General Anesthesia Versus Moderate Sedation: Factors Affecting
Caregivers' Decision

BY

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<tr>
<td>AAP</td>
<td>American Academy of Pediatrics</td>
</tr>
<tr>
<td>AAPD</td>
<td>American Academy of Pediatric Dentistry</td>
</tr>
<tr>
<td>ECC</td>
<td>Early childhood caries</td>
</tr>
<tr>
<td>GA</td>
<td>General Anesthesia</td>
</tr>
<tr>
<td>IQR</td>
<td>Inter-quartile Range</td>
</tr>
<tr>
<td>IRB</td>
<td>Institutional Review Board</td>
</tr>
<tr>
<td>LCG</td>
<td>Legal Care Guardian</td>
</tr>
<tr>
<td>MS</td>
<td>Moderate Sedation</td>
</tr>
<tr>
<td>MWU</td>
<td>Mann Whitney-U</td>
</tr>
<tr>
<td>PI</td>
<td>Principal Investigator</td>
</tr>
<tr>
<td>SECC</td>
<td>Severe early childhood caries</td>
</tr>
<tr>
<td>SES</td>
<td>Socioeconomic Status</td>
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Summary

The purpose of this study is to examine factors influencing caregivers’ decisions to select either general anesthesia (GA) or moderate sedation (MS) for their child's dental treatment. Factors considered include demographic information, overall health, number of appointments, extent of treatment, missed days from work/school, cost, child behavior, age, and dental knowledge, among others.

The study design was a cross sectional survey of parents that presented with their child to the UIC Post-Graduate Pediatric Dental Clinic. Inclusion criteria were English or Spanish speaking caregivers of children 2 to 10 years of age who were either healthy or had mild health conditions. Patients had to be present for a GA pre-operative appointment or a MS appointment.

One hundred thirty surveys met inclusion criteria; 74 from the MS group and 56 from the GA group. Demographic characteristics did not differ between the MS and GA group. Analysis shows parental perception of knowledge of MS (higher for GA group, $P=0.02$) was the only factor that differed between groups. Parents highly valued their dentists’ recommendation and did not value out of pocket expenses when selecting treatment modalities.

There is an association between caregivers having more knowledge about MS and preferring treatment to be completed under GA. Although other factors may be important, there was no difference between the GA and MS groups. This indicated that decision-making might rely heavily on providers’ recommendations.
1. INTRODUCTION

1.1 Background Information

♦ Note: Throughout this paper, moderate sedation is used interchangeably with: “oral sedation” and “conscious sedation.” “Parent” is used interchangeably with “caregiver,” “care provider,” “legal guardian” and “legal care guardian.”

It is essential to have a diverse armamentarium of behavior management techniques when providing dental care to the pediatric population. Many of these techniques are aimed towards the management of pre-cooperative children or children with special medical considerations. Commonly used basic behavior management techniques include tell-show-do, nitrous oxide-oxygen inhalation, and voice control, while advanced techniques include protective stabilization, moderate sedation, and general anesthesia. General anesthesia and moderate sedation are advanced pharmacological behavior management techniques that are often utilized to manage pre-cooperative patients, treat children when basic behavior management modalities are unsuccessful, and reduce medical risks.

Factors that can influence the parents’ decision of preferred behavior management techniques include risks, benefits, cost to the care provider, prior knowledge and experience, child's medical status, child's age, child's behavior, and number of appointments required to complete treatment, among others. Parental acceptability of these techniques often varies with societal changes and
needs to be revisited to determine contemporary factors that influence parents’ decision.3,5,6

Moderate sedation is defined as a decreased state of consciousness induced by a pharmacologic agent. Patients respond to verbal commands with no or light tactile stimulation, are able to maintain their airway independently, and do not require intervention to assist with ventilation. During moderate sedation, patients have normal cardiovascular function.7-9 Moderate sedation can be used to diagnose and treat fearful or anxious patients when basic behavior guidance techniques are unsuccessful. Patients requiring moderate sedation often exhibit lack of psychological or emotional maturity to cooperate in the dental setting. They may also have mental, physical, or medical disabilities necessitating advanced pharmacological behavior management. Moderate sedation may be utilized to protect the developing psyche of children. Treatment goals of moderate sedation include, protecting the patient’s safety and welfare, decreasing the pain and discomfort experienced, maximizing the possibility of amnesia, and controlling the anxiety, movement, and behavior of the patient. Conscious sedation can be done in a dental clinic supplied with the proper monitoring and rescue equipment.2,7

General anesthesia is a state of unconsciousness induced by a pharmacologic agent. Patients are not arousable by painful sensations and often require assistance with ventilation and maintaining their airway.7 General anesthesia can be used to diagnose and treat dental ailments in fearful, anxious, or medically compromised children and children with special healthcare needs.
General anesthesia is indicated for patients who are unable to cooperate, are unable to be anesthetized using local anesthetic (due to infection, allergy, or variation of anatomy), require concurrent surgical procedures, are extremely fearful or uncooperative, or require immediate comprehensive dental care. Treatment goals of a patient undergoing general anesthesia include protecting the patient’s psyche, welfare, and safety and eliminating the anxiety, movement and pain response. General anesthesia can be performed in a hospital setting or an ambulatory clinic with proper administration, monitoring and reversal equipment available. General anesthesia in a pediatric dental patient is typically provided by a dental or medical anesthesiologist, or qualified medical professional (i.e. oral surgeon or nurse anesthetist).
1.2 **Purpose of the Study**

The purpose of this study is to examine factors that influence parents’ decision to select general anesthesia or moderate sedation for their child’s dental treatment. Another objective is to compare factors within and between both groups to evaluate for differences and similarities.

1.2 **Hypothesis of the Study**

We hypothesize that the most influential factors driving parents’ decision to pick moderate sedation or general anesthesia for their child’s dental treatment will be costs to the family (out of pocket expenses), number of appointments required to complete the proposed treatment, and the risks of general anesthesia compared to moderate sedation. We believe that parents’ knowledge and their child's oral health status will significantly influence their decision to select moderate sedation or general anesthesia.
2. REVIEW OF LITERATURE

2.1 Factors influencing Parental Preferences

When utilizing advanced behavior therapy with pharmacological agents for behavior management, safe practices must be exercised. Young children and medically complex patients are at a greater risk of adverse outcomes when not properly managed. While the American Academy of Pediatric Dentistry states that general anesthesia and moderate sedation are safe and effective procedures (with proper case selection), adverse events have still been documented.\textsuperscript{7,10,11} A study completed in 2013 attempted to quantify the mortality related to pediatric dental anesthesia procedures. It was found that the majority of pediatric deaths occurred in patients 2-5 years old in an office setting for patients undergoing dental treatment under general anesthesia or moderate sedation.\textsuperscript{11} While death is the most serious outcome, other adverse complications (i.e. neurologic injuries, cardiac arrest, ischemia) from moderate sedation or general anesthesia can cause irreversible damage and significantly impact the patient for the remainder of his/her life.\textsuperscript{11} Proper training, equipment, rescue protocols, and dose administration aid in minimizing the risks present for each procedure. However, unforeseen situations may arise. Parents must be provided with complete informed consent, including the potential of adverse events, when presented with the option of oral sedation or general anesthesia. With GA and MS being high-risk procedures, it is easy to understand the concern parents may
have when discussing these advanced pharmacological behavior techniques. Due to these risks, some parents may even deem general anesthesia and moderate sedation as less acceptable forms of behavior management.

Another factor influencing parents’ selection of moderate sedation or general anesthesia for treatment of a child is the cost. Cost can be defined by what is directly billed to the patient or what is billed to his/her insurance company. The latter represents the cost to society and includes the opportunity cost of the parent missing work and children missing school. It was found that the average cost for general anesthesia was more expensive than moderate sedation in terms of dental charges as well as societal charges including the opportunity costs. The average cost per procedures to society (including opportunity cost and excluding dental treatment) for a child being treated under general anesthesia is $2698. The average cost to society (including opportunity cost and excluding dental treatment) for a child being treated under moderate sedation is $2203. One study indicated that general anesthesia proved to be more cost-effective if the patient were to require 3 or more moderate sedation visits to complete the proposed dental treatment. Parents take into consideration the cost of dental care when selecting the treatment modality for their child. While they often value the dentist’s recommendations for treatment, they may be more inclined to select a less expensive plan if presented with both options.

The type of insurance coverage may also influence caregivers to select one behavior management modality over another. Various dental insurance
coverage for children include private insurance, no insurance and Medicaid. Studies have shown that families with dental insurance for their children have a lower rate of unmet dental needs.\textsuperscript{13} Often Medicaid insurance may not pay for a certain portion of either the hospital/surgical center or dental fees for children requiring GA, but may provide coverage for MS procedures done in the office. To minimize costs to the family a caregiver may select for the child to be treated using MS, when GA would be the ideal recommended treatment modality. Families with private insurance may be better able to afford the ideal treatment and behavior management modality due better coverage by their insurance.\textsuperscript{13,14}

2.2 **Parental Attitudes**

Parents’ decision to choose general anesthesia or moderate sedation may be influenced by the extent of dental treatment recommended. Early studies completed in 1984 were amongst the first to measure parental acceptability of various behavior management techniques.\textsuperscript{15} These studies observed how parents rated ten different behavior management techniques including oral sedation and general anesthesia. Each parent was provided a standardized explanation of the technique and shown a video demonstrating each technique. The parents were requested to rank, on a visual analogue scale, their acceptability of the technique. This early study found that parents were least accepting of general anesthesia and oral sedation compared to less invasive techniques (i.e. tell-show-do and positive reinforcement).\textsuperscript{6} Despite this finding,
general anesthesia and oral sedation remain the only option for many patients. Additionally, these studies were not intended to examine the preferences of general anesthesia versus moderate sedation when other modalities have been exhausted; they examined all behavior management techniques. A similar study found that while parents still felt general anesthesia and oral sedation were unacceptable for restorative dental treatment; they were more accepting of these techniques if an emergency extraction was required. This indicates that the extent or type of dental treatment recommended may influence parents’ acceptability of oral sedation or general anesthesia. A limitation to many of these previous studies is that they questioned caregivers of children that may not necessarily required the behavior management technique they were investigating. Parents may not be able to reliably answer questions regarding a procedure if they did not need to make that decision for their child.

Parents may be more accepting of advanced behavior management modalities if provided a thorough explanation of the technique or if their child has ECC or S-ECC. To examine parent reactions and feelings towards conscious sedation, Riekaman surveyed parents following treatment of their child under conscious sedation when the medication was administered via an intramuscular route. Intramuscular conscious sedations are not common amongst pediatric dentists and medication is typically delivered via an oral route. In the study, parents were provided with a physical copy of the description of the procedure, preoperative instructions and postoperative management prior to the sedation appointment. The results showed that most parents (90.2%) felt sufficiently
informed of the procedures. All parents felt that conscious sedation was an
effective treatment modality for their child and would allow their child to be
treated using this method again. This suggests that an adequate explanation of
the behavior management technique may improve parent acceptability of the
procedures. Informed consent is required for all treatment completed on a child
and has significantly increased parents’ knowledge of the procedures.

In 1991, a study indicated that the percentage of pediatric dentists who
used moderate sedation in their practices decreased from 86% in 1971 to 77% in
1988. Factors responsible for this decrease included new state regulations, the
cost of liability insurance to the provider, the cost of monitoring equipment, and
challenges following the "sedation guidelines." However, recent reports have
shown that the number of dental sedations has increased over the past two
decades. They also showed that parents who were provided a rationale for the
treatment recommended were more accepting than those who did not receive an
explanation, specifically with relation to conscious sedation and general
anesthesia. Through the 1990’s parents continued to rank conscious sedation as
more acceptable than general anesthesia. With informed consent and more
readily accessible knowledge regarding general anesthesia, parents may
become more accepting of this behavior management technique than in years
past.

The most recent study observing attitudes of parents towards behavior
management techniques was completed in 2005. This study observed eight
different behavior management techniques including conscious sedation and
general anesthesia. Parents were shown videos of each technique and used a visual analog scale to rate their acceptance for each. Parents rated general anesthesia as the third most favorable and conscious sedation as the fifth most favorable out of all eight techniques shown to them. This indicates the changing attitudes amongst parents and their acceptability towards advanced pharmacological behavior management techniques. General anesthesia and conscious sedation have become more acceptable over the course of the past decade. Factors that may contribute to the changing trends observed in the literature are the decrease in acceptance of protective immobilization, increase in caries amongst children, and the increase in outpatient surgical centers. Compared to previous studies, these results provide further insight into the changing parental attitudes towards behavior management in pediatric dentistry.

2.3 **Conclusion of Background and Literature Review**

General anesthesia has historically been rated as less acceptable than conscious sedation by parents. It was not until recently, that general anesthesia and conscious sedation have gained considerable approval of use amongst the various behavior management techniques. These shifts in parental attitudes have been discussed in attempts to discover the motivating factors behind these changes. There has been an increase in the use of outpatient surgeries and surgical centers that may contribute to parent familiarity with general anesthesia. Parents may be better informed of risks and benefits of
general anesthesia and conscious sedation through informed consent. Parents may have exposure to general anesthesia and conscious sedation through family members requiring such procedures, television and media advertisements, information available on the internet, and other medical/dental professionals informing them of each technique.

Amongst the increasing parental acceptance of general anesthesia and conscious sedation, there has been no study examining the factors influencing parent preferences to use of one or the other. Previous studies examine multiple behavior management techniques without taking into account the actual treatment needs of the child. This study differs in that it restricts the subjects to parents of children who have been identified as requiring moderate sedation and general anesthesia for dental treatment delivery. This study aims to examine these two advanced pharmacological behavior management techniques and determine factors that parents in their decision making process. While parents are often concerned about cost of dental treatment, risks associated for their child, and impact on their daily life (number of appointments required for treatment completion), it was thought that these factors may significantly influence their decision of selecting MS or GA.

This research will aid pediatric dentists in understanding factors that influence parental preference of utilizing general anesthesia or conscious sedation for their child's dental care. It will also, provide insight into the changing parental attitudes towards advanced pharmacological modalities of dental treatment in the pediatric population.
3. MATERIALS AND METHODS

3.1 Overview

This study is a cross-sectional survey of parents in the UIC College of Dentistry Pediatric Dental Clinic. Questionnaires were used to obtain demographic data, information about the parents’ and patients’ dental history, and factors that influence parents to select general anesthesia or conscious sedation for dental treatment of their child. Different surveys were administered to parents in each specific category: general anesthesia or moderate sedation. Both surveys were provided in English and Spanish and included most of the same questions; however, each type of survey has an additional section added to collect data specific to either general anesthesia or moderate sedation. The primary predictor variables were the various factors influencing parents’ decision (measured using a Likert score). The outcome variables were whether they had chosen moderate sedation or general anesthesia as the treatment modality. Demographics and dental history were collected as covariates. The data were entered into the SPSS statistical analysis program using a coding scheme agreed upon by the research team. Some questions were collapsed for data analysis purposes. The data is self-reported by the parent or legal guardian of the child. There is a degree of subjectivity when responses are self-reported; however, the survey questions were explained when necessary to minimize this variability.
3.2 **Study Site and Subject Selection**

*Study Site:*

This study was administered at the UIC College of Dentistry Post-Graduate Pediatric Dental Clinic. The site was selected based on current practice location of the lead researcher. GA and MS procedures for restorative care are services provided by only the Post-Graduate Pediatric Dental Clinic (there is another pediatric clinic for pre-doctoral dental students that was excluded). It was also selected due to the high volume of patients that are treated under general anesthesia and moderate sedation in the clinic. Moderate sedation procedures are completed in the UIC Post-Graduate Pediatric Dental Clinic and general anesthesia procedures are completed at the UIC Hospital. In the Post Graduate Pediatric Dental Clinic at UIC, there were approximately 6 general anesthesia work-up appointments and 10-13 moderate sedation appointments scheduled per week at the time of the project development. It was estimated that about 50% of these patients will be eligible based on the inclusion criteria. It was estimated that 97% of the patient population at the clinic have Medicaid insurance.

*Study Subjects:*

Study subjects were recruited from the UIC Post-Graduate Pediatric Dental Clinics. Subjects were pre-screened through the Axium® clinic scheduler and only included those patients that were present for either a general anesthesia pre-operative evaluation or a first time moderate sedation
appointment. The eligibility criteria were legal guardians of children 2 to 10 years old. These children must have been either healthy or have mild health conditions as self-reported on the questionnaire. The legal guardian’s eligibility was determined based on the age of the child present for the dental appointment, type of dental appointment, and the self-reported medical status of their child. The child’s age and appointment type are determined via the Axium® scheduler. The Axium® scheduler is an electronic health record (EHR) dental software used in the UIC Pediatric Dental Clinic. Axium® tracks all patient appointments in the clinic and is used to record patient dental and health history. Through the Axium® scheduler view, the principal investigator determined the patient's name, appointment type and age. The principle investigator first looked at the patient's appointment type and then age from the scheduler to determine qualifying participants.

This study sample was chosen as parents have already committed to have their child treated using either general anesthesia or moderate sedation. The results are most meaningful if evaluating parents that have decided on that specific behavior management technique. Including all patients that presented to the clinic (initials, general treatment, etc) would reduce the validity as parents may not select the same treatment for their own child as they would for a hypothetical child. The target number of study subjects was 200 with a minimum of 100 and a maximum of 300. The surveys collected were anonymous and voluntary. The questionnaires did not include any direct identifier for the patient or parent, thus minimizing the risk of a privacy breech.
**Inclusion Criteria:**

The inclusion criteria for the children were as follows: the lower limit of the age group was selected as due to the minimum age required to administer oral sedation (age 2). The upper limit of the age group was determined based on the age at which patients would likely only have general anesthesia due to a physical, medical or mental disability instead of a behavioral cause. Subjects were selected based on English or Spanish literacy due to the population at the UIC Pediatric Dental Clinic. This criterion captured the majority of patients who presented for a general anesthesia work-up or moderate sedation appointment, as more than 80% of the population at the clinic speaks English or Spanish.

**Exclusion Criteria:**

Parents of children with moderate to severe health care needs (as defined by the parent) will be excluded. This criterion was implemented to eliminate a bias in results based on medical healthcare needs. For example, children with moderate to severe health care needs do not qualify for moderate sedation and are more likely to be treated under general anesthesia due to their condition.

### 3.3 Survey Tool

The study instrument was two 11-page, 44-item printed surveys with English and Spanish versions. The first survey was distributed to guardians of children present for GA pre-op appointments (Appendix B). The second survey
(blue in color) was distributed to guardians of children present for MS appointments (Appendix C). Both surveys were the identical for the first 38 items and differed in the last 6 questions. The last 6 questions were different between surveys in order to gain information regarding modality-specific factors. The survey questions collected information about demographics, dental history, caregivers' knowledge of MS and GA, and various factors that may influence caregivers' decision. The various factors assessed for influencing caregivers' preference include: dentist's recommendations, knowledge of treatment modality selected, child's age, cost of dental treatment, extent of dental treatment, number of days missed from school, among others.

Identified subjects were invited to participate in the study by being read a script (Appendix D). Once subjects agreed to participate, they were provided a survey in an envelope with a pen. The survey included a cover page (page one of the survey) outlining the purpose of the study, terms of participation, and a brief summary of their chosen treatment modality.

No personal identifiers were collected on the surveys. The surveys were anonymous and posed minimal risk to participants and patients in the clinic. The parents were informed the survey was voluntary and would not affect the dental treatment of their child. Once completed, parents were asked to place the survey in the envelope and return it to the front reception staff, dentist or clinic staff. The number of parents that did not elect to participate was not recorded to minimize the amount of workload to those dentists agreeing to distribute the surveys.
Additionally, it was not recorded as different clinic staff were distributing the surveys and were not asked to document the refusal rate or no response rate.

**Spanish Translation:**

The English survey and cover letter were written and translated to Spanish by the principal investigator who has a minor in Spanish language and is proficient. The Spanish documents were then given to a clinic dental assistant, who completed the back translation of the survey and cover letter to verify the consistency between the English and Spanish versions. Her qualifications for translating include being born in Columbia to Native-Columbian parents, and being raised in a home where Spanish was the primary language spoken. She has been working in the dental profession for 18 years and has been interpreting and speaking clinical terminology with parents and providers constantly throughout her career. The back translation was then compared to the original English documents and necessary modifications were made to verify consistency between the Spanish and English versions. The final Spanish translated documents were then proofread by the same dental assistant.

### 3.4 Data Collection

All clinic staff and dentists assisting with the distribution and collection of surveys were provided a brief explanation of the research project and study aims. They were then explained the distribution process and collection process of the
surveys. To distribute surveys, the dentist was provided a script to read to patients (Appendix D). Upon identification of eligible participants via the Axium scheduler, the PI distributed survey envelopes to the appropriate patients or providers for distribution. The data collection and subject selection summary flow chart is outlined in Appendix E. The surveys were then collected and stored in a locked desk. The length of data collection was four months from June 1, 2015-September 30, 2015. This was determined by the minimum time allotted to collect data from a meaningful sample size due to the limited length of time of the study.

3.5 **Statistical Analysis**

All collected survey data was then inputted into the IBM SPSS 22.0 Statistics Data Editor database. The inputted data file was stored on a password-protected computer. The data was inputted by question number and was coded, for the most part, corresponding to the answer choices selected. Questions that permitted more than one reply were added on to the existing variables and noted in SPSS. Questions that allowed participants to write in an “other” response, were inputted in SPSS as with the number corresponding to “other.” The free written answers were then inputted into a separate word document. Any missing data was left as a blank cell in SPSS.

The SPSS data file was then reviewed and cleaned. Frequencies for all questions were run to obtain the minimum and maximum ranges of responses. If
these ranges were out of the limits of the question answer choices, the outlying data point was identified and the original survey was identified and referenced to correct the mistyped value. The original survey was then accessed and the data point was then corrected based on the actual survey response. The data was then analyzed based on the inclusion criteria. Surveys were deleted from the data set based on the inclusion criteria, including if the child was not within the correct age range, if a legal guardian was not completing the survey and if the child had moderate or severe health conditions.

Several variables were re-coded or groups were collapsed in SPSS in order to simplify the output, data analysis, and minimize cells with small numbers. The variable for GA and MS informants (Questions 23 and 25) was recoded into Dentist, Medical Doctor, Dentist and Medical Doctor, No One, and Other. Race was collapsed into Caucasian/White, African American/Black, Asian/Pacific Islander, and Other (Including Hispanic). Marital status was collapsed into Single/Never Married, Married, and Other. Guardian Education was collapsed into less than High School, High School Graduate or Equivalent, Some College/Vocational, Bachelor’s Degree or Higher. The last two choices for Household Income were collapsed into $40,000 or greater, as there were few respondents with incomes greater than $40,000.

The data analysis consisted of univariate descriptive statistics, frequencies, and bivariate statistics including Mann Whitney-U and Independent T tests. Univariate descriptive statistics (mean, median, standard deviation, frequencies) were used to describe demographic characteristics, dental history of
the sample, caregiver knowledge, and exploratory questions asked about modality specific factors. Mann Whitney-U was used to explore associations between factors for the GA and MS groups independently. Mean responses, standard deviations, and t-tests were used to explore differences within MS and GA groups. A p-value of <0.05 was used to determine statistical significance for the Mann Whitney-U and T tests. A Friedman’s Anova was used to complete comparisons of factors within groups. Post-hoc tests were run to accommodate multiple tests. As there were 10 variables, the number of combinations of comparisons was 45. The adjusted p-value for the post-hoc analysis was calculated by doing 0.05/45. Thus the adjusted p-value for statistical significance was p<0.0011.
4. RESULTS

4.1 Number of Respondents

The data collection period was approximately 4 months. Upon termination of data collection, 136 surveys were obtained. The refusal rate was not documented. There were 6 surveys excluded due to failure to meet the inclusion criteria including the child's age being greater than 10 years old (N=1), the participant completing the survey not being the legal guardian (N=2), and the child having moderate or severe health conditions (N=3). The total number of surveys after exclusions was N=130. The total number of GA surveys collected was N=56 and the total number of MS surveys collected was N=74. It is estimated that approximately 10-15% of the surveys were returned incomplete due to refusal to participate.
4.2 **Demographic Characteristics of Respondents**

Table I summarizes the demographic characteristics of the sample including the total of all responses as well as the totals within each survey group (MS and GA). The average age of the respondents was 33.05 years old and the average age of the child receiving treatment was 4.36 years old. The majority of the guardians were female (81.4%) and the majority of the children receiving treatment were male (61.2%). The majority of the respondents were Hispanic or Latino (51.6%). Approximately three-fourths of the participants (76.9%) reported an annual household income of less than $29,999. The majority of respondents had the equivalent of a high school education (40.2%) with the second highest category of some college/vocational education (38.6%). On average it was reported that 1.36 adults and 1.26 children under the age 18 resided in the household. The distribution of demographics between the MS and GA groups were more or less similar, varying within 0-6.5% or 1 standard deviation of each other. The only exception to this was the education reported by each group. In the MS group there were 18.1% that stated they received less than a high school education and 34.7% that stated they received a high school education or equivalent, compared to the GA group that reported 5.5% and 47.3% respectively. There were no statistically significant differences between the MS and GA groups for any of the demographic factors evaluated.
TABLE I: DEMOGRAPHIC CHARACTERISTICS OF SAMPLE TOTAL, MS GROUP AND GA GROUP

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total</th>
<th>Moderate Sedation</th>
<th>General Anesthesia</th>
<th>Test Statistic ^^^</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Mean</td>
<td>Mean</td>
<td>Mean</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guardian Child</td>
<td>4.36</td>
<td>1.51</td>
<td>4.16</td>
<td>1.40</td>
<td>4.63</td>
</tr>
<tr>
<td>Guardian Male</td>
<td>24</td>
<td>18.6</td>
<td>11</td>
<td>14.9</td>
<td>13</td>
</tr>
<tr>
<td>Guardian Female</td>
<td>105</td>
<td>81.4</td>
<td>63</td>
<td>85.1</td>
<td>42</td>
</tr>
<tr>
<td>Child Sex</td>
<td>N=129 %</td>
<td>N=74 %</td>
<td>N=55 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>79</td>
<td>61.2</td>
<td>44</td>
<td>59.5</td>
<td>35</td>
</tr>
<tr>
<td>Female</td>
<td>50</td>
<td>38.8</td>
<td>30</td>
<td>40.5</td>
<td>20</td>
</tr>
<tr>
<td>Race</td>
<td>N=128 %</td>
<td>N=73 %</td>
<td>N=55 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian/White</td>
<td>39</td>
<td>30.5</td>
<td>21</td>
<td>28.8</td>
<td>18</td>
</tr>
<tr>
<td>African American/Black</td>
<td>27</td>
<td>21.1</td>
<td>15</td>
<td>20.5</td>
<td>12</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>10</td>
<td>7.8</td>
<td>6</td>
<td>8.2</td>
<td>4</td>
</tr>
<tr>
<td>Other (including Hispanic)</td>
<td>52</td>
<td>40.6</td>
<td>31</td>
<td>42.5</td>
<td>21</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>N=128 %</td>
<td>N=74 %</td>
<td>N=54 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>66</td>
<td>51.6</td>
<td>27</td>
<td>50.0</td>
<td>39</td>
</tr>
<tr>
<td>No</td>
<td>62</td>
<td>48.4</td>
<td>27</td>
<td>50.0</td>
<td>35</td>
</tr>
<tr>
<td>Primary Language</td>
<td>N=130 %</td>
<td>N=74 %</td>
<td>N=56 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>70</td>
<td>53.8</td>
<td>39</td>
<td>52.7</td>
<td>31</td>
</tr>
<tr>
<td>Spanish</td>
<td>44</td>
<td>33.8</td>
<td>26</td>
<td>35.1</td>
<td>18</td>
</tr>
<tr>
<td>Other</td>
<td>16</td>
<td>12.3</td>
<td>9</td>
<td>12.2</td>
<td>7</td>
</tr>
<tr>
<td>Marital Status</td>
<td>N=125 %</td>
<td>N=71 %</td>
<td>N=54 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single/Never Married</td>
<td>52</td>
<td>41.6</td>
<td>31</td>
<td>43.7</td>
<td>21</td>
</tr>
<tr>
<td>Married</td>
<td>55</td>
<td>44.0</td>
<td>30</td>
<td>42.3</td>
<td>25</td>
</tr>
<tr>
<td>Other</td>
<td>18</td>
<td>14.4</td>
<td>10</td>
<td>14.1</td>
<td>8</td>
</tr>
<tr>
<td>Education</td>
<td>N=127 %</td>
<td>N=72 %</td>
<td>N=55 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than High School</td>
<td>16</td>
<td>12.6</td>
<td>13</td>
<td>18.1</td>
<td>3</td>
</tr>
<tr>
<td>High School Graduate or</td>
<td>51</td>
<td>40.2</td>
<td>25</td>
<td>34.7</td>
<td>26</td>
</tr>
<tr>
<td>Equivalent</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some College/Vocational</td>
<td>49</td>
<td>38.6</td>
<td>27</td>
<td>37.5</td>
<td>22</td>
</tr>
<tr>
<td>Bachelor’s Degree or</td>
<td>11</td>
<td>8.7</td>
<td>7</td>
<td>9.7</td>
<td>4</td>
</tr>
<tr>
<td>Higher</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual Household Income</td>
<td>N=117 %</td>
<td>N=65 %</td>
<td>N=52 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than $20,000</td>
<td>46</td>
<td>39.3</td>
<td>24</td>
<td>36.9</td>
<td>22</td>
</tr>
<tr>
<td>$20,000-$29,999</td>
<td>44</td>
<td>37.6</td>
<td>24</td>
<td>36.9</td>
<td>20</td>
</tr>
<tr>
<td>$30,000-$39,999</td>
<td>16</td>
<td>13.7</td>
<td>9</td>
<td>13.8</td>
<td>7</td>
</tr>
<tr>
<td>$40,000 or greater</td>
<td>11</td>
<td>9.4</td>
<td>8</td>
<td>12.3</td>
<td>3</td>
</tr>
<tr>
<td>People Living in House</td>
<td>2.37</td>
<td>1.36</td>
<td>2.46</td>
<td>1.44</td>
<td>2.25</td>
</tr>
<tr>
<td>Household</td>
<td>2.22</td>
<td>1.26</td>
<td>2.09</td>
<td>1.16</td>
<td>2.40</td>
</tr>
</tbody>
</table>

* Total N = 130 (GA N=56, MS N=74); N may not equal total due to missing responses
** Percentages are reported as valid percent (missing data excluded from calculation)
*** Chi-square tests comparing differences between MS and GA groups
**** T-test comparing differences between MS and GA groups
Table II summarizes the dental history of the sample including the total of all responses as well as the totals within each survey group (MS and GA). Approximately half of the respondents reported that they were the primary dental treatment decision makers for their child, and the other half indicated joint decision making. The majority of guardian's in the MS group (45.9%) and the GA group (41.8%) indicated that their child's oral health was fair. The second highest report of child's oral health for the MS group was good (25.7%), whereas that for the GA group was poor (36.4%). The third highest report of child's oral health for the MS group was poor (21.6%), whereas that for the GA group was good (18.2%). For both groups, excellent oral health had the lowest percent of respondents. For the guardians' report of their own oral health both MS and GA groups were similar with most stating their oral health was good, followed by fair, followed by excellent and then poor. Almost all of the respondents (98.4%) indicated their child had dental public aid insurance. The majority indicated their child had never had a history of MS or GA for any dental treatment in both groups (77.7%). The majority indicated no member of the household had a history of MS or GA for any dental treatment (76.2%). There were no statistically significant differences between the MS and GA groups with respect to the dental history factors. There were marginal statistical significant differences for families that had a child with a history of previously have GA or MS for dental treatment.
TABLE II: DENTAL HISTORY OF SAMPLE TOTAL, MS GROUP AND GA GROUP

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total</th>
<th>Moderate Sedation</th>
<th>General Anesthesia</th>
<th>Test Statistic ^^^</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dental Treatment Decision for Child</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N=130</td>
<td>N=74</td>
<td>N=56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accompanying Guardian</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joint Decision Making</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>64</td>
<td>49.2%</td>
<td>38</td>
<td>51.4%</td>
<td>0.309</td>
</tr>
<tr>
<td></td>
<td>66</td>
<td>50.8%</td>
<td>36</td>
<td>48.6%</td>
<td>0.578</td>
</tr>
<tr>
<td>Assessment of Child's Oral Health</td>
<td>N=129</td>
<td>%</td>
<td>N=74</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>5.4%</td>
<td>5</td>
<td>6.8%</td>
<td>3.933</td>
</tr>
<tr>
<td></td>
<td>29</td>
<td>22.5%</td>
<td>19</td>
<td>25.7%</td>
<td>0.269</td>
</tr>
<tr>
<td></td>
<td>57</td>
<td>44.2%</td>
<td>34</td>
<td>45.9%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>36</td>
<td>27.9%</td>
<td>16</td>
<td>21.6%</td>
<td></td>
</tr>
<tr>
<td>Assessment of Guardian's Oral Health</td>
<td>N=126</td>
<td>%</td>
<td>N=72</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>15.1%</td>
<td>14</td>
<td>19.4%</td>
<td>5.638</td>
</tr>
<tr>
<td></td>
<td>58</td>
<td>46.0%</td>
<td>29</td>
<td>40.3%</td>
<td>0.131</td>
</tr>
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<td></td>
<td>39</td>
<td>31.0%</td>
<td>21</td>
<td>29.2%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>7.9%</td>
<td>8</td>
<td>11.1%</td>
<td></td>
</tr>
<tr>
<td>Child's Dental Insurance</td>
<td>N=129</td>
<td>%</td>
<td>N=73</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>127</td>
<td>98.4%</td>
<td>72</td>
<td>98.6%</td>
<td>0.036</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1.6%</td>
<td>1</td>
<td>1.4%</td>
<td>0.850</td>
</tr>
<tr>
<td>Child had history of MS or GA for dental treatment</td>
<td>N=130</td>
<td>%</td>
<td>N=74</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>29</td>
<td>22.3%</td>
<td>21</td>
<td>28.4%</td>
<td>3.653</td>
</tr>
<tr>
<td></td>
<td>101</td>
<td>77.7%</td>
<td>53</td>
<td>71.6%</td>
<td>0.056</td>
</tr>
<tr>
<td>History of household member receiving MS or GA for dental treatment</td>
<td>N=130</td>
<td>%</td>
<td>N=74</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>31</td>
<td>23.8%</td>
<td>20</td>
<td>27.0%</td>
<td>0.957</td>
</tr>
<tr>
<td></td>
<td>99</td>
<td>76.2%</td>
<td>54</td>
<td>73.0%</td>
<td>0.328</td>
</tr>
</tbody>
</table>

^ Total N = 130 (GA N=56, MS N=74). N may not equal total due to missing responses
^^ Percentages are reported as valid percent (missing data excluded from calculation)
^^^^ Chi-square tests comparing differences between MS and GA groups
^^^^^ Joint Decision Making is defined as the decision being made by the guardian and another individual (significant other or spouse).
4.4 Respondents' Knowledge about MS and GA

Table III summarizes the respondent’s knowledge of the sample including the total of all responses as well as the totals within each survey group (MS and GA). Most respondents in both groups indicated they had a moderate level of knowledge about both MS and GA. It was interesting to note that a high level of knowledge of GA and MS was the lowest percent of respondents in both groups (13.3% and 11% respectively). Most participants were provided information regarding GA and MS by their dentist (45% and 50.8% respectively). There were no statistically significant differences noted between the caregiver knowledge factors for MS and GA groups. There were marginal statistical significant differences for knowledge about MS between the MS and GA groups.
### TABLE III : CAREGIVER KNOWLEDGE TOTAL, MS GROUP AND GA GROUP

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total N=128</th>
<th>Moderate Sedation N=73</th>
<th>General Anesthesia N=55</th>
<th>Test Statistic</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Knowledge about GA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>17 (13.3%)</td>
<td>8 (11.0%)</td>
<td>9 (16.4%)</td>
<td>2.024</td>
<td>0.363</td>
</tr>
<tr>
<td>Moderate</td>
<td>81 (63.3%)</td>
<td>50 (68.5%)</td>
<td>31 (56.4%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>30 (23.4%)</td>
<td>15 (20.5%)</td>
<td>15 (27.3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Knowledge about MS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>14 (11.0%)</td>
<td>10 (13.9%)</td>
<td>4 (7.3%)</td>
<td>5.956</td>
<td>0.051</td>
</tr>
<tr>
<td>Moderate</td>
<td>78 (61.4%)</td>
<td>48 (66.7%)</td>
<td>30 (54.5%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>35 (27.6%)</td>
<td>14 (19.4%)</td>
<td>21 (38.2%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Informants about GA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dentist</td>
<td>58 (45.0%)</td>
<td>26 (35.6%)</td>
<td>32 (57.1%)</td>
<td>6.046</td>
<td>0.196</td>
</tr>
<tr>
<td>Medical Doctor</td>
<td>11 (8.5%)</td>
<td>7 (9.6%)</td>
<td>4 (7.1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dentist and Medical Doctor</td>
<td>22 (17.1%)</td>
<td>15 (20.5%)</td>
<td>7 (12.5%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No One</td>
<td>8 (6.2%)</td>
<td>5 (6.8%)</td>
<td>3 (5.4%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>30 (23.3%)</td>
<td>20 (27.4%)</td>
<td>10 (17.9%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Informants about MS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dentist</td>
<td>66 (50.8%)</td>
<td>40 (54.8%)</td>
<td>26 (47.3%)</td>
<td>6.344</td>
<td>0.175</td>
</tr>
<tr>
<td>Medical Doctor</td>
<td>10 (7.7%)</td>
<td>5 (6.8%)</td>
<td>5 (9.1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dentist and Medical Doctor</td>
<td>18 (13.8%)</td>
<td>9 (12.3%)</td>
<td>9 (16.4%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No One</td>
<td>13 (10.0%)</td>
<td>4 (5.5%)</td>
<td>9 (16.4%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>21 (16.2%)</td>
<td>15 (20.5%)</td>
<td>6 (10.9%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

^ Total N = 130 (GA N=56, MS N=74). N may not equal total due to missing responses

^^ Percentages are reported as valid percent (missing data excluded from calculation)

^^^ Chi-square tests comparing differences between MS and GA groups
Table IV summarizes the parent expectations of treatment visits for the MS and GA groups. The majority of the respondent in the MS group were willing to miss more than 5 work days (50.7%) and more than 5 school days (42%) to complete their child's dental treatment. The majority of the respondents in the GA group were also willing to miss more than 5 work days (45.3 %) and more than 5 school days (42.3%) to complete their child's dental treatment. Furthermore, the majority of respondents in the MS group (70.6%) and GA group (67.3%) indicated they expected 1-2 appointments to complete the proposed dental treatment. There was a larger number of respondents in GA group (13.5%) compared to the MS group (2.9%) that expected more than 6 appointments to complete the dental treatment for their child. There were no statistically significant differences between the MS and GA groups with respect to parent expectations.
### TABLE IV: PARENT EXPECTATIONS OF TREATMENT VISITS MS GROUP AND GA GROUP

<table>
<thead>
<tr>
<th>Variable</th>
<th>Moderate Sedation</th>
<th>General Anesthesia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days Willing to Miss Work for Child’s Dental Treatment</td>
<td>N=69 %</td>
<td>N=53 %</td>
</tr>
<tr>
<td>0-1 days</td>
<td>8 11.6</td>
<td>9 17.0</td>
</tr>
<tr>
<td>2-3 days</td>
<td>20 29.0</td>
<td>17 32.1</td>
</tr>
<tr>
<td>4-5 days</td>
<td>6 8.7</td>
<td>3 5.7</td>
</tr>
<tr>
<td>More than 5 days</td>
<td>35 50.7</td>
<td>24 45.3</td>
</tr>
<tr>
<td>Days Willing to Miss School for Child’s Dental Treatment</td>
<td>N=69 %</td>
<td>N=52 %</td>
</tr>
<tr>
<td>0-1 days</td>
<td>12 17.4</td>
<td>9 17.3</td>
</tr>
<tr>
<td>2-3 days</td>
<td>19 27.5</td>
<td>19 36.5</td>
</tr>
<tr>
<td>4-5 days</td>
<td>9 13.0</td>
<td>2 3.8</td>
</tr>
<tr>
<td>More than 5 days</td>
<td>29 42.0</td>
<td>22 42.3</td>
</tr>
<tr>
<td>Number of Appointments Expected to Complete Dental Treatment</td>
<td>N=68 %</td>
<td>N=52 %</td>
</tr>
<tr>
<td>1-2 appointments</td>
<td>48 70.6</td>
<td>35 67.3</td>
</tr>
<tr>
<td>3-4 appointments</td>
<td>17 25.0</td>
<td>8 15.4</td>
</tr>
<tr>
<td>5-6 appointments</td>
<td>1 1.5</td>
<td>2 3.8</td>
</tr>
<tr>
<td>More than 6 appointments</td>
<td>2 2.9</td>
<td>7 13.5</td>
</tr>
</tbody>
</table>

^ Total N = 130 (GA N=56, MS N=74). N may not equal total due to missing responses
^^ Percentages are reported as valid percent
4.6 **Comparison of Demographic and Dental Characteristics between GA and MS Groups**

Table V compares demographic and dental characteristics between the MS and GA groups. The statistic test performed for the comparison was determined based on the data type, nominal versus ordinal. For all nominal data a chi-square test was performed. For all ordinal data a Mann Whitney-U test was done. The only statistically significant comparison obtained was the knowledge of MS between the two groups (p=0.017). The comparison of child's oral health and child's history of MS or GA for previous dental treatment were approaching significance (p=0.055 and p=0.056 respectively).
### TABLE V: COMPARING DEMOGRAPHIC AND DENTAL CHARACTERISTICS BETWEEN GA AND MS

#### Table V

<table>
<thead>
<tr>
<th>Variable</th>
<th>Test performed</th>
<th>Test Statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guardian Gender</td>
<td>Chi square</td>
<td>1.603</td>
<td>0.2</td>
</tr>
<tr>
<td>Child’s Gender</td>
<td>Chi square</td>
<td>0.232</td>
<td>0.63</td>
</tr>
<tr>
<td>Race</td>
<td>Chi square</td>
<td>0.330</td>
<td>0.954</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>Chi square</td>
<td>0.091</td>
<td>0.763</td>
</tr>
<tr>
<td>Primary Language</td>
<td>Chi square</td>
<td>0.129</td>
<td>0.938</td>
</tr>
<tr>
<td>Marital Status</td>
<td>Chi square</td>
<td>0.282</td>
<td>0.868</td>
</tr>
<tr>
<td>Level of Education</td>
<td>MWU</td>
<td>1981</td>
<td>0.649</td>
</tr>
<tr>
<td>Household Income</td>
<td>MWU</td>
<td>1810</td>
<td>0.196</td>
</tr>
<tr>
<td><strong>Dental Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child’s Oral Health</td>
<td>MWU</td>
<td>1657</td>
<td>0.055</td>
</tr>
<tr>
<td>Guardian’s Oral Health</td>
<td>MWU</td>
<td>1927</td>
<td>0.93</td>
</tr>
<tr>
<td>Child History of MS or GA</td>
<td>Chi square</td>
<td>3.653</td>
<td>0.056</td>
</tr>
<tr>
<td>Family History of MS or GA</td>
<td>Chi square</td>
<td>0.957</td>
<td>0.328</td>
</tr>
<tr>
<td>Knowledge of GA</td>
<td>MWU</td>
<td>1973</td>
<td>0.848</td>
</tr>
<tr>
<td>Knowledge of MS</td>
<td>MWU</td>
<td>1555</td>
<td>0.017*</td>
</tr>
<tr>
<td>Informants of GA</td>
<td>Chi square</td>
<td>6.381</td>
<td>0.172</td>
</tr>
<tr>
<td>Informants of MS</td>
<td>Chi square</td>
<td>6.038</td>
<td>0.196</td>
</tr>
</tbody>
</table>

* Statistically significant (p<0.05)
4.7 Treatment, Financial, and Social Factors Influencing Parents' Decision

Table VI and VII summarize treatment, financial, and social factors influencing parents' decision for choosing MS or GA. Table VI summarizes the median responses, inter-quartile range, and Mann Whitney-U test statistic, and table VII summarizes the mean, standard deviation, and p-value from t-tests. Although none of the tests showed statistically significant differences, it is of note to observe the mean ranks in table VII. Out of ten factors, the top three factors that most influenced parents' decision for choosing MS were the dentist's recommendation, child's behavior, and that the treatment costs were covered by their insurance. Out of ten factors, the top three factors that most influenced parents' decision for choosing GA were the child's behavior, dentist's recommendation, and tied for third was that that child requires a lot of dental treatment and that treatment costs were covered by their insurance. The factor that was ranked last in influencing parents' decision was less out of pocket expenses for both groups. Figures I, II and III also summarize the various factors that influence parents' decisions for choosing MS or GA. Figures I and II are box plots that visually represent the factors for either MS (figure 1) or GA (figure 2) that parents value most. Items listed to the left on these plots indicate factors that were rated higher in influencing parents' decisions and items listed to the right were those that were not as important in parents' decisions. Figure III represents all factors that were compared between MS and GA groups. There were not any differences in how families rated each factor between both MS and GA groups.
TABLE VI : COMPARISON OF MEDIANS - TREATMENT, FINANCIAL, AND SOCIAL FACTORS INFLUENCING PARENTS' DECISION FOR CHOOSING MS OR GA

Table VI
(1 = strongly disagree, 5 = strongly agree)
Mann-Whitney U

<table>
<thead>
<tr>
<th>Variable</th>
<th>Moderate Sedation</th>
<th>General Anesthesia</th>
<th>Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median</td>
<td>IQR</td>
<td>Median</td>
</tr>
<tr>
<td>Treatment Factors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well informed of treatment modality</td>
<td>4</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Dentist recommendation</td>
<td>4</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Child requires a lot of dental treatment</td>
<td>4</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Fewer Risks than other modality</td>
<td>4</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Financial Factors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less out of pocket expense</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Costs of treatment are covered by insurance</td>
<td>4</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Social Factors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Due to child’s behavior</td>
<td>4</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Due to child’s age</td>
<td>4</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Parent will miss fewest days from work</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Child will miss fewest days from school</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
### TABLE VII: COMPARISON OF MEANS - TREATMENT, FINANCIAL, AND SOCIAL FACTORS INFLUENCING PARENTS' DECISION FOR CHOOSING MS OR GA

(1 = strongly disagree, 5 = strongly agree)

<table>
<thead>
<tr>
<th></th>
<th>Moderate Sedation</th>
<th>General Anesthesia</th>
<th>Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td><strong>Variable</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Treatment Factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well informed of treatment modality</td>
<td>3.63</td>
<td>1.14</td>
<td>3.74</td>
</tr>
<tr>
<td>Dentist recommendation</td>
<td>4.04</td>
<td>1.03</td>
<td>4.13</td>
</tr>
<tr>
<td>Child requires a lot of dental treatment</td>
<td>3.65</td>
<td>1.13</td>
<td>4.00</td>
</tr>
<tr>
<td>Fewer Risks than other modality</td>
<td>3.68</td>
<td>0.87</td>
<td>3.56</td>
</tr>
<tr>
<td><strong>Financial Factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less out of pocket expense</td>
<td>2.94</td>
<td>1.20</td>
<td>2.86</td>
</tr>
<tr>
<td>Costs of treatment are covered by insurance</td>
<td>3.93</td>
<td>1.19</td>
<td>4.00</td>
</tr>
<tr>
<td><strong>Social Factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Due to child’s behavior</td>
<td>3.99</td>
<td>1.04</td>
<td>4.17</td>
</tr>
<tr>
<td>Due to child’s age</td>
<td>3.81</td>
<td>0.96</td>
<td>3.81</td>
</tr>
<tr>
<td>Parent will miss fewest days from work</td>
<td>3.09</td>
<td>1.22</td>
<td>3.00</td>
</tr>
<tr>
<td>Child will miss fewest days from school</td>
<td>3.20</td>
<td>1.28</td>
<td>2.98</td>
</tr>
</tbody>
</table>
FIGURE 1: WITHIN GROUP COMPARISON OF FACTORS INFLUENCING PARENTS’ DECISION FOR CHOOSING MS (results show Mean response)

FIGURE 2: WITHIN GROUP COMPARISON OF FACTORS INFLUENCING PARENTS’ DECISION FOR CHOOSING GA (results show Mean response)
FIGURE 3: COMPARISON OF MS and GA FACTORS THAT INFLUENCE PARENTS’ DECISION (results show Mean response)
4.8  **MS and GA Specific Factors that Influence Parents' Decision**

Table VIII and IX summarize the median response for MS- and GA-specific factors respectively. Figures IV and V summarize the mean response MS- and GA-specific factors visually via a bar graph. These factors were only evaluated within each group and were used to gather exploratory data specific to either MS or GA. Amongst the MS group, most parents reported that all factors influenced them about equally except for "MS is the only reason I came to UIC," which received a median response of neutral. For the GA group, all factors weighed equally in influencing their decision, in spite of differing means.
### TABLE VIII: SUMMARY OF SEDATION SPECIFIC FACTORS ASKED ONLY TO MS GROUP

<table>
<thead>
<tr>
<th>Variable</th>
<th>Moderate Sedation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median</td>
</tr>
<tr>
<td>Child will remain awake during treatment</td>
<td>4</td>
</tr>
<tr>
<td>Fewer number of appointments than N2O Alone</td>
<td>4</td>
</tr>
<tr>
<td>Shorter wait list than GA</td>
<td>4</td>
</tr>
<tr>
<td>Dentist wanted to try MS before considering GA</td>
<td>4</td>
</tr>
<tr>
<td>MS is the only reason I came to UIC</td>
<td>3</td>
</tr>
</tbody>
</table>

### TABLE IX: SUMMARY OF GENERAL ANESTHESIA SPECIFIC FACTORS ASKED ONLY TO GA GROUP

<table>
<thead>
<tr>
<th>Variable</th>
<th>General Anesthesia</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median</td>
</tr>
<tr>
<td>Child will be asleep during treatment</td>
<td>4</td>
</tr>
<tr>
<td>All treatment would be competed at one time</td>
<td>4</td>
</tr>
<tr>
<td>Willing to wait for GA to be available</td>
<td>4</td>
</tr>
<tr>
<td>Tried all other treatment options for my child</td>
<td>4</td>
</tr>
<tr>
<td>GA is the only reason I came to UIC</td>
<td>4</td>
</tr>
</tbody>
</table>
FIGURE 4: SUMMARY OF SEDATION SPECIFIC FACTORS ASKED ONLY TO MS GROUP

FIGURE 5: SUMMARY OF GENERAL ANESTHESIA SPECIFIC FACTORS ASKED ONLY TO GA GROUP
4.9 MS and GA Factors that Influence Parents’ Decision: Within Group Comparison

Table X and XI summarize the comparison of factors within the MS and GA groups to select that modality. A Friedman’s Anova test was used to complete the initial within group comparison. The results of this test indicated statistical significance (p<0.05) that a difference existed within each group. To identify which factors differed, individual post-hoc tests were completed using the Wilcoxon signed ranks. The adjusted p-value was calculated using the 45 different combinations compared in each group. A p-value of 0.0011 was used for statistical significance after the post-hoc adjustment (p=0.05/45= 0.0011).

The results summarized in the table indicate the adjusted p-values. Positive and negative ranks were used to determine the direction of the comparison. For those comparisons that were statistically significant (highlighted in purple), the direction of the significance was included in parenthesis. For example, when comparing the two factors, “I was well informed about it” and “the dentist recommended” it, for the MS group, there was a statistically significant difference between which factor was more valued. In this case, the dentist’s recommendation (indicated in parenthesis) was more important to families to select MS than whether they felt they were well informed about MS.

For all statistically significant finds comparing the number of days missed from school or work, for both MS and GA groups, parents valued other factors more than the number of days missed from school or work. Similar findings were noted when comparing costs to parents (“costs me less”) for both groups.
Parents value other factors greater than the costs that may be incurred to them from the procedure. However, 98.4% of the parents surveyed incurred no costs of treatment for their child due having dental public aid insurance. For all statistically significant findings comparing whether the dentist’s recommendation was more valued or if another factor was valued, parents selected the dentist’s recommendation.
### TABLE X: RELATIVE COMPARISON OF FACTORS THAT INFLUENCE PARENTS TO SELECT GENERAL ANESTHESIA

<table>
<thead>
<tr>
<th>GENERAL ANESTHESIA</th>
<th>I was well informed about it</th>
<th>Dentist Recommended</th>
<th>Child needs a lot of dental work</th>
<th>Costs me less</th>
<th>Costs covered by insurance</th>
<th>Child’s behavior</th>
<th>Fewer Risks</th>
<th>Child’s age</th>
<th>Miss fewest number of work days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dentist Recommended</td>
<td>0.009</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child needs a lot of dental work</td>
<td>0.079</td>
<td>0.197</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Costs me less</td>
<td>0.001 (Informed)</td>
<td>0.001 (Recommended)</td>
<td>0.001 (Dental Work)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Costs covered by insurance</td>
<td>0.183</td>
<td>0.267</td>
<td>0.934</td>
<td>&lt;0.001 (Insurance)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child’s behavior</td>
<td>0.005</td>
<td>0.816</td>
<td>0.099</td>
<td>&lt;0.001 (Behavior)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fewer Risks</td>
<td>0.262</td>
<td>0.001 (Recommended)</td>
<td>0.027</td>
<td>0.002</td>
<td>0.019</td>
<td>0.001 (Behavior)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child’s age</td>
<td>0.545</td>
<td>0.039</td>
<td>0.182</td>
<td>&lt;0.001 (Age)</td>
<td></td>
<td>0.246</td>
<td>0.048</td>
<td>0.032</td>
<td></td>
</tr>
<tr>
<td>Miss fewest number of work days</td>
<td>&lt;0.001 (Informed)</td>
<td>&lt;0.001 (Recommended)</td>
<td>&lt;0.001 (Dental work)</td>
<td>0.558</td>
<td>&lt;0.001 (Insurance)</td>
<td>&lt;0.001 (Behavior)</td>
<td>0.002</td>
<td>&lt;0.001 (Age)</td>
<td></td>
</tr>
<tr>
<td>Miss fewest number of school days</td>
<td>&lt;0.001 (Informed)</td>
<td>&lt;0.001 (Recommended)</td>
<td>&lt;0.001 (Dental work)</td>
<td>0.614</td>
<td>&lt;0.001 (Insurance)</td>
<td>&lt;0.001 (Behavior)</td>
<td>0.004</td>
<td>&lt;0.001 (Age)</td>
<td>0.923</td>
</tr>
</tbody>
</table>

- Statistically Significant Results (p<0.001).

*More important factor is labeled in cell.
### TABLE XI: RELATIVE COMPARISON OF FACTORS THAT INFLUENCE PARENTS TO SELECT MODERATE SEDATION

<table>
<thead>
<tr>
<th>MODERATE SEDATION</th>
<th>I was well informed about it</th>
<th>Dentist Recommended</th>
<th>Child needs a lot of dental work</th>
<th>Costs me less</th>
<th>Costs covered by insurance</th>
<th>Child's behavior</th>
<th>Fewer Risks</th>
<th>Child's age</th>
<th>Miss fewest number of work days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dentist Recommended</td>
<td>0.001 (Dentist Recommend)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child needs a lot of dental work</td>
<td>0.790</td>
<td>0.020</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Costs me less</td>
<td>0.002 &lt;0.001 (Recommended)</td>
<td>0.001 (Dental Work)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Costs covered by insurance</td>
<td>0.015</td>
<td>0.385</td>
<td>0.169 &lt;0.001 (Insurance)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child's behavior</td>
<td>0.027</td>
<td>0.694</td>
<td>0.017 &lt;0.001 (Behavior)</td>
<td>0.632</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fewer Risks</td>
<td>0.730</td>
<td>0.008</td>
<td>0.772 &lt;0.001 (Risks)</td>
<td>0.171</td>
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<td>Child's age</td>
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<td>0.064</td>
<td>0.233 &lt;0.001 (Age)</td>
<td>0.647</td>
<td>0.251</td>
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<td>Miss fewest number of work days</td>
<td>0.004 &lt;0.001 (Recommended)</td>
<td>0.003 &lt;0.001 (Insurance)</td>
<td>0.0182 &lt;0.001 (Behavior)</td>
<td>&lt;0.001 (Risks)</td>
<td>&lt;0.001 (Age)</td>
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- Statistically Significant Results (p<0.0011).

*More important factor is labeled in cell
5. DISCUSSION

5.1Demographic, Dental History, Caregiver Knowledge

This study found that there were no differences between the MS and GA groups with respect to demographic and dental history of the patients. Parents that presented were from similar demographic backgrounds. The majority of the population sampled were from a low SES, had Medicaid insurance, and a high school education or less. This is expected at the UIC Post Graduate Pediatric Dental Clinic as it is one of the few clinics in the Chicago-land area that accepts Medicaid dental insurance. It is good to have a uniform demographic background between the GA and MS groups as comparisons between groups do not need to account for any such differences.

The dental history between the MS and GA groups were also similar and presented with no significant differences. Between both groups, parents assessed their child’s oral health to be mostly fair and their own personal oral health to be good. This is expected as many patients undergoing GA or MS often have below average oral health and more severe oral disease or treatment needs. It was found that the majority of families did not report that their child had a past history of GA or MS for dental treatment. This is a favorable result because when a child undergoes GA or MS, the dentists’ goals are to prevent the child from having another occurrence requiring advanced pharmacological behavior management for dental treatment.
There were similar rankings of factors noted between the MS and GA groups (Figures 1, 2, 3). This could be due to parents perceiving both advanced pharmacological behavior management techniques (GA and MS) as similar. They may have similar thought processes when decided GA or MS for their child as both involve greater medical risks than basic management techniques and both require more parental involvement of the procedure. For example, it is requested that parents adhere to pre-operative criteria (fasting guidelines, etc.) and provide close post-operative monitoring of the child following the procedures due to residual effects of medications used. It was noted that for both groups the parents’ decisions were heavily influenced by the dentist. This could be due to families having increased trust in the dentist and his/her area of specialty to follow the recommended treatment. This could also be due to the fact that many parents may have been referred to UIC from an external dentist that suggested their child would require GA or MS for their dental treatment. It would have been interesting to ask families if they agreed with the treatment recommended due to another dentist previously suggesting their child would require one of these advanced pharmacological behavior management techniques.

5.2 Dental Treatment and Impact on Child’s Education

This study found that many parents were willing to allow their child to miss greater than five days of school to complete their dental treatment (42% in MS group, 42.3% in GA group). Missing many days of school can have significant
impacts on the educational experience for many children. Unfortunately, with
dental caries being the most common chronic childhood disease, many children
do not attend school to either receive dental care or address pain/infection. This
study found that parents are willing to remove their children from school to
receive the necessary dental treatment. It is encouraged that children with dental
caries seek treatment for the disease; however, when severe disease is present
children often have to miss many days from school to complete the necessary
treatment. Routine preventative dental visits for children are typically
recommended twice a year as long as no active caries infection or other oral
diseases are noted. In addition to these routine visits, if a child has caries they
may be required to schedule additional appointments for treatment.

A study done on the consequences of poor oral health and children’s
attendance and performance at school found that children with poor oral health
were three times more likely to miss school due to dental pain. They found that
children missing school due to dental pain/infection were associated with having
poor performance in school. Absences related to routine dental care were not
associated with poor performance.17 Thus, poor oral health leads to an increase
in the number of days missed from school and is associated with poor
performance in school. Children on the GA and MS waitlist (1 year for GA and 3
months for MS) may be subject to developing dental pain/infection as they wait
for these modalities to become available. This may lead to increased absences
as well as decreased performance in school. Additionally, the study indicated that
children insured with Medicaid was related to having absences caused by
pain/infection. With our population being primarily Medicaid insured, it is expected that these children may be missing more days of school to address pain/infection. This study also found that parents did not consider time their child missed from school as factors that influenced their modality treatment decision.

Parent expectations of how many days will be required to complete their child’s dental treatment was an interesting finding in this study. The majority of parents in the GA group (67.3%) and in the MS group (70.6%) indicated they expected 1-2 appointments to complete their child’s dental treatment. This was interesting as MS appointments typically require 1-2 appointments to complete the dental treatment. Children requiring more than 2 MS appointments are often not qualified for MS and may be recommended to have treatment completed under GA. Dental treatment completed under GA are done in 1 appointment. Parents indicated an accurate understanding of the number of appointments required. However, when evaluating the number of appointments from the initial evaluation to completion of dental treatment, MS patients typically require 2-3 appointments and GA patients typically require 4 appointments at the UIC Pediatric Dental Clinic. It is important that parents understand the time commitment of these advanced pharmacological behavior management modalities so they can accurately plan and convey predicted absences with their child’s school. Providing dental care is essential to eliminate disease, prevent pain/infection, and restore healthy smiles; however, dentists should be sensitive to the impact frequent dental visits may have on a child’s educational experience and performance in school.
5.3 **Oral Health Literacy**

Oral health literacy is the ability to understand and obtain oral health and dental treatment information necessary to make a decision. Studies completed indicate that low oral health literacy can increase the incidence of individuals seeking emergency care and having a higher health expense. Also, caregivers’ oral health literacy has been linked to the outcomes of their child’s oral health.\(^{18,19}\) Parent’s with lower oral health literacy were shown to have increased annual dental expenses for their children and the children had an increased use of emergency and restorative services.\(^{18}\) While oral health literacy was not directly measured in this study, there are some similarities between this study and others that identified such relationships. For example, one study indicated that the majority of their patient population was Medicaid insured (73.7%) and found that lower Rapid Estimate of Adult Literacy in Dentistry (REALD-30) scores were related to caregivers whose children had severe dental disease. Children with mild/moderate dental health needs were more likely to have higher REALD-30 scores (indicating higher oral health literacy).\(^{20}\) Another study linked higher parent education with higher oral health knowledge scores.\(^{19}\) In this investigation, subjects were almost all insured by Medicaid (98.4%). Additionally, the parents in this study had a lower household income (76.9% reported less than $29999/year) and educational level (52.8% reported high school education or less) than those in the previous investigation. Thus, the conclusions can apply to this study and
these relationships may even prove to have more significance in this population as the study subjects are from lower SES and educational levels than the former.

Lower parental oral health literacy is linked to poorer oral health of their children.\textsuperscript{18-20} Many patients that undergo GA or MS have poor oral health and may require more dental treatment than other children. It was found that 67.5\% of MS parents 78.2\% of GA parents reported their child as having poor/fair oral health. Seeing that poor oral health of children is related to lower caregiver oral health literacy provides insight into the literacy of our parent population. Many of our parents may not have adequate health literacy to be making appropriate health decisions for their child. This finding may also be related to the finding that parents value the dentists’ recommendation among the top two factors that influence their treatment decision for their child. These factors are important for a healthcare provider to recognize in their patients. Parents with low oral health literacy are associated with having children with poorer oral health statuses and often follow the dentists’ recommendations with regards dental services for their child.

There was a statistically significant difference between the knowledge of MS between the groups (\(p<0.05\)). Parents of children that underwent GA reported having a higher level of knowledge of MS than those undergoing MS. This could be due to several factors. First, parents selecting GA may have already had previous MS appointment for that child for attempted care. Acute dental needs may be addressed in a MS appointment for the child due to the UIC clinic having a large waiting time for GA appointments (1 year). Second, a MS
appointment may have been attempted for a child with unsuccessful results and thus the patient may have subsequently been recommended to have treatment completed with GA. Lastly, GA is the most advanced behavior management modality available for children in the dental setting. Due to this being the last option available to many of these parents for their child’s dental treatment, parents may have sought out more information about GA and all other options including MS. These factors may have caused parents with children undergoing GA to have a higher level of knowledge of MS.

5.4 Informed Consent

Informed consent is a legally and ethically driven process that provides legal guardians of children or adults information regarding their medical/dental treatment needs to allow them to make an educated decision for their care.\textsuperscript{21,22} During the dental informed consent process the dentist should provide patients/legal guardians information about the oral health issues observed, dental treatment recommended, benefits and risks associated with the treatment, alternatives to the recommendations, benefits and risks associated with the alternatives as well as consequences of receiving no care.\textsuperscript{21} The informed consent indicates the patient/legal guardian authorizes the given treatment to ensue.\textsuperscript{22} The discussion of informed consent is often a verbal interaction between the consenting party and the healthcare provider, and can be supplemented at times with visual, auditory, or physical resources to provide
additional information.\textsuperscript{21-23} Unfortunately, studies have indicated that patients/legal guardians do not always understand the information presented during the informed consent process.\textsuperscript{21}

There were several results in this study that indicated our parents may not truly be understanding the information presented in the informed consent to the treatment. Caregivers in both the MS and GA groups did not indicate having a high level of knowledge of the procedure. Table III indicates the level of knowledge (high, moderate, low) the caregivers self-reported. In the MS group, 66.7\% reported having a moderate level of knowledge about MS. In the GA group, 56.4\% reported having a moderate level of knowledge of GA. Most parents in both group expressed having a moderate level of knowledge of the procedure for which they presented. From an informed consent perspective, this is concerning as parents are not highly knowledgeable of the advanced pharmacological behavior management technique their child is soon to experience. For these procedures that involve greater risks than less advanced methods, parents are indicating that they are not highly knowledgeable.

There may be certain barriers to achieving a high level of knowledge from the informed consent of the procedure. Language and cultural barriers may pose threats to comprehension of the information conveyed by the dentist.\textsuperscript{22} Dentists must be aware of these barriers and make time to clearly explain dental treatments, and if needed request the presence of a language interpreter to bridge the gap of this barrier.\textsuperscript{21} Additionally, healthcare providers do not receive a lot of training on how to have an informed consent conversation. Dentists often
do not receive guidance on how to conduct an informed consent with families, what to include as key elements, and how to ensure comprehension of the patient/legal guardian. Limitations of clinical time allotted for the dentist to converse, provide thorough information of the treatment options and alternatives, and answer questions also pose a large barrier in the informed consent process. Table III also shows that for both groups MS and GA, dentists were the primary informants of the procedure to the caregivers. This shows that the majority of parents receive information about their child’s treatment modality from the dentist that is also obtaining the informed consent. This indicates that dentists should take greater responsibility and care to ensure patients are accurately and thoroughly informed of the treatment they have authorized.

According to the AAPD Guideline on Informed Consent, there is a recommended set of topics to include in the consent. The topics include, the name/date of birth of the patient, name and relationship of the legal guardian providing consent for a minor, clinical diagnosis, purpose of the treatment recommended, risks and benefits of the treatment, alternative treatment options and associated risks/benefits of the alternative, forum for questions from the consenting individual, and signatures of the involved parties and witness. Including these factors can aid in parental knowledge of the procedure. Furthermore, these topics are often referenced in legal situations to determine if adequate informed consent was provided to the parent/patient. Dentists must exercise proper documentation of key elements discussed in the informed
consent process and use this as a guide to providing patients with an in-depth explanation of the proposed treatment.

There are different methods of conveying the information in the informed consent process. Written, verbal discussions, audiovisual and test/feedback techniques can supplement and aid in delivering information.\textsuperscript{21-23} Studies completed in the dental setting show that the oral (verbal discussion) provided better consent for certain procedures, including GA, when compared to written and audiovisual methods. The verbal method also produced the highest percent of parents indicating they felt well informed of the dental intervention and produced the highest consent rates.\textsuperscript{21} However, other studies indicate that written and audiovisual information provide adequate information for the informed consent process and patient comprehension. This study indicated that test/feedback methods, where the parent paraphrases the basic information received in the consent, provides and improved comprehension of the consent.\textsuperscript{22} For procedures such as GA and MS, dentists should exercise the use of verbal discussions with test/feedback methods to ensure patient understanding, and supplement these discussions with written resources summarizing the key elements of the discussion.

Various patient factors may influence the informed consent comprehension in a dental setting. For example, a study found that a higher SES was related to a greater consent for GA in the dental setting.\textsuperscript{23} The patient population in this study is from a low SES background, where all make less than $40,000 per year and over half made less than $30,000 per year. Although no
significant relation was made in this study with annual household income and selection of GA or MS, there may be a greater preference for GA consent for those with a higher SES. Studies completed by Lawrence et al. also indicate that individuals from a lower SES may be more likely to accept a medical professional’s opinion for a given procedure. Further studies would need to be done to observe this trend. Greater consent to moderate sedation was predicted by maternal anxiety. Maternal anxieties were not studied in this investigation, but would yield interesting information regarding parent factors to providing informed consent for advanced pharmacological behavior management techniques.

5.5 Comparison to Past Studies

While this study was one of the first investigating parental preferences to select GA or MS, there have been several studies completed looking at GA and MS compared to other behavior management modalities. A study completed by Eaton et al., Lawrence et al., and Havelka et al. asked guardians to rate their acceptability of behavior management modalities for children in general (not necessarily their child). A study and done by Murphy, Fields, and Machen questioned parents and asked them to consider ranking their acceptability based on the behavior management use for their child. This study was one of the first to request parents to indicate their preferences after committing to a specific behavior management technique. This is important to note as parents often may
find other behavior management modalities as acceptable for children in general but may find that same modality unacceptable when it comes to their own child. This situational standard for behavior management may introduce bias in the parents’ responses and compromise the validity of the results. This study eliminated this factor by directly surveying parents based on the modality they selected.

The demographics of this sample were predominately lower SES individuals. This was similar to the demographics in the study done by Lawrence et al. In that study they found that families with low SES were less accepting to GA and MS when compared to other behavior management modalities, including tell-show-do, nitrous oxide, protective immobilization, etc. A study completed by Murphy, Fields, and Machen, which had subjects from the middle-high SES, showed that parents were less accepting of MS and GA procedures compared to other modalities. They also showed that as SES increases the acceptability of GA decreases. While this finding is interesting it is difficult to apply to the current population in this study due to differences in SES of the subjects and due to the study being completed in 1984. Trends and perceptions of GA and MS have changed over the past 3 decades and the acceptability of advanced pharmacological behavior management techniques has increased. Another study completed by Havelka et al. compared behavior management modalities and their acceptability for families from all SES statuses. They found that families from a lower SES were more accepting of GA but less accepting after receiving an explanation. This may have been due to having increased health care benefits
from Medicaid and not having cost be a factor to their treatment modality.\textsuperscript{24} Families with higher SES may be less accepting of GA due to their understanding of increased risks and costs associated.\textsuperscript{6,24} The study by Havelka et al. showed similar acceptability of MS and GA between all experimental and control groups. This was similar to the present study that found no differences between different SES individuals and between MS and GA groups.

\textbf{5.6 Study Strengths}

To date, there have been no studies investigating factors that may influence parents’ decisions when selecting an advanced pharmacological behavior management modality for their child’s dental treatment. This study provides insight into what parents’ value when making a decision to have their child’s dental treatment completed under either MS or GA. The study indicated that the dentist’s recommendation plays an important role in their decision making process. This leads us to rethink the information that we as dental providers are sharing with LCGs and aid them in making an educated and informed decision.

\textbf{5.7 Study Limitations}

This study was amongst the first to evaluate factors that influence legal care guardians’ decisions to selecting GA or MS for their child’s dental treatment. Due to the time constraints of the study the sample size was relatively small.
Additionally, it would have been ideal if there were 50% of each survey submitted; however, we anticipated a higher number of moderate sedation subjects due to more moderate sedation appointments scheduled than general anesthesia. In order to add power to the observed trends within the study, the sample size would have to be larger. Additionally, a pre-survey was not completed to determine the health literacy or bias and direction of each question. Due to this we are unable to truly verify that the questions posed in the survey were measuring our desired outcomes. It was not determined if the oral health terminology used in the survey was consistent with the general population’s knowledge of that type of language. A pre-survey would have also aided with completing a power analysis to determine the sample size required to identify factors that influence legal care guardians’ decisions with a given degree of confidence. Due to the time constraints of our study, we were unable to complete a power analysis and therefore cannot conclude that the sample size was large enough to accept or reject the hypotheses with confidence.

Another limitation to this study was that LCGs had already selected their chosen modality of treatment for their child prior to survey distribution. Thus the surveys captured responses after LCGs had chosen the method they prefer. Furthermore, parents selecting either MS or GA for their child’s dental treatment may not have been offered the other option. There is a great degree of variation in the decision making process for the child’s behavior management technique between dentists and families. For example, some children may have been treated under GA with no other behavior management modality (i.e. MS) offered
due a variety of different reasons including, behavior at the dentist, dentist recommendation, parent preferences, and extent of dental treatment plan. Some children that did not qualify for MS type appointments (due to physiologic factors such as pre-term birth, history of snoring, or narrow/obstructed airway) were often not offered this behavior management modality. The dentist often determines this independent of the parent’s choice and may very briefly introduce the modality as a non-option and continue to describe other advance pharmacological modalities such as GA. The study also included children that may require GA due to a failed attempted MS appointment. LCGs in this group were not excluded and may have introduced a bias to the study as their opinion of MS may have been influenced by a negative experience in the past. A patient that qualifies for MS with minimal dental treatment required may not have been presented with the GA option due to the dentist’s ability to complete the treatment using MS with fewer risks than GA. These issues also pose threats to the internal validity of this study. It is difficult to determine which variables were confounding as there may have been different factors that influenced each group, GA and MS, into selecting that modality. These confounding variables make drawing conclusions from this study difficult as it is questionable whether a true “cause/effect” relationship exists. These threats to internal validity also undermine our confidence in stating that relationships exist between the studied variables.

The UIC Post-Graduate Pediatric Dental Clinic has a unique population of patients that makes results of this study difficult to apply in a private practice
setting. This introduced a threat to the external validity of the study. The PG Pediatric Clinic is one of the few Medicaid dental providers in Chicago for children. Due to this the respondents of the survey were 98.4% Medicaid insured. With a homogenous patient population as this, it is difficult to apply the findings to other diverse samples.

Additionally, due to being one of the few Medicaid providers in Chicago, there is a high volume of referrals from external dentists that tell LCGs that their child needs to come to UIC to be “sedated” or “put to sleep.” Parents may present to our clinic with a preconceived notion of what they prefer based on the recommendations of another healthcare provider. Additionally, due to the high volumes of referrals and often difficult behavior of many of our patients, there is a wait list for MS and GA procedures. The current wait list for GA is 1 year and for MS is 3 months at the UIC PG Pediatric Dental Clinic. Due to more urgent dental needs and a long GA waitlist, patients that qualify for MS physiologically but are not ideal candidates due to behavior or extent of treatment plans may be offered a MS appointment instead of GA to minimize the wait time to receive the earliest urgent care. These patients were not identified or excluded in our study. This poses threats to the internal validity of the study and acts as a confounding variable preventing true evaluation of the factors that influence LCGs’ decisions.

Another factor that limited our study was the length of time allotted to complete the survey. For our patients that required MS, LCGs often had 30-60 minutes to complete the survey as they waited for their child’s treatment to be completed. For patients that required GA, LCGs generally only had 5-15 minutes
to complete the survey as their provider completed paperwork. Due to this there were greater missing responses in the GA survey group. LCGs in the GA group often did have time to start the survey. While the “not completed” response rate was not collected, the short amount of time allotted to the GA group was an influencing factor to the decreased response rates.

5.8 Future Studies

An interesting follow-up to this study would be to repeat a similar questionnaire, except distribute the surveys to dental providers and determine what factors they feel may be influencing LCGs to select an advanced pharmacological behavior management technique. Seeing that LCGs heavily rely and value the dentists’ recommendations when selecting the treatment modality for their child, it would be interesting to explore what dentists feel influences LCGs. A study of this nature would allow providers to determine if what they feel affects parents’ choices align with what the parents value in their decision making process.

Another future investigation that could be done is one surveying LCGs at their first ever dental appointment with their child and presenting two different scenarios involving MS and GA to determine which they prefer and why. This would be difficult to achieve at the UIC Pediatric Dental Clinic as many of the patients have seen a dentist prior. However, a study of this nature would eliminate many of the threats to validity and provide responses that could be compared within and between the MS and GA groups.
6. **STUDY CONCLUSIONS**

Based on this study, the following conclusions can be made:

- Minimal differences existed between the MS and GA groups with respect to their demographics and dental history.

- Parents selecting GA were more informed about MS than parents who selected MS. Possible causes for this finding include:
  - Child experiencing an acute sedation or unsuccessful sedation appointment in the past.
  - Parent researching more about other options due to GA being the most advanced behavior management modality available.

- Parents in both groups, MS and GA, value many factors higher than the number of days their child will miss from school. However, it is important for dentists to be sensitive to the impacts poor oral can have on a child’s school attendance and performance.

- Caregivers may be relying heavily on the dentists’ recommendations for their child’s dental treatment and behavior management modality. Dentists must be aware of the oral health literacy amongst these adults and find methods to improve treatment discussions so parents can make educated decisions.

- The majority of parents consenting to MS and GA did not indicate having a high level of knowledge of either procedure. Informed consent issues are raised with this finding as parents may not truly be aware of the authorized treatment and alternatives.


APPENDIX A

UNIVERSITY OF ILLINOIS
AT CHICAGO

Office for the Protection of Research Subjects (OPRS)
Office of the Vice Chancellor for Research (MC 672)
203 Administrative Office Building
1737 West Polk Street
Chicago, Illinois 60612-7227

Approval Notice
Initial Review (Response To Modifications)

June 3, 2015

Nisha D. Mehta, DDS
Pediatric Dentistry
801 S. Paulina
Room 267, M/C 850
Chicago, IL 60612
Phone: (630) 423-6474 / Fax: (312) 413-8006

RE: Protocol #2015-0465
"General Anesthesia versus Moderate Sedation: Parental Preferences for Children's Dental Treatment"

Dear Dr. Mehta:

Your Initial Review (Response To Modifications) was reviewed and approved by the Expedited review process on May 18, 2015. You may now begin your research.

Please note the following information about your approved research protocol:

Protocol Approval Period: May 18, 2015 - May 17, 2016
Approved Subject Enrollment #: 300
Additional Determinations for Research Involving Minors:
These determinations have not been made for this study since it has not been approved for enrollment of minors.

Performance Sites:
UIC
Sponsor:
None
PAF#:
Not applicable
Research Protocol:

a) General anesthesia versus moderate sedation: parental preferences for children’s dental treatment; Version 2, 05/11/2015

Recruitment Material:

a) English/Spanish Script for Research Study; Version 2, 06/03/2015

Informed Consents:

a) Sedation Survey - Spanish; Version 8, 05/11/2015
b) General Anesthesia Survey - English; Version 8, 05/11/2015
c) Sedation Survey - English; Version 8, 05/11/2015

Phone: 312-996-1711 http://www.uic.edu/depts/ovcr/oprs/ FAX: 312-413-2929
d) General Anesthesia Survey - Spanish; Version 8, 05/11/2015

e) A waiver of documentation of consent (waiver of signature on consent) and an alteration of consent have been granted for this survey under 45 CFR 46.117(c)(1), minimal risk; identifiers will not otherwise be retained; information sheet will be provided.

f) A waiver of documentation of consent (waiver of signature on consent) and an alteration of consent have been granted for screening under 45 CFR 46.117(c)(1), minimal risk; if subjects decline/ineligible contact data will not be retained; verbal consent for screening will be obtained.

Assent:

a) Waiver of assent has been granted under 45 CFR 46.116(d) for children as secondary subjects of the survey; minimal risk; for identifiable data collected from parent/guardian subjects and obtaining assent from a child would be more intrusive and present more risk than waiver.

Parental Permission:

a) A waiver of parental permission and assent has been granted under 45 CFR 46.116(d) for access to medical records for recruitment purposes; minimal risk.

HIPAA Authorization:

a) The Board determined that this research meets the regulatory requirements for waiver of HIPAA authorization for accessing records via medical scheduling software as permitted. The research involves no more than a minimal risk to the privacy of the individuals; the research could not practicably be conducted without the waiver; and the research could not practicably be conducted without access to and use of the PHI.

Your research meets the criteria for expedited review as defined in 45 CFR 46.110(b)(1) under the following specific category:

(7) Research on individual or group characteristics or behavior (including but not limited to research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Please note the Review History of this submission:

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Please remember to:

➔ Use your research protocol number (2015-0465) on any documents or correspondence with the IRB concerning your research protocol.

➔ Review and comply with all requirements on the OPRS website under:

"UIC Investigator Responsibilities, Protection of Human Research Subjects"
(http://tigger.uic.edu/depts/ovcr/research/protocolreview/irb/policies/0924.pdf)
Please note that the UIC IRB has the right to seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

Please be aware that if the scope of work in the grant/project changes, the protocol must be amended and approved by the UIC IRB before the initiation of the change.

We wish you the best as you conduct your research. If you have any questions or need further help, please contact OPRS at (312) 996-1711 or me at (312) 996-9299. Please send any correspondence about this protocol to OPRS at 203 AOB, M/C 672.

Sincerely,

Anna Bernadska, M.A.
IRB Coordinator, IRB #2
Office for the Protection of Research Subjects

Enclosures:

1. Informed Consent Documents:
   a) General Anesthesia Survey - English; Version 8, 05/11/2015
   b) Sedation Survey - English; Version 8, 05/11/2015
   c) Sedation Survey - Spanish; Version 8, 05/11/2015
   d) General Anesthesia Survey - Spanish; Version 8, 05/11/2015

2. Recruiting Material:
   a) English/Spanish Script for Research Study; Version 2, 06/03/2015

cc: Marcio Da Fonseca, Pediatric Dentistry, M/C 850
    David Avenetti, Faculty Sponsor, Pediatric Dentistry, M/C 850
Dear Parent or Guardian,

If you are the parent or legal guardian of a child who is 2 to 10 years old, you are invited to take this survey. Additionally, please only complete this survey if your child is here for a General Anesthesia “work-up” appointment. For the purposes of this study, we are not including children using nitrous oxide alone (also known as “laughing gas”). This survey is a part of the UIC research study.

We are interested in determining what factors might have influenced your decision to have your child treated using General Anesthesia. Please review the definition below for additional information.

Participation is voluntary and will not affect your child’s dental care. The survey is anonymous and does not include your name or your child’s name. If you choose not to participate, there is no impact on your child’s treatment at UIC and no information will be shared with your child’s dentist. We anticipate no risks or benefits as a result of completing this survey.

If you choose to participate in the survey, we ensure that no personal identifiers will be collected. The information you provide is confidential and will be used for research purposes only. We will combine your responses from the survey with those of other participants and analyze all responses as a group. The data will be stored in a password protected electronic format and all physical copies of the surveys will be stored in a locked filing cabinet. No one will be able to identify your answers and no one will know whether or not you participated in the study.

The survey should take about ten to fifteen minutes to complete. When you have finished, or if you choose not to participate, please place the survey in the envelope provided and return the envelope to the front desk or your child’s dentist. If you have previously completed this survey, please do not fill it out again. You may skip any questions that you do not feel comfortable answering.

Please contact Dr. Mehta or Dr. Avenetti (contact information below) if you would like additional information about the study. You may also contact the UIC Office for the Protection of Research Subjects (uicirb@uic.edu or 866-789-6215) if you have any questions or concerns about this study. You may keep this information sheet for your records and if you want to ask questions or express concerns later. Thank you for your participation and time!

**Definition**

General Anesthesia: “General anesthesia is a controlled state of unconsciousness that eliminates awareness, movement and discomfort during dental treatment. A physician or dentist with specialized training can use various medications to provide General Anesthesia for patients receiving dental care.”


**Principle Investigator:** Nisha Mehta, DDS - (312)996-1990 - ndmehta2@uic.edu

**Primary Faculty Advisor:** David Avenetti, DDS, MSD, MPH - (312) 996-2046 -avenetti@uic.edu

General Anesthesia Survey-English
Version 8: May 11, 2015
General anesthesia versus moderate sedation:
Parental preferences for children’s dental treatment

Please Continue to the Next Page ➔
Section I: Inclusion Criteria

1. Are you the parent or legal guardian for the child you brought today?
   1. Yes
   2. No

2. Please indicate your child’s overall health status:
   1. Healthy
   2. Mild health conditions (well-controlled, do not affect daily life activities)
   3. Moderate health conditions (conditions somewhat affect daily life activities)
   4. Severe health conditions (conditions that affect daily life activities and are a threat to life)

   If your child has one or more health condition(s), please specify:

3. My child is here today for:
   1. Moderate Sedation (also known as Oral Sedation or Conscious Sedation)
   2. General Anesthesia “work-up”
   3. Other dental treatment, please specify: __________________

4. What is the primary language spoken in your household?
   1. English
   2. Spanish
   3. Other, please specify: __________________

5. How old is your child receiving treatment today? ______ years
Section II: Demographics

6. What is your child’s gender?
   1. Male
   2. Female

7. What is your age? ______ years

8. What is your gender?
   1. Male
   2. Female

9. What is your racial background? (circle all that apply)
   1. White/Caucasian
   2. Black or African-American
   3. Asian or Pacific Islander
   4. American Indian or Alaska Native
   5. Other, please specify: ____________________

10. Are you of Hispanic or Latino origin?
    1. Yes
    2. No

11. What is your current marital status?
    1. Single or Never been married
    2. Married
    3. Separated, Divorced, or Widowed
    4. Other, please specify: ____________________

12. How many adults including yourself, live in your household? ______

13. How many people under 18 years old live in your household? ______

14. What is the highest level of education you have completed?
    1. Less than high school
    2. High school graduate (or equivalent)
    3. Some college or vocational
    4. Bachelor’s degree
    5. Graduate or professional degree

15. What was your annual household income last year (2014)?
    1. Less than $20,000
    2. $20,000-$29,999
    3. $30,000-$39,999
    4. $40,000-$49,999
    5. $50,000 or greater
Section III: Dental History

16. Who makes decisions about dental treatment for your child?
   1. Primarily you
   2. Both you and your significant other
   3. Primarily your significant other
   4. Someone else, please specify: __________________

17. How would you assess your child’s oral health?
   1. Excellent (no cavities or disease)
   2. Good (few cavities or limited disease)
   3. Fair (some cavities or moderate disease)
   4. Poor (many cavities and/or dental infection)

18. How would you assess your oral health?
   1. Excellent (no cavities or disease)
   2. Good (a few cavities or limited disease)
   3. Fair (some cavities or moderate disease)
   4. Poor (many cavities and/or dental infection)

19. What type of dental insurance does your child have?
   1. Dental public aid / Medical card / Medicaid
   2. Private Insurance
   3. Self-pay (no insurance)
   4. Other, please specify: __________________

20. Has your child had a history of Moderate (oral/conscious) Sedation or General Anesthesia for any dental procedure?
   1. Yes
   2. No

21. Has anyone in your household had a history of Moderate (oral/conscious) Sedation or General Anesthesia for any dental procedure?
   1. Yes
   2. No
Section IV: Caregiver Knowledge

22. How would you rate your knowledge about General Anesthesia?
   1. High
   2. Moderate
   3. Low

23. Please indicate who has provided you information about General Anesthesia:
    (Select all that apply)
    1. Dentist
    2. Medical Doctor/Physician
    3. Family
    4. Friends
    5. Internet
    6. Other____________
    7. No one

24. How would you rate your knowledge about Moderate Sedation?
    1. High
    2. Moderate
    3. Low

25. Please indicate who has provided you information about Moderate Sedation:
    (Select all that apply)
    1. Dentist
    2. Medical Doctor/Physician
    3. Family
    4. Friends
    5. Internet
    6. Other____________
    7. No one
Section V: Caregiver Preferences

Please indicate how strongly you agree or disagree with the following statements:

*I choose for my child to be treated under General Anesthesia because…*

26. I am well informed about it.
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

27. It is what the dentist recommended.
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

29. It costs me less (out-of-pocket expenses) than moderate sedation.
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

30. The costs are covered by my child’s insurance.
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

31. I thought it was best due to my child’s behavior at the dentist.
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree
32. There are fewer risks involved compared to moderate sedation.
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

33. Of my child's age:
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

34. I will miss the fewest number of days from work:
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

35. My child will miss the fewest number of days from school:
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree
Section VI: Other Considerations

36. How many days are you willing to miss work for your child’s dental treatment?
   1. 0-1 days
   2. 2-3 days
   3. 4-5 days
   4. More than 5 days

37. How many days are you willing to take your child out of school for dental treatment?
   1. 0-1 days
   2. 2-3 days
   3. 4-5 days
   4. More than 5 days

38. How many appointments do you expect it will take to complete your child’s dental treatment?
   1. 1-2 appointments
   2. 3-4 appointments
   3. 5-6 appointments
   4. More than 6 appointments
Section VII: General Anesthesia Questions

Please indicate how strongly you agree or disagree with the following statements:

*I choose for my child to be treated under General Anesthesia because…*

39. My child will be asleep.
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

40. All the treatment would be completed in one visit.
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

41. I am willing to wait for this option to be available.
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

42. I have tried all other treatment options for my child.
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

43. General Anesthesia is the only reason I came to UIC.
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

44. How many months are you willing to wait before your child is treated under General Anesthesia?
   1. 3 months or Less
   2. 4-6 months
   3. 7-9 months
   4. 10-12 months
Dear Parent or Guardian,

If you are the parent or legal guardian of a child who is 2 to 10 years old, you are invited to take this survey. Additionally, please only complete this survey if your child is here for a first-time Sedation appointment. For the purposes of this study, we are assuming Oral Sedation, Moderate Sedation and Conscious Sedation all mean the same thing. For the purposes of this study, we are not including children using nitrous oxide alone (also known as “laughing gas”). This survey is a part of the UIC research study.

We are interested in determining what factors might have influenced your decision to have your child treated using Sedation. Please review the definition below for additional information.

Participation is voluntary and will not affect your child’s dental care. The survey is anonymous and does not include your name or your child’s name. If you choose not to participate, there is no impact on your child’s treatment at UIC and no information will be shared with your child’s dentist. We anticipate no risks or benefits as a result of completing this survey.

If you choose to participate in the survey, we ensure you that no personal identifiers will be collected. The information you provide is confidential and will be used for research purposes only. We will combine your responses from the survey with those of other participants and analyze all responses as a group. The data will be stored in a password protected electronic format and all physical copies of the surveys will be stored in a locked filing cabinet. No one will be able to identify your answers and no one will know whether or not you participated in the study.

The survey should take about ten to fifteen minutes to complete. When you have finished, or if you choose not to participate, please place the survey in the envelope provided and return the envelope to the front desk or your child’s dentist. If you have previously completed this survey, please do not fill it out again. You may skip any questions that you do not feel comfortable answering.

Please contact Dr. Mehta or Dr. Avenetti (contact information below) if you would like additional information about the study. You may also contact the UIC Office for the Protection of Research Subjects (uicirb@uic.edu or 866-789-6215) if you have any questions or concerns about this study. You may keep this information sheet for your records and if you want to ask questions or express concerns later. Thank you for your participation and time!

**Definition**

Moderate Sedation: “is a technique to guide a child’s behavior during dental treatment. Medications are used to help increase the cooperation and reduce the anxiety or discomfort associated with dental procedures. Sedative medications cause most children to become relaxed or drowsy. Unlike general anesthesia, sedation is not intended to make a patient unconscious or unresponsive.”


**Principal Investigator:** Nisha Mehta, DDS - (312)996-1990 - ndmehta2@uic.edu
**Primary Faculty Advisor:** David Avenetti, DDS, MSD, MPH- (312) 996-2046 - avenetti@uic.edu

Sedation Survey-English
Version 8: May 11, 2015
General anesthesia versus moderate sedation:
Parental preferences for children’s dental treatment

Please Continue to the Next Page →
Section I: Inclusion Criteria

1. Are you the parent or legal guardian for the child you brought today?
   1. Yes
   2. No

2. Please indicate your child’s overall health status:
   1. Healthy
   2. Mild health conditions (well-controlled, do not affect daily life activities)
   3. Moderate health conditions (conditions somewhat affect daily life activities)
   4. Severe health conditions (conditions that affect daily life activities and are a threat to life)

   If your child has one or more health condition(s), please specify:

3. My child is here today for:
   1. Moderate Sedation (also known as Oral Sedation or Conscious Sedation)
   2. General Anesthesia “work-up”
   3. Other dental treatment, please specify: __________________

4. What is the primary language spoken in your household?
   1. English
   2. Spanish
   3. Other, please specify: __________________

5. How old is your child receiving treatment today? _______ years
Section II: Demographics

6. What is your child's gender?
   1. Male
   2. Female

7. What is your age? _______ years

8. What is your gender?
   1. Male
   2. Female

9. What is your racial background? (circle all that apply)
   1. White/Caucasian
   2. Black or African-American
   3. Asian or Pacific Islander
   4. American Indian or Alaska Native
   5. Other, please specify: _____________________

10. Are you of Hispanic or Latino origin?
    1. Yes
    2. No

11. What is your current marital status?
    1. Single or Never been married
    2. Married
    3. Separated, Divorced, or Widowed
    4. Other, please specify: _____________________

12. How many adults including yourself, live in your household? ________

13. How many people under 18 years old live in your household? ________

14. What is the highest level of education you have completed?
    1. Less than high school
    2. High school graduate (or equivalent)
    3. Some college or vocational
    4. Bachelor's degree
    5. Graduate or professional degree

15. What was your annual household income last year (2014)?
    1. Less than $20,000
    2. $20,000-$29,999
    3. $30,000-$39,999
    4. $40,000-$49,999
    5. $50,000 or greater
Section III: Dental History

16. Who makes decisions about dental treatment for your child?
   1. Primarily you
   2. Both you and your significant other
   3. Primarily your significant other
   4. Someone else, please specify: __________________

17. How would you assess your child’s oral health?
   1. Excellent (no cavities or disease)
   2. Good (few cavities or limited disease)
   3. Fair (some cavities or moderate disease)
   4. Poor (many cavities and/or dental infection)

18. How would you assess your oral health?
   1. Excellent (no cavities or disease)
   2. Good (a few cavities or limited disease)
   3. Fair (some cavities or moderate disease)
   4. Poor (many cavities and/or dental infection)

19. What type of dental insurance does your child have?
   1. Dental public aid / Medical card / Medicaid
   2. Private Insurance
   3. Self-pay (no insurance)
   4. Other, please specify: __________________

20. Has your child had a history of Moderate (oral/conscious) Sedation or General Anesthesia for any dental procedure?
   1. Yes
   2. No

21. Has anyone in your household had a history of Moderate (oral/conscious) Sedation or General Anesthesia for any dental procedure?
   1. Yes
   2. No
Section IV: Caregiver Knowledge

22. How would you rate your knowledge about General Anesthesia?
   1. High
   2. Moderate
   3. Low

23. Please indicate who has provided you information about General Anesthesia:
   (Select all that apply)
   1. Dentist
   2. Medical Doctor/Physician
   3. Family
   4. Friends
   5. Internet
   6. Other____________
   7. No one

24. How would you rate your knowledge about Moderate Sedation?
   1. High
   2. Moderate
   3. Low

25. Please indicate who has provided you information about Moderate Sedation:
   (Select all that apply)
   1. Dentist
   2. Medical Doctor/Physician
   3. Family
   4. Friends
   5. Internet
   6. Other____________
   7. No one
Section V: Caregiver Preferences

Please indicate how strongly you agree or disagree with the following statements:

I choose for my child to be treated under Moderate Sedation because…

26. I am well informed about it.
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

27. It is what the dentist recommended.
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

29. It costs me less (out-of-pocket expenses) than general anesthesia.
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

30. The costs are covered by my child’s insurance.
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

31. I thought it was best due to my child’s behavior at the dentist.
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree
32. There are fewer risks involved compared to general anesthesia.
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

33. Of my child's age:
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

34. I will miss the fewest number of days from work:
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

35. My child will miss the fewest number of days from school:
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree
Section VI: Other Considerations

36. How many days are you willing to miss work for your child's dental treatment?
   1. 0-1 days
   2. 2-3 days
   3. 4-5 days
   4. More than 5 days

37. How many days are you willing to take your child out of school for dental treatment?
   1. 0-1 days
   2. 2-3 days
   3. 4-5 days
   4. More than 5 days

38. How many appointments do you expect it will take to complete your child's dental treatment?
   1. 1-2 appointments
   2. 3-4 appointments
   3. 5-6 appointments
   4. More than 6 appointments
Section VII: Moderate Sedation Questions

Please indicate how strongly you agree or disagree with the following statements:

I choose for my child to be treated under Moderate Sedation because…

   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

40. All the treatment will be completed in fewer appointments than using nitrous oxide ("laughing gas") alone.
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

41. There is a shorter wait for this option compared to General Anesthesia.
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

42. The dentist wanted to try Moderate Sedation before considering General Anesthesia.
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

43. Moderate Sedation is the only reason I came to UIC.
   1. Strongly Disagree
   2. Disagree
   3. Neutral or Undecided
   4. Agree
   5. Strongly Agree

44. How many months are you willing to wait before your child is treated under Moderate Sedation?
   1. 1 month or Less
   2. 2 months
   3. 3 months
   4. 4 months or More
APPENDIX D

Script to be used by the assigned dentist when handing the envelope with survey enclosed to the parent or legal guardian of patient (child):

ENGLISH:

Hello, my name is [insert name]. Do you prefer speaking and writing in English or Spanish? I am distributing a survey for a colleague of mine who is conducting a research study about "General anesthesia versus moderate sedation: Parental preferences for children's dental treatment." All information regarding the survey is provided on the cover sheet. Please read the cover sheet before participating. If you choose to participate, please complete the survey to the best of your ability, place it back in the envelope, and return it to me. If you choose not to participate please place the survey back in the envelope, and return it to me. I will not be reviewing your survey responses and it will not affect your child's dental treatment. Thank you for your time.

SPANISH:

Hola, mi nombre es [insert name]. ¿Ud. prefiere hablar y escribir en inglés o español? Estoy distribuyendo una encuesta para una de mi colega que está haciendo un investigación sobre "La anestesia general frente sedación moderada: preferencias de los padres para el tratamiento dental de los niños." Toda la información sobre la encuesta se proporciona en la portada. Por favor, lea la portada antes de participar. Si decide participar, por favor complete la encuesta a mejor que pueda, lo coloca en el sobre, y devolverlo a mí. Si decide no participar, por favor coloque la encuesta en el sobre, y devolverlo a mí. No voy a revisar sus respuestas de la encuesta y no va a afectar el tratamiento dental de su hijo. Gracias por su tiempo.
APPENDIX E

Flow chart for identifying eligible participants, distributing the survey, and collecting surveys

1. **PI identifies subjects to administer surveys to using the Axium Scheduler**
2. **Eligible subject appointments are labeled either under "Sedation" or "GA Work-Up"**
3. **Eligible patients (ages 2-10) are identified**
4. **PI identifies the age of the patient from the Axium Scheduler**
5. **PI provides the patient's doctor with survey envelope to give to legal guardian of patient**
   - OR
   - **PI distributes survey envelope to legal guardian of patient**
6. **PI or patient's doctor reads script to research participant in English or Spanish**
7. **Participants return survey envelope to PI, patient's doctor or auxiliary clinic staff to return to PI**
8. **Participants complete the survey to the best of their ability and comfort level**
VITA

Nisha D. Mehta, D.D.S.

Education:

2014 – Present
University of Illinois at Chicago – College of Dentistry
Pediatric Dentistry Residency, PGY2, Chief Resident
Masters in Oral Sciences,
Projected Completion: June 2016

2010 – 2014
University of Illinois at Chicago – College of Dentistry
Doctor of Dental Surgery: 2014
Honors: Omicron Kappa Upsilon National Dental Honors Society

2007 – 2010
University of Illinois at Chicago
Major: Biological Sciences. Minor: Spanish
Bachelor of Sciences: 2010
Honors: Phi Beta Kappa Honors Society

2004 – 2007
Illinois Mathematics and Science Academy
Boarding Public Magnet High School
High School Diploma: 2007

Board Examinations:

NBDE Part I – Pass
NDBE Part II – Pass

Licensure:

NERB Licensure Exam – Pass
Illinois State Dental License
Illinois State Controlled Substance License
Texas State Dental License

Work Experiences:

Family Dental Care
Calumet City, IL
General dentist associate treating children and adolescents during residency
Publications:


Presentations:

2016  General Anesthesia versus Moderate Sedation: Factors Affecting Caregivers' Decisions for Children's Dental Treatment
*Presented at the UIC Clinic and Research Day, Chicago, IL*
*Presented at the Illinois Society of Pediatric Dentists Spring Meeting, Chicago, IL*
*Presented at the American Associate of Pediatric Dentistry (AAPD) Annual Meeting, San Antonio, TX*

2015  Orthodontic Considerations for Children with Cerebral Palsy: A case Report and Review of the Literature
*Presented at the UIC Clinic and Research Day, Chicago, IL*

2013  Special Considerations in Dental Management of Children with Autism
*Presented at the UIC Clinic and Research Day, Chicago IL*

2012  CD4+ and CD8+ T Cells in Murine Wound Healing Models
*Presented at the Association for Dental Research (AADR) Annual Meeting, Tampa, FL*
*Presented at the UIC Clinic and Research Day, Chicago IL(2011)*

Research:

2014 – Present  General Anesthesia versus Moderate Sedation: Factors Affecting Caregivers' Decisions for Children's Dental Treatment With Dr. David Avenetti – UIC College of Dentistry Department of Pediatric Dentistry

2010 - 2012  CD4+ and CD8+ T Cells in Murine Wound Healing Models with Drs. Lin Chen and Luisa DiPietro – UIC College of Dentistry Center for Wound Healing and Tissue Regeneration, Chicago, IL
Honors and Awards:

- 2016: Dr. Indru C. Punwani Graduate Student Research Award
- 2014-Present: Omicron Kappa Upsilon National Dental Honors Society
- 2014: Dental Lifeline Network Outstanding Students Award
- 2014: American Academy of Esthetic Dentistry Award
- 2014: American Academy of Orofacial Pain Award
- 2014: Delta Dental Plan of Illinois Outstanding Dental Students Award
- 2014: Walter E. Dundon Memorial Award
- 2013-2014: Albert Schweitzer Fellowship - Chicago
- 2013: Dr. Marshall W. Milnarik Scholarship Award
- 2012: DENTSPLY-Caulk National Student Research Group Award 2nd Place
- 2011: Omicron Kappa Upsilon Best Basic Science Research Award
- 2011: Johnson & Johnson Predoctoral Student Basic Science Research Award
- 2010: Isaac Schour Research Scholarship
- 2010-Present: Phi Beta Kappa Honors Society, 2010

Affiliations:

- 2014 – Present: American Academy of Pediatric Dentistry (AAPD)
- 2010 – Present: American Dental Association (ADA)
- 2010 – Present: Chicago Dental Society (CDS)
- 2010 – Present: Delta Sigma Delta (DSD)
- 2013 – 2014: Special Care Dental Association (SCDA)

Additional Language Proficiencies:

- Spanish & Gujarati