PRACTICE MANAGEMENT

Reducing After-Hours Referrals by an After-Hours Call Center With Second-Level Physician Triage

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Abstract. ***Objectives.*** **One-third of practices signing-out to The Children's Hospital Call Center in Denver, Colorado, choose to do second-level physician (SLP) triage for calls judged by the Center to require after-hours referral (AHR). We examined: 1) the effect of SLP triage on the rate of AHRs and 2) reasons for physicians' decisions.**

Design. **From January 1998 to August 1998 all calls from patients using a 5-member suburban pediatric practice judged by the Call Center to require AHR were referred to the practice's on-call physician who did SLP triage and completed a questionnaire.**

Results. **There were 955 eligible calls, 22% (*N* = 216) of which were initially given an urgent disposition by Call Center nurses. Physician questionnaires were completed for 97% (*N* = 209). Of patients initially triaged for AHR, 49% (*N* = 103) were subsequently given an AHR, 17% (*N* = 35) a next day office referral, and 34% (*N* = 71) home care and advice. Reasons for not urgently referring included the following: 1) medical problem didn't require urgent evaluation (95%, *N* = 99); 2) change in the patient's condition; (40% *N* = 43); 3) prior knowledge of family's ability to evaluate and care for the patient (40%, *N* = 43); and 4) knowledge of the patient's medical history (18%, *N* = 19). After SLP triage the overall urgent referral rate was 11%.**

Conclusions. **Signing out to a Call Center decreased physicians' after-hours calls by 77% and SLP triage halved the number of urgent after-hours referrals.** ***Pediatrics*** **2000;106:226–230; *telephone triage, telephone medicine, call centers***

ABBREVIATIONS. PTAS, Pediatric Triage and Advice System; AHR, after-hours referral; SLP, second-level physician.

In recent years there has been dramatic growth in centralized call centers to manage after-hours calls from patients of multiple providers.[1–3] Such centers are generally based within a local hospital or within a service bureau that may be located at a geographically distant site. Conservative estimates suggest that at least 25% of all general pediatricians currently sign out their after-hours calls to call centers.[4] The change from an on-call physician model to a model in which nurses triage calls using protocols or guidelines was initially driven by the desire to reduce the after-hours work load for pediatricians.[3,5] However, other potential benefits of such systems include an increase in the consistency of telephone advice and triage, improvement in documentation of telephone encounters, and decreased medical-legal risk.[3,6] Despite the rapid growth of call centers, there has been little evaluation of the clinical validity or cost-effectiveness of this type of after-hours care. One area of controversy has centered on the difference in triage outcomes between nurses using telephone guidelines in call centers and pediatricians providing traditional after-hours telephone care. Pediatric call centers have previously reported referring approximately 20% to 25% of after-hours calls for after-hours urgent or emergent care,[1,3,6] while pediatricians may refer substantially fewer calls for after-hours care[7] In an era of managed care and capitation, call centers will be expected to match the emergency services utilization rates obtainable by physicians. One approach for accomplishing this is for physicians to request that any patient call for which urgent after-hours care is deemed necessary by call center nurses be referred to the practice on-call physician for "second level physician triage." This allows a physician from the patient's practice to make the final decision regarding the necessity of an after-hours visit.

The After-Hours Call Center at the Children's Hospital in Denver, Colorado currently provides after-hours (5 PM to 7 AM weekdays and 24 hours per day on weekends and holidays) telephone triage of acute pediatric problems for the patients of 91% of private practice pediatricians in the Denver metro area and 90% of private pediatricians in the state of Colorado. Nurses at the Call Center use a computerized system of clinical decision-making algorithms, the Pediatric Triage and Advice System (PTAS),[8] to determine urgency and level of care needed by patients. The majority of Denver Metro pediatric groups allow the After-Hours Call Center to make after-hours referrals (AHRs) to designated sites directly. However, approximately 35% request that any patient call for which urgent after-hours care is deemed necessary by Call Center

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nurses be referred to the practice's on-call pediatrician for second-level physician (SLP) triage. The objectives of the present study were to determine the effect of second-level triage by on-call private pediatricians on the rate of referrals by nurses at the Denver Call Center and to describe the most common reasons for pediatrician's second-level triage decisions.

METHODS

Description of the After-Hours Program at the Children's Hospital Denver, Colorado

The After-Hours Program consists of the 1) Call Center where nurses use the PTAS computerized system to answer after-hours calls and the 2) Community Hospital-Based Physician Program (CHBP) where the majority of children referred for after-hours evaluation are seen for care. At the After-Hours Call Center, pediatric nurses, using the PTAS, identify the presenting complaints of the caller, access the appropriate computerized PTAS algorithm, and ask a series of questions dictated by the algorithm. Based on the responses to these questions, the algorithm gives 1 of the following recommended dispositions: activate the Emergency Medical System, see immediately at an after-hours facility, see within 4 hours at an after-hours facility, see within 24 hours in physician's office, see within 72 hours, see within 2 weeks, and home care and advice. Because the focus of this article is the necessity of urgent referral, possible dispositions are grouped in this study into the following categories: 1) patient should be referred for an urgent after-hours evaluation (within the next 4 hours); 2) patient should be referred for evaluation the next day at their primary care physician's office; or 3) patient could be seen at a later date or requires home care and advice only. Under certain circumstances, the nurse may override the algorithm and advise parents to seek after-hours care. Likewise, a parent who feels uncomfortable complying with a recommendation of next day appointment or home care may override an algorithm disposition and request after-hours evaluation.

If after-hours evaluation is recommended by algorithm, the patient is usually referred to an after-hours site directly. If the patient's physician has requested that SLP triage be performed for urgent referrals, the Call Center does not inform the family that an urgent referral has been determined to be necessary by algorithm. Instead, the nurse tells the family that the child's symptoms indicate the on-call physician needs to speak directly with the family. The Call Center then reaches the on-call physician either while the family holds on or the physician calls the family back.

Study Design

During a 7-month period (January 1998 to August 1998) all after-hours calls from patients of a 5-member suburban Denver practice (Centennial Pediatrics Practice) were analyzed. Those calls between 5:00 PM and 7:00 AM judged by Call Center nurses to require after-hour evaluation were transferred to the practice's on-call physician for SLP triage. A survey was then completed by the triaging pediatrician at the time of the call, specifying their second-level triage disposition decision and reasons for their decision. The questionnaire provided disposition options that were similar to those available to nurses at the Call Center, including 1) refer to the emergency department for same night evaluation, 2) see in the office in the morning, 3) observe at home with call back, and 4) home care advice. It also elicited information about types of prescription medications and home therapies that were provided to families. In eliciting the reasons for physicians' decision to refer or not refer for same night evaluation, a list of potential reasons were provided with an additional category of "other" for open-ended responses if the desired reason was not listed as a choice. The questionnaire was developed by the principal investigator and refined based on comments of 4 practicing pediatricians who each listened to 50 taped after-hours calls and documented their triage decisions and reasons for their decisions.

Excluded from our analysis were repeat calls for the same child during the study period, calls for which triage was not completed, calls not successfully referred to the physician and calls in which the urgent disposition was the result of a parent's decision to "override" the recommended disposition. The latter were excluded because in cases in which the parent insists on evaluation, the Call Center nurses are instructed to arrange for after-hours evaluation.

Data Analysis

The following proportions were calculated: 1) the proportion of all after-hours calls that were urgently referred by nurses (urgent primary triage disposition/all calls), 2) the proportion of these urgently referred calls that subsequently were triaged by physicians into the major triage categories, and 3) the proportion of all calls urgently referred after SLP triage (urgent secondary triage disposition/all calls). Descriptive data including physicians' reasons for triage decisions and treatment decisions were also reported. All analyses were performed using SAS version 6.12 (SAS Institute, Cary, NC).

RESULTS

As shown in Fig 1, there were a total of 1302 after-hours calls to the practice during the study period, of which 169 were excluded because they did not undergo triage (medication dosage advice, poison control, or refused triage) and 178 because they were repeat calls about the same child. Of the remaining 955, 22% ($N = 216$) were given an urgent disposition by Call Center nurses. Of these, 3 calls were unavailable for review because they were handled manually rather than by computer, 1 call was excluded because it was only judged to be urgent because of a parent override, and for 3 calls the questionnaire was incomplete. Therefore, an on-call physician questionnaire was completed for 97% of the sample ($N = 209$).

Table 1 shows the SLP triage decisions. Forty-nine percent of the calls originally judged urgent were referred for AHR by the on-call physician, 17% were referred for next day evaluation and in 34% of cases, the physician thought the problem could be managed at a later time at the office or at home. Therefore, after SLP triage, the overall urgent referral rate decreased from 22% to 11% ($N = 103$).

The major reasons given for not referring patients urgently, as shown in Table 2, included: 1) the patient's problem did not require same night evaluation (95%), 2) the condition of the patient had changed since the original triage (40%), 3) prior knowledge of family's ability to evaluate and care for patient (40%), and 4) prior knowledge of patient's specific past medical history (18%). Of patients not urgently referred by the physicians, prescription medications were called in for 11% ($N = 12$). These included antibiotics ($N = 1$), phenergan suppositories ($N = 2$), oral prednisone ($N = 4$), albuterol ($N = 2$) and rectal analgesics ($N = 2$). Table 3 shows physician reasons for urgently referring patients, including: 1) a history suggesting a condition that required after-hours evaluation for diagnosis or therapy (92%), 2) a patient in sufficient discomfort to warrant evaluation or therapy (46%), 3) parental anxiety (39%), and 4) physician's prior knowledge of the patient's specific past medical history (21%).

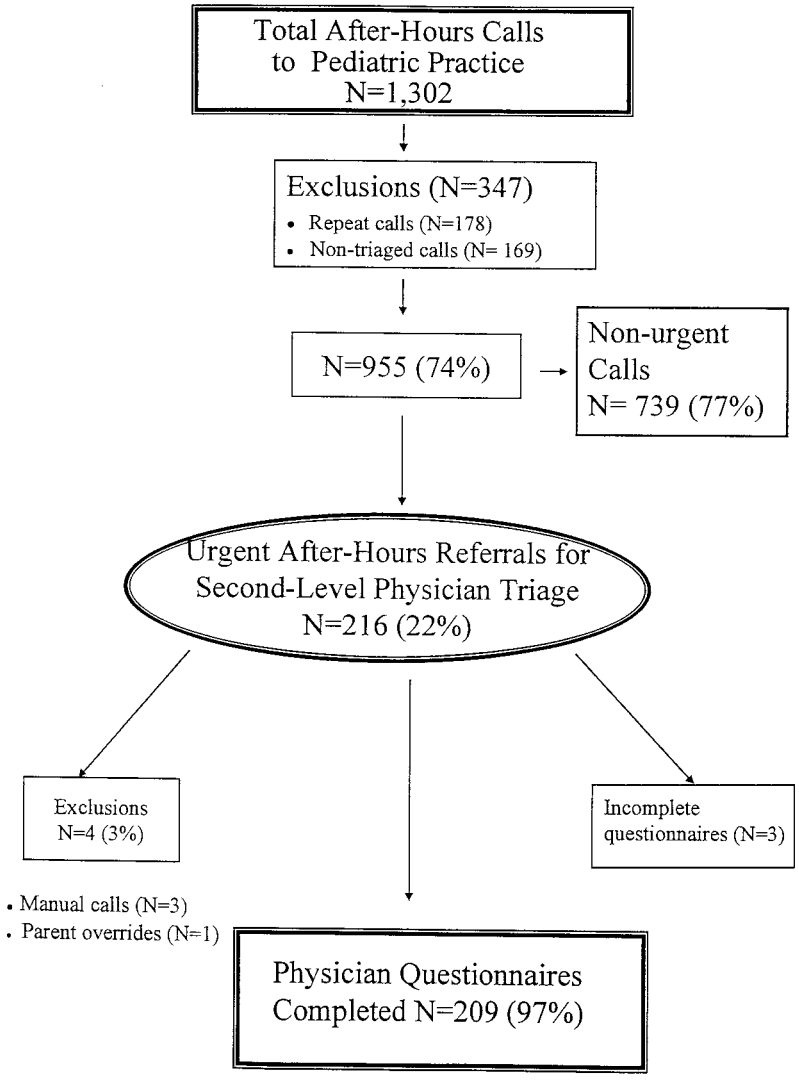

Fig 1. Study population.

TABLE 1. Disposition After Physician Triage (N = 209)

Refer same night	49% (N = 103)
See in office in AM	17% (N = 35)
Home care	34% (N = 71)

TABLE 2. Physician Reasons for Not Urgently Referring

(Nonexclusive Categories) (N = 107)	
Medical problem did not require urgent evaluation	95% (N = 99)
Change in patient's condition	40% (N = 43)
Prior knowledge of family's ability to care for patient	40% (N = 43)
Prior knowledge of patient's past medical history	18% (N = 19)

TABLE 3. Physician Reasons for Urgent Referral

(Nonexclusive Categories) (N = 102)	
History suggested condition requiring emergery department visit	92% (N = 94)
Patient discomfort	46% (N = 47)
Parental anxiety	39% (N = 40)
Prior knowledge of patient's past medical history	20% (N = 21)

DISCUSSION

Growing numbers of primary care providers that care for children are signing out to telephone call centers, generally staffed by nurses who use guidelines or algorithms to triage pediatric problems. Results of our study suggest that signing out to a call center decreased after-hours calls taken by physicians by almost 80% and resulted in an initial urgent referral rate of 22%. Subsequent secondary triage by a physician for those cases judged urgent by the call center cut the final urgent referral rate in half. If clinically valid decisions are made, such an arrangement may combine the advantages of dramatically decreasing calls to on-call physicians while minimizing the number of urgent AHRs.

The rate of urgent referrals by the call center nurses that we report in this study is similar to those previously reported from our center.[3,6] It is also similar to the rate reported for private practice populations (25.5%) served by the Children's Hospital Medical Center in Cincinnati triage service, using the same triage software system,[1] although they document a lower urgent referral rate, 16.8%,

for their nonprivate practice sites. There are little published data about disposition decisions by physicians triaging after-hours calls directly for a suburban practice with which to compare the final urgent referral rates by the physicians in our study. Caplan et al[7] in 1983 reported that private physicians recommended after-hours evaluation for 6.4% of patients in 2 urban health centers and 3 suburban private practices, although an additional 5.6% went to the emergency department without their consent. The overall second-level referral rate in our study was higher, 11%, possibly because of a higher level of concern on the physicians' part because of the initial triage decision by the nurse or because of differences in the populations or physicians studied.

Although the present study did not evaluate appropriateness of triage, it is interesting to contrast our results to those of a previous study focusing on the appropriateness of urgent triage decisions using the same triage system.[6] In the previous study, the overall urgent referral rate from the Call Center was approximately 20%. Eighty percent of referred patients complied and were urgently evaluated and, of these, evaluating physicians judged 91% to have been appropriately referred. In contrast, only about half of calls judged to be urgent by Call Center nurses using guidelines in our study were subsequently judged to be urgent enough for referral by the physicians performing secondary triage. Several factors must be taken into account in comparing the results of these 2 studies. In the earlier study of appropriateness of referral, 20% of urgently referred patients did not comply with the recommendation for urgent referral and were not evaluated. It is possible that there was significant self-selection on the part of families who actually came to urgent care sites and could be assessed for appropriateness, while patients of lower acuity were triaged out by their parents. The high rate of appropriateness, therefore, may not have been reflective of the lower acuity patients. In the present study, physicians had the opportunity to screen out lower acuity patients themselves. In addition, the perspectives of the physicians making decisions in these studies were different. In the earlier study, appropriateness of referral was judged by physicians who did not know the patient or families and were asked to make a decision based solely on the history and clinical factors at the time of evaluation. In the present study, the patient's primary care physician or their colleague took direct responsibility for the triage decision and had the luxury of both phone follow-up and continuity of care the next day as well as knowledge of the patient, family and treatment styles of their colleagues in making their disposition decisions. There are no studies of which we are aware that assess the effect of being the primary care provider or having a prior relationship with a family on telephone triage decisions in pediatrics. However, it seems likely that physicians who assume responsibility for patients during the day and have some expectation of continuity in their future care may be more comfortable in assuming a higher level of risk in managing their patients at home at night.

Our study has a number of strengths and limitations. Data capture was virtually complete. Data collection did span 3 seasons, including the winter and summer months, and therefore, with the exception of the fall months, were fairly representative of data for the year. However, our data included triage decisions in a single suburban practice. As suggested by at least 1 recent study, despite using the same triage system referral rates might differ in different practices based on insurance issues and patient characteristics.[1] Secondary triage decisions by physicians will likely also vary by physician characteristics and practice styles, although we did not have a sufficiently large sample to assess interphysician variability. In addition, the practice studied was one of a minority of practices in the area that choose to do second-level triage, raising the possibility that the physicians studied may be more concerned about limiting urgent after-hours visits or may have a different philosophy about patient care than other local practices. If the practice studied was particularly motivated to reduce after-hours visits, our results may be reflective of the maximum impact that second-level triage could achieve if a broader range of practices were studied. Replicating our study in a variety of practice settings would yield more generalizable results. The physicians involved were also aware of the study, which could theoretically have altered their referral patterns, although they were told that our focus was on the Call Center and that we would not provide data to any administrative or supervisory personnel.

A central dilemma in after-hours telephone triage is how to minimize unnecessary urgent visits while ensuring that all potentially seriously ill children receive care and that families feel their concerns are being addressed. Physicians who delegate their after-hours calls to nurses using guidelines or algorithms must determine how to balance these factors. Most physicians would agree that it is appropriate for them to assume a higher level of risk for patients than nurses using guidelines; but how closely should urgent referral rates by nurses using guidelines approximate referral rates of physicians? The combination of using fairly conservative guidelines or protocols and involving the primary care physician in those cases in which an urgent referral may be necessary may maximize the convenience of nurse triage for the physician and minimize expensive and inconvenient after-hours visits. Recent data has indicated that parental satisfaction with telephone care received from Call Center nurses has been in the range of 94% to 96%,[3,9] which compares favorably with rates of 89% previously reported for physician-based after-hours telephone care.[7] Previous studies also suggest that physicians spend approximately 3 to 5 minutes on the phone in dealing with an acute problem[10,11] whereas a recent study of call centers based in childrens' hospitals demonstrates that call center nurses spend an average of 11.3 minutes per

call.[12] Based on such data it is reasonable to think that speaking with an experienced Call Center nurse regarding minor problems in some depth may be more advantageous to families than having a briefer discussion with a physician. On the other hand, for more urgent and severe problems, involving the primary physician may optimize continuity of care, as well as minimizing AHRs.

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