

Comparison of Manitoban general and pediatric dentists behaviour
guidance technique usage and preference

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Abstract

Objective: To examine differences in the usages and otherwise preferences of behaviour guidance techniques between Manitoban general and pediatric dentists when considering year of graduation, training locations, and source of training.

Methods: Surveys using SurveyMonkey were emailed to a random 25% sample of general dentists and all pediatric dentists in Manitoba. The nonparametric test Wilcoxon Mann-Whitney test was performed on all data. Significance levels were considered at $\alpha < 0.05$ and at 95% confidence interval (CI).

Results: A total of 87 completed responses were collected (72 general dentists, 15 pediatric dentists). Statistically significant differences were found in voice control, oral sedation, tell-show-do, and general anesthesia.

Conclusions: In general, there were few statistically significant differences; however, there were some clinically significant findings. Overall, tell-show-do for both groups, oral sedation for general dentists, and nitrous oxide sedation for both groups were found to be the most favoured in their respective categories while protective stabilization and IV sedation were the least favoured in their respective categories.

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Introduction

Dental caries is one of the most common diseases affecting children worldwide. By the age of five, up to 60 percent of children may develop caries.¹ Multiple factors contribute to early childhood caries including one's microflora, socioeconomic status, oral hygiene care, diet, and fluoride exposure.² Children with early childhood caries present with complex treatment needs that may be executed by lengthy procedures. For children, dental treatment may be a stressful experience leading to aversive behaviour requiring some means of behaviour guidance.³ Unruly behaviour can contribute to disruption in a child's quality of care, length of treatment time, and increase the risk of injury.⁴ In the pediatric dental office, these children comprise up to 22 percent of the patient population.⁵

Treatment of caries for the pediatric patient can include pharmacological and non-pharmacological behaviour management means, in conjunction with the actual restorative measures, to address their the child's and anxiety.² The American Academy of Pediatric Dentistry (AAPD) recognizes behaviour guidance as a process that "is a continuum of interaction involving the dentist and dental team, the patient, and the parent; its goals are to establish communication, alleviate fear and anxiety, deliver quality dental care, build a trusting relationship between dentist/staff and child/parent, and promote the child's positive attitude toward oral health care."⁶

Non-pharmacological behaviour guidance techniques (also known as behaviour management techniques) include distraction, tell-show-do, voice control, positive reinforcement, protective stabilization and parental absence/presence (Appendix 1).⁶ Children may not always respond well with non-pharmacological behavior guidance,

which leads dentists to use pharmacological management. Uncooperative children that can not be managed in the dental chair with the use of non-pharmacological means may be offered to the use of nitrous sedation, oral sedation, IV sedation, or general anesthesia.

⁶ The pediatric patient's behaviour is managed medically with these techniques to place the patient into mild, moderate, or deep sedation. ⁶

Although it is ideal for a child's safety to have dental treatment done without pharmacological intervention, this is not always manageable. The preference and effectiveness of non-pharmacological and pharmacological behaviour management in the dental office are bound by drug choice and provider preference. In Manitoba, it is unknown as to which behaviour management techniques general dentists and pediatric dentists commonly use and which they prefer.

In this study, a survey of the Manitoban pediatric and general dentists will examine the behaviour guidance techniques practiced among the different categories of clinicians. The survey data will be analyzed regarding the use, preference, training location, and source of training for behaviour guidance technique. Comparisons of pre- and post- 1998 graduation year along with the training location training will be made. The year 1998 was selected since this is when the Variety Outreach Dental program was initiated at the University of Manitoba providing dental students with a sufficient number of pediatric patients in need of dental work. The information will help guide and examine whether the behaviour guidance management techniques being taught in the undergraduate and graduate pediatric dental programs at the University of Manitoba are adequate for the management of the pediatric patient of the general and pediatric dentists in Manitoba.

Literature Review

Evolution of Behaviour Guidance/ Types of Behaviour Guidance

Behaviour guidance techniques are the modes by which treatment can be facilitated for pediatric patients. The AAPD has recognized that behaviour guidance reduces anxiety and ensures a positive dental experience and attitude of the pediatric patient, while allowing for safe and effective dental treatment delivery.⁶ Previously in the 1970s the dentist could easily take the “captain of the ship” approach in which, techniques such as the hand-over-mouth exercise was utilized to gain a child’s attention.⁷ In today’s society this technique invites controversy and litigation.⁷ It is used less in pediatric dentistry as shown in its decline from 88 percent in 1979 to 22 percent in 2004 by pediatric dentists.^{8,9}

Well-known behaviour management techniques currently being used include tell-show-do, distraction, positive reinforcement, voice control, parental absence/ presence, protective stabilization, sedation, nitrous inhalation, and general anesthesia.⁶ Additional newer and/ or less utilized behaviour guidance techniques include positive pre-imagery, ask-tell-ask, memory restructuring, child centered care, magic tricks, hypnosis, and motivational interviewing.^{6,7} (Appendix 1)

Over the years there has been a paradigm shift in the movement away from controversial behaviour guidance such as voice control, parental absence/ presence, and physical restraint.¹⁰ Subsequently the utilization of certain behaviour management techniques has changed from the early 19th and 20th century and is a constant evolutionary aspect of pediatric dentistry.¹⁰

Behaviour Guidance Education

It is well known that a practitioner's choice of behaviour guidance will depend on their knowledge, training background, skills, and viewpoints.⁷ From a survey conducted of 56 pediatric dental graduate programs in 2003 in North America, it was found that in most programs greater than 75 percent of the students received at least one hands on experience of tell-show-do, nonverbal communication, positive reinforcement, and distraction.¹¹ Juntgen *et al.* found that a practitioner's type of training in behaviour guidance played a role in whether or not they were likely to utilize certain techniques.¹² The study found that majority had training and felt comfortable utilizing tell-show-do, voice control, nonverbal communication, positive reinforcement, distraction, parental presence/ absence, nitrous oxide inhalation, protective stabilization, oral/ nasal sedation, and general anesthesia.¹² Another study found that the majority of students from advanced pediatric dentistry programs had either no experience (52 percent) or minimal experience (23 percent) with IV sedation.¹³

A 2011 survey done at the University of Florida comparing undergraduate and graduate pediatric dentistry behaviour guidance training was able to reveal differences between the two groups. They found that senior dental students had statistically higher acceptability scores than postdoctoral pediatric dentistry graduates for not allowing the child to speak during treatment, voice control, hand over mouth, active immobilization, and providing an exact explanation to the child.¹⁴ However, it should be noted that the study was limited to one dental school.

In general, most pediatric dental graduate schools give less than 5 hours of didactic material for behaviour management techniques and very few schools give hands-

on experience for general anesthesia or nitrous oxide inhalation.¹¹ This may affect the usage of more advanced behaviour guidance techniques.¹¹ Directors of the pediatric graduate programs revealed that in the past 5 years not much of their behaviour guidance education training has changed and they do not anticipate it changing in the future.¹¹ Yet Adair *et al.* proposed that in pediatric dentistry training programs movement towards or away certain behaviour management techniques being taught occurs because of changes in scientific bases, perceived safety, and social validity.¹⁵

Dental Operator Preference

In 2003 a survey sent out to AAPD members the majority of the respondents revealed that they commonly used tell-show-do, nonverbal communication, voice control, positive reinforcement, distraction, nitrous oxide/oxygen inhalation sedation, and general anesthesia for all age groups (from <3 years to >12 years).⁸ Most of the practitioners used active and passive immobilization on patients from <3 years to 5 years of age when non-sedated.⁸ Seventy-nine percent of respondents did not use the hand-over-mouth technique.⁸ In the study conducted by Strom *et al.* it was found that the most used behaviour management techniques by dentists in Norway were tell-show-do, relaxation, distraction, systematic cognitive behaviour therapy, and conscious sedation.¹⁶

Additional research by Adair *et al.* evaluated U.S. and Canadian AAPD members in the difference of their use of behaviour management techniques between older and younger male and female pediatric dentists. Interestingly, younger females were less likely to use nonverbal communications and less likely than older males to use hand-over-mouth.¹⁵ Females in general were likely to use passive immobilization of a non-

sedated child and younger females were significantly more likely to use distraction than males.¹⁵ Another significant finding was that older pediatric dentists were less likely to use sedation and the younger ones were more likely to use nitrous oxide and general anesthesia.¹⁵ Gender and marital status can also affect a practitioner's choice in behaviour guidance.¹⁴

Pediatric dentists have noted changes in behaviour guidance usage over time.¹⁷ Over a period of 5 years it was found that hand-over-mouth decreased by 50 percent in usage and nitrous oxide/ oxygen inhalation increased to more frequently using by 25 percent of the practitioners.⁸

Factors influencing Behaviour Guidance Usage and Preference

Parenting style, attitude, and tolerance play an influential factor in what behaviour management techniques the dental operator will select for individual pediatric patients.⁷ Studies conducted as far as 2 to 3 decades ago have found an increase in parent participation in their child's dental experience.^{18,19} From the survey conducted in 2003 among the AAPD members, 85 percent of the respondents felt that parenting styles have changed while they have been in practice.⁸ The most selected responses were that parents were "less willing to set limits for their children" and "less willing to use physical discipline."⁸ Today's parents are more preoccupied and less likely to discipline their child and prepare them for their dental experience, yet the parents are more insistent on being present in the operatory.^{8,20} Pediatric dentists feel that this change in parenting style has lead to a "somewhat or much worse" patient behaviour.²¹

Patel *et al.* conducted a cross sectional survey regarding parental attitudes toward advanced behaviour guidance techniques. The study highlighted from several studies that over 30 years parental attitudes moved from tell-show-do, positive reinforcement, and nitrous as being the most acceptable behaviour guidance techniques to sedation and general anesthesia.²²⁻²⁵ The trend of oral sedation and general anesthesia has been shown to move from being considered one of the least acceptable techniques to the most acceptable techniques preferred by parents over time.²²⁻²⁵ Notably, it has also been found that the papoose board, passive restraint, and hand-over-mouth continued to be the least acceptable technique preferred by parents.²²⁻²⁵

In his conference paper, Strange lists several social and professional factors that have changed over time affecting the usage of behaviour management techniques. Some of the factors are as such; “higher expectations for the health care dollar and experience, lower level of professional expectation for behavior compliance, a diminishing respect within society for authority, a growing lack of trust in professionals, and a growing litigiousness of society with propensity toward legal action”.¹⁰ Although there has been a study that showed parenting style had no effect on the child’s behaviour this should be carefully interpreted since habituation was done prior to the appointments and the parents were not in the operatory at the time of treatment.³

Understanding the usage and preference of behaviour guidance techniques between general and pediatric dentists and also considering their dental training and location may prove to be helpful in evaluating the University of Manitoba’s undergraduate and graduate pediatric dental behaviour guidance curriculum. Currently, in the undergraduate training tell-show-do, voice control, distraction, and positive

reinforcement are the most commonly taught behaviour guidance techniques. Other techniques are discussed didactically but not clinically taught. The graduate program teaches their residents clinically tell-show-do, voice control, distraction, positive reinforcement, protective stabilization, parental absence/presence, nitrous oxide, oral sedation, and general anesthesia.

Objective

The study objectives are as follows:

- 1) To determine if there are significant differences in the usage and otherwise preferences of behaviour guidance techniques between general and pediatric Manitoban dentists
- 2) To determine if graduating after 1998 from undergraduate and graduate programs reveals a significant difference in the usage and preference of general and pediatric Manitoban dentists
- 3) To determine the source of training for behaviour guidance techniques for both general and pediatric Manitoban dentists
- 4) To determine if graduating outside of Manitoba for undergraduate and graduate programs affects the usage and preference of behaviour guidance techniques

Null Hypothesis

The null hypothesis for statistical testing is that there is no difference in the usage, preference of behaviour guidance techniques when considering location, year, or source of training between the general and pediatric dentist in Manitoba.

Alternate Hypothesis

There will be a significant difference in the usage, preference, and training in behaviour guidance techniques between the general and pediatric dentist. Both will likely prefer the usage of positive type behaviour guidance techniques like Tell-Show-Do and positive reinforcement. However, pediatric dentists will likely use more pharmacological management techniques compared to the general dentists because of their training background. A difference in years of practice may reveal that those graduating before 1998 may use or prefer more authoritative behaviour management techniques such as voice control, protective stabilization, and parental absence/presence compared to those graduating after 1998 in both general and pediatric dentistry.

Methods and Materials

A cross sectional study that used an online survey (Appendix 2) was designed to satisfy the objectives. The survey addresses the practitioner's year of study, location of training, sources of training, and the preference and usage of behaviour guidance techniques, thus allowing for a comparison between Manitoban general and pediatric dentists.

The University of Manitoba's Research Ethics Board (REB) approved the study on August 20, 2015 (Appendix 3). The study was conducted as an online survey via SurveyMonkey. Once the approval was received from the REB the Manitoba Dental Association (MDA) was contacted for support of conducting the survey. Data collection for the study commenced September 2, 2015 and ended December 31, 2015. The survey was initially sent out on September 2, 2015 with an attempt to resend the survey 4 weeks afterwards. After 3 email requests to resend the survey the decision was made to accept the data that was collected as the final data.

Inclusion/Exclusion Criteria:

For this study the inclusion criterion consisted of all registered pediatric dentists and a sample of all registered general dentists in Manitoba. There was no exclusion criterion.

Sample Size and Informed Consent:

The sampling frame was a 25 percent sample of all registered general dentists and all the pediatric dentists of Manitoba. This came to a total of 145 general dentists and 19

pediatric dentists. No power calculation was done prior to study commencement as the statistician advised that there is no benefit to the calculation as the number of pediatric dentists in Manitoba limits the sample size.

The list of all Manitoban general dentists and pediatric dentists was obtained from the MDA directory online. From there the list of general dentists was extracted. The Manitoban general dentist list was randomized using Microsoft Excel. From there a random number from 1 to 4 was chosen from a hat to which every fourth dentist from that initial number was chosen for the study. The MDA was then contacted with this list and asked to email all those on the list as well as all pediatric dentists in Manitoba. Along with the email of the survey a disclosure statement (Appendix 4) was attached to provide informed consent. Participation of the online survey was voluntary.

Survey Administration:

Once the practitioner agreed to participate in the study they were directed to the survey via a link in the email. The survey consisted of 7 questions in total. The first question asked the participant whether they were a general dentist or a pediatric dentist. The second question addressed the year of graduation and location for the undergraduate degree of the general dentists and of the specialty training for the pediatric dentists. Next the participant was asked to rank in order most used (1 being the most used) the non-pharmacological behaviour management technique that they would use on an uncooperative/anxious child. They were asked to only rank the ones that were applicable to them. The following question asked which behaviour guidance techniques they would otherwise like to use by asking to rank them by preference (1 being the most preferred).

Both questions included tell-show-do, distraction, voice control, positive reinforcement, protective stabilization, and parental absence/presence as the non-pharmacological behaviour management techniques. Question 5 then asked the participant to rank in order the most common used pharmacological behaviour management technique and the following question ask to rank the same ones in order of which ones they were otherwise like to use. The pharmacological techniques included in the survey were nitrous oxide, oral sedation, general anesthesia, and IV sedation. The last two questions addressed where the source of training for the non-pharmacological and pharmacological behaviour management techniques was. The categories were undergraduate, graduate, and continuing education courses and participants were able to select more than one or none if applicable.

Statistical Analysis:

The data was extracted from SurveyMonkey into Microsoft Excel. Then frequencies of the first ranked non-pharmacological and pharmacological techniques were organized into tables for each objective into Microsoft Excel. Statistical analysis was performed using the statistical software in SAS 9.3 (SAS Institute Inc., Cary, NC, USA). Pearson Chi-Square test was used to compare the proportions between the general and pediatric dentists. However, for any cell frequency less than 5 a Fisher's exact test was then used. The nonparametric test Wilcoxon Mann-Whitney test was also performed on all the data by considering all the behaviour guidance techniques as continuous variables. In order to do so, the median rank for each technique was calculated. Results between both tests were similar and the Wilcoxon Mann-Whitney test was used for the

purpose of this study. For all of the analysis the significance levels were considered at $\alpha < 0.05$ and at 95% confidence interval (CI).

Results:

Survey Administration and Results:

The survey was emailed to 145 registered general dentists and 19 registered pediatric dentists in Manitoba. A total of 112 responses were collected. Of those responses only 87 were used as the others were deemed incomplete surveys (more than two thirds of the survey was not completed).

Participant Demographics

Of the 87 completed responses, 72 were general dentists and 15 were pediatric dentists. However, since participants were encouraged to answer questions or rank the variables if applicable, not all questions had the same number of responses.

Survey Results

The survey results are displayed in Appendix 4. Tables 1 to 12 and 15 to 22 show the results as median rank for the non-pharmacological and pharmacological behaviour guidance techniques used and otherwise preferred by general and pediatric dentists as per the objectives. The tables show the respective p-values calculated via the non-parametric Wilcoxon Mann-Whitney test. For the objective regarding the sources of training for each behaviour guidance technique no statistical test was conducted due to the complex nature of the data from questions 6 and 7 of the survey. The results for those questions were displayed as frequencies, which are seen in Tables 13 and 14.

Objective 1 – Usage and Otherwise Preference of Behaviour Guidance Techniques of General and Pediatric Dentists in Manitoba

Tables 1 to 4 address the first objective of a general comparison of the usage and otherwise preferences of behaviour guidance techniques between general and pediatric Manitoban dentists.

Table 1 – Median Rank of Non-pharmacological Behaviour Guidance Techniques Used by General and Pediatric Dentists

Non-pharmacological Behaviour Guidance	General Dentist Median Rank (n/N)	Pediatric Dentist Median Rank (n/N)	P-value
Tell-Show-Do	1 (50/71)	2 (6/15)	0.1350
Distraction	3 (27/70)	3 (9/15)	0.1492
Voice Control	4 (25/67)	5 (4/14)	0.0406
Positive Reinforcement	2.5 (2 – 26/72, 3-18/72)	3 (6/15)	0.9209
Protective Stabilization	6 (34/50)	5 (4/13)	0.1911
Parental Absence/ Presence	4 (13/61)	4 (3/16)	0.4214

Table 2 – Median Rank of Non-pharmacological Behaviour Guidance Techniques Otherwise Preferred by General and Pediatric Dentists

Non-pharmacological Behaviour Guidance	General Dentist Median Rank (n/N)	Pediatric Dentist Median Rank (n/N)	P-value
Tell-Show-Do	1 (48/68)	1.5 (1 – 7/14, 2 – 3/14)	0.1488
Distraction	3 (27/69)	3 (8/14)	0.5372
Voice Control	4 (22/64)	4 (3/12)	0.7081
Positive Reinforcement	3 (18/67)	2.5 (2 – 6/14, 3 – 4/14)	0.9375
Protective Stabilization	6 (32/47)	6 (7/13)	0.2985
Parental Absence/ Presence	5 (23/60)	4 (3/14)	0.5648

From Tables 1 and 2, mostly there are no significant differences between the two groups except in the usage of voice control with a p-value of 0.0406. It should be noted that of those that use voice control 37.3% general dentists ranked voice control usage as their fourth choice and 28.6% pediatric dentists ranked it as their fifth choice. The most popular non-pharmacological behaviour guidance technique selected as the number one choice was tell-show-do for both groups in the usage and otherwise preference with 70.4% general dentists and 46.7% pediatric dentists using it as their first option. The least popular non-pharmacological behaviour guidance for both groups was protective stabilization.

Table 3 - Median Rank of Pharmacological Behaviour Guidance Techniques Used by General and Pediatric Dentists

Pharmacological Behaviour Guidance	General Dentist Median Rank (n/N)	Pediatric Dentist Median Rank (n/N)	P-value
Nitrous Oxide	1 (8/13)	1 (10/12)	0.2998
Oral Sedation	1 (10/19)	3 (5/7)	0.0002
General Anesthesia	2 (2/10)	2 (10/15)	0.3808
IV Sedation	4 (2/3)	3.5 (3 – 1/4, 4 – 2/4)	0.6933

The usage of oral sedation was statistically significant with a p-value of 0.0002. 26.4% of general dentists and 46.7% that use oral sedation. Of those, 52.6% general dentists ranked it as their first choice and 71.4% pediatric dentists ranked it as their third option.

Table 4 - Median Rank of Pharmacological Behaviour Guidance Techniques Otherwise Preferred by General and Pediatric Dentists

Pharmacological Behaviour Guidance	General Dentist Median Rank (n/N)	Pediatric Dentist Median Rank (Range)	P-value
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Nitrous Oxide	1 (6/10)	1 (7/11)	0.9023
Oral Sedation	1 (11/18)	3 (6/8)	0.0007
General Anesthesia	2 (2/9)	1.5 (1 – 7/14, 2 – 7/14)	0.3510
IV Sedation	3 (2/3)	3.5 (3 – 1/4, 4 – 2/4)	1.0000

The preference of oral sedation was statistically significant with a p-value of 0.0007. Of those that prefer to do oral sedation (25% of the general dentists and 53.3% of pediatric dentists), 61.1% of general dentists ranked oral sedation preference as their first option and 75% of pediatric dentists ranked it as their third option.

For pharmacological behaviour guidance techniques the most popular first option was oral sedation for general dentists and nitrous oxide for pediatric dentists for the usage and preference. Ten general dentists use oral sedation as their first option and 10 pediatric dentists use nitrous oxide as theirs. The least popular option for pharmacological behaviour guidance techniques was IV sedation.

Objective 2 – Usage and Otherwise Preference of Behaviour Guidance Techniques of General and Pediatric Dentists in Manitoba Before and After 1998

Tables 5 to 12 show the usage and otherwise preference of behaviour guidance techniques before and after 1998 graduation. As mentioned before, the year 1998 was chosen as this was the year when the Variety Dental Outreach Program began at the University of Manitoba's undergraduate dental school. Before this change to the curriculum there was a limited number of pediatric dental patients for the undergraduate students.

Table 5 – Median Rank of Non-Pharmacological Behaviour Guidance Techniques Used by General and Pediatric Dentists Before 1998

Non-pharmacological Behaviour Guidance	General Dentist Median Rank (n/N)	Pediatric Dentist Median Rank (n/N)	P-value
Tell-Show-Do	1 (31/47)	2 (5/6)	0.0071
Distraction	3 (14/46)	3.5 (3 – 3/6, 4 – 2/6)	0.1658
Voice Control	3 (15/48)	5 (3/5)	0.6272
Positive Reinforcement	3 (11/48)	3 (3/6)	0.5430
Protective Stabilization	6 (25/37)	6 (3/5)	0.6754
Parental Absence/ Presence	5 (17/43)	1 (4/7)	0.0861

Table 6 – Median Rank of Non-Pharmacological Behaviour Guidance Techniques Otherwise Preferred by General and Pediatric Dentists Before 1998

Non-pharmacological Behaviour Guidance	General Dentist Median Rank (n/N)	Pediatric Dentist Median Rank (n/N)	P-value
Tell-Show-Do	1 (30/45)	4 (3/5)	0.0049
Distraction	3 (15/46)	3 (2/5)	0.3682
Voice Control	3 (13/47)	2.5 (2 – 1/4, 3 – 1/4)	0.1949
Positive Reinforcement	3 (12/44)	3 (2/9)	0.2987
Protective Stabilization	6 (22/34)	6 (4/6)	0.7885
Parental Absence/ Presence	5 (8/19)	1 (4/6)	0.1270

As seen in Tables 5 and 6, there are significant differences in the usage and otherwise preference of tell-show-do between the general and pediatric dentists before 1998. The p-values are 0.0071 and 0.0049 for the usage and preference before 1998 respectively. Thirty-one of 47 general dentists selected Tell-Show-Do as their first option for usage and 5 of 6 pediatric dentists selected it as their second choice. It should be noted that of the 7 pediatric dentists that graduated before 1998, 57.1% ranked parental absence/presence as their number 1 used non-pharmacological behaviour guidance

technique. For the behaviour guidance techniques otherwise preferred by pediatric dentists that graduate before 1998, 60% chose tell-show-do as their fourth option.

Table 7 - Median Rank of Non-Pharmacological Behaviour Guidance Techniques Used by General and Pediatric Dentists After 1998

Non-pharmacological Behaviour Guidance	General Dentist Median Rank (n/N)	Pediatric Dentist Median Rank (n/N)	P-value
Tell-Show-Do	1 (19/24)	1 (7/9)	1.0000
Distraction	3 (13/24)	3 (6/9)	0.5260
Voice Control	4 (10/19)	5 (1/9)	0.2381
Positive Reinforcement	2 (11/24)	2 (5/9)	0.9130
Protective Stabilization	6 (9/13)	5 (3/8)	0.2927
Parental Absence/ Presence	4 (4/18)	5 (4/9)	0.4890

Table 8 - Median Rank of Non-Pharmacological Behaviour Guidance Techniques Otherwise Preferred by General and Pediatric Dentists After 1998

Non-pharmacological Behaviour Guidance	General Dentist Median Rank (n/N)	Pediatric Dentist Median Rank (n/N)	P-value
Tell-Show-Do	1 (18/23)	1 (7/9)	1.0000
Distraction	3 (12/23)	3 (6/9)	0.7997
Voice Control	4 (10/46)	4.5 (4 – 0/5, 5 – 2/5)	0.5358
Positive Reinforcement	2 (12/23)	2 (5/9)	0.7479
Protective Stabilization	6 (10/13)	5 (3/7)	0.1884
Parental Absence/ Presence	4 (8/19)	4.5 (4 – 3/8, 5 – 2/8)	0.5248

From tables 7 and 8, there was no statistically significant difference in the usage and otherwise preference of the non-pharmacological behaviour guidance techniques for those that graduated after 1998. Both groups chose Tell-Show-Do as their first option

with 19 of 24 general dentists and 7 of 9 pediatric dentists using it as their first choice and 18 of 23 general dentists and 7 of 9 pediatric dentists prefer it as their first choice.

Table 9 - Median Rank of Pharmacological Behaviour Guidance Techniques Used by General and Pediatric Dentists Before 1998

Pharmacological Behaviour Guidance	General Dentist Median Rank (n/N)	Pediatric Dentist Median Rank (n/N)	P-value
Nitrous Oxide	1 (7/11)	1 (2/3)	0.9272
Oral Sedation	2 (8/15)	3 (2/3)	0.0183
General Anesthesia	2 (2/9)	1 (4/6)	0.2716
IV Sedation	4 (2/3)	2 (1/4)	0.3458

Table 10 - Median Rank of Pharmacological Behaviour Guidance Techniques Otherwise Preferred by General and Pediatric Dentists Before 1998

Pharmacological Behaviour Guidance	General Dentist Median Rank (n/N)	Pediatric Dentist Median Rank (n/N)	P-value
Nitrous Oxide	1 (4/7)	2.5 (2 – 0/2, 3 – 0/2)	0.7460
Oral Sedation	1 (8/13)	3 (2/3)	0.0405
General Anesthesia	1 (4/6)	1 (4/5)	0.6411
IV Sedation	3.5 (3 – 1/2, 4 – 1/2)	2 (1/1)	0.5403

For the usage and otherwise preferred use of oral sedation with those that graduated before 1998 there were some statistically significant findings. For the usage of oral sedation for graduates before 1998 the p-value is 0.0183 and for the otherwise preferred use the p-value is 0.0405. For the preference of pharmacological behaviour guidance techniques of those graduated before 1998, 8 of 13 general dentists ranked it as their first option and 2 of 3 pediatric dentists ranked it as their second option.

Table 11 - Median Rank of Pharmacological Behaviour Guidance Techniques Used by General and Pediatric Dentists After 1998

Pharmacological Behaviour Guidance	General Dentist Median Rank (n/N)	Pediatric Dentist Median Rank (n/N)	P-value
Nitrous Oxide	1.5 (1 – 1/2, 2 – 1/2)	1 (8/9)	0.2918
Oral Sedation	1 (3/4)	3 (3/4)	0.0228
General Anesthesia	3 (1/1)	2 (8/9)	0.0469

IV Sedation	NA	4 (2/3)	NA
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Table 12 - Median Rank of Pharmacological Behaviour Guidance Techniques Otherwise Preferred by General and Pediatric Dentists After 1998

Pharmacological Behaviour Guidance	General Dentist Median Rank (n/N)	Pediatric Dentist Median Rank (n/N)	P-value
Nitrous Oxide	1 (2/3)	1 (6/9)	1.0000
Oral Sedation	1 (3/5)	3 (4/5)	0.0238
General Anesthesia	3 (1/3)	2 (6/9)	0.0375
IV Sedation	3 (1/1)	4 (2/3)	0.6171

For graduation after 1998 the p-values for the use of oral sedation and general anesthesia were 0.0228 and 0.0469. The otherwise preference of oral sedation and general anesthesia also showed a statistically significant difference for those that graduated after 1998 with p-values of 0.0238 and 0.0375 respectively. Noticeably, oral sedation is not used by many general and is less so used as a first option by pediatric dentists. Of the 5.6% of general dentists and 26.7% of pediatric dentists that graduated after 1998 3 of 4 general dentists selected oral sedation as their first choice to use and 3 of 4 pediatric dentists selected it as their third option to use. Also in this category, 1 of 1 general dentist selected general anesthesia as their third option to use while 8 of 9 pediatric dentists selected as their second option to use. For those graduated after 1998, 3 of 5 general dentists chose oral sedation as their first preference and 4 of 5 pediatric dentist chose it as their third preference. In the same category, 1 of 3 general dentists selected general anesthesia as their third option in preference and 6 of 9 pediatric dentists selected it as their second option in preference. Clearly, pediatric dentists use general anesthesia more as an option than general dentists.

Objective 3 – Source of Training of Behaviour Guidance Techniques of General and Pediatric Dentists in Manitoba

For the third objective, the source of training for the behaviour guidance techniques, the results, as frequencies, will be discussed given that statistics on the data for this objective would have been overly complex with little added value. Tables 13 and 14 show the frequencies for the source of training in the non-pharmacological and pharmacological behaviour guidance techniques.

Table 13 – Frequency for Source of Training of Non-pharmacological Behaviour Guidance Techniques

Type of Technique	General Dentist % (n/N)			Pediatric Dentist % (n/N)		
	Undergraduate Only	Graduate Only	Undergraduate and Graduate	Undergraduate Only	Graduate Only	Undergraduate and Graduate
Tell Show Do	82.19 (60/73)	0.00 (0/73)	2.74 (2/73)	15.38 (2/13)	7.69 (1/13)	53.85 (7/13)
Distraction	71.01 (49/69)	0.00 (0/69)	1.45 (1/69)	7.69 (1/13)	30.77 (4/13)	38.46 (5/13)
Voice Control	81.25 (52/64)	1.56 (1/64)	1.56 (1/64)	0.00 (0/12)	58.33 (7/12)	25.00 (3/12)
Positive Reinforcement	80.60 (54/67)	0.00 (0/67)	1.49 (1/67)	15.38 (2/13)	15.38 (2/13)	46.15 (6/13)
Protective Stabilization	81.25 (39/48)	4.17 (2/48)	2.08 (1/48)	0.00 (0/13)	84.62 (11/13)	7.69 (1/13)
Parental Absence/ Presence	82.54 (52/63)	3.17 (2/63)	1.59 (1/63)	8.33 (1/12)	50.00 (6/12)	16.67 (2/12)

Table 14 - Frequency for Source of Training of Pharmacological Behaviour Guidance Techniques

Type of Technique	General Dentist % (n/N)			Pediatric Dentist % (n/N)		
	Undergraduate Only	Graduate Only	Undergraduate and Graduate	Undergraduate Only	Graduate Only	Undergraduate and Graduate
Nitrous Oxide	51.52 (17/33)	12.12 (4/33)	0.00 (0/33)	8.33 (1/12)	50.00 (6/12)	16.67 (2/12)
Oral Sedation	42.86 (15/35)	17.14 (6/35)	0.00 (0/33)	0.00 (0/12)	66.67 (8/12)	0.00 (0/12)
General Anesthesia	40.00 (6/15)	33.33 (5/15)	6.67 (1/15)	0.00 (0/12)	83.33 (10/12)	0.00 (0/12)
IV Sedation	27.27 (3/11)	45.45 (5/11)	9.09 (1/11)	0.00 (0/9)	66.67 (6/9)	0.00 (0/9)

Undergraduate only training seemed to be the primary source for tell-show-do, distraction, voice control, positive reinforcement, protective stabilization, and parental absence/presence for the general dentists. General dentists also selected undergraduate only for all four of the pharmacological behaviour guidance techniques as the primary source of training. Undergraduate and graduate training was the primary option selected by pediatric dentists for tell-show-do, distraction, and positive reinforcement. Majority of pediatric dentists listed graduate training as the primary source of training for voice control, protective stabilization, parental absence/presence, nitrous oxide, oral sedation, general anesthesia, and IV sedation.

Objective 4 – Usage and Otherwise Preference of Behaviour Guidance Techniques of Licensed Manitoban General and Pediatric Dentists Depending on Training Location

The fourth objective, the usage and otherwise preference of the behaviour guidance techniques for those trained within and outside of Manitoba, is displayed in Tables 15 to 22. Only the general and pediatric dentists' usages and preferences were compared within each category and not between those trained within versus outside of Manitoba. Of the participants of the survey, 62 general dentists and 4 pediatric dentists were trained within Manitoba while 9 general dentists and 11 pediatric dentists were trained outside of Manitoba. The training outside Manitoba included countries such as the United States, Denmark, England, and Brazil. The majority of outside training was completed in the United States.

Table 15 – Median Rank of Non-pharmacological technique used by General and Pediatric Dentists trained within Manitoba

Non-pharmacological Behaviour Guidance	General Dentist Median Rank (n/N)	Pediatric Dentist Median Rank (n/N)	P-value
Tell-Show-Do	1 (43/62)	1 (4/4)	0.2057
Distraction	3 (25/62)	3 (2/4)	0.9215
Voice Control	4 (22/58)	5.5 (5 – 1/4, 6 – 2/4)	0.0190
Positive Reinforcement	2 (17/63)	3.5 (2/4)	0.9231
Protective Stabilization	6 (31/45)	5 (1/5)	0.1849
Parental Absence/ Presence	4 (13/56)	5 (2/5)	0.5040

There is a statistically significant difference of the usage of voice control between general and pediatric dentists trained within Manitoba with a p-value of 0.0190. Twenty-two of 58 general dentists chose voice control as their fourth option to use and 1 of 4 pediatric dentists chose it as their fifth option (whereas two chose it as their sixth option).

Table 16 – Median Rank of Non-pharmacological technique used by General and Pediatric Dentists trained outside of Manitoba

Non-pharmacological Behaviour Guidance	General Dentist Median Rank (n/N)	Pediatric Dentist Median Rank (n/N)	P-value
Tell-Show-Do	1 (7/9)	2 (6/11)	0.0908
Distraction	3 (2/8)	3 (7/11)	0.4042
Voice Control	3 (4/9)	4.5 (4 – 2/10, 5 – 3/10)	0.1976
Positive Reinforcement	3 (1/9)	3 (4/11)	0.5540
Protective Stabilization	6 (3/5)	5.5 (5 – 3/8, 6 – 4/8)	0.6808
Parental Absence/ Presence	5 (2/5)	4 (2/11)	0.2662

Table 17 – Median Rank of Pharmacological technique used by General and Pediatric Dentists trained within Manitoba

Pharmacological Behaviour Guidance	General Dentist Median Rank (n/N)	Pediatric Dentist Median Rank (n/N)	P-value
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Nitrous Oxide	1 (6/11)	1 (4/4)	0.1347
Oral Sedation	1 (9/16)	3.5 (3 – 1/2, 4 – 1/2)	0.0161
General Anesthesia	2 (3/7)	2 (4/5)	0.7964
IV Sedation	3.5 (3 – 1/2, 4 – 1/2)	3.5 (3 – 1/2, 4 – 1/2)	1.0000

Table 18 – Median Rank of Pharmacological technique used by General and Pediatric Dentists trained outside of Manitoba

Pharmacological Behaviour Guidance	General Dentist Median Rank (n/N)	Pediatric Dentist Median Rank (n/N)	P-value
Nitrous Oxide	1 (2/2)	1 (6/8)	0.5762
Oral Sedation	2 (2/3)	3 (4/5)	0.0500
General Anesthesia	2 (1/3)	2 (6/10)	0.5060
IV Sedation	4 (1/1)	3 (0/2)	1.0000

Table 19 – Median Rank of Non-pharmacological technique Otherwise Preferred by General and Pediatric Dentists trained within Manitoba

Non-pharmacological Behaviour Guidance	General Dentist Median Rank (n/N)	Pediatric Dentist Median Rank (n/N)	P-value
Tell-Show-Do	1 (43/61)	1 (4/4)	0.2178
Distraction	3 (25/63)	2.5 (2 – 2/4, 3 – 2/4)	0.3393
Voice Control	4 (20/57)	5 (2/4)	0.0810
Positive Reinforcement	3 (17/60)	2.5 (2 – 2/4, 3 – 1/4)	0.9422
Protective Stabilization	6 (29/42)	5 (2/5)	0.1803
Parental Absence/ Presence	4.5 (4 – 10/54, 5 – 20/54)	4 (3/5)	0.3777

Table 20 – Median Rank of Non-pharmacological technique Otherwise Preferred by General and Pediatric Dentists trained outside of Manitoba

Non-pharmacological Behaviour Guidance	General Dentist Median Rank (n/N)	Pediatric Dentist Median Rank (n/N)	P-value
Tell-Show-Do	1 (5/7)	2 (3/10)	0.2441
Distraction	2.5 (2 – 3/6, 3 – 2/6)	3 (6/10)	0.1753
Voice Control	3 (3/7)	3.5 (3 – 1/8, 4 – 3/8)	0.9525
Positive Reinforcement	3 (1/7)	2.5 (2 – 4/10, 3 – 3/10)	0.5408
Protective Stabilization	6 (3/5)	6 (5/8)	0.9333
Parental Absence/	5 (3/6)	1 (5/9)	0.3130

Presence			
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Table 21 – Median Rank of Pharmacological technique Otherwise Preferred by General and Pediatric Dentists trained within Manitoba

Pharmacological Behaviour Guidance	General Dentist Median Rank (n/N)	Pediatric Dentist Median Rank (n/N)	P-value
Nitrous Oxide	1.5 (1 – 4/8, 2 – 3/8)	1.5 (1 – 2/4, 2 – 2/4)	0.9247
Oral Sedation	1 (9/14)	3 (2/3)	0.0072
General Anesthesia	1 (4/7)	1 (3/5)	0.7148
IV Sedation	3 (2/2)	3.5 (3 – 1/2, 4 – 1/2)	0.6171

There was also statistical significance between both groups in the preference of oral sedation of those trained within Manitoba with a p-value of 0.0072. Nine of 14 general dentists chose oral sedation at their most preferred and 2 of 3 pediatric dentists chose it as their third option of preference.

Table 22 – Median Rank of Pharmacological technique Otherwise Preferred by General and Pediatric Dentists trained outside of Manitoba

Pharmacological Behaviour Guidance	General Dentist Median Rank (n/N)	Pediatric Dentist Median Rank (n/N)	P-value
Nitrous Oxide	1 (2/2)	1 (5/7)	0.5476
Oral Sedation	1.5 (1 – 2/4, 2 – 1/4)	3 (4/5)	0.3017
General Anesthesia	2.5 (2 – 1/2, 3 – 1/2)	2 (5/9)	0.1128
IV Sedation	4 (1/1)	3 (0/3)	1.0000

Discussion:

The purpose of this study was to provide data on the usage and otherwise preference of behaviour guidance techniques of the general and pediatric dentists of Manitoba. With this information, the University of Manitoba's pediatric behaviour guidance teachings in the pediatric dental curriculum of both the undergraduate and graduate clinics may be assessed. The survey was emailed to all the pediatric dentists and a 25% sample of general dentists of Manitoba. The findings in general were that there were few statistically significant differences among the usages and preferences of behaviour guidance techniques between general and pediatric dentists when considering the year, source, and location of training.

A majority of the general and pediatric dentists surveyed identified undergraduate only as their primary source of training for most of their behavior guidance techniques employed. As a group, pediatric dentists identified graduate training was their primary source for more advanced behaviour guidance techniques such as nitrous oxide, oral sedation, general anesthesia, and IV sedation. This is an intuitive result as it is expected that the more advanced behaviour guidance techniques be taught in a graduate setting. The location of training, including the University of Manitoba, appeared to be acceptable in preparing practitioners for behaviour guidance techniques. This is similar to Adair *et al's* findings of most graduate programs adequately teach that communicative and pharmacological behaviour guidance techniques are acceptable.²⁶

The usage of voice control and the usage and otherwise preference of oral sedation had statistically significant differences in the median rank between the general and pediatric dentists. Although this displayed statistically significant results, the clinical

significance is questionable as it was a difference of median rank of 4 for general dentists and 5 for pediatric dentists.

Graduation Year

In the dentists that graduated before 1998, the usage and preference of tell-show-do showed statistically significant difference in the median ranking in which the general dentists ranked it higher than the pediatric dentists. Once again, although statistical significance was displayed upon closer inspection the clinical significance may be absent in the usage of tell-show-do as the general dentist median ranking was 1 and the pediatric dentist median ranking was 2. However, it is of interest that in the otherwise preference of tell-show-do among those that graduated before 1998, that pediatric dentists had a median ranking of 4 versus the general dentists with a median ranking of 1. This displays that pediatric dentists that were trained almost 20 years ago were more likely to otherwise prefer a more paternalistic approach of non-pharmacological behaviour guidance like parental absence/presence, which they gave a median ranking of 1. This finding is in agreement with a previous study, which identified older male pediatric dentists were more likely to use parental absence/presence for routine examinations and restorative treatment.¹⁵ The difference in the otherwise preference between the general and pediatric dentists can also be attributed to the fact that those general dentists that graduated from the University of Manitoba in 1993 were less likely to do complex pediatric dental procedures and more likely to refer as the program at this time did not have a lot of pediatric patients for the dental students.²⁷ The University of Manitoba's pediatric dental program changed from a comprehensive-based clinic to a block system in 1998 to 1999

in which children from nearby schools and colonies were bused to the dental school in order to provide more pediatric patients for the dental students.²⁷

Oral sedation's median ranking was found to be statistically significant from those that graduated before and after 1998. It appeared clinically significant in the otherwise preference of oral sedation for those that graduated before 1998 and for both the usage and otherwise preference for those that graduated after 1998 as the general dentists had a median ranking of 1 and the pediatric dentists had a median ranking of 3 for above categories. This displays that general dentists reported a higher relative comfort level and preference of using oral sedation than pediatric dentists. This is not to say general dentists are better educated in oral sedation but rather display it as a more highly ranked technique in both usage and otherwise preference. There are risks associated with oral sedation in the pediatric population including difficulties in titration leading to cardiovascular and respiratory issues and loss of consciousness.^{28,29} The in-depth understanding of these risks may reduce pediatric dentist's preference of use.

General anesthesia was found to be statistically significant from those that graduated after 1998 in the both the usage and preference of them. Again there appears to be a lack of clinical significance since the median rankings are between 3 for general dentists and 2 for pediatric dentists. It is of value to note that it is likely a minority of general dentists that would have appropriate training and access to surgical facilities including hospitals and private surgical suites with which to administer dental treatment under general anesthetic.

Source of Training

For the source of training, pediatric dentists listed undergraduate and graduate training as their main source for most behaviour guidance techniques while general dentists listed undergraduate only as theirs. For pediatric dentists this shows the value of their undergraduate training as a supplement to the skills obtained during their graduate program.

Training Location

The usage of voice control and the otherwise preference of oral sedation for those trained within Manitoba were found to be statistically significant between the general dentists and pediatric dentists. Given the difference between median rank of general dentists (4) and pediatric dentists (5.5) for voice control usage, it is unlikely this is of clinical significance. However, for oral sedation otherwise preferred there is clinical significance in the median ranking of 1 for general dentists and 3 for pediatric dentists trained within Manitoba. This may once again highlight the understanding of risks associated with oral sedation in a pediatric dental population.^{28,29}

Overview

At the inception of the study, there was anticipated to be more statistically and clinically significant differences between general and pediatric dentists trained within and outside Manitoba. General and pediatric dentists practicing in Manitoba mostly use and otherwise prefer similar behaviour guidance techniques. In the study of the dental undergraduate program of the University of Manitoba's pediatric division, it was found that those that graduated in 2000 and 2002 when compared to those that graduated in

1993 were more likely to perform more complex pediatric dental procedures and referred less to pediatric dentists.²⁷ Pharmacological techniques where statistical and clinical significance was displayed for otherwise preference are most likely attributed to a lack of understanding of the relative risks versus benefits associated.

Overall, for non-pharmacological behaviour guidance techniques, tell-show-do was found to be the most favoured and protective stabilization the least favoured for both groups. Tell-show-do marked the birth of pediatric dentistry from when it was first introduced by Addleston in 1959.³⁰ Tell-show-do allows the practitioner to explain and show the child the dental procedure at a level of their understanding to facilitate a smoother delivery of care. The ease of use of this technique explains why it is widely favoured among both the general and pediatric dentists of Manitoba. In the pharmacological groups nitrous oxide sedation was the most favoured and IV sedation was the least favoured. These findings are supported by Patel *et al*'s study in which tell-show-do and nitrous oxide sedation were found the most acceptable by parents.²⁵ The ranking of nitrous oxide sedation as most favorable stems from its ease of administration and titration, rapid onset, reversibility, and relatively few contraindications to use.⁶ This all supports the notion that it is commonly used by both general dentists and pediatric dentists. In agreement with other studies, these behaviour guidance techniques tend to also be the most acceptable techniques.^{22,23}

In general, the preferred pharmacological behaviour management techniques have likely adapted over time given additional scientific research into the risks associated coupled with a less paternalistic and a more patient centered care approach to treatment.

¹⁵ Likewise, non-pharmacological approaches have likely adapted from increased

parental involvement, awareness and preference. It is valuable to note that the application of behaviour management techniques was found not to be significantly different between general and pediatric dentists in Manitoba, lending to the strong undergraduate training systems in place.

Study Design

One of the limitations of the study was that the number of participants (87 complete surveys) was relatively low. The study was also limited by the sample of general dentists and number of pediatric dentists of Manitoba at 145 and 19 respectively. Had the survey be sent out to all the general dentists this would have increased the number of responses; however, regardless of the number of general dentist responses obtained, the number of pediatric dentists inherently limited the study. Other studies involving surveys were conducted nationwide as a means to increase the power of the study.^{8,11,16,26} It was also determined that the survey responses tended to lessen towards the completion of the survey. It is possible that participants may have found the survey to be longer than expected hence explaining the diminished response rate for the last few questions in comparison to the first question's response rate.

Future Studies

Future studies in this area of research may consider sampling all general dentists in Manitoba and possibly opening up the survey nationwide to increase the power of the study. The survey could be more concise by only asking about either usage or preference instead of both. In addition, eliminating the ranking aspect of the questions could be done

and replaced by choosing the 3 most applicable behaviour guidance techniques to simplify the results and their interpretation.

Conclusions

The survey response from the general and pediatric dentists indicated that:

- 1) In general, there are few differences in the usage and preference of behaviour guidance techniques between both groups when considering the year, source, and location of training.
- 2) The most favoured non-pharmacological behaviour guidance techniques used and preferred was tell-show-do and the least favoured was protective stabilization among both groups.
- 3) The most favoured pharmacological behaviour guidance technique used and preferred was oral sedation for general dentists and nitrous oxide for general and pediatric dentists and the least favoured was IV sedation for both.
- 4) Undergraduate training provides adequate behaviour management training for general dentists and the combination of both undergraduate and graduate training provides adequate behaviour management training for pediatric dentists.

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Appendix 1- Behaviour Guidance Techniques

- 1) Distraction: attention is directed away from the dental procedure; requires child to have cognitive ability.⁶
- 2) Tell-show-do: Verbal explanation, demonstration, completion; most effective on child with cognitive ability but can be used on any child; effective on most children.⁶
- 3) Nonverbal: reinforcement of desired behaviour by appropriate contact, posture, expression and body language.⁶
- 4) Positive Reinforcement: reward for desired behaviour; requires consistency (avoid reinforcing negative behaviour).⁶
- 5) Voice Control: controlled alteration of voice (volume, tone, pace).⁶
- 6) Parental absence/ presence: the use of the absence or presence of parents in the operatory to gain the patient's cooperation. Can be used if parenting style allows.⁶
- 7) Nitrous sedation: use of inhalation of a combination of nitrous oxide and oxygen gas as a mild sedative. It is a safe and effective way to reduce anxiety and enhance communication with the patient.⁶
- 8) Oral/ IV sedation: sedation delivered either by mouth (oral) or intravenously (IV) to achieve a mild, moderate, or deep sedation. Can be used on those who lack the psychological or emotional maturity and/or a disability.⁶
- 9) General anesthesia: a controlled state of unconsciousness accompanied by the loss of protective reflexes.⁶
- 10) Protective Stabilization: restriction of the patient's freedom of movement with or without their permission.⁶
- 11) Hand-over-mouth: placement of the operator's hand over the patient's mouth to gain attention.⁷
- 12) Positive pre-imagery: patients are shown positive photos or images of dental work and treatment before the dental appointment.⁶
- 13) Ask-tell-ask: ask the patient about their feelings towards the planned treatment (*ask*); then explain to them how the procedure will be done by demonstrating it (*tell*); finally ask if they comprehend the treatment and how they feel about it (*ask*).⁶
- 14) Memory restructuring: Restructuring memories associated with negative or difficult events into positive ones using visual reminders, positive reinforcement, concrete examples, and a sense of accomplishments.⁶
- 15) Child centered care: creating a child friendly and positive environment.⁷

- 16) Magic tricks: a patient is shown a magic trick to reduce anxiety and encourage positive behaviour.⁷
- 17) Hypnosis: formalized process of suggestion and visualization.⁷
- 18) Motivational interviewing: facilitating behaviour changes in the patient or parent collaboratively with the dental team. It is accomplished by helping them explore and resolve their uncertainty about the change. Often can be done for prevention.⁶

Appendix 2 - Survey



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Comparison of Manitoban General and Pediatric Dentists Behaviour Guidance Technique Usage and Preference

1. What type of dentist are you? Please select the option applicable.

- ☐ General
- ☐ Pediatric Dentist

Next

2. Please enter the year of graduation and place of training for your undergraduate degree if you are a general dentist
OR for your specialty training if you are a pediatric dentist.

Year of Graduation:

Place of training:

Prev

Next

3. Please select in order of the most commonly used non- pharmacological Behaviour Management Techniques (BMT)
(1 being the most used) you use on an uncooperative/ anxious child (do not select an option if BMT is not applicable):

⋮	⬆	Tell Show Do
⋮	⬆	Distraction
⋮	⬆	Voice Control
⋮	⬆	Positive Reinforcement
⋮	⬆	Protective Stabilization
⋮	⬆	Parental Absence/ presence

Prev

Next

4. Please select in order of preference the non- pharmacological BMT (1 being the most preferred) you prefer to use on an uncooperative/ anxious child (do not select an option if BMT is not applicable):

⋮ ⋮ ⋮	⬇	Tell Show Do
⋮ ⋮ ⋮	⬇	Distraction
⋮ ⋮ ⋮	⬇	Voice Control
⋮ ⋮ ⋮	⬇	Positive Reinforcement
⋮ ⋮ ⋮	⬇	Protective Stabilization
⋮ ⋮ ⋮	⬇	Parental Absence/ presence

Prev

Next

5. Please select in order of the most commonly used pharmacological BMT (1 being the most used) you use in your practice on pediatric patients (do not select an option if BMT is not applicable):

⋮ ⋮ ⋮	⬇	Nitrous oxide
⋮ ⋮ ⋮	⬇	Oral Sedation
⋮ ⋮ ⋮	⬇	General Anesthesia
⋮ ⋮ ⋮	⬇	IV Sedation

Prev

Next

6. Please select in order of preference the most common pharmacological BMT (1 being the most preferred) you prefer to use in your practice on pediatric patients (do no select an option if BMT is not applicable):

⋮ ⋮ ⋮	⬇	Nitrous oxide
⋮ ⋮ ⋮	⬇	Oral Sedation
⋮ ⋮ ⋮	⬇	General Anesthesia
⋮ ⋮ ⋮	⬇	IV Sedation

Prev

Next

7. For each non-pharmacological BMT, from what training source did you receive training from? Please select the options that are applicable. You may select one or more options.

	Undergraduate	Graduate	CE Courses
Tell Show Do	☐	☐	☐
Distraction	☐	☐	☐
Voice Control	☐	☐	☐
Positive Reinforcement	☐	☐	☐
Protective Stabilization	☐	☐	☐
Parental Absence/ Presence	☐	☐	☐

Prev

Next

8. For each pharmacological BMT, from what training source did you receive training from? Please select the options that are applicable. You may select one or more options.

	Undergraduate	Graduate	CE Courses
Nitrous Oxide	☐	☐	☐
Oral Sedation	☐	☐	☐
General Anesthesia	☐	☐	☐
IV Sedation	☐	☐	☐

Prev

Next

You have now completed the survey. Thank you for your time!

Prev

Done

Powered by



See how easy it is to [create a survey](#).

Appendix 3 – HREB Certificate of Approval



UNIVERSITY
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Bannatyne Campus
Research Ethics Board

P126-770 Bannatyne Avenue
Winnipeg, Manitoba
Canada, R3E 0W3
Telephone : 204-789-3255
Fax: 204-789-3414

HEALTH RESEARCH ETHICS BOARD (HREB) CERTIFICATE OF FINAL APPROVAL FOR NEW STUDIES Delegated Review

PRINCIPAL INVESTIGATOR: Dr. Simrit Nijjar	INSTITUTION/DEPARTMENT: U of M and HSC/Dentistry	ETHICS #: H2015:299
APPROVAL DATE: August 20, 2015	EXPIRY DATE: <u>August 20, 2016</u>	
STUDENT PRINCIPAL INVESTIGATOR SUPERVISOR (If applicable): Dr. C. Lekic		

PROTOCOL NUMBER: NA	PROJECT OR PROTOCOL TITLE; Comparison of Manitoban General and Pediatric Dentists Behaviour Guidance Technique Usage and Preference
SPONSORING AGENCIES AND/OR COORDINATING GROUPS: University of Manitoba, Pediatric Dentistry Graduate Program	

Submission Date of Investigator Documents: July 27 and August 20, 2015	HREB Receipt Date of Documents: July 27 and August 20, 2015
--	---

THE FOLLOWING ARE APPROVED FOR USE:

Document Name	Version(if applicable)	Date
---------------	------------------------	------

Protocol:

Protocol
Revised REB Submission Form

V. 1
July 28, 2015
August 20, 2015

Consent and Assent Form(s):

Other:

Online Survey Consent Disclosure Email
Survey for Comparison of Manitoban General and Pediatric Dentists

V. 1
August 20, 2015
July 28, 2015

CERTIFICATION

The above named research study/project has been reviewed in a **delegated manner** by the University of Manitoba (UM) Health Research Board (HREB) and was found to be acceptable on ethical grounds for research involving human participants. The study/project and documents listed above was granted final approval by the Chair or Acting Chair, UM HREB.

HREB ATTESTATION

The University of Manitoba (UM) Research Board (HREB) is organized and operates according to Health Canada/ICH Good Clinical Practices, Tri-Council Policy Statement 2, and the applicable laws and regulations of Manitoba. In respect to clinical trials, the HREB complies with the membership requirements for Research Ethics Boards defined in Division 5 of the Food and Drug Regulations of Canada and carries out its functions in a manner consistent with Good Clinical Practices.

QUALITY ASSURANCE

- 1 -

umanitoba.ca/research

The University of Manitoba Research Quality Management Office may request to review research documentation from this research study/project to demonstrate compliance with this approved protocol and the University of Manitoba Policy on the Ethics of Research Involving Humans.

CONDITIONS OF APPROVAL:

1. The study is acceptable on scientific and ethical grounds for the ethics of human use only. ***For logistics of performing the study, approval must be sought from the relevant institution(s).***
2. This research study/project is to be conducted by the local principal investigator listed on this certificate of approval.
3. The principal investigator has the responsibility for any other administrative or regulatory approvals that may pertain to the research study/project, and for ensuring that the authorized research is carried out according to governing law.
4. **This approval is valid until the expiry date noted on this certificate of approval.** A Bannatyne Campus Annual Study Status Report must be submitted to the HREB within 15-30 days of this expiry date.
5. Any changes of the protocol (including recruitment procedures, etc.), informed consent form(s) or documents must be reported to the HREB for consideration in advance of implementation of such changes on the **Bannatyne Campus Research Amendment Form**.
6. Adverse events and unanticipated problems must be reported to the HREB as per Bannatyne Campus Research Boards Standard Operating procedures.
7. The UM HREB must be notified regarding discontinuation or study/project closure on the **Bannatyne Campus Final Study Status Report**.

Appendix 4 - Disclosure Statement

Comparison of Manitoban General and Pediatric Dentists Behaviour Guidance Technique Usage and Preference

University of Manitoba Pediatric Dentistry (Department of Preventive Dental Science)

Thank-you for accessing the Behaviour Guidance Technique Usage/ Preference in Manitoba survey on the SurveyMonkey. Dr. Simrit Nijjar, a second year pediatric dental resident along with Dr. Charles Lekic, the program director of pediatric dentistry will be conducting this research as part of Simrit's Masters Thesis research project.

This online survey is being conducted to *compare the behavior guidance techniques used by general dentists and pediatric dentists in Manitoba.*

Your feedback will be collected through an online survey, which will ask you a series of questions and should take about 2-3 minutes to complete.

Your participation on this online survey is completely voluntary. You are not required to provide any personal information such as your name, address or telephone number, and you don't have to answer any questions you don't want to. The survey system will not record your e-mail address or IP (Internet protocol) address.

The risks of participating are low as we will not be collecting personal information and you will remain anonymous.

If you agree to participate in the survey, please note that you must complete the survey in one sitting.

Also, please note that when you submit your response. You will not be able to withdraw them as we cannot link the survey responses back to you.

Your participation is important to us and will help allow an insight into the usage of behaviour guidance techniques practiced among Manitoban general and pediatric dentists. This information will be applicable specifically to the University of Manitoba's undergraduate and graduate pediatric programs to see if the behaviour guidance techniques being taught in school are adequate for the management of pediatric patients. If you have any questions about this survey study, please do not hesitate to contact Simrit Nijjar (Pediatric Dental Resident) at nijjars@myumanitoba.ca.

The study is funded by the Graduate Pediatric Dental Program at the University of Manitoba.

This study has been approved by the University of Manitoba Health Research Ethics Board. The results of the study will be made available to you once the study is completed.

By continuing on and completing the on-line survey you are consenting to participate in the on-line survey.

Appendix 5 - Survey Results

Response	Year of Graduation	Place of Training	Tell_Sho	Distract	Voice_C	Positive	Protective	Parental_Abs	Tell_Sho	Distract	Voice_C
General	2013	University of Manitoba	1	4	5	3	6	2	1	4	5
Pediatric Dentist	2007	University of Minnesota	2	3	4	1	6	5	2	3	4
Pediatric Dentist	1977	Belgrade, Copenhagen	2	3	5	4		1	4	2	3
Pediatric Dentist	1977	Belgrade, Copenhagen	2	3	5	4		1	4	3	2
General	1989	University of Manitoba	1	4	3	2		5	1	4	3
Pediatric Dentist	1965	University of Connecticut	4	3	1	2	6	5	4	3	1
Pediatric Dentist	1965	University of Connecticut	2	5	1	3	6	4			
General	1975	University of Manitoba	3	4	5	2		1	3	4	5
General	1962	University of London (Eng	1	6	3	4	5	2			
General	2010	University of Manitoba	2	3	4	1	6		2	3	4
Pediatric Dentist	2006	University of Minnesota	1	3	6	2	4	5	1	3	6
General	1977	University of Manitoba	2	5	3	1	6	4	2	5	3
Pediatric Dentist	2015	University of Manitoba	1	3	6	2	4	5	1	3	6
General	1991	University of Manitoba	1	4	2	3	5	6	1	3	4
General	2009	University of Manitoba	5	3	2	1		4	5	3	2
General	1993	University of Manitoba	1	3	5	2	6	4	1	3	5
Pediatric Dentist	2001	SOSP- Brazil	1	3	6	2	5	4	1	3	
Pediatric Dentist	2014	University of Manitoba	1	2	4	3	6	5	1	2	3
Pediatric Dentist	1999	University of Connecticut	4	5	2	3		1	4	5	2
Pediatric Dentist	1987	University of Manitoba	1	5	3	4	2	6	2	1	3
General	1979	University of Manitoba	1				4	2	6	4	2
General	2008	University of Manitoba	1	3	4	2	5	6	1	3	4
Pediatric Dentist	1975	University of Toronto	2	4		3	5	1	2	5	
General	1973	USA	1	2	3	4		1	2	3	
General	1990	University of Manitoba	1	3	4	2	6	5	1	3	4
General	1997	University of Manitoba	1	2	3	4	5	6	1	2	3
General	1991	University of Manitoba	2	3		1		2	3		
General	1995	University of Manitoba	3	1	5	4		2	4	1	5
General	2000	University of Manitoba	3	4	5	1	6	2	3	4	6
General	1984	University of Manitoba	1	3	4	2	6	5	1	2	4
General	1979	University of Manitoba									
General	1995	University of Manitoba	2	3	1	5	6	4	1	2	4
General	2007	University of Saskatchewan	1	3	4	2		1	3	4	
General	1970	University of Manitoba						1	3	4	
General	1990	University of Manitoba	1	2	4	3	6	5	1	2	4
General	2014	University of Manitoba	1	2		3		1	2		
General	2012	University of Manitoba	1	3	4	2		5	1	3	4
General	1986	University of Manitoba	1	3	4	2	5	1	3	4	
General	1983	University of Saskatchewan	3	4	2	1	6	5	4	5	1
General	1997	University of Manitoba	1	4	5	2		3	1	4	5
General	1988	University of Manitoba	4	2	1	3	6	5		2	1
General	1964	Ireland	1	2	3	4	6	5			
General	1964										
General	2006	University of Manitoba	1	3	4	6	2	5	1	3	5
General	1976	University of Western Ont	1		3	2		1			3
General	1977	University of Manitoba	1	3	5	2	6	4	1	4	3
General	2005	University of Manitoba	4	2		3		1	4	1	
General	1976	University of Manitoba	1	2	3	4		5	1	4	2
General	1992	University of Manitoba	1	3	4	2	6	5	1	3	4
Pediatric Dentist	2016	University of Manitoba	1	3	5	2	6	4	1	3	5
General	1999	University of Manitoba	1	3	4	2	6	5	1	2	3
General	1994	University of Manitoba	1	3	2	5	6	4	1	3	4
Pediatric Dentist											
General	2013	University of Manitoba	1	2		3			1	2	
General	1960	University of Toronto									
General	1982	University of Manitoba	1	4	2	3	6	5	1	4	2
General	1990	University of Manitoba	1	3	4	6	5	2	1	4	2
General	1980	University of Manitoba		2				1			1
General	2009	University of Connecticut	1	3	4	2	6	5	1	3	4
Pediatric Dentist	1972	University of Connecticut									
General	1980	University of Manitoba									
General	1987	University of Manitoba	2	3	4	1		5		3	2
General	1982	University of Manitoba			3	2	1	4	5	3	
General	1987	University of Manitoba	2	1	3	4	6	5			
General	2001	University of Manitoba	1	3	4	2	6	5	1	3	4
General	1989	University of Manitoba	1	3	5	2	6	4	1	3	5
General	1983	University of Toronto	1	4	2	3	5	6	1	2	3
General	2007	University of Manitoba	1	3	5	2	6	4	1	3	4
Pediatric Dentist	1980	University of Connecticut	2	4	5	3	6	1	2	5	4
General	2010	University of Manitoba	1	3		2			1	3	
General	2005	University of Manitoba									
General	2002	University of British Columbia	1	3	4	2			1	2	4
General	1989	University of Manitoba									
Pediatric Dentist											
General	1983	University of Manitoba	2	5	3	1	6	4	2	5	3
General	1995	University of Manitoba	1	2	4	3	6	5	1	2	4
General	1983	University of Manitoba									
General	1983	University of Manitoba	2	1	3				2	1	3
General	1975	University of Manitoba	1	2	4	3	5	6	1	2	4
General	1972	Dalhousie University	3	1	4	5	6	2	4	3	5
General	1996	University of Manitoba	1	5	4	2	6	3	2	6	5
General	1990	University of Manitoba	1	3	5	2	6	4	1	4	5
General	1980	University of Manitoba	1	4	2	6	3	5	1	4	2
Pediatric Dentist	2014	University of Manitoba	1	4	6	3	5	2	1	2	5
General	1993	University of Manitoba	2	5	4	6	1	3	1	3	2
General	2014	University of Manitoba	1	4	2	3		5			
Pediatric Dentist	1972	University of Manitoba						1			
General	2007	University of Manitoba	1	2	5	3	6	4	1	2	5
General	1999	University of Manitoba									
General	1985	University of Manitoba	1	2	4	3	6			1	3
General	1978	University of Manitoba			1				6	5	3
General	1988	University of Manitoba	4	1	3	5		2	1	2	5
General	1993	University of Manitoba	1	3	5	4	6	2	2	3	5
General	1984	University of Manitoba									
General	1986	University of Manitoba	2	1	4	3	6	5	1	2	4
General	2005	University of Manitoba	1	2		4		3	1	3	
General	2002	University of Manitoba	1	3		2		4	1	3	
General	2000	University of Manitoba	4	2	6	1	5	3	2	1	3
General											
General	2010	University of Manitoba	1	4	5	3		2	1	4	5
General	2001	University of Manitoba	1	5	4	2	6	3	1	5	4
General											
General	1987	University of Manitoba	1		3	2			1		3
General	1979	University of Manitoba	2	4	1	3	6	5	2	3	1
General											
General	1992	University of Manitoba	1	2	4	3	6	5	1	2	4
Pediatric Dentist	2002	University of Minnesota	1	3	4	2	5	6	1	3	4
Pediatric Dentist											

Positive Protective Parental Nitrous_ Oral_Sed General_ IV+Seda Nitrous_ Oral_Sed General_ IV_Seda

[illegible]

Tell_Shown Distracted Voice_C Positive Protective Parental Nitrous_O Oral_Sed General IV_Sed

[illegible]