, Jul 1974.

Journal summary: The Ambulatory Care Project is developing a system by which non-physicians can use explicit, problem-oriented protocols to see patients, either in lieu of a physician visit or as a pre-physician workup. The protocols define a standard of care that can be subjected to medical validity study. They describe required skills, provide for training personnel to acquire these skills, and mandate an audit of these individuals in their performance. The protocols are compatible with existing record systems and have been demonstrated to save physicians' time in a busy setting by freeing them from the tasks that do not make maximum use of their skills and training. Preliminary studies have shown that physicians and patients accept the system and that there appear to be medicolegal benefits to the use of protocols.

Sox H, Sox C, Tompkins R. "The training of physician's assistants: the use of a clinical algorithm system for patient care, audit of performance and education." *New Engl J Med.* 288(16): 818-824, Apr 19, 1973.

Journal abstract: A large-scale audit of patient records was used to educate and evaluate physician's assistants. Clinical algorithms (sets of step-by-step instructions for solving a medical problem) for 11 acute medical complaints were used in patient care by physician's assistant trainees. Each algorithm had a corresponding checklist medical-record form, which was filled out by the physician's assistant as he saw the patient. A computer program analyzed the data from each checklist to determine if the algorithm had been followed correctly. Checklist records from 3024 patients showed that a physician's assistant could have evaluated 45 percent of these patients accurately without direct physician involvement if he had correctly followed the algorithm logic. This clinical algorithm system provides guidance in problem solving and also measures the ability of a trainee to follow instructions.

Sims N, Seidel H, Cooke R. "A structured approach to the use of physician extenders in well-child evaluations." *J Pediatr.* 79(1): 151-163, Jul 1971.

Journal abstract: Systems analysis techniques were used to develop a new method for data acquisition in well-child evaluations. This method, a departure from tradition, was designed to increase physician efficiency, yet maintain an acceptable patient-physician relationship in providing high-quality care. Results of well-child examinations on 104 children using the new method were compared with those obtained by physicians examining children in the traditional manner. More information was obtained by the new method, with significant reduction in time expenditure by the physician. High acceptance with a frequent preference for the new method was expressed by parents and clinic staff.

