

Experiences of Children Undergoing Dental Treatment Under General Anesthesia: A Qualitative
Study in Canada

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By

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Abstract

With the current move in childhood medicine away from a disease-centered approach to a child-centered approach, an interest in involving children in all aspects of their medical care has emerged. This requires healthcare providers to listen to children's (and families') opinions regarding illness, treatment, and health services. Dental treatment under general anesthesia (DTGA) is a common yet problematic approach due to cost and safety concerns for managing severe dental caries in children. The purpose of this qualitative inquiry was to explore children's and parents'¹ experiences of DTGA, focusing on the emotional and psychological effects. Semi-structured, in-person interviews, telephone interviews, video diaries, drawings, and a family background information form were used to collect data to gain further understanding of child patients' experiences of DTGA as they move through the stages of health, illness, treatment, and recovery. A qualitative descriptive design is the methodology of choice when a researcher seeks rich description of a phenomenon about which little is known. The study was designed from a qualitative perspective and thematic analysis was used to analyze data. Brief narrative accounts of the experience of DTGA from the perspective of child patients (children's drawings, video diaries, and selected parts of the interviews) and their parents (selected parts of the interviews) were constructed. The findings from 12 children (mean age 6.1 years) and their parents (12 mothers and one father, mean age 33.6 years) indicated DTGA is a frightening procedure from the perspectives of both children and parents: parents wished that their children could avoid this "hard route," and children found the use of the anesthetic gas and balloon procedure "stinky" and "weird." Parental guilt and the desire of both parents and children to not have to go through the

¹ In all the American Academy of Pediatric Dentistry (AAPD) clinical practice guidelines, the term "parent" has a broad meaning encompassing a natural/biological father or mother of a child with full parental legal rights, a custodial parent who in the case of divorce has been awarded legal custody of a child, a person appointed by a court to be the legal guardian of a minor child, or a foster parent (AAPD, 2015). In this thesis, the use of the term parent is based upon who is important to the child and who is affected by the child's procedure.

experience again fueled at least short-term compliance with brushing, flossing, and changes in dietary habits such “cutting down on” the consumption of sugar, "pop" and “junk” food. The parents appreciated managing the child’s whole dental problem in a single visit, the humane nature of the surgical staff, and the short wait times to get an appointment for the dental surgery. Since the study revealed that DTGA can have negative emotional impacts for both children and parents, it is imperative to explore ways to improve the GA experience. Specific recommendations were provided by participants for optimizing dental and health services for the children and their families. The children participants provided valuable information to augment that gathered from parents. As children provided insights about dental and medical experiences have scarcely been previously described, future research should fully incorporate children’s perspectives in the evaluation of dental and medical services. Creative activities used here with children as research tools, such as drawings and video or audio diaries, could be included in future research.

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The biggest thank you goes to the families—parents and children—who agreed to take part in this study. They opened their hearts to an *outsider* and shared their experiences about undergoing dental general anesthesia.

Dedication

I dedicate this dissertation to the memory of two great men, teachers in my life:

- My Dad, **Osman Al Baghdadi**, a high-school teacher and principal, whose lifetime dedication to his students and their education has inspired me and instilled in me the love of teaching and learning and
- my university teacher, **Professor Nabih Khurdaji**, the godfather of pediatric dentistry in my hometown in Syria, who intentionally or unintentionally instilled in me the love of dentistry for children. His devotion to his career and students was exemplary. To him, *“education is not the filling of a pail, but the lighting of a fire.”*

To both men, I say and pray:

Rest in peace and be assured your good deeds will never go unrewarded!

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Picture 3 (C1-5Y-Post2). This drawing by the child shows herself lying in her own bed at home after surgery with a tooth fairy next to her bed. (The child’s signature was removed.)

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Picture 24 (C5-6Y-Post1). Child 5's post-op drawing shows the child in the OR lying in a hospital bed with her head on a pillow and a female dentist standing next to her bed with a smiley face. The cords used to hook up the OR equipment are depicted in two colors.

Picture 25 (C5-6Y-Post2). This picture shows the parents talking to the dentist at her office.

Picture 26 (C5-6Y-Post3). A third drawing by the child depicts her sleeping in bed wearing her pajamas.

Picture 27 (C5-6Y-Post4). The fourth drawing depicts the teddy bear the child got from the "hospital surgery."

Picture 28 (C5-6Y-Post5). Child 5 drew herself lying on a bed and holding the teddy bear.

Picture 29 (C5-6Y-Post6). In her sixth drawing, child 5 again depicted herself lying in the hospital bed with three "doctors dentist," in addition to her mother, next to her bed.

Picture 30 (C5-6Y-Post7). Child 5 drew herself and her teeth, which were not "white all the way."

Picture 31 (C7-4Y-Pre1). Child 7 is in the pre-schematic stage of drawing. The child narrated that she drew three teeth and a tooth fairy that looks like a butterfly. The teeth and butterfly all feel sick because they have holes.

Picture 32 (C7-4Y-Pre2). Similar to Picture 31, the child narrated that she drew three teeth and a tooth fairy that looks like a butterfly. The teeth and butterfly all feel sick because they have holes.

Picture 33 (C7-4Y-Post1). Child 7 narrated that she drew a “black dragon” with “a lot of arms,” and a smiley face of her stuffy, “Suzy Sheep.”

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Picture 35 (C8-5Y-Pre1). Child 8 drew herself lying in a bed with a tooth fairy next to her. “The child is happy because of money coming from the tooth fairy.”

Picture 36 (C8-5Y-Pre2). Child 8 drew herself sitting on a dental chair with her mother next to her.

Picture 37 (C9-6Y-Pre1). Child 9’s pre-op drawing depicts the Sun, clouds, and the town-house he lives in now.

Picture 38 (C9-6Y-Pre2). Child 9’s next pre-op drawing shows his mouth, teeth, and tongue. He commented: “This tooth has a cavity.” (The child’s signature was removed.)

Picture 39 (C9-6Y-Post1). Child 9’s post-op drawing shows the operating room where he was lying down on a bed, along with a mask and two doctors next to him, and his nine extracted teeth. The OR has two windows.

Picture 40 (C9-6Y-Post2). Child 9 drew a home in his post-op interview, similar to the one he drew in the pre-op interview.

Picture 41 (C9-6Y-Post3). Child 9 drew his nine extracted teeth (The child's signature was removed.)

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Chapter 1: Introduction to the Study

Dental caries is the most common chronic disease in children (Bagramian, Garcia-Godoy, & Volp, 2009). Despite the remarkable decrease in caries in the last few decades—particularly in developed countries—its high prevalence in certain segments of the population (e.g., children and adolescents, the economically disadvantaged, and other underserved populations), its burden (e.g., cost and absences from work or school), and other negative ramifications (e.g., pain, lack of sleep, and in severe cases, death) necessitate more effort from the public, organized dentistry, and government to control the epidemic nature of oral disease (Allukian, 2008, World Health Organization [WHO], 2015). The estimated direct cost of dental disease was US\$356.80 billion and indirect costs were estimated at \$187.61 billion, totalling worldwide costs of \$544.41 billion in 2015. The corresponding numbers for high-income North America were \$131.20 billion and \$50.64 billion, respectively. The estimated productivity losses due to untreated caries in primary teeth in high-income North America were \$223,617,180 (Righolt, Jevdjevic, Marcenes, & Listl, 2018). It is estimated that total expenditures on dental services in Canada in 2015 amounted to \$13.6 billion. Approximately 60% of all private dental care expenditures originate from private insurance sources and 40% directly out-of-pocket (Canadian Dental Association [CDA], 2017).

Full-mouth dental treatment under general anesthesia (DTGA) is a common approach for management of severe dental caries in children (Amin, Nouri, ElSalhy, Shah, & Azarpazhooh, 2015). With the current trend towards decreasing proportions of public funding going to dental care in Canada (Rowan-Legg, 2013), DTGA requires clear evidence of its benefits for children and their parents, including evaluation of the impact of DTGA on children and families. This study will add to the understanding of the factors involved when making the decision whether (or not) to undergo DTGA from both the child patient and parental viewpoints, and the effect of the

DTGA on quality of life (QoL) and fear before and after DTGA, as reported by the children undergoing the treatment and their parents. This is in line with the Canada's current Strategy for Patient-Oriented Research (SPOR), (CIHR, 2012) considering that little research has been done in the area.

Epidemiological studies exploring caries in Canadian children point out all children are at risk of caries, but children living in poverty are at greater risk (Amin et al., 2015). Early childhood caries (ECC) is a particularly serious form of caries, affecting primary teeth in children. ECC affects about 7% of preschoolers in Saskatchewan (Pilly, 2010), lower than the national average of an estimated 25% of children affected (Ontario Dental Association, 2008). These statistics are averages and underestimate the problem of childhood caries for both preschoolers and schoolchildren in rural communities and northern territories who experience a higher level of caries compared to peers in urban and southern areas (Leake, Jozzy, & Uswak, 2008). The decayed, missing and filled primary teeth (dmft) of Canadian Indigenous children ranges from 3.1 to 13.7 depending on the community, with ECC affecting 90% of children in some Canadian Indigenous communities (Smith, F.A. Blinkhorn, A. S. Blinkhorn, & Hawke, 2018). In the September 2007 issue of *Journal of the Canadian Dental Association*, Smith (2007) reported, "With few exceptions, there is agreement on the subject of dental caries: more young children have early childhood caries, school-age children frequently have interproximal caries" (p. 555). Evidence shows dental decay, particularly in severe forms, adversely affects the quality of life for young children; caries can lead to pain, infection, abscesses, malnutrition, and gastrointestinal problems, all affecting children's daily routines (Alkarimi et al., 2012; Alkarimi, Watt, Pikhart, Shiham, & Tsakos, 2014; Poureslami & Van Amerongen, 2009). In connection to the subject matter of this thesis, a comprehensive review of the literature revealed that there is a

paucity of evidence elucidating effects of DTGA on children and parents (Chapman & Kirby-Turner, 2018; Seligman et al., 2017).

When severe, ECC treatment is done under general anesthesia. Despite the increased risk and cost of dental treatment under general anesthesia (DTGA) compounded by wait times that delay treatment, DTGA is considered effective as it enables a dentist to perform complete rehabilitation of a child's dentition in one visit and mitigate the possible psychological trauma associated with multiple visits (American Academy of Pediatric Dentistry [AAPD], 2008-2009; Chen, Hsieh, Hsu, Wu & Shih, 2017; Mittal & Sharma, 2012). It was reported ECC-related day surgery for children occurred at 35 per 1,000 child population in Saskatchewan in 2011-2012, with 3,886 operations conducted (Canadian Institute for Health Information [CIHI], 2013a). In the Saskatoon Health Region (SHR)², approximately 700 children ages 2-12 receive dental treatment under GA in the SHR facilities every year (L. Topola., SHR, personal communication, January 7, 2016).

In recent years, more attention in both research and practice has focused on treating disease and improving patient QoL, in line with the goal of patient-centered care. Health-related QoL (HRQoL) is multidimensional, including physical (e.g., pain), psychological (e.g., anxiety and fear), and social (e.g., being teased) constructs (Jokovic, Locker, Tompson, & Guyatt, 2004; Vermaire, de Jongh, & Aartman, 2008). To date, however, few studies assessed the effects of DTGA on children and their parents; studies that have been done used the oral HRQoL (OHRQoL), and this form of inquiry, due to its limited nature, may not be sensitive enough to assess the full effects on child-patients and their families. In addition, the use of pre-determined questions from the OHRQoL measures may not accurately reflect effects of DTGA important to children and parents due to the limits of the instruments. Children, especially very young

² Saskatoon Health Region has transitioned into one health authority—Saskatchewan Health Authority

children, are often considered unreliable sources of information, particularly for medical purposes (e.g., diagnosis). Parents/guardians are relied on as informants to understand children's perceptions (Chang, Patton, & Kim, 2014; Gaynor & Thomson, 2012; Marshman et al., 2005).

Exploration of children's experiences leading up to and after GA for dental treatment would be useful to better understand those experiences (K. Cantekin, Yildirim, & Cantekin, 2014). Research in this area is limited (Chapman & Kirby-Turner, 2018; Chen et al., 2017). Fear of and anxiety about dental treatment are important factors to consider managing children in a dental office (Cuthbert & Melamed, 1982; Gao Hamzah, Yin, McGrath, & King, 2013; Klinberg, 2008; Klinberg & Broberg, 2007; Nicolas et al., 2010; Poulton, Waldie, Thomson, & Locker, 2001; Quinonez, Santos, Boyar, & Cross, 1997; Ryding & Murphy, 2007; Taani, E-Qaderi, & Abu Alhaija, 2005). A main reason parents choose DTGA is negative experiences at previous dental appointments due to a child's fear (AAPD, 2008-2009; K. Cantekin et al., 2014). Little is known about children's reactions to DTGA, its effects on children, and their families. Research investigating this has yielded conflicting results (K. Cantekin et al., 2014). The few existing studies in this area were quantitative and cross-sectional, and found dental fear may have a negative effect on a child's OHRQoL, but did not explore a child's lived experience (Luoto, Lahti, Nevanpers, Tolvanen, & Locker, 2009; Goyal et al., 2014). The three published studies that used the Dental Subscale of Children's Fear Survey Schedule (CFSS-DS) (Arapostathis, Coolidge, Emmanouil, & Kotsanos, 2008; Attar & Baghdadi, 2015; Nakai et al., 2005) to measure children's dental anxiety after DTGA reported conflicting results. K. Cantekin et al. (2014) reported CFSS-DS anxiety scores were significantly higher after DTGA (32.7 vs. 37.8, $p < 0.001$); whereas Klaassen, Veerkamp, and Hoogstraten (2009) reported no statistically significant change in CFSS-DS scores as a result of DTGA.

Qualitative accounts of postoperative morbidities following tooth extraction under GA have been reported (Mittal & Sharma, 2012; Rodd et al., 2014). Mittal and Sharma studied 180 child patients (age 6-12 years) 7 days after undergoing dental procedures, using a questionnaire, essays, or drawings to collect data. The researchers found over 92% of children had positive recollections of a visit to a dentist. Younger children (6-8 years) who experienced pain during a procedure reported negative emotions regarding a procedure. Findings from Rodd et al. suggested child patients were particularly concerned with the physical effect of extraction, such as discomfort, bleeding, and limited eating ability leading to sensations of hunger. Additional concerns were nausea, vomiting, and pain associated with the use of an intravenous cannula. Despite the study's limitations, this was one of the first identifiable efforts to explore concerns from a child's perspective (Hulin, 2015).

Client and family-centred care (CFCC) considers family as integral to children's wellbeing and is widely recognized as critical to the field of child health. Family members (particularly parents) are the constant in a child's life, and CFCC as it relates to child health has historically been rooted in the principles of partnership and collaboration between parents and professionals (Shen et al., 2017). The concept of engaging patients and parents in health research aligns with the CFCC. Additionally, engaging parents recognizes their unique experiences and knowledge to contribute, increases the quality and relevance of the research, and aligns with ethical principles by allowing patients to have a voice in research (Kuo et al., 2011). This moves pediatric practice from a paternalistic model to family-centred model where parents serve as partners in care planning and delivery. The core principles of CFCC consider a family as a child's primary source of strength and support and children's and parent's perspectives and information are important in clinical decision making (American Academy of Pediatrics

Committee on Hospital Care and Institute for Patient- and Family-Centered Care, 2012; Macdonald, Liben, Carnevale, & Cohen, 2012).

Problem Statement

The motivation for this study was the scarcity of research on children undergoing DTGA. There is currently little understanding of the experience of children undergoing major dental procedures and the experiences of and their parents. This lack of understanding has the potential to negatively affect patient care, because being informed and as a result, being sensitive and responsive to the experiences, emotions, and reactions of dental patients is critical to provide proper patient-centred care. If the problem remains unaddressed, child patients may continue to experience suboptimal care, suffer negative emotions from a dental experience, affecting their wellbeing as well as their willingness to return to a dentist.

The purpose of this qualitative study was to understand the experiences of children and their parents when children underwent DTGA. This was done by interviewing a sample of children and their parents, taken from the population of individuals in Saskatoon, Saskatchewan, Canada. The method chosen was open-ended interviews, coupled with children's video diaries and drawings, intended to provide data to answer the research questions. Thematic analysis of the interview transcripts provided insight into narrative and addressed the specific research questions.

Research Questions

Building on the existing literature, this study explored child patient and parental perceptions of DTGA, considering the effect of various concerns that might play a key role in perceptions. Additionally, this dissertation focused on the impact of DTGA for pediatric dental

patients on patient and parent anxiety, knowledge, compliance with preventive instructions, and acceptability of this treatment.

The research questions, logically arranged - one building on the other, were:

- RQ1: What is the children's experience of the dental general anesthesia procedure and what are parents' views regarding GA treatment?
- RQ2: What is the impact of the GA experience on the child and parents?
- RQ3: What do parents think about their children's oral health?
- RQ4: Does a dental GA experience result in any changes to the way the child and parent approach oral health?

To answer these questions, this research focused on families whose children had been referred to receive DTGA in Saskatoon's surgical health centres. Narrative data were collected and analyzed using a qualitative method to identify significant aspects of experiences for children and parents and explore the challenges related to children's dental health.

A qualitative approach is preferred because it allows participants to describe experiences using their words, while enabling a more detailed exploration of certain topics identified by reviewing relevant literature, as well as the appearance of unanticipated concerns. By exploring these different aspects, this research bridged some of the limitations and gaps in the literature by addressing the experiences and challenges faced by families whose children undergo DTGA.

Organization of the Dissertation

In the second chapter, DTGA is explained and literature on studies of children receiving dental care is examined. The chapter also reviews the conceptual frameworks underpinning the methodology of the research. The methods are presented in Chapter 3. In Chapter 4, results are

presented, including the analysis of the children's video diaries and interviews with children/parents regarding their experience with DTGA. Further discussion of the themes in light of the literature is the goal in Chapter 5. This chapter discusses the implications of the findings for clinical care and health policymaking. This chapter also includes the key conclusions, proposed recommendations, and future directions for research.

Chapter 2: Literature Review

The review of the literature will focus on dental decay in children, emphasizing why it is a public health issue affecting an increasing number of Canadian children. I will also review the statistics on dental day surgery for children, particularly in Canada. The chapter also presents a review of the relevant qualitative and quantitative research in this area, including the use of children drawings as data in healthcare research and the theoretical perspectives that informed this research.

In searching for relevant literature, Pubmed, Medline, and GoogleScholar were queried for relevant peer-reviewed articles. The websites of dental societies such as the American Academy of Pediatric Dentistry Pediatric Oral Health Research and Policy Center, American Dental Society of Anesthesiology, and American and Canadian Dental Associations were used to find relevant studies and references that could be used to further search the literature. Preference was given to recent studies published 2010-2018, as well as original, seminal works.

Caries in Children: Etiology and Risk Factors

Globally, 621 million children have untreated caries in primary teeth, reaching peak prevalence at six years of age (Kassebaum et al., 2015). Dental caries is the most common chronic disease of childhood (Kassebaum et al.). It is an infectious, transmissible disease that results from bacteria that, after adhering to tooth structure, begin to metabolize sugars and produce acids that ultimately demineralizes tooth structure that can progress to a cavity. The three necessary requirements for the formation of dental caries over time, as shown by Miller as early as 1890, are cariogenic bacteria (dental plaque), sugar (carbohydrates), and teeth. In addition, several factors can contribute to demineralization of tooth structure, such as higher oral bacteria load (resulting in more acid production), frequent feedings (allowing less time for

remineralization), poor oral hygiene (helping plaque and sugar to remain longer), and decreased saliva production (American Academy of Pediatrics [AAP], 2015). The determinants of childhood caries are shown in Table 2.1.

Table 2.1

Determinants of Early Childhood Caries

ECC Determinants	Schroth & Moffat 2005	Schroth, Halchuk & Star 2013
<i>Lifestyle</i>		
Smoking during pregnancy	Significant increase in caries	Significant increase in caries
<i>Diet & feeding customs</i>		
Breast feeding duration	Decreased incidence not significant	Decreased incidence not significant
Bottle feeding duration	No relationship	No relationship
Daily fruit juice		Significant increase in caries
Soft drinks		Significant increase in caries
Sweets		Significant increase in caries
Fast food consumption		Significant increase in caries
<i>Child</i>		
Age	Older children—more caries	Older children—more caries
Number of children in family	Larger families—more caries	Larger families—more caries
<i>Parents</i>		
Literacy: oral health	Poor literacy—more caries	Poor literacy—more caries
Education level	Significant decrease in caries with higher education levels	Significant decrease in caries with higher education levels
Income	Significant increase in caries linked with lower income levels	Significant increase in caries linked with lower income levels

Caries in Children: Prevalence in Canada

Before 2007, there was no nation-wide information on the oral health of Canadians, which was considered a longstanding limitation within Canada's health information system. To enrich health data sets, Statistics Canada collected data for the Canadian Health Measures Survey (CHMS) from a sample representing 97% of the Canadian population aged 6 to 79 years old.

Caries in Children (aged 6 to 11 years) in Canada

The CHMS showed that 57% of 6- to 11-year-olds have or have had a cavity, with 2.5 being the average number of teeth affected by decay in this group of children. The severity of decay is calculated by the mean number of teeth that are decayed (d/D – lower case letter for primary teeth and upper case letter for permanent teeth), missing (m/M), or filled (f/F). Forty-eight percent of children 6-11 have at least one dmft: 49% of males and 46% of females. Caries is extremely prevalent among Indigenous children (84%). Other factors that affect the prevalence of decay include living in families with public insurance (61%), lower education (60%), and middle income status (55%). The mean caries severity scores for children experiencing these conditions are 3.58, 3.45, and 2.95, respectively. Among six-year-olds, 47% had one or more dmft/DMFT with a mean severity score of 2.52. Interestingly, Canadian prevalence and severity counts correspond very closely to those in the US, as reported by the National Health and Nutrition Examination Survey (NHANES, Dye et al., 2007).

Dental Caries in Inuit and First Nations Children (3 to 11 years) in Canada

The Inuit Oral Health Survey found 85.3% of preschool children (age 3 to 5 years) had experienced one or more cavities at the time of the survey (2008-2009), where the mean dmft was 8.22. For children aged six to 11 years, the prevalence was 93.4%, where dmft and DMF were

5.08 and 2.01, respectively. For six-year-olds, 86% had one or more dmft/DMFT, with a mean score of 8.3 (Health Canada, 2011).

Similarly, the First Nations Oral Health Survey (FNOHS) showed a high rate of dental caries among children ages three to five years (78.5% have at least one caries), with the mean dmf 7.62 (The First Nations Information Governance Centre, 2012). Although these results were slightly lower than those reported with Inuit, they are three to five times the rate of tooth decay in non-Indigenous children of the same age (Lawrence et al., 2009; Lawrence et al., 2004; Leake et al., 2008; Peressini et al., 2004; Pacey, Nancarrow, & Egeland, 2010; Schroth, Smith, Whalen, Lekic, & Moffatt, 2005; Schroth, Harrison, Lawrence, & Peressini, 2008). 18.7% of First Nations infants had teeth affected by tooth decay (The First Nations Information Governance Centre, 2012). For children aged six to 11 years, the caries prevalence was 93.9%, where the mean dmft/DMFT was 6.58 (these findings are very similar to those for Inuit school-age children).

National and international oral health reports consistently document the issue of oral health disparities between Indigenous and non-Indigenous populations. The most serious concerns affecting the wellness of Native populations are related to social determinants of health, including lower level of employment and education, poor and overcrowded housing, limited access to adequate and culturally-appropriate health services, the problems associated with poverty, food insecurity, and issues related to alcohol, smoking, and drug addiction (The First Nations Information Governance Centre, 2012).

The oral health status of Indigenous people in Canada and elsewhere, such as in the US, Australia, and New Zealand, places undue stress on these populations and on the dental care delivery system because the exceedingly high rates of dental decay for all ages, particularly

among young children (Parker et al., 2010), are coincident with cutting, rather than adding, services (The First Nations Information Governance Centre, 2012). An already major problem in dental health of the Indigenous population is exacerbated by a reduction in funding for services. Addressing the problem properly requires an increase, not a decrease, in services (Parker et al, 2010).

Dental Caries in Children (below 6 years) in Canada

The presence of one or more decayed, missing (due to caries), or filled tooth surface in any primary tooth in children below 71 months of age is known as early childhood caries (ECC) (Canadian Dental Association, 2010b). The advanced form of ECC, known as severe ECC (S-ECC), refers to atypical or progressive or acute or rampant patterns of dental caries (American Dental Association, 2000, 2004).

Poon, Holley, Louie, and Springinotic (2015) noted that, “most studies of dental caries in young Canadian children involved smaller, non-representative samples of subpopulations.” They reported that 36.7% of all children (ages 4 to 6 years) enrolled in kindergarten in British Columbia had dental decay in 2009/10. This was a reduction by 2.2% from a similar survey conducted in 2007/07 (rate of 38.9%). However, this was far higher than the rate reported in 1982 by Derkson and Ponti (1982)—a prevalence rate of 3.2% in 594 children (ages 9 months to 6 years) randomly selected from public health clinics and community centres in Vancouver. A similar rate (4.6%) was reported by Weinstein, Smith, Fraser-Lee, Shimono, and Tsubouchi (1996) using a random sample of 19-month-old Edmonton children. The increasing trend was reported in 2007 by the Centers for Disease Control and Prevention (CDC), which reported a significant increase of dental caries in primary teeth of children (ages 2 to 5 years) from 24% to 28% (Dye et al., 2007). ECC is an epidemic in developing countries, with prevalence rates

comparable to those in disadvantaged populations (e.g., immigrants, refugees, Indigenous) in developed countries, where it is found at rates of up to 90% (Schroth et al., 2005).

Dental Caries Prevalence in Saskatchewan

Saskatchewan (SK) is a province in west-central Canada with a total population of 1,033,381 (Statistics Canada, 2011a). The province's Indigenous population is 16%, numbering 157,740, from which 103,205 were First Nations, 52,450 Métis, 290 Inuit, and the rest reporting other Indigenous identities (e.g., more than one Indigenous identity) (Statistics Canada 2011b). In the census report, 54% of Indigenous people were under 25 (compared with 30% of the non-Indigenous population). As discussed earlier, a factor affecting overall health is that more Indigenous people live in crowded homes or homes in need of major repairs compared to non-Indigenous people. For example, 36% of on-reserve and 16% of off-reserve First Nations people lived in crowded homes compared with 3% for non-Indigenous populations.

Another difference is related to the level of education: 42% of Indigenous people ages 25 to 64 had a certificate, diploma, or degree compared to 60% for their non-Indigenous counterparts. Employment rates and median total income were also lower among Indigenous people compared to non-Indigenous people. Additionally, rates of daily smoking were higher among Indigenous people (for example, 34% of off-reserve First Nations people ages 12 and older smoked compared to 14% for their non-Indigenous counterparts; it was 29% for Métis). A similar trend was also reported for heavy drinking (Statistics Canada, 2011b).

The most recent comprehensive publication reporting on dental health in SK is that by Gill (2014). This report, which is the fifth since its introduction in 1993-94, provides an appraisal of the dental health of grade one and grade seven students. The prevalence of dental caries in primary teeth among grade one students was 61%. Among grade seven students, the prevalence

of caries was 43%, with 12.7% having at least one or more decayed permanent tooth. The average deft+DMFT for grade one and grade seven students were 3.58 and 1.68, respectively. Disparities were reported between Indigenous versus non-Indigenous students in deft+DMFT (5.05 versus 2.66), between students attending schools in rural versus urban communities (2.86 versus 2.60), between students having access to fluoridated water versus students without access to fluoridated water (2.45 versus 2.95), among children who visited a dentist in the past one year versus children who did not (2.35 versus 2.21), and between children who had dental insurance versus who did not have (2.53 versus 2.34).

Comparing these findings to those reported by the screening program in 2008-09 (Pilly, 2010) reveals that tooth decay in Saskatchewan's children remains a significant childhood problem. The results of the 2008-09 screening showed that 27.5% of grade one children and 11.2% of grade seven children had dental caries. The prevalence of ECC was set at 6.6%. Similar disparities were also reported; in response, Gerry Uswak, Dean of the College of Dentistry at the time, said this about the report: "Oral diseases are all but completely preventable yet Saskatchewan still has far too many of its residents suffering from unmet dental needs because they face access to care barriers" (Pilly, 2010, p. 10).

The poor oral health of the province's children was earlier reported in the 1968 survey, which found that 75% of these children needed restorations and 26% required extractions (dmft=5.4) (Lewis, 1977; Mathu-Muju, Friedman, & Nash, 2017). The rates of dental caries among Indigenous children in SK are as high as those reported among Indigenous children in Canada in general, and other provinces populated by Indigenous populations such as Ontario, Manitoba, Alberta, and British Columbia. In 1946, a dentist examined schoolchildren in Onion Lake, SK and found that 91% of girls and 78% of boys needed dental treatment, including

extractions and fillings. In 1949, a dentist found 180 schoolchildren out of 212 (85%) in Duck Lake, SK needed dental treatment, including extractions and fillings, which required 31 actual working days to complete (Truth and Reconciliation Commission of Canada, 2015).

Dental Caries in Special Populations (Newcomers and Refugees)

In addition to Indigenous peoples, other groups of people in Canada suffer a great burden of disease, yet have difficulty accessing care. Locker, Clarke, and Murray (1998) found that immigrant children were five times more likely to have dental caries than their counterparts born in Canada. They reported that 23% of immigrant children in North York, Ontario required restorative treatment for dental caries. Despite the high need, refugees and immigrants coming from Africa and Asia face barriers in accessing oral health care for several reasons. These can include: limited income, poor English language skills, history of inadequate care, and differences in cultural approaches and concepts for dental prevention and treatment (Federal, Provincial and Territorial Dental Working Group, 2013).

A recent scoping review by Reza et al. (2016) assessed the oral health status of the children of refugees and immigrants, as well as barriers to use of dental services in North America, through 32 relevant North American studies. Six studies were conducted in Canada (Edmonton, Alberta: Amin & Perez, 2012; Amin, Perez, & Nyachhyon, 2015; Weinstein et al., 1996; Vancouver, British Columbia: Harrison, 2003; Harrison & Wong, 2003; Montreal, Quebec: Nunez et al., 2013; Toronto, Ontario: Woodward, Leake, & Main, 1996). In general, newcomer children exhibited poorer oral health status compared with their non-newcomer counterparts. Amin et al. (2015) found that 63.7% of children below six years of age of African parents who were in Canada for less than ten years had untreated dental caries, where the mean dmfs was 11.2 (mean decayed surface [ds] was 6.9). Additionally, 61.6% of parents were

unaware of their children's poor dental status. Weinstein et al.'s (1996) study revealed that race ($P=0.0008$) and having a mother born outside of Canada ($P=0.06$) were related to higher decay rates in children (about 18 months of age). Risk factors included current bottle use, bottle propping, leaving the baby unattended with a bottle to fall asleep ($P=0.0001$), and a lower percentage reported cleaning the child's teeth ($P=0.0004$).

A study conducted by Hoover, Vatanparast, and Uswak (2016) aimed to identify the risk determinants of caries and record oral hygiene status in recent immigrant and refugee children (ages 3 to 15 years) residing in Saskatoon and Regina, the two major cities in SK. The immigrant group consisted of 44 children (mean age 8.63) and the refugee group consisted of 89 children (mean age 9.22). Refugees had higher dmft/DMFT scores compared with immigrants (5.80 ± 4.24 and 3.52 ± 3.78 , respectively, $P<0.001$). However, both groups required major treatment, including restorative treatment, scaling, and plaque control instructions. The dmft/DMFT scores obtained from this and other studies in Canada show that recent refugees and immigrants have caries rates higher than the national norm and therefore do not meet the Canadian Oral Health Strategy Guideline for children at ages six and 12 (Federal, Provincial and Territorial Dental Directors, 2005). The study also revealed that immigrants and refugees have other priorities and concerns, such as learning English as a second language and adapting to a new culture. Other issues that hinder seeking dental treatment include the high cost of dental treatment and the immigrants lacking dental insurance or the financial means to meet the cost. The problem of the lack of dental coverage associated with low income populations appears to be at the Canadian national level and is not restricted to refugees and new immigrants (Locker, Maggiri, & Quinonez, 2011). Notably, the factor in play is SES, not ethnicity or national origin.

A scoping review by Keboa, Hiles, and Macdonald (2016) was conducted to synthesize available evidence (from both quantitative and qualitative studies) on the oral health of, and access to oral health care by refugees and asylum seekers. The data were taken from 44 retained studies (five from Canada). They found the most common study designs were quantitative (75%), and studies mainly explored oral health status, knowledge and practices (91%), not interventions. Furthermore, the refugee populations in the studies showed higher burden of oral disease and limited access to oral health care compared to even the least privileged populations in the host countries.

Consequences of Childhood Caries

Poor oral health in children is a concern because dental caries is associated with tooth pain, missed school, in addition to impairment of daily life activities such as eating, smiling, concentrating in school, and sleeping, as well as academic achievement (Jurgensen & Petersen, 2009). Jackson, Vann, Kotch, Pahel, and Lee (2011) and Pham, Teitelbaum, & Ortiz (2006) reported about 52 million lost hours annually due to absences from school (which may lead to academic problems [Fox, 2011]). Seirawan, Fraust, and Mulligan (2012) found that students who had a toothache were six times more likely to miss school compared with the control group. Valencia (2015) placed health, including oral health, as one macrolevel factor, in addition to income and housing, as a major contributor to the “achievement gap” facing “students of color.” In Canada, there are an estimated 2.26 million school-days lost annually due to dental visits or dental sick-days (Health Canada, 2010).

There is general agreement that oral health status affects childhood health and wellbeing (Schroth, Harrison, & Moffatt, 2009). Williamson, Oueis, Casamassimo, and Thikkurissy (2008) report that children who frequently suffer from caries have significantly more behavioral

problems (e.g., being withdrawn, sleep problems, and attention deficit/hyperactivity problems) than those who do not. Recently, the relationship between childhood caries and childhood growth has drawn more attention. A Canadian study revealed that children affected by severe dental caries were significantly more likely to be overweight or obese compared to caries-free children (Davidson et al., 2016b). Other studies, however, linked severe caries with being underweight and failure-to-thrive, leading to low Body Mass Index (BMI) (Liang et al., 2016). Still, other studies reported no association (Kumar, Kroon, Lalloo, Kulkarni, & Johnson, 2017). Goncalves, Moreira, Rauen, Rossi, and Borgatto (2016) linked BMI in children and caries experience to other factors such as oral hygiene habits and diet (fruits/vegetables versus sugar). Casamassimo, Thikkurissy, Edelstein, and Maiorini (2009) discussed serious comorbidities with childhood caries affecting children, their families, the community, and the health care system. They presented the disease impact as a morbidity and mortality (M&M) pyramid. Childhood caries consequences are depicted graphically and range from mild dysfunction to death. Included in this M&M pyramid, growing evidence supports a diminished quality of life for families with children affected by ECC (Filstrup et al., 2003). Other comorbidities involve the effects on the community and the health care system. For example, Quinonez, Gibson, Jokovic, and Locker (2009) argue that the use of hospital emergency departments in Canada for dental conditions that are best treated in regular oral health care settings contributes rising health costs and consumes societal and governmental resources that should be used for other illnesses best treated in hospital settings. Another allocation issue includes the use of physician offices for oral health-related complaints (LaPlante, Singhal, Maund, & Quinonez, 2015). This issue was also reported for Medicaid children in the US, where less than 5% of those receiving dental care in a hospital

or ambulatory care setting consumed 25% to 45% of the dental resources (Kanellis, Damiano, & Momany, 2000).

Dental Treatment under General Anesthesia for Children

The American Society of Anesthesiologists (ASA, 2014) defines general anesthesia (GA) as:

A drug-induced loss of consciousness during which patients are not arousable, even by painful stimulation. The ability to independently maintain ventilatory function is often impaired. Patients often require assistance in maintaining a patent airway, and positive pressure ventilation may be required because of depressed spontaneous ventilation or drug-induced depression of neuromuscular function. Cardiovascular function may be impaired. (p. 2)

General anesthesia has been used in medicine and dentistry since the 1840s (AAPD, 2008). There has been much attention in recent years, even publicly, on the use of GA to perform dental procedures. This public interest is illustrated by a 2012 article in the *New York Times* titled, “Preschoolers in Surgery for a Mouthful of Cavities: Rise in Preschool Cavities Prompts Anesthesia Use” (Saint Louis, 2012). The author of the article suggests the DTGA is widespread and increasing.

A recent review by Thomson (2016) stated the incidence of dental caries in children will continue to rise, leading to an increase in the number of children requiring DTGA. He noted this has been a concern in his country, New Zealand, as well as in other industrialized countries such as Australia, England, and Canada because this treatment is resource-intensive and not without risk. Analyzing data from the Australian Institute of Health and Welfare Hospital Morbidity Database from 1993 to 2004, Jamieson and Roberts-Thomson (2006) found a three-fold increase

in dental treatment using general anesthesia (DTGA) from 1993-1994 to 2003-2004 (from 215 per 100,000 to 731 per 100,000). Across all years, male children 0-9 had higher DTGA rates than their female children; rural dwellers also had higher DTGA rates than urban dwellers. Within a decade, there was a seven-fold increase in the number of Indigenous children admitted for DTGA. For admissions in which one or more extractions were anticipated, Indigenous children rates were 47% greater than non-Indigenous rates after adjusting for covariates.

A similar increase in the annual number of hospital admissions for dental care in children was reported by Moles and Ashley (2009) in England between 1997 and 2006, where over half a million children were admitted (peak age 5 years). The 28% increase over 9 years was attributable to a 66% increase in extractions for caries. Children who lived in relatively deprived areas received dental care in hospitals more than children who lived in more affluent areas. The underlying reasons for this trend were not discussed, but the authors emphasized this is a major public health concern arising from a preventable disease and requires further exploration of the reasons behind the trend.

Factors Related to Dental Treatment under General Anesthesia for Children

When pediatric dental patients, due to psychological/emotional nature and/or a dentist's resources and ability, cannot be managed using non-pharmacologic behavioral management techniques, they are referred to be treated under pharmacologic techniques, including sedation and GA. This choice has benefits and risks.

Risks associated with GA

Morbidities and mortalities associated with GA are related to physiological changes in the body and, thus, it is commonly regarded as a high-risk procedure. Due to advances in safety improvements, anesthesia-related mortality rates are lower today (threefold improvement) than

20 years ago. A systematic review of 20 studies, the pediatric perioperative mortality rates for the past decade in developed countries were reported to be 0.41 to 6.8 per 10,000 anesthetics, based on a systematic review of studies published up to 2011 (Gonzalez et al., 2012).

In addition to deaths, there are concerns anesthetics harm young children's brains, resulting in cognitive and behavioral problems, and generating extensive concerns among clinicians, parents, and governmental regulations regarding the safe use of anesthetics for children. Lin, J.R. Lee, C. S. Lee, Deng, and Loepke (2016) examined 440 laboratory studies and 30 human neurocognitive studies to demonstrate long-term alterations in brain development are not unequivocally confirmed. Lin et al. recommended expanding efforts to devise safer anesthetic techniques and mitigation strategies. The risk seems to be higher in children younger than 4 years, and specifically with increased duration of anesthesia or with anesthesia repetition (Davidson et al., 2016a). In a recent press release (June 17, 2016), SmarTots, a public-private partnership of the International Anesthesia Research Society and the U.S. Food and Drug Administration, cautioned more research is needed to identify difficulties that exist when administering GA under high-risk circumstances such as patient age or complicating conditions.

A Winnipeg study reported a risk of an adverse event (both major and minor) in 35% of pediatric cases (double the rate for adults) (Cohen, Cameron, & Duncan, 1990). In children older than age 5, one-third of the children experienced postoperative nausea and vomiting, presumably associated with GA (Cohen et al., 1990). In a more recent study, Millar et al. (2006) assessed the effects of brief sevoflurane-nitrous oxide anesthesia on children's postoperative cognition, behavior, and physical morbidity up to 1 week postoperatively. Children ($n=48$, aged 5 to 10 years) received anesthesia without premedication for multiple dental extractions. The results confirm impairment of children's cognitive function at the time of discharge following brief

sevoflurane-nitrous oxide anesthesia, with some residual impairment in performance 48 hours postoperatively. Finally, anterograde amnesia affected recall of pictorial stimuli shown prior to GA, but recognition memory was unimpaired. Physical and psychological morbidities were common at discharge and 48 hours postoperatively, but less at 1 week, although 19% of children reported having a sore mouth, 17% reported a loss of appetite, and 8-21% demonstrated attention-seeking behavior, tantrums, crying, and nightmares, presumably connected to GA. Similar results were reported by Bridgman, Ashby, and Holloway (1999), who found of 80 children (2-15 years of age), 92% complained of symptoms associated with DTGA: 20% were distressed at induction, 39% cried on the journey home and 37% continued crying at home. It was not determined in these studies, however, whether the emotional and physical distress exhibited by young patients was due to the GA or the overall traumatizing nature of the experience. Additional morbidities reported by Ramazani (2016) included nausea, sickness, and prolonged bleeding. Of note, six patients reported psychological trauma 1 month after, including nightmares, bad memories, and depression (Bridgman et al., 1999).

Coping with GA

Hosey et al. (2006) found a majority of children undergoing DTGA are dentally anxious and dental anxiety, induction distress, and postoperative morbidity are interrelated. There was a need to develop means by which children and parents can manage better with what likely to be remembered as a distressing experience. There is also a problem separating reactions to GA from reactions to the overall experience of dental surgery.

Several preparatory schemes have been suggested to reduce anxiety and help young children cope with induction of anesthesia more effectively. Schwartz, Albino, and Tedesco (1983) found play therapy related to hospital and surgical procedures can alleviate stress and

anxiety in children hospitalized awaiting GA. A 2015 Cochrane review found the presence of parents during induction of GA does not diminish a child's anxiety. Although requiring further investigation, 17 promising interventions were identified; for example, clown doctors, playing videos chosen by the child during induction, low sensory stimulus, and hand-held video games (Manyande, Cyna, Yip, Chooi, & Middleton, 2015). One study investigated providing acupuncture for mothers and found a mother was less anxious, and a child exhibited less distress at induction of anesthesia (Wang, Maranets, Weinberg, Caldwell-Andrews, & Kain, 2004). Hulin, Baker, Marshman, Albadri, and Rodd (2017) developed and tested a decision aid for children faced with the need to undergo dental treatment under sedation or GA. Initial findings suggest such tools could be beneficial to dental sedation or GA patients and their parents/guardians. However, the decision aid had no effect on patients' dental anxiety or patient and parental decisional conflict. Another limitation of this study was children involved with the development and testing of the guide were over age 10 (Hulin et al., 2017). This age group of patients, however, does not constitute the majority of child patients receiving DTGA in the UK.

Postoperative shivering is a major problem for children undergoing general anesthesia, with incidence varying from 5% to 65% (Sanie, Kalani, Ghobadifar, Zabetian, & Hosseini, 2016). This complication occurs 5-30 minutes after anesthesia cessation can be reduced by administration of ketamine or similar drugs, but it is not a common practice due to undesirable complications associated with administration (Zahra et al., 2008).

Acceptance of GA

Because GA is considered an advanced behavior management techniques in pediatric dentistry (AAPD, 2016a), several authors have examined parents' acceptance of this technique compared to other techniques. This is important not only because these techniques undergo

reassessment over time (based on cultural, philosophical, and legal requirements), but also because parents are responsible for their children and make the final treatment decision (Roberts, Curzon, Koch, & Martens, 2010). A study by Boka, Arapostathis, Vretos, and Kotsanos (2014) found between nine behavior-management techniques, general anesthesia was the least accepted by Greek parents.

In a U.S.-based study, Eaton, McTigue, Fields, and Beck (2005) found GA to be the third most acceptable technique (of eight techniques). The Visual Analogue Score (VAS) rating for GA preference was 21.7 ± 23.2 , compared to 7.8 ± 11.2 for the first preferred technique (Tell-show-do [TSD]) and 77.2 ± 24.3 for the least preferred technique (Hand-over-mouth [HOM]). TSD is used with communication skills and positive reinforcement, whereas HOM combines placing a dentist's hand over the mouth of a screaming child with voice control; both are non-pharmacological techniques used in the practice of pediatric dentistry (Oliver & Manton, 2015). The HOM has been eliminated from the AAPD's clinical guidelines (Oueis, Ralstrom, Miriyala, Molinari, & Casamassimo, 2010).

A 1984 study by Murphy, Fields, and Machen and a 1991 study by Lawrence et al. ranked GA as the lowest-rated technique in terms of acceptance. Camm, Mourino, Cobb, and Doyle (1987) found mothers of children received DTGA were under greater stress than mothers whose children received oral sedation or routine dental care. This change in GA acceptability was justified by Eaton et al. (2005) due to increased familiarity with outpatient GA and direct drug marketing to the public. Some authors noted oral explanation of the technique is preferable, as situational specific dental needs can modify parents' attitudes that may influence a willingness to consent (Allen, Hodges, & Knudsen, 1995; Fields, Machen, & Murphy, 1984; A.H. Mokdad et al., 2016).

Relapse/caries recurrence after DTGA

Reviewing additional reports reveals that relapse has been reported to affect between 37-52% of children within the first six months after the dental surgery (Berkowitz, Amante, Kopycka-Kedzierawski, Billings, & Feng, 2011; Graves et al., 2004), leaving 17-23% of children requiring further restorations/extractions (even under another GA) within two years of initial treatment (Almeida, Roseman, Sheff, Huntington, & Hughes, 2000; Amin et al., 2010). Relapse declaration requires at least one caries lesion needing a restoration (Berkowitz et al., 2011). Sheller, Williams, Hays, and Mancl (2003) and Amin et al. (2010) grouped factors associated with relapse into treatment-related and patient/parent-related factors: the former includes the number of extractions, stainless steel crowns, space maintainers, pulpotomies and pulpectomies and previous treatment with DTGA; the latter includes involvement of maxillary central incisors at the time of initial treatment, socio-economic and health status, parental compliance with advice related to dietary and oral hygiene modifications, poor cooperation in the medical and dental setting, dysfunctional social situation, lack of follow-up dental care, and exposure to topical or systemic fluoride. These issues are dentist-centred and do not take into account factors that dentists may not observe or be aware of.

Better understanding the complexity of the DTGA experience requires a variety of research approaches. To date, most research on DTGA has been based on questionnaires using Likert-type scales. These questionnaires were completed mostly by parents (or an adult proxy) that wove together diverse strands of understanding. However, there is a paucity of in-depth prospective data on how the DTGA is experienced by patients and their parents. “Qualitative designs provide a complementary perspective to quantitative research, as they aim to understand experiences and attitudes and ask ‘how’ and ‘why’ questions that can’t always be answered by

numeric data” (Macdonald, 2018, p. 31). A qualitative descriptive design is the methodology of choice when a researcher seeks description of a phenomenon of which little is known, providing deep understanding of a process and the why of specific behaviors. A qualitative design also answers questions such as “what reasons do people have for using (or not using) a service or procedure? [and] who uses a service and when do you use it?” (Mostajer Haqiqi, Bedos, & Macdonald, 2016, p. 494).

DTGA in Canada

In Canada, the Canadian Institute for Health Information (CIHI, 2013b) reports, each year, 19,000 day-surgery operations, almost always under GA, are performed to treat caries in children younger than age 6 (this data set excludes Quebec that uses a different reporting system). This constitutes 31% of all day surgeries for children under 5, making it the leading cause of day surgery for children this age. The CIHI also noted day surgery rates were 8.6 times higher for children from neighborhoods with high Indigenous populations compared to neighborhoods with low Indigenous populations and were 3.9 times as high for children from the least (versus the most) affluent neighborhood, along with 3.1 times as high for children from rural (versus urban) neighborhoods. Children spent an average of 82 minutes in an operating room. Treatment consisted of fillings, primary pulp therapy, full coverage crowns (stainless steel and tooth-coloured), and/or extractions.

Using the Canadian Institute for Health Information Discharge Abstract Database and National Ambulatory Care Reporting System for 4 years (2010/14), Schroth et al. (2016, a,b) quantified the human and economic burden of day surgery for children with early childhood caries in Canada. Similar to the report by the CIHI, all provinces and territories participated except Quebec. Rates were calculated for the pooled 4-year cohort. The results were:

- Over the 4-year study period, 57,249-day dental surgeries were performed, representing one-third of all pediatric day surgeries.
- The overall rate was 12.1 per 1,000 children (age 12 to 59 months).
- Rates above 25 per 1,000 children were found in three provinces (Saskatchewan [36.2], Manitoba [25.5], and Newfoundland and Labrador [27.8]), and two territories (Nunavut [110.6] and the Northwest Territories [47.6]).
- Health regions in northern Saskatchewan and Manitoba had the highest rates of day surgery.
- In Saskatchewan, the Athabasca Health Authority³ (AHA) had the highest rate (221.4 per 1000), closely followed by the Mamawetan Churchill River Health Region (135.2 per 1000).

Located in northern Saskatchewan, The AHA provides health care services to five main communities of about 3,000 residents. The Mamawetan Churchill River Health Region (MCRHR) provides service to over 24,000 residents in the north-east area of Saskatchewan (MCRHR, 2015).

Rates of dental surgery were calculated for some key variables, such as Indigenous concentration, material deprivation (MDI) and rurality. The findings were (Schroth et al.):

- Rates of DTGA from neighborhoods with a high proportion of Indigenous people ($\geq 32.5\%$) were 7.8 higher than for children living in areas with a low proportion (84.5 versus 9.8 per 1000).
- Children in rural regions had rates 3.2 times greater than urban-dwelling children (31.2 versus 9.8 per 1000).

³ Twelve health regions in Saskatchewan dissolved to form one provincial body called the Saskatchewan Health Authority on December 4, 2017.

- Children from the least-affluent regions had DTGA rates 3.7 times higher than children from the most affluent communities (25.7 versus 6.9 per 1000).

This variable was based on the material deprivation index (MDI), a composite of three indicators: education, employment, and income (Pampalon et al., 2012).

- The average annual total hospital-associated costs of DTGA were \$21,184,545 (\$1,564 per child).

The highest average cost per child was in Alberta (\$1,963), and the lowest was in New Brunswick (\$1,271). It was \$1,699 in Saskatchewan. The Province of Ontario had the highest total average hospital cost annually (\$6,506,893); Saskatchewan spent \$3,292,791.

These reports of dental surgery rates in Canada are important because the data can be used to monitor the burden of caries in young children, because national data on the incidence of dental caries in children are not available, dental surgery rates can be used as a useful proxy measure of severe dental caries in children (Schroth et al., 2016). However, there are limitations to these two studies that should be considered. First, rates were calculated for children age 1 to younger than age 5 (older children were not included) because census data groups children in intervals: <1, 1<5, and 5<9. Children under age 1 who underwent DTGA were omitted. Records of children older than age 6 were not analyzed because, by definition, early childhood caries is the presence of caries in any primary tooth in a preschool-aged child (<6 years old) (AAPD, 2015a).

Additionally, the reports did not take into consideration cases of children who underwent repeated dental surgery operations, so the rates presented were day surgery operations per population. Children treated in community clinics and children on wait lists were not captured.

As well, children with a diagnosis of a developmental handicap and received dental surgery in hospitals were not included. Consequently, the reports underestimate the number of cases.

In a report by the British Columbia (BC) Dental Association in 2001, there were 2,641 children under age 4 treated under GA in publicly-funded hospitals, and another 3,173 children treated in private facilities. In 2003/2004 the number of dental surgical day care cases for children up to 14 years of age was 4,331 in BC hospitals (excluding private anesthetic facilities). The estimated cost per child treated in hospitals was \$2,090 and \$1,650 per child treated in private facilities (BC Ministry of Health, 2006). A 1999 report of a study at the Montreal Children's Hospital revealed children scheduled for DTGA had to wait 6-8 months before receiving treatment (as cited by the BC Ministry of Health, 2006). In contrast, the average wait time reported by U.S. pediatric dentistry programs was 28 days for children experiencing pain, and 71 days for children without pain (Forsyth et al., 2012). It should be noted DTGA completed in private surgical centres in Canada is paid for, at least partially, by public funding by the universal health care system (Schroth et al., 2016).

Office-based GA was gradually introduced throughout Canada as an alternative to hospital-based GA for increased convenience, ease of scheduling, and cost savings (Caputo, 2009). There is also some evidence that pediatric dental patients were more willing to come to the 6- and 12-month recall appointments following office-based GA compared to hospital-based GA (Vinson et al., 2016). However, there is concern related to patient safety based on morbidity incidents affecting children receiving DTGA in office settings (Gerein, 2016).

Schroth, Pang, Levi, Martens, and Brownell (2014) examined trends in pediatric dental surgery for severe early childhood caries (S-ECC) in Manitoba using provincial administrative databases for fiscal years 1997-98 to 2006-07. Rates of dental surgery were compared between

two 5-year periods (1997-98 to 2001-02 and 2002-03 to 2006-07). The analysis took into consideration the regional health authority (RHA) of a patient's residence in the Province of Manitoba as well as in Winnipeg neighborhoods. The main finding was the numbers and rates of children undergoing dental surgery appeared to increase over time (from 19.4 per 1000 children in 1997-98 to 32.6 per 1,000 in 2006-07). The number of children who received dental surgery during the 10-year period was 18,544; 231 (1.2%) underwent an additional surgery within one to 2 years of the first surgery. The number of repeat surgeries also increased over time. This trend held true for both northern RHAs and Winnipeg. The authors noticed the rates of disease relapse are likely an underestimation, as numerous studies have reported higher rates of relapse (ranging from 23% to 57%) (e.g., Berkowitz, 2003).

Reviewing data from the Province of Alberta, Schroth and Smith (2007) reported, from 1996 to 2005, 339 children (all First Nations or Inuit) received two or more DTGA (76% received two procedures and the remainder three or more surgeries). The authors noted reasons for repeat dental treatment under GA might be related to that a majority of children were treated by general practitioners (instead of pediatric dentists), in addition to reasons related to patients.

In three publications, Amin and colleagues reported on caries recurrence after comprehensive dental treatment under general anesthesia in Canada. In the first report, Amin, Bedard, and Gamble (2010) found parents' failure to maintain good oral health and healthy behaviors in the long term was the reason for relapse. In a second report, Amin, Nouri, ElSalhy, Shah, and Azarpazhooh (2015) found a 22% rate of relapse in 278 children 36 months after DTGA. The third report, by Amin, Nouri, Hulland, ElSalhy, and Azarpazhooh (2016) found 33% of 818 children required further treatment during the 3-year follow-up after DTGA.

Qualitative Investigations of DTGA

There have been a few qualitative reports exploring the DTGA experience. The various reports were derived from two studies: one from Amin et al. from the University of British Columbia, and the second from Rodd et al. from the University of Sheffield. The reason these are considered separately in this review is that qualitative inquiry provides an in-depth perspective on the experiences and viewpoints of persons, which is an approach rarely used for pediatric dental patients and their parents.

The first study to appear in the literature was by Amin and Harrison (2006) to explore parental beliefs and behaviors that place a child at risk to caries relapse and parental readiness to adopt preventive behaviors following a child's DTGA. They found parents with lower levels of dental self-efficacy (i.e., their belief in their ability to control dental decay), as measured by self-reporting, believed they were less responsible for their children's dental health compared to parents with higher levels of dental self-efficacy; the second group of parents struggled to accept DTGA and blamed themselves for placing their children at such risk. Another finding is that stress of life (e.g., being a single mother, discord between mothers and fathers, mothers of an only child) negatively influenced parenting practices and child's dental health, including the ability to return for recall assessment. One significant finding was many parents were happy with the outcome of the oral rehabilitation under GA because of a child's general improvement in well-being. Amin (2007) defined dental GA experience as:

the set of events which were more than just the treatment appointment under GA. It was the 'total' experience of referral, the consultation appointment, the 'GA appointment' and the parent's, child's, and even other family member's reaction

to these events that collectively comprised the GA experience...the GA experience was really an experience of the family and child. (p. 116)

This definition is aligned with the present study's purpose. Amin's study, however, had some limitations. First, Chinese families living in Vancouver ($n=9$) were the majority of her sample ($N=19$) and Amin noted a need to further investigate parental beliefs and attitudes "cross-culturally" (p. 175). Second, six families were interviewed by Chinese-speaking dental students in Chinese. Third, interviews were conducted with parents only; children were not interviewed. The researcher approached the parent who was present for a child's GA. Consequently, 15 mothers and 4 fathers were interviewed. Despite these limitations, this study provided unique insight into parents' beliefs and behaviors related to their child's oral health.

The role of self-efficacy in maintaining oral health practices for children after DTGA was the focus of Amin's and Harrison's second (2006) and third reports (2007). They found parents' readiness to take action, based on a balance of health-related beliefs and environmental factors, had the greatest impact to change and maintain behaviors conducive to good oral health for their children. Although the authors recommended parents need encouragement and support as well as hands-on training in brushing their young children's teeth from an early stage, the effect of such a recommendation was not studied.

A second qualitative study examining DTGA, this time from the child's viewpoint, was by Rodd et al. (2013, 2014). The study involved 10 children (ages 8-11) who required multiple dental extractions under general anesthesia. Data were collected using two interviews and a video diary. Children reported negative as well as positive emotional and physical outcomes. Before the DTGA, the sensation of hunger due to the requirement for pre-operative fasting was a recurring theme. Another theme in the pre-operative period was of worry about the upcoming

DTGA. In recovery, children reported being sick, altered taste in their mouth (due to bleeding from extraction), and altered neurological sensations (due to local anesthetic). Difficulties eating due to multiple extractions were also noted post-operatively by children. The positive outcomes included a reported sense of achievement and relief at successfully undergoing a procedure, improved oral health after the procedure, and the perceived positive effect on toothache. The limitations of this study were the participants were all white, British children (the majority female), and the children were relatively older age group of pediatric dental patients. The authors used two activities in data collection (that were combined in analysis and findings reporting): a personal video diary and semi-structured interviews to further explore children's accounts of the event that included multiple dental extractions under GA (restorative dental treatments were not provided). In terms of the present study, it is important to include minority groups and young children because they represent the biggest proportion of DTGA users in Canada (CIHI, 2013). Also, comprehensive dental treatments under GA usually include restorative dentistry, in addition to tooth extraction, if needed.

Qualitative Studies Related to Children's Oral Health

Additional qualitative studies reported on factors affecting children's oral health and parental cultural beliefs, attitudes, and behaviors. The results may not be transferable to the present study context because some focus on a very ethnically or culturally-specific context and other studies were conducted outside of Canada (or North America). However, the findings of these studies have some relevance to the present study, casting light on topics related to children's oral health and the critical roles parents play.

Riedy, Weinstein, Milgrom, and Bruss (2001) noted parenting attitudes and beliefs and subsequent behaviors (e.g., feeding and oral hygiene) serve to either protect or place a child at

risk for oral disease. The authors believed individual-level factors function in a system with societal, cultural and environmental characteristics. An ethnographic study based on seven community focus groups comprising five ethnic populations (Chamorro, Filipino, Carolinian, Pohnpean, and Chuukese) living on the island of Saipan, Commonwealth of the Northern Mariana Islands revealed the low value placed on primary teeth and the negative treatment experiences parents had with symptomatic dental care appear to be important determinants of health beliefs and subsequent behaviors. Riedy et al. further found while some low-income individuals (particularly experienced mothers) saw no need for preventive oral care even with a clear oral pathology (e.g., tooth cavity), others were open to information and experiences, particularly women who were going to be mothers for the first time (i.e., primiparous) (Riedy et al., 2001).

Another study by Vaughn and Robinson (2003) explored the oral health-related experiences, attitudes and behaviours of the carers of Aboriginal children of Groote Eylandt (an island in Australia, owned by the Anindilyakwa people). The authors found a population with a high risk of poor general and oral health and frequently high levels of sugar consumption, along with limited oral hygiene and a lack of fluoridated water. The authors concluded that the feeling of a lack of personal control resulted in individuals having lost their will and enthusiasm to take responsibility for themselves (Vaughn & Robinson, 2003).

Lopez del Valle, Riedy, and Weinstein (2005) reported similar parent perceptions that create an environment where no one looks after children's oral health. Similar findings were also reported by Chestnutt, Murdoch, and Robson (2003) in Cardiff, Wales, and Weinstein, Troyer, Jacobi, and Moccasin (1999) in the United States. Giving a specific reason for lack of parental oversight in their children's dental health, Preston, Davies, and Craven (2001) reported some

parents in Manchester, UK considered dental health to be the responsibility of a child once children had reached age of 7 or so.

Some researchers have examined barriers to care that are in addition to parental cultural beliefs, attitudes, and behaviors. For example, Lee and Horan (2001) reported families whose children needed care and were enrolled in Connecticut's Medicaid managed care program encountered significant administrative and logistical problems trying to find willing providers and obtain appointments. Similar limited access to dental services for low-income children was reported by Lam, Riedy, and Milgrom (1999), who found dentists' dissatisfaction with low reimbursement fees and the hassle of paperwork were not the only main factors affecting dentists' participation in the Medicaid program in Washington. Other important barriers to care included office staff's personal connection to Medicaid-insured patients, staff member attitudes about Medicaid-insured patients, and staff member perceptions of Medicaid-insured patient (Lam et al., 1999).

An Australian study of Aboriginal health workers (AHWs) perceptions of barriers to and enablers of oral health based on professional and personal experience (Durey, McAullay, Gibson, & Slack-Smith, 2016) found AHWs' responses indicated oral health is important to Aboriginal people, but current policy and practices fall short to improve oral health outcomes. The barriers identified were: insufficient education about oral health promotion and disease prevention; private dental practice is financially out of reach; public dental services do not meet oral health needs; barriers related to access and a lack of transportation; clinics are not prepared to accommodate babies and young children; and some health providers have a discriminatory attitude towards Aboriginal patients.

For a vast majority, dental care is accessed only in an emergency (i.e., severe pain) requiring in tooth extraction. A limitation to this study was that AHWs working in rural and remote locations were not interviewed. While this study was limited to Western Australia, the authors believe the findings would, given a legacy of colonisation and discrimination, apply to other Aboriginal communities in Australia, and could be applied to indigenous populations in other colonised countries such as Canada.

A number of qualitative studies in dentistry were recently conducted at McGill University, Canada and published in oral and general health journals (Macdonald, 2018; Makansi, Carneval, & Macdonald, 2018, Mostajer Haqiqi et al., 2016). Makansi et al. (2018) critically examined the dominant childhood discourses in prominent North American pediatric dentistry texts (Macdonald and Avery's textbook: *Dentistry for the Child and Adolescent* and the guidelines published by the American Academy of Pediatric Dentistry). They used these two texts because they are recommended as reference texts by the National Dental Examination Boards in both Canada and United States. Conducting a qualitative discourse analysis, the authors found the predominant discourses in pediatric dentistry suggest a paternalistic, behaviorist approach, focusing primarily on completing interventions and treatments with little acknowledgement of emerging controversies regarding children's participation capacities and interests. The authors call for children to be consistently recognized as active participants in decisions that affect them, which can inform more respectful child-centered clinical approaches. This call is supported by evidence from a UK study that found when assent was sought, children receiving dental treatment reported were more involved in deciding about treatment, and better able to understand the information about their treatment (Adewumi, Hector, & King, 2001).

Mostajer Haqiqi et al. (2016) explored the reasons parents to select emergency departments (EDs) over a dental clinic for child's nontraumatic dental problem despite that all children under age 10 are provided public insurance for dental services. They interviewed parents (10 mothers and five fathers) of children under age 10 who sought care for dental problems in an ED of a pediatric hospital in Quebec. Thematic analysis using Grembowski's dental care process model as a sensitizing construct was used. Three salient themes emerged from the data: (a) family challenges and beliefs (e.g., parents' understanding of oral health, SES) that contribute to care-seeking behaviors, (b) barriers (e.g., lack of dentists' willingness to welcome young children) families faced finding oral healthcare options for children, and (c) parent's high satisfaction with the care provided in a hospital. The parents expressed dissatisfaction with private dentists, stating they would not go back to a private dentist for further treatments contrary to another study (Macdonald, Beaudin, & Pineda, 2015) that found patients reviews of Quebec dentists to be generally positive. Limitations to this study were the lack of children's perceptions on their experience and dentists' perceptions and opinions on pediatric emergency problems and the reasons for referral.

Mostajer Haqiqi et al. (2016) used Grembowski's dental care process model as a framework to guide their study. This model was developed by Grembowski, Anderson, and Chen (1989) in the United States and was later used by Bedos et al. (2003) to describe the dental care pathway of people receiving welfare in Quebec. The model describes stages undertaken by an individual in the process of dental care. The process is initiated by some form of stimulus in both symptomatic and asymptomatic patients. Patients' interpretation of symptoms, their coping strategies, and success finding a dentist influence the decision to consult. The model also encourages exploration of the reasons to choose a specific service to complete the care or end it.

In addition, the model proposed people's decisions to seek dental care are not a random event; rather they are determined by social and financial characteristics. Grembowski's model indicates obtaining dental care is a social process that includes a patient (in the case of a child, his/her parents) and a dentist as care provider. Additionally, the dental care process can be influenced by the providers through their decision of what constitutes appropriate care. This model is pertinent to guide semi-structured interviews in the present study to describe stages undertaken by an individual (in this case, parents) after an illness episode.

Effects of DTGA on Children: Quantitative Studies

Several measures of oral health-related quality of life (OHRQoL) have been developed for children; the most frequently used are the Child Perceptions Questionnaire (CPQ), the Child Oral Impacts on Daily Performances (C-OIDP), and the Child Oral Health Impact (COHIP) (Gilchrist, Rodd, Deery, & Marshman, 2014; Thomson, Foster Page, Gaynor, & Malden, 2013).

The use of these scales is consistent with the recent drive for patient-reported outcome measures (PROMs), a result of a shift from a biomedical perspective to a broader biopsychosocial model of health (Engel, 1977). The acknowledged psychological and social implications of oral conditions have made use of PROMs appropriate in dentistry. Importantly, OHRQoL scales for children are designed for self-reporting or parents as proxies. Studies have demonstrated there may be discrepancies between proxy scores and score self-reported by children (Eiser & Morse, 2001; Theunissen et al., 1998; Wilson-Genderson, Broder, & Phillips, 2007). Therefore, researchers should consider proxy scores may not accurately represent a patient's perceptions and emotions.

Gilchrist et al. (2014) reviewed tools used to measure children's' OHRQoL and described their use in cross-sectional studies. Knapp, Gilchrist, Rodd, and Marshman (2017) systematically

reviewed articles reporting changes in children’s OHRQoL results following DTGA. Similarly, Thomson (2016) discussed the evidence supporting the efficacy of DTGA to improve the lives of children and families. Table 2.2 presents an overview of the studies related to changes in child’s OHRQoL following DTGA. In addition OHRQoL scales, researchers have used other scales including the Early Childhood Oral Health Impact Scale (ECOHIS) (the most commonly used instrument) (Lee, McGrath, Yiu, & King, 2009; Peker, Uysal, & Bermek, 2011), the Parental-Parent Perception Questionnaire (P-CPQ), the Family Impact Scale (FIS), and the Child Perceptions Questionnaire (CPQ) (a child-reported measurement tool).

Table 2.2.

Overview of Studies Related to OHRQoL Changes Following DTGA

Study	Country	Number of patients at baseline	Number at follow-up	Scale used
Malden et al. (2008)	New Zealand	202	130 (64%)	P-CPQ and FIS (full scales)
Klaassen et al. (2008)	The Netherlands	31	31 (100%)	P-CPQ and FIS (full scales)
Klaassen et al. (2009)	The Netherlands	144	104 (72%)	ECOHIS
Lee et al. (2011)	Hong Kong	32	32 (100%)	ECOHIS
Gaynor et al. (2012)	New Zealand	157	144 (92%)	P-CPQ and FIS (full scales)
Baghdadi (2014)	Saudi Arabia	67	67 (100%)	P-CPQ and FIS (short-form version)
Jankauskiene et al. (2014)	Lithuania	140	122 (87%)	ECOHIS

Cantekin et al. (2014)	Turkey	311	311 (100%)	ECOHIS
Almaz et al. (2014)	Turkey	120	98 (82%)	ECOHIS
Ridell et al. (2015)	Sweden	75	75 (100%)	P-CPQ and FIS (full scales)
Schroth & Grant (2017)	Canada	150	N/A	ECOHIS

Analyzing data from these studies, Knapp et al. (2016) reported a widespread heterogeneity in how researchers reported changes in OHRQoL. In general, an overall improvement in OHRQoL was seen, but improvements were not found across all subscales in some studies. Additionally, three studies reported worse OHRQoL related to child self-image (Lee et al., 2011), social interaction (Cantekin et al., 2014), and social wellbeing (Klaassen et al., 2008). The interval between the time of the procedure and the time of assessment varied. When linking improvements in OHRQoL scores to clinical improvement (by calculating minimally important difference [MID]), about half the population studied met or exceeded the MID (Knapp et al., 2016).

Besides changes in OHRQoL scores after DTGA as a primary outcome, some studies quantified changes in secondary outcomes, such as dental anxiety (Cantekin et al., 2014; Klaassen et al., 2009; Klaassen et al., 2008; Murray, Liddell, & Donohue, 1989), change in weight (Thomas & Primosch, 2002), parental satisfaction (Almaz, Sonmez, Oba, & Alp, 2014; Anderson, Drummond, & Thomson, 2004; El Batawi, Panigrahi, & Awad, 2014; Jankauskiene et al., 2014), and caries experience (El Batawi et al., 2014; Xiao et al., 2014).

The findings regarding dental anxiety were not consistent, although the sample sizes were statistically justified, the ages of children in studies differed and ranged between 2-8 years in different studies, making true comparison impossible. Klaassen et al. (2008, 2009) found no significant difference between pre-DTGA and post-DTGA anxiety scores (age groups < 8 years for the 2008 study and 4 years in the 2009 study), while Cantekin et al. (2014) found a significant increase in dental anxiety in children ages 4-6. Although there was a change in weight of children in the age group 2 to 7 years, this change was not statistically significant 18 months post-DTGA (Thomas & Primosch, 2002). Using a simple question on parental satisfaction, 80-100% of parents reported being satisfied with the DTGA (Almaz et al., 2014; Anderson et al., 2004; Chao et al., 2016; El Batawi et al., 2014; Jankauskiene et al., 2014, 2017). Chao, Gui Jin, and Cong (2017) found a majority of families reported a high degree of satisfaction. Finally, recurrent caries (or occurrence of new carious lesions) was reported to occur in 37% of children after 6 months (Xiao et al., 2014) and 59% within 2 years of treatment (El Batawi et al., 2014). Primosch, Balsewich, and Thomas (2001) reported retreatment (relapse) was prevalent in Medicaid children after treatment of ECC under GA, and held true for children who received follow-up evaluations.

There is a need for further research on the after effects of DTGA on children and their families that research should consider cultural and demographic differences. Knapp et al. (2016) and Thomson (2016), two of the most recent reviews on the topic, indicated a need for further research to evaluate OHRQoL following DTGA, with an emphasis on child-reported measures. Thomson (2016) noted the likelihood of cross-cultural differences in caries effects on children (and families), and in responsiveness to treatment and how family functioning might affect these differences.

Children Involvement in Research

Recent times have brought changes to the traditional view of children as “an incomplete version of an adult” (Danby & Farrell, 2004, p. 35) (i.e., a developmental approach) where children are not viewed as capable players in their regular environments that explain children’s ability to create their social worlds (Danby & Farrell, 2004). This view is in sharp contrast with a sociological perspective of a child as an active participant in constructing his world (Danby & Farrell, 2004)

Several qualitative and quantitative studies (e.g., Sartain, Clarke, & Heyman, 2000; Koller, Khan, & Barrett, 2015) in medicine have focused on children’s perspectives, rather than learning of their lives through the eyes of others (i.e., parents/parents or healthcare workers). This approach has inherent difficulties in that some children may be unable to articulate their experiences and ethical dilemmas arise when questioning a vulnerable population. The general aim of these studies was to investigate children’s experiences of various illnesses. Although the language children used was different than that used by adults in both form and content, children were able to describe their experiences and discuss their knowledge and understanding of their condition, the limitation an illness placed on their lives, emotions, and their role in self-care. Makansi et al. (2018) highlighted how the current dominant conceptions of childhood perpetuate dismissive views of children’s capacities to participate in discussions and decisions that affect them, and these views can shape clinical practices that can be distressing for children.

In addition to general chronic illness investigations, several investigators reported how children describe their experience with some aspects related to dental treatment or oral conditions. A systematic review by Gilchrist, Marshman, Deery, and Rodd (2015) found a 10% increase in the involvement of children in pediatric dental research compared to results from an

earlier 2005 systematic review. *Involvement* refers to active participation of children in the research process and their accounts (Gilchrist et al., 2015; Harman, Lindsay, Adewami, & Smith, 2005; Marshman et al., 2015; Soares, Cardoso, & Bolan, 2015).

Children: Active Social Agents

This is a new paradigm: children as active social agents who “shape the structures and processes around them, and whose social relationships are worthy to study in their own right.” (Morrow, 2008, p. 50). In their book titled, *Theorising Childhood*, James, Jenks, and Prout (1998) identify four archetypes of a child that can be linked to how children are conceptualized in research:

- The developing child, which has tended to undervalue children’s competencies and, even when their opinions are elicited (through experimentation or observation) by adults, their responses may not be taken seriously or even trusted.
- The tribal child, which sees children as competent actors with their own rules and agendas, making them open to research using social anthropological and ethnographic approaches.
- The adult child, which sees children living in an adult world, and, although it considers children as competent participants, the focus is on how children comprehend the adult-centred world that they are required to share. This view may lead the adult researchers to conclude that children are ignorant and incapable of understanding, particularly when asking children about things they have not experienced. Of note, this perspective assumes that children are the same as adults and so the same research tools can be used (e.g., qualitative interviews, questionnaire, survey).

- The social child, which sees children as possessing different competencies than adults that require a conceptual modification to permit researchers to engage children inhabiting an autonomous world. For example, children are encouraged to master differing mediums of communication (e.g., drawings, stories), which will enable them to be more productive in research using the talents they uniquely possess.

Sociologists divide children and childhood into four categories, collectively comprising the sociological child (James et al., 1998):

- The *socially constructed child*—understandings of childhood are not the same everywhere because societies in which children live acknowledge children are different, but how they are different and what is expected from them change in accordance with society. Thus, the emphasis of this view is in the variable content of childhoods.
- The *tribal child*—views children as autonomous actors whose actions are structured, but unfamiliar, making them suitable for anthropological and ethnographic studies.
- The *minority group child*—this group holds few or no positions of power that defines the relationship between adults and children.
- The *social structural child*—children are viewed as a body of social actors, as citizens with acknowledged needs and rights.

In this study, we embrace the notion of the social structural child—a new sociological approach that views children as competent interpreters of their worlds. The sociological approach stresses children can participate in research and share in decision making about aspects of their lives. At the same time, we acknowledge children’s maturity/age can affect the nature of participation (National Institutes of Health, 2005), but, as shown earlier, empirical evidence suggests children as young as age 5 can describe their experience and perceptions, and make

decisions about their health care. What is more, young children with a chronic illness (Alderson, Sutcliffe, & Curtis, 2006; K. Sutcliffe, R. Sutcliffe, & Alderson, 2004) or disability (Moore & Kirk, 2010) have demonstrated children's capacity to understand and participate in healthcare decisions. Nevertheless, concerns have been voiced to ensure the process and outcomes of such participation do not harm a child (ethical principle of non-maleficence). For example, children may be coerced to participate (McNeish, 1999). Research is warranted to specifically look at disadvantages of children's participation.

Theoretical Perspectives Underpinning the Methodology of this Study

The purpose of this study was to further explore children's experiences of DTGA from the perspectives of the children themselves. Because there is little data available on the topic and children have been an overlooked group in the research, a qualitative inquiry is an appropriate course to pursue. In this study, the aim was to understand the physical and psychological (i.e., behavioral, emotional) impacts of DTGA on children prior to their DTGA and then collect data as they prepare, experience, and recover from DTGA. The study also included children's parents in evaluating the experience of the children and their parents following DTGA. This involved looking at children and parents' experiences, going beyond the experience to ask questions about the conditions that produced any perceived negative experiences, and to critically examine the positive ones.

The framework of inquiry is based on the chronology of care as the child moves from disease (preoperative) to treatment (perioperative) to recovery (postoperative). This research was informed by two theoretical perspectives: Wilson's and Cleary's (1995) model for health-related quality of life (HRQoL) and its revised versions and based on Amin's and Harrison's (2007) model for parent's experience of children's DTGA.

OHRQoL Model

Quality of life (QoL) is often described as satisfaction or happiness (Ferrans & Powers, 1992). QoL is a broad multidimensional concept, emphasizing subjective evaluations of negative and positive aspects of life, where health constitutes an important life domain. Health is broadly defined as a state of complete physical, mental and social well-being; not merely the absence of disease or infirmity (WHO, 1946). Health-related quality of life (HRQoL) is a health-focused QoL-concept, encompassing aspects of health QoL ratings (Wilson & Cleary, 1995; Zubritsky et al., 2013) and denoting the effects of health, illness, and treatment on overall QoL (Ferransl, Zerwic, Wilbur, & Larson, 2005).

There are two levels that influence HRQoL: an individual level and an environmental level. The former includes physical and mental health perceptions along with correlates (e.g., health conditions, health risks, social support, functional status, SES). The latter includes resources, policies, and practices that affect a population's health perceptions and functional status (Zubritsky et al., 2013). Both levels are consistent with the current emphasis on patient-centred care. It is important to note the HRQoL framework has five core domains (biological and physiological factors, symptoms status, functional status, general health perceptions, and perceived QoL), has potential causal relationships with emotional and social constructs, such as fear and anxiety, as well as other individual characteristics (Baier, Milgrom, Russell, Mancl, & Yoshida, 2004; Zubritsky et al., 2013). OHRQoL is an integral part of general health and wellbeing and, as Locker (1988) suggested it is the result of an interaction between and within oral health conditions, social and contextual factors, and the rest of the body (Figure 2.1).

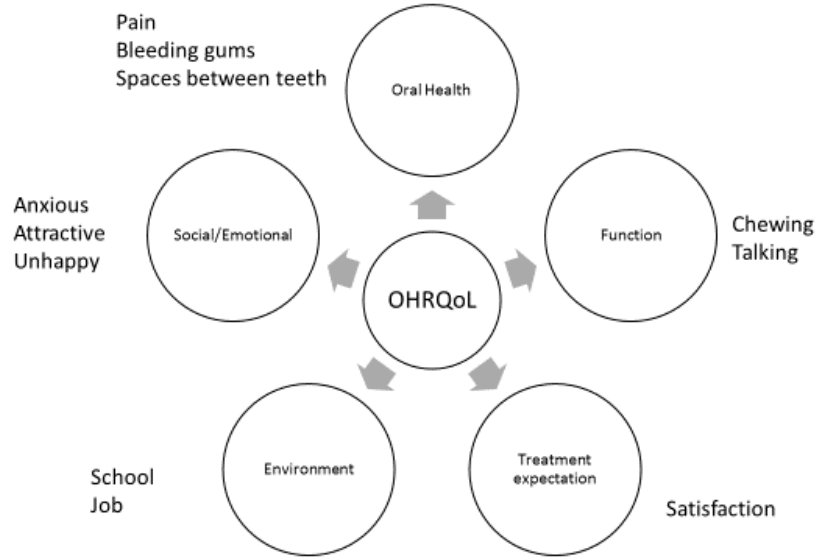


Figure 2.1. Dimensions of OHRQoL

Recently, the FDI World Dental Federation (2016) Think Tank panel reviewed existing definitions of oral health, particularly definitions relied on by biomedical perspectives, and presented a new definition: “Oral health is multifaceted and includes the ability to speak, smile, smell, taste, touch, chew, swallow and convey a range of emotions through facial expressions with confidence and without pain, discomfort, and disease of the craniofacial complex” (p. 916). Alongside this definition, a framework was developed to link core elements of oral health (disease, physiological function, and psycho-social function) to a range of determinants and moderating factors to overall health and wellbeing (Glick et al., 2012).

This model is pertinent to guide semi-structured interviews conducted with children and parents. For example, questions about a child’s oral health in both health and disease are informed by the oral health element in OHRQoL. Questions related to the importance of

children’s teeth for both proper function and esthetics (self-esteem) were also informed by the physiological (function) and psychosocial (social/emotional) elements of oral health. Data analysis in this study proceeded based on this model and an inductive approach to interpreting words of participants.

Amin’s and Harrison’s Model

Amin’s and Harrison’s model includes both negative and positive perceptions concerning DTGA from the perspectives of the parent. This model resulted from combining three related categories: parents’ general concept of oral health, parents’ experience of the DTGA, and parents’ perceived outcome of the DTGA. The model for a parent’s experience of a child’s DTGA is depicted in Figure 2.2, that shows while some parents experience guilt for a child’s poor oral health, others express no guilt.

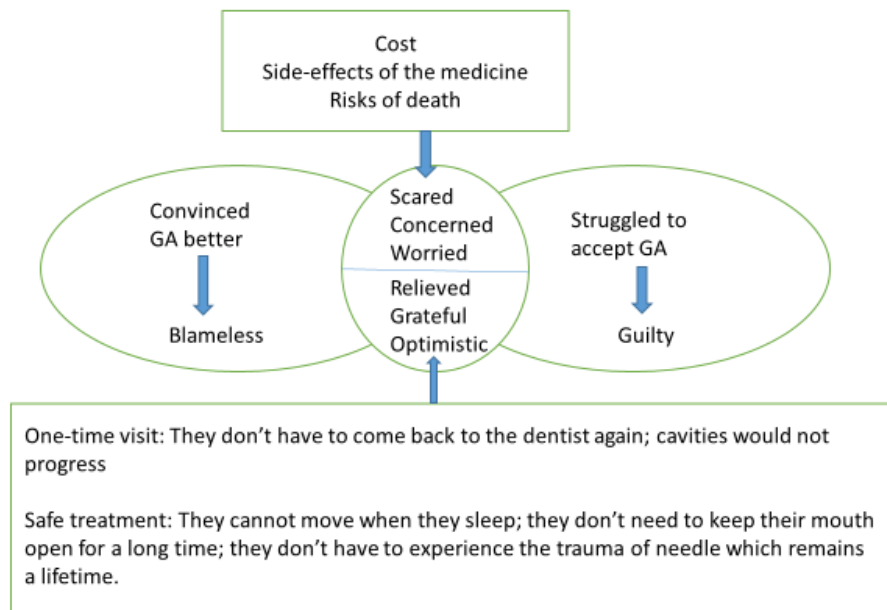


Figure 2.2. Parent experience of child’s DTGA (Amin & Harrison, 2007)

Some positive factors considered by parents include trust in professionals, instant relief of pain, safe treatment, no cooperation required, and stopped disease process. Negative factors include the side effects of GA medicine and cost of treatment (Amin, 2007; Amin, Harrison, & Weinstein, 2006). Negative perceptions involve emotions like fear and worry; whereas, positive perceptions are that this will be a single experience resulting in full remission. This model is also pertinent to guide semi-structured interviews. For example, the question on the cost of GA and whether it is prohibitive is informed by an element in this model. Similarly, the questions on parental emotions before, during, and after GA are informed by other elements in this model. It is worth noting this framework is from parent's point of view that might differ from children's based on what we was earlier discussed based on the societal systems in which children are viewed. The aim in this study is not to compare findings with adults (parents) to that with children (patients); instead, the findings from children and their parent(s) are regarded as a unit as, like their parents, children are perceived as competent social actors.

A number of theoretical perspectives have influenced research and interpretations of HRQoL, including theories on uncertainty in illness, stress and coping, patients' search for meaning, and general health policy (Inglehart & Bagramian, 2002). Pertinent to the present study is the theory proposing that health may be determined by the meaning people attach to their experiences with disease and illness, that is, by placing an event or illness in its physical, psychological, social, or spiritual contexts (O'Connor, Wicker, & Germino, 1990). Based on this view, it is thought health outcomes are influenced by a person's ability to make sense of events by instructing meanings for experiences in a larger context; construction of meaning is an intrinsically personal, subjective process (Cimprich & Paterson, 2002, p. 50). Qualitative

methods using in-depth interviews and open-ended questions are most effective to capture the richness of patient experiences and the effects on health outcomes.

Qualitative Research in Dentistry

In a series of four papers, Stewart, Gill, Chadwick, and Treasure (2008) overviewed the key elements of qualitative research for the dental community because “few dental studies have been conducted using qualitative research methods” (p. 235). They asserted qualitative methods can offer dentistry a greater depth into people’s personal perspectives than quantitative research and are particularly useful to obtain detailed information from minors, or to develop hypotheses in emerging or under-researched areas. In a third paper of the series, Gill, Stewart, Treasure, and Chadwick (2008) pointed out that qualitative research with children *per se* is still relatively rare due to methodological, pragmatic, cognitive, and ethical concerns. As a result, children’s perspectives are not explored to their fullest potential to improve understanding and influence policy, practice, and future research in dentistry. Increasingly, however, research *with* children, rather than *on* children, has been conducted (Christensen & James, 2017). Interviewing children, as a key element of qualitative research can produce unique, detailed, personal accounts to improve knowledge and understanding on a variety of topics of interest and import to dentistry. Interviews with children include verbal interaction and may use other forms of expression, such as drawing for young children and writing essays for older children (Mittal & Shrama, 2012). Although more recent qualitative studies have been conducted in dentistry, Potvin (2018) asserted the *Canadian Journal of Public Health* has committed to qualitative research because “qualitative data taken from a discursive or a visual representation has no a priori scientific value. It is the representation of a singular and unique experience that is clearly important for the

individual but which has to be decoded and recontextualized to answer the research question.”
(p. 1)

Further, Mykhalovskiy et al. (2018), on behalf of *CJPH*, issued an invitation to the public health community to support and participate in the *CJHP* vision to enhance critical, theoretically informed qualitative research in public health.

Constructionism

My main narratological research question was: What is the children’s experience of the dental general anesthesia procedure and what are parents’ views regarding GA treatment? The paradigm of the research question is social constructionism, assuming that the participants—including the researcher—have a limited understanding of their own experiences in terms of the research question, and that the participants cannot fully understand their individual experiences without engaging first in a dialogue about the experience (Hays & Singh, 2012).

There are many approaches to conducting a qualitative inquiry, which is related to research paradigms and research traditions (Hays & Singh, 2012). Research paradigms are belief systems upon which I rely when investigating my research problem related to DTGA, selecting narratology as my research tradition to help solidify the foundation for my research inquiry. I adhere to the social constructionist perspective because social constructionism emphasizes the importance of culture and context in understanding what occurs in society and constructing knowledge based on this understanding (Kim, 2014). Other features of what constitutes a social constructionist perspective include the absence of an ultimate truth, understanding that knowledge and truths are constructed and sustained through language, linguistic resources, and social processes. This constructionist’s position does not deny the reality, but sees this only as significant through social processes and practices; knowledge and social action go together. An

ontology is a philosophical belief system about the nature of social reality—what can be known and how. The conscious and unconscious questions, assumptions, and beliefs that the researcher brings to the research serve as the initial basis for an ontological position (Hesse-Bibler & Leavy, 2011, p. 13). An epistemology is a philosophical belief system about who can be a knower. It includes how the relationship between the researcher and research participant(s) are understood (Hesse-Bibler & Leavy, 2011, p. 13).

Ontological and epistemological views in the constructionism paradigm disallow the existence of an external objective reality independent of an individual from which knowledge may be collected or gained. Instead, each individual constructs knowledge and his or her experience through social interaction (Costantino, 2008). Based on this concept, I conceptualize that the DTGA experience is a relative construct that can be understood only within the social context of the child participants who will be experiencing it. This approach takes into consideration the environment and situation in which the DTGA experiences will be implemented, the perceptions of the participants, and the interaction between the participants and the researcher.

I chose narratology as my research tradition because it is a specific qualitative design where “narrative is understood as a spoken or written text giving an account of an event/action or series of events/actions, chronologically connected” (Creswell, 2013, p. 70). Clandinin and Caine (2008) assert:

narrative inquiry is first and foremost a way of understanding experience. It is also a research methodology. It is, then, both a view of the phenomena of people's experiences and a methodology for narratively inquiring into experience and thus

allows for the intimate study of individuals' experiences over time and in context.
(p. 541)

Beginning with a narrative view of experience, researchers attend to place, temporality, and sociality from a three-dimensional space that allows for inquiry into researchers' and participants' storied life experiences. In this space, each story told and lived is situated and understood in larger cultural, social, and institutional narratives. Narrative inquiry is marked by its emphasis on relational engagement between researcher and participants. Narrative inquiry, across various disciplines and multiple professional fields, is to understand and make meaning of experience through conversations, dialogue, and participation in the ongoing lives of research participants (Clandinin & Caine, 2008). Therefore, narratology was the most appropriate research tradition to explore the thoughts and emotions of children. Mittal and Sharma (2012) did a similar study with young children aged 6-8 years using questions-and-answers, drawings, and essays from older children as narrative data.

Communicating with Children through Drawing

Edwards (1979), author of *Drawing on the Right Side of the Brain*, wrote:

The object of drawing is not only to show what you are trying to portray, but also to show *you*...Paradoxically, the more clearly you can perceive and draw what you see in the external world, the more clearly the viewer can see *you*, and the more you can know about *yourself*. (pp. 23-24)

Eliciting children's opinions and thoughts about health and wellbeing is critical to make meaningful, relevant recommendations about matters affecting their lives. This recognition of children's unique outlook is increasingly acknowledged in medical literature, particularly literature related to patient-provider communication (Naar-King & Stanton, 2016). Research has

shown healthcare providers spend more time communicating with parents than pediatric patients; in a typical medical care visit, less than 20% of the communication engaged pediatric patients, regardless of age (Vigilante, Hossain, Wysocki, & Sharif, 2015). Even more, when a provider attempts to engage a child in conversation, it is generally related to social topics, not medical history or treatment decisions, typically completed by provider and parent (Tates & Meeuwesen, 2000). Children are therefore unaccustomed to discussing their health complaints with professionals. Direct communication with a child patient builds trust and rapport, and helps socialize children into a patient role, leading to better medical care experiences, improved outcomes, and greater satisfaction with medical interactions (Byczkowski, Kollar, & Britto, 2010; Nova, Vegni, & Moja, 2005).

Engaging children's perspectives is challenging, and drawings can open a child-centric dialogue about matters important to them. The premise is, "Children's ability to retrieve information that is encoded about their experiences may be more readily accessed by stimulating their perceptive senses than by semantic stimulus," and that participatory methods (e.g., story games, drawings, scrapbooks, mapping, photographs, and videos) can be used as innovative and developmentally appropriate methods to visualize health, and to reveal how children understand illness and communicate their experiences (Horstman, Aldiss, Richardson, & Gibson, 2008).

A qualitative study (Driessnack, 2005) with 22 children ages 7-8 to determine if an opportunity to draw as part of the interview process enhanced communication over communication using only a standard interview found drawing appears to be a relatively robust interview strategy with a large overall effect size ($d=0.95$). Driessnack considered children's drawings a child-sensitive approach to data collection and assessment, and referred to this as the

Draw-and-Tell Conversation (Driessnack, 2006). An app, *DrawnTogether*, has been developed to be used by healthcare providers to communicate with children (Driessnack, 2006).

Children's Drawings in Healthcare

The use of drawing to communicate with children in health settings is not new. In 1926, Goodenough developed the Draw-a-Man test (DAMT, also known as Draw-a-Person test) to evaluate children's intelligence, which was later revised and called the Goodenough-Harris Drawing test (GHDT) in 1963. The DAMT requires children between ages 4-10 to draw a single picture of a man, whereas, the GHDT is for children up to 15 years of age who complete three individual drawings (a man, a woman, and themselves). In the Kinetic Family Drawing (KFD), developed by Burns and Kaufman in 1970, children are asked to draw a picture of their family, including themselves, doing something, to understand family dynamics from a child's perspective. These drawings have also been used for understanding child abuse. The drawings are scored based on several criteria, usually detailed in an examiner's manual (Imuta, Scarf, Pharo, & Hayne, 2013).

More recently, pediatric drawing has been used to understand the experience of sick children in inpatient settings. In Massimo's and Zarri's (2006) study, spontaneous drawings of 50 Italian children affected by illnesses were evaluated to reflect on their perceptions of the disease, and their present and future relationship with the hospital and the environment in general. Dolidze, Smith, and Tchanturia (2013) investigated how the emotional wellbeing of children with heart defects and hospitalized for surgery was expressed in drawings before and after surgical treatment. This study showed differences between hospitalized and non-hospitalized children's drawings, highlighting the importance of providing continuous support during hospitalization, including after successful heart surgery.

In dentistry, Kasuya, Sawaki, Ohno, and Ueda (2000) readapted the KFD technique to study how children with cleft palate perceived their parents and family. Based on analyses of several items from the drawings (position of self-image, distance from self-image to other individual figures, size of figures, and action of figures), it was shown these children, ages 7-9, experienced anxiety and fear toward family members, and perceived themselves as at a major psychological distance from their parents.

Drawings have been used in various ways to study children's relationship with dentistry. For example, Taylor, Roth, and Mayberry (1976) asked 1,101 children to draw a picture of a dentist at work. The drawings, which were evaluated based on 60 characteristics, contained a dental chair, a dentist, and a patient in the chair and dental cabinetry or furniture. Similarly, Sheskin, Klein, and Lowental (1982) used children's drawings to evaluate anxiety in a dental setting. Aminabadi, Ghoreishizadeh, Ghoreishizadeh and Oskouei (2011) tested the hypothesis that drawing analysis can be a reliable assessment tool for evaluating a child's distress (pain and anxiety) during conventional pediatric dental procedures. Children (ages 4-11) drew a picture of a person in a dental clinic using an A4 (8.27 × 11.69 inches) paper sheet and pencil crayons. The pictures were scored by a pediatric dentist and a psychologist based on the *Child Drawing: Hospital (CD:H)*, manual developed to measure anxiety in hospitalized school-age children (Clatworthy et al., 1999a,b). Results indicated drawing can be a *projective*, natural mode of communication in the field of dentistry that children rarely resist; other results (e.g., Aartman, van Everdingen, Hoogstraten, & Schuurs, 1998; Chambers, Giesbrecht, Craig, Bennett, & Huntsman, 1999) are consistent.

More recently, Looman (2006) reported drawing may help children who survived Hurricane Katrina organize their narratives, allowing them to tell a better story. In addition, the

following advantages/features have been suggested for the use of art with children (Looman, 2006):

- Drawing may help children gain symbolic control over events that are confusing and frightening.
- A primary benefit of using art with children is that it increases the amount of information a child reports about past experiences.
- It is important to consider children's drawings in the larger context of their developmental, emotional, social, cultural experiences and to be open to a variety of meanings.

Brooks (2002) stated children draw to convey thoughts and ideas, making them concrete and perceivable. Drawing is seen as a means of creating working models of the world—a visual correspondence to objects in the everyday world that is easily understood.

A study, similar to the one by Aminabadi et al. (2011), was carried out by Torriani, Goettems, Cademartori, Fernandez, and Bussoletti (2014), where children's drawings were analyzed based on Vygotsky postulations for context reading. Brooks (2002, 2009) discussed four of Vygotsky's basic principles concerning learning and development to analyze children's drawings.

Knowledge can be constructed in several ways depending on philosophical stance. Knowledge can be constructed internally or metacognitively, with little or no influence from the social context (that is, constructionism or cognitive constructionism, linked to Jean Piaget). Social constructionism, on the other hand, acknowledges the role society plays in the construction of knowledge (Bodrova & Leong, 2007). In this perspective, the learner brings prior knowledge and combines it with new knowledge through interaction with others; knowledge is

co-constructed. A third perspective views learning as determined primarily by external or environmental variables. This is the behaviorist school; Skinner was a prominent psychologist who embraced this perspective and believed the only scientific approach to psychology was one that studied behaviors, not internal (subjective) mental processes (Brooks, 2002).

Summary

Although the number of children receiving dental treatments under GA has increased substantially, there is a paucity of research on treatment approaches under GA based on patient-reported outcome measures. To fill this gap in knowledge, there have been several studies to evaluate dental GA using OHRQoL measures. While most of these studies were quantitative using a proxy, further enquiries should be directed toward assessing the effect of different approaches under GA on the daily lives of children and from their perspectives.

The review of the literature suggests children's views of their experiences receiving dental care have largely been ignored. Either they are considered incapable of describing their experiences adequately, their parents are considered better reporters of experiences, or researchers have been simply reluctant to examine young patients directly. However, the views of recent researchers as well as the mandates of the patient-centred care model suggest child-patient experiences and perceptions warrant direct and thorough examination. This is a major aspect of the impetus for the present study.

This chapter also introduced the framework for the qualitative study in addressing the research questions presented in Chapter 1. A synthesis of the earlier work provided an overview of the research topic, as well as the context for identifying data collection requirements for the present inquiry. The theoretical perspectives underpinning the methodology followed in this thesis concluded this chapter. The research approach employed is outlined in the next chapter.

Chapter 3: Methods

Participants

Eligible participants included children referred to the Royal University Hospital (RUH) or Prairieview Surgical Center (PVSC) to receive DTGA for restorative dentistry and possibly extraction of teeth, in addition to preventive procedures such as fluoride application. There was no ethnicity criteria for eligibility, but families needed to speak English or Arabic to convey their emotions and experiences. Patients were required to be eligible for GA, other eligibility criteria were: younger than age 12; classified as either ASA I Class I (healthy) or ASA II (mild systemic disease); no disabilities affecting quality of life; and severe childhood caries as defined by the AAPD.

Patients with significant medical or developmentally compromised conditions, such as autism, patients requiring oral surgery for reasons other than simple extractions, and very young children were excluded.

The DTGA was conducted at RUH or PVSC; the latter is a private on-site general anesthetic suite for day-surgeries performed by dentists who limit their practice to pediatric dentistry and who have several years' experience as practitioners and academic researchers. The PVSC opened in 2012, with the main goal to reduce wait times for some day surgeries. The centre has seven operating rooms for various types of procedures (e.g., orthopedic, ophthalmology, pediatric dentistry). The costs of treatment are fully or partially supported by publicly-funded programs.

Sampling Method

English-speaking and Arabic-speaking families from a variety of ethnic backgrounds whose children were referred to receive DTGA at RUH/PVSC were invited to participate. The selection of participants was based on the detail they were willing and able to provide about their

DTGA experience (i.e., information-rich cases). The screen for this criterion was done through a phone call to parents. This selection constitutes a quota sampling technique, a type of purposive sampling where the chosen criteria allow a researcher to focus on people most likely to experience, know about, or have insights into the research topic (Mack et al., 2005). When a family whose child had been referred for DTGA contacted the surgical center for an appointment, the center receptionist informed the family about the study and requested consent to pass contact details to the research team. A parent was informed about the study in more detail by the research team, and an interview was scheduled at the convenience of the participants before and after the surgery day.

Hays and Singh (2012) assert sample size in qualitative inquiry depends largely on the degree to which the research purpose is met. The sample size should be consistent with the minimum number of participants needed to adequately represent the phenomenon of inquiry. Here, the inquiry involved a vulnerable population to investigate a little-researched phenomenon and used purposeful sampling to identify information-rich cases. Because the research tradition of this inquiry was narratology and emphasis on depth (rather than breadth) from participants, a sample size of 10 was judged adequate, guided by recent qualitative studies examining the phenomenon of inquiry (Hays & Singh, 2012; Rodd et al., 2013; Rodd et al., 2014).

Approval for the study was received from the University of Saskatchewan's Behavioural Research Ethics Board (BEH# 16-106) (Appendix K). Children and parents were recruited for the study in conjunction with the RUH and Prairieview Surgical Centre's staff (approval dated May 2, 2016; Appendix L).

Participants Materials

All study materials (e.g., consent form, letter of invitation) were written in English (translated into Arabic, if required). The letter of invitation was read over the phone to potential participants who originally showed an interest in participation, and a paper copy was provided in person when informed consent was obtained. Arabic-speaking participants interested in participating were assessed for their eligibility to participate through a short phone interview (in Arabic). During this call, all questions about the study and their contribution were answered. Volunteers who indicated they were interested in participating and were eligible to participate, provided addresses and an initial meeting was arranged. Regardless of recruitment techniques used, all participants' parents/guardians signed informed consents, and all were given a copy of the consent form prior to the interview (Appendices A & B). Child patients were also required to complete an assent form, if able (Appendix C).

Data Collection

Data were collected through children's drawings, researcher field notes, video recordings, transcribed conversations with children, transcribed conversations with parents, and a short form for family background information (Table 3.1.). Semi-structured, open-ended, one-on-one interviews to collect child and parent stories were conducted. A short questionnaire was recorded information about each patient's demographics (e.g., age, gender, SES) and dental history. Dental health status of children before DTGA (expressed by the number of decayed, missing, filled teeth surfaces [dmfs/DMFS]), information on the severity of caries (i.e., number of teeth with pulpal involvement/infection and number of extractions), and any adverse medical occurrences during DTGA from the clinic chart were also recorded. In addition, data collection

involved a personal video diary, enabling child patients to document their thoughts and experiences related to DTGA as they went through the pre-, peri-, and post-operative pathway.

For most patients, a pre- and post-operative interview was conducted; some families completed an additional interview (the second day following GA [peri-operative]) to gather information This was done at the parent's convenience.

Table 3.1.

Data Collection: Methods, Objectives, and Timing

Method	Objectives	Materials	Data collected	Timing
Drawing	Non-threatening and familiar method to use with children Focus the inquiry, build rapport	Blank sheets of paper, crayons, colored pencils	Drawings were collected and described	Pre-, peri- and post-operative
Participatory observation	Detailed narrative of the visit Meanings of drawings or brief descriptions of drawings	Field notes and memos written up after each visit Reflections, questions, interpretations that came to mind during the visit	Field notes	Pre-, peri- and post-operative
Video recording	Immediate, visual documentation of emotions and experience		Video diaries	Peri-operative
Conversation with children	Build rapport, allow children to express themselves Patient-centered research practice Allowing children to vocalize issues via direct consultation	Structured interview guide	One, two, or three visits per child Personal information, direct quotes, individual needs, and preferences of participant	Pre-, peri- and post-operative
Conversation with parents	Build rapport with parents and develop trust. Family-centered health care Allowing mothers/fathers to vocalize issues via direct consultation	Structured interview guide	Personal information, family dynamics, parents' preferences (gathered over 1 to 3 family visits)	Pre-, peri- and post-operative
Family Background Information Form	Collect pertinent demographics	Short paper form	Information form completed	Pre-operative

Interviews

Interviews are widely used in qualitative research because they give participants a voice and are appropriate to explore perceptions and experiences. Semi-structured interviews are considered flexible and versatile, allowing a researcher to clarify, discuss, and follow up on points of interest, if and when they arise, and to explore different responses participants may make.

Pre- and post-operative semi-structured interview guides were developed by the Researcher to direct interviews that Interviews began with open-ended questions, becoming more specific as an interview progressed. Because semi-structured interviewing “uses a protocol as a guide and starting point for the interview experience” (Hays & Singh, 2008, p. 431), Guides of specific questions to better understand the child’s quality of life pre- and post DTGA were included. Topics explored related to function, pain, or discomfort, as well as social, emotional, and psychological concerns. Both guides were refined as new topics emerged and refined following an interview when needed. Probes and prompts were used to encourage elaboration. Questions were poised delicately to keep a sense of intrusion into the lives of participants to a minimum..

The goal of each interview was to create a relaxed atmosphere to encourage the participants to share experiences/emotions with the interviewer. The interview started with a warm-up talk related to the child’s hobbies, and then proceeded to ask about the child’s oral health, what oral health means to them, and their experiences of dentistry.

Interviews were conducted in a quiet area of the Health Sciences Library or in a child’s home. A child’s parent(s) attended all interviews. Children’s parents were also separately interviewed to gather information related to their children’s DTGA. All interviews with children

and parents were conducted by a female research assistant who has experience conducting similar research. Children received paper and crayons/pens for doodling/coloring during interviews. Interviews lasted between 20 to 60 minutes. At the end of each interview, a child and parent were given the chance to provide more information about any topics they thought important. The key points in the interview were summarized and repeated back to the child (and parent) and modified as necessary. Finally, a verbal assent was taken from a child (and parent) for any further contact/interview. The researcher monitored all interview audio recordings and received ongoing feedback from the interviewer.

The first interviews, 1-2 weeks prior to DTGA, were to build rapport and establish familiarity to maximize a child's potential to contribute to the research. It was observed that children welcomed and invited the interviewer into their world almost immediately. Drawings played a key role in building rapport. Children were given blank sheets of paper and colored crayons/pencils and invited to draw their perspectives on the dental experience using the prompt: Please draw anything you can think of when you hear the word dentist or teeth. A second, more specific prompt was: Please draw your experience visiting the dental clinic to complete your dental treatment.

While a child was busy drawing, the interviewer gave detailed information on the study to the parent(s), reiterating the purpose of the research, and inviting the parent to sign written informed consent and a transcript and video release forms (Appendix H). These forms outlined the objectives of the study, the participants' rights to anonymity, confidentiality, and withdrawing from the study, in addition to stating the possible risks or benefits of the research to the participants. The parent also completed a form related to the family and child's demographic information and dental history (Appendix D). Participants were reassured all data provided

would be confidential and that pseudonyms or interviewees' initials would be used to identify participants when attributing quotes or characteristics. Participation in the study was voluntary and participating parents were informed they could stop participation of themselves and their child at any time without any penalty. All interviews were recorded after the reasons for the making the recordings were explained to participants.

All participants were asked the same questions as set in the interview protocol. Additional questions were asked depending on the situation of each participant (for example, a question was asked related to the health services available in northern Saskatchewan). In all cases, however, the interviewer gave participants an opportunity to speak unprompted when talking about a topic, but still made sure that all topics were covered. Following each interview, the participants were de-briefed about the study, given information about the second interview, and given two \$10 gift vouchers to thank them for their participation.

Second interviews 2-4 weeks post-operative were conducted to seek child and parent narratives about the GA experience. The emphasis of this interview was on specific topics relevant to the GA procedure and type of dental treatment provided to a child including: the instructions provided to parents; short-term effect of GA on the child and parent (immediately after GA [i.e., during recovery] and 3-4 weeks postoperatively); perceived risks, fasting and wait times; and children's and parents' readiness to adopt and maintain preventive behaviors against future dental caries. At the conclusion of each interview, key points from the interview were summarized and repeated back to participants. Parents and patients were also invited to add any other comments they thought important but not addressed. A verbal consent was taken for future contact, if needed. Finally, the parent and the child were given two \$10 gift vouchers to thank them for their participation. A \$10 voucher was given if a child completed a video diary.

Video Diaries

In addition to semi-structured interviews, children were given a video camera enabling them to record visual narratives related to DTGA (Appendix G). Video diaries have not yet found common use in oral health research, but have been used in general pediatric medical care to gain meaningful insight into children's experiences of illness and care (Rich, Lamola, Gordon, & Chalfen, 2000; Rodd et al., 2014). This visual medium provided participants with an opportunity to express themselves freely, potentially accessing deeper aspects of their understanding and experience of the DTGA (Hays & Singh, 2012). The video camera also gave a child the opportunity to record thoughts when the interviewer was absent, such as the night before DTGA.

This data collection method provided the flexibility necessary to work with children, but allowed participants to visually translate the meaning and value of their experiences of DTGA (Cole & Knowles, 2008). There is also an empowerment advantage embedded in this data collection strategy because the participants are valued for the video they create (Hays & Singh, 2012), as well as having the advantage of offering a source of complex data that can be reviewed repeatedly (Gibson, 2008). This method will also diminish the potential for a power imbalance between an adult researcher and child participant by not imposing the researcher's views and interpretations (Punch, 2002).

The children directly controlled the camera and made the primary choices of what would be filmed. However, I an instruction sheet with guiding questions about the study's focus the children could use as they made their films was provided. Children were encouraged to use the camera throughout the DTGA care pathway to reduce the potential for recall bias.

Drawings

Drawings by the children were used as a visual medium to complement their verbal responses. Drawings enhance the spoken word and often give a richer, more holistic understanding of participants' worlds, as well as often acting as stimuli (Duncan, 2013). Broadly, visual material such as drawings have a role in two aspects of research: they can be a form of data gathered from research participants and initiated either by the researcher or by the research participants; alternatively, they can be used as a stimulus that is provided by the researcher to act as a prompt or focus of discussion. However, these two aspects are not discrete and often overlap (Keegan, 2008). In short, drawings were used to understand children's lives and experiences in their voices and engaged children regarding *their* perspectives on *their* dental concerns.

Data Management and Analyses

Only the researcher, interviewer, supervisor, and transcriber had access to raw data. The audio recordings of the interviews sent for transcription only had a child's pseudonym as an identifier. All drawings were kept by the researcher and photographed for reference. Photos were uploaded, providing both a back-up tool and a practical way of organizing, analyzing, and presenting them. The data were always analyzed across the entire sample; no case analysis was performed or reported in a way that disclosed a participant's identity. The raw data were stored on the Cloud, in addition to a password-protected PC. After 5 years of dead storage, the audiotapes and the transcripts will be destroyed. Presentation of the study findings in future journal publication/meeting presentations will not identify participants.

Data collection involved multiple methods, resulting in a diverse dataset to manage, analyze, and report. The interviews and video recordings were transcribed verbatim. Sandelowski (1994) asserted choices made about transcription can affect the nature and direction

of analysis and therefore should not be taken lightly. Transcripts should not be seen as an objective presentation of what happened, but rather be detailed reconstructions, produced for the purpose of analysis and useful to the extent that this constructed reality is recognized (Sandelowski, 1994). An orthographic style of transcription was used, where all words and word particles, including laughter, strong emphasis, and long pauses were transcribed. This level of transcription offers a number of advantages (Braun & Clarke, 2013, 2014). It is more than adequate for an analysis of themes in texts that was done in this research. Text transcribed in this way makes analysis at a broad thematic level easier and the text is relatively easy to read. A final advantage of this transcription style is aspects of talk, as it occurs, are captured using detailed transcription notation such as speech errors, pauses, repetitions, and filler words. The transcriber transcribed each interview immediately and before conducting the next interview. The interviews with Arabic-speaking families were translated into English for analysis. Another bilingual Arabic-speaking individual verified the accuracy of translations. Another member of the research team checked transcripts for accuracy. During the process, the researcher kept a journal to document his ideas and thoughts; the interviewer did the same. The transcriptions and field notes were combined with the drawing data during analysis and interpretation..

A narrative approach in data analysis was followed to discern meaning from children's stories (Leedy & Ormrod, 2010). A coding paradigm was used to identify concepts and the relationships among them. Coding is the process of examining the raw data in the form of words, phrases, sentences, or paragraphs and then assigning codes or labels. Each transcript was read twice before making notes or comments on it. Each transcript was analyzed for similar terms, emerging themes, or divergent terms or themes. Transcribed interviews were coded and separated into categories with similar codes or organization of data related to a theme. Field

notes were integrated with the transcribed interviews to ensure the accuracy of interpretation. Each interview was coded as described by Merriam (2014) using NVivo codes (common phrases or concepts derived from the data) or using participants' actual words to reveal their perspectives. After the interviews had been coded, similar codes were grouped together to remove redundant codes, and then these were placed into themes or categories.

The data from this study were presented in thematic groupings using participants' narratives. In addition to thematic analysis, structural, dialogic-performative, and visual narrative analyses were used to interpret different texts—oral, written, and visual—considering stories are purposeful and told or performed to accomplish particular aims (Riessman, 2008). Data collection and analysis were conducted concurrently to guide participant recruitment. For example, some children found it difficult to run the camera and, therefore, older children or children were considered who would likely have had experience with video recording; when providing video equipment was not an appropriate approach, I gave these children an opportunity to draw their experiences.

Based on the existing literature, key emergent themes were identified by creating abstractions from a specific analysis of the data and generating a constant comparison between participants. Emergent themes were discussed and agreed upon by the research team, and were discussed with some participants for verification (i.e., debriefing: peer and participants) (Leech & Onwuegbuzie, 2008). These were used to modify the frameworks used in the study design with emphasis on the characteristics of the individual, characteristics of the environment, and parent reactions to DTGA. An inductive (i.e., as themes emerged) and interpretive coding approach was used to categorize themes, make inferences, and make connections to the research questions, theoretical framework, and relevant literature.

The next chapter presents the sample demographics, the results from the interviews with parents and children, the descriptions of the children's drawing and video diaries, and the thematic analyses of the family stories.

Chapter 4: Results

This research focused on the lived experiences of children and their parents who underwent DTGA. Personal interviews, children's drawings, and video diaries were used to collect data. The four research questions centered on the children's and parents' experience and views regarding DTGA treatment, the impact of the GA experience on the child and parent, what parents thought about their child's oral health, and if the experience changed the way a family approached oral health.

In this chapter, the findings are presented in three parts. The demographics of the sample are presented first. The second part, *Participants' Stories*, summarizes key information related to participants' lives, their experiences going through the path of care, and their expressed stories of DTGA. This section also presents the children's drawings of their dental surgery experiences. The third part, *Thematic Analysis*, uses an inductive means to gain insight and knowledge from the data, moving from a broad reading to aligning themes to the research questions.

Demographic Findings

Recruitment occurred 3 May 2016 through 30 January 2017 when data saturation occurred. Data saturation was observed with the tenth child-parent pair and two more child-parent pairs were recruited as a check to confirm theme redundancy had been reached. As a result, 12 joint interviews with patients ($n=12$) and family members (mothers, $n=12$; father $n=1$) were completed.

Fourteen patients and 14 parents were approached and invited to take part in the study. Of these, 12 patients/parents accepted and signed a consent form. One participant could not be contacted using the contact number provided on the information sheet. Another participant cancelled the treatment and did not respond to phone calls. There was a parent who cancelled the

GA, but agreed to take part in the study to talk about reasons for the decision. This parent also responded to all other questions related to her child's oral health and related information.

Table 4.1 presents the demographic information of the child participants. There were 8 girls and 4 boys, with an age range from 2.6 to 9.9 years, and a mean age of 6.1 ($SD=2.1$).

Table 4.1

Child Participants

Code	Age	Gender	Ethnicity /Status	Age of 1st dental visit	Dental pain before GA	Means of payment	Dental treatment provided during GA
Child 1	5.8	F	Indigenous	2yrs	Yes	Government funding	# of extractions – two # of pulp treatments – none # of SSCrowns (and other crowns) – three # of amalgams – two # of composites –none Prophy and Fluoride – done
Child 2	8.8	F	Indigenous	4.5 yrs	yes	Government funding	# of extractions – none # of pulp treatments – one # of SSCrowns (and other crowns) –one # of amalgams – one # of composites – none Prophy and Fluoride – done
Child 3	6.3	F	Caucasian	3ys	Yes	3 rd party	# of extractions -one # of pulp treatments - two # of SSCrowns (and other crowns) –three # of amalgams – none # of composites – none Prophy and Fluoride – done
Child 4	9.9	F	Indigenous	2yrs	Yes	3 rd party	# of extractions -Zero # of pulp treatments- Zero # of SSCrowns (and other crowns)- Two # of amalgams - one # of composites - Four Prophy and Fluoride - done

Child 5	6.5	F	Caucasian	4yrs	No	3 rd party	# of extractions – one # of pulp treatments – one # of SSCrown (and other crowns) –three # of amalgams – four # of composites – none Prophy and Fluoride – done
Child 6	2.6	M	Indigenous	1yr	No	Government funding	# of extractions: none # of pulp treatments: three # of SSCrowns (and other crowns) – eight # of amalgams – none # of composites – one Prophy and Fluoride – done
Child 7	4.3	F	Indigenous	4.2yrs	Yes	3 rd party	# of extractions - one # of pulp treatments -Four # of SSCrowns (and other crowns) - Five # of amalgams - one # of composites – Four Prophy and Fluoride - done
Child 8	5.2	F	Caucasian	1.5 yrs	No	3 rd party	did not have treatment
Child 9	6.5	M	Refugee	6yrs	Yes	Government funding	# of extractions - nine in OR and 2 or 3 in clinic # of amalgams – four # of SSCrowns (and other crowns) – four
Child 10	6.6	M	Newcomer immigrant	3yrs	No	Government funding	# of extractions – eight # of SSCrowns (and other crowns) – eight # of Band & Loop – two
Child 11	8.1	M	Refugee	5yr	Yes	3 rd party (sponsor)	N/A

Child 12	3.1	F	Refugee	2yrs	Yes	Government funding	N/A
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Table 4.2 presents demographic information of the children’s parents. All parents were mothers, except one father who served as a co-participant with the child’s mother. The mean age of parents was 33.7 ($SD=7.8$), with an age range from 22.8 to 46.2. For ethnicity/status in Canada, there were 3 non-Indigenous families, 5 Indigenous families, 3 refugee families, and 1 newcomer family. Seven parents self-reported low-income, two low/middle-income, two middle-income, and one high-income.

Table 4.2

Adult Parent Participants

Code	Age	Gen der	Race	Income	Education	Single?	Child’s previous GA experience	Work
Parent 1	27	F	Indigenous	Low	College graduate	No	No	Student
Parent 2	37.8	F	Indigenous	Low	College degree	No	Yes	Student
Parent 3	46.2	F	Caucasian	High	College graduate	No	No	Yes
Parent 4	28.4	F	Indigenous	Low/ Middle	High school	No	Yes	Yes
Parent 5	39	F	Caucasian	Middle	College degree	No	No	Yes
Parent 6	22.8	F	Indigenous	Low	High school diploma	No	No	Yes
Parent 7	28.5	F	Indigenous	Low	College graduate	Yes	Yes	Student

Parent 8	38	F	Caucasian	Low/ Middle	College degree	No	No	Yes
Parent 9	41	F	Refugee	Low	High school diploma	No	No	No
Parent 9.5	44.5	M	Refugee	Low	Elementary	No	No	No
Parent 10	31.3	F	Newcomer	Middle	Graduate degree	No	No	Student
Parent 11	30.2	F	Refugee	Low	High school diploma	No	No	No
Parent 12	23.6	F	Refugee	Low	High school diploma	No	No	No

The interviews with children and parents varied in length, but the average duration was 45 minutes for pre-operative interviews and 60 minutes for post-operative interviews.

In the next part of this chapter, I will present the study's findings in two sections. In Section I, *Participants' Stories*, I will summarize key information related to the participants' lives; describe their experiences going through the path of care pre-, peri-, and postoperatively; and discuss their expressed feelings and stories about the DTGA. This section also presents the children's drawings as they relate to the experience of their dental surgery (Figure 4.1.). The narratives based on the children's drawings and video diaries are dovetailed with quotes from the interviews in forming these narratives. They are so individualized and used to situate each participant and their experiences of DTGA. In Section II, *Thematic Analysis*, I use thematic analysis as an inductive means to gain insight and knowledge from the data gathered through the interviews, moving from a broad reading of the data toward discovering patterns based on a specific research question.

Using a narrative approach helps keep accounts as a whole, rather than fragmenting them into components, making analysis more sensitive to chronological ordering of events and experiences (Hays & Singh, 2012). Thematic analysis, on the other hand, can be useful in identifying commonality across participants by identifying central themes and subthemes and their development across interviews. The two approaches are complementary and compatible, and have been used in examining details of research participants narratives by first describing events, second describing subjective experiences, and finally analyzing the meaning of participants' narratives (Angus, Levitt, & Hardtke, 1999).



Figure 4.1. Child drawing during the interview

Section I: Participants' Stories

For the purpose of the presentation of data, family refers to the participating child-and-parent(s) unit. The children's drawings have been deidentified.

Family 1

The first family consists of a 26-year-old mother and her 5-year-old daughter. They are Indigenous from a northern town and moved to Saskatoon about 3 years ago.

Child 1 is the first-born child and has a younger brother (age 2). The mother reported low-income level for the household. Child 1 first went to the dentist when she was 2 years old, and the total dental visits before referral for GA were two. The reason for the first dental visit was a “dead tooth” that became “colored” due to a fall. The family had no previous experience with DTGA.

Of child 1’s first experience with dentistry Mother 1 said:

Her top teeth, right here, she fell down on the rug and so it knocked them both loose and I was worried so I called the dentist and then decided not to worry it is... you don’t have to be worried about anything, because those are just baby teeth that they will soon fall anyways so she shows two wiggly teeth.

When she was asked to explain her feelings when she heard about the need for GA, the mother said:

Maybe it would be better than watching her sit and get that first tooth done because she was obviously scared out of the needle, cause I am traumatized to needles from when I was younger so I barely go the a dentist [laughing].

The wait time (2 months) for GA was acceptable as the mother did not think like it was too long, but she was worried that “it would be in Fall in the month of September when she [the child] [is] starting school and I [am] starting school. So it happened to be perfect at this month.”

The mother was interviewed once again a day after DTGA. During this interview, she summarized the DTGA experience as “good.” She said:

It was good...there were 3 teeth taken out...then when she was done, the recovery was okay so she didn't cry or anything. They gave us a prescription of Tylenol and when time to give her the Tylenol was 6 o'clock and then a half an hour later she was running around and playing like everything was fine.

The mother said her child was embarrassed to make a video after GA because two front teeth were removed. She narrated her feelings during her daughter's GA:

I felt sick to my stomach. I was scared. I was nervous so it made me feel sick, just I didn't like it. I hoped I don't cry, but I didn't cry...I just didn't feel better...just felt sick to my stomach.

A few weeks after DTGA, the mother shed more light upon her feelings related to the GA experience:

It is too hard. The whole process...to get it done, like the waiting, then the fasting, and the toll not eating. That makes you feel...to feel guilty. I just want to be someone who makes sure that he brush his teeth and eat healthy and less candy...

Child 1 completed two short video diaries a day before GA. The child recorded:

Hi guys: I can't eat nothing till tomorrow after my surgery. I know how I am...I don't feel happy. I feel like I have to do it. I feel like the dentist will ask me to blow something on my head. I think it will be awesome. I will go to sleep in no time. [the child is trying to practice placing the surgical mask given by the anesthetist over her nose and mouth].

Child 1's drawings. Child 1 drew herself (in red) sleeping in her bunk bed with the tooth fairy coming at night to fix her anterior "wiggly" tooth (Picture 1: C1-5Y-Pre1⁴). The use of red

⁴ This code used with all drawings stands for Child 1, 5 Years, Pre-op Drawing 1, and so on.

is considered to indicate higher levels of anxiety. Child 1 used only two colors although twelve colors were available to her.

Child 1 drew four more pictures after the GA. The first draw depicted her lying in the surgery bed (Picture 2: C1-5Y-Post1). Here there was presence of hospital equipment; the child drew the anesthesia unit (anesthesia machine) singling out the anesthesia mask. Hospital equipment indicates hospital anxiety; the items drawn often represent the items that create the greatest concern. It is worth noting that the picture was totally drawn in red with the exception of the mask, which appeared green, which is the true color of the mask used during GA induction. The child also put her name on the drawing using her first name as a signature (also in red). Compared to the child's pre-operative drawing, the child here depicted herself lying in bed, but with an arm up; at the same time, this was the arm used for the IV catheter during the GA (which was not depicted in the drawing). The child also projected her feelings into the picture by drawing a facial expression along with large eyes. The child, here, drew a six-part person with head, eyes, mouth, body, arms (one arm only), and legs, which is consistent with the developmental age of five (the drawing before the GA lacked these details). Nose and hair are found, along with a hand and feet. The head is large, suggesting that there is some preoccupation with the area, along with a pillow (which was used during GA) supporting her head and providing firm grounding.

The third drawing by the child shows herself lying in her own bed at home after surgery with a tooth fairy next to her bed (Picture 3: C1-5Y-Post2). Contrary to her pre-operative drawing, the tooth fairy here is colorful (in blue) with a face containing eyes, a nose, and a smiley mouth. The child's head depicts eyes, a nose, and a smiley mouth, but the body is covered, yet present, under a blanket.

In two more drawings, the child drew her face (Picture 4: C1-5Y-Post3) and her dentist's face (Picture 5: C1-5Y-Post4). During the interviews, the child indicated that she likes makeup (particularly, eyeliner). The child used the whole sheet of paper, placing her drawing in the centre of the paper. She drew large eyes with pupils and sclera. In addition to eyeliner, the child drew a teardrop. The child shaded, in red, her mouth, indicating the anxiety may be related to that part. The dichotomy of health and sickness was represented by contrasting the child's mouth to the dentist's mouth, with the latter lightly shaded in yellow and pink, generally considered cheerful or happy colors. In these two drawings, the child used almost all the space available on the paper, placing the faces in the center.

During the interview a few weeks after GA, Child 1 narrated her experience during hospital admission. She said:

I remember they gave me a rob [Mother: scrubs]. One part was showing [Mother: we had to tide it up for her so a kid there couldn't see her]. But when I moved my hand, my belly was showing [laughing].

Child 1 expressed two contradictory feelings toward removing a few of her teeth during surgery; she was happy to get money from the tooth fairy, but she was sad because this made her look like a "vampire."

Family 2

The second family consists of a 38-year-old mother and an eight-year-old girl. They are Indigenous, with a low family income reported by the mother. The child had undergone two previous DTGAs, and her brother had undergone three. The child is the youngest of five siblings. Parent 2 has a long history with dental problems with all of her children. She took child 2 to the dentist for the first time when she was a "baby" because her "front teeth were rotten," and "when

she got older she was complaining of her teeth, having toothaches.” When the mother was asked: “Can you remember what happened at the first visit when she was 4.5 at the dentist?” the mother said:

She was crying on pain from her front teeth because they went rotten from bottle sucking because I should grab away from her earlier, but I didn’t. So it caused her to rot right to the gums. That when I had to take her -- make an appointment for her to get them pull out.

When she was asked to explain her last appointment before the GA, the mother said:

She didn’t let them put the needles in. She would cry. She kept moving around. She absolutely refused. They were fixing a filling on top on one side and she flipped right out, she absolutely screamed. She moved, kicked the screen. She even bit the dentist [laughing loudly], so why would he transfer her? It was the needle that scared her.

Child 2’s drawings. The child’s first pre-operative drawing (Picture 6: C2-8Y-Pre1) depicted the mother’s description, in which we can see a needle, a dental mirror, and a dental air-water syringe, all drawn in black. The screen (which the mother referred to) was also present in the child’s drawing, again in black. The child placed herself in a defenceless position lying in the dental chair crying with a frown drawn on her face, which was also the mother’s facial expression standing next to her. The child used three colors (brown, red, black) in this drawing. The child used a relatively small portion of the paper, using the left area. Importantly and in contrast with child 1, transparency (showing part of the body through clothing or objects [dental chair]) is not found here, because normally children develop a visual reality to their drawings about age eight or nine.

In the second pre-operative drawing (Picture 7: C2-8Y-Pre2) the child shows her own teeth, depicting dirt on both sides of her mouth and a “hole” on one side, consistent with her description that, “Like, when I am chewing, this side hurts, but when I am chewing on that side, doesn’t.”

The categories that can be identified from this drawing in terms of oral health can include the dichotomy of health and sickness with some teeth appearing straight and healthy, while others appear with “dirt” and a “hole.” Her level of abstraction allows her to associate unhealthy teeth with imperfections. This also reflects that the child perceives oral health as a process.

The child drew two informative drawings post-operatively. The first drawing shows representations of herself, her mother, dental instruments (again: the needle, air-water syringe, the mirror), and the GA machine (Picture 8: C2-8Y-Post1). The mother, standing next to her surgical bed, is frowning. These representations of the mother and child are consistent with the statement made by the mother:

When they had called her in and I went with her behind the doors, there, they got her to blow a balloon, and I was, like, holding her hands crying because she is my baby, so [laughing loudly] -- so she is my last child. I was scared. Really scared.

The child stated: “I was pretty scared, but for just a little time, then I was calm.” At another point, she said:

I was a little bit scared and a little bit shy because -- because I had to put that thing on, and I was, like...had no friends, but a kid was there [all laughing] and these doctors gave me that tasty thing that I don’t like...I don’t know what they did, but they they said “open your mouth” and I did. They had to check how much temperature was, but I didn’t know because I didn’t know.

In this drawing, we can see a surgical mask in green next to the child's head (it is the most prominent part of the GA machine). The child said that she loves green, as well as the "balloon" (i.e., the surgical mask), in contrast to the needles. She said:

I kind of liked the balloon. I stared at it a little bit, but they told me to breathe in and that was, kind of, scared because I thought they were gonna, like, put needles in my gum because last time they did it and it hurt it. It was really bad and I did not like it.

According to the child, this drawing represents the operating room (although the term used by the child was "the thingy," "I drew me and the thingy...I don't know what is called"), and, as it appears in the drawing, it contains a big window showing a blue sky, yellow sun, and white clouds. A parking lot along with some cars can also be seen through the OR's window. This shows that the child could see beyond the OR building, ensuring the expansion of the field of vision and the mobility needed to relate to the closed environment, which is now limited due to the fact that the child is lying in the bed.

When the child was asked how she felt right after surgery, she replied: "Happy because we went to Dollarama store to buy some stuff." She continued, "I was happy because I wanted to go to Dollarama and we actually did." A Dollarama shop can be seen through the OR's window.

In contrast to the pre-operative drawing, the child here used almost all the space available on the paper, signing her name below the drawing at the bottom centre. She also chose to use more colors (nine colors).

When the mother was asked about the reaction of the child to the GA experience compared to the previous two experiences, she said that her reaction was very positive. And when she was asked about the possible reason, she said:

I do not know. I think they used a different...ssss... [anesthetic] I do not know what it was, but it was different. I do not know if they used more or a different thing or do not know. Probably she was so small to have little more compared to now where she had to use less. Age difference. She grew, right? That is what I think. That is what it was.

The child's last drawing shows the waiting area of the surgical centre (Picture 9: C2-8Y-Post2). The drawing depicts two doors, one for the dental surgical room (i.e., dental OR) and the second one for non-dental medical procedures. It also includes the learning station along the wall, which is an educational space for children.

Two children can be seen in this drawing: the child herself and another child who seems to be making fun of her. During the interview, the child described how bullying at school and other children making fun of her teeth affected her perceptions in the waiting area.

In this drawing, we can see green furniture, the child said that she likes green, and the sun the child described as "my cute sun!"

Family 3

The third family consists of a 46-year-old mother and a six-year-old girl. The mother self-defined her ethnic group as Caucasian with high-income level. The child lives with her parents and an older sibling. Mother 3 is a university graduate who works in a health-related discipline. The child's first visit to the dentist was at age three for a "regular check-up." Parent 3 believes that primary teeth are important: "I assume that if you don't take good care of baby teeth, that could possibly transfer that over into the health of your permanent teeth." The mother narrated the difficult experience the child (and the dentist) had during treating of Child 3's teeth. She explains:

All the checkups went smoothly except this last time she was more anxious. She had to have a procedure done the year before. The procedure for the first filling went smoothly, but the second one didn't. She knew what was coming when she was going to be getting a needle and she didn't take it very well. The dentist had really a hard time actually getting her to sit still for getting the needle. I know the dentist was not looking forward to having to do it again and gave us the option of having the surgery.

Mother 3's reaction to the news of her daughter's need for GA was:

I had fear...hello, anxiety [laughter], wondering how she was going to do. We left the choice up to her whether she wanted to try to come back for a needle, and that is what I was hoping she would choose. None of my kids have had to be under general anesthesia before. I have, and I just felt very nervous and anxious about having to go through it.

Mother 3 gave two reasons for the cavities in her child's teeth: "her molars are very tight and very close together and the cavities are between the teeth, and I think that we are probably not doing good enough job at flossing, [and] she may just have bad teeth. Like, she may get cavities regardless of whether we brush or floss."

Child 3's drawings. During the pre-operative interview, the child made two drawings. The first depicts her mouth, including teeth and tongue (Picture 10: C3-6Y-Pre1). There are spaces representing "lost teeth" and a tooth that seems "broken down" and "hurting." The dichotomy of health/sickness is well represented in this drawing. The second drawing depicts a toothbrush (Picture 11: C3-6Y-Pre2). When the child was asked why she drew a toothbrush, she replied: "It helps you take care of your teeth more." Although the mother told the child what to

expect the next day during the dental surgery, the child explained as follows: “They put, kind of, something inside my mouth and they will ask me to blow up a balloon. Then I will fall asleep and then they can do the stuff they need to.” The child did not draw anything directly related to this upcoming procedure.

The post-operative drawing, however, depicts the GA induction experience as perceived by the child. Here we can see the mask (in black) and the balloon (in purple) that the child “blew in,” in addition to the scrubs the child chose to be in: green and orange (Picture 12: C3-6Y-Post1). The child described her feelings during this time as “scared,” “nervous,” and “I didn’t want to go to sleep.” Contrasting the pre-operative drawings with this drawing completed post-operatively, one can easily notice the focus shifting from the dental conditions, represented by the drawing of the mouth and a toothbrush, to the general wellbeing condition, represented by the child lying down in the surgical bed with a surgical mask over the lower part of her face. The patient is the only person depicted in the picture.

Family 4

The fourth family consists of a 28-year-old mother and a nine-year-old girl. Mother 4 described her child’s ethnicity as Native American, and the family income level as lower-middle class. The girl had undergone DTGS a few months ago. The girl’s brother had also undergone DTGA. According to the mother, the girl has had a history of dental work since she was 2 years old, with “17 to 23 dental appointments.”

Child 4’s drawings. The girl drew two pictures pre-operatively. The first represented the tool she was most afraid of: the needle (Picture 13: C4-9Y-Pre1). During interviews the mother revealed she too feared needles: “I would be hating needles.” The child drew a supersized

syringe. The picture depicts a ready-to-use syringe, including the medicine to be injected (in blue) and a sharp needle. She also drew her sad face.

The second pre-operative drawing is bright, happy, and confident. Child 4 has a smiley face and a cheerful sun (Picture 14: C4-9Y-Pre2). Although the child carefully drew many details, she drew her mouth as a smile, rather than an oral cavity.

During the post-operative interview, the child made three drawings (Picture 15: C4-9Y-Post1, Picture 16: C4-9Y-Post2, & Picture 17: C4-9Y-Post3), two depict the Pokémon characters of a dog and a “Girl Picachu.” (The character’s name is Pikachu). When was asked about the drawings, she related a bad dream she had after the surgery.

The third drawing by the child, directly related to her GA experience, depicts her in OR, lying in the hospital bed, with the GA machine dominating the scene (Picture 15). The child depicts the surgical mask as a smiley face (“because it is the one that it keeps how I breathe and...my heartbeat”; the heart was in pink). The child drew the only window in the OR with a couple of clouds showing through. Most importantly, perhaps, is what the child drew at the upper right corner of the paper: it was her “brian” (i.e., brain) that is now “blank.” As the child stated: “Now, I do not dream anything.” Shading is seen everywhere in this drawing. The child drew a closed door in black to represent her blank brain. She drew the door twice, once in the picture representing her brain and another one just close to the brain, cluing us to the emphasis she places on her brain as important to her or that concerns her emotionally. The child signed her drawing at the right bottom of the paper, also in black. When the child was asked what she saw in her dreams before her brain went blank, she replied: “Unicorn, wolves, and wilderness...and broken down car.” Another important note: although this child felt the pain of the IV cannula in her arm, she did not draw it.

Child 4's video diaries. The child narrated her experiences in two video diaries. Her mother prompted her with some questions.

Child's first video diary entry (Duration: 4:53). In this diary, the child's narratives were about the admission and GA induction (referring to as "time to sleep") focused on smell of the gas, "gas mask," and "needles" and continued feelings of anxiety. "Stuffed animal" would make her feel more comfortable in the dentist office, however.

Child: When you think of a dentist...I think of a dentist, what first thing comes to mind --, my mind? Gas mask, tooth brush, that gel thing...tooth gel thing...And needle. When they put me to sleep what comes to my mind? I am in the chair. Wolves...hunting...running around. I am being bitten. How do I feel when I wake up after the sleeping gas wearing off? I feel tired and sort of awake and excited.

Second video diary entry (0:57). Narratives focused on the effects of the GA and "gas."

Hello again. My name is M and ...when I go to the dentist I was scared and excited. I was scared because of gas...excited because finally I got my sleep, and when I woke up I felt tired and bored and thirsty. I couldn't walk. Bye- bye.

Family 5

The fifth family consists of a 39-year-old mother and a six-year-and-five-month old female child. The mother described her child's ethnicity as Caucasian and reported middle-income level. The family will have their first GA experience in the near future. The child has one younger brother and both parents are in the home. The mother indicated that she and her spouse believe primary teeth are important: "Because we felt that even though the baby teeth will fall out, if they are unhealthy or infected or anything like that can make the child sick as well, so we thought they are important."

According to the mother, the child's first experience with a dentist was when she was about 4 years old and it was not a good experience. The mother described the child's experience with dentistry:

...she did not have a good experience. She was very, very scared. The dentist that we went to see seemed quite rushed, her, and it just got to be a bad start, so she didn't have a good experience and they did find out from the x-ray that she had a cavity, so then we were referred to the college, so we went to the college where she was put on the laughing gas nitrous. And she did get that filling there and that was a better experience.

During the last visit and after doing x-ray radiographs, the dentist found more teeth in need of treatment, and the option of completing the treatment under GA was discussed with the parents.

Child 5's drawings. The child drew four drawings during the pre-operative interviews (Pictures 18-21). All related to her dental issues. Two drawings have the tooth fairy as the main theme (Pictures 18 & 19). In her first drawing (Picture 18: C5-6Y-Pre1), the child depicted herself sleeping at home with a tooth underneath her pillow and a tooth fairy visiting, hoping replacing the lost tooth with a small payment (as the child explained during the interview). In this drawing, we see part of the child is apparent through the blanket that is drawn in two colors. Transparency is a normal development sequence until children develop a visual reality to drawings, which generally occurs around age 8-9. Also of interest is the child drew five fingers on her hands and her legs have feet, which is an advanced developmental level in drawings at this age. There is also a basic Tinkerbell-type tooth fairy with wings and a smiley face. The facial expression of the child seems neutral in contrast.

The second drawing also shows the child lying in her bed with a tooth fairy approaching the child's bed. Fine details are missing in this drawing, and there is the addition of a shape depicting the child's house (Picture 19: C5-6Y-Pre2).

The child depicts her teeth in two additional drawings (Picture 20: C5-6Y-Pre3, Picture 21: C5-6Y-Pre4) and wrote at the top edge of one drawing: "A tooth of mine is wiggly." In her final drawing, the child depicts her upper and lower teeth using the colors of a rainbow. She even drew a rainbow with its seven colors in their correct order: red, orange, yellow, green, blue, indigo, and violet. The wiggly tooth hurting the child was drawn in red in both drawings.

The family was visited the day before the dental surgery to give the video camera to the child. When we asked the mother how she had prepared her child for the next day's appointment, she explained she prepared the child about seeing a different dentist and the fact that there would be medicine allowing her to sit still for a long time.

Child 5's video diaries. The family made two video diaries the night of surgery. They were done as dialogue between mother and child. The child was aware of the procedure for a DTGA, but unaware of the venue for the procedure

First video diary (1:25). The child was aware of the procedure for a DTGA, but unaware of the venue for the procedure and what having the GA would be like. The child expected to be "angry," "scared," and "fun" during DTGA.

Second video diary (1:18). The focus in the second video diary was on tooth extraction and how "pulling out of my tooth" makes her nervous and scared. When Mother 5 asked: "Anything else that make it exciting or make you feel more happy about the dentist or dental surgery?" The child replied: "The tooth fairy comes."

Peri-operative Interviews and Drawings. Family 5 was visited at home the day after the dental surgery for a peri-operative interview with mother and child. The child drew two pictures. The first depicts an umbrella with six of the rainbow colors (Picture 22: C5-6Y-Peri1). You can see raindrops in the seventh rainbow color, the blue. This drawing can be described from two perspectives. In one, the picture can be a way of denying the hospital experience from the day before. This argument is supported by the conversation between the mother and child at the beginning of the interview:

Q: (to child) So would [you] come here and draw something for me related to your visit yesterday? (Mother: So something to do with your visit yesterday to the hospital.)

Child 5: I do not know what you mean! (Mother: Draw something that comes to your mind about yesterday, your experience, and your appointment at the hospital yesterday. So you can draw, like, a picture of the operating room or draw a picture drawing your pajamas [laughing].) Child 5: Okay.

From another perspective, the mother told us the child liked umbrellas, and to have a rainbow you need some rain. It is noteworthy Child 5 chose to draw a non-dental, non-medical situation. After repeating the instructions regarding the drawing, the child drew another relevant picture, placing images low on a page. In this drawing, the child depicted herself lying in OR, with a mask in green covering her face and four medical personnel, in addition to her mother, surrounding her. You can see two vacant chairs in the room away from the bed (Picture 23: C5-6Y-Peri2). This operating room is different from other children's representations of the room, there are no windows, and the mother is present (the anesthetist allowed the mother in). When asked if she had anything to add, Mother 5 said:

Umm...umm...I do not think so. It was good experience and we really like that doctor. She was very...explained things nice and very patient, sweet and kind and...umm...the two anesthesiologists that were there, like, one doctor and a resident, the two explained things nice. They were talking and singing songs from Frozen and having fun with her.

The mask used to induce anesthesia was mentioned in several interviews as well as represented in almost all children's drawings. It is worth mentioning that, during our study, there was another ongoing study evaluating the use of flavored anesthesia masks for inhalational induction in children compared to conventional non-flavored ones. The children in the study group received a flavored mask by mail sometime before the operation along with instructions for the parents asking them to try it in out on their child. The child here received a conventional, non-flavored mask. When we asked the child to describe the mask and how she reacted to its use, she explained that it "smelled gross," and "like Canadian Tire" and "plastic." Another child described the smell as "stink" and "rubber."

Post-operative Interviews and Drawings. The final interview with this family was conducted about 4 weeks post DTGA. During this interview, it was evident Child 5 was herself again compared to the visit 2 days after surgery where the child looked sad and did not want to talk about her GA experience (she instead preferred to talk about Christmas and her grandparents' visit).

During the final visit, the child held a teddy bear given to her in the hospital, except when she was drawing. Unlike the previous visit, where the child was repeatedly asked to draw something related to her experience at the hospital, she was internally motivated to draw and talk

openly about her experience. She completed seven drawings (Pictures 24-30), all addressing her medical/dental experience at the hospital. Child 5's father also briefly joined this discussion.

In the first post-operative drawing (Picture 24: C5-6Y-Post1), there is a child lying in the OR with her head on a pillow and a smiling female dentist next to her bed. The cords to hook up the OR equipment (the child referred to these as "stuff") are depicted in two colors. Although the child drew stick figures and the figure depicting the child has a small-sized head with no facial expression that provided little information, she drew a large-sized dentist's head with a distinct smile. The child confirmed the figure was a female dentist, not a doctor, and the dentist is smiling. Another item to note is Child 5 opted to use two colors, red the dominant.

The second post-operative drawing (Picture 25: C5-6Y-Post2) shows parents talking to a dentist at her office. The drawing has elements of interaction that suggests the dynamics of the personalities. The dentist is clearly smiling, as was confirmed by the child. The mother seems less happy than the dentist, and the father is frowning. The interview conducted 2 days after surgery explains this representation. The mother mentioned "we were a little bit nervous because we felt if there is to be any complication it would be from having general anesthetic. I think that was – are kind of scary factor there."

Another note from this drawing is related to the size of the figures: the larger the more dominant the personalities (the dentist in this drawing, while the father seems short and at some distance from the dentist and mother). Finally, the child does not depict herself in this drawing, as if she is observing the dynamics between the dentist on one side, and her parents on the other.

A third drawing by the child depicts herself in bed wearing pajamas (i.e., surgical scrubs), drawn in red and white (Picture 26: C5-6Y-Post3). She added more detail to her head, including sleeping eyes, a smile, and hair. There is a pillow below her head, a constant in her drawings.

The fourth drawing (Picture 27: C5-6Y-Post4) depicts a teddy bear the child received from the “hospital surgery.” We know the actual teddy bear is white, but she drew it red and blue. In another drawing, the child drew herself on a bed and holding the bear (Picture 28: C5-6Y-Post5). Both mother and child appreciated the bear as a positive thing during a stressful event. Mother 5 said:

Overall experience, I would say, was very good. The way that the doctor and the anesthesiologist -- that they came in in the holding room before we went on to the surgery, they came in and explained everything. They came in and talked to us. That was really good. Umm, I like that. I think they treated her very well. I think that was really good she got that teddy bear there.

The child also was happy receiving a bear:

Q: Anything special happened there?

Child 5: I got a teddy bear!

In her sixth drawing, the child again depicts herself in a hospital bed with three “doctors dentist” in addition to her mother next to her bed (Picture 29: C5-6Y-Post6). It was the time when the mother was invited into OR before GA induction.

In the last drawing (Picture 30: C5-6Y-Post7), you see Child 5 and her extracted teeth off to the side. In the interview when we asked about her teeth, she replied, “My teeth are not white all the way in the computer as they look like now because they were a little bit fuzzy.” The child got \$2 from the tooth fairy for her lost tooth!

It is worthy to mention that, in mother’s opinion, the dental surgery has helped the child to curb her thumb-sucking habit. She explained:

My child still sucks her thumb sometimes at night while she sleeps. We always check that, and if she sucks we pull her thumb out [laughter], but of course sometimes it happens at night while we are not watching. But it seems to help with that, as it is less now. That night after surgery she was told that she cannot suck on anything like a straw or suckers, so we told her that you cannot suck your thumb as it will suck out your fillings and stuff. So I think that helped with that.

Family 6

The sixth family consists of a 23-year-old mother and a three-year-old boy. They live in a community north of Saskatoon. The mother reported their ethnicity as “First Nation” and the family had a low-income. The mother reported she did not complete high school and the household had three adults and three children. The child has been having teeth problems since he was 1-year-old, and now has “cavities in back teeth.” There had been no previous dental surgery. The mother believes primary teeth are important because “they are there to grow until they are ready to fall out, until other teeth come out.” She also stated her child cried at the dental office and the dentist explained the child will need several teeth to be “capped”; the dentist is also reported to have said, “I want them to be fixed before they get worse.” We asked the mother about her reaction to hearing the child would be requiring GA for the dental work.

The child went for the dental surgery, but we were unable to meet with the family again despite several attempts to make contact.

Family 7

The seventh family consists of a 29-year-old mother and a four-year old girl. The mother stated they were originally from a northern Saskatchewan village, where they lived for most of their lives before they moved to Saskatoon for the mother to attend university. The mother

reported “First Nations” ethnicity and a low-income level. The mother described her social status as a single mother living with her child. She has another older child who lives with his grandparents in a northern community, and this child had previously undergone a dental surgery.

The mother learned about the need for her daughter to have GA during her first visit to the dentist to treat “cavities causing toothaches.” The mother agreed she delayed taking her child to the dentist, but she admitted, “We did not go to the dentist before her initial...I think it is because I am afraid of the dentist, so I am...we are just of that kind that avoid.” This contradicted her belief of the importance of primary teeth: “I believe they [primary teeth] are important for establishing a good routine for when the big teeth come in. So yeah, I do believe they are important.”

When we asked the mother how she responded to the need for GA, she replied she was okay because her older son had had dental surgery before, but she added that, “I am a little nervous. I know there are, sure, some risks associated with it, but for the most part I am very confident.”

Answering a question about the risks she knew about, she said: “Maybe like complications of her not reacting well to anesthetic. Other than that, I think all will go just fine.” The mother felt helpless to prevent dental decay in her children’s teeth and mentioned being overwhelmed as a working, single mother.

Child 7’s drawings. The child drew a couple of pictures depicting the dental situation (Pictures 31: C7-4Y-Pre1, and Picture 32: C7-4Y-Pre2). The child is in the pre-schematic stage of drawing in which symbols for objects are formed with circles, squares, and lines, and they generally float on the paper without being in the correct proportion (Di Leo, 1970). In this stage, telling stories becomes a very important part of children’s drawings, so we asked the child to

give meanings to her drawn symbols. The child narrated that she drew three teeth and a tooth fairy that looks like a butterfly. She told us that the teeth and butterfly all feel sick because they have “holes.”

It is important to note that, despite the young age Child 7, the interview with the child was informative. When we asked the child to describe how her teeth felt, she said, “They kick me in the face...and my eyeball!”

Post-operative interviews. The post-operative interviews with mother and child were conducted about 3 weeks after the dental surgery at the child’s home. During the interview, the child drew a couple more pictures (Pictures 33 & 34). The focus of the interviews was on the feelings of the mother during the dental surgery, and notes related to postoperative doings of the child, as well as any changes in eating/brushing habits.

The mother noted she was anxious and worried because the surgery took more time than what she had been told before the commencement of the surgery, and she added: “Just because there had been a little boy that he came in, went in, and came out, and just maybe wonder, like, if there were complications or what was going on, like, why is taking so long, yeah.”

The mother described her child directly after GA using the expressions/terms: “wanted to go home,” “upset,” “angry,” “in pain,” “very sore,” “super sore,” “mad” and “very cranky.” The child also had “run a bit of fever after.” The child was “back to normal” after 2 days.

Answering a question about how the surgical experience had influenced dental care at home, the mother replied:

I think before the treatment, she didn’t quite know -- she didn’t quite understand, like, how important it was to brush properly, and now that she had to go for her surgery, she takes it more seriously and she is more willing to let me help her,

whereas before it was such a huge fight to get her to let me help her brush her teeth and make sure we get all of them and flossing.

Another important topic was related to perceived barriers or obstacles that might prevent the family from keeping these positive changes. The mother stressed as a single, working mother and from the north where access to dental care is limited. She explained:

I would say sometimes I am overly busy, and that is...she would like for travelling or...basically running around, sometimes she falls asleep in the vehicle and just waking her back up to get her [to] dress, the pajamas and brush her teeth and...The little time we have at bed [is] just enough to go pee and brush her teeth and stuff like that. Just being single and busy mother, it is kind of tough sometimes, but it doesn't take very long so...

She explained the health services situation “up north” as follows:

There are no dentist[s] where we [are] from. There are only dental therapists, I believe. So, in order for us to get one -- to see a natural dentist, we have to travel south, which is, like, three or four hours' drive, just to see the dentist. So it is kind of hard.

Child 7's Post-operative drawings. During the post-operative interview, the child drew two more pictures (Pictures 33: C7-4Y-Post1, & Picture 34: C7-4Y-Post2) depicting her situation. The first depicts a dream the child had right after surgery. The picture showed a “black dragon” with “a lot [of] arms” and a smiley face of her stuffed “Suzy Sheep.” The child was also talking about a bad smell and referred to it as “stinky garbage.” In the second drawing, the child scribbled some lines depicting a “tooth” that feels “OWEE” (i.e., in pain).

Family 8

The eighth family is unique in at least two ways. First, the parents cancelled, or “held off,” the dental surgery just a day before its scheduled date. Second, the child had already undergone two GAs for medical conditions (adenoid and middle ear tube surgeries). The 38-year-old mother described the child’s ethnicity as “Caucasian” and reported a low-middle income level. The 5-year-old girl is the mother’s only child, but the father’s fourth child. The child has had a history of dental problems that started when the child was 18 months old.

The mother commented on her child’s teeth:

There have been problems, which I am not used to. She has a crown. She needs another crown. They are not as...I don’t know...strong as I thought they would be...Severity, I think, would have come in to play with this. She has one horrible tooth, but other teeth are moderately healthy. I think if all were not healthy, she wouldn’t be able to eat.

This sort of denial or underestimation of her daughter’s dental problems is consistent with her opinion regarding the importance of a child’s baby teeth: “Moderately. I am...since they are falling out. I...I know they are important, but I don’t think they are that important.”

This was in stark contrast with her daughter’s description of her dental problems and the mother’s description of treatment sessions. The mother described her daughter’s dental experience as follows:

She had an appointment for two fillings, but he thought there were what he called “kissing” cavities, two cavities on teeth [cavities between teeth]. It turned out from being two conservative cavities fillings to be two root canals. And the painkiller was not working on her and it was horrifying for me.

What the mother meant by “painkiller” is a local anesthetic or “injection” or a “needle,” as she later clarified. The mother made an analogy between her experience during dental treatment and her daughter focusing on the little effects the local anesthetics have on the level of pain during dental treatment. She stated:

I am sure she felt every minute of it, and He [dentist] gave her quite a few [injections], but as if it takes me quite a few as well. I usually feel everything too. But I am not sure she was, like, ...like four [years old] and gives her two root canals ...he was drilling on her teeth and she was trying to say it hurt her so bad, it hurt, every minute of it...it hurt...That is not fair.

While the mother stated her daughter had never complained about her teeth, the interview with the child revealed several concerns her mother was unaware of, or in denial of, including problems with child’s anterior teeth that were causing pain when eating and preventing her from smiling.

Although two dentists recommended DTGA because Child 8 was three-and-a-half, the parents avoided the procedure by taking several steps in terms of the child’s dental health. The mother said: “We had a consult with a different dentist and it took about three months, and we supposed to go next week, but I cancelled it.” This was in stark contrast to what she thought when she heard about the need for GA the first time, “Kind of relief just because it was so...so bad on her...the needles. I couldn’t let that happen again.”

The steps Mother 8 had taken to manage her daughter’s dental problems included asking two dentists to carry out the treatment in the dental office; changing the child’s daily oral hygiene routine by trying an electric toothbrush, a different toothpaste, a mouthwash, and flossing; reducing candies and soft drinks, and choosing snack foods with higher calcium content

such as yogurt and cheese; and continuing with “regular dental appointments” because her child “likes going to the dentist” and “routine dental care is comfortable as it is” but “the thing that they use for the x-rays, should be...smaller because every kid I know gags because it is so big.”

The mother became very emotional when asked about her reasons for cancelling her daughter’s scheduled GA treatments. She responded, “We can’t afford it.” She elaborated:

We both [her husband and herself] have benefits that pay for dental appointments, and in setting up this appointment [dental surgery] we have been told to bring money, but they didn’t know how much money. And maybe it would be covered, but they were not sure, and they did not give us any information to go on.

[At another time, she stated]

It is heartbreaking not being able to take her [mother crying]. And if there was any way we could, we would. And we will. Absolutely, we will, just we cannot right now. But I know we can soon.

Child 8’s drawings. The child drew two pictures (Picture 35: C8-5Y-Pre1, & Picture 36: C8-5Y-Pre2) depicting herself in a dental chair or lying in a hospital bed with either her mother or tooth fairy next to her. Child 8 made a connection between going to a dentist and the tooth fairy:

Grip the tooth fairy. When somebody’s tooth falls out, they put it under the pillow. Then the tooth fairy comes when it is night, and that the tooth fairy makes them into a coin with her wand.

Child 8 drew Picture 36 in black and brown, depicting a girl, who “has her teeth out,” in a dental chair and the mother’s hand next to her. In comparison, the colors in drawing the tooth fairy in Picture 35 were multiple (blue, red, yellow, brown, orange, purple); the yellow color was

used to depict the moon. Picture 35 shows Child 8 asleep and covered. The drawing shows two bed legs facing the viewer, whereas the other two bed legs (away from the viewer) were missing. This feature might represent the developmental level of Child 8.

Family 9

The ninth family consists of a 41-year-old mother and a six-and-a-half-year-old boy. In this family the father, 44 years old, was directly involved with the interviews. The members of this family defined themselves as “refugees” from Asia. Both parents reported low-income level and low-education level (elementary school). They had lived in a refugee camp for three-and-a-half years before moving to Canada about a year ago. There were seven members of the family (five adults and two children) in the household.

Although the child’s dental experiences began once in Canada, it was an intense experience. He first visited the dentist because of “his molar being infected and swollen” and it had to be “pulled out.” Three more molars, in addition to other teeth in need of cleaning and treatment. Despite Child 9’s extensive needs, he refused to cooperate with two dentists. His parents described the dental experience as the child “was yelling and shouting,” “He held the dentist’s hand several times,” and “He was crying...”

The father explained when people move to Canada with no clear immunization history, they receive a bundle of immunizations to catch up with the schedule. This means, depending on age, each person might receive several immunizations at an appointment. According to Child 9’s father, this was the source of child’s needle phobia.

Like Family 8, the father felt “good” upon hearing about the need for GA. He explained:

I felt good because I wanted to help him. It was very difficult for me when he was refusing to get the treatment, and I wanted badly to help, him but I didn’t know

how. The treatment with the oxygen [i.e., nitrous oxide, laughing gas] was not helping; it was not effective.

This was the first family to mention concern about waiting times for GA, particularly because the child was “living on painkillers” and missing school due to his dental problems. Eventually, the dentist removed two more molars while waiting to schedule the GA. Mother 9 explained:

[My child] is in severe pain. We have already removed three of his teeth, and he was living on pain killers. We are waiting for the letter to reach our box telling about his operation. That was too long to get that letter” [more than six months].

The father added:

Because of this long waiting time and the child was in severe pain, we removed two molars while waiting to schedule his GA. The dentist said it might take more than a year to schedule the GA, so he removed the teeth, and he called to speed up the scheduling. In total, he removed three or four molars, two of them in one appointment waiting for the GA.

Although the father felt “good” about the forthcoming GA, there were concerns about how common this type of operation is in terms of dental treatment, including the long wait time, and Mother 9 expressed “fears from anesthesia.” The father said:

This is the first case in our family. My wife got GA before for endoscopy, but this was a short and simple procedure. But my whole extended family thought it was a major operation. And members of my family were talking with me saying it is unusual to do dental treatment under GA, so I started to worry.

The interview with the child revealed he was in severe pain that woke him up at night. In addition to toothaches, the child described his teeth as “sometimes swollen,” “have cavities,” and “black.” When we asked the child his feelings about the upcoming GA appointment, he replied: “I am upset. I am sad and afraid,” and added, “I don’t like it. I am nervous.”

Child 9’s drawings. During the pre-operative interview, the child drew two pictures (Picture 37 & 38). The first depicts his mouth, teeth, and tongue (Picture 37: C9-6Y-Pre1). He commented “this tooth has a cavity.” The second drawing depicts the sun, clouds, and the town house he lives (Picture 38: C9-6Y-Pre2). When asked why he drew the sun, he replied: “To give us some heat.” It is worth noting both pictures are drawn in red. Another item of note is the child did not draw anything related to his dental experiences at the dental offices.

Post-operative drawings. The child’s drawings (Pictures 39, 40, & 41) 2 weeks after dental surgery mirror most of the concerns discussed with the family. In the first drawing, he drew a home (Picture 39: C9-6Y-Post1). The second drawing (Picture 40: C9-6Y-Post2) depicts an operating room where he was lying on a bed, along with the mask and two doctors, next to him, as well as, more importantly, his nine extracted teeth. The OR in this picture has two windows. In the last drawing (Pictures 41: C9-6Y-Post3) the child drew nine extracted primary teeth as leaves falling off a rose.

It is interesting that when asked to draw about dental treatment, the child drew homes (in both interviews). The house in both drawings was huge with windows, images of a sun and clouds.

The interviews with parents after the surgery focused on some specific points, including that both parents were sad, afraid, depressed, and helpless while the child was in the OR. The father explained:

We have not left him alone before, never. I was sad, but at the same time, I was happy for him to get rid of his pain. It is true that, before he was in pain, but the whole family was with him, but now [in the OR] he is by himself.

There was discussion about the number of teeth removed before and after dental surgery and how this has negatively impacted the child psychologically and physically, although his pain resolved after surgery. Father 9 said:

He was a good eater, but not any more [laughter]. He removed nine teeth, and yesterday another one shed off, so the total now is ten. So he has no more teeth. I felt sorry for him. He now has a restricted diet: milk and bread.

The mother added:

He was shocked after he watched his mouth by mirror. He started to cry. That is because he did not find many teeth remained. We tried to tell him that a new set will come in in a few months. He felt better, but still sad and shocked. He felt normal afterwards, but still asking when I will have new teeth.

The father wanted to stress his point:

They said that they will remove teeth that cannot be fixed, but it was bad news for us that eight or nine teeth were removed (Mother: It was a shock! They said they will only take out the four anterior teeth only and restore the back teeth).

Although the dentist was transparent with us about the difficulties in saving teeth, but it was difficult to accept removing all of these teeth.

This is the first family that complained of a long wait time for surgery. Their child's severe pain contributed to their complaint.

There was also a belief among the family members that general health factors contributed to the child's poor oral health more than local factors. The father said:

Lack of vitamins. The general physician said that he has a problem in his blood like lack of calcium (Mother: And lack of iron too). And I think that lack of calcium in his blood affected his teeth. So before we know that decay might normally affect a tooth or two maximum, but to affect all of his teeth now we know it is because of his blood issues like lack of vitamins and calcium.

This case was unique considering Child 9 missed 10 days from school due to surgery. The reasons given by the child for this long absence from school were that he could not eat and that he felt upset, but his dental pain stopped.

Family 10

The tenth family consists of a 31-year-old mother and a six-and-a-half-year-old boy. They described themselves as “newcomers” from North Africa, with an “average” income level. The child lives with both parents and another younger sibling. The interviews with the mother and child were in English, as the mother has been studying at the graduate level in Canada and the child is in Grade 1. The mother described her life as a “long journey” moving from one city to another. They have been in Canada for the last 4 years.

The first dental visit for the child was at age 3, when the mother noticed some “black spots” on the child's anterior teeth. Because the child was “uncooperative” and “crying” during the appointment, the dentist suggested deferral of treatment for 6 months. The mother described the next appointment about a year later as quick and did address the child's dental problem.

When the family moved to another Canadian city 2 years later, the mother noticed more cavities. A general dentist removed an anterior tooth. As this experience was “very traumatizing”

for the child, the dentist referred the child to a pediatric dentist, who suggested comprehensive treatment under GA because the child might not tolerate several appointments to remove more teeth.

When asked how she felt or what she thought when she heard about the need for GA, the mother said:

I know general anesthesia, but I was worried. And we ...when the...like, even my family, like, why you are going to general anesthesia? Why you are putting your child under this stress? Why you are putting your child under this risk? Just think again.

The worry and dread were also there while the child was asleep and being worked on by the dentist in the OR. “I cried! I don’t know...you just...you feel helpless. You cannot do anything. Yeah. I was. I cried,” the mother said. These feelings were in line with her suggestion that “doctors” should give more “reassurance” to both parents about the children during their dental surgery and allow both parents in the OR during induction as well as recovery.

There also was another comment from the mother on the lack of information about how to prevent dental decay from reaching an advanced stage requiring dental surgery because she “just hoped that we don’t let things get to the point we need general anesthesia.” The mother noted most of the post-operative instructions focused on medical concerns rather than prevention of decay.

Although the mother regarded the importance of primary teeth less than adult teeth (e.g., “his adult teeth are coming out and I do not want him to have cavities in his adult teeth”), she recommended healthcare givers to:

Educate parents of so young children, like, when they are one or two [years old], so before they can start to have to get cavities, yeah. I think this or even before when the parents...the mom is pregnant, as early as possible. Educate them about this, yeah. I do not want others to go -- to work under general anesthesia.

The interview with the child was informative; the child had a remarkable ability to narrate. He recalled when he woke and was both hungry and happy because surgery was over and was able to list foods he was allowed on the day of surgery and the day thereafter.

Child 10's drawings. The child drew a picture depicting his teeth, four suns, and an apple core (Picture 42: C10-6Y-Post1). He also jotted down the number of his room (602) three times. It is worth mentioning Child 10 lisps now, related to the extraction of his upper anterior teeth. The mother clarified what he was saying several times during the interview. For example, he was referring to his "seewii teeth" meaning silly teeth. The removal of his teeth also affected his ability to eat apples, hence the representation of an apple in the drawing.

Family 11

The eleventh family consists of a 30-year-old mother and an eight-year-old boy. They identified "refugees" who moved to Canada a year ago in a privately sponsored scheme. The mother defined the child's ethnicity as "white" and reported a low-income level. The child lives with both parents and two siblings, one younger and one older. He is in Grade 3. The child's first visit to a dentist was in his native country after traumatic injury to an anterior upper tooth at age 5. The dentist removed the tooth, leaving Child 11 with negative impressions of dentistry.

The child (using a mirror) and the mother noted some black spots and many cavities after they moved to Canada. There was no pain, however. The dentist recommended treatment under GA. In the interview Child 11 explained he did not like the smell from "the thing [they put] on

my nose and asked me to breathe through.” Mother 11 commented her son vomited several times after waking up, including on the way home. Also, he was tired, cranky, and in pain. These symptoms abated a couple of days after surgery.

The mother was “okay” with the recommendation for dental surgery. She said:

Because teeth can be all treated in one to two hours. It is better than to go several appointments and every time he takes needles to be numb and [they] work on his teeth. In this way, within two hours he will finish, and although it is tiring but for the rest of his day and even life he will be done.

Nevertheless, once the doctors started induction, she was not “okay” anymore. She explained:

I know that it is ok to get GA because this will make the child does not feel pain and make the dentist free in providing the treatment. Then when I saw him under anesthesia and started to sleep, I was upset because he was moving around a lot as if he is dying, god forbid [laughter]. At that time, it was difficult. I was thinking badly although I was sure that he will be okay, but I felt afraid.

After the experience, the mother still advocates for the DTGA. She recommended, “Mother should never go inside [the OR] and father goes with the child...yes, it is better this way [laughing loudly].”

There was no financial concerns since the dental treatment was totally covered by their private sponsors.

Although we left papers and crayons at his house for a few days, the child did not want to draw anything related to his dental experience. The drawings collected were completed by his siblings and were not included in the thesis.

Family 12

The twelfth family consists of a 23-year-old mother and a three-year-old girl. They identify as government-sponsored refugees from Asia. They moved to Canada about a year ago. The child lives with both parents and a younger sibling. The child had her first dental experience when she was one-and-a-half years old after a traumatic injury resulting in broken teeth. The mother described her daughter's reaction to the experience: "She was very sad, she was crying the whole day. She was in pain." The family managed to see a dentist in the refugee camp. "The dentist tried to fix her teeth, but it was a difficult situation and barely did the dentist do her work. She [child] was uncooperative," the mother explained.

After they moved to Canada, the child complained of toothaches and problems with eating, and a dentist tried to treat her at an office, but the child was uncooperative. "We tried, the dentist tried, but she couldn't do anything...anything," the mother said. The dentist then recommended treatment under GA, which was unknown to the parents: "This is the first time I know that they can anesthetize her so they can work on her teeth. In [home country], nobody told us about this possibility."

Answering the question about her feelings about the need for GA to do dental treatment, the mother said:

I was happy [laughter] because it was impossible to treat her teeth without anesthesia. But I thought that anesthesia is dangerous for her, but the doctor, who is well-versed in this situation, explained that, no, we can anesthetize her to work on her teeth.

The points discussed with the mother after dental surgery included that she felt "sort of scary" when the child was taken by the surgical staff to begin the treatment. She thought

allowing a mother to accompany the child during anesthesia induction would provide relief for both mother and child. Mother 12 was proud of her child's behavior during recovery and contrasted it to other children who were in the recovery room. She explained:

Thank God she was quiet and relaxed. There were children over there [in the recovery room] who were shouting and made a disturbance. But my girl was quiet and even the doctor told me that your daughter was so quiet over there. The recovery was so smooth for her, not yelling and shouting.

The mother stated at another time:

I was so pleased from and proud of my child because she was quiet after the surgery and did not disturb the environment there. There were some other children who did probably a tooth or two and they did disturb the environment a lot. There was a boy who could make an injury to his mom who was pregnant. I was afraid that my girl will act the same way, but that did not happen. Thank God. Her reaction was normal; she did not do a thing.

The child complained of some pain directly after GA, but a painkiller controlled that for a couple of days after the surgery.

The one negative impact of dental surgery was related to removal of anterior teeth. The mother said:

At the beginning, she felt weird that she lost her teeth at a sudden after the surgery, but with time, she got used to it. At the beginning, it was like a shock to her to lose all of her anterior teeth, but eventually she got used to it as normal.

When asked if she was aware of anyone teasing her child about the loss of teeth, the mother affirmed the child's father and someone from daycare were making statements about her daughter's appearance. The mother explained:

She [child] was bothered by missing of her anterior teeth and her father teasing her by asking: Where were your teeth gone? Even other children teasing her about her anterior teeth. They ask her, where your teeth gone, which is normal for her situation, losing all of her anterior teeth. They asked her sometimes: who ate your teeth? And she replied: the mouse!

On the positive side, the mother was pleased with the improvement of her child's appetite after surgery. She related her child's improved ability to chew food resulting in an increase in weight. She explained:

The most important change was her ability to eat comfortably. Before when she ate, she felt pain, so sometimes she refused to eat and stayed without any food to avoid feeling pain. Now she eats as normal. And she starts to get more weight. She was underweight, but now she is better.

The mother noted lack of information given in terms of how the child got cavities or to demonstrate how to brush a child's teeth. The instructions given on how to take care of the child's teeth recovery from surgery included "brushing, flossing, and do not eat sweets." The amount of toothpaste to be used was mentioned as the size of "chickpeas." However, 8 weeks after surgery, the family has not yet started to follow these instructions.

Based on her experience, the mother recommends dental surgery for other children. She talked about her child's young age as an obstacle for treatment at a regular dental office: "I think if the child is older, then he can understand that he/she should sit still to do teeth, but at the age

of my girl, I don't think that child can sit still so the dentist can do the job." She also noted the positive experience she had at the day surgery centre. I asked: "I would like you to ask advice about how to improve the experiences of parents whose children have many cavities and in need of GA," to which she replied:

I can advise them that there is no need to be scared. It is true that I felt scary at the beginning, but this is because it was my first time. I think they should feel normal. At the surgical centre, they take care after the child in a good way, and the child will feel better after the surgery.

Child 12's drawing. Although only 3 years old, the interview was informative as the child expressed herself independent of her mother. She even drew an oral cavity with two teeth inside (Picture 43: C12-3Y-Post1). She was able to remember and narrate fine details from her GA, although it had been several weeks since surgery. For example, the child described the appearance of the surgery centre ("there was a picture with a girl playing and flowers"), its color ("green"), and the smell ("sweet") of the balloon (i.e., surgical mask) used to induce her. The child repeated her concern about the removal of her teeth during the interview ("They removed my teeth").

Section II: Thematic Analyses

Data collected from the participants through interviews, video diaries, and observations were analyzed to discover themes relating to the study's primary research questions. Data were analyzed for both literal meaning and thematic context. For example, in order to analyze a participant's anxiety surrounding a dental procedure using general anesthesia, the researcher looked for incidences of a participant saying, "I felt anxiety," as well as a participant describing feelings of anxiety, such as, "I was scared," or "I was shaking." The resultant themes are presented here.

The Experience of Children's Dental General Anesthesia

Research question one asks: What is the children's experience of the dental general anesthesia procedure and what are the parents' views regarding GA treatment? While participants described particular experiences with general anesthesia or watching a child undergo general anesthesia, the emerging themes from the data were shared by many or all of the participants. These themes include child anxiety, parental anxiety, extended wait times, side effects, dentist referral, and positive experiences.

Child anxiety. Anxiety was commonly reported among young participants who were to undergo general anesthesia. Participants described this feeling in different ways. For example, Child 3 said she was nervous and scared about going to the dentist, and that she didn't want to go to sleep. Child 3 reported that several different facets of the experience were concerning for her. She indicated that she knew she would have to fast before the surgery, and that she was worried she would get hungry and be unable to eat. She also indicated that she was nervous at the time of the surgery and was made further uncomfortable by the smell of the mask used to administer general anesthesia. Child 3 said, "I don't like the smell of the mask a little bit, and I did not want to go to sleep." These concerns were common for child participants; four participants reported that they were anxious about experiencing general anesthesia. Four participants also reported that they did not like the smell of the inhalational anesthetic.

Anxiety leading to general anesthesia. While several child participants experienced anxiety caused by undergoing general anesthesia, anxiety was also a contributing factor in many families' decisions to utilize general anesthesia rather than a local anesthetic. Nine (75%) child participants, or their participant parents, reported that they had experienced traumatic dental visits in the past. For many of these parent participants, a desire to not repeat painful or

frightening experiences led to the decision to use general anesthesia rather than a local anesthetic. Parent 2 described the incident her daughter had with the dentist that led to them deciding to use general anesthesia rather than a local anesthesia to complete child 2's dental work. Parent 2 explained that her child's reaction at the dentist's rooms made it impossible to complete the treatment, hence the decision to use GA.

Other parents experienced a similar incident to that of parent 2 when their children required extensive dental work. Many families found that their children were afraid of the needles that were used to administer local anesthetic. This fear was a contributing factor in choosing general anesthesia over a local anesthetic, since general anesthesia delivers an inhalational anesthetic through a mask rather than administration by needle. Six (50%) families indicated that their children were afraid of the needles used to administer the local anesthetic. Parent 3 indicated that her daughter's previous dental visits had gone relatively smoothly, but that she grew fearful when needles were required for the procedures. In this case, the use of needles caused an otherwise cooperative child to resist dental work. Parent 3 indicated this, saying:

All the checkups went smoothly except this last time she was more anxious. She had [to] have a procedure done the year before. The procedure for the first filling went smoothly, but the second one didn't. She knew what was coming when she was going to be getting a needle and she didn't take it very well. The dentist had really a hard time actually getting her to sit still for getting the needle. I know the dentist was not looking forward to having to do it again and gave us the option of having the surgery.

Like parent 3 and parent 2, family 9 indicated that their son experienced a traumatic dental visit brought on by his fear of needles. Family 9 described their son's experience at the dentist, saying:

He was yelling and shouting. He did not allow the dentist to do anything unless he saw the materials or tools to be used. He did hold the hand of the dentist several times. He was crying and yelling. He was not happy. The dentist showed sympathy, but he was not cooperating.

When asked what caused child 9's anxiety, his father exclaimed that it was, "The needle! It started with him since we moved here because of immunization. He is showing the same behavior with blood analysis. He refused to receive any needles."

Parental anxiety. Several adult participants reported feeling a great deal of anxiety both before and during their children's procedures with general anesthetic. The majority of participants had no previous experience with general anesthesia, but two reported that other children in the family had had negative reactions to general anesthesia and that it negatively affected their future willingness to use general anesthesia over a local anesthetic. In both cases, the participants reported negative side effects over and above what they had expected for their children. These side effects included severe vomiting, mood swings, and disorientation.

Parental anxiety was experienced by 11 (91.67 %) of the adult participants. The severity of the anxiety varied by participant, with some reporting mild discomfort or concern, and others reporting a great deal of fear and guilt around allowing their child to be anesthetized. Parent 1 described the experience of watching her daughter undergo general anesthesia in the following way:

I felt sick to my stomach. I was scared. I was nervous, so it made me feel sick. Just, I did not like it because when I went there and watched her, I just felt bad. I mean, before that a woman -- a woman and her daughter before my child, the woman came out crying, so I said, oh, my God. So I hoped I do not cry, but I did not cry, I just did not feel better, just felt sick to my stomach. It did not simmer it, it did not feel normal.

Parent 10 reported similar feelings of anxiety to parent 1. She indicated that watching her son undergo general anesthesia made her feel helpless and scared. In describing her feelings, parent 10 said, "I cried! I don't know, you just...you feel helpless. You cannot do anything. Yeah. I was -- I cried, but we tried to get out of this mood." While many participants reported anxiety regarding their decision to have general anesthesia administered, parent 10 was one of only two participants who changed their mind about general anesthesia or who considered not having the procedure done. While parent 10 reported that her indecision was more hesitation than an actual desire to change her mind, the decision to use general anesthesia was not one she took lightly. When asked how she felt about her son undergoing general anesthesia, parent 10 reported:

I know general anesthesia, but I was worried. Even my family [said] like, "why you are going to general anesthesia? Why you are putting your child under this stress? Why you are putting your child under this risk? Just think again." And we were hesitating, but at the end we just thought that it is -- like, I was thinking to take off the [tooth] with the big cavity and just leave the rest. Like, because I know we couldn't do five settings, like, it's impossible. But maybe, I thought I

could try to take off this one [tooth] and then just -- but then we decided to go for it.

Positive outcomes. While nearly all of the adult participants reported that they felt anxious about their children experiencing general anesthesia, many participants went on to say that the procedure went smoothly and was a positive decision overall. Parent 2 described a great deal of anxiety during the onset of the procedure, but then went on to say it turned out well in the end. She articulated this by saying:

I was scared. You know, she is my baby, right? So I am very scared. That's why I was crying when they told her to blow a balloon. And she tried very hard and she couldn't. And she just went limp. So I just left for 20 minutes and came back, and I was waiting in the waiting room for her. For two hours. Yeah, it turned out doing great.

Parent 5 described similar mixed feelings around their decision to treat their daughter with general anesthesia. While parent 5 was anxious about the procedure, she also indicated that she believed it was the right thing to do in the end. Parent 5 described these feelings, saying:

There is, I know, complications, whether they are slight or not. I am sure there are more complications with general anesthetic than just going to a dentist without, but, on the other hand, my husband and I feel it is good to go through general anesthetic route and then save the trauma. So just, you know, that oral hygiene without that fear of the dentist or what is happening there. I think oral hygiene and regular visits to the dentist will get easier and easier, and that we are trying to create for her in her life. So we are okay with the general anesthetic for that reason.

Parent 5 indicated that, while she had concerns about using general anesthesia, she believed the benefits to her daughter outweighed the risks involved with the procedure. Like many other participants, child 5's mother wanted to save her the trauma of a potentially painful dental procedure, and chose general anesthesia for that reason.

Parent 9.5 (the second Child 9's parent) indicated that he felt general anesthesia was the right choice for his son because other kinds of painkillers were not as effective, and he wanted to spare his son a traumatic dental visit. Rather than feeling anxious about the decision to use general anesthesia, parent 9.5 indicated that he felt good about the decision. Parent 9.5 said:

I felt good because I wanted to help him. It was very difficult for me when he was refusing to get the treatment, and I wanted badly to help him, but I didn't know how. The treatment with the oxygen [i.e., nitrous oxide, laughing gas] was not helping; it was not effective.

Like parent 9.5, parent 8 also indicated that she felt relieved to use general anesthesia during her daughter's dental procedure. This relief was similar to parent 9.5's, since parent 8 was glad her daughter wouldn't feel pain like she had during previous dental visits. Parent 8 said:

[I felt] kind of relief, just because [the previous dental visit] was so, so bad on her. The needles! I couldn't let that happen again. [The dentist] was drilling on her teeth and she was trying to say it hurt her so bad. It hurt every minute of it, it hurt. That is not fair!

Child 12 indicated that she was happy about the surgery, despite mild pain after, because she had less tooth pain following the surgery. Child 12 experienced few side effects to the general anesthesia, and parent 12 indicated that seeing her daughter quiet and unconcerned soothed her anxiety about the surgery.

Child preference for general anesthesia. Like adult participants, children indicated that they felt anxiety about their upcoming general anesthesia. However, like adult participants, a small number of children also indicated that they were relieved to be undergoing general anesthesia. Two child participants indicated that they weren't concerned about undergoing general anesthesia because they knew they wouldn't feel any pain. Parent 2 indicated that her daughter was very calm before and after the procedure, and credited child 2's calm demeanor to the fact that the dentist explained to child 2 about the procedure. Parent 2 explained:

She was just nice and calm. She knew what to expect because they explained to her. She didn't, like, freak out or anything. Yeah, she was very calm. She didn't make a peep. Like, she didn't cry or anything, but she was very calm and quiet, but she just woke up kind of loose.

The night before the surgery, child 1 indicated in her video interview that she was unconcerned about the surgery the following day. At that time, she was practicing putting the mask over her nose and mouth to breath in the inhalational anesthetic. To indicate how she was feeling, child 1 said:

I can eat nothing till tomorrow after my surgery, yeah. I feel like I have to do it. I feel like the dentist will ask me to blow something on my head [the mask]. I think it will be awesome. I will go to sleep in no time.

Side effects of general anesthesia. Many participants reported having experienced side effects when they, or their children, had been administered general anesthesia. Ten (83.32%) families reported side effects as being impactful to their overall experience with general anesthesia. For some families, these side effects were mild and expected; for others, they were more severe and worrisome. Common side effects included pain in the teeth and gums, lack of

appetite, nausea, fatigue, and moodiness. Parent 1 described her daughter as tired and cranky after her surgery, and indicated that child 1 had lost her appetite. Parent 1 said:

When [child 1] got up, she was cranky and tired. She didn't cry or nothing, she just...before we went in, she was like, "Mom, can we go to Burger King when I am done?" And then after she was, like, "Mom, I don't think that we can go to Burger King. I do not feel so good, so we can't go to Burger King."

Parent 11 indicated her son experienced nausea after he underwent general anesthesia. He also exhibited moodiness that could have been caused by nausea or the general anesthesia itself.

Parent 11 indicated:

When he was in the recovery room, he was so annoyed and upset as well as crying. He became better after sometime when he woke up from anesthesia, but he started to vomit a lot, several times. And even on our way home...he vomited some blood because he swallowed a lot while they were working on him. He then slept, and when he woke up he was okay and even normal, and he started to eat without pain or similar stuff. Directly after the operation, he was annoyed from the anesthetic and he complained from toothache. After he had some sleep, he didn't complain at all. So probably that was because he was tired after the operation.

Child 3 experienced symptoms similar to that of child 11. She also experienced vomiting and fatigue after general anesthesia. Parent 3 described the experience saying:

I think they usually say once they come out of general anesthetic, [the dentist] usually keeps them around for about one hour after and I think we stayed for about two hours after because she was very sleepy and she was very pale and she

threw up probably three times there. And when we came home, she threw up when we got home as well. And just very tired. So she did not necessarily have pain, but she did not respond well too.

Wait time for general anesthesia. All participants reported that they experienced some wait time between when they knew their child would undergo general anesthesia and when the appointment could be made. This wait time ranged from several weeks to several months. The majority of participants specified that the wait time was acceptable and that they did not feel like it was too long. Three participants, however, reported that they felt like the wait time was too long or that it was concerning. Two of these participants remarked that since their children were not in much pain, the wait time was not horrible, but that it would have been very difficult if their child's condition was more urgent. Parent 9, however, said that she felt like the wait time was causing her child unnecessary discomfort as her son was in considerable pain. Parent 9 indicated:

[Child 9] is in severe pain. We have already removed three of his teeth, and he was living on painkillers. We are waiting for the letter to reach our box telling about his operation. That was too long to get that letter.

The Impact of General Anesthesia on Children and Parents

Research question two asks: What is the impact of the GA experience on the child and parents? These themes include less pain, hesitation to undergo general anesthesia again, and cost concerns. When a child suffers pain, loss of appetite, and cannot concentrate at school as a result it impacts on the parent's emotional well-being.

Less pain. Many participants reported that, after the dental appointments using general anesthesia, their children had less pain. While pain reduction may affect the child on a physical

level, psychologically the parents suffered as well due to their concern for the child and their inability to ease the pain. This was a lasting impact enjoyed by six (50 %) participants which reduced concern for their child experienced by the parents. When asked about her daughter's experience after her surgery, parent 12 indicated that, "Her eating gets better after the surgery because before when she was eating she complained about toothache. [Her eating got better because] no more pain! No more pain!" Parent 3 reported that her daughter experienced a similar lack of pain after surgery. As a result, child 3's eating improved after surgery. Parent 3 reported, "As far as chewing and what she had, it got better; she used to have pain when she chewed because her teeth were sore, and they got better."

Hesitation to undergo general anesthesia again. When asked if they would prefer their children to have general anesthesia or a local anesthetic for future dental work, three participants said they would prefer a local anesthetic, two indicated that they would prefer general anesthesia, and three indicated that their choice would depend on the amount of work that needed to be done. Participants who said that they would prefer not to undergo general anesthesia again, but did not state what they would decide to do if their children exhibited the same fear that caused them to choose general anesthesia for the procedures detailed in this study. Parent 10 stated that, while she would prefer not to have general anesthesia administered again, it was because she hoped her daughter's teeth would not need so much work a second time. Parent 10 expressed this, saying:

I just hope that we don't let things get to the point we need general anesthesia.

Now we are more aware of preventing or at least going to the dentist early when

he has one cavity, not too many where we have to do the general anesthesia.

Parent 5 stated that she would prefer that child 5 not undergo general anesthesia again because, while the family's experience with general anesthesia had been generally positive, she felt inhalational anesthetic was bad for the body. Parent 5 described this, saying:

I think we would prefer without. Just because -- we didn't have a bad experience with all of this, no concerns or anything, but I think in general we just know that having general anesthetic, if there were to be complications, that -- what we think would be from having general anesthetic, and that is not necessarily good for your body. But if you have to do it, we are not against it. What has to be done, it has to be done. But we rather prefer to go to a regular dental.

Parent 3 is an example of a participant who stated that her decision to use general anesthesia again would depend on the amount of dental work that needed to be done. Parent 3 pointed out that if the procedure was quick, it would be preferable not to use general anesthesia; however, she also acknowledged that, for more complicated procedures, general anesthesia was preferable when doing a great deal of work in one appointment. Parent 3 articulated this, saying:

I would prefer without, on one hand, because it is just so much simpler, but, on the other hand, when she did go under GA, I think she, the dentist, was able to do more completely take care of all the problems where she got three caps put on. She had two baby root canals. She had another cavity filled. I do not think we ever could have all these done as efficiently and as well if I would take her to the dentist. We probably would have just a couple of cavities done and would not be able to do the extra caps. I like that the dentist could do whatever they needed to do. The child wasn't squirming. Like, they could just do their work without any interruption, without worrying about the child, I guess. So I mean, if she had to

have anything else done in the near future, we would probably have to do it under general anesthetic again because of her fear, but -- I don't know. I guess if it is a simple procedure, maybe just an easy filling that needed to be done, I hope that we could just do it with the simple needle and freezing, but -- yeah. I am really glad that we had it done this way because I guess I don't know if her regular dentist would have noticed the need for the root canal and all that that happened there, so I know that she had done what she needed to have done and nothing was missed.

Cost concerns. The cost of general anesthesia was a concern for several participants. Two participants indicated that they did not know how they would be able to afford the procedure, with two more going on to say they were not sure if the surgery would be covered by their insurance. Parent 5 indicated that, while she thought insurance would cover the cost of her daughter's surgery, she was not sure. Parent 5 articulated:

We are not sure [if it will be covered by insurance] yet. Because how that clinic does is they are going to send us -- we have to pay, like, with a credit card, then they are going to send us the receipt thing that we hand it to the insurance. We are pretty sure that all will be covered, but we do not...are not sure 100%.

Parent 8 expressed a similar predicament to parent 5, indicating that she was not sure if insurance would cover her daughter's procedure. Additionally, parent 8 indicated that she was told to bring money to pay for the procedure, but that nobody was able to tell her how much money to bring. Parent 8 communicated this predicament, saying:

Well, we both have benefits that pay for dental appointments, and in setting up this appointment we have been told to bring money, but they didn't know how

much money. And maybe it would be covered [by insurance], but they were not sure and they did not give us any information to go on. And so it was very uncomfortable. Just, it did not seem proper. And I know that my dentist wouldn't refer me to someone not proper, but it...how much money did you bring?

Parents' Views of Their Children's Oral Health Status

Research question three asks: What do parents think about their children's oral health? The emergent themes include the importance of baby teeth, the need for education, the reason for decay, and barriers to maintaining a hygiene routine.

Importance of baby teeth. The majority of participants indicated that baby teeth were important. Two participants indicated that permanent teeth were more important and did not specifically indicate if they thought baby teeth were important as well. All participants knew at least a little bit about baby teeth, indicating that baby teeth emerge when a child is young and generally fall out to make room for permanent teeth before adolescence. Of the participants, parent 8 indicated that she did not feel baby teeth were particularly important. She indicated that, since baby teeth were going to fall out, they were less important than permanent teeth. She expressed this, saying, "Since they are falling out, I know they are important, but I don't think they are that important." Parent 7 indicated that she believed baby teeth were important for establishing a good routine for when permanent teeth come in: "I believe they are important for establishing a good routine for when the big teeth come in. So yes, I do believe they are important." This was a unique statement since many other participants indicated that they believed baby teeth were primarily important for gum health and chewing food.

Need for education. Several participants expressed that there was a lack of education around general anesthesia and oral health in general. These participants indicated that they either

did not fully understand how to interpret their child's oral health status or their need for general anesthesia. Parent 10 indicated that the surgery center was more focused on relaying postoperative instructions than how to prevent further decay. Parent 10 articulated this, saying:

They didn't really discuss that much about what to do. Like, they gave you the toothbrush, they gave you the flossing, but they are usually more concerned about the post-operative instructions. They discussed these instructions more in-depth rather than what to do to prevent another cavity.

Parent 3 indicated wanting to be more informed about what would happen before and after her daughter's surgery. She indicated she was surprised when her daughter received morphine, and that she would have liked to know the reason beforehand so she could have been better prepared. In her own words, parent 3 indicated:

I think I would have maybe wanted -- informed more about -- I know they told me they are going to give her Advil and Tylenol. I would have liked to be informed of the potential of giving her morphine. I might question a little bit, but am sure -- like, I totally trusted the dentist, so I thought -- I mean, she probably gave her the morphine for a reason. Maybe because of the extensive work that they did, but I just would have [liked to have] been more informed of that possibility beforehand so I would be better prepared for it.

Parent 4 expressed thoughts similar to that of parent 3. She indicated that she felt like there was not much information available about general anesthesia in the dentist's office. Parent 4 said that, although the dentist discussed the procedure, there was a lack of in-depth information available. Parent 4 also indicated that, like parent 10, she would have liked more information of taking care of teeth to prevent future decay. Parent 4 indicated:

Yeah, probably more pamphlets out there because, really, there are nothing in the waiting room there that I really want to, like, the after care and how important it is, like, what to do after care to keep her teeth proper after. Like, the dentist will come out and tell you a few things, but that is it. Not that helpful.

Reason for decay. The majority of participants indicated that their dentist had not told them the reason for their child's dental decay. Specifically, the role of cariogenic bacteria as the major role in causing dental decay had not been discussed. Four participants indicated that the dentist did not tell them why their child had developed dental problems. Some of these participants indicated that they believed they understood why their children had developed dental problems, even if nobody had told them. Parent 3 was one such participant. She indicated that she believed her daughter had developed cavities because of the tight space between her teeth. In parent 3's own words:

The dentist really did not say a whole what about [why] she got the cavities, but I know her cavities were between her teeth, because the space is tight and the flossing between there very often.

Like parent 3, parent 11 understood why her son had dental decay, even if nobody had ever told her. Parent 11 expressed this by saying, "[The dentist] didn't tell me a thing! But I know the reason [child 11 had decay]! Because he never brushes."

Unlike parent 3 and 11, parent 10 indicated that she did not know why her son had dental decay, and that nobody had given her a reason. This lack of information meant that she was not sure how to prevent further dental decay. In parent 10's own words:

Not really. I do not think that any dentist we went to discuss the issue. Well, I asked one of them how much sweet I should give him, but I asked. Nobody really offered or discussed why!

Barriers to hygiene. Several participants felt like they faced at least some barriers to maintaining their child's oral hygiene after surgery. Three participants indicated that they faced at least one barrier to their maintaining good oral hygiene. Common barriers included a lack of time, distance to the dentist's office, and the child's discomfort upon going to the dentist. Parent 7 indicated that both a lack of time and the distance from the dentist's office was a barrier to maintaining good oral hygiene. Parent 7 indicated that travelling to the dentist's office was burdensome. She expressed this, saying, "So in order for us to see a natural dentist, we have to travel south, which is like three or four hours' drive, just to see the dentist. So it is kind of hard." Parent 7 also indicated that time was a barrier to maintaining good oral hygiene. She expressed this, saying:

I would say sometimes I am overly busy and that I -- she would like travelling or basically running around, sometimes she falls asleep in the vehicle and just waking her back up to get her dress[ed], the pajamas and brush her teeth and -- the little time we have at bed [is] just enough to go pee and brush her teeth and stuff like that. Just being single and busy mother, it is kind of tough sometimes, but it doesn't take very long.

Prevention of Further Dental Decay

Research question four asked: Does a dental GA experience result in any changes to the way the child and parent approach oral health? According to the participants, having dental treatments with general anesthesia had led to some positive behavioral changes.

Positive behavioral changes. Many participants reported that they and their children experienced positive behavioral changes after their children underwent general anesthesia. Eight (66.67 %) participants reported that they changed behaviors around their child's oral hygiene routine after the dental surgery. Common changes included increasing the amount of brushing and flossing and decreasing sweets. Parent 3 indicated that she and her daughter improved their dental hygiene routine following surgery. Parent 3 described these changes, saying:

I make sure that if she is asking for candy, I make sure -- I always say that remember that candy causes cavities. And so if she does have something sugary, she wants to brush her teeth right away. Cleaning teeth -- we know that because she never wants to brush her teeth in the morning, we always did that at night, and she was never, never in the routine to do it as much in the morning, and now she has to do it both times. And about -- and we did get -- she did want an electric tooth brush, so we are using electric tooth brush [to] hopefully help clean her teeth better.

Parent 5 indicated she had noticed her daughter was doing a better job brushing her teeth following surgery. She indicated that she believed child 5 had become more aware of good dental hygiene following her surgery. Parent 5 described these changes, saying:

I think she is getting better. Sometimes before, what we was doing, we helped her. Like, watch her brush, and I just cue her to do more or do the top or whatever. But she does now seem to do better with brushing. She seems to do a better job. She tends to do it quick, so we watch her and cue her to do it more properly, and she is doing better with brushing now. I think these little things make her more dental aware, and we are, as parents, are more expressing ourselves more. How, like, we

always were saying, like, we need to brush your teeth and get the sugar bugs out and things like that. But I think this made her more aware, and also made our wording better by emphasizing how, you know, we could avoid going to the dentist by making sure she taking care of her teeth, you know? Some of the stuff that happened to our teeth can prevent that from happening, so we have been talking more about prevention, to prevent that happening and going to the dentist, and I think that made her more aware.

Like parent 5, parent 7 indicated that she thought her daughter had become more aware following surgery, and that she was doing a better job brushing her teeth. Like parent 5, parent 7 indicated that the experience had them more focused on prevention, rather than relying on treatment. Parent 7 articulated this, saying:

I think before the treatment, she didn't quite know -- she didn't quite understand, like, how important it was to brush properly, and now that she had to go for her surgery, she takes it more seriously and she is more willing to let me help her, whereas before it was such a huge fight to get her to let me help her brush her teeth and make sure we get all of them and flossing. And now she is more – like, I just have to remind her that we need to do this properly or else you will have to go into another surgery and we don't want that. So I think she is more understanding now, she needs to take better care and let me help her.

Summary

In this chapter, the participant (both children and their parents) narratives were presented relative to children's DTGA experience. The children's drawings were presented. The drawings provide rich insight explaining the DTGA experience from the perspective of a child. Key

themes that emerged from narratives were presented. In addition, thematic analysis was used for decomposing data into themes, identifying commonalities across participants.

The next chapter interprets and describes the significance of these findings in light of the literature and offers insights based on the findings.

Chapter 5

Discussion, Conclusions, and Recommendations

This chapter is divided into a summary of the study's findings, what the findings might mean, how valuable they are and why, limitations and strengths, contributions, conclusions, and some recommendations for future research in this field. Where applicable, I describe where my work is similar to others or how it differs and why, along with an emphasis on the clinical relevance of the findings.

The Study's Findings as They Relate to the Study's Questions

With research question one regarding the experiences of the child and parents regarding the child's dental general anesthesia, five themes were observed; these include child anxiety, parental anxiety, extended wait times, side effects, and positive outcomes and experiences. On the perceived impact of the experience of dental general anesthesia from the parents' perspectives, three themes were identified: children had less pain, hesitation to undergo general anesthesia again, and cost concerns. For the beliefs and attitudes of parents in relation to their children's oral health status and treatment, themes included: importance of baby teeth, need for education, reason for decay, and barriers to hygiene. Lastly, on the early effects of the general anesthesia on the child and parent in terms of the prevention of further dental decay, the only theme identified was positive behavioral changes.

RQ1. What is the children's experience of the child's dental general anesthesia procedure and what are parents' views regarding GA treatment?

Participants of the study reported that anxiety was common among children who were to undergo general anesthesia. Although participants experienced anxiety caused by undergoing general anesthesia, anxiety was also a contributing factor in the family's decision to choose

general anesthesia rather than a local anesthetic due to failure of the latter. Seventy-five percent of the participants or their parents reported experiencing anxiety. Some of the participants reported that they were scared of going to the dentist. They also indicated that they were nervous at the time of the surgery and were made further uncomfortable by the smell of the mask used to administer general anesthesia. These findings support the study of Hosey et al. (2006), who found a majority of children undergoing DTGA were generally anxious about dentist appointments. They also reported dental anxiety, induction stress, and postoperative morbidity are interrelated. There was a need to develop ways to help children cope better with what they are likely to remember as a distressing experience. Results are contradictory about whether the presence of parents during the GA induction would diminish their child's anxiety (Kain et al., 1996; Sanchez et al., 2014); however, it may increase the parent's heart rate and skin conductance level (Kain, Caldwell, Andrews, Mayes, Wang, Krivultza, & LoDolce, 2003). In studies by Rodd et al. (2013, 2014), children reported negative as well as positive emotional and physical outcomes. Before the DTGA, the sensation of hunger due to the requirement for pre-operative fasting was a recurring theme. Another theme in the pre-operative period was that of being worried about the forthcoming DTGA. These were also reported by some of the participants of this study. Based on the findings of the study, children experience anxiety and stress due to an upcoming GA procedure. The existing literature also found the same results. As such, anxiety experienced by children undergoing dental GA is confirmed.

Studies have shown that having dental treatment under GA does nothing to alleviate anxiety about dental treatment (this is the case with the current study's children) (Goodwin, Sanders, & Pretty, 2015; Hosey, Macpherson, Adair, Tochel, Burnside, & Pine, 2006). And at least one study reported that, according to the Children's Fear Survey Schedule-Dental Subscale

(CFSS-DS), there was an increase in dental anxiety following treatment under GA (Cantekin et al., 2014).

Adult participants reported that they also experienced a great deal of anxiety before and during the procedure on their children. Grimes, Bowman, Dodgion, and Lavy (2011) reported that patients from low- and middle-income countries also face similar barriers, including fear of undergoing surgery, fear of having an anesthetic, and fear of negative outcomes as a result of surgery. The majority of the participants did not have any previous experience with general anesthesia. The participants indicated that negative side effects were over and above what they expected when their children experience general anesthesia, including severe vomiting, mood swings, and disorientation. These findings are broadly in line with the statement made by da Fonseca and Nelson (2014) that, “Although the use of GA is mostly uneventful, it is associated with greater morbidity and mortality than provision of dental care under local anesthetics” (p. 185). Jenkins and Baker (2003) listed the complications that might result from anesthesia as the following: sore throat (14-64%), postoperative pain (6-95%), drowsiness and dizziness (11-62%), nausea and vomiting (20-30%), and conscious awareness during the procedure (0.1-0.7%). In our study, explicit recall or awareness of procedures was one of the themes that emerged from the interviews and analysis of children’s drawings. There is a risk, at least theoretically, that patients who experience dental surgery may develop post-traumatic stress disorder, particularly if the memory is associated with severe pain (Jenkins & Baker). This issue warrants further research. More “mild” complications mentioned by others (e.g., Mayeda & Wilson, 2009) include sleeping irregularities, disruption of bodily functions, and bleeding (all of which were noted, with different severity, by this study’s participants). Costa, Harrison, Aleksejuniene, Nouri, and Gartner (2011) noted in their study that most child patients under seven years of age

returned to their normal behavior within 24 hours without any medical attention. However, about one third of the children required two to five days before experiencing a significant decrease in their post-operative discomfort.

In concurrence with researchers such as Li and Lopez (2006) and Lizasoain and Polaino (1995), the current study's findings show that children experience elevated levels of anxiety and distress prior to dental surgery; the child's operation is also a stressful experience for parents. Importantly, the main concern of the parents was exclusively related to anesthesia, and not related to the dental work itself, whereas the children's concerns were ambiguous. For example, Parent 3 reported being extremely nervous as it was the child's first experience of GA and she did not want it to be an extremely negative experience for the child. A parent in this study was rather vocal about never wanting to go through GA with her child again as they had experienced it negatively. This appears to strengthen their resolve to keep up with good oral hygiene.

Although these findings are generally compatible with the existing literature (as discussed above), there are a few areas where they differ. Parents from Wong et al.'s (2005) study were fearful of treating their children's teeth under GA because they thought that GA would affect the development of the child's brain, threaten the life of the child, affect their temperament, affect the child's memory, growth, and development, and cause hair loss. Amin (2007) reported that one mother said: "He might not awaken after the [dental] surgery...and it might affect my child's brain or his IQ" (p. 292). Amin's study included nine Chinese immigrants out of 19, the total sample of her study, all living in Burnaby, British Columbia. In comparison, none of our respondents mentioned these potential complications of GA - reported by Wong et al. and Amin - as a concern. This may be related to problems with informed consent.

In answering the first research question, the data were indicative of GA being a source of stress to parents and children. Children in the current study used the term, “I don’t know,” many times when they were asked why they felt “sad” or “scary” before their treatment. And while the expression “going to sleep” is used by both health care professionals and parents when describing general anesthesia—intended to be less anxiety provoking—it was associated with elevated anxiety and fear. For example, child 3 said: “I do not want to fall asleep...go to sleep.” Similarly, child 5 said: “I don’t like going to sleep.” We also found that parental fears intensify children’s anxiety, which is consistent with the findings of Fortier, Del Rosario, Martin, and Kain (2010), who also found that children’s perioperative anxiety was related to postoperative pain and negative postoperative behavioral change. As such, these adverse outcomes underscore the urgent need to develop effective strategies to minimize preoperative and perioperative anxiety in children and their parents.

As this thesis primarily focused on exploring children and parent experiences, I will briefly describe some strategies or tools used or proposed to prepare those involved with elective pediatric day care surgery. Parents, usually mothers, feel anxious about the procedure to be done to their children; research shows that children are more cooperative and less stressed if their mothers are less anxious (Kain et al., 2000). One study showed that treating mothers with acupuncture reduced anxiety in the mother, and children were more co-operative at the induction of anesthesia (Wang et al., 2004). Other non-pharmacological interventions for assisting induction of anesthesia in children were systematically reviewed by Manyande, Cyna, Yip, Chooi, and Middleton (2015). One approach was that of parental presence during anesthesia induction, and it deserves some discussion because parents in our study were, in general, in favor of parental presence for induction. There is a general agreement that parents and children prefer

to stay together during medical procedures, which results in reduction of the child's and parents' anxiety (Kain, Mayes, Wang, Caramico, Krivutza, & Hofstader, 2000). However, randomized controlled trials show that routine parental presence during induction of anesthesia (PPIA) is not always beneficial in reducing child's anxiety (Manyande et al., 2015). Kain et al. (1996), for example, found that children who were older than four or those with a parent with a low trait anxiety benefited from PPIA, which was not true for other groups. A parent in our study thought that allowing PPIA for both parents is a good idea, whereas another parent (mother) thought that only fathers should be present at that critical moment and emphatically stated that the mother should never be present. In a single trial, there was no significant difference to a child's anxiety whether one or two parents were present, although parental anxiety was significantly reduced when both parents were present at the induction (Manyande et al., 2015). The policy regarding PPIA differs among medical facilities in each country. In the Swedish public health system, there is a formal policy in favor of PPIA generally (with some exceptions) (Wennstrom, Hallberg, & Bergh, 2008). The Children's Hospital of Pittsburg of UPMC (2009) issued a pamphlet outlining its policy on PPIA; it also contains helpful information for parents and children undergoing GA.

Two points from this pamphlet are worth discussing because of their relevance to our study. First, only one parent or guardian may accompany the child into the OR; this policy is similar to the day-care surgery centre policy (where most of this study's participants experienced the GA). Second, there is advice for parents to bring along a "comfort" item (e.g., a stuffed animal) for the child to hold during induction. We found this recommendation to have a positive effect on a couple of cases in our study (Case 7: Suzy Sheep; Case 5: Teddy bear). Other non-pharmacological interventions for assisting the induction, such as the use of a favorite scent in the air or flowing through the mask, and a Virtual Reality Exposure Tool, are potentially

promising and need further investigation (Eijlers et al., 2017; Gupta, Mathew, & Bhardwaj, 2017). Hosey et al. (2014) are currently investigating whether an interactive online GA-coping cartoon with an embedded video would help families to better prepare a child for surgery, particularly dental since this is the most common referral for GA in the UK.

Some other factors that might contribute significantly to operation-related anxiety were presented by the research's participants and include:

- Age: Lumley, Melamed, and Abeles (1993) considered children between the ages of one and five be at a higher risk for developing significant anxiety before surgery. The question of when is a child too young to understand or not experience fear in unfamiliar situations deserves further exploration. The role age plays in preoperative anxiety warrants further research, particularly because children five and younger constitute the bulk of children receiving day dental surgery in Canada (Schroth, Quinonez, Shwart, & Wagar, 2016a), as well as in the US (Saxen, Urman, Yepes, Gabriel, & Jones, 2017) and the UK (Hosey et al., 2014).
- How many people present during induction: This factor played a key role based on children's drawings. For example, a child drew four "people" representing "doctors dentist" in addition to her mother standing next to her OR bed.
- Long wait times between arrival at the facility and induction: This factor was important for some children and was associated with two more factors: presence of other children waiting or in recovery, and the physical environment where the service is provided.
- "Playing" at home with an anesthesia mask prior to the GA appointment: At least one parent indicated that they received a mask by mail for this purpose (family 7). Aydin et

al. (2008) found this practice to relieve mask-related anxiety, improving its acceptance and shortening the induction period.

Another approach for reducing children's anxiety during a hospital stay is the use of sedative premedication. The modern concept of "balanced anesthesia," in which GA is administered using a mixture of small amounts of several drugs, aims to get patients into the "Goldilocks zone." To reach this zone, several drugs are given to meet the specific goals of an anesthetic; namely, loss of consciousness, amnesia, analgesia, and muscle relaxation (Dease, 2015). In a preliminary study, Purra et al. (2005) suggested that the simple method of analyzing the drawings of children might help to pinpoint which children would benefit from sedative premedication. The weakness of this study is that some children received rectal diazepam as a premedication drug, which causes reduction of both cognitive and motor functions needed for drawing, and were asked to draw after the drug was administered.

While the practice followed by anesthesia providers in our study adheres to a best-practice guideline that, "good post-operative pain control starts before surgery" (AAPD, 2017/2018a; da Fonseca & Nelson, 2014, p. 187), the lack of the use of sedative premedication needs some review. Weddell, Jones, and Emhardt (2016) recommended six ways to minimize negative behavioral changes after children's hospitalization for DTGA; giving preinduction sedation is among them. Other recommendations (such as allowing the child to bring along a favorite doll or toy, allowing parents to rejoin their children as early as possible in the recovery area) were followed during DTGA in this study. Benzodiazepines, particularly midazolam (intranasal or oral), is the most researched pre-induction sedative (Abdallah & Hannallah, 2011), showing effective anxiety reduction in the one to ten year age group, especially for the most anxious children (da Fonseca & Nelson, 2014; Kain et al., 2004; Manoj, Satye Prakash,

Swaminathan, & Kamaladevi, 2017). It may also cause amnesia, a desirable “side effect” especially when induction proves to be difficult (Stewart, Buffett-Jerrott, Fineley, Wright, & Valois Gomez, 2006). The use of pre-induction sedatives seems to be not practiced by all dentist-anesthetist teams and further research on the desirability of routine in the case of young children (under 6 years of age) should be undertaken.

Midazolam, and more recently dexmedetomidine, have been suggested to be used as sedative premedicants to significantly reduce anxious during the induction of anesthesia as well as give analgesic and anti-shivering properties (Al-Sarheed & Abdelhalim, 2014; Kain et al., 2014). At least a couple of parents in our study singled out the “shivering” effect of GA on children under GA. Parent 1 described: “I had family members that had went. They got general anesthesia and they told what does [it] look like and what to prepare for when they got putting to sleep like the *twitchiness*... they got twitchy...muscles *twitch*...yeah, that from the family.” Parent 11, a mother, had witnessed the “twitchiness” firsthand, commenting: “Because he was moving around a lot as if he is dying, god forbid) [laughter]. At that time, it was difficult.”

Participants also reported experiencing variable wait times between when they knew their child would undergo general anesthesia and when the appointment could be made. The wait time ranged from several weeks to several months. The majority of participants indicated that the wait time was acceptable and that they did not feel like it was too long. Demand for GA when treating caries in young children is high, and is increasing in several countries, including Canada, Australia, the UK, and the US (Alcaino, Kilpatrick, & Smith, 2000; Goodwin, Pretty, & Sanders, 2015a; Nagarkar, Kumar, & Moss, 2012; Schroth et al., 2016a). Alsharif, Kruger, and Tennant (2014) noted that Indigenous status, poverty, and rural/remote dwelling are all risk indicators for delayed admission to a hospital for dental conditions in Western Australian children. However,

Indigenous children in metropolitan areas are more likely to be admitted quickly, and the real admission rates were higher among non-Indigenous children. The differences observed are thought to be attributed to a number of factors, such as variation in service access since a significant proportion of Indigenous children live in rural and remote locations, socioeconomic, or environmental factors. Subsequently, wait times for treatment can be long, up to several months. In this study, a parent reported concern and frustration over the negative effects on their children due to a long wait time, including ongoing or increasing pain, difficulty sleeping, and the subsequent impact on school attendance. The Wait Time Alliance (n.d.) released a report card showing that, in 2015, almost 50% of Canadian children in need of dental surgery had to wait longer than medically acceptable. The report also showed that Saskatchewan was successful in reducing the wait times for surgery from six months to 90 days or less in 96% of cases. This improvement was evident in the current study. In contrast, wait times were problematic in a study involving 456 children (mean age: 6.7 years) referred to six hospitals in the northwest of England for teeth extraction in a hospital under general anesthetic; the average time from referral to operation was 137 days. More importantly, pain, sleepless nights, and missing school were also a feature during the wait for dental GA, which was exacerbated by the extended wait (Goodwin, Sanders, Davies, Walsh, & Pretty, 2015). The side effects of wait time described by Goodwin et al. (2015c) is applicable to only one case in our sample, a refugee who waited for about seven months, during which he suffered from pain, sleepless nights, and missed school days.

RQ2. What is the impact of the GA experience on the child and parent?

In considering the impact on the child and parent the results are subtle as the absence of pain in children may constitute a significant relief to the parent. Similarly, when a child does not

eat or has to miss school due to toothache, parents are worried about their health and education, resolution of such an issue has an impact on the parent's emotional well-being. The amount of disruption and personal stress caused by visits to dentists and undergoing GA differ in families, in this study parents identified significant amounts of anxiety about having to consent to the GA procedures. This burden of GA and the possible side-effects had an emotional impact of the parents.

Many participants reported that children experienced less pain after their dental appointment when using general anesthesia. Some of the participants indicated that, if given the chance again to choose between general anesthesia or a local anesthetic for future dental work on their children, three participants shared that they would pick the latter, two the former, and three indicated their choice would depend on the amount of work that had to be done. Participants who preferred the local anesthetic did not explain what they would do if their children exhibited the same fear that made them decide to choose general anesthesia this time. Wong, Copp, and Haas (2015) found that 48.5% of children undergoing GA for dentistry at the University of Toronto's dental surgicenter reported moderate-to-severe postoperative pain, whereas parents estimated that 29% of children suffered from moderate-to-severe pain. Pain subsided over three days (Wong et al.). However, similar to the note by Rodd et al. (2014), children in our study described impacts in a highly sensory manner, referring to taste ("They gave me the yucky medicine"), touch ("I wanted to feel nice and warm"), smell (I don't like the smell of the mask a little bit...and I did not want to go to sleep"), and sight ("I was in the waiting room and everybody was looking at me and I had a little blanket").

One of the concerns pointed out by several participants was the cost of general anesthesia. Two participants shared that they didn't know how they would be able to afford the

procedure, and a few others voiced a concern that they were not sure if the surgery would be covered by their insurance. Locker et al. (2011) explained that there is a lack of dental coverage associated with low income families at a national level, which hinders dental treatment. The high cost of dental treatment and lack of dental insurance and/or financial means to meet the cost contributes to hesitation in seeking dental treatment. Discussions with the participants also highlighted that the cost of the treatment is one of the factors that they feel impacts their family when choosing DTGA. Due to the high cost of dental treatment, participants were concerned about how they would be able to afford the cost of dental treatment.

The costs associated with treating children's caries in the OR are substantial not only for families, but also for a universal health care system. In Canada, the hospital-associated costs for dental GAs are absorbed by the health care system and exceed \$21 million annually (Schroth et al., 2016a). Additional costs include dental costs (some of which are covered by third-party insurers, IFHP, or NIHB), travel costs, and costs borne by the family. In the US, some third-party payers deny reimbursement for general anesthesia and facility costs related to oral health care (AAPD, 2017/2018b). This has motivated some states to enact legislation requiring medical insurers to reimburse for hospital charges associated with provision of dental care for children in the OR (AAPD, 2017/2018b). In Alberta, Alberta Health Services (AHS) requires that the operating time should not be exceeding one hour in order to be funded by AHS (B. Krusky, personal communication, January 22, 2018). The ramifications of this policy need research.

A 2016 study by Patel, McTigue, Thikkurissy, and Fields investigated the effect of treatment cost on parental acceptance of behavior management techniques in dentistry. Of relevance, they evaluated parental acceptance of oral sedation and GA based on varying out-of-pocket expenses. They found that when the cost per visit of oral sedation or GA increased,

parental acceptance of that technique decreased. For example, paying \$400 per visit for oral sedation was in the unacceptable range for parents; the limit was \$1,000 for GA. These findings led the authors to conclude that, although parents may find a technique acceptable, a cost-versus-benefit analysis must be done. Also, choice of behavior management technique may be limited due to financial implications. Finally, the state of the economy can impact a parents' willingness to pay for dental treatment and the technique used to manage their child's behavior (Patel et al., 2016). Family 5, Family 8, and Family 12 in our study raised concerns about expenses paid out-of-pocket (\$300 for Family 4 and Family 12 each). One family cancelled their GA appointment mainly because of cost concerns. It is worth noting that direct cost as presented here is only one aspect, another is indirect costs/earning forgone that is sometimes differentially distributed across patients (e.g., travel costs, accommodation costs, non-paid leave, etc.). In addition, the cost of dental GA/OR visit is covered for children under 14 by Saskatchewan Health Authority (the medical part is covered, but not the dental). The Government of Saskatchewan Ministry of Social Services, First Nations and Inuit Health Branch (FNIHB), the Interim Federal Health (IFH) Program, and the Non-Insured Health Benefits (NIHB) program also cover treatment for their respective beneficiaries. However, a fraction of children receiving dental GA still need to pay for some dental services provided in the operative room through third-parties insurance or out-of-pocket, as pointed out by a couple of families in this thesis. Another parent, a refugee, stated that it was not clear to him who was paying for his child's dental treatment. Finally, as the IFH covers the cost of supplemental services (such as dental care) for one year, a privately-sponsored family (refugees) cited this as an issue.

While it is true that exodontia (i.e., removing teeth) services under GA require less time and equipment, thus representing a less expensive option than provision of comprehensive care,

children in this study (and some of their parents) reported extraction of teeth, provided as part of comprehensive dental care, as negative outcomes, being distressed by this “loss.” This loss was represented in some children’s drawings in the current study by images of the tooth fairy. For example, child 5 drew the tooth fairy as a little beautiful child with wings flying through the air (Appendix M, Picture 18). Some children pictured something else in place of a tooth fairy (e.g., a dog by child 4, Appendix M, Picture 17; a bear by child 5, Appendix M, Pictures 27 & 28; a “Girl Picachu” by child 4, Appendix M, Picture 16). Notably, among gift-bearing imaginary figures, only the tooth fairy (compared to Santa Claus and the Easter Bunny) can appear in a variety of ways and can take on any appearance, enabling children to use their imaginations when describing her (Wells, 1991). However, some common characteristics of the tooth fairy include long hair, a long dress, wings, and a wand, in addition to being feminine (all features depicted in Child 8’s representation of a fairy, Appendix M, Picture 35).

Findings from a Visa survey based on 3000 phone interviews conducted in July 2013 revealed that the tooth fairy will be visiting close to 90% of US households with children. While a fairy left an average of \$3.70 per tooth under children’s pillows, the tooth fairy left the most (up to \$50) in households with young parents (Journal of California Dental Association, 2014). In an Editorial, Toumba (2013) suggests that dentists should better use the tooth fairy to promote the oral health of children’s teeth by telling children that they will get more money from the tooth fairy for sound teeth than for decayed teeth. Parents who are often struggling to get children to brush their teeth could also use this type of persuasion. It is worth mentioning that parents in our study have their own fears that children might lose their teeth as a result of dental decay. Parent 2, an Indigenous (as described herself), used the term “druggie” to describe a person who has lost teeth.

RQ3. What do parents think about their children's oral health?

The majority of the participants indicated that they believe baby teeth are important. Two of the participants shared that permanent teeth are more important, and did not specifically indicate if they thought that baby teeth are important as well. An ethnographic study based on seven community focus groups comprised of five ethnic populations (Chamorro, Filipino, Carolinian, Pohnpean, and Chuukese) living on the island of Saipan, Commonwealth of the Northern Mariana Islands, USA, revealed the low value of baby teeth and the negative treatment experiences parents have had with symptomatic dental care, which appeared to be important determinants of health beliefs and subsequent behavior. They found that, while some low-income individuals (particularly experienced mothers) see no need for preventive oral care even with clear oral pathology (e.g., dental cavities), others are open to new information and experiences, particularly among those who will be mothers for the first time soon (i.e., primiparous) (Riedy et al., 2001). It seems that the dental community has not done enough efforts in spreading the word regarding the importance of baby teeth for children's health and their general well-being.

In the current study, a parent recommended that effective prevention messages should commence when, or even before, the mom is pregnant, or at least as early as possible, well before dental decay manifests. The Baby Teeth Talk study (BTT) is an ongoing tri-country project with Canada, New Zealand, and Australia and that focuses on addressing the high prevalence of ECC in Indigenous populations worldwide. The BTT's interventions include offering dental care during pregnancy, applying fluoride varnish to infants, and using motivational interviewing and anticipatory guidance to counsel mothers on how to care for their children's teeth (Cidro et al., 2017). In Saskatchewan, Enhanced Preventive Dental Services Initiative is a program to improve children's oral health by increasing access to dental care,

particularly preventive services for children at risk, targeting pre- and post-natal mothers, preschool and school-age children across the province (Government of Saskatchewan, 2011).

The need for education was also identified as a theme in the present study. Several participants shared that there was a lack of education on general anesthesia and oral health overall. Despite the provincial and federal Children's Oral Health Initiative (COHI) and healthy moms healthy baby interaction with parents. The GA is a separate education process. These participants indicated that they either did not fully understand how to interpret their child's oral health status or their need for general anesthesia. Participants also indicated that their dentist had not told them the reason for their child's dental decay. A lookback at what community the families were from could be instructive with respect to the existing programming they may have been exposed to which explains etiology and prevention. Four participants explained that their dentist did not tell them why their child had dental problems. Some of these participants explained that they believed they understood why their children had developed dental problems, even if nobody had told them. Soussou, Aleksejuniene, and Harrison (2017) conducted structured interviews with parents of under-served low-income children as part of the University of British Columbia Children's Dental Program (CDP). Similar to our results, they identified that the parents' knowledge about caries etiology and prevention was limited. As a result, CDP developed a dental education program aimed at engaging parents in the waiting room. They found the program to be a feasible, acceptable, and promising strategy for improving short-term dental behaviors for children, including brushing teeth, and avoiding eating sugar-containing snacks and sugar-containing drinks.

Participants also highlighted that there are barriers to hygiene before and after surgery. Several participants felt like they faced at least some barriers to maintaining their child's oral

hygiene after surgery. Common barriers cited were lack of time, distance to dentist's office, and the child's dislike going to the dentist. One participant indicated that both a lack of time and the distance from the dentist's office were barriers to ensuring good oral hygiene for her child.

Similar barriers were reported in studies conducted earlier. Families whose children needed care and enrolled in Connecticut's Medicaid-managed care program encountered significant administrative and logistical problems when trying to obtain appointments (Lee & Horan, 2001). Limited access to dental services for low-income children was also reported (Lam et al., 1999). They found that the dissatisfactions of dentists with low reimbursement fees and the hassles of paperwork were not the only factors affecting dentists' participation in the Medicaid program in Washington. Factors such as staff personal connections to Medicaid-insured patients, staff members' attitudes about Medicaid-insured patients, and staff members' perceptions of Medicaid-insured patients were reported as barriers to care. Publically-funded programs are not panacea for resolving dental issues encountered by this segment of population.

Durey et al. (2016) investigated the perception of barriers and enablers to oral health of Indigenous health workers. Based on responses in this study, current policies and practices are falling short in improving oral health outcomes. The barriers identified by participants included insufficient education about oral health maintenance and disease prevention, private dental practice being financially out of reach, public dental services not meeting oral health needs, barriers related to access without transport, and clinics not prepared to accommodate parents/carers with babies and young children. Insufficient education was a theme raised by adult participants in this study. They highlighted that there is a need to get more information on the procedure and the cause of dental decay and oral health promotion. The distance of the dental

clinic was also a concern pointed out by adult participants. Due to the distance and lack of time, adult participants usually have a hard time going to dentist appointments.

The World Health Organization (2012) recognizes that oral disease can be prevented by brushing teeth twice a day with a fluoride toothpaste and by limiting the frequency of sugar consumption. Low-frequency tooth brushing tends to be accompanied by unhealthy eating patterns, socioeconomic inequalities, and other common health-risk factors such as smoking and low levels of physical activity (Sheiham & Watt, 2000). Although Canadian parents seem to have good knowledge about how and why to clean their children's mouths even before primary teeth emerge due to public health messages and early childhood oral health promotion campaigns (Schroth et al., 2005; Schroth et al., 2014), the lack of willingness of some parents to initiate and then maintain preventive oral health care for their children is troubling. This is particularly true considering that these parents have had to experience a very stressful event to address oral health care for their children. Although it is out of the scope of this thesis, some questions in the interview cast light on parents' perceived barriers to addressing their children's oral health/hygiene. One factor that comes into play is fatalism, or what Amin (2007) called "normalizing the disease" (p. 78): "I think having a cavity is OK, because I don't think there is anybody out there without a cavity" (Amin, 2007, p. 245). In our study, Parent 7, responding to the question, "Do you believe that if you got the chance before to take her to the dentist, she wouldn't go through GA?" said, "I think we would probably still need it. Just because I think where we -- kind of, one downhill was...like, I am a single parent and I work for the summer and my job requires me to be gone half of the time." Another factor is parenting style. For example, Parent 12, a permissive parent, allows considerable self-regulation and avoids confrontation: "She [her daughter] likes to eat sweets a lot and if we try to control that, she would make a lot of

disturbance.” The association between parenting style and ECC is not clear and requires further research (Dabawala, Suprabha, Shenoy, Rao, & Shah, 2017). Another factor is perceived unimportance of baby teeth by some parents. This was reflected in statements like, “They [baby teeth] are not as important as adult teeth.” Similar findings were reported in Saudi Arabia (Baghdadi, 2014, 2015), Poland (Szatko, Wierzbicka, Dybizbanska, Struzycka, Iwanicka-Frankowska, 2004), Libya (Almoudi, Hussein, Doss, & Schroth, 2016), and India (Setty & Srinivasan, 2016). Aversive parental experience and disregard for primary teeth were also identified by Riedy et al. (2001) as serious obstacles to reducing dental disease among five ethnic populations living in the US. In a similar qualitative study done in Finland, parents of preschool children gave less importance to primary teeth when compared with general health (Lahti, Hausen, & Vaskilampi, 1999). In Kuwait, however, 80% of parents indicated better appreciation of the importance of baby teeth (Ashkanani & Al-Sane, 2013). In the current study, we presented the parents’ perceptions of baby teeth and the need for education about the importance of baby teeth which emerged as a theme.

Reporting on parent knowledge and attitudes toward preschool oral health and ECC from four communities in Manitoba, Schroth, Brothwell, and Moffatt (2007) found that most parents believed that primary teeth are important, that dental disease could lead to health problems, and that a first dental visit should be made by age one. Despite this reported knowledge, the prevalence of ECC among Manitoban children is high (ranging from 47% in Winnipeg to 98.9% in Garden Hill FN) (Schroth & Prowse, 2011). This divergence suggests that knowledge and attitude, though necessary, are not adequate factors for controlling ECC. Amin (2007) argues that the self-efficacy theory could be suitably used for understanding change in parental dental health behavior following general anesthetic dental treatment provided to their children. Parent’s

behavior, attitude, and practice regarding their child's oral health is important because parents are responsible for child's oral health hygiene and oral health-related behaviors (e.g., cariogenic food) (Amin, 2006). Increasing parents' participation in childhood oral hygiene practices would help to curb rising oral health conditions and diseases in children, and parents' self-regulatory skills are important to translate intentions into behavior (Hamilton, Cornish, Kirkpatrick, Kroon, & Schwarzer, 2018). Translating oral health knowledge to behavior change is difficult. In our study, participants presented some obstacles (e.g., time, work, study) they perceived as hindering positive change related to oral behavior (such as brushing, flossing, and reducing sugar-containing foods and drinks).

While healthcare professionals in our study included health promotion during their conversations with families undergoing dental GA, there is a lack of a systematic approach in doing so considering how many patients return for further treatment under GA or return only when they have a dental problem (Olley, Hosey, Renton, & Gallagher, 2011). Oral health promotions should be ongoing—they should not only be a snapshot in time (de Fonseca & Nelson, 2014). Amin and Harrison (2009) advise that counseling should be tailored to an individual parent's stage of change and readiness. In many northern communities the dental therapist does a home visit to assess outcomes of GA and provide oral health education.

Hoover et al. (2016) revealed that immigrants and refugees in Saskatchewan have other priorities and concerns that are more pressing than their children's oral health needs (e.g., learning English and adapting to the new culture). In this study, Parent 12 considered attending English classes and a lack of time as obstacles to taking care of her daughter's oral health. Other issues that hinder seeking dental treatment include the high cost: immigrants often lack dental insurance or the financial means to pay for treatment. One parent admitted that he cannot afford

to pay for his son's dental treatment despite the severe toothache impacting the quality of life for the child and family (e.g., school absences, waking parents at nights). This parent wanted to cancel the GA appointment since his son had stopped complaining about tooth pain, but he did not know how to do so. Prowse et al. (2014) and Naidu, Nunn, and Forde (2012) found that parents from certain ethnic and cultural groups may seek dental care only after their children start to experience pain. Amin and Perez (2012) found that seeking dental care was not the cultural norm for African newcomers to Alberta. Tickle et al. (2003) also found that families living in deprived areas in the UK expressed little explicit support for the restoration of asymptomatic carious primary teeth. Similarly, El Azrak et al. (2017) found that, despite more than 75% of preschool children of refugee and immigrant families in Manitoba having caries that remained untreated, few parents believed that their children had dental problems. Amin and Elsalhy (2017) found that parents of new immigrant children do not always recognize caries easily, and that they view dental visits as painful encounters, lack time to take their children, and face barriers to accessing care, making them less likely to seek dental care for their children. These findings suggest that oral health promotion activities must be tailored to each group to ensure they are culturally appropriate and effective (El Azrak et al., 2017; Hilton, Stephen, Barker, & Weintroub, 2007; Prowse et al., 2014). Reza et al. (2016) found that immigrant and refugee children in North America were less likely to brush and floss compared to non-newcomers.

Hancocks (2011) commented on the increased number of children being referred to hospitals for dental GAs:

It is human nature to wish that things might be different but it is also human nature to find that all the things we 'should do' just are not feasible in a busy life, and more

particularly in a life lived in relatively poor socio-economic conditions, as many of children in this study did. (p. 360)

RQ4. Does a dental GA experience result in any changes to the way the child and parent approach oral health?

The majority of the participants reported positive behavioral changes after their children underwent general anesthesia. Eight participants reported that they changed their behavior around their child's oral hygiene after they underwent general anesthesia. Common changes included increasing the amount of brushing and flossing and decreasing the consumption of sweets.

Vaughn and Robinson (2003) found that populations with higher risks of poor general and oral health correlated with higher levels of sugar consumption, along with limited oral hygiene and a lack of fluoridated water. Burt and Pai (2001) argue that people eating sugar are more likely to have increased cariogenic bacteria, but the relationship is not linear and the resultant caries rates differ by individual. They conclude that "sugar consumption is likely to be a more powerful indicator for risk of caries infection in persons that don't have regular exposure to fluoride" (pp. 1020-1021). In addition to fluoride (both topical and in drinking water), eating patterns, duration of exposure, food form (e.g., sticky), nutrient composition, and saliva affect the risk for caries associated with fermentable carbohydrates (Gibson & Williams, 1999).

Poor oral health in children is a concern because dental caries is associated with tooth pain, missing school, in addition to impairment of daily activities such as eating, smiling, concentrating in school, academic achievement, and sleeping (Jurgensen & Petersen, 2009).

There is general agreement that oral health status affects childhood health and wellbeing (Schroth et al., 2009). Early dental care and, if needed, intervention is an important strategy for

preventing childhood caries. In addition to the weakness of the scientific support for age one dental visits (Bhaskar, McGraw, & Divaris, 2014), some investigators pointed to the fact that provider availability may pose a barrier to early visits (McKernan et al., 2016), particularly in remote and rural areas given the geographic distribution of providers. Another issue is that some general dentists may need further training and skills for first dental visits, as shown by a study in Winnipeg (Schroth et al., 2016c) and another study in Malaysia (Hussein, Schroth, & Abu-Hussan, 2015). Amin and Harrison's second (2006) and third reports (2007) demonstrate that parents' readiness to take action based on a balance of health-related beliefs and environmental factors has the greatest impact on changing and eventually maintaining behaviors conducive to ensuring good oral health.

A national clinical guideline published by Healthcare Improvement Scotland in March 2014 identified the repeated need for dental general anesthesia as a form of dental neglect that requires dental practitioners to raise concerns about the child's oral health as well as report the situation to the authorities. Haworth, Dudding, Waylen, Thomas, and Timpson (2017) in their paper, *Ten Years On: Is Dental General Anaesthesia in Childhood a Risk Factor for Caries and Anxiety?*, suggested dental GA to act as a proxy for environmental and behavioral risk factors for dental caries in childhood. They also found that children who undergo DGA are a high-risk group for poor oral health and dental anxiety as they age (they followed patients from the age of 7 to the age of 17). Thus, DGA should be included in all of the major risk assessment tools such as the CDA CAMBRA (Domejean, White, & Featherstone, 2011 [California Dental Association Caries Management by Risk Assessment]), the ADA (American Dental Association, n.d.) Caries Risk Assessment forms, or the AAPD (2016b) caries-risk assessment guideline. A sizeable number of children in our study (considering the size of our sample) had already undergone

dental GA themselves or their sibling(s) had (n = 3 or 25%). In one case, the child (younger than nine years old) had had a total of three dental GAs. In another family, the child's three brothers had undergone dental GAs. A dental practitioner who provided dental GA in SK cited *apathy* as a reason for repeated GAs, but we did not find evidence of this in the interviews with these two families. Robert Schroth, a renowned scholar, professor, and public health dentist, also indicated that some families in Winnipeg, Manitoba "visited" several pediatric clinics in the city to finally have their children's GAs done at the cheapest price, in an office-based GA model (R Schroth, personal communication, March 2017). He implied that GAs for these families act as "dental tourism," rather than an invasive procedure with inherent serious risks and potential complications. The results of our study do not support this conclusion of Schroth's. For example, describing her situation during GA induction for the third time, a child in this study explained that it felt like a hot air balloon ride and she found it scary. Also, the tourism aspect of coming to the big city is in play here, as well as the preference to travel versus having the GA close to/at home.

Implications of the Study's Findings

The results of the study have several implications and applications for different stakeholders including health policymakers, health professionals, parents, and children who need dental treatment. The focus of the study was to explore child and parent experiences with DTGA through the lived experiences of families whose children were referred for dental treatment under GA. The results of the study provided information that can be useful to improving dental health care.

The findings in the study may help health policymakers evaluate the current policies to see if they are actually beneficial for children who need dental treatment. The study's results can

be used to assist health policymakers to better understand the situation and experience of children affected by severe dental caries, as well as the effect on the parents. Health policymakers can make use of these inputs to support federal and provincial expenditures on dental treatment, especially for children with severe dental caries. This is particularly important in light of the data presented by the Auditor General (2017) showing that enrolment in children's initiatives for improving oral health in Canada has declined, as well as a decline in the number of services provided (the reason cannot be identified at the time of writing). The study explained that there are many barriers that hinder individuals from seeking dental treatment, and health policymakers can focus on these barriers to design better policies to encourage parents and children to seek dental treatment. There are current debates in Canada about whether dental care should be included in the public health system (Allison, 2014). However, there also is an acknowledgement that people skip seeing their dentist for many reasons, making the issue quite complex and necessitating complex solutions. The recent study by Roos, Dragan, and Schroth (2017) found that providing funding for dental care for Manitobans on income assistance has not prevented visits or increased treatments in high-cost facilities, specifically treatment under GA. Similar findings were previously reported in Ontario (Agha, Glazier, & Guttman, 2007). A recent US study (Meyer et al., 2017) examined pediatric emergency dental trends in two safety net clinics, where there is a large proportion of pediatric dental visits conducted. While the safety net clinics should have played a key role in optimizing dental care to a population facing barriers to accessing dental care, the study found that a considerable proportion of children's first visits to the dental safety net clinics was emergency related, not routine preventive care. Moreover, children's parents voiced issues related to access to care and lack of child-centered care; discordance was apparent between how professional organizations define the dental home and

how parents experience it in the context of care. Based on these results, it is imperative that professionals and policy stakeholders address this public health problem by developing an effective dental care model to optimize child-centered dental care. The recent study in the UK by Ramdaw, Hosey, and Bernabe (2017) shows that children from low SES (e.g., parents in routine/manual occupations, or who have never worked), as well as children living in deprived areas, with higher level of dental anxiety, or who visited the dentist only when in trouble were more likely to undergo dental GA.

The findings from this study will also help dental professionals consider some aspects that have not been previously addressed, such as reviewing pre-operative protocols (e.g., fasting) and developing strategies to manage pre- and peri-operative fear/anxiety. Results of the study provided the experience of children and their parents of DTGA, which could be helpful to dental professionals for better handling of children undergoing DTGA. In our study, some children pointed out that they felt “hungry” directly after GA. Some children, whose operations were late (at noon or after), experienced hunger, compared to those whose operations were in the early morning.

The impacts of fasting protocols as well as the advice given to children and their parents on post-operative feeding are rarely researched. Rodd et al.’s (2016) study revealed that the sensation of hunger (up to “starvation”) was a recurring theme in their ten-child study (aged 7-13 years), who underwent teeth extraction under GA (no other dental treatment was performed). What is more, children in the Rodd et al. study were more affected by the impact of the eating restriction and the resulting hunger than by pain or fear. In our study, hunger was a theme, but fear (or anxiety) was a predominant theme that transcended hunger and fasting concerns. Another study (Engelhardt, Wilson, Horne, Weiss, & Schmitz, 2011) revealed that Scottish

children had fasted for a median of 12 hours for solids and 7.5 hours for fluids before their dental GA, both times being far longer than current accepted protocols. Engelhardt et al. concluded that strategies to guarantee minimal fasting at hospital admission are urgently needed. Rodd et al. (2016) stated some recommendations that, if applied, would improve the patient experience:

- providing clearer information for parents and children about required fasting times;
- seeking advice from dieticians to inform families and dental health professionals as to what pre-fasting food types would best reduce feelings of hunger; and
- producing a simple visual post-operative guide to suggest good things to eat (e.g., noodles, soup, mashed potatoes).

The experience of parents and children identified in the study can be leveraged by health professionals to re-evaluate the way they treat patients and the procedures in place. For example, there are ongoing efforts and research aiming to prepare children to facilitate coping strategies thereby easing anesthetic induction; it is important to consider this for dental GA because it was proved a main issue for both parents and children. Distressing experiences associated with dental GA may have long-term emotional impacts, as Hosey, Robertson, and Bedi (1995) reported. In their study, it appears that some adults reported, via a dental helpline, that their traumatic DGA at an early age was a causative factor for their dental anxiety and resulted in their avoidance of dentists resulting in poor dental health. Another potential avenue for research would be to develop age-specific material such as videos or cartoons to prepare children for their dental GA experience using child-centered terminology and concepts. Similar material could also address other related aspects, such as post-operative expectations and oral health prevention. Involving and engaging children in the development of such educational sources is essential in the current era of patient-centered healthcare. Development of a general anesthesia guideline, a detailed

protocol, and policies (e.g., parental presence at induction, use of pre-medication, fasting protocol) also is required for health facilities providing dental GA in Saskatchewan.

A group of anesthesiologists and dental providers who were involved in providing general anesthesia to children for dental treatments in Saskatchewan's Royal University Hospital, recognizing that this population are known to suffer most from emergence agitation (EA), conducted a pilot study to test the efficacy of adjuncts to anesthesia in reducing postoperative EA (Mckay, Derdall, Brahmania, Nagle, Hamilton, & Teekasingh, 2010). The study found that none of the drugs studied were likely to be useful in reducing EA. They found 6.6% of their subjects (11/167) had side effects that were more severe than listlessness or lack of appetite. Of those children, only one parent decided to seek medical attention. In our study, EA (also known as emergence delirium [ED]) was described by some parents as a disturbing occurrence for children during recovery.

Dahmani, Delivet, and Hilly (2014) stated that ED is still considered as a mysterious complication after pediatric anesthesia, occurs typically in preschool children (incidence rate 12-55%), and is associated with a high intensity of anxiety and/or pain. Letting some parents know about these complications may assist in alleviating their anxiety and enhancing their satisfaction with the service provided.

The results from the current study can also be helpful for parents and families when deciding whether or not to go ahead with the treatment since research shows that some people neglect the importance of children's teeth or are scared of having dental care provided under GA. Given the information shared by the children regarding the procedure, parents may be more aware of the importance of dental health and the need to address the oral health of children, even if it means going through DTGA. It has become evident that suggesting and promoting

toothbrushing for young children is not enough; parents and children need training and coaching into the process (hands-on demonstrations and mentoring). Parents may also draw from this study to better understand how they can help lessen the stress and trauma felt by children when undergoing a dental procedure.

Children may also benefit from this study. This study relates the experience of children undergoing DTGA. This may prompt parents to involve children in decisions about their own health. This study will give a voice to an otherwise relatively overlooked segment of the population. It is not a common practice to ask children about their health-related experiences, particularly surgical operations. For example, children who might need extractions during GA need to be prepared for the loss of teeth to make the experience less stressful. Providing children with a prosthetic appliance, when indicated, might help, particularly when removing anterior teeth in very young patients. Child 1 felt too embarrassed after the GA to do a video diary because of the removal of her two anterior teeth. This child did three video diaries; two the night before GA and one in the early morning the day of the procedure. Dentists may also consider partial dentures for older children when there is extraction of multiple posterior teeth to help the child chew food (e.g., Child 9). These treatment modalities are currently not covered, limiting utilization. Dentists also are obliged to explain different aspects related to extraction of children's teeth during GA (e.g., effects on child's self-esteem, risks). Warning parents about post-operative morbidity is required considering its high prevalence, as shown in our study and studies by others (e.g., Hosey, Macpherson, Adair, Tochel, Burnside, & Pine, 2006).

This study shows that drawing can facilitate discussions with children as young as three, and help them talk about their traumatic experiences; the drawings provide a link between their internal thoughts and perceived reality. This is important because children, particularly young

children, who are more frequently subjected to DTGA may not always be able to verbally communicate their exact feelings, experiences, fear, and anxiety. While Thomas and Jolley (1998) indicated that children's drawings on their own are too complexly determined and inherently ambiguous to be reliable sole indicators of the emotional experiences of the children who drew them, we found that drawing gave children the opportunity to express clues that were internally generated and which helped children organize their narratives and share their story. It is worth noting that, in this study, children showed a great interest and tendency to draw (except one child who did not want to make a drawing). Child 5 (age: six years and five months) drew a total of 14 drawings during the three times periods of the study: pre-operative (four drawings), peri-operative (two drawings), and post-operative (seven drawings). In addition, this child recorded two video diaries, both the night before her GA appointment. The drawings, the video diaries, as well as the narratives have enabled the child to tell their stories, which benefited this research tremendously. The drawings can also serve as a reward for children, in addition to being a tool to establish rapport with them to facilitate communication and bond. Several children were proud of their drawings, signing them. That being said, further studies with larger sample sizes are recommended to shed more lights on these novel research approaches (i.e., drawings and video diaries) in different dental settings.

An additional note from this study is related to children's drawings from different cultures. While Kellogg and O'Dell (1976 [as cited in Cox, 2005]) argued that, "the art of young children everywhere is identical" (p. 105), Wales (1990 [as cited in Farokhi & Hashemi, 2011]) considers culture to play a fundamental role in the development of symbolic representations. In the current study, the representation of a tooth fairy, for example, as a Western concept can be contrasted with the representation of "home" in the refugee child's mind. Looking at how the

local cultural symbolism affects the way children draw and how it is pictorially realized in medical and dental environments warrants further research.

There is a dearth of research examining cultural factors that might impact parental anxiety/stress, particularly within the medical setting (Stevenson et al., 2017). Acculturation is also a factor; we need to scrutinize its potential effects on anxiety and stress. In the current study, we found similarities between all participants in terms of pre- and peri-operative distress, regardless of ethnicity/cultural background. The only difference we found related to the role of extended family in the decision as to whether (or not) to accept the dentist's recommendation to treat children's teeth under GA. Newcomers (Family 9, Family 10, Family 12) involved their extended families back home with deliberations related to GA. On the contrary, we did not find this involvement with non-immigrant families. It is customary that relatives of some of the Indigenous children accompanied them to the GA facility (an aunt) or to the interview venue at the University of Saskatchewan (a grandmother), but their role was to support, rather than interfere with, the mothers' decisions. Nonetheless, this area warrants further research.

The findings reported herein are consistent with those of a series of studies we conducted on children undergoing dental GA using OHRQoL instruments (i.e., quantitative), both short- and full-form questionnaires (Baghdadi, 2014; Baghdadi & Muhajarine, 2015). These studies involved families from different backgrounds, residing in Riyadh, the capital city of Saudi Arabia, and represented a multicultural society as seen in most big cities nowadays. Prior to interviewing Chinese parents residing in New York, USA, about their beliefs, attitudes, and perspectives regarding ECC, oral care habits, and dental treatment, Wong, Perez-Spiess, and Julliard (2005) argued that questionnaires alone do not explore the complexities of quality of life, and, thus, qualitative interviews are useful in providing in-depth understanding of physical and

psychological impacts of disease and treatment. Gilchrist (2015) also indicated that existing OHRQoL measures are generic and have not involved children at all stages of development. In designing our study and developing the interview question guide, we tried to capture as much information as we could that has not been captured by OHRQoL questionnaires, and that can be taken from the relatively small sample. The open response format adopted here provided an opportunity to obtain large and rich amounts of data in the respondents' own words. With this approach, we obtained a deeper level of meaning, made important connections, and identified subtle nuances in expression and meaning that have never reported before in this population group. Additionally, it was possible, via children's drawings, to observe and describe non-verbal responses such as smiles, frowns, stick figures, colors used, and so forth, which carried information that supplemented the verbal responses.

Limitations of the Study

This study encountered some limitations. First, the study was focused on one medium-sized city (i.e., Saskatoon) of diverse cultural backgrounds, and did not include children from other areas of Canada. However, as Saskatoon becomes more ethnically diverse, it is important to understand the experiences of various populations of parents (Stevenson et al., 2017). This is particularly true for immigrants (newcomers and refugees), who increasingly make Western Canada their home (Statistics Canada, 2015). In addition, given the qualitative nature of this study, generalizability was not the goal; instead, transferability is relevant. Second, while the study tried to capture the families' lived experience of this care pathway, pre- peri- and post-operative, there is a need to revisit participants 12 months or longer into the future to identify persistent or new effects. Third, while the focus of this study was children (and their parents), giving them a voice and empowering their engagement with research, there is a need to include

healthcare professionals in the dialogue, enabling a more holistic understanding of patient-reported outcomes. Anesthesia providers and recovery room nurses, in particular, would provide invaluable insights into the care pathway, with the goal of enriching and improving children's experiences.

Recommendations for Future Research

The study focused on children and parents' experience with DTGA through the lived experiences of families whose children were referred to receive dental treatment under GA.

Future research in this area could focus on the following areas:

1. Expand the scope of this study to include other geographic locations and compare the results of this study if the same results are observable in other areas. This would help researchers identify if region is a factor.
2. Compare and contrast results among different ethnic and SES backgrounds. While the study included different ethnic backgrounds, it would be helpful to further explore how experiences are perceived from different cultural backgrounds.
3. Include the perceptions dental health care professionals to expand perspectives presented by the study participants.
4. Include the perceptions of non-dental health care professionals (e.g., anesthesia providers, nurses) to give better meaning to the experiences of parents and children.
5. Study the potential link between available dental public health services in communities for children, mothers, and expectant mothers to the parents' dental knowledge and attitude.

Final Remarks

There are two incompatible approaches to deal with the current *status quo* of DTGA, as described in this project. We have had the option to go with Murray Dease (2015 [staff anesthesiologist University of Saskatchewan]) when he reflected on “how good we [now] have [GA]” by saying:

The contemporary Canadian might be getting spoiled. I am sometimes struck by the expectations of some patients who seem to think that having to wait for their surgery, or having any pain associated with their surgery, is unacceptable.

Compared to what people had to endure a few hundred years ago, when even a minor surgical or dental procedure would be a horrible ordeal, it's incredible how our expectations have changed. I'm not immune to this either. Like most people, I take many things for granted and therefore don't really appreciate them. I often expect things to go a certain, smooth way and when they don't, it annoys me.

When events don't live up to my expectations it makes me unhappy. Maybe by reading about how fortunate we are can help us reevaluate our expectations so that we can feel grateful when things go well, instead of just feeling angry when they don't. (p. 26)

The second approach, which was emphasized throughout this thesis, is that we can embrace challenges of “Narrative Medicine” aiming to meaningfully connect with patients, listen to stories they tell, and sympathize with their experiences and perspectives of illness (Charon, 2006). “People need to have a voice in healthcare research, not just a number, percentage or ratio” (Doherty, 2016, p. 470). The dialogues we held here with families while carrying out this research may be an important first step not only to see and explore the perspectives of others, but

also by entertaining alternative views we can work together to construct a vision for the future. This requires identification of the issues, but possible interventions require all stakeholders (e.g., anesthesia providers, pediatricians, dentists, support staff, patients, health policy makers) to work together. Interprofessional collaborative models of health-service delivery are critical for improving access to client-centred health (and dental) care in Canada (Canadian Nurses Association, 2017) and around the World (WHO, 2010).

Wabishki Mitadim Ojichidaa Ikwe, or Sheri McKinstry, an “Ojibway-Cree status First Nations mother, wife, sister, aunt, cousin, daughter, dentist, MPH graduate, and enrolled pediatric dentistry resident,” (McKinstry, 2017, para. 1) has described in an Editorial the vicious cycle of dental decay occurrence, treatment, and relapse in a special issue of the *Canadian Journal of Public Health* (2017):

Frustrated and feeling somewhat defeated, the time had come where I had to decide if I was going to continue with the status quo and policy of pushing patients through the clinic to satisfy program goals of productivity based on doing as many fillings or extractions as I could in a day, or suffer the consequences. To me, this approach to treatment is not complete. We send children and adult patients off for dental surgery to fix current dental disease and then send them right back into the environment that created the dental disease requiring surgery in the first place. Although we are treating our patients, we are only temporarily patching the problem.

This thesis has tried to explore several aspects related to dental decay in children and how it is dealt with in Canada. By doing so, it has been possible to shed some light on the dental burden and its ramifications (e.g., hospital experience) from the perspectives of parents and

children (whether they are Indigenous, non-Indigenous, or immigrants [refugees and newcomers]). “The oral health cannot be considered in isolation if we are to be successful in making change in the future. I heard once in passing that those who bring up hard issues are blamed for being troublemakers. The justification given is that there is no problem until it is said out loud for all to hear” (McKinstry, 2017, para. 5). Social determinants of health need to be fully addressed to significantly reduce the numbers of children having dental treatment under GA.

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APPENDICES

Appendix A

University of Saskatchewan

Letter of Initial Contact

Experiences of Children Undergoing Dental Treatment under General Anesthesia

Dear Parents/Parents,

As part of several studies in the College of Dentistry at the University of Saskatchewan, we are doing research on preventing/treating tooth decay (cavities) in children. We are hoping to find better ways to help children and their families prevent/manage these cavities. We are inviting you to be part of this research because one of the dentists at the Prairieview Surgical Centre will be fixing your child's teeth while he/she is asleep (under general anesthetic).

If you agree to participate in this study, we will provide your name and phone number to the study's researchers. The work on this particular study by Dr. Ziad Baghdadi, one of the co-investigators, will be part of his PhD thesis. The study mainly involves interviews with you and your child, which will be scheduled at your convenient time and location (e.g., your home or a quiet room at the Centre) 1-2 weeks before the dental surgery and 1-2 weeks after the surgery. The interviews will be a series of questions about your child and your own thoughts and feelings about the child dental experiences and how both of you felt about your child's dental treatment and the general anesthetic. The interviews will last about 60 minutes or as long as you need to explain your experiences and opinions.

Each interview will be tape-recorded and you and your child comments will be typed. The child will also be given the opportunity to video record or draw his responses/feelings related to dental experience. The video recordings will also be typed. You can read the typed version of the interviews/videos if you wish. The tape-recorder will be turned off at any time that you ask to do so.

Your participation in this study is entirely voluntary and you may refuse to participate or withdraw from the study at any time without penalty. Your withdrawal will not affect the services that any of your family receives from the Centre. You may also refuse to answer any questions. Your identities will not be revealed in any reports arising from the interviews/videos/drawings. Only code numbers known to the investigators will identify all documents. Tapes, videos, drawings, and transcripts of interviews will be kept in a locked filing cabinet. Security of any information kept on a computer hard drive will be maintained by password access.

I have received information about the study and am interested in participating. I would like the project researcher to contact me with further details about participation. My contact information is given below:

Child's Name:

Parent's Name:

Phone number and preferred time to be called:

The researcher will call me in the next few days to answer any questions about the project and make further arrangements for my participation.

Appendix B

University of Saskatchewan

Information Sheet and Consent Form

Experiences of Children Undergoing Dental Treatment under General Anesthesia

Investigator:

Ziadeddin Al Baghdadi, PhD Candidate, College of Medicine, University of Saskatchewan

Tel: 306-880-8843

Email: zia766@mail.usask.ca

Principal Investigator

Nazeem Muhajarine, PhD, College of Medicine, University of Saskatchewan

Tel: 306-966-7940

Email: nazeem.muhammad@usask.ca

Introduction

You and your child are being invited to take part in a research study because your child has been referred to undergo a dental procedure at this clinic. Please read the information about the study presented in this form. The form includes details on study's risks and benefits that you should know before you decide if you would like to take part. You should take as much time as you need to make your decision. You should ask the investigators or study staff to explain anything that you do not understand and make sure that all of your questions have been answered before signing this consent form. Before you make your decision, feel free to talk about this study with anyone you wish including your friends, family, and family doctor. Participation in this study is voluntary.

Objective of Research Study

The study's objective is to explore children's experiences of dental treatment under general anesthesia. The study will answer the research question: What do child patients tell about their dental treatment under general anesthesia experiences?

Procedure

Children will be invited to participate in 2 interviews at 2 different time periods, the first one will be completed prior to the dental procedure and the second questionnaire will be requested to be completed 1 to 2 weeks after the dental procedure. The interviews will explore the child's views related to dental treatment under general anesthesia. The children will be given the opportunity of expressing themselves through drawing which is used as a focal point for the interview and help establish a rapport with the individual child. In addition to interviews, the child will be given a video camera to make a 'film' related to dental treatment under general anesthesia. A simple list of things that the child can talk about will be provided, along with the camera. Similar separate interviews with children's parents/parents will be also conducted before child's admission and following discharge from the dental treatment. These interviews will take place in the child's home and the duration of each will be 20 to 30 minutes. As we understand that family's home might not be a suitable place for completing the interviews for some families, the research team offers as an alternative location a quiet room in the surgical centre, or any other locations deemed suitable by the concerned family. The interviews with the child will be conducted with the presence of his/her parent, but without any interruption from the parent. The parent will be given the opportunity to comment on the child's interview when he/she is interviewed separately later.

Potential Risks

There are no known or anticipated medical risks to you by participating in this research

The risks we know of are: feeling uncomfortable when being asked the same questions which were asked previously, before receiving the dental procedure.

If we learn about current or ongoing child abuse or neglect, we will report this to the appropriate authorities, as required by law.

Potential Benefits

There is no direct benefit from being in this study. Information learned from this study may help dental medicine and patients similar to your child in the future know the benefit of this procedure and how child reacts to. In order to defray the costs of inconvenience, each child/family will receive an honorarium in the amount of \$10 after completion of each event (interviews, video diary, drawing).

Alternatives to Being in the Study

It is done completely voluntarily, no change in your child's level of care will occur.

Confidentiality

No data will be used outside of the dental centre/University. Paper, audio, and video records will be stored in a locked filing cabinet at the University (Research Center Office), and computer files related to the study will be protected by passwords. The participant's identity will be coded and a pseudonym and a master list will be used instead of identifying information. The data will be kept for about 5 years after last publication. After this time, paper records will be shredded and electronic files will be permanently deleted.

Personal Health Information

If you and your child agree to join this study, the principal investigator and his/her study team will look at your personal health information and collect only the information they need for the study. Personal health information is any information that could identify you and includes patient's:

- name,
- date of birth (age in years)
- Dental procedures

Your participation in this study will also be recorded in child's medical record at this centre. This is for clinical safety purposes. The videos will be used as part of the analysis process; that is, the videos will be transcribed and analyzed. The video recording (and drawings) will be copied and stored in a secure password protected computer in the research office of the researchers. As a parent, you will be given a separate Video and Transcript Release Form to sign, indicating that you, as a child's parent, are giving your permission for video use from the participating child, as described above. Only the research group will have an access to these videos/drawings. There will be no sharing of audio-recording and/or video-recording beyond the research team.

The principal investigator will keep any personal health information about your child in a secure and confidential location for 5 years after last publication. A list linking your study number with child's name will be kept by the investigators in a secure place, separate from child's study file.

The following people may come to the hospital to look at the study records and at your personal health information to check that the information collected for the study is correct and to make sure the study is following proper laws and guidelines:

- Representatives of the University of Saskatchewan including the University of Saskatchewan's Research Ethics Board

All information collected during this study, including your child's personal health information, will be kept confidential and will not be shared with anyone outside the study unless required by law. You and your child will not be named in any reports, publications, or presentations that may come from this study.

Right to Withdraw

You have the right to withdraw your and your child data from the study. You own this right until data have been pooled. After this it is possible that some form of research dissemination will have already occurred and it may not be possible to withdraw your data.

Questions about the Study

If you have any questions, concerns or would like to speak to the study team for any reason, please call the number provided on page one of this consent form.

This research project has been approved on ethical grounds by the University of Saskatchewan's Research Ethics Board. Any questions regarding your rights as a participant may be addressed to that committee through the Research Ethics Office ethics.office@usask.ca (306) 966-2975. Out of town participants may call toll free (888) 966-2975.

Everything that you discuss will be kept confidential.

You will be given a signed copy of this consent form.

Consent

By signing this form I agree that the study described in the Participant Information Sheet has been explained to me and that I have been given a copy of the information sheet and the consent form. I have also been informed that information about my child's dental health will be obtained from the dentist and the records at the SurgiCentre, Saskatoon Health Region and the University of Saskatchewan. All of my questions about the study have been answered and I have been given the name of the person who I may contact if I want any further information. I understand that my child has the right not to take part in the study and the right to stop at any time. I have been told that no matter what my child decides to do, he/she will continue to receive care at the SurgiCentre. I have been assured that my name, my child's name and information collected will be known only to people who are helping with the study and will not be used on any documents reporting the results from the study. I have been informed that if I have any questions about my and my child's rights as a research participant I may contact the Research Ethics Facilitator.

I hereby consent for my child _____ to participate
(Name of Child)

Parent's or Parent's Name

Signature

Date

Researcher's Name

Signature

Date

Appendix C

University of Saskatchewan

Assent Form

Experiences of Children Undergoing Dental Treatment under General Anesthesia

Investigator:

Ziadeddin Al Baghdadi, College of Medicine, University of Saskatchewan

Tel: 306-880-8843

Email: zia766@mail.usask.ca

Why are we doing this study?

We are doing this study to find out about problems children may have in their daily lives because of their teeth and mouth. We also want to find out how much the treatment they receive in this Clinic helps them not to have these problems.

What will happen during this study?

You will have 2 interviews, one before dental treatment and another one after completing the dental treatment, to answer some simple questions. Some questions will ask if your teeth and mouth hurt, and if you can chew some foods. Other questions will ask whether your teeth and mouth affect your schoolwork or other things you do. We will also ask about your visits to the hospital clinic and how you feel...etc. You will be given a video camera so you can record your answers as well. We will also ask your dentist in this Clinic to tell us about your teeth and mouth.

Are there good things and bad things about this study?

There is nothing in this study that can hurt you. There are no right or wrong answers. The things you tell us will help dentists to be better at treating children like you.

Who will know about what I did in the study?

Only people who are helping with the study will see your responses to the questions. Your name will not be used anywhere.

Do I have to take part in the study?

No. Only you can decide if you want to be in the study. Even if you decide to take part and later change your mind about that, nobody can make you stay in the study. No matter whether you choose to be in the study or not, your dentist in this Clinic will keep helping you with your teeth and mouth.

ASSENT

I was present when (child's name) _____ was given the above information about the study and he/she gave his/her verbal assent.

Name of the person who obtained assent

Signature of person who obtained assent

Date

Appendix D

University of Saskatchewan

Experiences of Children Undergoing Dental Treatment under General Anesthesia

Demographic Information

ID# _____ Date of interview: _____ Time: _____ am _____ pm

Child's Name: _____

Parent's Name: _____

Address: _____

Child's date of birth: _____

Month/ day / year

Parent's date of birth: _____

Month / day / year

Relationship to the child: Father Mother Legal guardian Other: define _____

Child's sex: boy girl

Child's school: No School KG Elementary school: Grade _____

Since birth has the child lived anywhere else?

No

Yes, list which city and time at each location:

How you describe the child's ethnic (race) group:

How you describe the family's income level:

What is the highest level of education that the parent has completed?

Elementary school Some high school Completed high school Vocational school
University Graduate studies

How many people live in the child's household? Adults Children

What is the birth order of your child?

- First Second Third Fourth Fifth or more

Have/had you taken your child to the dentist before coming to the Surgical Centre?

- No Yes

If yes, how many times has the child gone to the dentist before coming to the Surgical Centre?

- Once Twice Three times More than three

What was the child's age when he/she first went to a dentist?

- Year Month

What was the reason for the first dental visit?

- Regular check-up Black spot Tooth cavity Pain Other define _____

Has your child ever had following problems before referring to the Surgical Centre? (you can tick more than one response)

- Sensitive teeth to hot or cold
Mouth/tooth pain
Problems in eating
Waking up through the night because of toothache
Other, please define _____

Is this the first dental treatment to be completed under general anesthesia for your child?

- Yes No If no, how many GA _____

Have the child's sister/brother ever put to sleep to have their teeth fixed?

- No Yes If yes, how many _____

Who is covering the dental treatment at the Surgical Centre (under general anesthesia)?

- Publicly-funded (governmental) Define (if you know) _____
Private health insurance
Out-of-pocket Other Define _____

Date and time of child's operation: _____ Time: _____ am _____ pm

Month/ day / year

Appendix E

Interview Guide with the Parent Experiences of Children Undergoing Dental Treatment under General Anesthesia

Some questions to child's parent (parent) include:

Pre-operative

Tell me what you know about baby teeth. Some parents think baby teeth are important; other do not. What do you believe? Why you believe so?

Had you taken your child to the dentist? What was the reason that you went? Tell me what happened at the dental office.

When did you first know that your child needed a GA for dental treatment? Tell me what you felt or thought when you heard about the need for a GA.

How long you have been waiting to get the GA treatment? What do you think about the wait time? Is it too long, okay, no problem...?

Post-operative

When your child was asleep and being worked on by the dentist, can you tell us what you are thinking and feeling during this time?

How did your child do after the dental work?

Did your child have less or more mouth pain after surgery? Did eating get better, worse, or the same? Was your child able to sleep better or worse after surgery? Was your child more happy or cranky?

How did your child feel about his/her teeth before treatment? How does he/she feel now?

Did you know that other kids make fun of his/her teeth before treatment? How about after surgery?

Tell me about any changes that you have noticed since his/her teeth were fixed.

What did the dentist tell you about how your child got cavities in his/her teeth?

Tell me what you learned from the dentist about what you should do at home to take care of your child's teeth?

Have you tried to change anything related to your child eating habits or cleaning teeth since your child had the dental surgery? Why or why not? How is it going so far?

If there were the need to have further dental work for your child (or siblings), would you prefer it to be done with or without GA? Why?

If you had to start again from the day your child got his/her first tooth, what would you do differently?

I would like you to ask advice about how to improve the experiences of parents whose children have many cavities and in need of GA.

Is there anything else I should have asked you or would like to say?

Is it ok that I contact you again after I transcribe the recording if some questions have occurred?

Additional Questions

What did the dentist or the Surgical Centre staff tell you about how your child got cavities in his/her teeth?

What did you know about dental decay in baby teeth before coming to the surgical centre? Tell me what you know now that is different from what you knew before? What did you learn from the staff or dentists at the surgical centre?

Can you tell me the main factors responsible for dental decay in children? Do you know that bacteria or germs are involved in causing cavities?

Tell me what you learned from the dentist or the surgical centre staff about what you should do at home to take care of your child's teeth? Has anyone ever shown you how to brush your child's teeth?

Have you tried to change anything about how you look after your child's teeth since he/she had the dental surgery? Why/why not? How is it going?

Tell me about the difficulties that you have had in changing how you look after your child's teeth? Do you think you will be able to keep up these changes? What barriers or obstacles may prevent you from keeping up these changes?

Tell me how the day-to-day stress and pressures of your life affect the way you look after your child's teeth?

Based on your experience, how can we help parents of young children make sure their children have healthy teeth?

Additional questions to parent(s)

What does it mean to you to have a healthy mouth?

What are the kind of problems people might get with their mouths?

What are some of your experiences of going to the dentist?

Would you say that these experiences have affected you taking your child for dental care?

What would be the reasons for taking or not taking your child for dental care?

Tell me what you know about baby teeth? How do you feel about your child's first set of teeth?

How important do you think they are and why? Is it important for kids to have healthy teeth in your culture?

What do you think makes young children get cavities or decay in their baby teeth?

When do you feel is the best time to take your child to the dentist for the first time?

Had you taken your child to the dentist? What was the reason that you went? Tell me what happened at the dental office.

What kind of problems did your child have with their teeth?

When did you first know that your child needed a GA for dental treatment? Tell me what you felt or thought when you heard about the need for a GA.

How long you have been waiting to get the GA treatment? What do you think about the wait time? Is it too long, okay, no problem?

Why did you cancel the GA? Who took the decision? Any information that can help in this regard that you can provide to families or doctors involved with this type of treatment?

What next after you cancelled the GA? How to treat the child's teeth?

Are there things you know about that can prevent your child getting cavities?

How easy or difficult to do you find it to have your child brush their teeth?

Are there foods or drinks that you know may be good or bad for your child's teeth?

Who makes the decisions about your child's dental care?

Do other people (friends or family) influence these decisions?

What things would make going for dental care for your child easier or more comfortable?

What would make it easier for you to look after your child's teeth?

Is there anything else that you would like to tell me about what we talked about today?

Appendix F

Interview Guide with the Child (Main Questions) Experiences of Children Undergoing Dental Treatment under General Anesthesia

1st Interview (pre-operative)

Tell me about your own teeth.

When are you going to the surgical centre?

What do you think will happen there?

How do you feel about it?

What else should I know about your visit to the surgical centre?

2nd Interview (post-operative)

What happened at the surgical centre?

What was it like?

How long were you there for?

How did you feel?

How do you feel now?

How long were you off school?

Did it affect your mood?

Did anything hurt?

Did your mouth feel different afterward?

Any good things about it?

Any bad things about it?

What else I should know about your visit to the surgical centre to understand what happened there?

Additional questions to child patients

Tell me about your own teeth. How does the condition with your teeth make you feel? Anything can make you feel different regarding your teeth?

Had the problems in your teeth make you

Stop eating on those teeth

Stop talking or smiling

Stop eating some types of foods

Make you eat slower

Have you been to the dentist? What was it like? Have you had any treatment? How did it make you feel?

Anything else the child or the mother can talk about regarding the child's dental problem

Appendix G

Instructions Regarding Video Diary

The child will be given a video camera to make a 'film' related to dental treatment under general anesthesia. The child can use the camera the night of the dental treatment (or at any time he/she likes) to talk about his/her thoughts related to the treatment. The child should only film himself/herself and talk about his/her own experience with the treatment and/or his/her teeth. The child can involve his/her own family with the film (e.g., brother, sister, parents/guardians), if they prefer so. The child should avoid 'filming' other people (e.g., people at the surgical centre).

OR

If the child cannot control the camera, he/she is encouraged to draw something related to dental treatment the child will receive or has already received it at the surgical centre.

The child/family will receive \$10 for doing either of the above as a 'thank-you' reward.

Appendix H

University of Saskatchewan

Transcript and Video Release Form

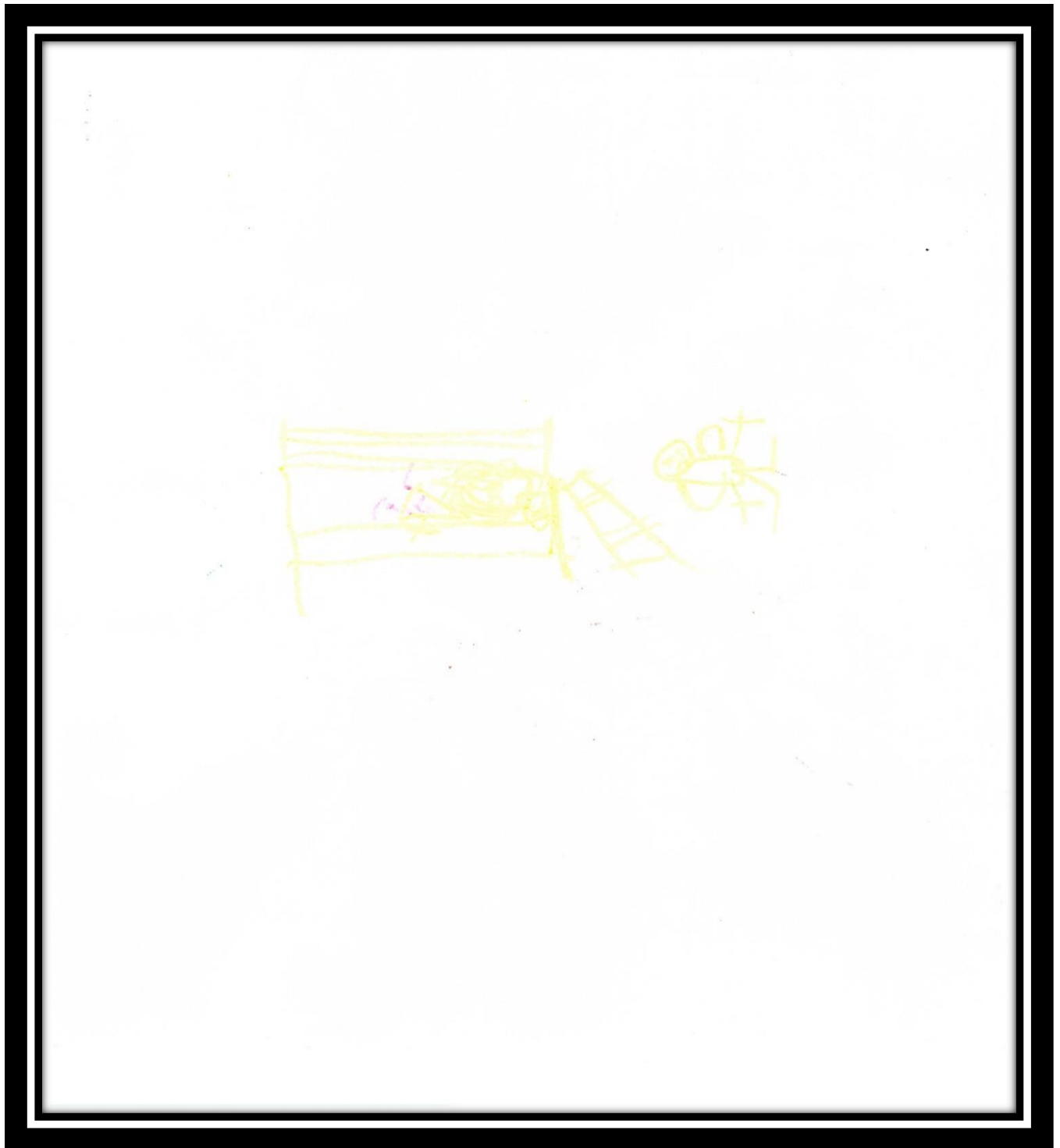
Experiences of Children Undergoing Dental Treatment under General Anesthesia

I, _____, have reviewed the complete transcript of my personal interview as well as my child interview in this study, and have been provided with the opportunity to add, alter, and delete information from the transcript as appropriate. I acknowledge that the transcript accurately reflects what we said in the personal and video interviews with the researcher. I hereby authorize the release of this transcript to the researcher to be used in the manner described in the Consent Form. I have received a copy of this Data/Transcript Release Form for my own records.

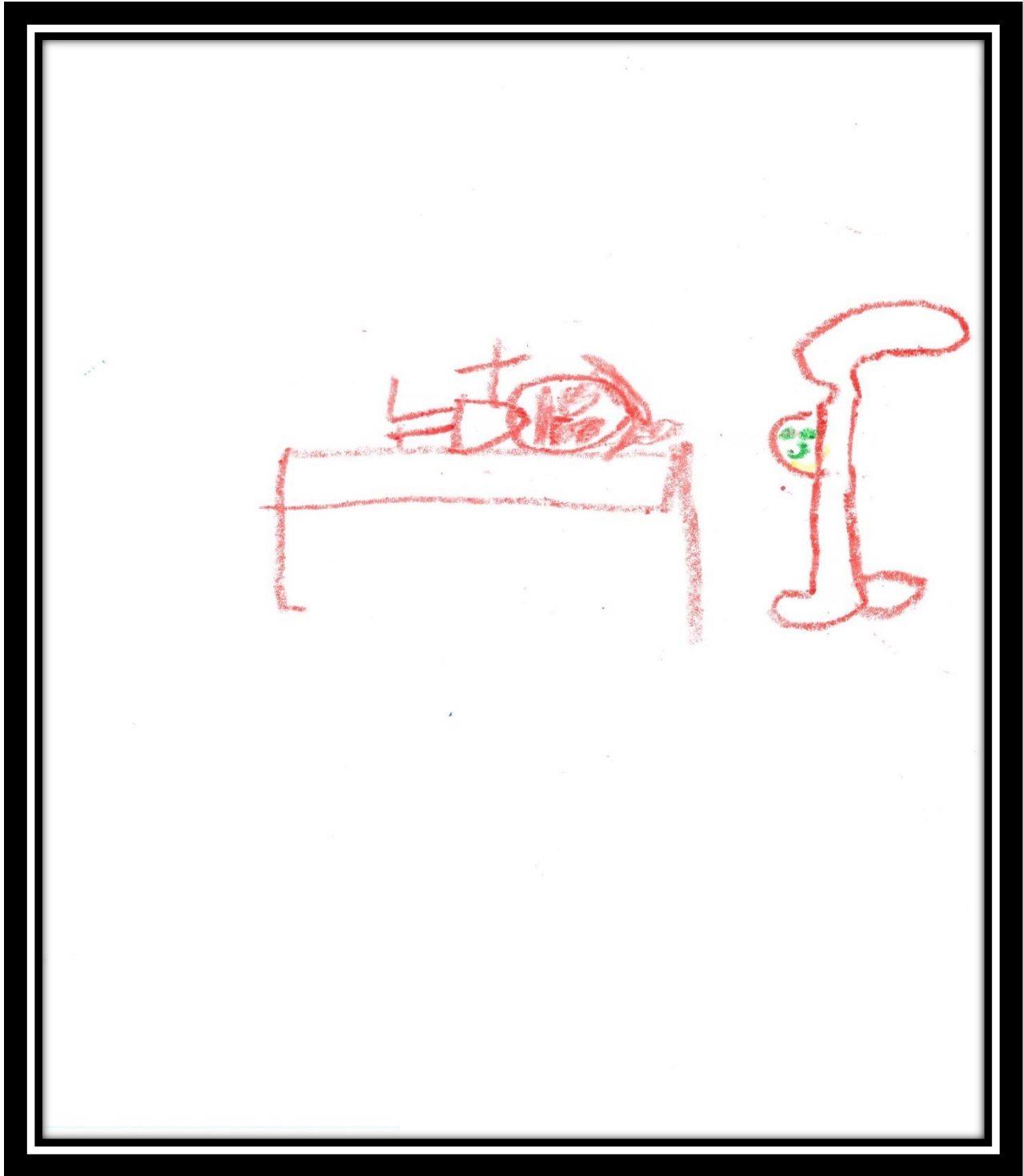
Name of Participant Date

Signature of Participant Signature of researcher

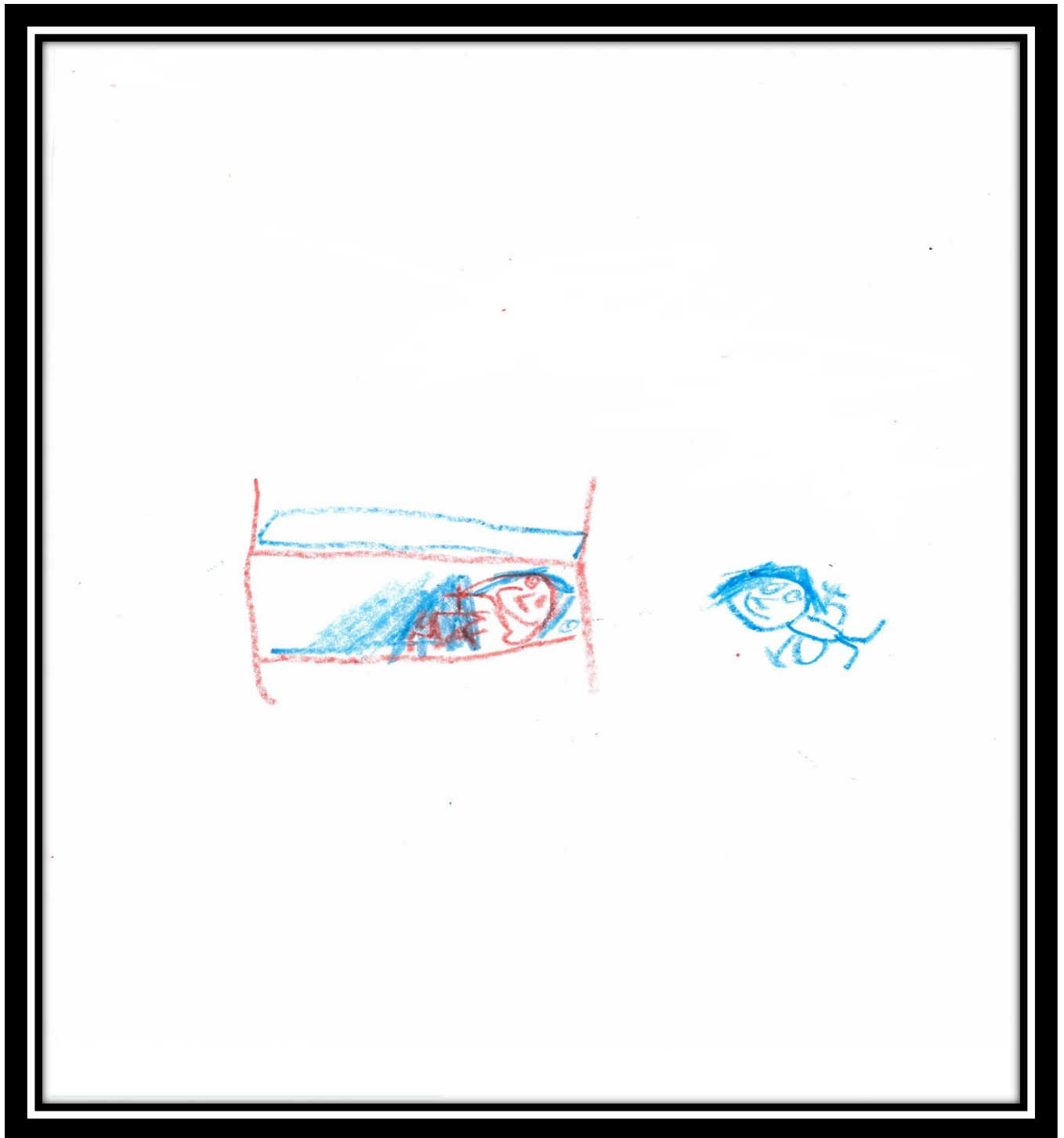
Appendix I: Children's Drawings



Picture 1 (C1-5Y-Pre1). Child 1 drew herself (in red) sleeping in her bunkbed with the tooth fairy coming at night to fix her anterior “wiggly” teeth.



Picture 2 (C1-5Y-Post1). Child 1's post-operative drawing depicted her lying in the surgery bed. There was the presence of hospital equipment: the child drew the anesthesia unit (anesthesia machine), *singling* out the anesthesia mask. (The child's signature was removed.)



Picture 3 (C1-5Y-Post2). This drawing by the child shows herself lying in her own bed at home after surgery with a tooth fairy next to her bed. (The child's signature was removed.)



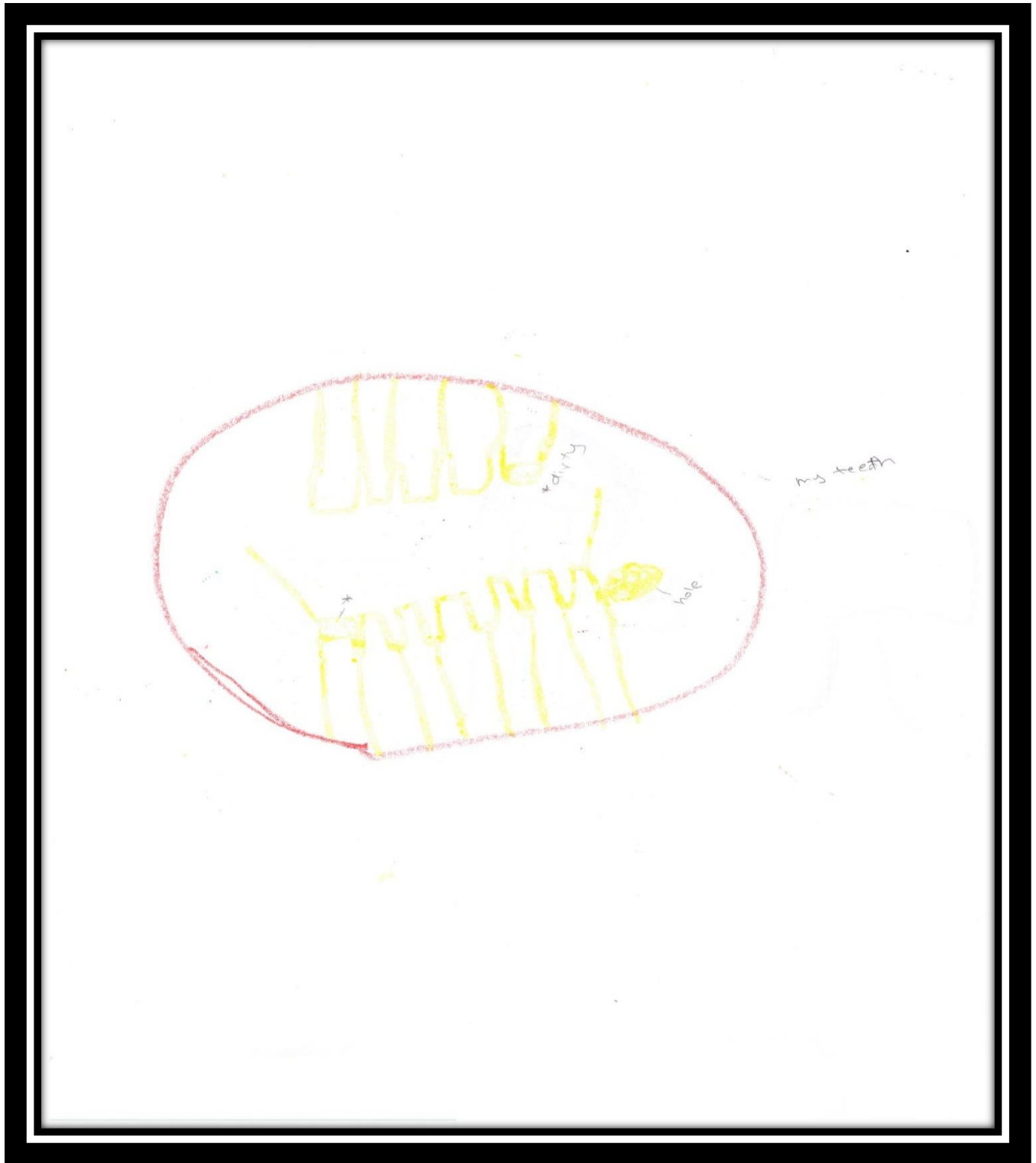
Picture 4 (C1-5Y-Post3). The child drew her face. She drew large eyes with pupils and sclera, indicating suspicion or hyper-vigilance. In addition to drawing eyeliner around the eye, the child drew a teardrop.



Picture 5 (C1-5Y-Post4). The child drew the dentist's face.



Picture 6 (C2-8Y-Pre1). Child 2's first pre-operative drawing depicted this mother's description of their experiences with dental visits in which we see a needle, dental mirror, and dental air-water syringe, all drawn in black, which is considered to indicate higher levels of anxiety. The mother and child are frowning.



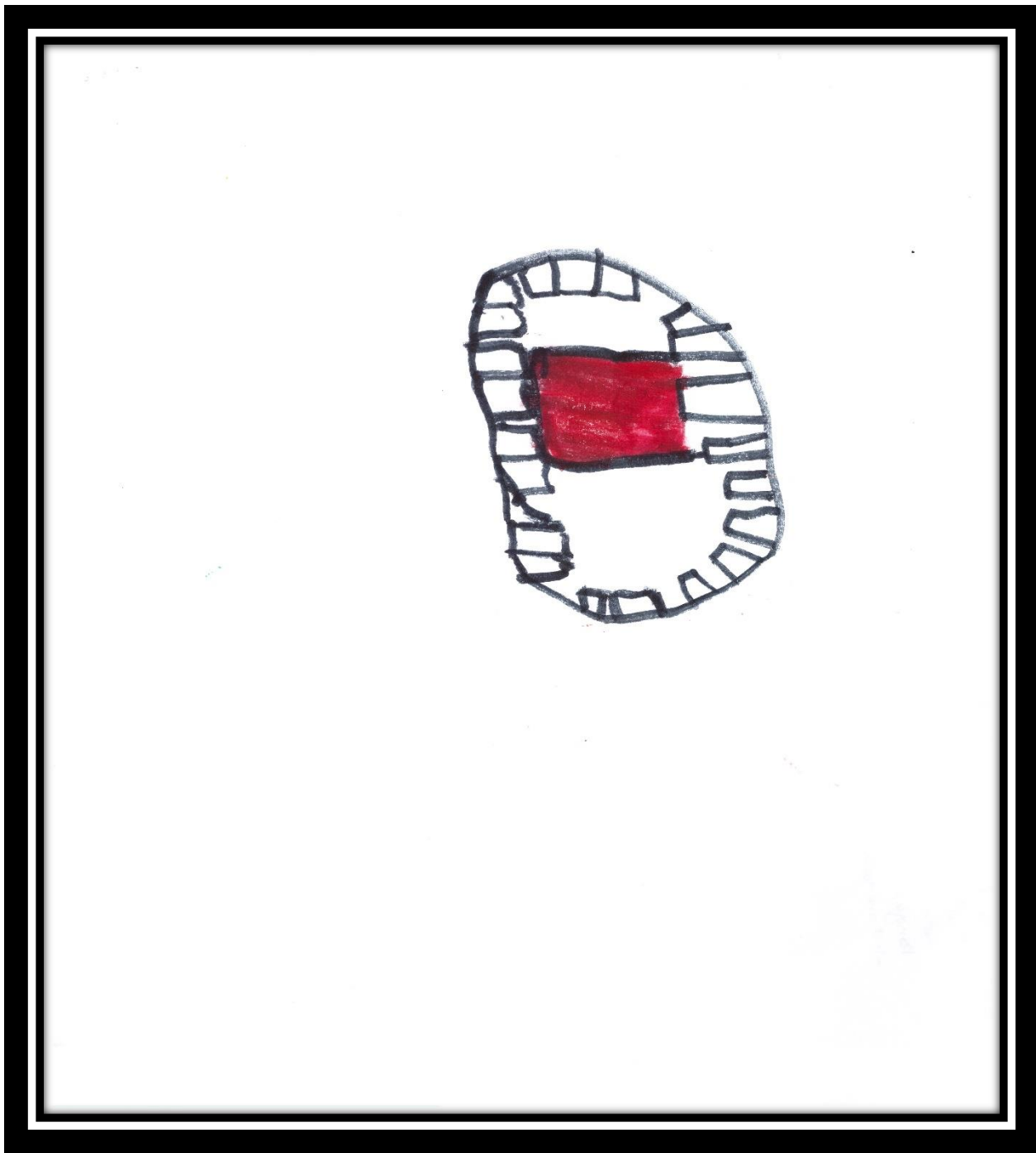
Picture 7 (C2-8Y-Pre2). The child shows her own teeth, depicting dirt on both sides of her mouth and a “hole” on one side, consistent with her description that, “Like, when I am chewing, this side hurts, but when I am chewing on that side doesn’t.”



Picture 8 (C2-8Y-Post1). The first post-op drawing shows representations of the child, her mother, dental instruments (again, the needle, air-water syringe, the mirror), and the GA machine. (The child's signature was removed.)



Picture 9 (C2-8Y-Post2). The child's last drawing shows the waiting area of the surgical centre. The drawing depicts two doors, one for the dental surgical (i.e., dental OR) and the second one for non-dental medical procedures. (The child's signature was removed.)



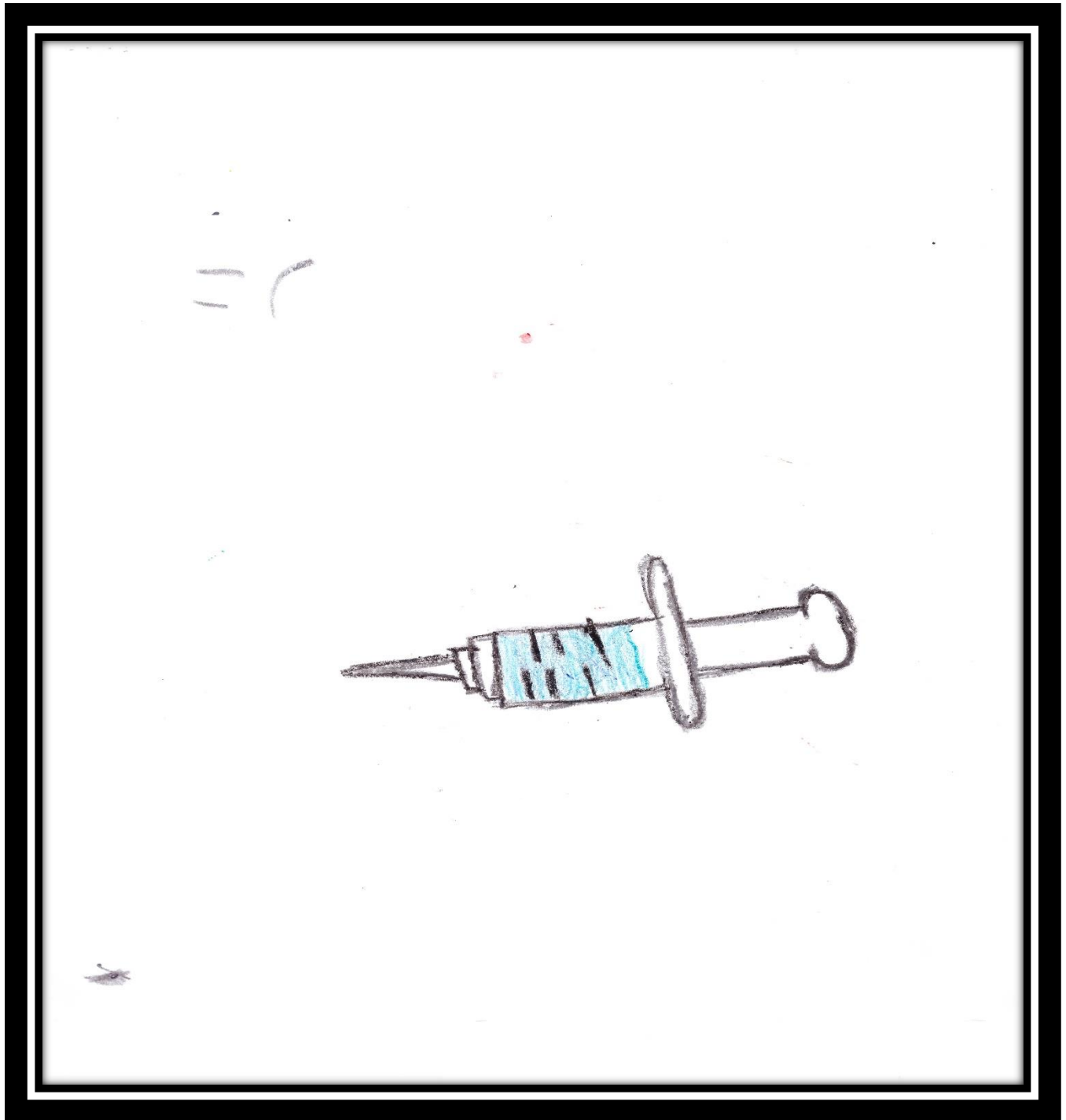
Picture 10 (C3-6Y-Pre1). Child 3 drew her mouth, including teeth and tongue. There are some spaces representing “lost teeth” and a tooth that is “broken down” and “hurting.”



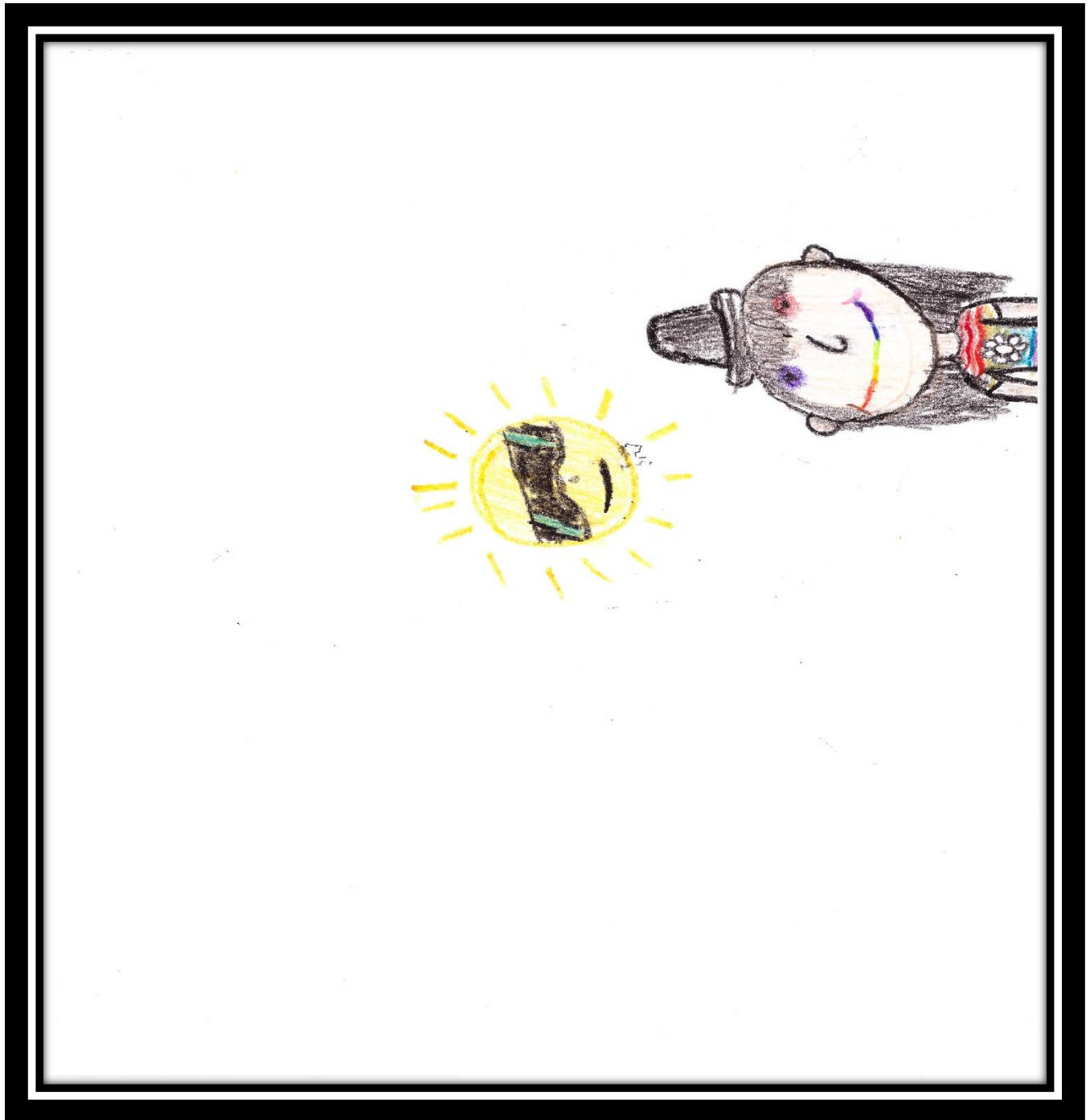
Picture 11 (C3-6Y-Pre2). The second drawing by the child depicts a toothbrush.



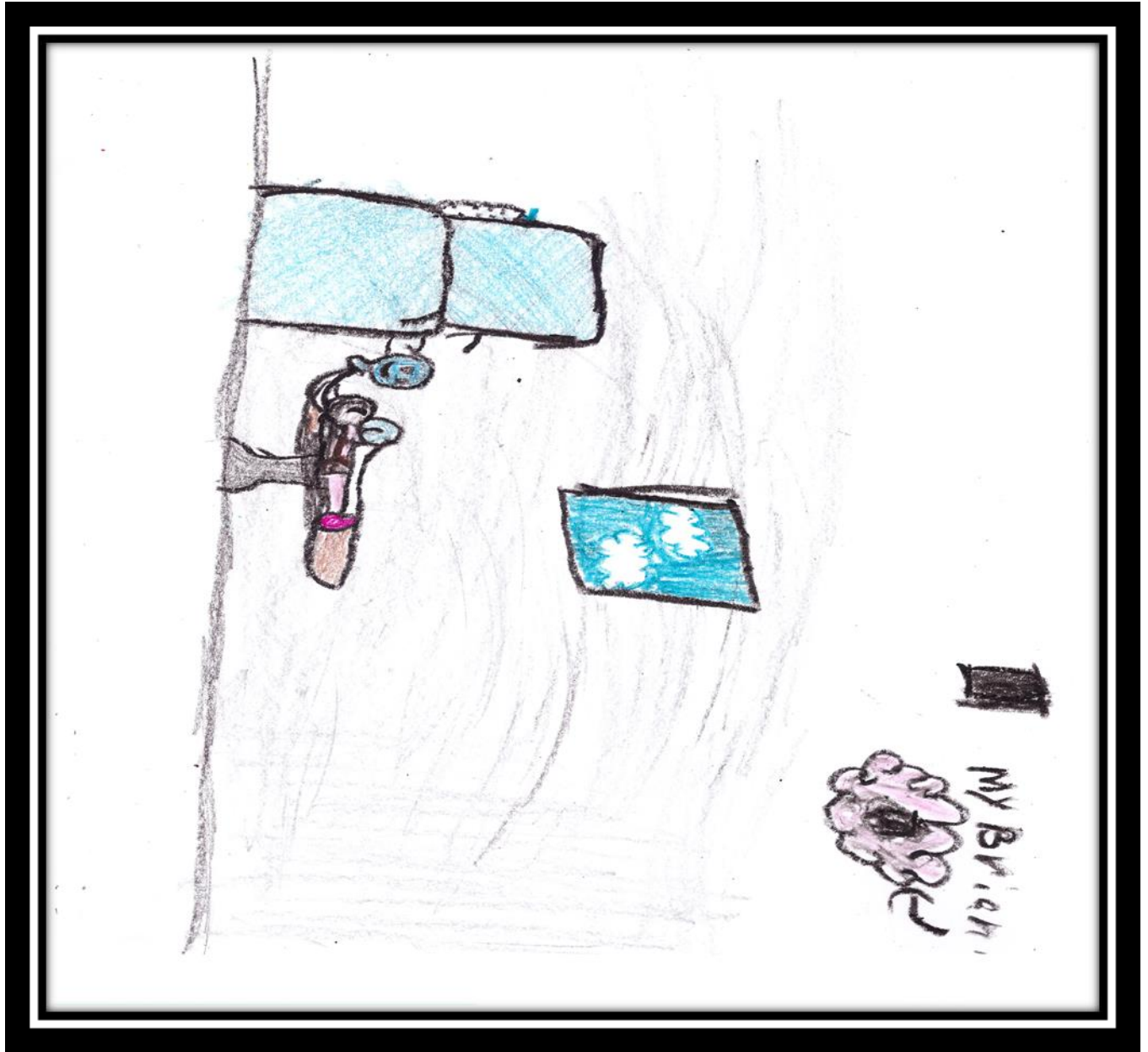
Picture 12 (C3-6Y-Post1). The post-op drawing depicts the GA induction experience: the mask, the balloon, and the surgical scrubs.



Picture 13 (C4-9Y-Pre1). Child 4's pre-op picture shows the single tool that she is most afraid of: the needle.



Picture 14 (C4-9Y-Pre2). The second pre-op drawing portrays the child with a smiley face with a cheerful Sun.



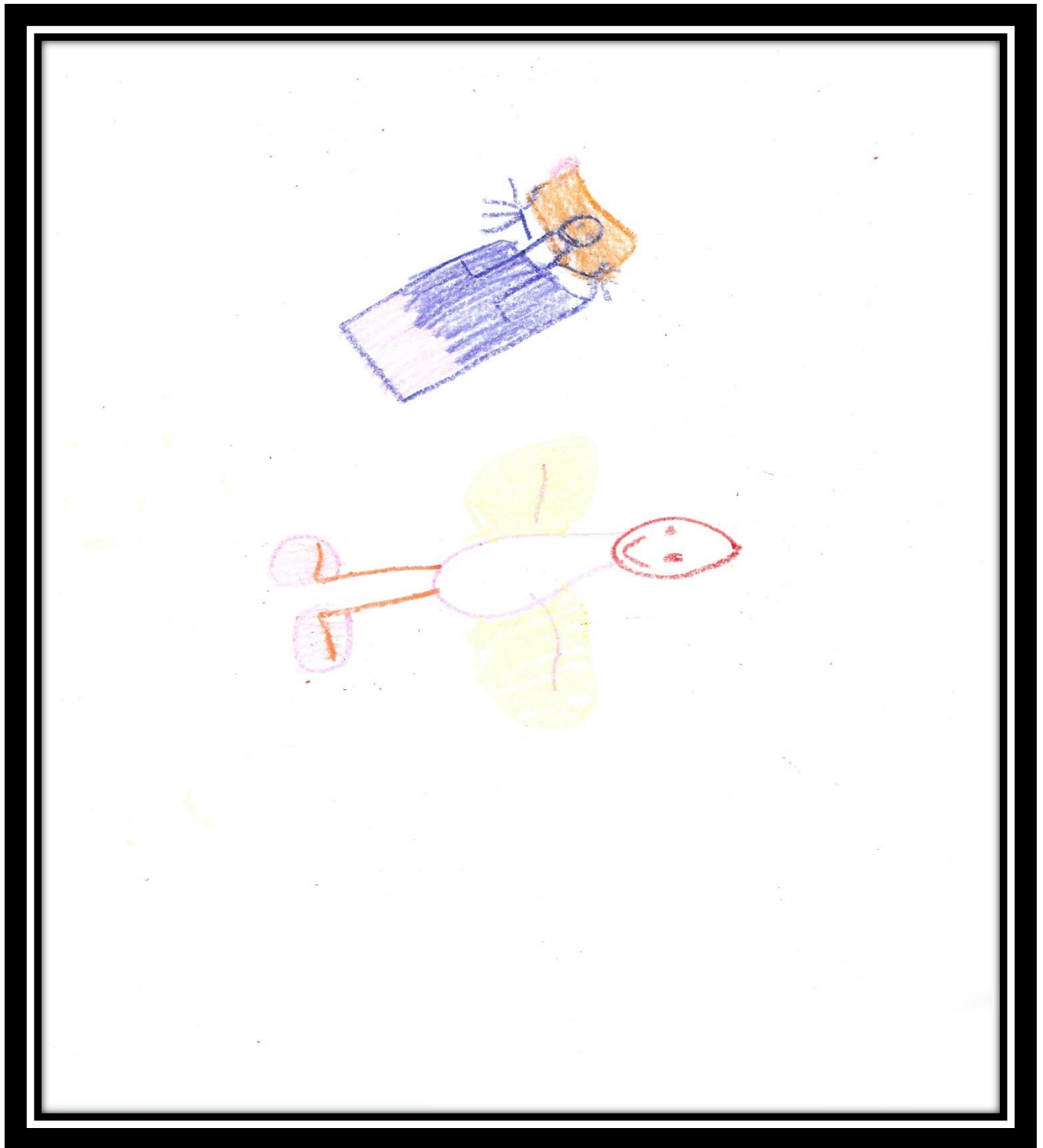
Picture 15 (C4-9Y-Pre3). The third drawing by the child depicts her in the OR, lying in the hospital bed, with the GA machine dominating the scene. The child points out that: "My Brian [i.e., brain] is blank." (The child's signature was removed.)



Picture 16 (C4-9Y-Pre4). The fourth drawing by the child depicts an alien: Girl Picachu (i.e., Pikachu). (The child's signature was removed.)



Picture 17 (C4-9Y-Pre5). The fifth drawing by the child depicts a dog, as seen in her dream.



Picture 18 (C5-6Y-Pre1). Child 5 drew herself sleeping in her bed at home with a tooth (in red) under her pillow and a tooth fairy visiting her. (The child's signature was removed.)



Picture 19 (C5-6Y-Pre2). The second drawing shows the child lying in her bed at home with a tooth fairy approaching the child's bed. (The child's signature was removed.)



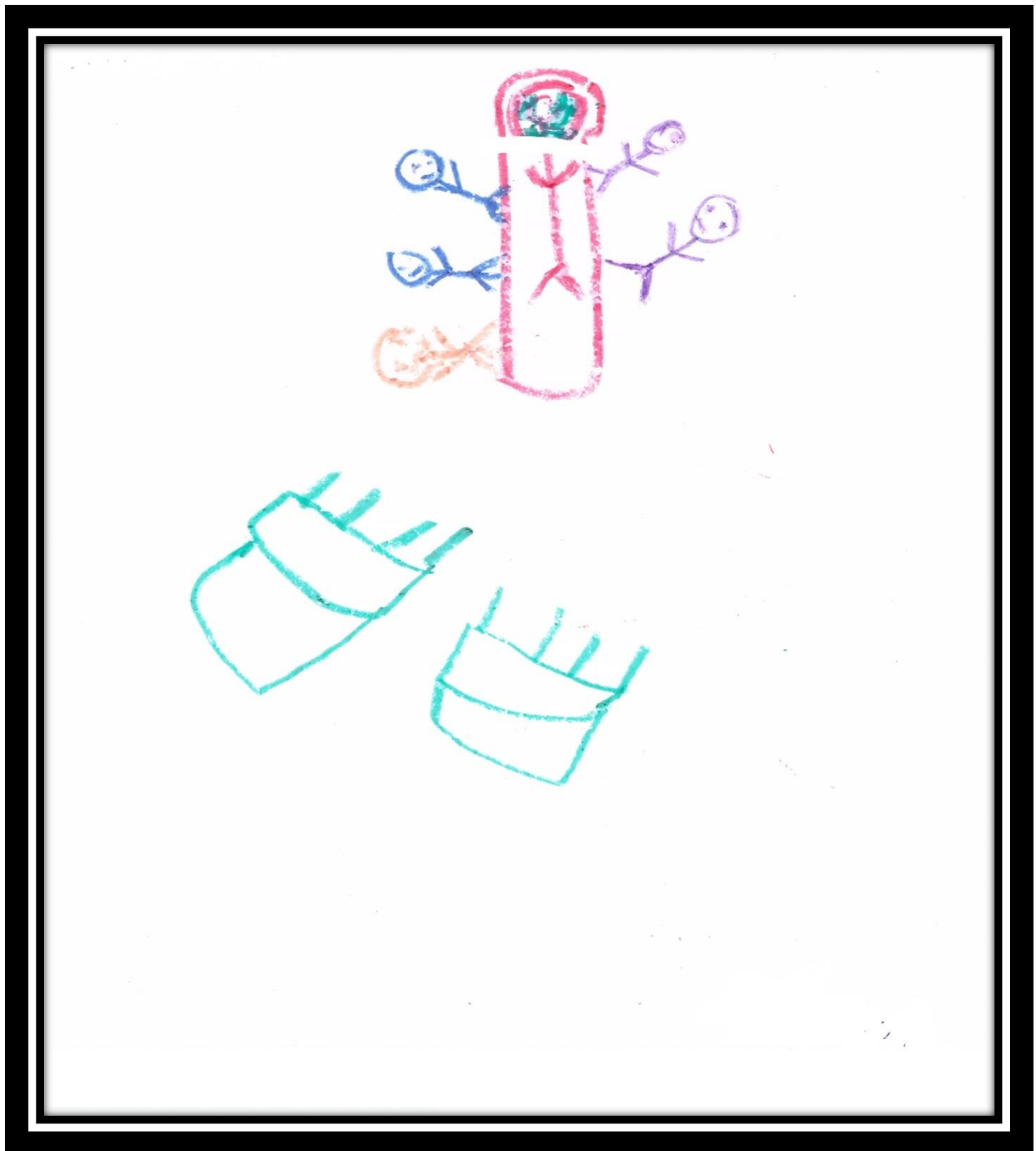
Picture 20 (C5-6Y-Pre3). In her third drawing, the child depicted her teeth with a statement: "A tooth of mine is wiggly." The child also drew a rainbow. (The child's signature was removed.)



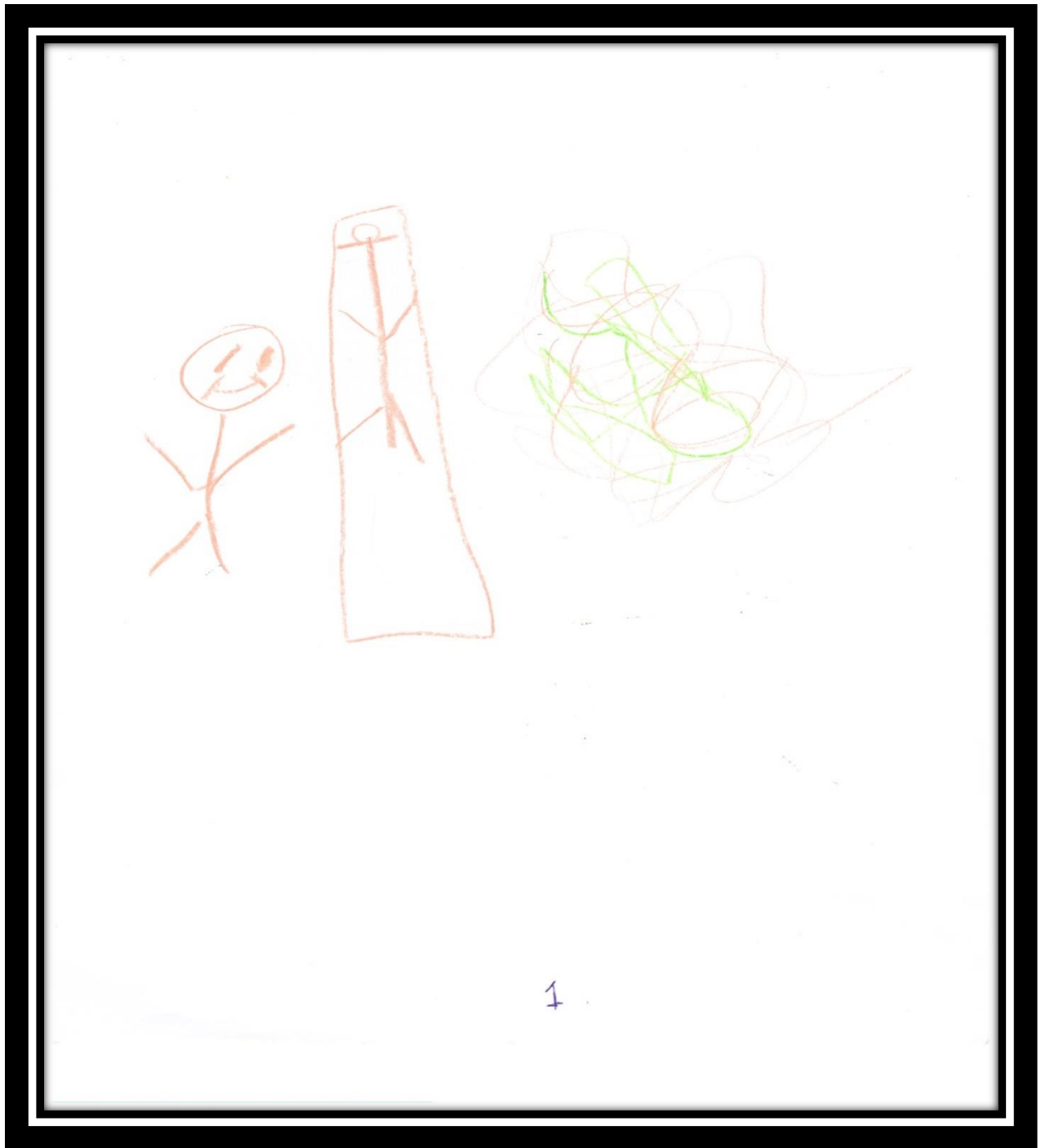
Picture 21 (C5-6Y-Pre4). In her fourth drawing, the child drew her upper and lower teeth using the colors of the rainbow. (The child's signature was removed.)



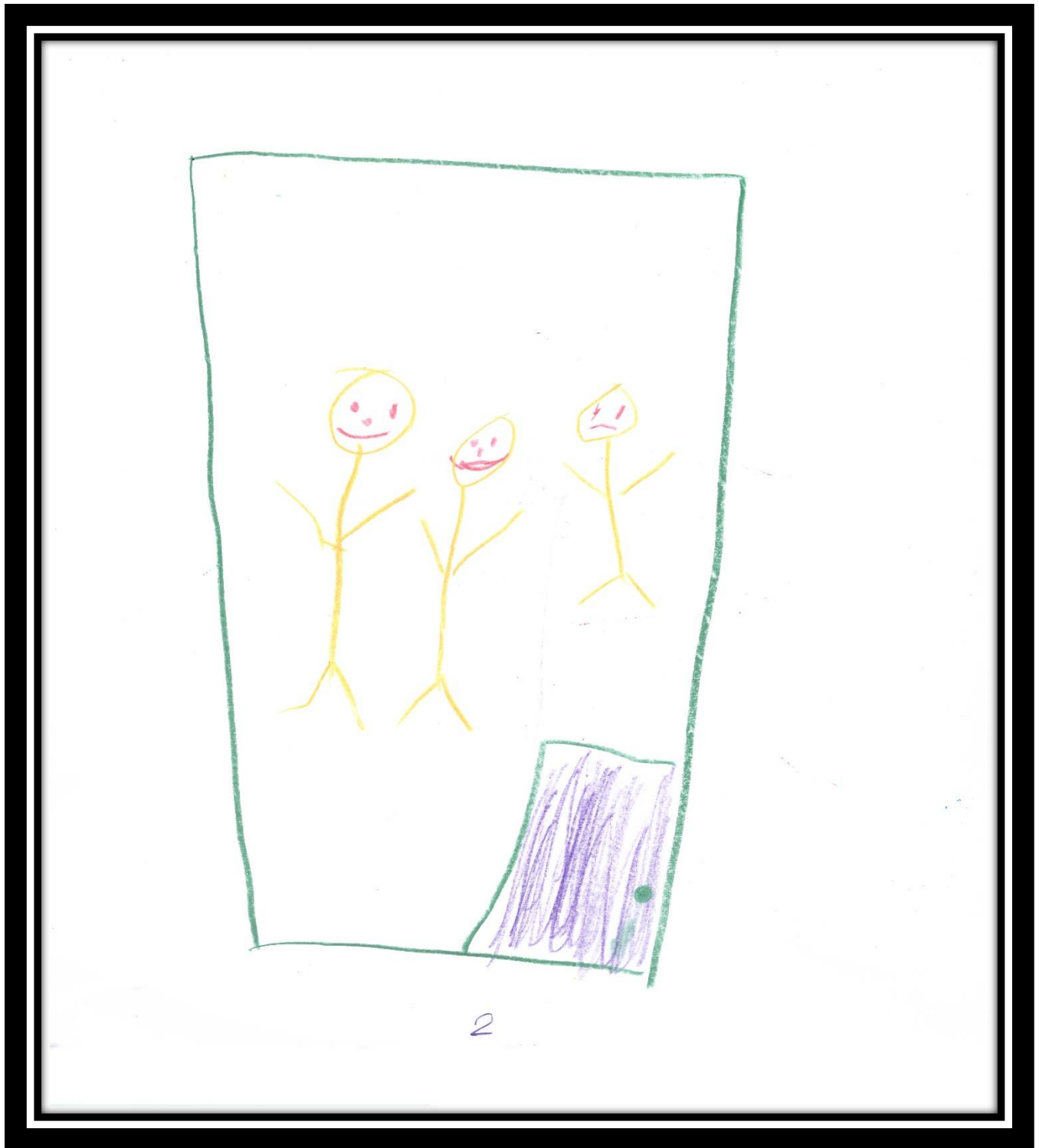
Picture 22 (C5-6Y-Peri1). Child 5's peri-op drawing depicts an umbrella and raindrops, drawn using the colors of the rainbow.



Picture 23 (C5-6Y-Peri2). Child 5's peri-op drawing depicted her lying in the OR bed with a green mask covering her face and four medical personnel, along with her mother, surrounding her bed. There are also two vacant chairs in the picture. (The child's signature and year were removed.)



Picture 24 (C5-6Y-Post1). Child 5's post-op drawing shows the child in the OR lying in a hospital bed with her head on a pillow and a female dentist standing next to her bed with a smiley face. The cords used to hook up the OR equipment are depicted in two colors.



Picture 25 (C5-6Y-Post2). This picture shows the parents talking to the dentist at her office. The father seems unhappy.



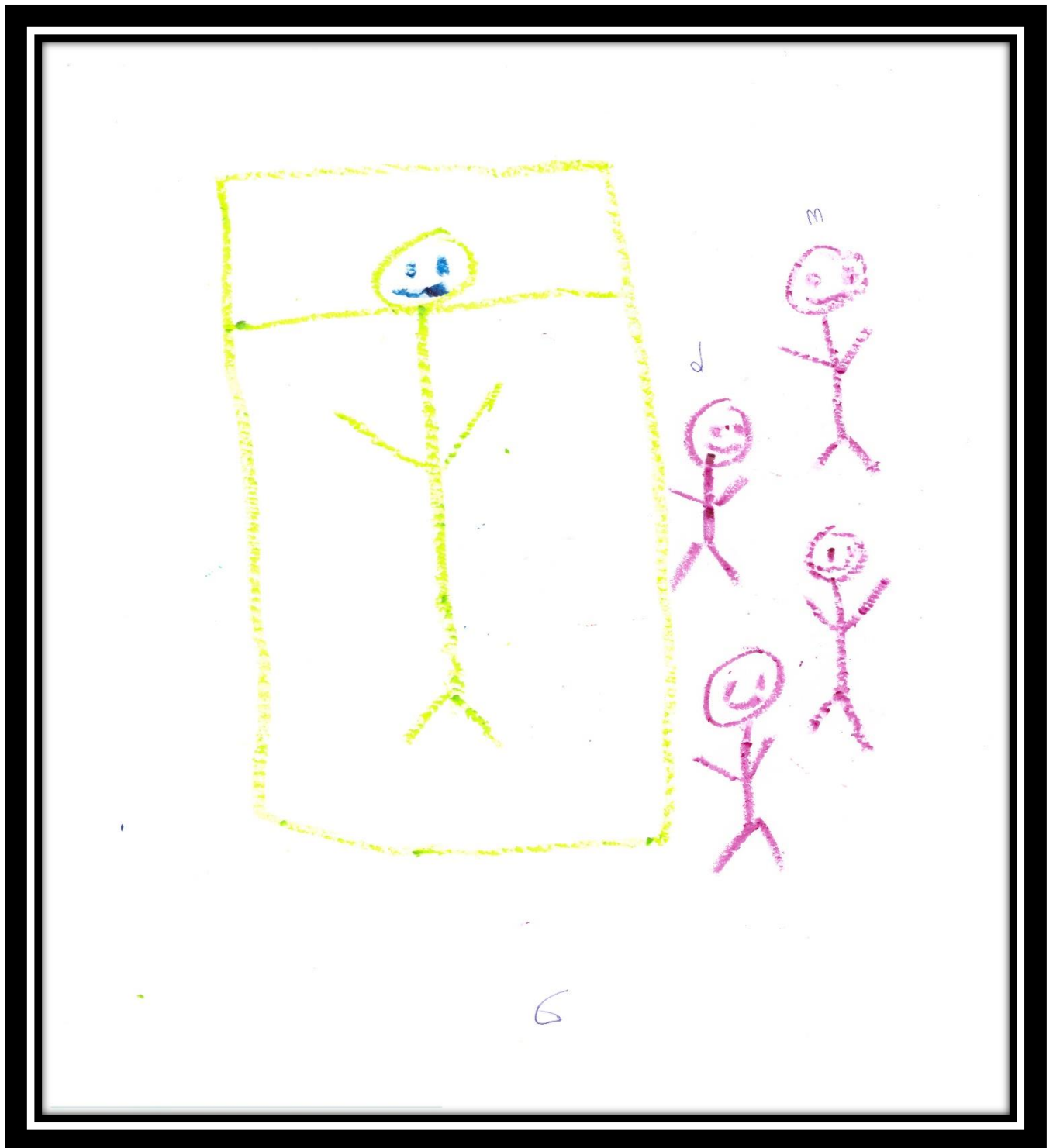
Picture 26 (C5-6Y-Post3). A third drawing by the child depicts her sleeping in bed wearing her pajamas. The child is smiling and her arms are up.



Picture 27 (C5-6Y-Post4). The fourth drawing depicts the teddy bear the child got from the “hospital surgery.”



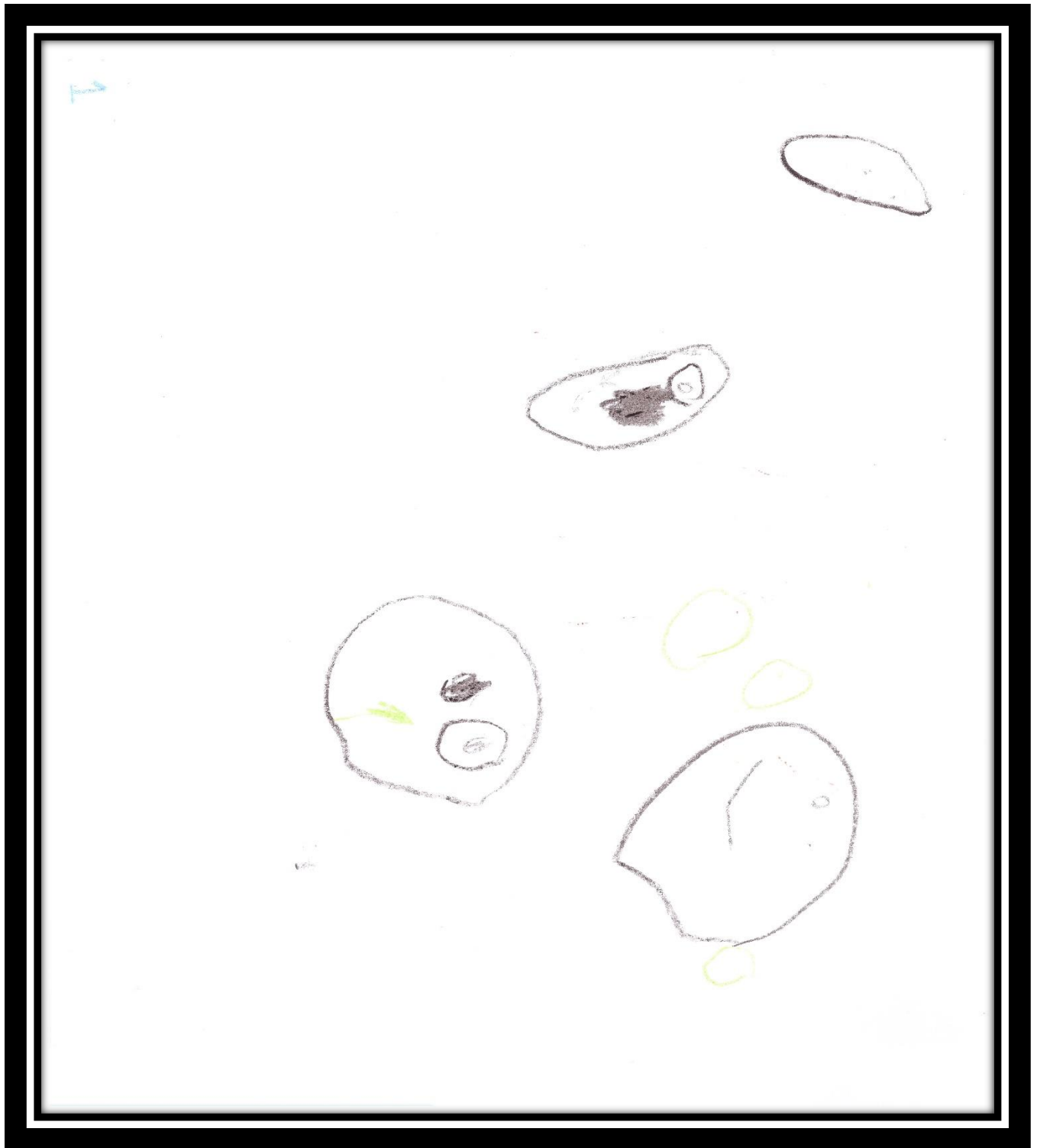
Picture 28 (C5-6Y-Post5). Child 5 drew herself lying on a bed and holding the teddy bear. Note the child's smiley face.



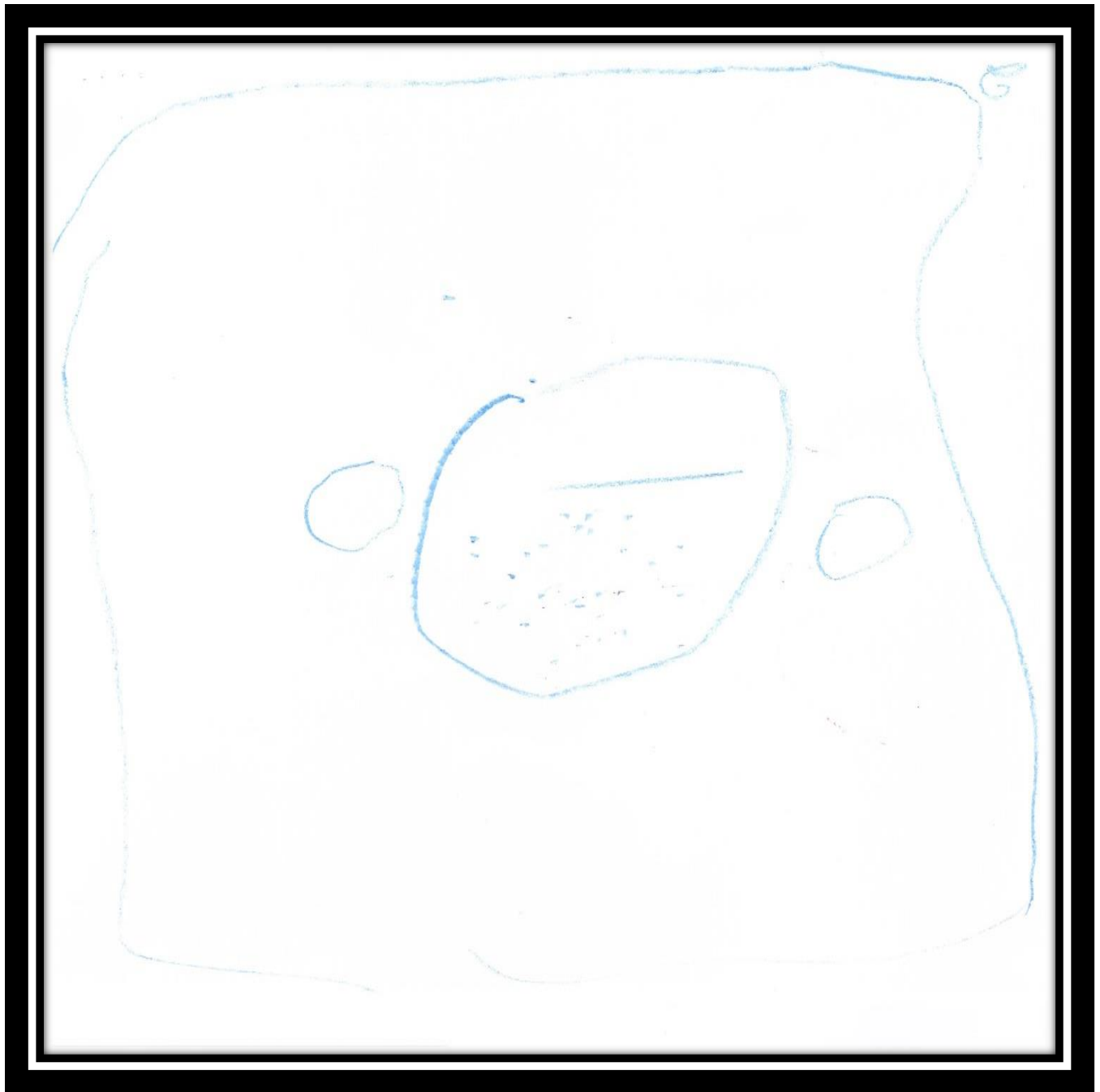
Picture 29 (C5-6Y-Post6). In her sixth drawing, child 5 again depicted herself lying in the hospital bed with three “doctors dentist,” in addition to her mother, next to her bed.



Picture 30 (C5-6Y-Post7). Child 5 drew herself and her teeth, which were not “white all the way.”



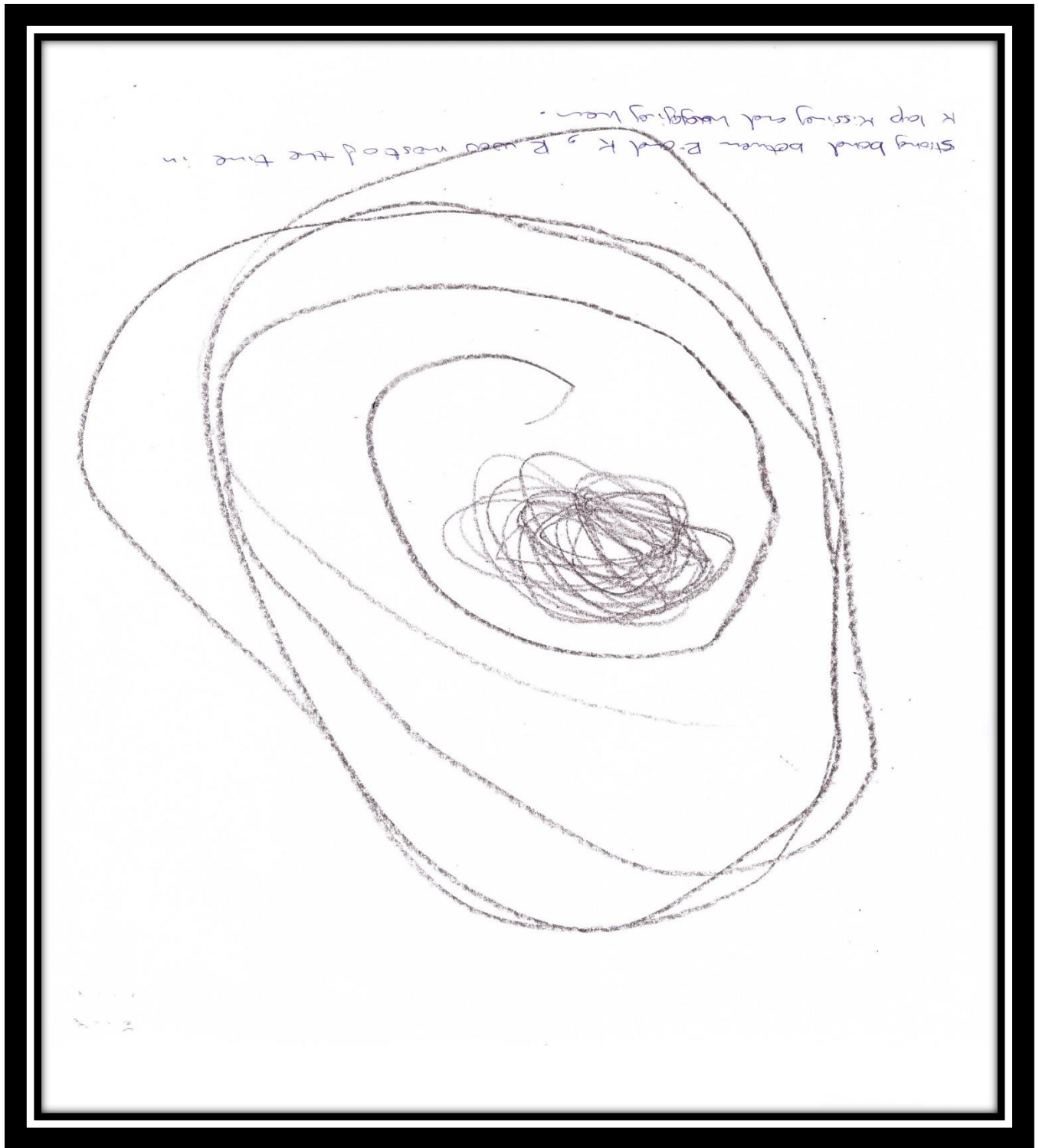
Picture 31 (C7-4Y-Pre1). Child 7 is in the pre-schematic stage of drawing. The child narrated that she drew three teeth and a tooth fairy that looks like a butterfly. The teeth and butterfly all feel sick because they have holes.



Picture 32 (C7-4Y-Pre2). Similar to Picture 31, the child narrated that she drew three teeth and a tooth fairy that looks like a butterfly. The teeth and butterfly all feel sick because they have holes.



Picture 33 (C7-4Y-Post1). Child 7 narrated that she drew a “black dragon” with “a lot of arms,” and a smiley face of her stuffy, “Suzy Sheep.”



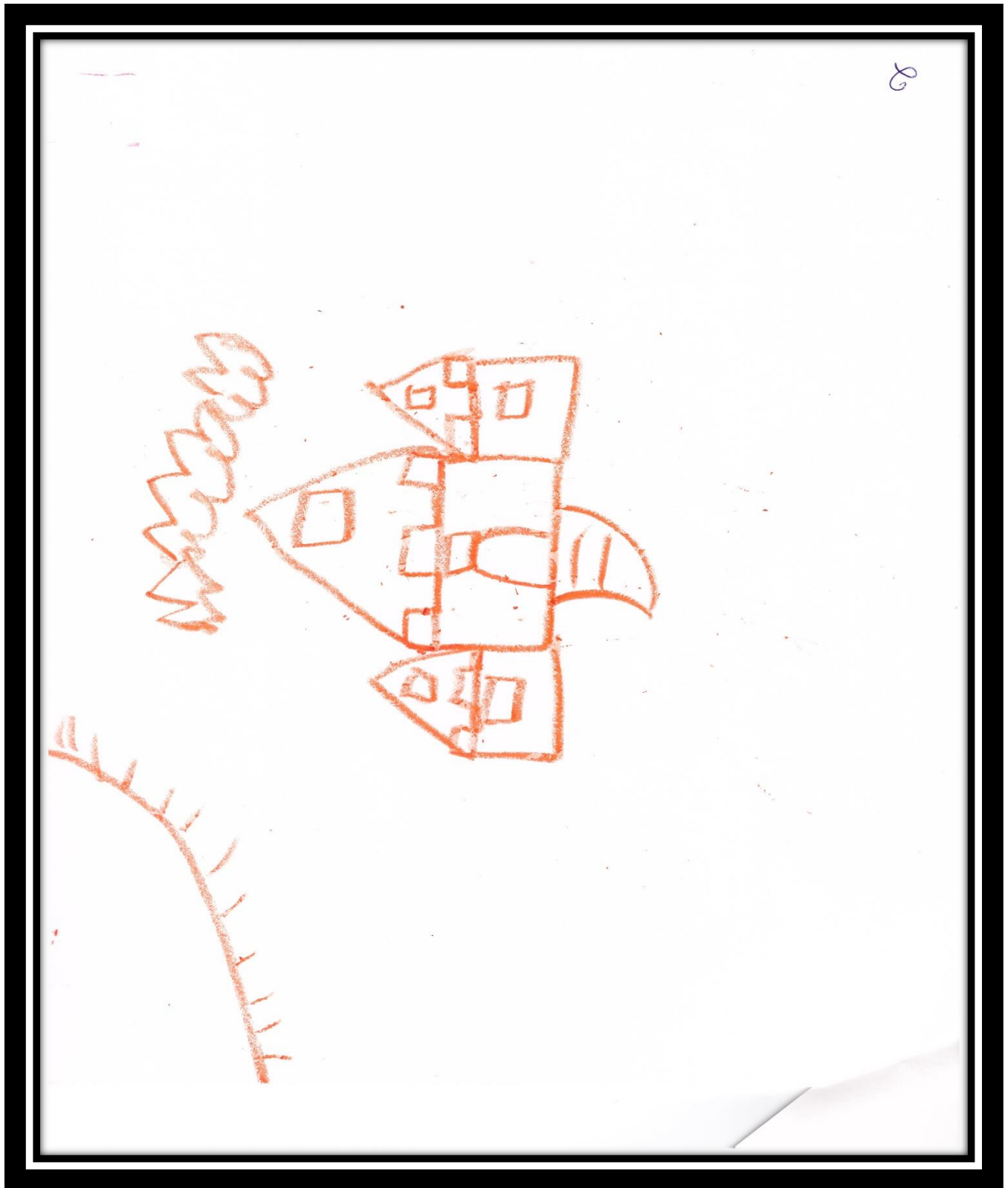
Picture 34 (C7-4Y-Post2). Child 7 scribbled some lines depicting a “tooth” that feels “OWEE” (in pain).



Picture 35 (C8-5Y-Pre1). Child 8 drew herself lying in a bed with a tooth fairy next to her. “The child is happy because of money coming from the tooth fairy.”



Picture 36 (C8-5Y-Pre2). Child 8 drew herself sitting on a dental chair with her mother next to her.



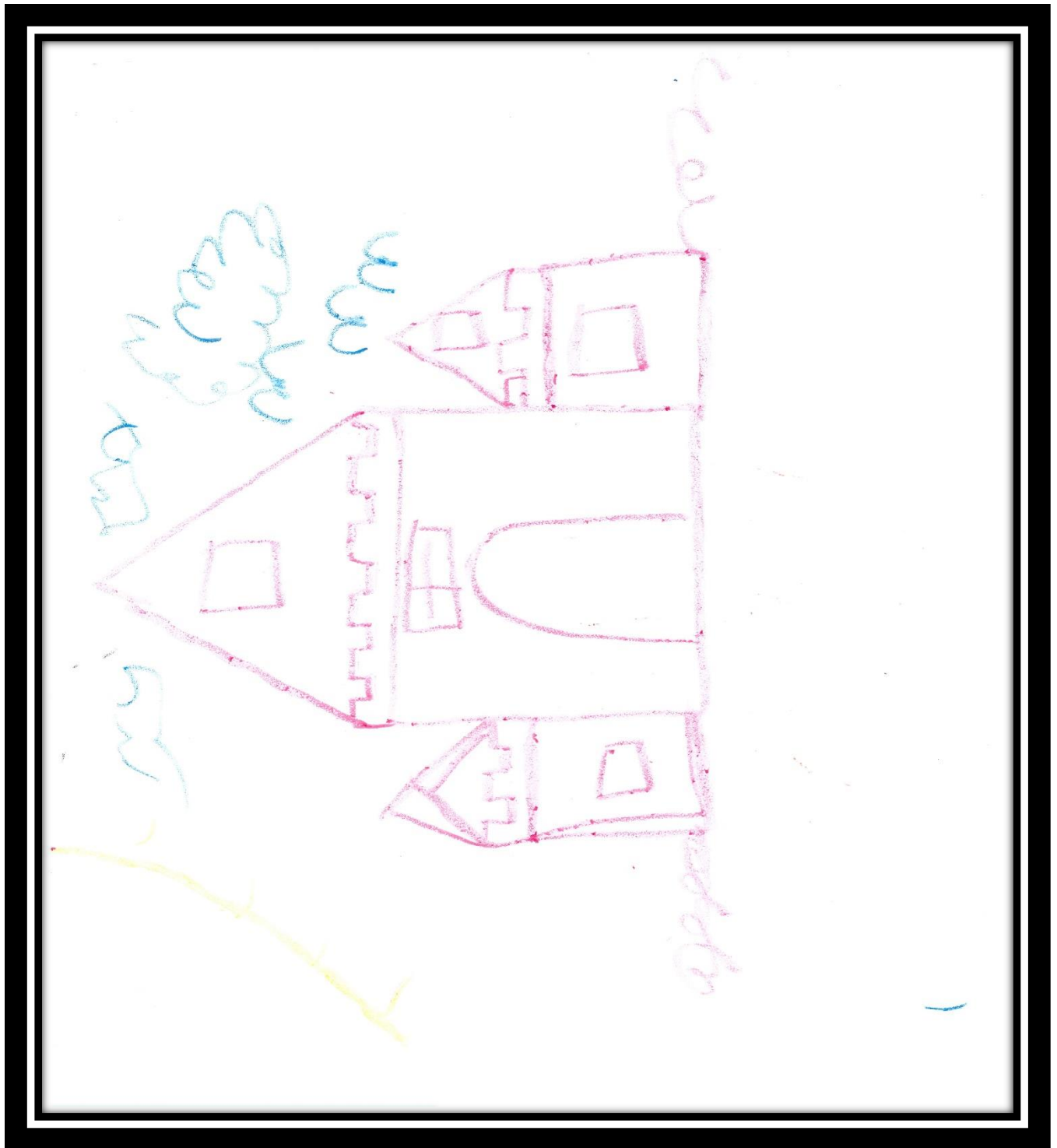
Picture 37 (C9-6Y-Pre1). Child 9's pre-op drawing depicts the Sun, clouds, and the townhouse he lives in now.



Picture 38 (C9-6Y-Pre2). Child 9's next pre-op drawing shows his mouth, teeth, and tongue. He commented: "This tooth has a cavity." (The child's signature was removed.)



Picture 39 (C9-6Y-Post1). Child 9's post-op drawing shows the operating room where he was lying down on a bed, along with a mask and two doctors next to him, and, more importantly, his nine extracted teeth. The OR has two windows.



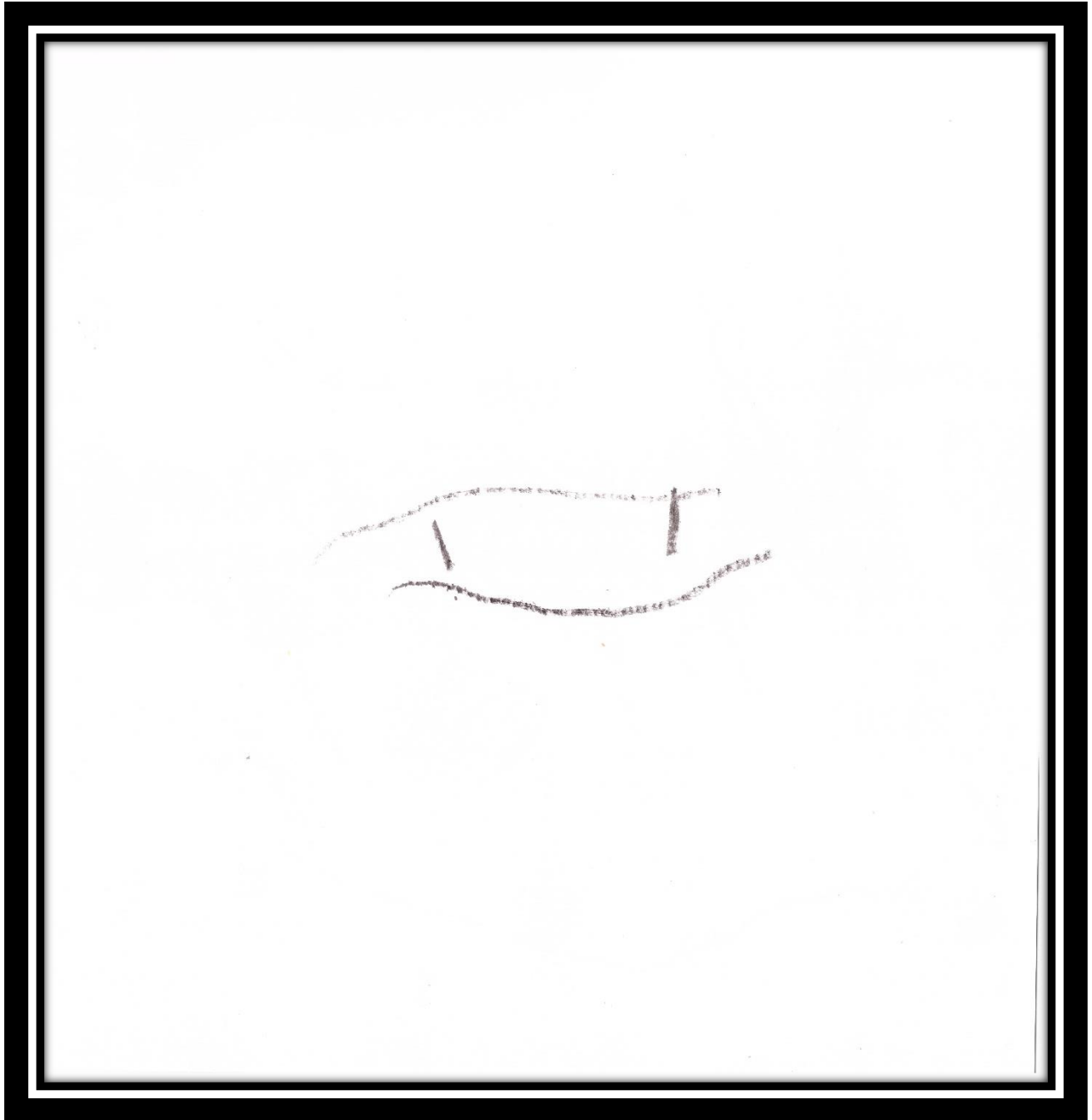
Picture 40. Child 9, a refugee, drew a home in his post-op interview, similar to the one he drew in the pre-op interview (in Picture 37).



Picture 41 (C9-6Y-Post3). Child 9 drew his nine extracted teeth (The child's signature was removed.)



Picture 42 (C10-6Y-Post1). Child 10 drew a picture depicting his teeth, four suns, and an apple, which he found difficult to eat after removing all of his anterior teeth during the GA procedure.



Picture 43 (C12-3Y-Post1). Child 12, aged three years one month, was able to draw post-operatively an oral cavity with two teeth inside. The child was concerned about having her teeth removed during surgery, saying, "They removed my teeth."