



Pediatric emergency room visits for nontraumatic dental disease

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Abstract

Purpose: This study described the incidence and predisposing, enabling, and need factors of outpatients in a pediatric ER who sought care for nontraumatic preventable dental disease and analyzed treatment rendered by attending physicians and associated hospital charges for treatment.

Methods: Chart review of outpatients discharged from the ER of a children's hospital during 1996-97, using ICD-9 diagnostic codes for dental caries, periapical abscess and facial cellulitis yielded the data for this investigation.

Results: During 1996-97, 149 patients made 159 ER visits. The most common diagnoses were ICD-9 codes 521.0 for dental caries (48%) and 522.5 for periapical abscess (47%). Medicaid recipients used the ER at an intermediate level between patients with no payor source and those with private insurance. Almost one-half of the accounts changed status during the billing process, with the majority being entered as private pay upon admission, but changing to bad debt or charity after the registration records were processed and collection was attempted. Most patients were treated empirically by the ER physicians according to their presenting signs/symptoms.

Conclusion: This study confirmed that parents utilize the ER as their child's primary dental care source. (*Pediatr Dent* 22: 134-140, 2000)

The number of hospital emergency room (ER) visits in the US has increased dramatically over the past 40 years. It is well documented that this increase can be attributed to nonurgent health care needs that are more appropriately addressed in a primary care setting. The National Center for Health Statistics analyzed data from the 1992 National Hospital Ambulatory Medical Care Survey and reported that a majority of ER visits (55%) were nonurgent.¹ An obvious change in the function and responsibilities of the ER has occurred.

A multitude of studies have attempted to identify the factors that determine ER utilization for nontraumatic problems. The most commonly used behavioral model of health service utilization was developed by Aday and Andersen² to provide a conceptual framework for organizing the components that have been found to determine ER use. This model proposes that the use of health services stems from three

sets of factors: (1) predisposing factors, (2) enabling factors, and (3) need factors.

Predisposing factors include sociodemographic variables such as age, sex, and race which affect an individual's propensity to seek professional health care. In 1994, Baker et al.³ found that African-Americans and Hispanics were more than twice as likely to identify an ER as their regular provider. In an attempt to explain why ethnic minorities have considered the ER as a key source of health care over the past 25 years, White-Means et al.⁴ attributed this trend to the following sociohistorical factors: the proximity of hospitals to urban areas; the tradition of free care within hospitals; the exodus of physicians from urban centers to the suburbs; the greater tendency of members of both groups not to have a regular physician or health insurance; and lack of knowledge of other health care options. Today, Hispanics constitute the fastest growing segment of the US population. Almost half (48 %) of Mexican immigrant mothers surveyed reported the emergency room as a regular source of care for a sick child.⁵

Enabling factors refer to conditions such as insurance coverage, income, regular source of care, and geographical proximity to the ER that allow an individual to satisfy a perceived need for health care.⁶ In general, research studies support the empirical finding that the uninsured and people on Medicaid use disproportionately more ER services than those who have private third-party coverage. It is well documented that the available number of Medicaid providers has continued to be insufficient to meet the health needs of patients since the advent of Medicaid in 1965. As a result, visits to the emergency room by Medicaid recipients for nonemergency problems are common.⁷ The Omnibus Budget Reconciliation Act (COBRA) of 1985 requires hospitals with emergency departments participating in Medicare/Medicaid to examine every patient who requests care, including those without the ability to pay.⁶ In addition to insurance coverage and income, the geographical location of the hospital has also been shown to influence the kind of patient population that an emergency room serves. Specifically, the urban hospital ER serves a population that is largely poor and without health insurance coverage or a regular source of health care, such as a family physician.⁸ However, Jones et al.⁸ emphasized that the role that an ER assumes is shaped by the

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location of the hospital and the particular needs of its patient population and the community at large.

Need factors refer to both the objective and subjective components of health problems and are the most immediate determinant of health services use.² Medical providers and patients differ greatly in what they consider constitutes an emergency medical problem.⁹ While an ER physician may consider a particular condition to be “trivial” or “non-urgent”, the problem may be perceived as life-threatening by concerned ER patients and their families. According to Haddy et al.¹⁰ and for the purpose of this study, a “nonemergency” ER visit refers to a health problem that can be treated adequately and safely in an office setting. In a study by Glick and Thompson, six medical diagnoses for ER visits, as specified by ICD-9 codes, were used as a measure of need factors because these codes were readily available. ICD-9 codes are derived from the International Classification of Disease-9th Revision, Clinical Modifications (ICD-9 CM) manual which is issued by the US Department of Health and Human Services to address physicians’ use of diagnosis codes. They are numerical in nature and specific for a limited number of diagnoses. In reporting ICD-9 diagnosis codes, physicians describe the patient’s condition using terminology which includes specific diagnoses, as well as symptoms, problems, or reasons for the encounter which are chiefly responsible for the services provided.¹¹

The perceived role that pediatric dental services plays in the hospital ER has traditionally been the treatment of oral trauma to the teeth and associated soft tissues. However, a review of recent literature suggests that the same metamorphosis seen in the ER from a place for medical trauma treatment to a primary care source is also occurring in dentistry. Battenhouse et al.¹² reported that nontraumatic events were responsible for 54% of the 1,456 pediatric dental emergencies presenting to the ER at Children’s Hospital of Pittsburgh, PA during one calendar year. Dental caries and abscess formation (45%) were the most common chief complaint. At Columbus Children’s Hospital in Ohio, Wilson et al.¹³ described the types of nontraumatic dental emergencies presenting to the ER during a one-year period. Caries was the primary diagnosis in 73% of the cases, with abscess present in 33% of patients and Early Childhood Caries accounting for 18% of all cases of caries.

A ten-year study¹⁴ conducted at the Seattle’s Children’s Hospital, Seattle, WA, evaluating trends in patients seeking emergency dental care reported an increase in the proportion of nontraumatic infection-related visits from 31% to 44%, comparing the periods of 1982-87 and 1988-91. Nearly two-thirds of the children did not have an usual source of medical care, 31% of children had no medical insurance, and 22% received Medicaid benefits. This study suggested an important trend: Carious teeth are responsible for an increasing proportion of emergency dental visits, despite an overall declining incidence of dental caries among children.

In the previously cited studies, patients who presented to the ER for nontraumatic dental disease were treated by a member of the dental staff. However, not all emergency rooms’ personnel include a dentist. Few physicians have received much, if any, education in dental management. A unique study by Pennycook et al.¹⁵ described the dental problems presenting to an ER and a dentist’s review of their management by physicians over a six-month period. Among the nontraumatic dental problems, an actual diagnosis was rarely made and most patients were treated based on their presenting signs and

Table 1. Predisposing Factors of ER Patients at Admission

Factor	1996 Pts. (N=28)	1997 Pts. (N=131)	1996+1997 (N=159)
Age (years)			
Birth-3	10	29	39
4-6	8	50	58
7-12	6	42	48
13-18	4	10	14
Gender			
Male	17	73	90
Female	11	58	69
Race			
White	8	11	19
Black	6	32	38
Asian	0	0	0
Hispanic	12	82	94
Other	2	6	8

symptoms. Although this empirical treatment was usually regarded as adequate, it was felt by the authors to be sub-optimal, but safe, for the period until appropriate definitive dental care could be obtained. More studies are needed to evaluate physicians’ management of dental emergencies.

Almost all dental disease is preventable¹⁶ and yet parents are bringing their children to the ER to receive costly and nondefinitive treatment by physicians for caries and its avoidable sequelae. The medical literature is replete with references to excessive costs for emergency primary care. However, no studies to date have focused on the hospital charges associated with ER treatment by physicians for nontraumatic preventable dental disease. Presentation of such data would highlight the magnitude of the problem if such misuse is actually occurring.

A model has been designed by Ettlbrick¹⁷ to acquire data for inpatients admitted through the ER for ICD-9 codes pertaining to nontraumatic preventable dental disease. The purpose of this retrospective study was to apply Ettlbrick’s¹⁷ model to a pediatric outpatient population and to describe the predisposing, enabling, and need factors of these patients who sought care for nontraumatic preventable dental disease during a two-year period. The treatment rendered by ER physicians for the presenting dental problems and its associated hospital charges were assessed.

Materials and methods

Children’s Medical Center of Dallas, Texas (CMC) is a 322-bed, tertiary-level pediatric teaching hospital. Pediatric dental residents are on call 24-hours a day. The study sample was comprised of patients seen in the emergency room for nontraumatic preventable dental disease at CMC during the 1996-97 period.

Data were collected on each patient for the following variables.

- 1) Predisposing factors which included: age (recorded in four intervals of birth-3 years, 4-6 years, 7-12 years, and 13-18 years), gender, and race (White, Black, Asian, Hispanic, and Other).
- 2) Enabling factors which included: season of ER visits [winter (December, January, February), spring (March, April, May), summer (June, July, August), or fall (September, October, November)], time during the week of visits [weekday (Monday-Friday) or weekend (Saturday,

Table 2. Enabling Factors of ER Patients at Admission

Factor	1996 Pts. (N=28)	1997 Pts. (N=131)	1996+1997 (N=159)
Season (years)			
Winter	9	19	28
Spring	8	13	21
Summer	4	44	48
Fall	7	55	62
Day of the week			
Weekday	19	82	101
Weekend	9	49	58
Time			
Day	16	66	82
Evening	9	50	59
Night	3	15	18
Financial class			
Private pay	14	51	65
Medicaid	6	44	50
Commercial insurance	8	20	28
Charity	0	16	16

Sunday)], time of emergency visits [day (7:30 AM-4:30 PM), evening (4:31 PM-11:30 PM), or night (11:31 PM-7:29 AM)], financial class [private pay (no health insurance), Medicaid, commercial insurance (included both private insurance and managed health care plans), or charity (assigned by the financial counselor to denote that patient qualified for uncompensated hospital care due to limited income)].

- 3) Need factors which included: ER diagnosis for each visit as specified by an ICD-9 code relating specifically to nontraumatic preventable dental disease. This code was used as a measure of the patient's need for emergency treatment.

Permission to perform this investigation was granted from Children's Medical Center of Dallas. The following model designed by Ettlbrick¹⁷ was applied to an outpatient ER population. A computer list was generated by the medical records department's computer software (the SMS Clinical System) of outpatients discharged from the ER during the calendar year 1996-97 with the ICD-9 codes of 521.0, 522.5, and 682.0. The following data were recorded for each chart

reviewed: a) ER admission date (season, day of week, and time of visit), b) age, c) gender, d) race, e) payor source (at time of admission and after 90-day collection period), f) ICD-9 diagnosis code, g) type of treatment rendered, and h) total hospital charge for ER visit.

Treatment rendered was recorded as the specific type and route of administration [oral, intramuscular (IM), or intravenous (IV)] of antibiotics given, the type of dental referral offered (CMC referral, outside referral, or no referral), and the type of diagnostic procedures ordered. The number of repeat ER visits was documented. All data were analyzed using descriptive statistics.

Results

One hundred-forty-nine patients collectively made 159 visits to the ER for nontraumatic preventable dental disease during the two-year period, 28 in 1996, and 131 in 1997.

The predisposing factors of children seen in the ER for infection-related dental disease are described in Table 1. During the two-year period, 61% (97 out of 159) of patients were age six and younger. A substantial proportion of children (25%) were age three and younger. The relative frequency of ER visits varied by gender: 57% males and 43% female. A majority (59%) of the visits were made by Hispanic children, followed by Black children (24%), and White children (12%). Eight children (5%) were considered to be of "other" ethnic background.

Table 2 presents the enabling factors of patients admitted to the ER on an outpatient basis for nontraumatic preventable dental disease. The largest volume of visits during the two-year period occurred in fall (39%), followed by summer (30%). A clear majority of admissions took place during the week (64%) rather than during the weekend (36%). The largest number of visits occurred during the day (52%), followed by evening (37%).

Financial class (source of payment for health care) for the sample upon admission to the ER was 41% private pay, 31% Medicaid, 18% commercial insurance, and 10% charity (hospital sponsored). Table 3 compares the financial class of patients at time of ER admission and after the 90-day collection period. The financial class initially assigned to 49% of patients (78 out of 159) upon admission changed status during the collection period. Fig 1 shows that decreases of 46 patients for private pay, 2 patients for Medicaid, and 13 patients for commercial insurance occurred, while an increase of 18 patients for the charity classification occurred.

Table 3. Comparison between Financial Class at ER Admission and after Collection Period

Financial class	1996 Patients (N=28)		1997 Patients (N=131)	
	At ER Admission	After Collection Period	At ER Admission	After Collection Period
Private pay	14	0	51	19
Medicaid	6	6	44	42
Commercial insurance	8	1	20	14
Charity	0	6	16	28
Bad debt	0	15	0	27
State CIDC	0	0	0	1

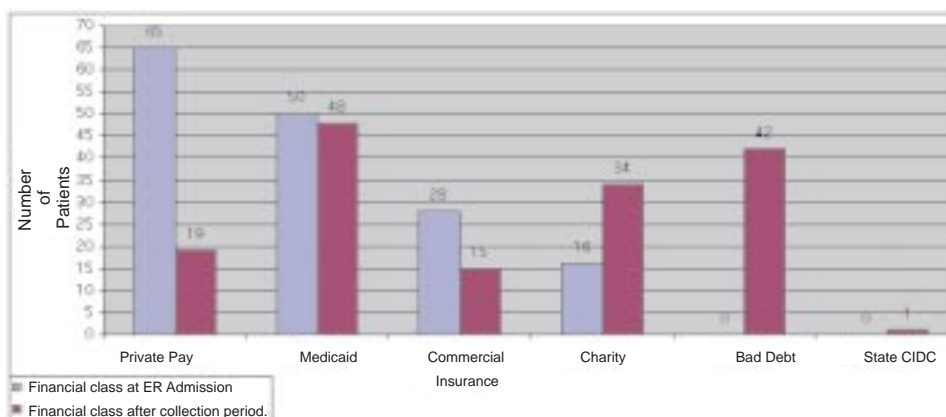


Fig 1. Distribution of financial class at time of ER admission and after 90-day collection period.

Finally, 26% (42 out of 159) of the accounts became bad debt and 0.8% (1 out of 159) of the accounts was assigned to the State's Chronically Ill and Disabled Children (CIDC) classification (certain medical eligibility criteria were met to receive state funding).

The need factors of ER patients are evidenced by ICD-9 codes (see Table 4). The most common ICD-9 diagnosis codes of children who sought care in the ER was 521.0 or dental caries (48%) and 522.5 or periapical abscess (47%). Only two children with an ICD-9 code of 682.0 or facial cellulitis (1%) were treated in the ER on an outpatient basis. The ICD-9 codes of the 8 (5%) visits designated by ICD-9 codes pertaining to nontraumatic preventable dental disease other than these three are also listed. The diagnoses were made in the majority of cases by the emergency room physicians, as the dental resident on call was notified in only six cases. The ICD-9 codes were assigned by a clerk based on the physician and/or triage nurse's notes under the chief complaint section of the encounter form.

Table 5 presents the treatment rendered by the attending ER physicians such as the type of antibiotic prescribed/administered and dental referral given. A total of 103 antibiotics were prescribed for oral use, 7 were administered via intramuscular (IM) injection, and 6 were given intravenously (IV). ER physicians referred 64 patients (40%) to the CMC dental clinic, 77 children (48%) to an outside dental clinic or private practitioner, and 18 (11%) of the patients were not given a dental referral. Nine out of the 149 patients seen (6%) had extensive diagnostic tests ordered by their treating physician.

The hospital charges associated with treatment rendered are shown in Table 6. In 1996, the minimum ER charge for a patient admitted for nontraumatic preventable dental disease was \$60 and the maximum ER charge was \$425. Two patients admitted to the ER in 1996 were not charged because they were referred directly to the dental clinic after registration. Hence, the mean ER charge was determined for the 26 patients charged. The minimum and maximum ER charges in 1997 were \$40 and \$900, respectively. Four patients were immediately referred and not charged in 1997, and therefore, the mean ER charge presented is for the 127 patients charged.

Discussion

Collection of the desired information revealed that Ettlbrick's model¹⁷ was successfully applied to an ER outpatient population.

The number of ER visits made for nontraumatic preventable dental disease increased four-fold between 1996 and 1997 from 28 to 131 in 1997. Considering that the total number of ER outpatient admissions only increased by 9.5% between 1996 and 1997, this represents a relatively large increase in the number of ER visits made for nontraumatic preventable dental disease. The simple fact that the newly-opened ER in this large tertiary medical center had been in operation a year longer and an adjacent county hospital started referring patients under the age of 18 to Children's Medical Center for emergency care in July of 1997, may explain the increase in dental visits. Therefore, inferences about the increase in the occurrence of visits found in this study should be drawn with caution.

Over the two-year period, a total of 10 ER visits were made by "repeat users". Six of these visits were for a re-evaluation and the other four were due to the progression of an abscess to a cellulitis or "pain persisting" despite an antibiotic having been prescribed. Patients in this study did not abuse the ER by virtue of repeat visits.

Predisposing factors

Approximately one-fourth of the children seen in the ER were age three and younger. Noteworthy gender predominance was not demonstrated in this study which is in accordance with

Table 4. Need Factors of ER Patients at Admission

Factor	1996 Pts. (N=28)	1997 Pts. (N=131)	1996+1997 (N=159)
ICD-9 CODE			
521.0 (Dental caries)	9	67	76
522.5 (Periapical abscess)	17	57	74
682.0 (Facial cellulitis)	0	2	2
OTHER			
382.9 (otitis media)		1	1
520.8 (Tooth devl/Erpt pbx)		1	1
522.3 (Abnhard tiss-tooth pulp)		1	1
522.9 (Dental disorder nos)		1	1
525.9 (Dental disorder nos)		1	1
682.9 (Dermatitis nos)	1		1
692.9 (Facial cellulitis nos)		1	1
782.3 (Edema)	1		1

nos=nonspecific

Table 5. Treatment Rendered: Antibiotics Administration and Dental Referrals

Treatment	1996 Pts., No. (%) (N=28)			1997 Pts., No. (%) (N=131)			1996+1997, No. (%) (N=159)		
	Oral	IM	IV	Oral	IM	IV	Oral	IM	IV
ANTIBIOTICS									
Amoxicillin	7			23			30		
amoxicillin + clavulanic acid	5			10			15		
ampicillin sodium			1						1
ceftriaxone sodium					2			2	
cephalexin monohydrate	1			2			3		
clindamycin	3	1	2	9	1	3	12	2	5
penicillin G benzathine			1			1			2
penicillin G benzathine + procaine				2			2		
pen V potassium	5			38			43		
REFERRAL									
CMC		14			50			64	
Outside		13			64			77	
No		1			17			18	

Wilson et al.'s findings¹³ that dental caries is not a selective process related to gender. The racial/ethnic composition of patients served by the ER at Children's Medical Center of Dallas was largely shaped by the community-at-large. The most predominant race in Dallas County is Hispanic, followed by White, and then Black.¹⁸

Enabling factors

Medicaid recipients were found to utilize the ER for nontraumatic preventable dental disease at an intermediate level between those patients with no payor source and those with private insurance. This level of use can be explained by the commonly documented premise that low reimbursement rates discourage physicians from providing services to the Medicaid population. Thus, these patients frequently have no primary care provider and must rely on ERs for primary care services.¹⁹ While dentists can respond to monetary incentives in patient selection, ERs that obtain federal funding are required by law to evaluate every patient regardless of the ability to pay. Emergency room co-payments are modest and frequently waived if the patient is unable to pay.⁷ Thus, low out-of-pocket patient costs provide incentives for Medicaid patients and the uninsured to use ERs for primary care services.²⁰

This study was unique in that it examined the financial class of patients at both the time of ER admission and after the 90-day collection period. Almost one-half of the accounts (42%)

changed status during the billing process, with the majority being entered as private pay upon admission, but transpiring to bad debt or charity after the registration form was reviewed or collection was attempted. Hence, the hospital was not reimbursed for 45 out of the 159 patients treated for nontraumatic preventable dental disease during the two-year period. Charity care, it should be noted, is care provided by the hospital for qualifying individuals and may therefore be viewed by recipients as third-party coverage while being viewed by the hospital as uncompensated care.⁶ These findings support the conclusion that high use of the ER by the impoverished is unavoidable because parents realize that treatment of a sick child will not be denied by this care source.

Need factors

ICD-9 codes were used as a measure of patients' need for dental care. Thorough chart review revealed that although ICD-9 codes attach a "label" to the reason for the encounter, they fail to describe a patient's true condition. Such terms as "toothache", "fever", "dehydration", and "sleeplessness" often accompanied these generic codes and validate the parents' decision to bring their child to the ER for dental disease. The sequelae of untreated caries are indeed serious and include toothache, sleep loss, the development of a dental abscess, general malaise, and intense discomfort.¹² This study was started with the belief that the ER was being used inappropriately in

Table 6. Hospital Charges Associated with Treatment

	1996 Pts. (N=28)	1997 Pts. (N=131)	1996+1997 (N=159)
Total ER Charges	\$3,707	\$14,268	\$17,975
Range of ER charges	\$60-\$425	\$40-\$900	\$40-\$900
Median ER charge	\$109	\$75	\$75
Mean ER charge	\$143±99	\$112±137	\$117±132

the majority of cases. After analysis, the notion of appropriateness may need to be redefined. DeLuke²¹ emphasized the issue by stating "the overriding factor is not whether the problem is determined to be a true emergency or not...but rather what the patient himself or his family believes is an emergency and what the community expects and anticipates that the hospitals within it will provide." Most of the ER visits in this study were prompted by acute signs/symptoms which could have been prevented with routine dental care. However, by the time parents sought treatment for their children, they perceived that the need for emergency care clearly did exist.

Analysis of treatment

A considerable amount of a dental student's education is spent studying medicine, but most medical students receive no formal dental education. However, all ER physicians will at some point be exposed to patients whose chief complaint is of dental origin. A Scottish study by Pennycook et al.²² analyzed treatment rendered by ER physicians for dental problems. However, this is the only American investigation to make such an analysis. It is of particular concern that although a pediatric dental resident is on call 24-hours a day at the hospital, one was contacted during the two-year period in only 6 of the 159 documented ER visits. The design of the study assumed the dental resident's involvement in making the original diagnosis. It made no provisions for examining the diagnostic criteria which were used to assign the ICD-9 code employed to identify the ER population studied. Children presenting to the ER are triaged by a nurse who determines that the chief complaint relates to a dental problem. However, the criteria used by the ER physicians for making their dental diagnoses are unknown and assumed to be by visual examination and/or based on patient history. The use of dental radiographs is presumed to be nil unless a dental resident was involved. Future studies into ER use for dental caries related admissions need to examine who is making the diagnoses and what criteria they are using to assign patients to ICD-9 diagnosis codes.

Most patients were treated empirically according to their presenting signs/symptoms. Oral antibiotics were prescribed in 103 cases, intramuscular antibiotics were administered in 6 cases, and intravenous antibiotics were administered in 8 cases. The choice of specific type and route of administration of the antibiotics was based largely on the presence of fever, dehydration, and most likely the treating physician's personal preference. It should be noted that certain antibiotics such as amoxicillin with clavulanic acid, cephalexin monohydrate, and ceftriaxone sodium were unduly expensive with no real advantage linked to their efficacy against odontogenic infections. It is reasonable to assume that physicians often chose these broad-spectrum, costly antibiotics due to their lack of knowledge regarding the pathogenic organisms responsible for causing dental disease. However, impoverished parents are more likely to fill a prescription for their child if it is inexpensive.

It was encouraging to find that all but 18 patients were referred to a source of dental care. However, only 32 out of the 77 outside dental referrals made were denoted specifically with the name of a clinic or private practitioner. Therefore, one recommendation of this study would be that more time should be devoted to making specific and thorough referrals in the ER to ensure that children with dental care needs get definitive treatment.

Associated hospital charges

There was a wide range of hospital charges associated with the visits which can be explained by both the varying conditions of patients who presented to the ER and the number of actions initiated by the nurse or ordered by the physician to adequately evaluate/treat the child. Most of the patients required limited or minor levels of care but a few were considered to need an intermediate level of care. The patients who were charged amounts in excess of a few hundred dollars were generally those who presented to the ER swollen, dehydrated, and with fever in need of IV antibiotics, fluids, and frequent monitoring. A few of the cases with outstanding charges were those previously discussed in which the physicians' ignorance of dental disease led him/her to order excessive, unnecessary diagnostic procedures. On average, a patient admitted to the ER for nontraumatic preventable dental disease in 1996 and 1997 was charged \$143 and \$112, respectively. This is a considerable amount to pay for nondefinitive care. While the number of interventions at each visit varied widely, it is particularly noteworthy that the majority of visits used no definitive services. These visits generally consisted of interventions such as assessment, administering a prescription for antibiotics, and providing a dental referral which could have been provided, more cost effectively, and definitively in the dental setting.

Although the number of ER visits made for nontraumatic preventable dental disease during the 1996-97 period does not seem alarming in relation to the total number of ER visits made, this study did confirm that parents are indeed utilizing the ER as their child's primary dental care source. This may suggest that either the child does not have a primary dental provider, the parents do not have the financial means to afford dental care and know that the hospital will not deny needed treatment, or that dental clinics/private practitioners do not provide after-hours emergency treatment. Whatever the case, use of the ER for nontraumatic preventable dental disease reflects a failure of our country's health care delivery system to provide accessible and affordable dental care for children in need.

Conclusions

1. During the two-year period, 149 individuals made 159 ER visits for nontraumatic preventable dental disease. Out of these visits, 28 occurred in 1996, and 131 in 1997, representing a 468 % increase. Due to the presence of extraneous factors, additional follow-up is necessary to determine if this truly is the start of an increasing trend in the use of the ER for this purpose.
2. Medicaid recipients used the ER at an intermediate level between those patients with no payor source and those with private insurance.
3. Almost one-half of the accounts changed status during the billing process, with the majority being entered as private pay upon admission, but changing to bad debt or charity after the registration records were processed or collection was attempted.
4. The most common ICD-9 diagnosis codes of ER patients was 521.0 (48%) and 522.5 (47%).
5. Most patients were treated empirically by the ER physicians according to their presenting signs/symptoms.

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ABSTRACT OF THE SCIENTIFIC LITERATURE



FACTORS ASSOCIATED WITH SIGNIFICANT INJURIES IN YOUTH ICE HOCKEY PLAYERS

This study was conducted to review injury occurrence, injury prevention and attitudes involved in youth ice hockey activities. This descriptive case series reviews a sample of 103 patients, ages 7 to 18, presenting to a children's hospital emergency department with injuries incurred while playing youth hockey in league-sanctioned games or practices from October, '95 through September, '96. Each patient completed a written questionnaire during the ED visit related to patient demographics, circumstances related to the present injury, protective equipment worn, and attitudes towards the risk of injury and other issues related to youth hockey.

Results indicated that of the 103 patients (113 injuries total), protective equipment compliance ranged from 97 to 100%. Of the 83% of injuries incurred during games, penalties were called on only 4%; in fact, injuries were apparently more common on plays that were perceived to be within the rules of the game. It was determined that the protective equipment worn may give players a 'false sense of security'. It was discussed that the style of play, enforcement of rules and attitudes of players and coaches play a role in injuries received.

Comments: As pediatric dentists, it should be routine to ask patients about sports related activities and to offer counsel on the potential and prevention on dental and other injuries. This article mentioned only one dental fracture among the 113 injuries, presumably indicating the effectiveness of mouth and face guards. **RFM**

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