Université de Montréal

Traumatic dental emergencies presenting to a children's teaching hospital

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Mémoire présenté à la faculté des études supérieures

En vue de l'obtention du grade de

Maître ès sciences (M.Sc.)

En médecine dentaire

Option dentisterie pédiatrique

Août 2005

Université de Montréal
Faculté des études supérieures

Ce mémoire intitulé :

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Mémoire accepté le : 2005-10-15

SOMMAIRE

Objectif: L'objectif de la présente étude est d'identifier et de décrire les facteurs associés aux traumas dentaires chez un groupe d'enfants ayant visité le département des urgences pédiatriques de l'hôpital Sainte-Justine entre les années 2000 et 2002. *Méthode:* Une revue des dossiers de tous les patients pédiatriques s'étant présentés pour une urgence dentaire à l'hôpital Sainte-Justine fut effectuée, et ce, pour les années 2000, 2001 et 2002. Les données statistiques sont présentées et stratifiées selon cinq catégories, afin d'évaluer certaines variables dépendantes, incluant les données démographiques du patient, les caractéristiques et mécanismes du traumatisme, de même que les traitements rendus. *Résultats :* 1021 dossiers furent passés en revue pour cette étude, 573 d'entre eux répondant au critère d'inclusion de traumatisme dentaire. En tout, 1002 dents furent traumatisées, chez 573 patients. Une base de données de traumatismes dentaires pédiatriques fut ainsi construite, incluant des statistiques descriptives. *Conclusions :* L'utilisation des données présentées pourra être bénéfiques aux individus responsables de l'administration des resources financières et du personnel reliés aux traumatismes dentaires pédiatriques de la région de Montréal. Ces données justifient la présence d'un programme de residence en dentisterie pédiatrique à l'hôpital Sainte-Justine, Montréal. Les données démographiques fournissent aussi des données essentielles à l'implantation de programmes éducatifs et preventifs, tout en permettant d'identifier les populations à risque. Cette information nécessitera une mise à jour périodique reflétant les changements démographiques de la population, de même que l'utilisation et l'efficacité des programmes d'intervention au sein d'un environnement urbain.

Mots clés : trauma dentaire, enfants, hôpital, épidémiologie, dent.

SUMMARY

Objective: The purpose of the present study is to identify and describe the factors associated with dental trauma in children admitted emergently during of the period 2000-2002 at Hôpital Ste-Justine. *Method*: A comprehensive retrospective chart review of all pediatric patients presenting through the dental clinic and identified as "emergency" was completed for years 2000, 2001 and 2002 at Hôpital Ste-Justine in Montréal. Descriptive statistics are presented, stratified along broad five categories constructed for assessment of dependent variables, including patient demographics, logistics, characteristics of the injury, mechanism of injury, and treatment rendered. *Results*: 1 021 charts were reviewed for this study and 573 meet the criteria for trauma, and were included for review. 1 002 teeth were injured in 573 patients during the three year period. A database of pediatric dental trauma was constructed, including descriptive statistics. *Conclusions*: The utilization data presented may be beneficial to those responsible for staffing, resources and manpower allotment and scheduling related to pediatric dental trauma in Montréal. The data also suggests that a graduate dental resident training program at the Hôpital Ste-Justine in Montréal is justified. The patient demographics provide essential information for programs designed at education and prevention of pediatric dental trauma by identifying at-risk populations and sub-populations. As with censuses, this information must be periodically updated if it is to be of use, reflecting the changing demographics, utilization and effectiveness of intervention programs in a large metropolitan environment.

Key words : dental trauma, children's hospital, epidemiology, tooth.

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ACKNOWLEDGEMENTS

I would like to acknowledge the invaluable contributions of Hélène Buithieu, D.M.D., M.S.D. Director of the Pediatric Dentistry Program at the Université de Montréal. Dr Buithieu served as advisor and as a director-investigator providing direction in the preparation of this thesis.

I would like to distinguish Dr Lionel Cudzinowski, Dr Leonardo Abelardo and Dr Patrick Canonne for their guidance as my professors.

I would like to thank Jacqueline Quintero for her availability in the elaboration of table database.

I would like to thank my colleagues Dr Mohanned Mecheri, Dr Marie-Eve Asselin, Dr Martine Nicopoulos for their assistance in the French translations.

DEDICATION

I thank my husband Dr C. Michael Haben, MD., M.Sc. for his encouragement and his precious help in the accomplishment of this work during my specialization. I dedicate this thesis to my family and my beautiful daughter Ariana Isabel for being the motivation and inspiration in the finalization of this work.

CHAPTER 1 : INTRODUCTION

Statistical analyses and databases of utilization are a critical source of information, which often serve as a foundation for numerous other studies. They also provide useful information for administrators, dental residencies and hospitals when planning coverage of services. Focused development of educational programs and manpower needs for clinical departments is based, in part, on the health care needs of a population. Accordingly, timely population statistics must be periodically updated. Frequently, these analyses are either decades outdated, or do not exist at all. A recent review of the literature yielded only three such studies for the province of Quebec[1-3], one and two decades old, respectively. These three prior studies published from Quebec contained exclusively descriptive statistics, which stopped short of analyzing treatment outcomes with critical dependent variables. Factors such as the timing and number of follow-up visits, as well as other co-factors outlined in the American Academy of Pediatric Dentistry guidelines of trauma[4] were not necessarily described. The only study having been completed at Hôpital Ste Justine in Montreal (1985[2]) does not automatically reflect the current population, volumes and distribution of dental trauma currently seen at this tertiary-care, dedicated pediatric, university hospital.

The purpose of the present study is to describe the factors associated with dental trauma in children admitted emergently during of the period 2000-2002

at Hôpital Ste-Justine. It is also intended to further clarify the pattern of dental trauma in the areas of: patient demographics, referral source, characteristics of the trauma, time and day of visit, interval between presentation to the dentist and performance of definitive treatment, type of emergency treatment performed, timing and number of follow-up visits, and follow-up referrals.

This study can provide a foundation from which future epidemiologic research could be based, in the hope of improving the planning, execution and after-care of pediatric dental trauma.

1.1 REVIEW OF THE LITERATURE

There are a multitude of epidemiological studies concerned with treatment outcomes for pediatric dental trauma. It is difficult to compare these studies directly because each varies depending on the study population and the material collected. Additionally, a meta-analysis of these studies would be impossible given the variability of criteria according to which, and how, dental trauma is measured. One of the earliest studies was completed by Andreasen[5] in Denmark. He looked at 1 298 patients referred to a university hospital for treatment of traumatic dental injuries during a 12 year period. He noted that referrals to the university hospital represented "mainly severe dental injuries whereas minor trauma are usually treated elsewhere" (and therefore presumably not included in the data). He divided the trauma into nine groups based on a presumed difference in the energy of the impact causing the trauma, as well as a difference in the resiliency of the impact. This formed a basis for a later modification of the World Health Organization[6] classification of dental injuries by Andreasen[7] in 1994. He found statistically significant differences in the injury pattern between the different trauma groups. Interestingly, he goes on to state that statistics concerning different types of dental injuries vary according to treatment institution. In other words, when compared to an earlier study in Denmark by Ravn and Rossen[8], he found that the injuries treated at a municipal school dental service differed significantly from the population he studied, although the prevalence of

clinical factors are in accordance. Clinical factors include information such as the dominance of males in the sex ratio. Thus, the clinical setting is of the utmost importance when considering the generality of the results, however, certain factors (i.e. male predominance) may be applicable across all populations.

In another example, an excellent prospective school-based epidemiological descriptive study from Ontario, Canada by Locker[9] provided probabilities of injury and the severity of the trauma related to gender, geography and caries, however, the data could not be generalized to other communities, a significant limitation within the study design. There is, however, important information and trends that can be learned when reviewing and comparing publications from, North American, Western European and third-world origins.

Although dental caries appear to be a major concern for most public heath professionals concerned with a pediatric population, increasing attention is being paid to traumatic dental injuries. A recent Medline search returned 5 695 articles for "dental trauma, tooth injuries, tooth avulsions and tooth injuries." 4 025 of these were in the English language alone since 1966. Studies by these same investigators, or using the same diagnostic protocol, show differences in prevalence rates among countries[9]. For children 12-18 years of age, prevalence rates of dental trauma range from 11.7%[10] to 58.6%[11], with significant variations between countries. A national study[12]

from the United Kingdom reported a prevalence of 17.0% for children up to age 14, with a prevalence within Northern Ireland at 27%, demonstrating regional differences. Furthermore, other regional differences were reported in areas of lower socioeconomic development, with the north of England having a 38.0% prevalence[13], and 27.9% for inner-city London boys[14]. Repeated cross-sectional studies in the same communities show that rates are stable "at best"[14], or increasing[15]. Studies originating from Finland[16,17], France[18], Greece[19], Spain[20] and Singapore[21] support this notion.

In third world countries, results show a higher prevalence of traumatic dental injuries. In Mexico, Sanchez and Garcia-Godoy[22] (1989) reported a 28.4% prevalence in 3-13 year old boys. In Malta, Galea[23] (1970) noted a 12-33% prevalence of evidence of traumatized primary incisors in 4-5 year old Maltese children.

In areas of the world in or near a region of conflict, the reported prevalence of dental trauma was similar to those of third world countries, however, these injuries were more frequently the result of violence. In Damascus, Syria and Budapest, Hungary[10,24] for the years 1998 and 1999, 42.5%-51.7% of injuries were the result of violence.

A survey of dental trauma in a major North American city (Washington, D.C[25]) reveals a different pattern of injuries, citing falls as the most common

etiology 46% versus 14% for violence presenting to a large pediatric teaching hospital. This trend was supported Zeng et al.[26] in Seattle, and Gordy et al.[27] in Indianapolis. Other differences appreciated when comparing North America / Western Europe with the rest of the world was the higher rates of group-sports related injuries in first world countries[17,28]. The authors do not go on to state the reasons for such differences, however, these may be related to the limited availability of these activities in underdeveloped countries, or the lack of specificity when reporting these injuries. In some countries where the incidence of dental caries is declining, dental trauma related to sporting activities has become a major oral health issue among children, and prevention methods are being investigated in an attempt to control the incidence of this type of injury[29, 30].

Access to care is another important distinction, particularly when comparing developing nations to the United States and Canada. For example, the higher prevalence cited by Frazão et al.[31] who reviewed the distribution of dental trauma in a random sample of 73 243 Brazilian schoolchildren, found that the incidence of trauma presenting to a clinic or hospital far underestimates the actual incidence, and that many traumas go unreported because of financial concerns which are directly related to access of care. He found that the number of dental traumas which received no medical attention was related in a linear relationship to the rate of unemployment and poverty in a particular region of the country.

While few studies go so far as to quantify the impact of dental injuries in terms of economic costs, estimates from Scandinavia have suggested that dental injuries cost 2-5 $ million (USD) per million population[32,33].

In Canada, there are five important reviews related to this study. Stephane Schwartz[3] analyzed 227 dental traumas presenting to the Montreal Children's Hospital during the 1983 calendar year. This study provided the first snapshot of statistics related to dental trauma in one of Montreal's two major pediatric hospitals for that time. Schwartz's database was used as a foundation for a later study by Charland et al.[2] conducted at the Sainte Justine Hospital (Montreal's other major pediatric teaching hospital), and Schwartz's two other publications relating to dental trauma in Montreal (below). In addition to categorizing the injuries based on location, type of injury, and demographics, Charland summarized trauma by month and region of Montreal. For example, July had the highest rate of injuries, a factor which may impact the distribution and staffing of personnel. July is the traditional month most dental residents begin their training (including the programs at the University of Montreal and McGill University), and many staff dentists in both the public and private sector are away on holiday.

Schwartz later reviewed 1 373 emergency dental visits to the Montreal Children's Hospital in 1992[1], expanding the scope of the descriptive data. She

concluded that with an average of more than 3 emergency dental consultations per day, there is a need for communities to have well-organized residency hospital clinics. Furthermore, she states that emergency visits should be handled without disturbing the normal activity of the clinic. In her 1992 study, 16.7% of consultations were made during non-working hours, concluding that "the residents on call made this service possible." Finally, she admits that it is difficult to compare her results with those from other centers as there had been only one study[34] in the 10 previous years pertaining to the same subject. This underscores the necessity for updated database, the most recent now being a decade old.

Later, Fried et al.[35] looked at injuries of maxillary primary teeth over an 11 year period at their institution. They found that primary anterior maxillary teeth were involved in 66.2% of emergency dental visits, findings which coincides with Zadik[36], Galea[23] and Ferguson[37] . This data may provide prognostic information regarding subluxation injuries to primary maxillary anterior teeth by considering dependent variables which included mechanism of injury, age, treatment, and the presence of other injuries. Multivariate analysis of these critical factors could impact treatment algorithms, prognosticators, and, ultimately, outcomes.

CHAPTER 2 : METHODOLOGY

2.1 SETTING

The Hôpital Sainte Justine is a university-based, tertiary-care dedicated pediatric teaching hospital serving Montréal, Québec and the surrounding communities with an average total of 62 000 emergency room visits[38] during the years included in this study. There are four full-time staff pediatric dental attendings and four pediatric dental master candidates affiliated with Hôpital Sainte Justine, and the Université de Montréal. The pediatric dental service is on call 24 hours a day, and sees, on average, a total of 9 500 patients through the dental clinic per year[38]. During standard dental clinic hours (M-F, 08 :30-16 :30) emergency patients are treated by attending dentists, pediatric dental residents and dentistry students. Pediatric dental residents and one dental staff were on-call and available during evenings and weekends. Emergency patients presenting outside of clinic hours come to the hospital through the emergency room and are first examined by a physician who determines if a dental opinion or treatment is required and calls the dental resident. Patients can contact the emergency room by telephone and ask to speak to the dental resident, who determines if the condition justifies an emergency dental evaluation.

2.2 SAMPLE

All patients registered through the dental clinic from 2000-01-01 - 2002-12-31 and identified as having dental trauma of any sort during emergency room triage by a physician were included for review. Additionally, any patient presenting directly to the pediatric dental clinic via referral without having registered through the emergency department during the same time frame and identified as having dental trauma were included. Once patients were identified via dental chart records and meeting the criteria for dental trauma, the complete hospital record, including the emergency department report was obtained, and used for the retrospective review. Those patients having a diagnosis of "infection", or "other" (non-trauma) from the dental records were excluded from review. Any patient designated as having dental trauma, and did not have a dental consultation were not identified for this study.

2.3 INSTRUMENT

A comprehensive retrospective chart review of all patients presenting through the dental clinic and identified as "emergency", was completed for years 2000, 2001 and 2002 by a single dentist (A.R.) for the sample. Only those identified as "trauma" were included for review. Emergencies identified as "infection" or "other" were excluded. All patients who had not reached their 18th birthday on the day of service were included. The minimum age entered

into the study was 6 months, 3 days old, and the oldest was 17 years, 8 months.

The following variables were collected and used for analysis (see appendix I):

1. Patient demographics: age, and gender
2. Nature of emergency: trauma versus infectious
3. Referral source: emergency room, telephone, or outside dental office
4. Medical comorbidities (based on the modification of the American Society of Anesthesiologists classification[39])
5. Characteristics of the mechanism of the trauma
6. Clinical examination utilizing the Ellis classification[40] for fractures; and Andreasen classification[7] for contusion and dental displacement
7. Logistics: hour, day, and month at presentation
8. Interval between presentation to the dentist and performance of definitive treatment
9. Type of emergency treatment performed
10. Timing and number of follow-up visits, as well as the presence of follow-up referrals

If more than one tooth was involved, the characteristics, diagnosis, and treatment of each individual tooth was independently noted, however factors such as demographics, logistics and follow-up were not duplicated in the dataset.

When more than one diagnostic category applied to a single tooth, the more serious diagnosis was chosen.

2.4 DEFINITIONS[4]

INFRACTION

Incomplete fracture (crack) of the enamel without loss of tooth structure.

Diagnosis is based on normal gross anatomic and radiographic appearances; craze lines apparent, especially with transillumination.

CORONAL FRACTURE

I- enamel fracture: loss of tooth structure confined to enamel;
II- enamel/ dentin fracture: loss of tooth structure extending into dentin, but not the pulp;
III- coronal fracture including pulp: loss of tooth structure resulting in pulp exposure.

Diagnosis is clinically based on an altered anatomic form, with a radiographic loss of coronal tooth structure usually apparent.

ROOT FRACTURE

Dental fracture involving cementum, dentin and the pulp. Clinically, the tooth may appear elongated. Radiographically, the coronal portion of the tooth may appear partially removed from the socket with the apical portion intact.

CROWN/ROOT FRACTURE

Fracture involving enamel, dentin and cementum with or without pulp involvement. Diagnosis based on a fracture evident within the crown. The fracture line may be difficult to distinguish radiographically.

CONCUSSION

Injury to tooth supporting structures without abnormal loosening or displacement of tooth. Normal clinical and radiographic; appearance with marked reaction to percussion.

SUBLUXATION

Injury to tooth supporting structures with abnormal loosening or displacement of the tooth. Normal radiographic appearance; greater than normal physiologic mobility with or without sulcular hemorrhage.

INTRUSION

Apical displacement of the tooth into alveolar bone. Clinically, tooth appears shortened, or missing. Radiographically, tooth appears displaced apically and the periodontal ligament space is not continuous.

EXTRUSION

Partial displacement of the tooth apically from the socket. Clinically, the tooth appears elongated and is mobile. Radiographically, the tooth appears partially removed from the socket with increased width in the apical periodontal ligament space.

LATERAL LUXATION

Displacement of the tooth into a direction other than axially. Clinically and radiographically, the tooth is displaced from its normal position.

AVULSION

Complete displacement of the tooth out of the socket. Clinically and radiographically, the tooth is not present in the socket.

2.5 RELIABILITY

In order to assess the reliability of the single record abstractor, 60 dental emergency records were randomized for internal controls and intra-observer reliability. Test-retest reliability was assessed by using the Kappa statistic.

2.6 ANALYSIS

Descriptive statistics are presented in tabular and graphic form. The data represents a sum total of all three years. Data was distributed by calendar year, when appropriate. Incomplete charts and / or missing information are noted in the tables as a blank space. Key variables, such as diagnostic codes, were complete for all patients included. Missing hospital charts were completely excluded. Reliability was discussed in chapter 2.5.

CHAPTER 3 : RESULTS

1 021 charts were reviewed for this study (table 1). N=573 meet the criteria for trauma, and were included for review. N=421 were identified as having "infection" or "other / non-trauma" and were excluded. Hospital charts, including emergency department evaluations were missing for N=27, and were therefore excluded. 1 002 teeth were injured in 573 patients during the three year period. The demographics for the sample are presented in tables 1 and 2, including gender, and age distribution at time of trauma. 348 of the 573 were male, corresponding to an approximate male to female ratio of 1.65:1.

Table 1: Statistics for Sainte Justine Hospital

Year	Trauma Patients	Non-trauma patients	Consultations requested	Dental visits (total)	ER visits (total)	Missing charts
2000	191	159	138	10,866	64,119	7
2001	227	140	175	9,931	63,238	12
2002	155	122	164	8,092	59,780	8
total	573	421	477	28,889	187,137	27

Table 2: Demographics (gender)

year	male	female
2000	122	64
2001	118	92
2002	104	52
total	348	208

Table 3: Demographics (gender distribution)

Age	1	2	3	4	5	6	7	8	9
Male	34	46	36	28	17	23	16	28	20
Female	17	43	36	13	18	12	8	6	18
Total	51	89	72	41	35	35	24	32	38

Age	10	11	12	13	14	15	16	17	18
Male	27	23	13	10	10	9	3	3	2
Female	10	7	8	5	2	1	0	2	0
Total	37	30	21	15	12	11	3	5	2

Logistic information is presented in tables 4-7. This information provides a breakdown of trauma divisions based on time of the day, day of the week, month of the year, and source of the referral.

Table 4: Hour at presentation

Year	08:00 – 16:30, M-F	M-F >16:30, Sat, Sun, Holiday
2000	102	69
2001	132	77
2002	93	56
Total	327	202

Table 5: Day of week at presentation

Year	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
2000	29	24	21	22	29	25	22
2001	31	15	29	22	26	51	38
2002	22	17	15	13	23	25	26
Total	82	56	65	57	78	101	86

Table 6: Distribution of trauma by month

year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2000	14	11	14	15	12	20	16	21	19	15	11	17
2001	16	14	19	20	29	18	24	18	14	21	16	15
2002	11	8	15	16	19	13	9	12	11	10	14	24
Total	41	33	48	51	60	51	49	51	44	46	41	56

Table 7: Source of referral

Year	Surgery E.R.	Med - Peds E.R.	Hospital Dept.	Urgent care center	Medical clinic	Dental clinic	telephone	other
2000	119	1	8	3	3	15	31	0
2001	111	35	6	0	6	26	38	1
2002	117	5	8	1	2	10	11	1
total	347	41	22	4	11	51	80	2

Details of the injury are presented next, including the mechanism of the accident in table 8. 406 of the 573 patients were identified as having fallen, resulting in the dental trauma. 97% of trauma victims had no protection at the time of injury. For those who identified "bicycle" as involved in the injury, 27 of the 34 (nearly 80%) were not wearing head protections at the time of the injury.

Table 8: Mechanism of the trauma

Year	fall	bicycle	auto	Collision / object	Collision / person	other
2000	133	11	2	29	6	5
2001	152	11	4	39	11	7
2002	121	12	3	5	4	11
Total	406	34	9	73	21	23

Characteristics of the traumatized tooth are summarized including: wait time between presentation to the dentist and performance of definitive treatment (table 9); diagnosis (charts 1-3); the tooth involved (with primary and permanent dentition separated in tables 10 & 11, respectively); statistics regarding multi-tooth trauma (table 12); emergency treatment rendered (table 13); type of radiographic investigation when obtained (table 14); and number of follow-up visits (chart 3). 322 of 561 (57.4%) of the traumas reportedly occurred indoors.

Table 9: Wait times to definitive treatment

Year	0-29 minutes	30-60 minutes	>61 minutes
2000	132	34	6
2001	169	36	4
2002	98	38	11
total	398	108	21
Business hours	240	73	12
After hours	158	35	9

Chart 1: Diagnosis of fractured primary tooth

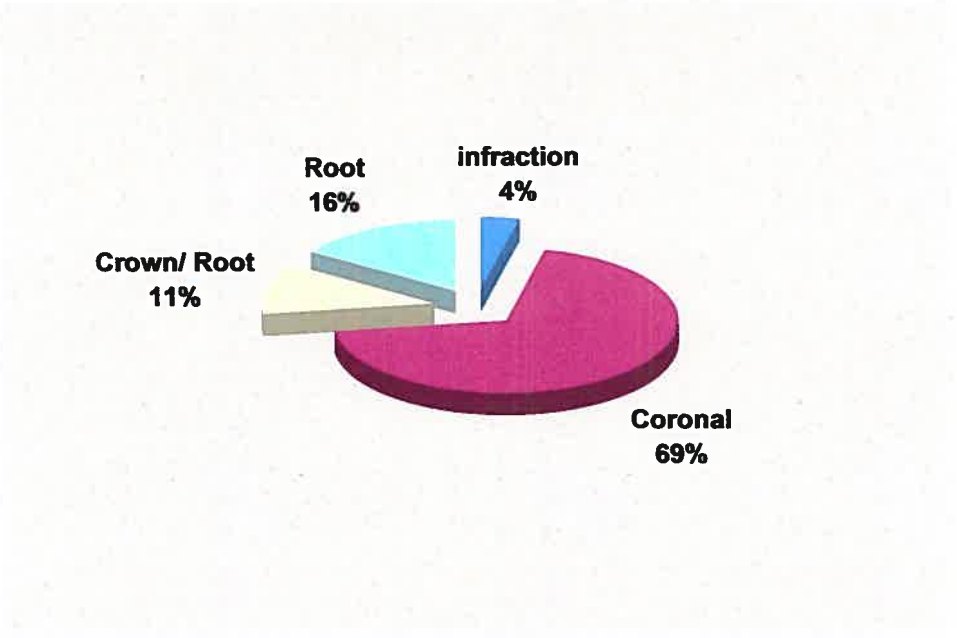


Chart 2: Diagnosis of fractured permanent tooth

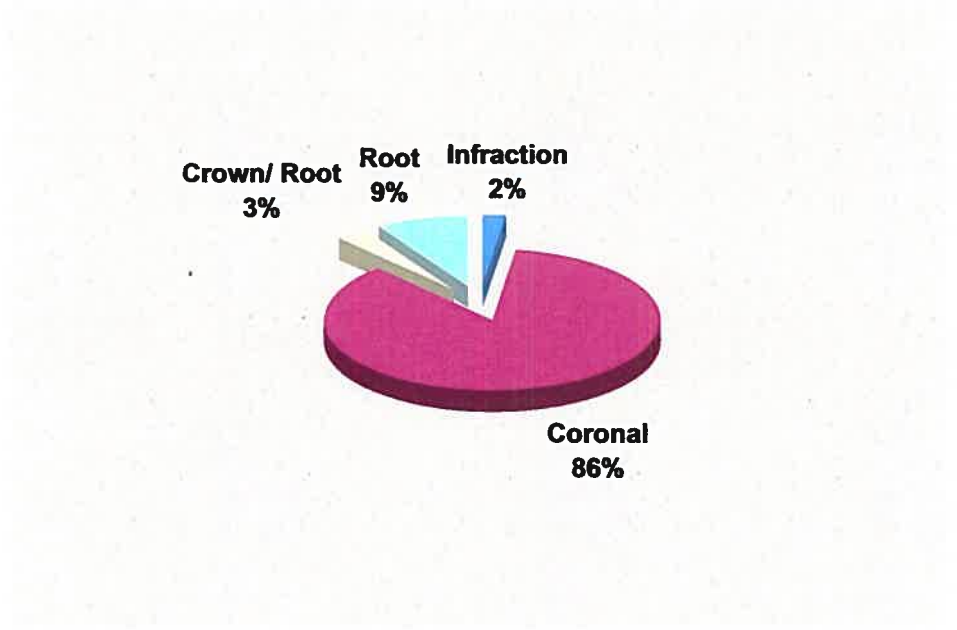


Chart 3: Dental displacement

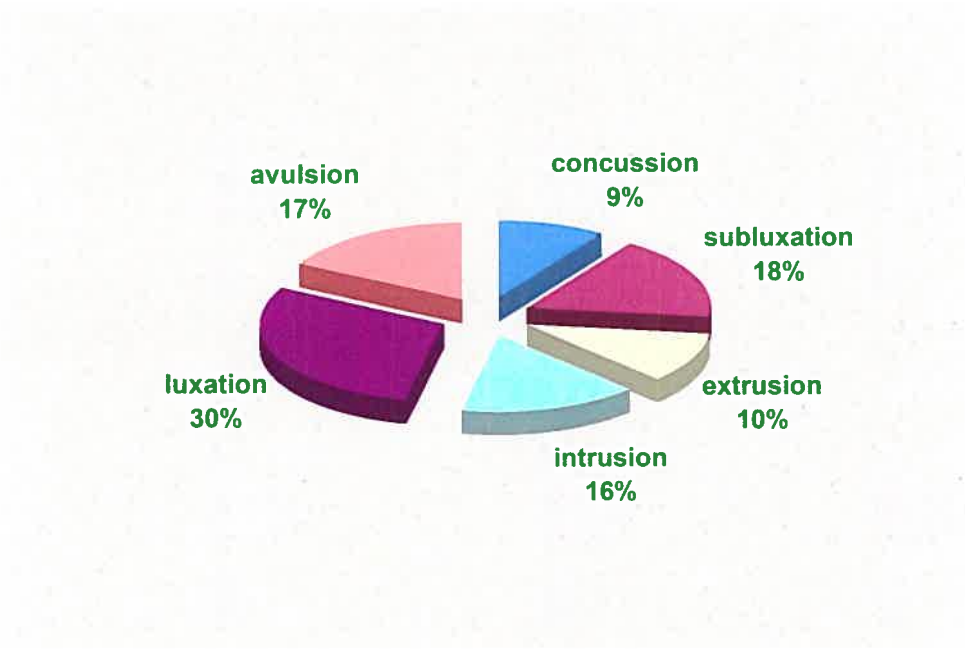


Table 10: Distribution of dental trauma in primary dentition

# teeth trauma	51	52	53	54	55	61	62	63	64	71	72	73	74	75	81	82	83
1	183	16	5	2	2	13	9	0	0	8	4	0	1	2	13	0	2
2	22	19	0	0	0	88	20	1	1	5	0	1	0	0	5	7	0
3	3	9	1	0	0	16	14	1	0	0	2	1	0	0	3	1	0
4	2	3	0	0	0	1	12	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total (499)	210	47	6	2	2	118	56	2	1	13	6	2	1	2	21	8	2

N.B. Color coding corresponds to Figure 1

Table 11: Distribution of trauma in permanent dentition

# teeth trauma	11	12	13	14	15	21	22	23	31	32	41	42
1	131	5	1	1	1	56	7	0	10	3	3	0
2	14	12	0	0	0	74	8	2	4	4	6	2
3	9	7	0	0	0	8	11	1	1	4	7	0
4	0	3	0	0	0	5	3	0	1	0	0	2
5	1	3	0	0	0	1	3	0	1	0	0	2
6	0	1	0	0	0	0	0	1	0	0	0	0
Total (419)	155	31	1	1	1	144	32	4	17	11	16	6

N.B. Color coding corresponds to Figure 2

Table 12: Statistics of multi-tooth trauma

Number of teeth involved	Total (patients)	Males any age	Female any age	Males >6 years	Female >6 years
1	255	157	98	67	34
2	207	130	77	60	22
3	75	48	27	26	16
4	29	17	12	10	3
5	4	3	1	2	1
6	3	1	2	1	1

Table 13: Type of emergency treatment performed

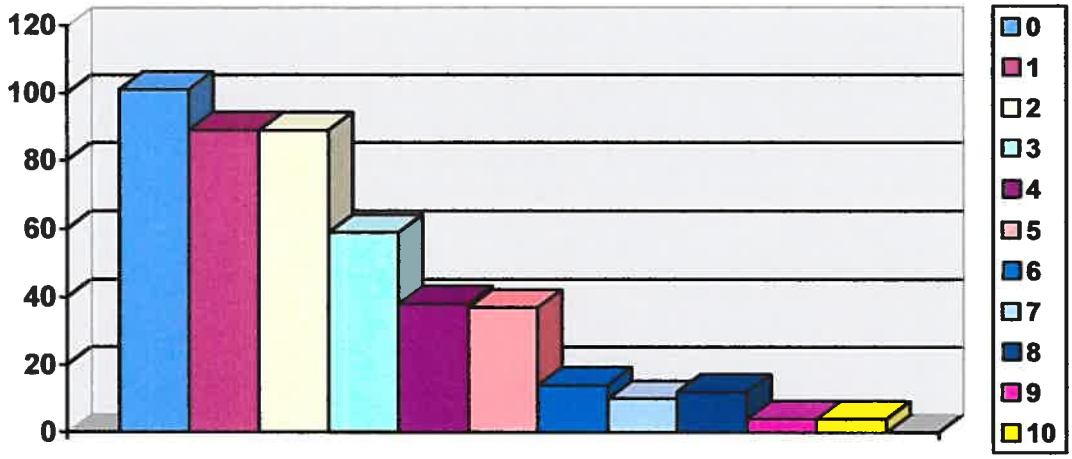
temporary restoration	direct capping	enamel polish	pulp-otomy	pulp-ectomy	extraction	reduction
155	24	9	32	1	88	81

fixation	suture	restoration	observation
145	7	12	439

Table 14: Type of radiologic investigation when obtained

year	Total traumas	Number of teeth traumatized	Occlusal (superior)	Occlusal (inferior)	Retro-coronary	Retro-aveolar	Panoramic
2000	191		120	10	2	18	3
2001	227		143	14	1	34	12
2002	155		105	15	0	34	13
totals	573	973	368	39	3	86	28

Chart 4: Number of follow-up visits to Sainte Justine Dental Clinic



Miscellaneous cofactors were also considered, and include the presence of any previous dental trauma; and medical comorbidity. As expected, over 80% reported no prior history of dental trauma (evaluated or otherwise), and 95% had no readily identifiable medical comorbidity, and was designated as American Society of Anesthesia[39] class one (ASA-I).

Five categories were constructed with assessment of individual variables, and the category as a whole to determine the reliability of data extraction. These included: I. demographics, which included the age, gender, co-morbidity, or

presence previous trauma as documented in the chart. II. Logistics, including the day of the week, month of the year, time of the day, and the time delay from presentation to definitive treatment. III. Characteristics of the injury, including the tooth involved, diagnosis for that tooth, additional tooth involvement (if any), as well as the diagnosis assigned to that tooth in cases of multi-tooth trauma. IV. The mechanism of injury, including the mechanism reported, presence of protection (if any), and location of the trauma. Finally, V. Treatment, including the type of radiologic investigations (if any), the number of follow-up visits, and place patients were instructed to follow-up. The results are summarized in table 15. The kappa values were greater than 0.75 for each individual variable and the category as a whole, suggesting that a high level of intra-rater reliability was obtained regarding data extraction. Kappa is a measure of agreement. A kappa with a value greater than .75 suggests excellent intra-rater reliability. A kappa with a value between .40 and .75 suggests a fair to good agreement with a kappa < .40 suggesting a poor agreement.

Table 15: Reliability statistics

category	variable	Kappa† (range)*
Demographics	Age Gender Co-morbidity Prior trauma	.94 (.93, 1.00)
Logistics	Day of week Month of year Time of day Delay of treatment	.89 (.88, .93)
Characteristics of injury	Tooth Other teeth Diagnosis Other diagnosis	.88 (.79, .96)
Mechanism of injury	Mechanism Location Protection	.96 (.85, 1.10)
Treatment	Treatment Radiology Location of follow-up Number of visits	.91 (.76, .97)

† Kappa for the category as a whole
* Range of kappa for individual variables

CHAPTER 4 : DISCUSSION

Injuries to the dentition of infants are infrequent during the first year of life. Tooth eruption does not begin until the infant is 6 months of age, and the child's ability to explore the environment is limited[41]. As children learn to walk and physical activity increases, the frequency of dental injuries also increases[7].

Teeth can suffer a variety of injuries. Injuries to the crown of a tooth may involve the enamel only, the enamel and dentin, or enamel, dentin, and pulp. If such injuries are clinically apparent on one or multiple teeth, adjacent teeth may also sustain injury and further clinical examination and radiographic evaluation are indicated. One tooth may have coronal damage while the neighboring tooth may have a root fracture[41].

Most traumatic injuries to the teeth and their supporting structures constitute a true dental emergency. In comparison to other types of traumatic bodily injury, dental trauma may not seem serious. The teeth, however, have the lowest potential of any tissue for returning to a normal healthy state after injury, therefore rational therapy based on accurate diagnosis must be instituted[9,32]. The signs and symptoms of isolated injuries may often be complex, and when multiple injuries occur, the assessment is even more difficult.

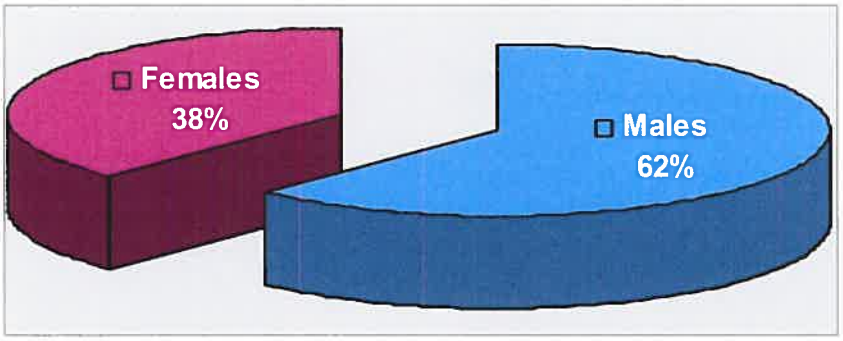
Traumatic dental injuries are one of the principal sources of work for the dental service in many children's hospitals. Early assessment and adequate treatment are factors important to minimize the pain, distress, cost and time to patients, parents, and dental practitioners. Assessment includes the history of the present illness, past medical and family history, and a thorough, targeted physical examination. Evaluation typically includes extraoral and/or intraoral radiographic examination. Certain situations, such as a compromised airway, obtunded or disorientated patient, loss of consciousness or persisting emesis necessitates a more generally trauma evaluation by a physician. Pediatric emergency rooms and emergency dental clinics are able to provide the first aid treatment for orofacial trauma during the evenings, weekends and holidays.

4.1 DEMOGRAPHICS

Reviewing the demographics presented in table 1 reveals several salient features. There was an average of 191 cases of dental trauma presenting to the Sainte Justine Hospital in Montreal per year during the time studied. This is a greater number than the number presenting to the Montreal Children's Hospital, Montreal's other dedicated, pediatric, university teaching institution, where 147 were reported on in 1983[3]. Preferences in referral patterns for pediatric dental trauma or simply population growth may account for this difference.

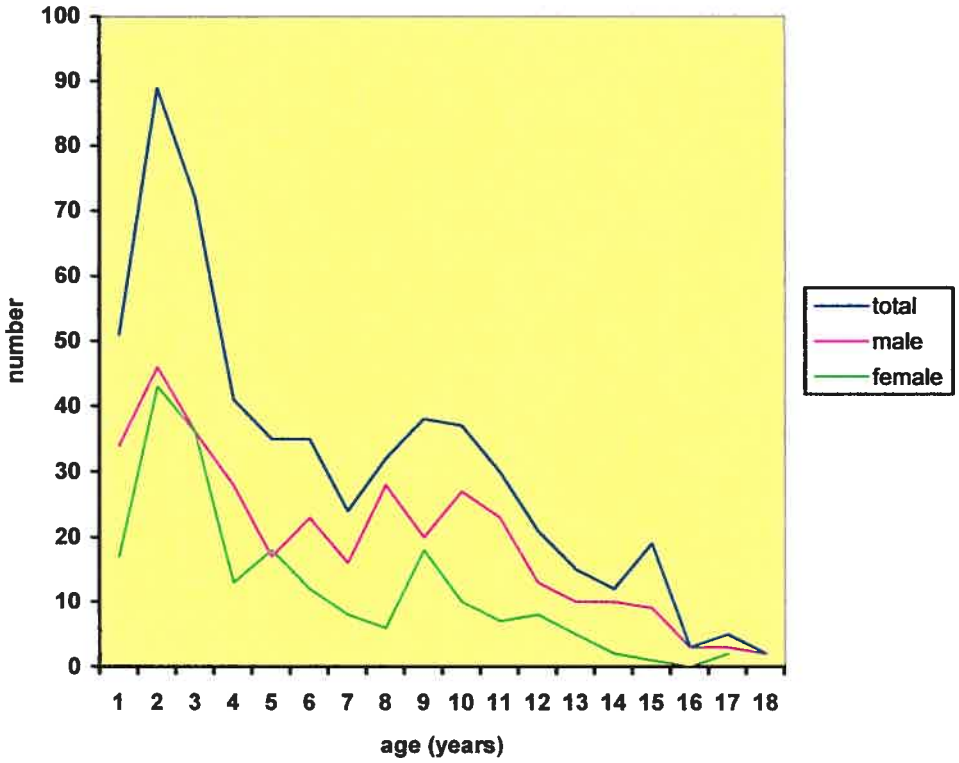
There was a notable male preponderance of approximately 1.65:1 over females.

Chart 5: Gender demographics



This supports data from other previous Canadian[1-3,35], American [25-27,42-45], European [17-20,35,34,46-48] and developing nation [21-24,31,49,50-52] authors. The results presented here also confirms findings of several of the authors who have noted that a gender differential is absent until age 5 or 6. The peak prevalence for dental injuries in this sample was at 2 years of age (chart 6).

Chart 6: Number of traumas distributed by age



This compares favorable to a similar study by Schwartz[1] and others [2,34,44,53,54]. In theory, this peak may be a result of an underdeveloped sense of balance with nascent neuromuscular reflexes, and a limited sense of fear. The second peak, occurring at 6-9 years of age, is where one begins to appreciate a male preponderance. Intuitively, this is at an age when many boys begin participating in contact sporting activities, and exhibit risk-taking behavior. Examples of this behavior would include jumping from object to object indoors, faster speeds when cycling, and a higher likelihood of being involved in fisticuffs. A third, albeit smaller, peak occurred at 13-14 years of age. Careful examination of the data indicates that this "peak" is more of a precipitous drop in the prevalence of pre-teen and teenage females, rather than

a spike in the male prevalence, which was relatively stable from 12-16 years of age. Continued participation in contact sports by males with discontinuation of 12-16 year old females may account for this phenomenon. Comparison of the rates of participation in contact sports for each gender supports this idea[16,17,46,55,56].

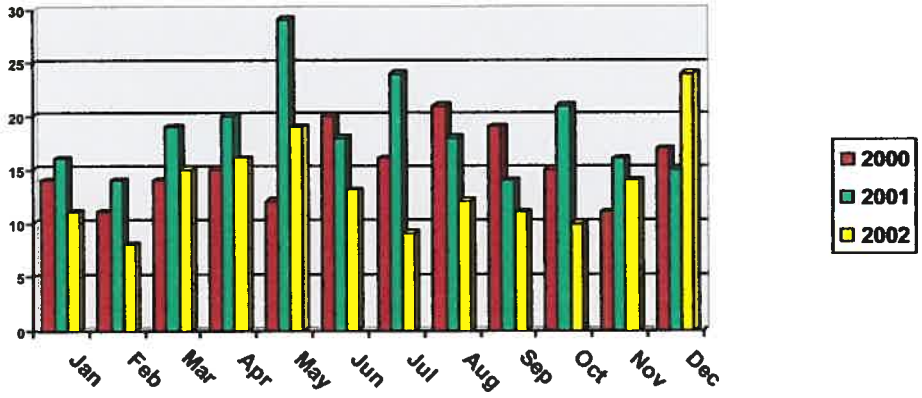
The distribution of multi-tooth trauma did not exhibit a greater male preponderance than for single tooth trauma, maintaining the roughly 1.60:1 ratio previously stated for two and three tooth involvement. However, with four, five and six teeth involved, the higher male ratio discontinued. The small numbers in these subcategories may account for this finding, which may, or may not, be statistically significant. When traumas under 6 years of age were excluded (in an attempt to uncover a male preponderance in multi-tooth trauma in the second and third peaks, i.e. 7-12 & 14-16 years), surprisingly, no such predilection was found. This argues against the theory that there may be a greater force of trauma experienced by males in cases of multi-tooth trauma.

4.2 LOGISTICS

According to some studies, summer months are the busiest period for trauma (chart 7). Factors such as warm weather and holidays from school are

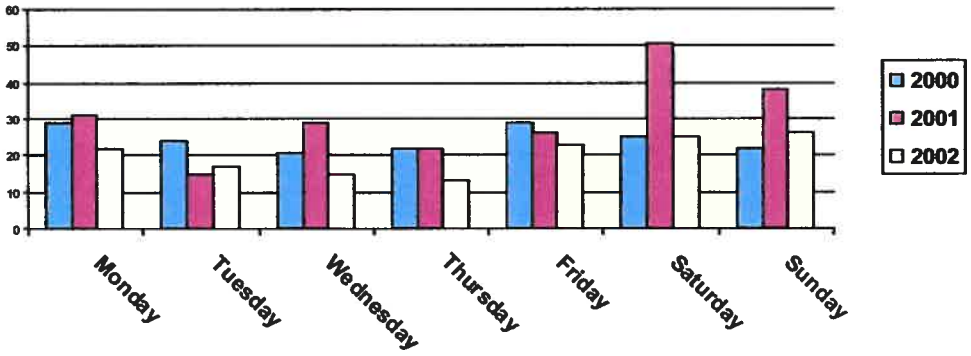
thought to be associated with this trend[25,34,42,49,57]. Others have reported autumn[42,46] and winter[51] as possessing the highest frequencies of trauma.

Chart 7: Distribution of trauma by month



The distribution of trauma by day of the week, and month of the year, was relatively stable for the years studied. There is a notable spike in weekend activity, particularly Saturdays, in 2001, and May, July and October during the same year (charts 7 & 8).

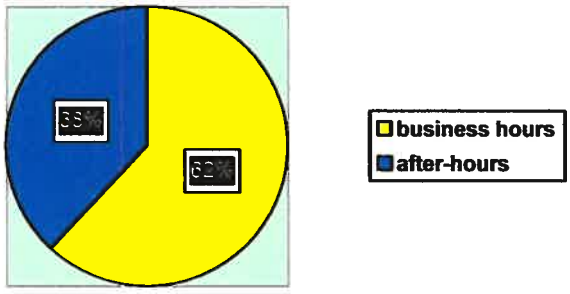
Chart 8: Day of the week at presentation



2001 was notable for an exceptionally mild springtime temperatures, prolonged summer, and warm autumn, with an average spring and fall temperature 3°c and 4°c higher respectively than in 2000 and 2002. When these seasonal variations are ignored, there was not an obvious increase in activity during any particular season, or day of the week. In contrast, Ravn[46] in Copenhagen , Denmark, and Meadow[42], in the United States, noted a peak number of dental traumas in September and October, which Meadow comments as correlating with the beginning of the school year. This trend was not reproduced here, with the months of highest incidence being May (in 2001, which was unusually warm). May was the month of relatively small numbers in the previously cited publications. In consideration of the data presented here and elsewhere, it is conceivable that seasonal variation is multifactorial with temperature and school calendars contributing to a varying extent.

38% of the dental trauma was treated outside of normal business hours (defined as 08 :30 – 16 :30, M-F, excluding holidays).

Chart 9: Hour at presentation

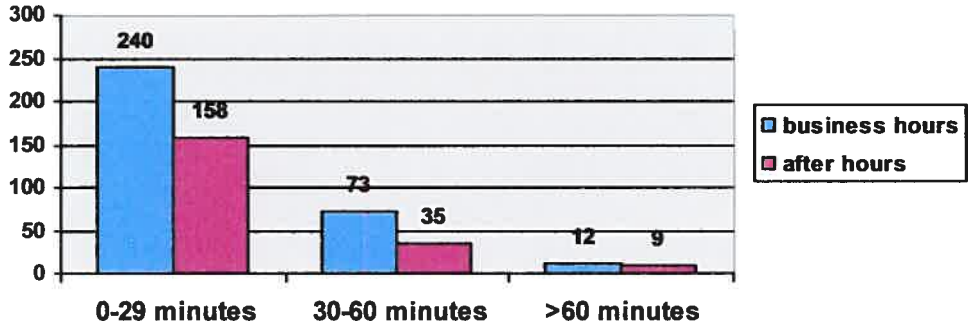


This number represents twice the percentage reported by Schwartz[1], however, her sample included infectious dental emergencies. These infectious "emergencies" are less likely to present after hours than traumatic injuries. The indolent nature of infections may lend to an apathy to seek emergency treatment after-hours, or during the middle of the night. When only dental trauma is considered, 39% presented after-hours in her sample. Her conclusions underscore "the need for communities to have well-organized residency hospital clinics …because (many dental emergencies) are made during non-working hours."

Wait times were included in the data collection. There was insufficient documentation available to consider the wait time from the time of trauma and performance of definitive treatment, or the delay between presentation to the emergency room and definitive treatment. These critical factors should be studied using a prospective design, and more accurately documented in the medical record, as they are likely to impact prognosis and outcome. The wait time between presentation *to the dentist* and definitive treatment was

considered, with patients experiencing a delay of 0-29 minutes in 76% of cases overall (chart 10).

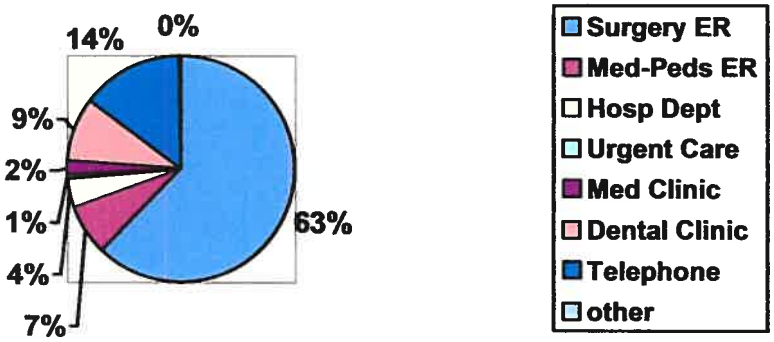
Chart 10: wait times stratified by hour



The percentage in the 0-29 minute wait time category diminished from 72% to 61% of the *after- hours* subpopulation owing primarily to a delay from the time a dental resident evaluated the case (presentation) and waiting for an attending dentist supervision prior to the rendering definitive treatment in certain cases. The absence of support staff (radiography technicians, etcetera) after-hours should also be considered as a factor in the slight increase in wait times, as it falls upon the dental resident to perform each of these duties without assistance. The number of cases waiting more than one hour was split evenly between the two groups. Presentation after-hours, therefore, is less likely to have a major impact on outcomes than the delay between injury and definitive treatment.

Referrals to the dental clinic came from a variety of sources, including the medical and surgical units of the emergency department, other hospital units, outside dental and medical clinics, urgent care centers, and via telephone calls to the on-call resident. Chart 11 summarize the pattern of referrals.

Chart 11 : Source of referral



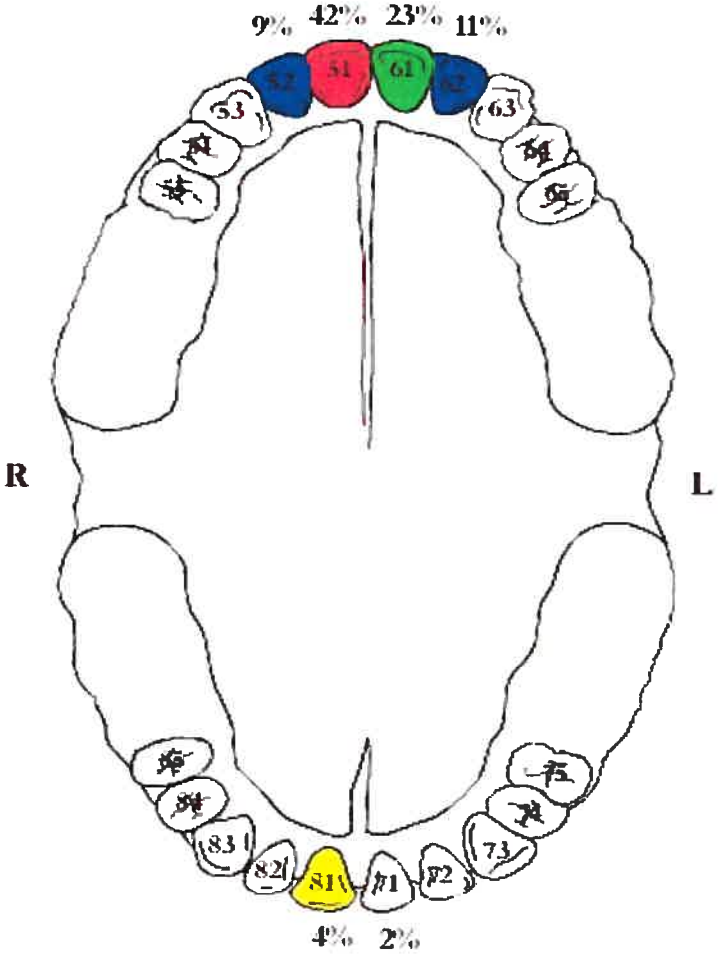
As expected, the surgical unit of the emergency department at a large, urban, university pediatric hospital such as Sainte Justine's is primarily responsible for trauma triage and management, representing nearly 2/3 of all referrals for dental trauma in this sample. There was a very different pattern of trauma reported by Meadow[42] , owing, in part, to an unspecified number of cases presenting through two "private dental offices" in Boston, Massachusetts. Similarly, the pattern of referrals reported by Luz[49] also reflects the large, urban emergency department used to enroll participants in São Paulo, Brazil. By far, the largest referral source from this Brazilian report was the trauma service, where 19% were adults, with a 7.4% rate of maxillary fracture overall.

As part of the intake, all patients were asked if they had a private / outside dentist. 19% of dental trauma patients had outside attending dentists, and were instructed to follow-up with their private dentist. 452 patients listed no private dentist, accounting for 81% of the sample. Of these, the distribution of the number of follow-up visits was shown previously in chart 4 . Of the 452 patients instructed to follow-up in the Sainte Justine Dental Clinic, the majority of patients came for their appointment (77.6%). 103 trauma patients, or almost 18% of the entire sample, did not show up for a scheduled follow-up visit. Of these 103 "no-shows", 63 were for children under the age of 6 years. The impact of these missed appointments could not be determined, yet common sense dictates that outcomes are compromised when patients (or their parents) are non-compliant with medical instructions. No longitudinal information is available for those patients instructed to follow-up with their outside, private dentist, and, as such, the overall rate of missed appointments is likely to be higher. Approximately 51% of those showing for follow-up had only 1 or 2 visits. Of the 178 patients with 3 of more follow-up visits, 77 of these had multi-tooth trauma (2 or more teeth involved), representing 24% of this sub-sample of 311 patients. To our knowledge, there has not been published data on the epidemiology of failed follow-up visits post dental trauma in Canada as a whole, or specifically in Quebec.

4. 3 CHARACTERISTICS OF INJURED TOOTH

A total of 918 teeth were injured and identified by number. 54.3% were primary dentition, and the remaining 45.7% permanent. The right side held 60% of the injuries of the primary dentition, with an almost 2:1 right to left ratio for the central upper and lowers (figure 1).

Figure 1: Distribution of trauma to primary dentition by site

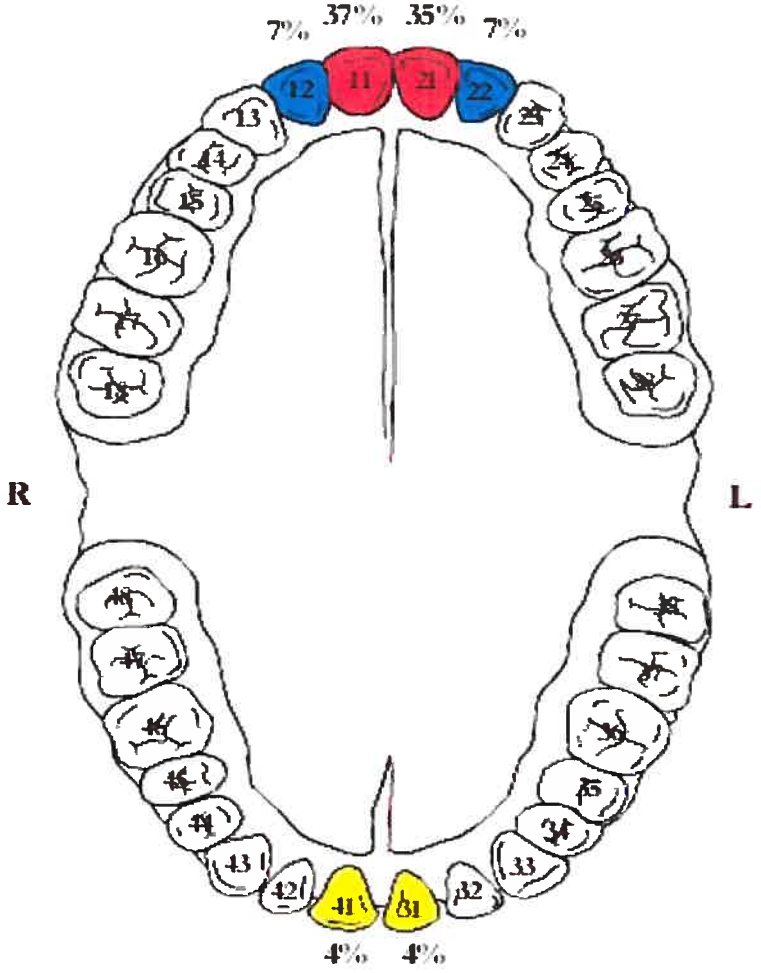


N.B. Color coding corresponds to the data presented in table 10

This disproportion disappeared for the upper and lower laterals. The injuries for permanent dentition were equally distributed between the two sides. No clear explanation is evident in the data or literature, however, Gudmundsson[58] and Finlayson[59] looked at handedness in preschool and primary school aged children and determined that right-handedness (the majority of children) was related to a right-sided predilection for injury to the limbs. Their studies included children up to 12 years of age, an age beyond which permanent teeth (central and lateral) should be present. As such, the laterality of handedness regarding injury of the limbs related to neuro-muscular development, coordination and sophistication may or may not be applicable to injuries involving the head and /or dentition. This considers the overlap in dentition in the age groups they studied and the loss of a lateral predilection in permanent dentition noted in this sample.

Maxillary central incisors are reportedly the most affected injured teeth in both primary and permanent dentitions[1-3,5,21,23,34,49,50,57,71 ,72]. As expected, in both primary and permanent dentition, the majority of injuries involved the central uppers, followed by the lateral uppers, and finally the central lowers with an approximate frequency of 5:2:1. Figure 2 depicts the distribution of trauma to permanent dentition by site.

Figure 2: Distribution of trauma to permanent dentition by site



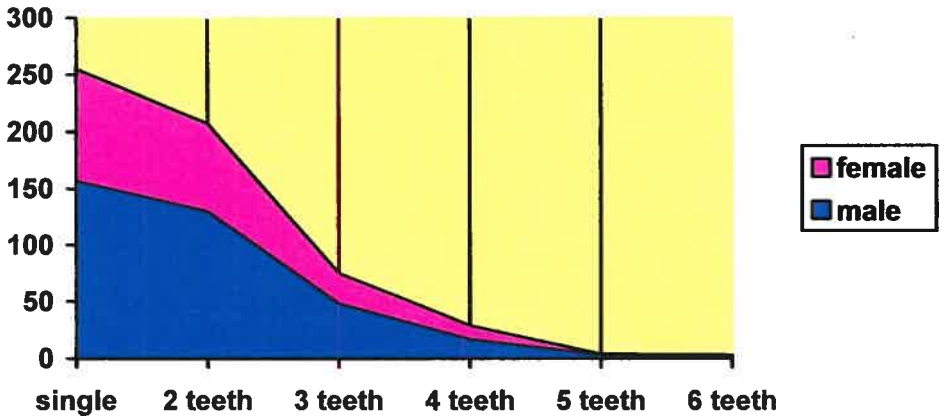
N.B. Color coding corresponds to the data presented in table 11

This concurs with other authors in Quebec[1-3,35], Canada[9], the United States[26,27,43,45,60], Europe [5,17-20,34,47,48,57,61], Asian[62], Middle East[10,63,64] and the third world[23,24,31,49,51,52]. It has been suggested that an "accident prone profile"[41] in children may be responsible for this predilection. Children who exhibit this profile have protruding anterior teeth that are often a component

of a definable malocclusion[7,41]. An increased overjet, incompetent lips, short upper lip, mouth breathing and Class II malocclusion appear to be the most important predisposing anatomic factors leading to increased susceptibility to traumatic dental injuries[19,23,65-67].

318 of the 573 cases involved 2 or more teeth (chart 12). Multi-tooth trauma was considered in relationship to gender, age, and gender + age.

Chart 12: Gender distribution of multi-tooth trauma



As previously stated, there was an overall 1.65:1 male preponderance (all comers). When only multi-tooth trauma is considered, 199 of the 318 cases (62.5%) were males, which, again, corresponds to a nearly identical ratio of 1.60:1 males to females . When the sexes are stratified by age greater or less than 6 years, which matches the beginning of the second peak of traumas discussed earlier, there was an increase of the male to female ratio to 2.3:1. This supports the idea that at the second peak of pediatric dental trauma where

males had more multi-tooth trauma than females, the mechanism of injury in males may involve greater destructive force than that of females. Furthermore, males over 6 years of age had more multi-tooth involvement than single tooth (99 versus 67, or 60%).

A majority of patients had a radiographic investigation. 524 films were obtained on 573 patients (some patients having more than one view). It should be noted that if a film was obtained and not documented (as to which type of film was taken, or if one was taken at all) data was not entered. Anecdotally, this lack of documentation of radiographic investigations was not an uncommon occurrence. Therefore, the number of patients *not* having received a radiographic evaluation could not be accurately determined. In general, the American Academy of Pediatric Dentistry[4] requires radiographs in all cases of suspected dental traumas, including concussions, or those whose "emergency" treatment is likely to be observation alone. When documented, the vast majority of these investigations were superior occlusal radiographs, which allows the dentist to assess tooth or root fractures, tooth displacement, or widening of the periodontal ligament space[35]. Panaromic radiographs (panorex) were obtained 28 times in this sample. This occurred when suspicion for mandibular fracture existed and was used in conjunction with other views (primarily the periapical and occlusal views) for evaluation of specific teeth. As noted by Fried[35], there is a limited diagnostic value in panaromic radiographs in assessing the anterior teeth involved in trauma, as

well as a technical difficulty in obtaining this film in young children whom may not hold still or cooperate enough to yield sufficient quality for diagnostic purposes. Finally, without ancillary personnel panoramic radiographs may be difficult to obtain after-hours, and were only ordered when clinical suspicion was high.

The diagnosis of trauma to primary and permanent dentition was evaluated as a whole and independently. The results indicate that as a whole coronary fractures predominate, particularly Ellis class II[40], which is in accordance with several other authors[1,19,20,23,24,42,49,52,63,64]. When primary and permanent tooth trauma are stratified in our sample, there appears to be a slight shift away from coronary fractures into crown/ root and root fractures in primary dentition. This agrees with data presented by Charland[2]. He goes on to state that certain studies, notably those by Ferguson[37] in 1979, and Meadow[42] in 1984, leaves one to believe that the percentage of coronary fractures in primary dentition should be higher than those reported here. Additionally, Feiglin[68] states that isolated (transverse) root fractures occur principally in the adult patient where the root is solidly supported in bone and periodontal membrane. It should be noted that although the *percentage* of root and crown/root fractures is higher in primary teeth in this sample, the *absolute numbers* (54 permanent versus 26 primary teeth) still support that statement that the rarer crown/root and root fractures are much less common in primary teeth for the reasons outlined previously. Root fractures, when they occur in

primary teeth, are uncommon before completion of root development, and are most frequent at 3-4 years of age, when physiologic root resorption has begun and the root is weakened[69].

Dental displacement was also considered and stratified by dentition. 2/3 of all displacements occurred in primary teeth, and, correspondingly, most trauma to primary dentition involves displacement. It is thought, and well supported in the literature[1,3,5,21,23,34,42,43,49,54], that this predilection for displacement is related to the elasticity of the alveolar bone supporting primary dentition, which facilitates movement versus the rigidity necessary for fracture. Therefore, a force which may fracture a permanent tooth may only displace or avulse a primary one. The results in this sample are in agreement, and support this theory.

The largest percentage of injuries was "observed with scheduled follow-up" as initial emergency treatment (43.4%). This treatment was chosen primarily for concussions, infractions, and subluxations, which accounted for almost 20% of the injuries. Other scenarios were observation was chosen included select Ellis class I fractures (fracture limited to the enamel), intrusion in primary dentition, and some primary teeth avulsions. The other commonly performed treatments included temporary coverings, reductions, fixations and extractions. It is important to note that these are procedures and/or treatments completed in the emergency setting, and were not, in some cases, intended to

be definitive. In all cases, as previously noted, follow-up visits were provided. Interestingly, as with the determination of diagnosis, a multitude of different dental staff attended trauma cases. Each dental attending has their own inherent biases, preferences and experience, and, as such, no consistent treatment algorithm was utilized for each subcategory of dental trauma encountered. The treatment chosen may or may not have been in line with those recommended by the American Academy of Pediatric Dentistry's guidelines for pediatric dental trauma[4], however they are not likely to be significantly different in frequency or substance from those recommended by the AAPD for similar injuries. Quantification of variance from the AAPD guidelines, with outcomes data and a prospective design would be a logical subsequent study to complete using this database as a foundation and starting point.

4. 4 CHARACTERISTICS OF THE INJURY MECHANISM

57.4% of all injury cases reportedly occurred in-doors. This was relatively equally distributed throughout the year, although a greater percentage of these occurred in the peak prior to age 6, and maintained the gender equality. More outdoor injuries occurred during the warmer summer months; however, some injuries did occur out-of-doors during the winter months as well. This is to be expected given Montreal's weather extremes, with falls related to icy

conditions and winter sports expected to account for a percentage of the wintertime outdoor traumas.

Many causes contribute to dental trauma including falls, collisions, sporting activities, domestic violence, automobile accidents, and assaults[28]. Special emphasis should be made to differentiate accidental (nonabusive) trauma from child abuse, neglect or battery. Most studies report that the primary precipitating factors in pediatric dental trauma are falls and collisions[2,3,7,16,23,25-27,34,35,42,52,63], followed sporting activities and less commonly, automobile accidents and fighting. One study[10] reports the main etiological factors of dental injuries are violence, followed by traffic accidents. Notably, this report comes from Damascus and may not reflect the patterns in North America.

Almost 80% of all injuries were classified as 'falls' in this sample. The majority of the remaining categories (cycling, etcetera) were present almost exclusively in the 4 year old and older age group for self-apparent reasons. Interestingly, of the 34 patients involved in cycling-related injuries, 27 of the 34 (79%) admitted to not wearing protective helmet protection at the time of the trauma. This may serve at a starting point and justification for initiatives targeting at-risk populations for community-based prevention and education programs.

Hallet[70] and Andreasen[5] mentioned that others factors are responsible for the type of trauma, such as the energy of impact (fall during play, bicycle or motor vehicle and automobile accidents), resilience of the impacting object (injuries during fight and foreign bodies striking the teeth), and angle of the impacting object (fall on staircase). These factors are difficult to estimate from the records used in the studies, and may be of academic interest alone.

4. 5 LIMITATIONS OF THE STUDY

There are a number of limitations with this study, primarily due to its' retrospective design. Missing and incomplete charts are some obvious examples. Additionally, it was not possible to control for how and when chart documentation was done, leading to a possibility of inaccuracies and misinformation (recall bias). There were a multitude of persons involved in the determination of diagnosis and treatment, which may introduce additional biases into the data. With a number of attending dentists and dental residents making diagnoses, there was no method for determining consensus opinion (or disagreement) regarding key dependent variables (i.e. diagnosis). This could have been overcome using a prospective design, or, at the very least, a blinded retrospective review of radiologic investigations which had been obtained in many cases. A consensus opinion regarding the clinical and radiographic evaluation could have served as the gold-standard in the diagnostic category. An example of the difficulties inherent in solely basing

diagnosis on clinical examination includes the fact that transverse root fractures and luxations and fractures of the alveolar process appear exactly the same from a clinical standpoint (refer to Feiglin[68] for more information). If radiology was not obtained (for any reason), examiner preconceptions and experience dictated diagnostic classification. Additionally, when multiple diagnoses were applicable to a single tooth, the "more serious" single diagnosis was chosen. There is inherent subjectivity in this determination. Obtaining intra-rater and inter-rater reliabilities for diagnostic dependent variables was not possible with the design utilized. Finally, data extraction was a potential limitation, however, the high intra-rater reliabilities suggest that this may have been only a minor confounder.

4. 6 FUTURE DIRECTIONS

The utility of any database, including the one presented here, is the accuracy that it reflects the population considered, and the generalizability to a population as a whole. Periodic updates of this database should be completed in order to keep the information current. This may be incorporated into a prospective study design with double-blinded randomizations to allow consideration of different treatment algorithms, effectiveness of utilization management, as well as intra-rater and inter-rater reliabilities regarding diagnoses based on clinical and/ or radiologic examinations. One possibility for a very interesting offshoot study would be to compare the ability of dental

residents to ascertain the 'correct' diagnosis, using consensus attending opinions as the gold standard. Additionally, several different treatment algorithms could be directly compared. Furthermore, a prospective design would allow the investigator to establish critical information not available in this retrospective design, most notable the time delay from the moment of the trauma to the completion of definitive treatment. This is likely to significantly impact outcomes, and may play a vital role in which treatment is chosen.

CHAPTER 5: CONCLUSIONS

A database of pediatric dental trauma has been created here, which may be used as a foundation for other epidemiological studies and a starting point for prospective studies on treatment outcomes. It provides the most recent information on pediatric dental trauma in Montreal. Patient demographics, logistics, characteristics and mechanism of the trauma, emergency care, follow-up and various other cofactors were identified and considered. The information provided here could also be used as a justification for a resident training program at the Hôpital Sainte Justine in Montreal, provide essential information for injury prevention programs, and may be beneficial to those responsible for staffing, resources and manpower allotment and scheduling.

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Urgences
Département de médecine dentaire

Date: ☐☐☐
an mois jour

Journée: OD OL OMa OMe OJ OV OS
Heure d'arrivée du patient:_____
Heure de traitement:_____
Heure de départ du patient:_____
Plainte principale:_____
Histoire de la plainte principale:_____
_____
Histoire médicale:_____
_____
Histoire dentaire:_____
Référé par: ☐ *(Spécifiez)* :_____
Type d'urgence: O Traumatisme O Infection O Autre:_____

Traumatisme

Cause: ☐ *(voir verso)* :_____
Lieu: O Intérieur O Extérieur
Équipement protecteur:
☐ *(voir verso)* : _____
Histoire de trauma antérieur:
O Oui O Non
Conséquences: ☐ *(voir verso)* :_____
Classe Angle: O I O II div. 1 O II div. 2 O III

Infection

Cause: ☐ *(voir verso)* :_____
Début des signes et symptômes:_____
_____
(Date et heure si possible)

Examen radiologique: O Occlusale sup. O Occlusale inf. O Rétro-coronaire O Rétro-alvéolaire
O Panogramme O Céphalogramme A.-P. O Céphalogramme latéral O Autre:_____

Dent/Tissu	Diagnostic	Traitement	Dent/Tissu	Diagnostic	Traitement

(Si déplacement, veuillez l'indiquer en mm s.v.p.)

O Revoir à la clinique O Référé à:_____

_____ _____ _____

Signature: Clinicien O *Résident* O *Étudiant* *Assistante*

Formule à l'essai 94-02-22 HB/RP

Causes de traumatismes: 1. Chute 2. Bicyclette 3. Bagarre 4. Automobile
4. Collision avec un objet 5. Collision avec une personne
5. Autre

Causes d'infections: 1. Carie 2. Complications post-traumatiques 3. Origine parodontale
4. Complications post-chirurgie 5. Autre

Équipement protecteur: 1. Casque 2. Visière 3. Grille 4. Protecteur buccal
5. Aucun 6. Autre

Conséquences d'un trauma antérieur: 1. Restauration 2. Mobilité 3. Déplacement
4. Douleur 5. Lésion périapicale

Référé par: 1. Urgence - Chirurgie 2. Urgence- Pédiatrie 3. Autre département
4. Hôpital 5. CLSC 6. Clinique médicale 7. Clinique dentaire 8. Autre

Diagnostic

1. Dentaire
a) Fêlure
b) Fracture émail
c) Fracture émail-dentine
d) Fracture émail-dentine-pulpe
e) Fracture émail-dentine-cément
f) Fracture émail-dentine-cément-pulpe
g) Fracture dentine-cément-pulpe (1/3 cervical)
h) Fracture dentine-cément-pulpe (1/3 moyen)
i) Fracture dentine-cément-pulpe (1/3 apical)

2. Déplacement
a) Contusion b) Subluxation c) Extrusion d) Intrusion e) Luxation labiale
f) Luxation linguale g) Luxation mésiale h) Luxation distale i) Avulsion

3. Osseux
a) Fracture alvéolaire b) Maxillaire supérieur
c) Maxillaire inférieur corps mandibulaire
d) Maxillaire inférieur branche montante
e) Maxillaire inférieur condyle f) Autre

4. Tissus mous
a) Peau-Contusion b) Peau-Abrasion c) Peau-Lacération d) Muqueuse-Contusion
e) Muqueuse-Abrasion f) Muqueuse-Lacération g) Gencive-Contusion
h) Gencive-Abrasion i) Gencive Lacération j) Corps étranger

5. Autre

Traitement: 1. Drainage 2. Antibiothérapie 3. Pansement temporaire 4. Coiffage direct
5. Polissage émail 6. Pulpotomie 7. Pulpectomie 8. Extraction 9. Réduction
10. Fixation 11. Sutures 12. Restauration 13. Analgésiques 14. Curetage
15. Endodontie 16. Aucun traitement

Appendix II

Journée :
1.-Dimanche.
2.-Lundi.
3.-Mardi.
4.-Mercredi.
5.-Jeudi.
6.-Vendredi.
7.-Samedi.
8.-Dimanche.

Histoire médicale :

ASA I : Normal bonne santé.
ASA II : Maladie systémique modérée.
ASA III : Maladie systémique sévère.
ASA IV : Maladie systémique sévère incapacitante.
ASA V : Patient moribond.

Référé par :

1.-Urgence-Chirurgie.
2.-Urgence-pediatrie.
3.-Autre département.
4.-Hôpital.
5.-CLSC.
6.-Clinique médicale.
7.-Clinique dentaire.

Type d'urgence:

1.-Traumatisme.
2.-Infection.
3.-Autre.

Causes de traumatisme:

1.-Chute.
2.-Bicyclette.
3.-Barrage.
4.-Automobile.
5.-Collision avec un objet.
6.-Collision avec une personne.
7.-Autre.

Appendix II

Lieu :

1.-Interieur.
2.-Exterieur.

Protection :

1.-Casque.
2.-Visiere.
3.-Grille.
4.-Protecteur buccal.
5.-Aucun.
6.-Autre.

Trauma antérieur :
1.-Oui.
2.-Non.

Conséquences :

1.-Restauration.
2.-Mobilite.
3.-Deplacement.
4.-Douleur.
5.-Lesion périapicale.

Diagnostic :

Dentaire :

11.-Fêrule.
12.-Fracture émail.
13.-Fracture émail dentine.
14.-Fracture émail dentine pulpe.
15.-Fracture émail dentine cément.
16.-Fracture émail dentine cément pulpe.
17.-Fracture dentine cément pulpe (1/3 cervical).
18.-Fracture dentine cément pulpe (1/3 moyen).
19.-Fracture dentine cément pulpe (1/3 apical).

Appendix II

Déplacement :

21.-Contusion.
22.-Subluxation.
23.-Extrusion.
24.-Intrusion.
25.-Luxation labiale.
26.-Luxation linguale.
27.-Luxation mésiale.
28.-Luxation distale.
29.-Avulsion.

Traitement :

1.-Drainage.
2.-Antibiotherapie.
3.-Pansement temporaire.
4.-Coiffage direct.
5.-Polissage email.
6.-Pulpotomie.
7.-Pulpectomie.
8.-Extraction.
9.-Reduction.
10.-Fixation.
11.-Sutures.
12.-Restauration.
13.-Analgesiques.
14.-Curatage.
15.-Endodontie.
16.-Aucun traitement.

Suivi :

1.-Revoir à la clinique.
2.-Référé a bureau privé.

DIRECTION DES OPÉRATIONS CLINIQUES APPENDIX III
RAMME URGENCE / TRAUMATOLOGIE / CHIRURGIE

CHU Sainte-Justine
Le centre hospitalier universitaire mère-enfant

Pour l'amour des enfants

Université de Montréal

VISITES TOTALES À L'URGENCE ET VUS À L'URGENCE AVEC UN DIAGNOSTIC E PLAIE INTERNE DE LA BOUCHE

ANNÉES 2000, 2001 ET 2002

YEARS	TOTAL EMERGENCY ROOM VISITS	NUMBER OF DENTAL CONSULTATIONS REQUESTED	SIZE OF THE POPULATION OFFICIALLY SERVES
2000	64119	138	NON DISPONIBLE
2001	63238	175	NON DISPONIBLE
2002	59780	164	NON DISPONIBLE

NUMBER OF DENTAL CONSULTATIONS REQUESTED

LE NOMBRE INSCRIT SOUS CE TITRE CORRESPOND AU NOMBRE E PATIENTS VUS À L'URGENCE AVEC UN DIAGNOSTIC DE PLAIE INTERNE DE LA BOUCHE AVEC OU SANS COMPLICATION :

- PLAIE DE LA BOUCHE
- PLAIE DES GENCIVES
- PLAIE DE LA LANGUE
- PLAIE DU PALAIS
- FRACTURE DE DENT
- TRAUMATISME DENTAIRE

Louise Beaudry, Conseillère en gestion et Coordonnateur des centres de rendez-vous
Direction des opérations cliniques

DIRECTION DES OPÉRATIONS CLINIQUES APPENDIX III
PROGRAMME URGENCE / TRAUMATOLOGIE / CHIRURGIE

VISITES TOTALES À L'URGENCE
ET
PATIENTS VUS À L'URGENCE AVEC UN DIAGNOSTIC DE PLAIE INTERNE DE LA BOUCHE

ANNÉES 2000, 2001 ET 2002

De plus, si cela peut vous aider, voici quelques données concernant le nombre de patients vus en clinique externe de médecine dentaire pour diverses raisons et non seulement en consultations via l'urgence.

Activités en clinique de médecine dentaire (année)	Nombre de visites
2000-04-01 au 2001-03-31	10866
2001-04-01 au 2002-03-31	9931
2002-04-01 au 2003-03-31	8092

Source : Système informatisé de l'urgence
2005-06-14

Louise Beaudry, Conseillère en gestion et Coordonnateur des centres de rendez-vous
Direction des opérations cliniques