Pediatric call centers fast-track urgent care

Call centers using evidence-based protocols ensure that patients receive urgent medical care in the most appropriate, most cost-effective setting.

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Many pediatricians sleep well at night because they utilize call centers to respond to after-hours calls. The first call center was introduced in 1988 as a uniquely pediatric innovation. This article presents a brief history of call centers, discusses their advantages, and describes how they will improve patient care.

A brief history
In the mid-1970s, researchers affiliated with the Children's Hospital Medical Center (now Boston Children's Hospital) in Boston, Massachusetts, performed a feasibility study in which nonmedical "health assistants" used algorithms to refer patients for urgent care.1,2 Health assistant triage recommendations were compared with those made by emergency department (ED) physicians and nurses. In the study, 60% of callers were advised by health assistants to seek urgent care, compared with 44% of those who spoke directly with medical providers. Although the overreferral rate was striking, the study established that algorithms could be used effectively, even by nonmedical personnel. The researchers speculated that "call centers" could be developed similar to "poison centers" that were common at the time.2,3

The first pediatric call center was introduced in 1988 at the Children's Hospital Colorado, Aurora, with 10 subscribing physicians, and in 4 years it grew to serve 92 pediatricians. Physicians were charged on a per call basis, initially $10 per call, later decreasing to $8.25 per call. For most physicians, payments to the call center were estimated to be about 1% of practice revenue. Nurses were trained to use telephone triage protocols4 developed by Barton Schmitt, MD, one of the authors of this article, to triage calls into 1 of 3 categories: 1) patient to be seen immediately; 2) patient to be seen next day; or 3) home advice only given.
Logs were reviewed regularly, and nurses continued to receive training to improve their triage abilities. In the first 4 years of the program, the call center managed 107,938 calls. Fever, rash, vomiting, injury, earache, cough, diarrhea, sore throat, fussiness, and abdominal pain were the top 10 triaged complaints (in order of decreasing frequency). Twenty percent of these calls fell into the "immediate care" category; 28% were advised to be seen the next day; and 52% were given home care advice only. One percent of calls resulted in the patient being hospitalized.5

The call center continued to grow and serve an increasing number of Colorado pediatricians. During a
1-year survey conducted from 1999 to 2000, 141,922 calls were answered, representing over 1000 calls per enrolled pediatrician. Disposition rates changed little from those reported 11 years earlier, with 21% of callers advised to be seen immediately, 45% given home care instructions, and 30% advised to follow up with their pediatricians the following day.⁶

**Acceptance and growth**

Eventually, many healthcare systems and hospitals developed call centers that served adults as well as children, and today these call centers receive an equal number of calls regarding adults as well as children. Overwhelmingly, physicians, patients, hospitals, and insurance companies have been advocates because call centers ensure that medical care is provided in the most appropriate, most cost-effective location.

Traditionally, patients are overusers of ED services. The New England Healthcare Institute (NEHI), Cambridge, Massachusetts, estimated in 2010 that on average an ED visit costs $580 more than an office visit, and that 67 million, or about 56%, of 120 million annual ED visits were avoidable.⁷ The institute estimated that more than $38 billion is wasted each year from ED overuse. It posited that reduction in costs associated with these unnecessary ED visits, could be achieved by:

- Aligning patients with a medical home;
- Providing primary care weekend and evening hours; and
- Providing access to a call center.

It is worth noting that 25% of patient calls to Children’s Hospital Colorado’s pediatric call center are from patients without a medical home. Also of note is that a recent study indicated that access to retail-based clinics did not result in a significant reduction in low-acuity ED visits.⁸

A follow-up study looked at the cost savings associated with recommendations made by the call center at Children’s Hospital Colorado during 2004. Researchers discovered that two-thirds of the cases in which parents reported initial intent to go to an ED or urgent care facility were not deemed “urgent” by nurse triage, whereas 15% of calls from parents who intended to stay home were triaged as “urgent.”⁹

Had the callers implemented their initial intentions, the cost to the healthcare system would have been more than $1 million. Had the recommendations that were made by the nurse advice line been heeded in every case, the cost to the healthcare system would have been $410,615 less than the intended services. This amount translated into a saving of $42.61 per call after expenses. The conclusion: Advice offered by call centers can save patients unnecessary healthcare costs and reduce ED overuse substantially.⁹

**Compliance rates**

Do parents take the advice of call centers? To determine compliance rates as well as the frequency of under-referrals made by their call center, investigators affiliated with the Children’s Hospital Colorado reviewed more than 32,000 calls received from 1999 to 2003. At that time, recommendations were divided into 4 categories: urgent (visit within 4 hours); next day (>4 hours and within 24 hours); later visit (>24 hours); or home care (no visit). They discovered that compliance with urgent and home care calls was 74%, and compliance with next day recommendations was 44%. No deaths occurred within the week following the triage call and only 1 case per 599 resulted in hospitalization.¹⁰ In another study, there was a 90% agreement between ED referrals made by nurses and the ED physicians who evaluated the patients.¹¹

Additionally, the goal of the call center at Children’s Hospital Colorado was to achieve 0% ED under-referrals, and to always err on the side of caution and have no higher than a 10% overreferral rate. The only way that has been shown to improve upon call center triage ED referral rates is to have second-level physician triage. Doing so can reduce call center referrals to EDs from about 20% to 10%.¹²
The reason is that physicians are familiar with patients and parents in their practices and this familiarity can guide recommendations. Frequently, physicians postpone seeing the patient until the next morning.

**Pediatric protocols**

The quality of call centers depends on multiple factors. The training of triage nurses is a key element, as is the accurate logging of calls with recommendations, in addition to ongoing quality assurance making sure that calls are triaged correctly. The call center at Children's Hospital Colorado has a monthly targeted review as part of its ongoing quality assurance program. All calls are recorded and are available for review. A rotation through the call center is an integral part of the pediatric resident training. The protocols are evidence based, reflect current opinion of experts in pediatric care, follow current national guidelines, and are reviewed and updated every year. Since opening in 1988, the call center logged more than 2 million calls, and there have been no adverse outcomes during this time.

**Contemporary call centers**

As of 2016, there were more than 400 call centers using the Smith-Thompson Clinical Content (STCC) protocols with 20 million calls logged every year.

Canada has a provincial call center system. Many hospitals have call centers, and many children's hospitals nationwide provide nurse triage services. There are independent call centers, and some health insurers provide call center services.

Providers should be aware that call center services are not created equal. Many centers that provide triage for pediatric patients do not employ pediatric nurses. Call centers usually charge less than $1 per minute, with most calls lasting less than 10 minutes. Many integrated health systems facilitate patient scheduling so nurses can access physician office schedules, and many hospitals are expanding their services to proactively counsel patients discharged from the hospital to reduce readmission rates.

Call center usage is changing (see page 42). Tech-savvy parents and patients use multiple resources to self-triage. Call centers can review videos and images sent by patients and routinely send e-mail instructions to facilitate compliance. It has been shown that access to a parent advice book can substantially reduce calls to triage services. In 1 study, distribution of a parent advice book reduced sick visits to health maintenance organization (HMO)-affiliated medical practices by 23%, nurse advice calls by 24%, and prescriptions by 26%.

When a healthcare system distributed and promoted the use of a triage app to its members in 2013, ED utilization dropped by 39%.
### Pediatric Call Centers

**What Has Changed in the Last 10 Years (2006-2016)**

Children's Hospital Colorado's call center continues to be a model for call centers nationwide. Recent data indicate that usage has changed over the last 10 years.

<table>
<thead>
<tr>
<th>Change</th>
<th>2006</th>
<th>2016</th>
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<tbody>
<tr>
<td>Home care disposition has gone down.</td>
<td>46%</td>
<td>40%</td>
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<tr>
<td>Community service line calls have become a larger part of call volume.</td>
<td>15%</td>
<td>37%</td>
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<tr>
<td>Primary care pediatricians are doing less second-level triage on patients that triage nurses refer to the ED or UC.</td>
<td>30% of practices</td>
<td>8% of practices</td>
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<tr>
<td>More call center nurses work from home (called “working remote”). New nurses need to be certified to do this.</td>
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**Reason**
- Parents are using more web-based and smartphone app-based self-triage and self-care.
- Phone number prominent in after-visit summary given to patient in the ED and clinic.
- They trust the call center and they have no incentive to prevent a few unnecessary after-hours ED visits.
- Increased technology in the call center: ability to receive pictures and videos.
- More call center nurses work from home (called “working remote”).

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<th>Change</th>
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<th>2016</th>
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<td>Urgent/Emergent referral rate has gone up.</td>
<td>21%</td>
<td>24%</td>
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<td>Home care instructions are being e-mailed to more callers after the call.</td>
<td></td>
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</tr>
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**Reason**
- Fewer calls about acute illnesses and injuries that parents can safely care for at home. Consequently, less total call volume, yet same volume of calls about serious symptoms.
- More callers request this and pediatric after-care instructions are now available in call center software.
- EHRs provide easy access to ED encounter notes.

**What the Future Holds**

Call centers will continue to evolve. Triage will eventually employ telehealth video technology to improve triage accuracy as well as compliance. It is also possible to recruit call centers to assist with care coordination of children with chronic or complex diseases. In addition, nurses or medical assistants, working out of a call center, can assist with many of the chores that overburden physicians today (prior authorizations, requests for routine forms/letters, and more), reducing burnout rates while facilitating access to an “integrated medical home.”

Watch for next month’s article on how to use an office triage system to improve efficiency.

**Abbreviations:** ED, emergency department; EHR, electronic health record; UC, urgent care.

Data provided by Pediatric Call Center, Children's Hospital Colorado.

For references, go to ContemporaryPediatrics.com/pediatric-call-centers
REFERENCES


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