

Characteristics of patients and families who make early return visits to the pediatric emergency department

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Objectives: The primary objective of this study was to identify reasons why parents make early return visits, within 72 hours of discharge from a tertiary care pediatric emergency department (PED). A secondary objective was to investigate associated demographic and diagnostic variables.

Methods: A survey was conducted with a convenience sample of parents of children returning to the PED within 72 hours of discharge. A chart review was also completed for consented survey participants. Recruitment occurred from September 2005 to August 2006 at the Stollery Children's Hospital, Edmonton, Alberta, Canada.

Results: A total of 264 parents were approached to participate. Overall, 231 surveys were returned and 212 (92%) charts were reviewed. The overall rate of early return during the study period was 5.4%. More than half of parents stated that they returned because their child's condition worsened and many parents (66.7%) reported feeling stressed. Patients were typically under 6 years of age (67.4%), and most frequently diagnosed with infectious diseases (38.0%). Patients triaged with the Canadian Emergency Department Triage and Acuity Scale (CTAS) as CTAS 2 (emergent) for initial visits were more likely to be admitted on return, regardless of age ($P < 0.001$).

Conclusion: Variables associated with early returns included young age, diagnosis, triage acuity, and parental stress. Future variable definition should include a deeper exploration of modifiable factors such as parental stress and patient education. These next steps may help direct interventions and resources to address needs in this group and possibly pre-empt the need to return.

Keywords: bounceback, recidivism, pediatric, survey, accident and emergency

Introduction

A major issue in the current health care system is overutilization of services provided in emergency departments (EDs). In the pediatric population, the issue of overcrowding has been described as a "national crisis for children."¹ Patients returning to general EDs shortly after an initial visit account for up to 14% of all emergency visits per year,^{2,3} which represents millions of visits each year to North American centers.^{4,5} In addition to potentially burdening the health care system, pediatric early return patients (ERPs) risk exposure to infectious diseases while waiting to be seen. Return visits are often considered to be an indication of potential medical management errors associated with inappropriate assessment or treatment and, as such, have perhaps developed a negative connotation associated with them. Receiving less attention is the fact that these patients may represent a group with unmet needs related to discharge education and follow-up.^{2,5,6} Early return visits should not necessarily be viewed as a negative event, given that such visits may be physician-scheduled or related to unmet needs.

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To date, the reasons caregivers and families return to the pediatric emergency department (PED) remain debatable, and some reasons may be as yet undefined.

With few exceptions, early return studies have been retrospective in design and have taken place in general EDs with limited pediatric representation. The primary objectives of these studies have included quality assurance, and identification of diagnostic indicators, and patient and caregiver characteristics.^{2,3,5,7–11} Recently, Goldman et al⁵ used a retrospective approach in North American pediatric patients to explore pediatric ERPs' demographic information, age, acuity, time of day at presentation, and season of presentation. They concluded that 5.2% of their study population returned within 72 hours, with some patients returning more than once. Age and triage scores were found to be significant predictors of return. Due to the retrospective nature of this study, they were unable to comment on the reasons for which patients and families returned to the ED soon after discharge.⁵ Only LeDuc et al conducted a prospective study of recidivism in an American PED.¹² They studied return visits made within 48 hours to 3 months of initial presentation. LeDuc et al found that some demographic and diagnostic predictability exists in the pediatric early return population, but they were unable to explore the 48-hour return group further because of sample size limitations. They recommended further research on identification of those at risk for early return, patient/family education, and follow-up programs.¹² While the current literature defines the magnitude of the problem, it also highlights the lack of exploration of the motivations for early return to the ED. Interestingly, potential relationships between parental education and anxiety factors have not been addressed in an early return context.

In order to better serve the pediatric early return population, it is essential that we have a comprehensive picture of this group and the physiologic, emotional, and educational factors that influence their return. The lack of prospective studies of pediatric ERPs and the limited understanding of the role of influencing factors in pediatric early returns to the ED are barriers to addressing the problem of pediatric early returns. The primary objective of this descriptive, observational study was to identify reasons for parents' return to the ED with their child within 72 hours of their initial visit. A secondary objective was to investigate demographic and diagnostic variables associated with these early return visits.

Materials and methods

This study used survey and medical record review methods during one year (September 1, 2005 to August 30, 2006).

The study took place in the PED of the Stollery Children's Hospital, Edmonton, Alberta, which is an urban tertiary care center in Western Canada. In 2005–2006, the PED had an annual census of approximately 22,000 patients. This study was reviewed and approved by our local ethics agency, the University of Alberta Health Research Ethics Board. Further, appropriate administrative approvals from the Stollery Children's Hospital were obtained prior to study implementation.

Sampling and recruitment

Potential participants were identified as "early return" if they returned to the same PED within 72 hours of their discharge; this timeframe is the most commonly cited and studied timeframe in the early return visits literature.² All parents of pediatric patients (<17 years old) returning within this timeframe were considered eligible for enrollment in the study. Parents were excluded if the child they accompanied was over the age of 16 or if their English language fluency prevented them from completing the survey. These exclusion criteria were identified during the initial history taken by PED nursing or medical staff. We only included patients on their second visit within a 72-hour period; we did not aim to include patients who may have had more than two visits. Survey packages were attached to the child's emergency chart (at second visit) along with the emergency record from the initial visit; written consent for medical record review was included within the survey. The survey was a four-page written tool that was provided to the family by the treating MD/RN at the second visit, and completed by parents during this second ED visit. Completed surveys were deposited in a sealed container, provided at the exit of the PED. Table 1 provides a summary of the survey's main themes. Convenience sample was obtained over a 12-month period in order to capture seasonal and school year-related variation. Data on excluded patients were not recorded due to convenience sampling.

Data collection

The survey and medical record review tools were developed for this study following a review of the literature, and each was reviewed by practicing pediatric emergency physicians

Table 1 Summary of survey tool themes

Survey themes
Reasons for return
Details of first visit
Impact of child's illness on caregiver
Social structure of family
Demographic variables for caregiver

and nurses for content validity. The survey tool was then piloted to further establish face and content validity. The principal investigator (PI) trained a research associate in the use of our study-specific medical record data abstraction tool, content analysis, and thematic coding. The PI completed all data entry, and the research associate rechecked 20% of the records for accuracy and consistency. The research associate and the PI jointly completed content analysis and thematic coding. Additionally, a second reviewer also checked 20% of the data for keystroke error.

Incomplete records were considered for inclusion in the study on a chart-by-chart basis, with consensus between reviewers being first established. Given the exploratory nature of this study, any and all available medical record or survey data were included. Data abstraction in the medical record review did not require reviewer blinding, again, due to the exploratory nature of our study design. The medical record review process was guided by current literature standard, in order to minimize inconsistencies; the review was monitored using weekly meetings to identify potential problems in the process.^{13,14}

A complete review of all documents from each PED visit was done. Depending on the length and complexity of the patient's stay in the ED, the record may or may not have included an Emergency Nursing Assessment Record, Order Sheets and Physicians Progress Notes. The medical record review was included to identify and document the use of written discharge information, patient education, referrals, presence of a primary physician, whether the return was scheduled, and if the child was admitted on the return visit. The survey included nine questions related to the following broad categories: patient teaching, caregiver stress and attitudes, and patient/caregiver demographics.

Data management and analysis

Chart review data were collected by trained reviewers and entered into SPSS statistical software (Version 16, SPSS Inc, Chicago, IL, USA) using a study-specific standardized data collection form. Descriptive statistics were generated for medical record review data and close-ended survey data. Final classifications from the open-ended responses and chart review variables were analyzed using descriptive statistics and Chi-square tests with statistical significance set at $P < 0.05$. Variables with multiple classifications were grouped into dichotomous variables for Chi-square analysis.

Results

The patient census for the PED during the one-year study period was 21,474 visits. Of these patients, 1173 (5.4%)

made early return visits. A total of 264, or 23% of these early return families were provided with a survey. Of the 264 surveys distributed to parents who agreed to participate, three cases did not meet inclusion criteria and 30 surveys were not returned or were returned, only with information on age and gender of child. Thus the distribution provided 231 (87.5%) surveys for inclusion in analyses. Permission for the medical record review was given by 212 participants (81.0%), and 205 charts had content available from health records for review (78.5%). Temporal and demographic characteristics of early return patients are summarized in Table 2.

In our sample, 26.0% of the return visits were considered "scheduled." Scheduled visits were defined as any visit that was a result of the patient being asked to return during the 72-hour period. Examples of scheduled returns included returns for dressing changes or wound care, IV therapy, or to check hydration status. Children ranged in age from 0 to 16 years ($n = 261$, mean = 4.4 years). Forty-three children were admitted on second visit to the ED (20.9%, 43/205). Most parents surveyed (85.0%) stated that they had a family physician and 67.1% stated that they had a pediatrician. Further characteristics of the ERPs' parents are summarized in Table 3.

Impact of child's age

Approximately two thirds (67.4%) of the children in our sample were aged 0 to 5 years. In comparison, the age 0

Table 2 Temporal and demographic characteristics of early return patients

Characteristics	Frequency (% of sample)
Age ($n = 261$)	
0–5 years	176 (67.4)
6–16 years	85 (32.6)
Sex ($n = 261$)	
Male	160 (61.3)
Female	101 (38.7)
Time of return ($n = 211$)	
00:00–07:59	17 (8.1)
08:00–15:59	105 (49.8)
16:00–23:59	89 (42.2)
Day of week ($n = 211$)	
Monday	29 (13.7)
Tuesday	32 (15.2)
Wednesday	22 (10.4)
Thursday	22 (10.4)
Friday	31 (14.7)
Saturday	31 (14.7)
Sunday	44 (20.9)

Table 3 Parental characteristics of early return patients

Characteristic	Frequency (%)
Age of parent (n = 214)	
<18	6 (2.8)
18–29	62 (29.0)
30–39	99 (46.2)
40–50	43 (20.1)
>50	4 (1.8)
Level of education (n = 228)	
High school	65 (30.4)
Community college	65 (30.4)
University	76 (35.5)
None of the above	8 (3.7)
Level of stress on return visit (n = 222)	
Not stressed at all	5 (2.3)
Not stressed	17 (7.6)
Neutral	48 (21.6)
Stressed	72 (32.4)
Very stressed	80 (36.0)

to 5 year census for the same year was 58.0%. Age was examined as a potential factor in return visits and patient age was grouped into two categories for analysis: preschool (0 to 5 years) and school-aged (6 to 16 years). Diagnosis was found to differ by age (see Table 4), but parental stress was not found to be significantly different between the two age groups, in this study (see Table 3).

Diagnostic information

Information related to diagnosis was classified into five categories using an adaptation of the approach described by Alessandrini et al.² Diagnoses were recorded as documented on the chart and then placed into one of five categories: (1) Infectious diseases (non-respiratory), (2) Respiratory presentation, (3) Abdominal/gastrointestinal (GI) presentation, (4) Trauma or musculoskeletal, and (5) Miscellaneous (see Table 4).

Table 4 Classification of diagnoses for included patients

Classification	0–5 years n (%)	6–16 years n (%)	Total patients n (%)
Infectious disease (non-respiratory)	51 (65.4)	27 (34.6)	78 (38.0)
Trauma/MSK	5 (27.8)	13 (72.2)	18 (8.8)
			$P < 0.001$
Respiratory	48 (94.1)	3 (5.9)	51 (24.9)
			$P < 0.001$
Abdominal/GI	15 (55.6)	12 (44.4)	27 (13.2)
Miscellaneous	19 (61.3)	12 (38.7)	31 (15.1)
Total	138	67	205

Abbreviations: GI, gastrointestinal; MSK, musculoskeletal.

Infectious disease (non-respiratory) was the most frequent diagnosis on initial visit (38.5%) for all patients. A respiratory presentation on initial visit was the most likely reason for patients to require admission on return ($\chi^2 = 6.3$; $df = 1$; $P = 0.012$).

Triage score

Acuity was scored using the Canadian Emergency Department Triage and Acuity Scale (CTAS).^{15,16} Of the ERPs included in the medical record review, the triage scores at return visit were: resuscitation (CTAS 1) (n = 0, 0%), emergent (CTAS 2) (n = 32, 15.2%), urgent (CTAS 3) (n = 132, 62.6%), semi-urgent (CTAS 4) (n = 45, 21.3%), and non-urgent (CTAS 5) (n = 2, 0.9%). Patients were more frequently triaged as acute at the time of their initial visit, with 77.8% triaged as CTAS 2 or 3. On return visits, the average acuity decreased by 8.1% with 69.7% of patients scored as CTAS 1, 2, or 3.

The initial visit triage score was analyzed to determine if there were different admission rates on return. CTAS 2 (emergent) presentations were compared with CTAS 3, 4, and 5. Children who were triaged CTAS 2 on initial visits were significantly more likely to require admission on return than children initially triaged as CTAS 3, 4, or 5 ($\chi^2 = 12.7$; $df = 1$; $P < 0.001$).

Reasons for returning to the PED

Of the 231 surveys returned, 222 parents described the reasons for bringing their child back to the PED (see Table 5). The open-ended data were examined independently by two reviewers and classified using content analysis techniques. Parents could give multiple responses to the question. Responses were classified into 13 possible categories. Discrepancies were resolved by consensus.

The five categories with the greatest frequencies were analyzed individually. Of these five reasons for return, three were found to be significantly different by children's age categories. The parents of children aged 5 years and under were significantly more likely to have responded that their child's condition had worsened or had not improved (102/135, 75.6%). Parents of younger children were also more likely to state that they returned because of the discharge teaching they received on when to return to the PED (39/48, 81.2%). Parents of school-aged children were more likely to report that they returned for access to PED-specific resources, than caregivers of preschool children, although the absolute difference between groups was small (18/33, 54.5%) (see Table 5).

Parents were asked if they were given any written information on their child's illness. Fourteen percent of parents

Table 5 Classifications of parental reasons for return to the ED

Response classifications*	0–5 years n (%)	6–16 years n (%)	All patients n (%)
My child's symptoms got worse or changed or the symptoms did not improve	102 (75.6)	33 (24.4)	135 (59)
Specific to ED instructions on what to look for and/or when to return	39 (81.2)	9 (18.8)	48 (21.1)
Resources not available until the next day or IV therapy or ED specific therapy	15 (45.5)	18 (54.5)	33 (14.5)
My doctor's office or the on call physician or telephone advice line sent me in	17 (70.8)	7 (29.2)	24 (10.5)
The doctors asked us to come back for a recheck	9 (47.4)	10 (52.6)	19 (8.3)
No diagnosis given or I wanted more information and/or test results	11 (91.7)	1 (8.3)	12 (5.3)
Recurrence of symptoms	8 (66.7)	4 (33.3)	12 (5.3)
Emergency was the most trusted or convenient	3 (50)	3 (50)	6 (2.6)
My doctor's office was closed; I was not able to make an appointment	5 (100)	0 (00)	5 (2.2)
Treatment complication	0 (0)	5 (100)	5 (2.2)
I don't think the doctor made the right diagnosis or I didn't like the recommendations	1 (25)	3 (75)	4 (1.8)
No primary doctor	2 (66.7)	1 (33.3)	3 (1.3)
Not stated	6 (60.0)	4 (40.0)	10 (4.4)

Note: *Responses were classified into multiple categories, where appropriate.

Abbreviations: ED, emergency department; IV, intravenous.

recalled being given patient education materials with 63.1% of those indicating that they found these materials “helpful” or “very helpful”. The chart review data revealed that only 4.8% of charts had written documentation confirming that educational materials had been disseminated to caregivers. When parents were asked how stressed they felt about their child's illness, 68.5% answered that they felt “stressed” or “very stressed” about their child's illness. Finally, when asked if they could express true feelings to the ED physician, 85.1% of parents “agreed” or “strongly agreed”.

Discussion

To our knowledge, this study is the first to focus on “parental perspectives” of reasons for early return to the ED. More than half of parents stated that they returned because their child's condition worsened and many parents reported feeling stressed. Variables associated with early returns included young age, diagnosis, and parental stress. Our reported rate of return is similar to other reported Canadian studies, but is higher than American pediatric return rates. Our sample includes scheduled ERPs, a factor not consistently included in the available American research. We purposely included scheduled returns in order to obtain a comprehensive picture of all factors that influence a parents' return to the ED. The lower American return rates may also be a reflection of differences between the health care systems in Canada and the USA. Li et al¹⁷ compared ED utilization patterns in the USA and Ontario, Canada. Interestingly, they found similar utilization patterns in the USA and Canada. The only significant clinical differences found between the two systems were related to acuity and admission rates. Patients in the USA were more likely to have conditions that required immediate

attention and were more likely to be admitted.¹⁷ Overall, this study of all ages of ED patients demonstrated that 13.9% of the Americans were admitted to hospitals, compared with 10.5% of the Canadians. Interestingly, our pediatric-only population study suggests that admission rates are almost double for our younger population; this finding merits further study of the factors that make children potentially more likely to be admitted.

The two most likely reasons for returning given by parents in our study related to their child's symptoms and to physician discharge instructions on what to watch for and when to return. As health care professionals, we do not aim systematically to discourage families from returning to the PED if they feel that their child's condition warrants it. Proper caregiver understanding of the natural course of illness and appropriate follow-up care could possibly pre-empt the need for some of these returns. Furthermore, some of these visits are undoubtedly a reflection of the child's worsening condition. Our study was not designed to distinguish between these two categories.

The third most frequently cited reason for parents' return was related to a need to access ED-specific resources that were not available during the initial visit; these visits were labeled as “scheduled” returns for the purposes of our study. Examples might include ultrasound, or to see a specialty service such as surgery or neurology. If patients require hospital services that are not available 24 hours per day and are not ill enough to stay in the PED until those services are available, an alternate follow-up plan could be implemented for these patients. This problem is resource-related, and might best be served by being explored from an administrative perspective.

The mean age of the ERPs in our sample is consistent with North American pediatric studies.^{2,5} Previous studies have indicated that younger children are more likely to make early return visits to the PED.^{5,18} Younger children are more susceptible to infectious diseases and respiratory illness. The younger the children, the more likely it is that they have been exposed to these illnesses for the first time before they have built immunity, increasing the severity of the illness.¹⁹

The diagnostic information gleaned from the initial visit would prove the most useful in implementation of strategies regarding ERPs. Intervention planning would need to be set in motion during the initial visit in order to influence return rates. Studying presenting diagnosis, combined with age, could identify patients who are at increased risk of early return and thus enable more directed strategies. For example, targeted teaching for the caregivers of children aged 0 to 5 years who present with respiratory illness, or patients aged 6 to 16 years presenting with traumatic injuries, might be high yield areas to address. Focusing attention on what to expect at home and the natural course of the illness, and providing carefully guided and organized follow-up, may decrease the need to make early return visits for some of these patients.

The implications of increased parental stress for early return visits have not been well explored to date. The majority of parents in our sample reported feeling “stressed” or “very stressed.” However, we have no clear understanding of the sources of this stress. Parental stress as an influence on early return visits warrants further exploration, with an emphasis on mediating and moderating factors. A more focused study to identify sources of stress in those parents at higher risk of return, and to determine methods of addressing those stressors in the PED, should be considered.

The identification of specific variables associated with early return visits would allow PED staff to develop programs that target patients at high risk of return. Several authors suggest strategies such as follow-up phone calls, more intensive education, and directed follow-up care to decrease the number of early return visits. However, we found no studies that looked at the efficacy of such interventions with regard to early return rates.^{5,7,20} Programs that allow for more focused education, discharge instruction, and follow up could pre-empt the need for some return visits but these programs also require evaluation to determine their usefulness in this population.

Although PED utilization and quality assurance information have often been the center of early return visit literature, we chose not to include it in this study. The definition of what is an appropriate emergency visit is variable

and “physicians of varying specialties have been shown to have poor inter-rater reliability when it comes to defining what constitutes an emergency.”²¹ Given this fact, we felt it unrealistic to expect caregivers to be able to do so.

The data for this study were collected from a single PED and it would be of value to explore ERPs on a larger scale (ie, national, cross-border) in order to determine the impact of this issue on the greater health care system. Further investigation could allow for the development of a clinical prediction tool to help identify patients at high risk of early return. This tool could allow PEDs across North America to better focus their interventions in order to increase educational and psychosocial supports, and to develop alternate follow-up strategies. This could be helpful on multiple levels, directing resources to meet patients’ and families’ needs and potentially decreasing the burden on the emergency department.

Limitations

Limitations of this study include the fact that it is based on single site data. The fact that not all potential subjects were recruited due to the lack of available research staff for recruitment and ED staff workload conditions, might have contributed to sampling bias. While data were collected across a full 12 continuous months, we could not ensure that an equal number of participants were recruited from each month; as such, certain illnesses with seasonal variation (eg, bronchiolitis) may have been over-represented in our sample. We were unable to collect the data to compare our sampled return population to either the early return population as a whole or the full ED population during the study timeframe. As well, we did not collect data on the ethnic make-up of our population, although it is possible that this might influence on rates of recidivism. These factors could impact the wider generalizability of this study.

Conclusion

Normal progression of illness and vague early presentations are part of the complexity of practicing patient care in the ED environment. Parents and families should always feel that they are welcome to return to the ED if they are concerned. Certain modifiable (eg, parental stress) and non-modifiable (eg, child’s age and diagnosis) variables proved to be significantly associated with early return visits. Non-modifiable variables could be paired with modifiable factors, such as increased educational strategies, to target the best ways to inform caregivers so that they will feel comfortable making decisions on the type of follow-up their child requires. In order to better meet the needs of

families, we need a greater understanding of what motivates caregivers. In addition determining better ways to address the need for families to access resources currently available only in the ED could help decrease the frequency of some scheduled returns. Identification of such factors in our sample is the first step toward developing a tool to identify pediatric patients and families at increased risk for early return visits.

Disclosure

The authors have no financial or other conflicts of interest to disclose.

References

- Weiss SJ, Ernst AA, Sills MR, et al. Development of a novel measure of overcrowding in a pediatric emergency department. *Pediatr Emerg Care*. 2007;23:641–645.
- Alessandrini EA, Lavelle JM, Grenfell SM, et al. Return visits to a pediatric emergency department. *Pediatr Emerg Care*. 2004;20:166–171.
- Zimmerman DR, McCarten-Gibbs KA, DeNoble DH, et al. Repeat pediatric visits to a general emergency department. *Ann Emerg Med*. 1996;28:467–473.
- Adekoya N. Patients seen in emergency departments who had a prior visit within the previous 72 h-National Hospital Ambulatory Medical Care Survey, 2002. *Public Health*. 2005;119:914–918.
- Goldman RD, Ong M, Macpherson A. Unscheduled return visits to the pediatric emergency department-one-year experience. *Pediatr Emerg Care*. 2006;22:545–549.
- Gordon JA, An LC, Hayward RA, et al. Initial emergency department diagnosis and return visits: Risk versus perception. *Ann Emerg Med*. 1998;32:569–573.
- Depiero AD, Ochsenschlager DW, Chamberlain JM. Analysis of pediatric hospitalizations after emergency department release as a quality improvement tool. *Ann Emerg Med*. 2002;39:159–163.
- Hu SC. Analysis of patient revisits to the emergency department. *Am J Emerg Med*. 1992;10:366–370.
- Jacobstein CR, Alessandrini EA, Lavelle JM, et al. Unscheduled revisits to a pediatric emergency department: Risk factors for children with fever or infection-related complaints. *Pediatr Emerg Care*. 2005;21:816–821.
- Lerman B, Kobernick MS. Return visits to the emergency department. *J Emerg Med*. 1987;5:359–362.
- Pierce JM, Kellerman AL, Oster C. “Bounces”: An analysis of short-term return visits to a public hospital emergency department. *Ann Emerg Med*. 1990;19:752–757.
- LeDuc K, Rosebrook H, Rannie M, et al. Pediatric emergency department recidivism: Demographic characteristics and diagnostic predictors. *J Emerg Nurs*. 2006;32:131–138.
- Gilbert EH, Lowenstein SR, Koziol-McLain J, et al. Chart reviews in emergency medicine research: Where are the methods? *Ann Emerg Med*. 1996;27:305–308.
- Panacek EA. Performing chart review studies. *Air Med J*. 2007;26:206–210.
- Beveridge R, Clarke B, Janes L, Savage N, Thompson J, Dodd G, et al. Canadian Emergency Department Triage and Acuity Scale: implementation guidelines. *Can J Emerg Med*. 1999; 1(3 suppl):S2–28.
- Beveridge R. CAEP Issues. The Canadian Triage and Acuity Scale: a new and critical element in health care reform. Canadian Association of Emergency Physicians. *J Emerg Med*. 1998;16:507–11.
- Li G, Lau JT, McCarthy ML, et al. Emergency department utilization in the United States and Ontario, Canada. *Acad Emerg Med*. 2007;14:582–584.
- Brown EM, Goel V. Factors related to emergency department use: results from the Ontario health survey 1990. *Ann Emerg Med*. 1994;24:1083–1091.
- American Academy of Pediatrics. *Red Book: Report of the Committee on Infectious Diseases*. Elk Grove Village, IL: American Academy of Pediatrics; 2006.
- Chande VT, Wyss N, Exum V. Educational interventions to alter pediatric emergency department utilization patterns. *Arch Pediatr Adolesc Med*. 1996;150:525–528.
- Doobinin KA, Heidt-Davis PE, Gross TK, et al. Nonurgent pediatric emergency department visits: care-seeking behavior and parental knowledge of insurance. *Pediatr Emerg Care*. 2003;19:10–14.

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