

# An evaluation of the management of dental emergencies by the school nurse

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## Abstract

*A questionnaire survey of Boston Public School nurses was undertaken to determine the extent of their dental knowledge. The results of the study indicated that although the nurses state that a sizable number (18-22) of dental emergencies occur during a typical school month, the diagnosis and treatment of these problems is often inadequate when judged by currently accepted standards. This is not surprising since less than 35 percent of the nurses received any training on the handling of dental emergencies.*

## Introduction

The nursing profession includes little, if any, dental education as part of its training programs. However, nurses who accept positions in schools are responsible for not only the student's medical needs, but their dental needs as well.

The nursing literature contains little evidence of work done to evaluate the function of the school nurse in relation to dental emergencies. A notable exception is a program undertaken by Aria C. Rosner, a registered nurse who proposed a comprehensive approach to dental health for the school population.<sup>1</sup> As part of a total health program instituted through the Office of Economic Opportunity, an attempt was made to increase the knowledge of the school nurse to enable him or her to provide on-site dental examinations and referrals to treatment facilities. Emphasis was placed on the identification of common dental problems of the school-aged child, including; abscesses, "broken restorations", gingivitis, and dental decay. Characteristic of the remainder of the pertinent literature are articles dealing primarily with the school nurse as a dental educator with emphasis on prevention through education.<sup>2,4</sup>

In Massachusetts, where the current study was undertaken, the Board of Registration in Nursing makes no mention of dentistry in either the natural science or clinical nursing requirements.<sup>5</sup> The major nursing schools in Boston have no provisions in their baccalaureate programs for coverage of dental topics, with the exception of basic dental anatomy within the

general anatomy coursework. Some of the schools, including all nurse practitioner programs, provide material on prevention of dental disease and proper methods of oral hygiene.

Although no information on the handling of dental emergencies is made readily available through nursing education, the nursing literature does contain some information pertaining to dentistry. Dr. Paul Lang, a dentist, emphatically pointed out the high prevalence of dental disease among children and highlighted the unique position of the school nurse in the recognition and prevention of dental problems.<sup>6</sup> Representative of articles stressing dental care and the role of the nurse as examiner of the mouth and teeth are those by Urbanska,<sup>7,8</sup> James,<sup>9,10</sup> and Rosenhouse.<sup>11</sup> Slattery attempted to aid nurses in managing their patients with dental complaints by describing common dental problems and their treatment.<sup>12</sup> Unfortunately, descriptions were cursory and the suggested treatments are no longer current.

The objectives of the present study, in light of current literature, is to document and describe the extent of dental knowledge and awareness of the school nurse in handling dental emergencies in the school setting. Information was compiled on the number, type and severity of dental emergencies encountered on a daily basis and the appropriateness of the treatment and/or referral modalities was evaluated.

## Methods and Materials

A questionnaire was mailed to the seventy-six nurses employed by the Boston Public School System. The questionnaire contained sixteen objective questions designed to gain information on the type and frequency of dental emergencies encountered and the diagnostic capability and treatment modalities of the school nurse. The remaining questions were designed to measure the perceived need for aid in handling these emergencies, and to obtain demographic data on the school nurse population.

The survey instrument was pretested on a separate nursing population of primary care nurses and revised to its present form. The estimated time to complete the questionnaire was approximately fifteen minutes. A second mailing of the questionnaire was performed two months after the initial mailing in an attempt to increase the response rate.

## Results

An overall response rate of 66 percent (N = 50) was obtained. The initial mailing resulted in a response rate of 52 percent (N = 39) with an additional 14 percent (N = 11) obtained after the second mailing. Only one questionnaire had to be excluded from the survey, due to incomplete response. The data analysis was broken down into four major groups: type and frequency of emergency encountered; diagnosis and treatment of hypothetical emergencies; referral patterns; study population demographics. Means and their associated standard deviations were chosen as the measurement statistics and were calculated where appropriate.

The first major area of data analysis deals with the number, type and frequency of emergencies seen by the school nurse. A mean score of 19.8 (S.D. = 1.81) dental emergencies per month were seen. Of the dental problems encountered, a mean of 6.7 (S.D. = .73) emergencies per month were traumatic in nature. These injuries were classified according to type of tissue involved. A majority (65%) were reported to involve soft tissue injury only, with a minority (35%) involving hard tissue only or a combination of hard and soft tissue. Both primary and permanent tooth trauma was noted. The nurses reported a mean score of 11 (S.D. = 1.12) emergencies per month dealing with pain or swelling associated with a toothache. The most frequent presenting symptom was that of pain alone (67%), and involved permanent teeth in the majority of cases (59%). The remainder of the emergencies (mean score = 3.7; S.D. = .61) were those dealing with loose baby teeth, intraoral infections, braces, broken fillings or broken appliances.

The second group of questions involved the diagnoses and treatment of four hypothetical dental emergencies as they might typically present to the school nurse. These are shown in Table 1.

The analysis of the first case involving a loose primary anterior tooth, revealed that the child would most likely be sent back to class, but, also that the nurses were uncertain about the diagnosis and the appropriate time to seek dental care. Of the 25 percent of the nurses who would perform treatment, 96 percent would recommend warm saline rinses. The next case, dealing with an avulsion of a permanent tooth, showed a definite trend toward sending the child home and advising immediate dental care. While 92

**Table 1.** Diagnostic options for sample emergency situations.

Focus of case discussion	Possible diagnoses
Loose primary tooth (age appropriate and without pathology)	<ol style="list-style-type: none"> <li>1. traumatically injured tooth</li> <li>2. decayed tooth</li> <li>3. loose baby tooth</li> <li>4. abscessed tooth</li> <li>5. tooth loose due to gum disease</li> </ol>
Abscessed tooth	<ol style="list-style-type: none"> <li>1. abscessed tooth</li> <li>2. advanced gum disease</li> <li>3. food impacted in gum tissue</li> <li>4. an erupting permanent tooth</li> </ol>
Herpes infection involving lip	<ol style="list-style-type: none"> <li>1. vitamin deficiency</li> <li>2. trauma to lip</li> <li>3. Herpes infection (cold sores)</li> <li>4. lip-biting habit</li> </ol>

percent of nurses would perform treatment, the treatment suggested varied. Reimplantation was the choice by 14 percent, while 58 percent would wrap the tooth in sterile gauze or ice and have the child go to a dentist immediately. The third treatment recommended by 28 percent of the nurses was control of bleeding through the use of an ice pack. When presented with a case of a child experiencing pain from a toothache with resultant intraoral swelling, there was uncertainty in diagnosis, treatment or course of action. Of the 26 percent of the respondents who would perform treatment, 87 percent recommended warm saline rinses. The remainder suggested a warm tap water rinse. The final case involving a painful infection with herpes simplex virus on the child's lips resulted in confusion regarding diagnosis, whether the child should be sent home, and when dental care should be sought. Of the 40 percent of the subjects who recommended treatment, 80 percent chose the application of vaseline or an antibiotic ointment as the preferred treatment modality. Others suggested warm compresses or alcohol on the affected area. The results of these four cases are presented in Table 2.

The third group of questions collected information on the referral sources for the emergencies and whether the nurses felt comfortable treating them. If the child is without a pre-existent source of dental care, 84 percent of the nurses refer to a neighborhood clinic and 48 percent refer to an outpatient dental clinic in a hospital. When asked if they were able to adequately handle the dental problems they see, 40 percent of the nurses answered affirmatively, while 60 percent felt they would manage some, but not all prob-

**Table 2. Response to different dental emergency situations.**

	Focus on case discussion	send back to class	send home	Inform parents	Advise to seek dental care immediately at own convenience	Possible diagnoses	Perform treatment
	0 _____ 10	0 _____ 10			0 _____ 10		
Loose primary tooth	$\bar{x} = 2.1 \pm .18$	yes=83% no=17%		$\bar{x} = 3.4 \pm .62$		1=83% 2=55% *3=85% 4=53% 5=51%	yes=25% no=75%
Avulsed tooth	$\bar{x} = 7.8 \pm 2.23$	yes=100% no=0%		$\bar{x} = .6 \pm .1$			yes=92% no=8%
Abscessed tooth	$\bar{x} = 6.5 \pm 1.59$	yes=100% no=0%		$\bar{x} = 1.2 \pm .13$		*1=98% 2=32% 3=60% 4=72%	yes=26% no=73%
Herpes infection	$\bar{x} = 3.2 \pm .44$	yes=100% no=0%		$\bar{x} = 3.3 \pm .4$		1=52% 2=62% *3=56% 4=60%	yes=40% no=60%

\* denotes correct diagnosis

lems. An overwhelming majority (96 percent), however, agreed that a manual which would aid them deal more effectively with these emergencies would be helpful.

The last group of questions collected data to describe the nursing population under study. The school nurse in this study was for the most part full-time (98%) and had greater than six years experience (88%). When asked if they had received any dental training, 78% responded in the affirmative. Of this group, the training was either in nursing school (71%) or from a continuing education course (40%). The information received was mostly on prevention, dental anatomy and childhood dental development (80%). Some of the nurses (34%) did receive information on emergency dental care from one or both of the above sources.

## Discussion

While two-thirds of the nurses responded, it is impossible to extrapolate to the entire nursing population. The results of the present study however, clearly indicated that the school nurse does see and treat a substantial number of dental emergencies during the school year. On the average, 18-22 dental problems of varying type and severity were reported to be encountered per month. Of these, 6-8 were the result of a traumatic episode; the majority of these injuries involved soft tissue damage only, although a fair number did involve hard tissue as well. The majority of the emergencies, 10-12 visits per month, were the result of pain or swelling from a toothache. In most of these cases pain alone was the presenting symptom.

These results are not surprising when considering public health statistics. A survey published in 1974 by the Department of Health, Education and Welfare showed high DMF and def scores for children age six through seventeen years, as well as a large unmet treatment need index.<sup>13,14</sup> More recently, a publication by the United States National Commission on the International Year of the Child showed that 47 percent of all children under twelve years of age had never seen a dentist.<sup>15</sup> Since the end result of untreated dental caries is pain and/or infection, it is not surprising to find a fair number of children presenting to the school nurse with the complaint of pain to one or more teeth. The incidence of trauma is equally well-documented. In a study of 4,251 secondary school children, Ellis found that 4.2 percent had sustained trauma to their dentitions.<sup>16</sup> In a similar study by Grundy of 625 children, a 5.1 percent frequency of primary and permanent tooth fracture was found.<sup>17</sup>

Most of the dental emergencies which were seen involved permanent teeth only. This fact must be viewed as a function of the study population; the majority of school age children are in late mixed or complete permanent dentitions.

When presented with various case histories and asked for diagnosis and/or treatment, responses varied widely. The first hypothetical emergency was that describing a loose, exfoliating primary tooth. While this is a common complaint of the six- or seven-year-old child, it is not a true dental emergency. The nurses tend to send the child back to class, inform parents and advise that the child seek dental care. This is

certainly a satisfactory management of the problem. Confusion involved the proper diagnosis of the emergency with 55 percent of the nurses choosing one or more incorrect diagnoses, including a tooth loose due to caries or gum disease. While most of the nurses would not treat the problem, the treatment chosen by those who did, including warm saline rinses, was largely ineffective.

The second case was the only true dental emergency which the school nurse is likely to encounter. It required immediate on-site treatment of a permanent tooth avulsion injury. The respondents recognized the seriousness of the problem and almost all advised immediate dental care. It is interesting that only 14 percent would have handled the emergency in the recommended manner by immediate reimplantation of the avulsed tooth.

The most common dental emergency, that of the abscessed tooth was presented next. A great deal of confusion was evident over the issue of sending the child back to class. Nurses stated that they would, however, urge the parents to seek immediate dental treatment. There was also uncertainty about diagnosis, with greater than 60 percent identifying the problem as possible food impaction or an erupting tooth, although 98 percent chose the correct diagnosis.

The last case history was that of an extraoral herpes infection of the lip. The treatment rendered and referral modalities were for the most part appropriate. Uncertainty of diagnosis was evident with greater than 52 percent of the respondents choosing one or more incorrect diagnoses, including vitamin deficiency or a lip-biting habit. The nurses did seem more comfortable dealing with this soft tissue extraoral problem than with the cases involving emergencies which were strictly of an intraoral dental nature.

Although 40 percent of nurses involved in this study felt they were able to handle all dental emergencies they encounter, the data indicates that this may not be the case. While treatment and/or referral was in many instances appropriate, there was confusion and uncertainty in both diagnosis and the urgency with which the emergency should be handled.

This study also obtained data on the information the nurses felt would be most useful to them in handling common dental emergencies. They corroborated the findings of the present investigation by indicating that they would like to obtain more information on common oral pathology, the treatment of dental emergencies and the differential diagnosis of dental problems.

## Conclusion

The present study suggests that considerable numbers of dental emergencies or dentally related problems, primarily involving painful teeth or oral trauma,

are seen by the school nurse, and that the school nurse could benefit from having information on the handling of dental emergencies available.

The results have confirmed the school nurses' perception of their inadequate management of dental emergencies and thereby highlights the opportunity for the dentist to help his or her local community by making this much-needed information available to the nurse serving neighborhood schools.

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