Development and Field Testing of Protocols for the Management of Pediatric Telephone Calls: Protocols for Pediatric Telephone Calls

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ABSTRACT. Although telephone calls comprise almost one fourth of all childhood patient-physician contacts, the content of telephone care is not emphasized in most educational and service programs. In response to the need to improve management of telephone calls to our pediatric emergency room, we developed 28 protocols to deal with the 25 most common complaints presented by phone. This paper describes the content of these protocols, the training of the health assistants who administered them, and the measures we took to assure their safety and general utility in pediatric practice settings. The study demonstrates the feasibility of an organized system for telephone care based on protocols which include: (1) basic data to be collected for each chief complaint category; (2) a range of appropriate dispositions; and (3) advice for home management when the patient does not require an immediate medical visit. Potential uses of these protocols for medical and nursing education and for clinical service needs are discussed. *Pediatrics* 64:558–563, 1979; *telephone, protocols.*

Telephone contacts for initial triage, consultation and advice for management of medical problems constitute an important proportion of all patient-physician encounters, particularly in general pediatrics, where as many as one fourth of all encounters are by phone. This high volume of demand for service consumes considerable professional time (one eighth of a pediatrician's working time is spent on the phone),[1] and is a source of frustration for both parents and medical staff. All assessments of the adequacy of current telephone practice have indicated relatively poor content of care provided by practicing pediatricians, house officers, and nurse practitioners.[2–4] Among physicians, length of time in practice or in training does not correlate with performance, and there is evidence that nurse practitioners handle phone calls in a more satisfactory fashion than do physician providers.[5]

To meet the need for more efficient processing of telephone calls, for improved content of telephone care, and for standardization of advice given in our hospital emergency room, we developed a collection of 28 protocols, or guidelines, for 25 common "chief complaints." Each protocol consists of the questions necessary to investigate, and the advice to manage a specific complaint for all pediatric age groups. These 25 chief complaints were those which occurred most frequently in a survey of telephone calls about symptomatic children made to the Children's Hospital Medical Center emergency room, the Harvard Community Health Plan (a large prepaid health maintenance organization [HMO]), and Dedham Medical Associates, a suburban pediatric group practice.

This report describes the protocol-based system developed to manage telephone calls to general pediatric settings, and the strategies used to assure the safety of this new model of care.

PROCEDURES

Protocols

A number of researchers[6–10] have described the use of protocols (or "clinical algorithms") for managing common problems of ambulatory patients. In most of these studies the protocols were administered by practitioners, not doctors. Beginning with

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a defined medical problem, the protocol specifies those elements of the patient's history, physical examination, and laboratory investigation which must be collected in order to manage his problem. The general format of protocols includes branching logic, which allows for individualization of data collected according to a patient's specific characteristics. Protocols designed for use by practitioners specify rules for referral to, or consultation with, a physician.

Adaptation of this format to management of telephone requests for pediatric service presents several distinctive features:

First, the patient often has a relatively poorly defined medical problem; the child's parent may be calling with any one or several undifferentiated complaints ranging from concerns about serious, even alarming signs or symptoms to the concerns of worried parents of well children.

Second, data collection is limited to questioning the parent. Clearly, neither physical examination nor laboratory study can be included when the patient is at a remote site.

Third, the range of provider response (disposition) is limited. A health assistant administering the protocol has only three options: (1) to advise the parent to keep the child at home, with suggestions about symptomatic treatment; (2) to advise the parent to bring the child for care (either immediately, within 24 hours, or for evaluation or referral at a later time for more chronic problems); or (3) to consult with a physician before recommending a course of action.

These features were taken into account in the development of the 28 protocols relating to the 25 chief complaint categories shown in Table 1. For three categories, there are two age-specific protocols, because different questions relative to verbal or nonverbal children were necessary.

With a flow chart design of logically branching questions for each protocol, all questions pertinent to the chief complaint are asked, while other questions are relevant only for specific responses to an antecedent question. The protocols also include items of general information, such as the child's age and general state of health, so that reasonable decisions about care can be made even in settings where the child is not known to any provider (such as in an emergency room) (see Figure). For those instances when the disposition is that the child does not require a medical evaluation, each protocol includes a brief section advising parents about managing the symptoms noted.

Health Assistants

The two health assistants who administered the protocols had no previous medical or nursing training and no work experience in clinical settings. They were chosen because, as mothers, they had experience in managing usual childhood illness, and were selected for their personal qualities of warmth, sensitivity, fluency, and attentiveness to detail.

Their general training included information about basic interviewing skills and a brief introduction to pediatric diseases. Specific training was directed toward administering the protocols, including the rationale for each of the questions, and toward explanation of the medical advice which they offered when the protocol-guided disposition was that the child could be safely managed at home. These three elements of the training process (the protocols, medical advice for symptom management, and information about chief complaint related illness) have been organized into a training manual.[11]

TABLE 1. Chief Complaints for Telephone Protocols*

1. Upper respiratory infection (for ages less than 30 months)
2. Upper respiratory infection (for ages 30 months and older)
3. Vomiting and diarrhea (for ages less than 30 months)
4. Vomiting and diarrhea (for ages 30 months and older)
5. Croup
6. Abdominal pain
7. Irritability and crying (for ages less than 4 months)
8. Irritability and crying (for ages 4 months and older)
9. Rash
10. Fever
11. Headache
12. Asthma
13. Lice
14. Worms
15. Eye infection
16. Insect bite
17. Ingestion of a solid
18. Nosebleed
19. Eye trauma
20. Head injury
21. Animal bite
22. Tick bite
23. Burn
24. Sunburn
25. Laceration
26. Abrasion
27. Sprain
28. Strain

* The training manual and protocols will be available from Patient Care Publications, Inc, Book Division, 16 Thorndal Circle, Darien, CT 06820.

EVALUATION OF PROTOCOL-HEALTH ASSISTANT SYSTEM

The task of evaluating the quality of care provided by this new approach to managing telephone encounters presented two issues central to validat-

PROTOCOL FOR HEADACHE—Age >30 Months

Note: This guideline should not be used if there are any symptoms of earache, cold, sore throat, or fever.

Caller's Name: _____ Date: _____ Time: _____
Child's Name: _____
Phone Number: _____ Age: _____

Has . . . had an accident or hit head? (Y) (N)
  Is the headache getting worse? (Y:****) (N: STOP see HEAD TRAUMA guideline)
Is . . . confused, acting abnormally, or excessively sleepy? (Y:****) (N)
Does . . . have a stiff neck when moving head up and down? (Y:****) (N)
Is . . . vomiting from this headache? (Y:***) (N)

What have you done to treat the headache?
  a. (aspirin or acetaminophen)
    Has this relieved the headache?
    a. (no)
      Is the pain so bad that usual activities are prevented? (Y) (N)
      Has the headache lasted > 6 hours? (Y:***) (N)
    b. (yes)
  b. (other: PAIN advice)

Has . . . had a problem with headaches before today? (Y) (N)
  Do headaches wake . . . from sleep? (Y:***) (N)
  Does . . . usually vomit with the headache? (Y:****) (N)
  Does . . . have > 1 headache per week? (Y:**) (N)
  Has . . . had headaches for > 6 weeks? (Y:**) (N)

Does . . . look very sick to you? (Y) (N)
  Are you worried that . . . is seriously ill? (Y:***) (N)

Is . . . having any other symptoms related to this headache? (Y:*) (N)
Has . . . been seen by a physician for this problem in past 48 hours? (Y:*) (N)
Has . . . been hospitalized for any reason in past 30 days? (Y:*) (N)
Does . . . have any serious medical problems? (Y:*) (N)
Are you giving . . . any medications now? (Y) (N)
  What medications?
  a. (non-prescription)
  b. (antihistamine)
  c. (other prescription medication: *)

*-Needs further evaluation—decision required medical personnel
****-Child needs medical attention immediately
***-Child needs medical attention within 24 hours
-2 or more ** = *
Other-Treat at home with HEADACHE advice.
Disposition: _____
Advice: _____

Figure. Protocol for headache for children more than 30 months old. Copyright © 1978, Children's Hospital Medical Center, Boston.

ing both the safety and the utility of the system:

1. Many calls handled by phone involve children with acute, self-limited illness which will resolve regardless of management. Any attempt to assess patient outcome would require very large samples to detect any ill effects of mismanagement. Evaluation by comparing treatments rather than outcomes is also limited by the fact that there are few unequivocal demonstrations of the efficacy of common treatments for self-limited illnesses. The literature provides only general, consensus standards for the diagnosis or triage of problems by phone,[12] and the lack of specific criteria which could be used as benchmarks for these protocols hampered attempts to validate them.

2. The second issue in evaluating the protocol system involves the delegation of medical responsibility to nonprofessional health assistants. Replacing nurses and physicians with nonprofessionals in telephone encounters calls for special concern about the safety and reliability of these new practitioners. It is not simply a question of whether the protocols can be used, but of whether relatively untrained staff can apply the guidelines in a fashion compatible with good practice and acceptable to callers.

To resolve these questions, four strategies were used in evaluating this new system:

Chart Review. It was essential to insure that seriously ill children would not be advised to remain at home. Since calls concerning seriously ill children are uncommon, the protocol guidelines were tested by using a population who were seriously ill—children admitted to hospital with illnesses having chief complaints represented in the protocols. From a list of admitting diagnoses, all patients with illnesses having chief complaints relevant to the protocols were selected for review. Nineteen of the 25 chief complaints, each with from five to 25 instances of hospital admission, were identified. In total, the medical records of 141 children admitted to Children's Hospital Medical Center, Boston, were used to evaluate the protocols. Symptoms recorded in the history were checked against the questions in the appropriate protocol. For a protocol to be judged adequate, at least one symptom of the hospitalized child had to trigger a protocol decision to advise that the child be seen by a physician. Among these 141 hospital admissions, only two records did not mention objective symptoms which would have resulted in a disposition either to come in or to consult with a physician. These two patients were children released after observation of 24 and 48 hours respectively, with a discharge diagnosis of abdominal pain with unknown etiology. The chart review indicated that few, if any, seriously ill children would have been mismanaged if the initial

contact had been made by phone, using these protocols.

Auditory Peer Review. Twelve pediatricians caring for ambulatory patients in different settings (private practice, community health centers, and teaching hospital clinics) were selected to review tape-recorded calls of 19 protocols. Not all protocols were reviewed because some were still under development, some were for seasonal complaints, and some were too infrequent. For each taped call, the entire conversation except for the health assistant's disposition was heard by four to ten reviewers. For each call the reviewers were asked to judge: (a) whether the information collected was sufficient for making a disposition; (b) whether any key questions relevant to the chief complaint were omitted; (c) whether questions were asked in a logical sequence; and (d) whether the call seemed satisfactory overall. For a protocol to pass this review we required that at least four out of seven reviewers were able to make a disposition from the tape and that their independent disposition (ie, treat the child at home, have the child come in to see a provider, refer the child to a specialty clinic) was the same as the disposition made by the health assistant.

A total of 126 taped calls were reviewed. For 19 calls involving five of the protocols, the peer reviewers thought more information was required to make a disposition. Subsequent changes in these protocols met the reviewers' criticisms and allowed the protocols to pass review. For the remaining 107 calls (Table 2) the peer reviewers and health assistants agreed in 71 instances (66%). Among the 36 cases of disagreement, six (6%) were calls in which the patient was advised to stay at home by the health assistants, but would have been told to come in by the reviewer. Thirty patients (28%) whom the reviewers would have treated at home were told to come in by the health assistants. For the majority of cases, then, the reviewers agreed with the protocol-mandated disposition. Disagreements tended to reflect a degree of conservatism or extra caution for the protocol system.

Pediatric Practice Field Test. In the HMO and in the private group practice, after the health assistants gathered the protocol information, the usual provider then took the call, collected independent information, and made a disposition without knowing what data the health assistant had collected. The provider's disposition was compared with that which the health assistant would have made with protocol mandated criteria.

A total of 345 calls were processed. The usual providers and the health assistants were in agreement on dispositions for 251 (73%) calls, but were discordant for 94 calls. The usual provider advised nine patients to be seen by a physician, while the health assistants would have recommended these patients be kept at home. The health assistants would have brought in 85 patients who were told to remain at home by the usual provider (Table 3). Again, these findings indicate a degree of conservatism for the protocols, as well as the modifications that occur when the provider has personal knowledge of the child and family.

Emergency Room Field Test. The health assistants answered calls for medical advice which were made to the hospital emergency room. Callers were informed about the experimental system to improve telephone care and asked for permission to tape record the call. If the caller agreed (all but two did) and if the complaint was suitable, the health assistant used a protocol to collect information for reaching a disposition. The taped conversations were audited by medical personnel working on the project to assess the general flow of conversation, the health assistant's communication skills, and the appropriateness of the disposition.

The emergency room log was checked daily for visits by patients participating in the telephone field test, and the medical records for any such visits were abstracted. Three project physicians independently judged whether the patient's condition had warranted a visit on the basis of the patient's age, recorded history, physical findings, test results, diagnoses, treatments, and follow-up arrangements.

Fifty-one visits to the emergency room were made by patients who had been told to come in by the health assistants. At least two of the three

TABLE 2. Auditory Peer Review: Comparison of Dispositions Between Reviewers and Protocol

Reviewer Disposition	Protocol and Health Assistant Disposition		
	Treat at Home	See a Physician	Total
Treat at home	32 (30%)	30 (28%)	62
See a physician	6 (6%)	39 (36%)	45
Total	38	69	107

TABLE 3. Pediatric Practice Field Test: Comparison of Dispositions Between Health Care Provider and Protocol System

Provider Disposition	Protocol and Health Assistant Disposition		
	Treat at Home	See a Physician	Total
Treat at home	80 (23%)	85 (25%)	165 (48%)
See a physician	9 (3%)	171 (49%)	180 (52%)
Total	89	256	345

project physicians thought that 43 (84%) of the 51 visits were appropriate (there was agreement by all three in 33). Of the eight inappropriate visits, four were generated by faulty questions, which were then revised. The remaining four occurred either because the caller was very worried or because the symptoms reported by phone were potentially serious even though no problem was found by subsequent medical examination.

Those who were advised to treat their children at home were called back within two to seven days of the initial call. Initial experience with call-backs was so uniformly positive that we deferred quantitative assessment of parent reports of subsequent health status and satisfaction to a later stage of the study—that of a randomized clinical trial comparing the usual system to that of the protocol.[13]

DISCUSSION

This paper describes the development of 28 protocols which collectively encompass a majority of the chief complaints triggering telephone calls for advice in three general pediatric service settings. The ill-defined nature of the need generating the demand for telephone advice, together with the lack of explicit criteria for management of this demand, led to difficulties in assessing the utility and safety of the protocol system of care. A multileveled evaluation strategy (Table 4), including measures of both process and outcome of care,[14] was used to assess the adequacy of the protocols in data collection and decision making.

The field test procedures were designed to test the safety of the system and its acceptability to both parents and the pediatrician peer reviewers. Results indicate validity and reliability of this approach to telephone care.

However, in each of the three component studies dealing with comparisons in disposition, results indicate a higher referral rate for the protocol system; 22% more patient visits suggested than by auditory peer review, 24% more than in pediatric practice trial, and 16% higher referral rate than usual emergency room system. These results raised questions about the efficiency of the protocol based system which could best be resolved by a randomized clinical trial, to be reported separately.

One feature leading to the higher protocol guided referral rate is the impersonal nature of the emergency room that it was designed for. If the clinical data reported by the parent indicated that the child's condition should be medically *monitored,* emergency room guidelines suggested a visit within 24 hours. We felt that conservatism was warranted because the physician in the emergency room, who does not know the patient or his parents, should see the child when there is uncertainty about the child's status, or about the mechanism for ongoing contact with the family. In contrast, the physician in the primary care setting, who knows the family and can call back to check on the child's progress, might react to the same data by managing the child's illness by telephone.

To accommodate these differences, in preparation for the randomized clinical trial[13] of the system, we modified the set of disposition criteria to meet the requirements of each of the two primary care program sites. As a result, the protocol system and the usual providers had equal referral rates. Thus, the protocols indicate which patients should be monitored. The precise mechanism for that moni-

TABLE 4. Evaluation Strategies for Telephone Protocols

	Data Source	Type of Assessment	Questions Resolved
1. Chart review	Medical records of inpatients with same chief complaints	Outcome	Is the system safe?
2. Peer review	Tape recording of telephone encounter	Process	Is the protocol system: (a) Adequate as a data collection instrument? (b) Adequate as a decision-making instrument? (c) Acceptable to callers? (interpersonal dimension)
3. Field test—private practice and HMO	Call back slips recording usual provider disposition	Process	Is there agreement between physician and protocol dispositions?
4. Field test—emergency room	(a) Tape recording of encounter	Process	Adequacy of content of data gathered, decision made and health assistant-caller communication
	(b) Medical record review, emergency room	Process	Were the disposition decisions appropriate?
	(c) Call back	Outcome	Were children treated at home improved? Was there caller satisfaction?

toring (whether by suggesting a visit or a phone back by the physician) should best be adapted to individual clinical settings by those providers who work on site. We believe that disposition options tailored to each practice will provide for flexible and efficient telephone care.

Staff currently employed in most pediatric practices are often experienced and adept with telephone communication and conversant with the nature of common pediatric problems, and can be readily taught to use the protocols. In some settings a member of the secretarial staff might be trained to manage calls, while in others, a nurse might be preferred. We recommend that the training include an introduction to the protocols through the use of the training manual followed by five to ten hours of supervised use, and an additional period of five hours of independent use, with physician review of each disposition made. If a nonprofessional is the person designated to administer the protocols, it is advisable to monitor performance by periodic review of content and disposition of calls.

A blank protocol form may be completed for each call, thus providing a written record of the telephone encounter which can then be included in the child's medical record. Such information is often valuable and seldom available. The lack of documentation of telephone encounters in a pediatrician's office records recently figured centrally in a large medical malpractice award.[15]

The study demonstrates that protocols for telephone encounters can be used to identify cases in which a patient needs to be seen, cases in which a physician should be consulted before making a disposition, and cases in which the child can safely be treated at home with specific advice for symptom management. We believe this organized approach to the management of pediatric illness presenting by telephone can be used in a variety of settings to improve the quality of this aspect of medical care.

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