

Factors Facilitating Dental Practitioners in the Provision of Infant and Toddler Dental Homes in Alberta: An Interpretive Description

by

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ABSTRACT

Early childhood caries is recognized as a preventable disease which has considerable systemic health and economic consequences. It has been described as the most common chronic childhood disease. Initiating oral health care early in the life course for infants and toddlers is an important recognized mechanism to mitigate risk for developing early childhood caries. The Canadian Dental Association issued a position statement in 2005 recommending that children have their first dental assessment no later than age one; however, uptake of this practice standard within the dental community has been limited. Continuity of care, which is also essential, can be facilitated by establishing a dental home. The dental home is a model of care where comprehensive care is continuously available and is delivered in a family-centered way.

Understanding facilitating factors utilized by dental practitioners who have successfully integrated infant and toddler oral health into their practice is an important underpinning to develop strategies to improve uptake of infant-toddler dental homes. The purpose of this study was to explore factors that influence dental practitioners' provision of infant-toddler dental homes and to develop recommendations to improve uptake within Alberta, Canada based on perspectives of dentists and dental hygienists who currently provide oral health care to the infant-toddler cohort. This study relied on an interpretive descriptive methodology and an ecological theoretical framework. Practitioners across Alberta were eligible for participation if they held an active practice license and if they routinely provided a dental home for children under 18 months of age. Individual interviews were conducted with 13 dental practitioners including pediatric dentists, general dentists, and dental hygienists who met these criteria. Data was collected and analyzed concurrently using the constant comparative method.

Thematic analysis led to four interconnected themes which influence practitioners in provision of infant-toddler oral health care including: 1) Practitioner; 2) Practice; 3) Profession; and 4) Population. Study findings include practitioner comfort in treating infants and toddlers, having education and training in infant and toddler oral health care, adequate remuneration and insurance coverage for preventive oral health procedures, and increased interprofessional awareness of the infant-toddler dental home. Study findings were interpreted in the context of current literature to develop recommendations to advance uptake of infant-toddler dental homes in Alberta.

While it is recognized that improved uptake will be evolutionary and involve a continuum of implementation processes, the following recommendations are put forward as initial steps based on the belief that they will promote the desired outcomes: review and amendment of accreditation requirements through the Commission of Dental Accreditation of Canada to include infants and toddlers in dental and dental hygiene curriculum; inclusion of clinical experience in provision of infant-toddler oral health in undergraduate dental and dental hygiene education to develop students' comfort and competence in providing treatment for this cohort; removal of age restrictions for preventive fluoride therapies through publicly-funded dental programs; expansion of provincial dental and dental hygiene practitioner directories through the Alberta Dental Association and College and the College of Registered Dental Hygienists of Alberta to identify practitioners who are providers of infant-toddler dental homes; and concurrently funding research to expand the body of knowledge related to infant-toddler oral health. These strategies offer a model to advance uptake of infant-toddler dental homes and improve the oral health of children in Alberta.

PREFACE

This thesis is an original work by Jacqueline Renée VanMalsen. The research project, of which this thesis is a part, received research ethics approval from the University of Alberta Research Ethics Board, “Factors Facilitating Dental Practitioners in the Provision of Infant and Toddler Dental Homes in Alberta: An Interpretive Description”, No. Pro00061569, March 17, 2016.

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This work is dedicated to

My nephews, Gavin, Will, Eric & Avery, whose enthusiasm for learning is infectious

- and to -

Vickie McKinnon, who inspired me with the idea in the first place.

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*“The more we say thanks, the more we find to be thankful for.”
... The Secret of Saying Thanks, Douglas Wood*

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LIST OF ABBREVIATIONS

AAP	American Academy of Pediatrics
ADA&C	Alberta Dental Association and College
AAPD	American Academy of Pediatric Dentistry
CDA	Canadian Dental Association
CDHA	Canadian Dental Hygienists Association
CE	continuing education
CIHI	Canadian Institute for Health Information
CIHR	Canadian Institute for Health Research
CHMS	Canadian Health Measures Survey
CRDHA	College of Registered Dental Hygienists of Alberta
DAT	Dental Aptitude Test
dmft	decayed, missing, and filled teeth (primary dentition)
dmfs	decayed, missing, and filled surfaces (primary dentition)
ECC	early childhood caries
FFM	Five-Factor Model
GPA	Grade Point Average
HPA	Health Professions Act
MBTI	Myers-Briggs Type Indicator
M&M pyramid	Morbidity and Mortality pyramid
MMI	Multiple Mini Interview
POHO	Provincial Oral Health Office (of Alberta)
S-ECC	severe early childhood caries
SES	socioeconomic status
WHO	World Health Organization

GLOSSARY OF TERMS

In the context of this thesis, terms are defined as follows:

AD-PIE: The AD-PIE acronym is a framework for the dental hygiene process of care, including five phases of dental hygiene process: assessment, diagnosis, planning, implementation and evaluation.¹

Child: A child is a person who is infant, toddler or preschool aged, and is generally considered to be under six years of age.

decayed, missing, and filled teeth (dmfs): dmfs is a commonly used index in oral epidemiology to assess decayed, missing, and filled tooth surfaces in the primary dentition.²

decayed, missing, and filled teeth (dmft): dmft is a commonly used index in oral epidemiology to assess decayed, missing, and filled teeth in the primary dentition.²

Dental Home: The American Academy of Pediatric Dentistry defines the dental home as “the ongoing relationship between the dentist and the patient, inclusive of all aspects of oral health care delivered in a comprehensive, continuously accessible, coordinated, and family-centered way. Establishment of a dental home begins no later than 12 months of age and includes referral to dental specialists when appropriate.”³

Age-one Dental Home: A dental home where care commences by age-one.

Early-Pediatric Dental Home: The term early-pediatric dental home is used in the scoping review of this thesis, and is a dental home which provides care for preschool-aged children.

Infant-Toddler Dental Home: A dental home for infants or toddlers, which establishes ongoing care of the child.

Early childhood caries (ECC): The case definition of early childhood caries is as follows: the presence of one or more decayed (noncavitated or cavitated lesions), missing (due to caries) or filled tooth surfaces in any primary tooth in a preschool-age child, i.e. between birth and 71 months of age.^{4,5}

Severe early childhood caries (S-ECC): Severe early childhood caries is the advanced form of early childhood caries. The case definition of S-ECC is as follows: In children younger than 3 years of age, any sign of smooth-surface caries is indicative of severe early childhood caries (S-ECC). From ages 3 through 5, 1 or more cavitated, missing (due to caries), or filled smooth surfaces in primary maxillary anterior teeth or a decayed, missing, or filled score of ≥ 4 (age 3), ≥ 5 (age 4), or ≥ 6 (age 5) surfaces constitutes S-ECC.^{4,5}

Infant: There is currently no standardized case definition available for the terms “infant or infants” in Canada; however, this study adopts the definition used by the Centers for Disease Control and Prevention in which children between 0-1 years of age are infants.⁶

Model: A model is a symbolic representation of concepts and the interrelationships among them.⁷

Parent: A parent is the primary caregiver(s) of a child, inclusive of biological parent, adoptive parent and or caregiver.

Preschooler: The Centers for Disease Control and Prevention classify preschoolers as children between three through five years of age.⁶

Theoretical framework: The theoretical framework is a visual or written explanation of key factors, concepts and or variables, and the presumed relationships among them, which provides theoretical and or conceptual underpinnings that serve as a starting point to scaffold the research to which the research questions are directed.^{7,8}

Toddler: The Centers for Disease Control and Prevention classify toddlers as children between one through three years of age.⁶

ORGANIZATION OF THE THESIS

The thesis is organized in five chapters. Chapter 1 introduces the scope of the study by providing an overview of relevant background literature, study purpose, the research questions addressed through the study, and delimitations. To conclude Chapter 1, the researcher's orientation to early pediatric oral health care is presented. Chapter 2 is a scoping review that has been published as: VanMalsen J, Compton SMC, "Effectiveness of early pediatric dental homes: A scoping review," *Journal of the Canadian Dental Hygienists Association*. 2017; 51(1):23-9. Jacqueline VanMalsen was responsible for the study conception and design, acquisition of data, interpretation of data, writing of the article, review and revision of the article and final article approval. Dr. Sharon M. Compton contributed to design, concept formation, manuscript review and revisions, as well as the final approval of the final manuscript.

Chapter 3 describes the study methodology. The first section of the methodology describes the use of interpretive description as the research design chosen to address the research questions. A description of the sampling procedure is included. Section two of the methodology chapter includes methods for data collection, including a description of recruitment and the interview process, and the process employed for data analysis and interpretation. The chapter concludes with a section addressing trustworthiness and validity, with specific emphasis on issues of credibility, transferability, dependability, and confirmability. Ethical considerations are also discussed.

Study findings are described in Chapter 4. Within the study findings, a model of the four themes that facilitate practitioners' provision of infant-toddler dental homes is presented. A detailed description of each of the four themes that emerged from the study is included. The

thesis concludes with Chapter 5, which offers a discussion of key findings including implications for practice, policy, and future research. Limitations of the study are considered.

CHAPTER 1

THE SCOPE OF THE STUDY

Introduction

A considerable body of evidence unequivocally recognizes that oral health and systemic health are intertwined. A report from the Surgeon General reinforced the multiple linkages between oral and systemic health, and highlighted the connection between oral diseases and ear and sinus infections, weakened immune systems, acute and chronic diseases, as well as other serious health conditions.⁹ While over the last several decades there have been significant improvements to oral health at a population level, epidemiological data indicates marked increases in early childhood caries prevalence in some preschool populations.⁹⁻¹² In fact, early childhood caries has been described as the most common chronic childhood disease – five times more common than asthma and twenty times more common than diabetes.^{9,13}

As defined by the Canadian Dental Association (CDA), early childhood caries (ECC) is “the presence of one or more decayed (noncavitated or cavitated lesions), missing (due to caries) or filled tooth surfaces in any primary tooth in a preschool-age child, i.e. between birth and 71 months of age.”⁴ Severe early childhood caries (S-ECC) is the advanced form of early childhood caries, which CDA has defined in accordance to the child’s age as follows: “In children younger than 3 years of age, any sign of smooth-surface caries is indicative of S-ECC. From ages 3 through 5, one or more cavitated, missing (due to caries), or filled smooth surfaces in primary maxillary anterior teeth or a decayed, missing, or filled score of ≥ 4 (age 3), ≥ 5 (age 4), or ≥ 6 (age 5) surfaces constitutes S-ECC.”⁴ Both definitions adopted by the CDA are also congruent with the definitions used by the American Academy of Pediatric Dentistry.⁵ When a child suffers

from ECC, dental treatment under general anesthesia is often necessary.¹⁴ The Canadian Institute for Health Information (CIHI) recently reported that hospitalization to treat ECC under general anesthetic is the most common day surgery procedure at most pediatric hospitals in Canada.¹⁵ The CIHI report indicated that the cost of hospitalization to treat ECC exceeds \$21 million per year, which CIHI further described as the “tip of the iceberg” as many children receive treatment in private facilities and many others with untreated decay are awaiting surgery.¹⁵ In Canada, there currently is no robust oral health surveillance data documenting the population prevalence of caries in preschool children. However, data from the Canadian Health Measures Survey (CHMS) indicated that nearly 60% of school-aged children (6-11 years of age) have at least one cavity or dental restoration.¹⁶

Impact of Early Childhood Caries

Poor oral health early in life can impact a child’s health throughout the life course. Untreated caries increase the risk of oral infection; head, neck, and dental abscesses; facial cellulitis; and systemic spread of infection.^{9,11,17-22} Early childhood caries can have a lasting detrimental impact on the dentition including premature tooth loss, predisposition to malocclusion, hypoplasia of the permanent dentition resulting from infection around developing tooth buds, development of dentofacial anomalies, and more than a three-fold increase of decay risk in the permanent teeth.^{9,11,23-32}

Beyond effects on the dentition, early childhood caries can manifest in acute and chronic pain and infection, which can lead to malnourishment, impact speech development, compromise learning, self-esteem, and quality of life, and negatively alter a child’s somatic growth patterns and cognitive development.^{9,33-44} In a study from the United States comparing percentile weight categories of children with ECC and matched caries free children, Acs et al. found that the

percentile weight categories of children with active, untreated caries was significantly less than that of the control group.³³ Of children with active dental disease, 13.7% weighed less than 80% of ideal body weight. In the caries free control group, no children fell below this threshold. One of the anthropometric parameters of failure to thrive is children weighing less than 80% of ideal age-adjusted body weight. Furthermore, following restorative treatment, the difference in age adjusted weights between the children with ECC and the control group disappeared, which the authors attributed to increased growth velocities of the ECC group post-treatment.³³

The impact of ECC on nutritional status was also investigated by Schroth et al. through a case control study to assess ferritin levels in children with severe decay.⁴⁵ Children with severe early childhood caries were nearly twice as likely to have low ferritin levels, and over six times more likely to have iron deficiency anemia than caries-free control children. These findings bring to bear a broader clinical concern because “a child’s iron status has been demonstrated to have a significant impact on health. For instance, learning and memory deficits, decreased fine motor skills, and increased anxiety may all be observed in children suffering from iron deficiency.”^{45, p6} Chronic iron deficiency is associated with impaired brain development and function.³⁵ Population studies have further suggested that there is no improvement in cognitive scores or behavior after iron supplementation therapy, and therefore the authors conclude that chronic deficiencies may have permanent, deleterious health consequences.^{35,46}

In understanding the impact of early childhood caries in its entirety, a perspective that considers the social implications of disease is important. Through a multi-level conceptual model, Fisher-Owens et al. depicted the impact of ECC as both a biomedical and social disease.⁴⁷ This model superimposes child-, family-, and community-factors associated with early childhood caries.⁴⁷ At a biological level, factors such as the individual child’s genetic endowment are

considered; while social aspects of the disease encompass the socioeconomic status and social supports of the family, as well community level factors such as the physical environment in which the child and their family live (i.e. having optimal water fluoridation) and dental care system characteristics (i.e. access to dental practitioners and public dental coverage).⁴⁷

Social effects of early childhood caries were also highlighted through national oral health surveillance data collected in the Canadian Health Measures Survey (CHMS). The oral health component of the 2007-2009 Canadian Health Measures Survey, which sought to survey a representative sample of Canadians, indicated that over 45% of children 6 through 11 years of age lost time for normal activities in the past 12 months due to oral health concerns.^{16, p74} This finding did not account for time lost in parental employment. Also the CHMS did not include data on children under 6 years of age,¹⁶ so the impact of early childhood caries is likely underreported.

The impact of ECC on health has also been described by Casamassimo et al. through a morbidity and mortality pyramid.⁴⁸ Morbidity and mortality pyramids depict impacts of disease by stacking increasingly severe disease consequences one on another to portray the impact of disease on all aspects of health.^{48,49} As Casamassimo et al. state:

A M&M (morbidity and mortality) pyramid allows one to both observe a meaningful measure of consequence and relate that measure to other consequences. For example, for every death resulting from ECC or its treatment, one expects a certain number of hospital admissions, missed school days or episodes of pain-induced difficulty in eating or sleeping. Use of M&M pyramids can help clinicians relate the occurrence of comorbidities and, through intersecting tiers, identify groups at higher risk of experiencing illness or adverse effects.^{48, p 651}

Their model proposes four broad tiers, stacked on one another, to help quantify the effects of dental caries. The broad base of the pyramid is characterized as direct costs associated with ECC and includes factors such as days missed from school or work and inappropriate use of over-the-counter medications. These are factors with high frequency, but of lesser health consequence. Moving upwards in the pyramid towards less frequent but more consequential variables, the subsequent tier describes family-associated morbidity, accounting for eating and sleeping dysfunction, disturbed pain perception, and family stress. This is followed by a tier related to hospital costs including misuse of emergency departments, costs of hospital admission, and morbidity resulting from general anesthesia. At the apex of the pyramid is death, a rare but not unknown consequence of ECC associated with infection and risks linked with sedation.⁴⁸

While there are inherent limitations to depicting the impact of disease through morbidity and mortality pyramids (such as loss of clarity through overlapping consequences), the utility of these models is that they provide a graphical depiction of the disease which goes beyond the biomedical impacts.⁴⁸ At a minimum, morbidity and mortality pyramids illustrate and confirm that the health effects of ECC extend far beyond the oral cavity. Consequently, as depicted through the morbidity and mortality pyramid, the impacts of early childhood caries provide further impetus for research to help ameliorate the social and economic burden of ECC. There are numerous systemic health ramifications linked to ECC, and severe forms of the disease are associated with failure to thrive, life threatening septic infections, and in rare circumstances death.^{18,20,22,34-36,48,50} Most importantly, this disease is largely preventable. Taken in their totality, these factors support the need to advance uptake of infant-toddler oral health care, which is ultimately the focus of this current research study.

Recommended Practice

Ameliorating early childhood dental caries is inherently complex. However, early access to pediatric oral care by one year of age is an important strategy to mitigate a child's risk by commencing preventive care before the onset of the disease process. As stated by Schroth et al., the premise of a first dental visit by 12 months of age is "based primarily on the argument that such a visit establishes a preventive and cost-effective practice for the caregiver and provides long-term benefits for the child."^{51, f15} The ultimate aim of preventive dental care by age one is to change the life course trajectories of a child's oral health, and consequently their overall health.

The current practice standard for infant and toddler oral health recommends that a child's first dental assessment should occur within six months of the eruption of the first tooth or no later than twelve months of age.^{4,52-54} Endorsement of the first year dental visit was first introduced in 1986, and is now recommended internationally as a standard of care.^{52,55} The major dental professional associations that endorse this position include, but are not limited to: American Academy of Pediatric Dentistry, Australian Dental Association, Canadian Dental Association and the European Academy of Pediatric Dentistry.⁵⁵ In a Canadian context, the recommendation that children have a first dental visit by age one was approved by the Canadian Dental Association (CDA) in 2005, and the position statement was reaffirmed in 2012.^{4,53,54} At a local provincial level, the Alberta Dental Association and College (ADA&C) provides information on infant and toddler oral health through their public website, and their messaging is consistent with the national CDA statement. They state:

Around the age of one or when the first teeth appear, make an appointment for your child to see the dentist. Having your child see the dentist early will ensure you receive important

information on their dental health and also help stop any disease that may be forming before it becomes a major problem.⁵⁶

Though the concept of first dental visit by age one has been endorsed within Canada for over a decade, uptake of the practice standard in the medical and dental community has been limited.⁵⁷ The impact of limited uptake by health care professionals is a posited barrier to accessing dental visits by age one. A cross-sectional study of 2,505 children in Toronto, Canada indicated that less than 1% of children had been to a dentist by age one, and only 1.9% reported seeing a dentist by two years of age.⁵⁸ The authors additionally posited that one factor limiting routine access to infant-toddler oral health care was that “many general dental professionals may not be comfortable providing care for infants and toddlers or may not be aware of current recommendations for early preventive dental care.”^{58, p1598} This supposition appears consistent with the results of a simulated parent phone call survey where Smith and Lewis determined that while 99% of general dental offices provide care to children five years of age and older, only 9% of offices offer preventive dental care for children one year of age or younger.⁵⁹

Research surveying general dentists across varied jurisdictions within Canada and the United States has produced consistent results with respect to limited provision of early pediatric oral health care by one year of age.⁶⁰⁻⁶⁸ Furthermore, survey data of general and pediatric dentists practicing in Manitoba, Canada indicated that most practitioners do not recommend a first dental visit until an average age of 18.9 months, which is over six months after the targeted age of 12 months.⁶⁰ These findings reaffirm that a barrier to access of age-one year dental visits is access to a practitioner who provides early pediatric care. For children who are at a high risk of early childhood caries, delayed assessment and preventive care may have deleterious consequences with respect to inhibiting the disease process.

The Dental Home Model

One emerging strategy to achieve comprehensive and routine oral health care by age one is through the dental home model. The concept of the dental home was first proposed by the American Academy of Pediatric Dentistry (AAPD) in 1986, and the concept was originally based on the American Academy of Pediatrics (AAP) policy on the medical home.^{69,70} The AAP policy states that, “medical care of children of all ages is best managed when there is an established relationship between a practitioner who is familiar with the child and the child’s family.”^{70, p93} The dental home is analogous to the medical home concept, and Nowak and Casamassimo suggested that the dental home could “improve access to and provide children with a source of care and anticipatory guidance as early as 1 year of age.”^{70, p93} As the founder of the term dental home, the AAPD defined it as “the ongoing relationship between the dentist and the patient, inclusive of all aspects of oral health care delivered in a comprehensive, continuously accessible, coordinated, and family-centered way. Establishment of a dental home begins no later than 12 months of age and includes referral to dental specialists when appropriate.”^{3, p12}

Though the definition from the AAPD is the most common depiction of the dental home, other conceptualizations of the dental home have been proposed. The health home model combines the dental and medical home in attempt to shift from a ‘silo approach’ to medical and dental care to a more holistic approach in which delivery of health and dental care are unified by housing these services as a single entity.⁷¹ Other experts have proposed a vertical high rise model where preventive care for the infant or toddler is provided by a dental hygienist and more complex care by a dentist with a pediatric specialty.⁷¹ The dispersion low rise model of the dental home assumes a broader conceptualization in which the entire community serves as the dental home, inclusive of community resources, primary health care providers, dental professionals, and

community dental programs and clinics. In this latter model, the ability of the dental home to serve the oral health needs of the population is emphasized.⁷¹ Hybrids of all conceptualizations have also been considered. However, despite variations in how the dental home has been defined, the common underpinning is that all definitions stress the importance of commencing oral health care no later than age one and that there is continuity of care aimed at disease prevention.

Access to Care

As delayed access to infant-toddler oral health care may impact patient outcomes, previous research has sought to clarify what barriers dental practitioners identify related to the provision of care for infants and young toddlers. Reluctance of dental practitioners to provide infant-toddler oral health care has been examined in several previous studies through quantitative paradigms.^{60,61,63,64,72-74} This data has been collected through surveys of dental practitioners with a general emphasis on barriers related to the provision of preventive dental care for this cohort. Though the surveys vary with respect to sampling frame (i.e. geographic jurisdiction, type of dental professional including pediatric dentists, general dentists, and dental hygienists) the existing research is consistent with respect to barriers such as lack of guideline awareness, insufficient education and training, and external factors such as insufficient remuneration.^{60,61,63,64,72-74} For example, in a survey of pediatric and general dentists, Garg et al. found that:

Three dominant themes [emerged] as potential barriers or facilitators: financial considerations, comfort level in seeing young children and training. Additional themes regarding parent education, pediatrician education and pediatrician referral also emerged although they appeared less frequently.^{63, p422}

The consistent aim of the prior research that has assessed dental practitioners' involvement in providing infant-toddler oral health care has been to facilitate an understanding of practice patterns related to care for this cohort with a common focus on barriers. However, despite research across jurisdictions and classifications of practitioners (pediatric dentists, general dentists, and dental hygienists), many practitioners remain uninformed and indisposed to providing care for infants and toddlers despite over decade of elapsed time since position statements for the age-one dental visit have been endorsed.^{51,60,61,63} A research paradigm that focuses on practitioners who have successfully integrated infant and toddler oral health guidelines may help to elucidate strategies to improve uptake of practice guidelines through understanding factors which have helped practitioners who serve as a routine dental home for infants and toddlers. Furthermore, an inclusive understanding of the mechanisms, knowledge, training, attitudes, and practice environments of practitioners who currently provide care is a crucial primary step, which can help to better inform the dental and medical community in its entirety.

Purpose and Research Questions

The research questions posed in this study sought to understand how practitioners who currently provide infant-toddler dental homes have overcome barriers, created environments, and implemented practices which facilitate provision of care for this cohort.

The overarching research questions addressed in this study were:

- 1) What is the effectiveness of early pediatric dental homes?
- 2) What factors facilitate provision of a dental home for infants and toddlers by oral health practitioners (pediatric dentists, general dentists, and dental hygienists) in Alberta?

To address the breadth of factors facilitating practitioners' provision of infant-toddler dental homes, the ecological model was used as an a priori framework to support development of secondary research questions. The ecological model delineates that behavior (i.e. provision of infant-toddler dental homes) is influenced by intrapersonal, interpersonal, community, organizational, and policy factors.⁷⁵ Use of the ecological model as a theoretical framework within the current study is detailed in Chapter 3.

The following secondary questions, supported by the ecological model, also framed the research study:

- What are the intrapersonal factors (such as, but not limited to knowledge and attitudes) that assist practitioners in the provision of an infant-toddler dental home?
- What are the interpersonal factors (such as, but not limited to provider relationships with patients, parents and caregivers, other dental and medical professionals, and ancillary staff) that assist practitioners in the provision of an infant-toddler dental home?
- What are the external organizational, community, and policy factors (such as, but not limited to enabling resources and practice environments) that contribute to the successful provision of a dental home for infants and toddlers?
- What recommendations would practitioners who currently provide early pediatric oral health care make to achieve greater uptake of infant and toddler oral health care?

To address the aim of determining the effectiveness of early pediatric dental homes, a scoping review was conducted and is presented in Chapter 2 of this thesis.

Rationale for the Study

Improved practitioner uptake related to provision of infant-toddler oral health care is a complex issue. Though a position statement on first visit by age one has existed in Canada for over a decade, uptake by dental practitioners has been limited. However, some dental practices in Alberta currently do provide age-one care consistent with the stated policy and this research study sought to consult practitioners who provide dental homes for infants and toddlers with a view to understanding factors which enable successful implementation. To the best of the researcher's knowledge, research that seeks to identify common factors that exist in dental homes that have successfully been able to provide routine infant-toddler dental homes has not been previously conducted.

Understanding the attributes of dental homes currently providing infant and toddler oral health care has potential to inform educational practice and training of dental professionals. Furthermore, if common facilitating factors can be identified, these factors can potentially be utilized to improve access to infant-toddler dental homes. The findings may help elucidate policy and establish strategic direction for dental stakeholders. Motivations for achieving congruence between policy and practice norms of infant and toddler oral health care include addressing the considerable economic burden of ECC and ameliorating the current related demand on health care facilities. However, of utmost importance are the direct ramifications for individual children's health, development, and well-being.

The Canadian Dental Association advocates that "all Canadians should have the right to good oral health."¹⁰ Evidence increasingly recognizes the adverse impacts that poor oral health has on overall health, and yet concurrent evidence suggests that in some populations early childhood caries prevalence is increasing and few advances have been made to improve access to

preventive infant-toddler oral health care. It has never been more clear that there is a fundamental moral and ethical responsibility of dental practitioners to seek solutions to address these disparities and ensure that best practices are implemented for all children. Establishing an understanding of factors that have enabled practitioners to successfully provide infant-toddler dental homes, has potential to set critical underpinnings for improved practice and uptake of infant-toddler oral health care, and is potentially an important strategy to ameliorate early childhood caries and move towards improved oral health for all children.

Delimitations of the Study

The interpretive description is delimited to pediatric dentists, general dentists, and dental hygienists in private practice who provide care for children less than eighteen months of age, and who are currently practicing and have active registration status in Alberta. Inclusion of practitioners who did not meet these criteria was eliminated based on the focus of the primary research questions. Also, inclusion of dentists and dental hygienists reflects the scope of practice of these professions. Dentists and dental hygienists in Alberta are able to diagnose ECC and provide preventive care.⁷⁶ Dentists may also provide restorative treatment,⁷⁶ which may be required for infants or toddlers affected by ECC.

Researcher's Orientation to Early Pediatric Oral Health

Demonstrating reflexivity requires a statement of how my experiences as a dental hygienist may have bearings on the research. Prior to returning to graduate school, I practiced as a dental hygienist in Alberta for fifteen years. I have worked in varied settings including private practice, community oral health, primary care, academia as a clinical instructor and as a facilitator in interdisciplinary undergraduate medical education, as well as an elected volunteer on Council for the College of Registered Dental Hygienists of Alberta. These roles have all influenced how I

conceptualize oral health as an integral part of overall health, and my endorsement of the importance of early pediatric oral health care. In my position serving as the first dental hygienist in Alberta to work in a primary care network, I served as a preventive “dental home” for literally thousands of children under the age of three. About a third of the children came with active decay for their first preventive visit, and many required referral for restorative treatment or extractions with a pediatric dentist, often under a general anesthetic.⁷⁷ While many of my patients came from vulnerable families, many also came from families who would not be classified as high risk. Not uncommonly parents confided that they had heard or read that children should have a dental assessment by age one, but were told by their family dental practitioner that oral health care with a dental professional did not need to begin until a child was three, or four or five years of age.

My experiential knowledge in directly providing care for patients and in working with other local dental practitioners who do see children by age one reinforced existing research that there is a gap in access to infant and toddler dental homes in our province. Being a firsthand witness to the consequences of this problem has given me an enhanced awareness and in turn has made me believe that the professional dental community has a role and responsibility to address this gap.

While this was the genesis of my decision to pursue graduate research in infant-toddler oral health care, of equal importance is how my perception of research has evolved. When I was first introduced to the concept of reflexivity in graduate school, I felt a sense of confusion regarding unveiling one’s biases. I was unsettled by the idea, as stated by Creswell, “the writing of a qualitative text cannot be separated from the authors, how it is received by readers, and how it impacts the participants and sites under the study.”^{78, p 215} I entered graduate studies resolute that

research sought to find *the truth*, and I wanted to objectively understand how practitioners provide dental homes for infants void from any personal biases. However, through the mentorship of my supervisors, discussions with my graduate educators and student colleagues, and a labyrinth of self-reflection and discovery from immersion in writings on research philosophies, theories and methodologies, I have dismantled my understanding of an objective truth void from bias. My understanding has evolved to recognize the researcher's position within the study can enhance the quality and rigor through emic knowledge and experience. To have a "text that is separated from the author" that does not "impact the participants" nor is purposefully "received by the reader" is to have a book that sits dusty on a shelf. I do not want research that sits on a shelf. I have come to embrace that my disciplinary background enhances the quality and rigor of this study.

A professor of economics recently introduced me to the concept of the "pracademic", described as an individual who is both an academic and a practitioner who appreciates the benefits of solving real world challenges (in person communication). This view most accurately reflects what I want to embody as a health care practitioner and researcher. I believe that it will forever permeate my research and contributions to oral health. It is my dream that every child in Alberta is free from oral pain and infection. It is with this motivation and inspiration that I pursue my graduate education and conduct this research.

CHAPTER 2

THE EFFECTIVENESS OF EARLY PEDIATRIC DENTAL HOMES: A SCOPING REVIEW

Scoping Review Abstract

Objective: This scoping review examines literature on the effectiveness of early pediatric dental homes based on clinical, behavioural, and cost parameters. Methods: A search of MEDLINE-Ovid, PubMed, CINAHL, Embase, Cochrane Database of Systematic Reviews (DSR), Scopus, and BioMed Central databases was undertaken using “dental home” and “dental homes” as key words. In total, 232 non-duplicate citations were identified. After reviewing the titles and abstracts of these citations, 14 full articles were reviewed. In the final data set, 7 articles met the inclusion criteria of preschool study population and a focus on effectiveness parameters. Results: The existing body of evidence generally supports the effectiveness of early pediatric dental homes for improving clinical outcomes (i.e., dmft scores) and behavioral outcomes (i.e., including utilization of future dental care services), and offering potential cost savings. However, exact quantifications of the impact on clinical and behavioral outcomes as well as cost savings vary due to heterogeneity of study design and methodological considerations related to level of evidence. Conclusion: Current research generally substantiates the establishment of a dental home model as an effective practice to improve early pediatric oral health.

RÉSUMÉ : à venir

Key words: child, dental home, dental visit, early childhood caries, infants, pediatric, toddlers

WHY THIS ARTICLE IS IMPORTANT FOR DENTAL HYGIENISTS

- The early pediatric dental home is a promising model to improve pediatric oral health based on clinical, behavioural and cost effectiveness outcome measures.
- Dental hygienists and other dental practitioners should encourage families with infants and toddlers to start seeing a dental professional no later than age one for routine professional oral health care.

Introduction

While recognizing that advances in the provision of oral health care have been significant and commendable, it is also acknowledged that the mandate of oral health care providers is to ensure continual evidence-based improvements to enhance client care. In this context, the Canadian Dental Association approved a position statement in 2005 endorsing the first dental visit by 12 months of age.¹ Similarly, the Canadian Dental Hygienists Association (CDHA) has endorsed the importance of infant oral health care through several publications including an oral health care call to action presented to the House of Commons Standing Committee on Finance in 2010, which prioritized data collection related to infant oral health.² This call to action further noted that the Canadian Association of Paediatric Health Centres identifies early childhood caries as the most common chronic childhood disease, declaring it a “pandemic in North America”^{2, p 4} in 2007.

Though the first dental visit by age one has been endorsed in Canada for over a decade, implementation of the practice standard has been limited within the dental and medical community.³ A cross-sectional study of children in one Canadian city indicated that fewer than 1% had received oral health exams by age one and only 1.9% of children had preventive dental care by 2 years of age.⁴ Of further concern, the Canadian Institute for Health Information has

reported that treatment of early childhood caries is the most common reason for pediatric day surgery in Canada.⁵ In particular, the report highlighted the significant prevalence of dental disease in Aboriginal populations and children from rural and lower socioeconomic status neighbourhoods.

Abating early childhood dental disease and improving uptake of first-year dental visits are inherently complex undertakings. However, the dental home model is one strategy that has been supported at an oral health policy level to improve access to early pediatric oral health care.^{6,7} Just as the American Academy of Pediatrics' policy on the medical home states that "medical care of children of all ages is best managed when there is an established relationship between a practitioner who is familiar with the child and the child's family,"^{8, p93} the American Academy of Pediatric Dentistry (AAPD) defines the dental home as "the ongoing relationship between the dentist and the patient, inclusive of all aspects of oral health care delivered in a comprehensive, continuously accessible, and family-centered way. The dental home should be established no later than 12 months of age."^{7, p12} The AAPD operational definition of the dental home has been adapted in contemporary literature to include not only physical spaces where a child can access routine oral health care, but has also been conceptualized as a broader more inclusive model of care in which preventive patient care is delivered by dental and other health care professionals through telehealth and community based sites.⁷⁻¹⁰ However, despite these variations, the dental home concept is inextricably connected to commencement of oral health care by a child's first birthday and a philosophy of care that seeks to improve routine access through a client/family-centered model.

This article aims to advance oral health care practitioners' awareness of the dental home concept by summarizing and disseminating the results of research on the effectiveness of the

early pediatric dental home. As purported by Nowak and Casamassimo, “a major obstacle in validating the dental home concept and early dental intervention and altering the antiquated view of when a child first needs to see a dentist is the lack of data, with few sources of nonemergent prevention available for study.”^{11, p124} This article reviews current literature focused on effectiveness of early pediatric dental homes using a scoping review methodology, with the intent of informing future programming, policy, and initiatives that seek to improve uptake of dental homes by age one.

A scoping literature review seeks to “scope” and map the breadth of literature that underpins a research area or field of interest.^{12,13} Scoping reviews are undertaken for various purposes, which include creating a summation of research findings through which compiled data can be disseminated to policy makers, practitioners, and consumers, and identifying gaps in existing literature.¹² Though a scoping review is distinct from a systematic review in that the scoping review focuses on a broad examination of existing literature without presenting a robust analysis of the evidence, it “takes the process of dissemination one step further by drawing conclusions from existing literature regarding the overall state of research activity.”^{12, p21}

Succinctly, by summarizing and disseminating a review of literature on early pediatric dental homes for infants and toddlers, the authors seek to inform future research, policy, and action to improve early pediatric dental care in Canada. To fulfill this purpose, this scoping review focuses on research that addresses the following question: “What is the effectiveness of early pediatric dental homes?”

Methods

A literature search was undertaken using MEDLINE-Ovid, PubMed, CINAHL, Embase, Cochrane Database of Systematic Review (CDSR), Scopus, and BioMed Central databases. Databases were searched using the following algorithm (dental home* or dental homes).mp.), and truncations were adapted for the various databases as shown in Table 1. Database searches were conducted in consultation with a health sciences librarian who recommended not placing any limits on the preliminary search strategy because of the relatively limited number of articles matching the search criteria of dental home or dental homes. Searches were conducted up to and including April 2016. While no date limits were placed on the search strategy, the search yielded articles published between January 1977 and February 2016.

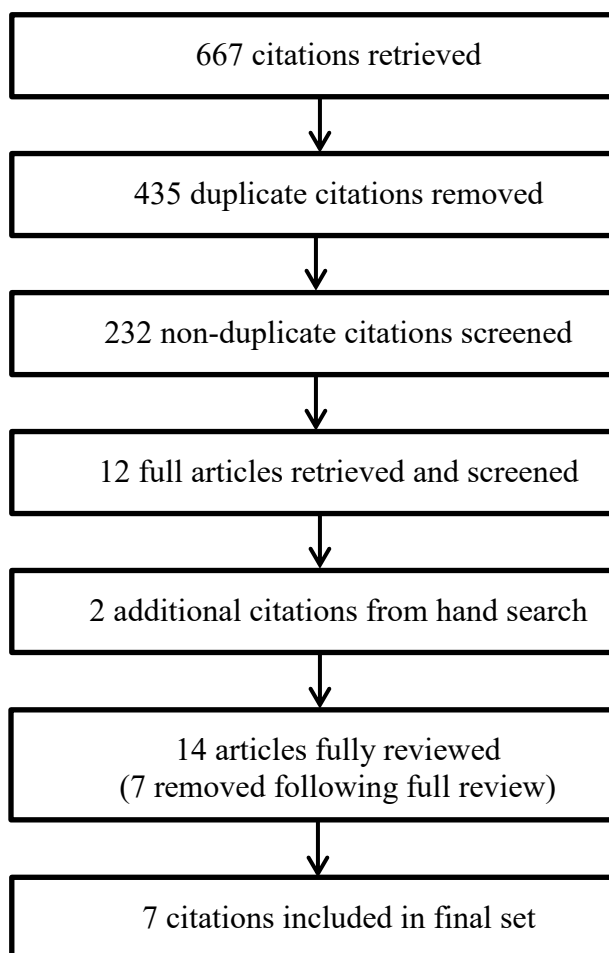
Table 1. Search strategy and results

Database	Number of citations
Medline-Ovid	146 (2 duplicates)
PubMed	138
CINAHL	80
Embase	120
Cochrane DSR	0
Scopus	165
BioMed Central	18
TOTAL	667

A summary of the search and citation retrieval process is presented in Figure 1. In total, 232 non-duplicate citations were identified. To facilitate identification of potentially relevant citations, inclusion and exclusion criteria based on the research question were developed prior to

abstract review. Inclusion criteria were study population (preschool children or preschool programming such as Head Start or Early Head Start initiatives) and a focus on clinical, behavioural or cost effectiveness of early pediatric dental homes. Non-human studies were excluded from the review.

Figure 1. Search and retrieval process flow chart



The authors assessed eligibility of titles and abstracts. When an abstract was not available, the full article was reviewed. After preliminary screening of titles and abstracts, 12 potentially eligible citations were considered for full article review. Two additional citations

were obtained for full review by hand searching reference sections from 2 book chapters that were included in the preliminary database search. All 14 potentially eligible citations were retrieved and assessed based on inclusion and exclusion criteria. Seven of the fourteen citations were removed following full article review because they did not fit the inclusion criteria. Seven articles were included in the final scoping review. Literature synthesis was completed by the first author and was subsequently verified by the co-author prior to abstraction into 2 data tables corresponding to primary study or systematic review (Tables 2 and 3). Quality assessment based on level of evidence was not performed, in keeping with the nature of a scoping review.

Results and Discussion

Six primary studies and one systematic review were included in the final data set and are presented in Tables 2 and 3. These data extraction tables identify author, study design, population and outcomes, as well as conclusions. Additionally, the second column in Tables 2 and 3 indicates which outcome measure or measures were considered in each study. Within these evaluation parameters, there is significant heterogeneity in study design, sampling strategy, methodological approach, and outcome variables used to assess effectiveness of early pediatric dental homes. The summary of evidence based on study outcomes reflects these incongruities.

Clinical parameters. Clinical effectiveness of the early pediatric dental home has most frequently been measured using decay, missing or filled teeth (dmft) or decay, missing or filled surfaces (dmfs) indices related to decay experience. Two cross-sectional survey studies of Head Start (n = 115) and Medicaid (n = 132) preschool-aged children independently reported that children who had an established dental home had statistically significant lower caries experience.^{14,15} This trend remained consistent in both univariate and multivariate models where Kierce et al. applied covariate adjustments for age, gender, daily servings of juice, age at first

dental appointment, and presence of biofilm and gingivitis (OR = 0.10, 95% CI = 0.02, 0.40).¹⁵ Likewise, Wagner and Heinrich-Weltzein reported that an interdisciplinary oral health program in Germany, employing oral health care providers as well as allied health practitioners (midwives, social workers, and nurses), was effective in reducing early childhood caries prevalence.¹⁶ The children who participated in the oral health program (n = 174) were recalled for continuous oral health care from birth to 5 years of age and had significantly lower caries prevalence and experience (10.9%, 0.2±0.7 d₃₋₄mft) (d₃₋₄ = dentinal caries) than children in a matched control group (n = 115; 57.4%, 2.9±3.8 d₃₋₄mft) (p < 0.05). These findings diverge from those reported by Biel et al., (as presented in Bhaskar et al. [2014]), who employed a retrospective cohort design to match Medicaid claims files with kindergarten state dental surveillance data (n = 11,394).¹⁷ Using multivariate modelling, Biel et al. found that children who had their first dental visit before 24 months and children who had a first visit between 24 and 36 months had similar clinical caries status. These authors also found that children who had their first dental visit before 24 months had poorer clinical disease status (higher dmft) compared to children who had a first visit between 37 and 60 months of age (as reported in Bhaskar et al. [2014]). Bhaskar et al. suggest that these findings may reflect a problem-driven pattern of dental care seeking, in which early dental visits in the under-24-month cohort may be the result of early presentation of caries and consequently the preventive value of early pediatric care is somewhat masked.¹⁷

Beyond caries experience, Kierce et al. also considered the presence of biofilm and gingivitis as clinical variables to code the child's dental status using adapted guidelines from the World Health Organization's (WHO) Basic Model of Oral Health Surveys. They found that a greater percentage of preschool-aged children with no dental home presented with biofilm

(96.8%) and gingivitis (71%) compared to children with an established dental home (79.2% and 44.6%, respectively) ($p < 0.05$). Clinicians who collected the data were calibrated prior to the beginning of the study.¹⁵ However, a methodological limitation is that the study does not clearly state how the WHO model was adapted to measure gingivitis and biofilm, thus making it difficult to extrapolate and compare their findings to other related studies.

Behavioural factors. Current research has also assessed the effectiveness of early pediatric dental homes based on behavioural factors. Not only did Kierce et al. report that Medicaid-enrolled preschool children with a dental home had lower prevalence of caries, but the authors also found reduced cariogenic feeding practices in the dental home group.¹⁵ This included lower frequency of consumed juice and soda, fewer sticky snacks, decreased nocturnal sippy cup feeding with milk or juice, and earlier bottle-fed weaning ($p < 0.05$), which the authors speculated may have been related to early anticipatory guidance and nutritional counseling implemented through the early dental home.¹⁵ These results are encouraging, but the generalizability of these outcomes would be enhanced by future research employing larger samples to increase statistical power to corroborate the association between decreased cariogenic feeding and an established dental home as found in this cross-sectional study.

Establishment of an early pediatric dental home also appears to be effective in improving utilization of oral health care services over the long term. For example, Savage et al. found that children who had at least one preventive dental visit by age one were more likely to have future preventive dental visits compared to children whose first dental visit was in later preschool years.¹⁸ Improved preventive dental care utilization is congruent with the findings of Grembowski and Milgrom¹⁹ and Wagner and Heinrich-Weltzien¹⁶, in which early access to dental care was promoted through community-based programming that linked care to public

health programs, such as Washington's ABCD program and a communal visiting newborn service (CVNS) in Germany. In the latter study, early establishment of continual dental care (i.e., through a dental home model) improved uptake of fluoride varnish as 100% of children in the program received fluoride varnish compared to 16.3% in the control group, and the number of applications was also significantly higher (5.8 ± 2.7 versus 1.2 ± 0.5).¹⁶ This outcome is of particular significance for children who are at a high risk of early childhood caries.

Cost effectiveness. Treatment costs are a third parameter that has been studied to evaluate the effectiveness of the early pediatric dental home. Cost effectiveness has been examined using both privately insured and publicly insured children. Through a retrospective cohort study, Kolstad et al. performed a cost-benefit analysis of the age one dental visit for privately insured children ($n = 94,574$) by comparing the age of first dental visit and the average cost of care per year from ages 1 to 5.²⁰ While only 1% of the sample had received dental care by age one, the annual costs for children who had a first-year dental visit were significantly less than for children whose first dental exam was in later preschool years. The positive effect of early dental homes on dental expenditures was also evident among publicly funded Medicaid-enrolled children. Savage et al. found a significant positive correlation between age of first dental visit and dental expenditure ($n = 9,204$ children between 0 and 5 years of age).¹⁸ Cost effectiveness of early dental homes was also validated by Nowak et al. who compared 2 groups: late starters, defined as first dental visit between the ages of 4 and 8 years ($n=25,492$), and early starters, defined as children whose had their first visit under 4 years of age ($n=17,040$). Results indicated that there were an average of 3.58 more dental procedures performed on the late starters at a cost of \$360 more per child over 8 years of follow-up.²¹ The cost effectiveness of public health programs that support establishment of early dental homes was studied by Sen et al. (see Bhaskar et al., 2014)

based on claims from Alabama's Children's Health Insurance Program (CHIP) and preventive procedure codes of 36, 805 enrollees.¹⁷ Their findings showed that preventive visits were associated with a reduction in non-preventive visits and thus lower non-preventive expenditures. However, the cost savings associated with reduced non-preventive visits appear to be offset by the cost of early intervention procedures since no reduction in overall dental expenditures was evident.¹⁷ This outcome appears to contradict previously mentioned studies, but it should be noted that this study only considered cost of care and did not evaluate the comparative oral health outcomes of the various cohorts.

Recommendations arising from the scoping review. Research on the effectiveness of early pediatric dental homes has produced mixed results because of methodological limitations and study heterogeneity. Nonetheless, the current body of evidence generally supports the clinical, behavioural, and cost effectiveness of the early pediatric dental home model.

One purpose of a scoping review is to highlight gaps in the literature. From this perspective, while research has begun to create an evidence base to support effectiveness of early pediatric oral health care, additional longitudinal research that specifically focuses on effectiveness of establishing a dental home by age one is merited. Additionally, the scoping review did not identify any articles that were conducted within a Canadian context. As external validity and generalizability of the current literature may be influenced by factors such as policy and culture, research in a Canadian context needs to be undertaken. It would also be beneficial if studies in the Canadian context included research on cohorts most impacted by early childhood caries, including children in Aboriginal, lower socioeconomic status, and rural communities.

A second purpose of a scoping review is to summarize research for dissemination to stakeholders. Accordingly, oral health care practitioners should be aware that current evidence,

even with significant variation in study design and methodological limitations, predominantly substantiates effectiveness of early pediatric dental homes for infants and toddlers. Support for greater implementation of Canadian practice guidelines and policies with respect to early pediatric oral health care appears to be warranted, but it is also evident that evidence-based research to further validate the efficacy of early access to infant and toddler dental homes should continue to be conducted.

Conclusion

Based on the findings of this review, the early pediatric dental home is a promising model to improve pediatric oral health based on clinical, behavioural and cost effectiveness outcome measures. However, gaps in the literature and heterogeneity in study methodology limit the potential to conduct rigorous cross-comparison of results to fully establish the potential effectiveness of the age one dental home. Research in a Canadian context is important to improve support for and implementation of age one dental visit practice guidelines.

Table 2. Effectiveness of early pediatric dental homes: Primary research studies

Author and country	Effectiveness parameter	Study design	Study population	Study outcomes	Conclusions
Chi et al. (2013) ¹⁴ United States (Washington)	Clinical	Cross-sectional study	3- to 5-year-old Head Start enrolled children (n=115)	Head Start children who had a dental home had lower dmfs scores. The dmfs prevalence ratio was 0.61 (CI 95%:0.42, 0.89; P < 0.01).	Findings suggest an association between children having a dental home and lower caries rates. The data do not reflect clinical outcomes relative to the age at which the dental home was established.
Grembowski & Milgrom (2000) ¹⁹ United States (Washington)	Behavioural	Post-test-only comparison group design	13- to 36-month-old children enrolled in Washington's ABCD program study (n = 465); n = 228 ABCD participants n = 237 comparison group (Medicaid enrolled not in ABCD)	Children who were enrolled in the ABCD dental program had an increased use of services, particularly preventive services, compared to non-enrolled Medicaid children (OR = 5.50, CI 95%: 3.45,8.79).	ABCD program increased access to dental care among Medicaid preschool children.
Kierce et al. (2016) ¹⁵ United States (Manchester, NH)	Clinical Behavioural	Cross-sectional study	2- to 5-year-old Medicaid enrolled children (n = 132)	Children with a dental home had lower rates of biofilm and gingivitis (p < 0.05) and lower dmft scores (1.8 vs 5.19, p < 0.05) compared to children with no dental home. Having a dental home had a strong protective effect on caries and dmft index (OR = 0.22; 57.4% vs 22.6% had no decay experience, p < 0.05). Children with no dental home consumed more juice and soda, ate more sticky snacks, were more likely to go to bed with a sippy cup containing milk or juice, and were bottle fed longer (p < 0.05).	Establishment of an early dental home may decrease ECC prevalence and reduce risk factors related to cariogenic feeding practices.

Table 2 continued. Effectiveness of early pediatric dental homes: Primary research studies

Study design	Effectiveness parameter	Study design	Study population	Study outcomes	Conclusions
Kolstad et al. (2015) ²⁰ United States (California, New York, Pennsylvania, Texas)	Cost	Cohort study	≤5-year-old children with private dental insurance (n = 94,574)	The annual cost per child per year of coverage was significantly less for children who had their first exam by age one; however, the difference in total average cost per child was not statistically significant.	There appears to be an annual cost benefit in establishing a dental home by age one for privately insured children.
Nowak et al. (2014) ²¹ United States (Tennessee)	Clinical Cost	Cohort study	≤8-year-old children from lower SES (n = 42,532); cohort groups: early starters <4 years old, late starters >4 years old	There were 3.58 more dental procedures performed on late starters compared to early starters (CI 95%: 2.80, 4.46; p < 0.001). Children whose first dental visit was after age 4 had a total dental cost (restorative and extractions) of \$360.13 more than children who had their first visit before 4 years of age, p < 0.001.	Children seen for dental care earlier in life had fewer restorative procedures and lower treatment costs compared to children who did not have dental care in preschool years.
Wagner & Heinrich-Weltzien (2016) ¹⁶ Germany (Jena, Thuringia)	Clinical Behavioural	Cohort study	Birth cohort with assessment at mean age 5.2 years Prevention group (PG) n = 174* Control group (CG) n = 115 *PG participated in early oral health program	Children in PG had lower caries prevalence (10.9%, 0.2±0.07 d3-4mft) compared to children in the CG (57.4%, 2.9±3.8 d3-4mft) (p < 0.05), as well as lower caries experience (17.2%, 0.3±0.8 d1-4mft vs 62.4%, 4.2±4.5 d1-4mft (p < 0.001). All carious lesions were restored in the PG compared to 47.3% in the CG. The average number of dental visits in the PG was 10.5±3.4 compared to 3.3±1.4 in the CG and all children (100%) in PG received fluoride varnish (average number of applications = 5.8±2.7), compared to 16.3% of CG (1.2±0.5 applications).	Early oral health program, including early establishment of dental home during the first year of life, was effective in reducing ECC risk in preschool children. Establishment of an early dental home may be associated with improved preventive dental care utilization, including use of preventive therapeutics (e.g., fluoride varnish).

Table 3. Effectiveness of early pediatric dental homes: Systematic review

Author and country	Effectiveness parameter	Study design	Study population	Study outcomes	Conclusions
Bhaskar et al. (2014) ¹⁷ United States	Clinical Behavioural Cost	Systematic review (4 retrospective cohort studies)	Review undertaken to analyse effectiveness of early preventive dental visits on oral health outcomes	Beil et al. (2013) found no benefit of early preventive dental visits in clinical dental caries levels in Medicaid-enrolled kindergarten children. The other 3 studies found mixed support for an association between early preventive dental visits and more preventive and fewer non-preventive visits, as well as lower non-preventive dental expenditures. Selection bias and seeking dental care when problems arise may have affected results.	Early preventive dental visits may be associated with reduced restorative dental care visits and related expenditures; however, evidence base is limited. The clinical benefits of early visits before age 3 are most evident in high-risk children and those with existing dental caries. Early visits may reduce restorative care and related expenditures.

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CHAPTER 3

METHODOLOGY

Introduction

This study employed the ecological model as a theoretical framework to shape the research questions, the study interview guide, and preliminary data analysis. The research followed an interpretive descriptive methodology to address the research questions and ultimately develop study recommendations. Subsequent sections of the methodology chapter explain the philosophical and theoretical underpinnings of these approaches to demonstrate how this study achieved methodological coherence. An interpretive descriptive methodology was determined to be most suitable to answer the research questions because of its emphasis on factors that enable provision of clinical best practice. As stated by Puplampu et al., “the aim of interpretive description is to provide immediately relevant and practical solutions to clinical problems.”^{79,p254} Through interpretive description, the researcher was able to look at the existing body of literature and specifics of practitioners’ provision of infant-toddler oral health care, and then subsequently provide a broad and detailed description and interpretation of findings to explain the overall phenomenon of factors that facilitate practitioners in provision of infant-toddler dental homes.⁸⁰

Additionally, in comparison to most other qualitative methods, which generally are characterized by inductive reasoning, interpretive description recognizes the value of using existing disciplinary knowledge to advance research to address clinical problems. Therefore, in studying factors facilitating provision of infant-toddler dental homes, this research blended inductive and deductive inquiry, as illustrated in Figure 2. In interpretive description there is an obligation of the researcher to examine the existing body of literature and to have familiarity

with the ethos of dentistry and dental hygiene as disciplines, so that in entering the field that which is already known can be applied to create new insights and to capitalize on understanding specific commonalities and variances related to provision of infant-toddler dental homes. This process enabled the researcher to subsequently provide a detailed and rich description and interpretation of findings to explain the overall phenomenon and to create knowledge within an applied health practice.⁸⁰

Figure 2. Schematic of study methodology

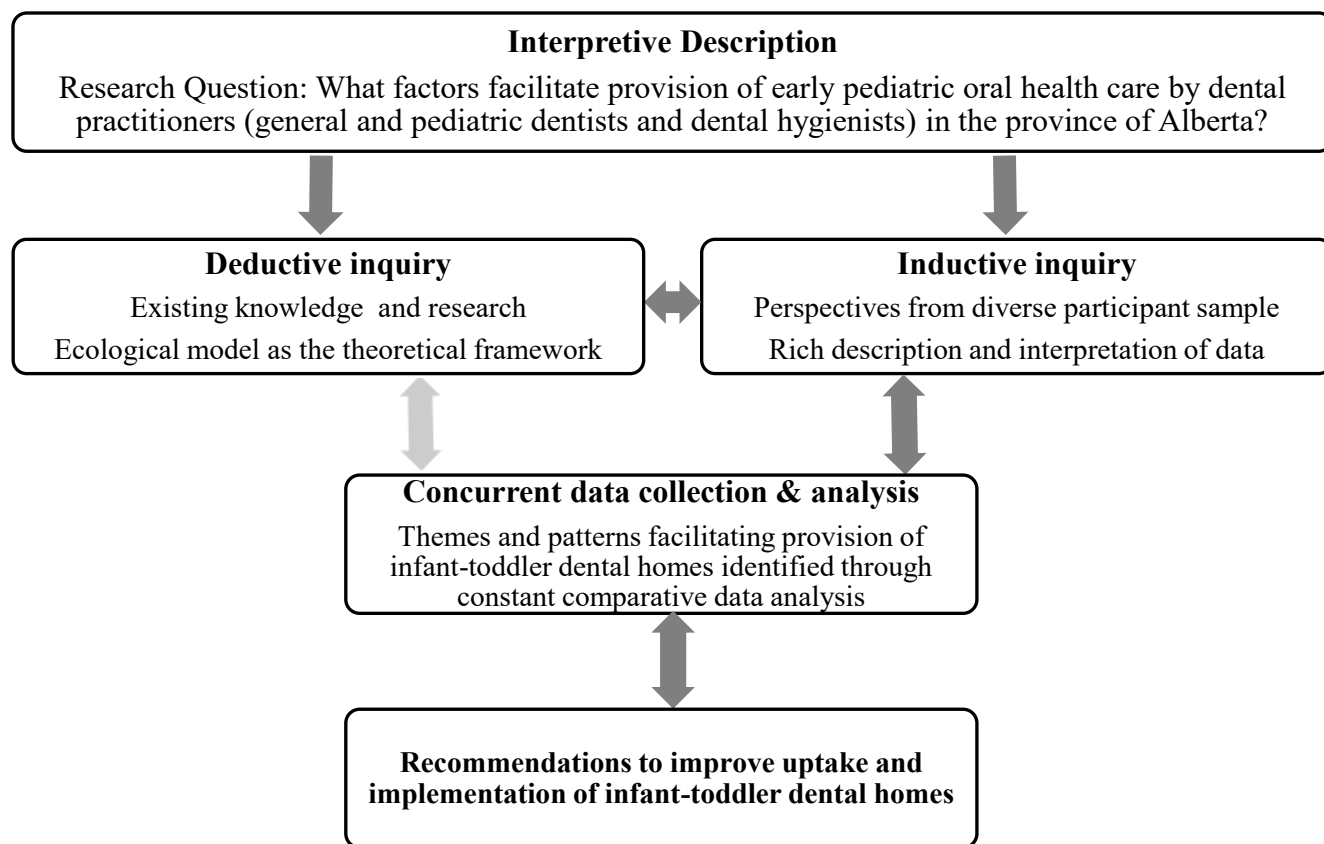


Figure 2. Diagrammatic overview of interpretive descriptive study methodology blending inductive and deductive inquiry

The subsequent sections of this chapter provide a more in-depth discussion of the ecological theoretical framework and interpretive description methodology. A description of the constant comparative method used for data analysis is provided. Criteria used to establish validity and trustworthiness including credibility, transferability, dependability, and confirmability are considered. Ethical considerations are then addressed.

Establishing a Theoretical Framework

A theoretical framework provides a lens which empirically grounds and focuses the research. It shows how the research fits with what is known in the field.⁸ The theoretical framework that guided this qualitative inquiry is the ecological model. The ecological model, proposed by McLeroy et al., describes five predominant influences on behavior: intrapersonal, interpersonal, organizational, community, and policy.⁷⁵ A core principle of the framework is that it accounts for the reciprocal interactions of behavior and environment, and in doing so, points to multiple impacts on specific behaviors.⁷⁵ As stated:

The ecological model adds further detail by systematically categorizing these factors [i.e. factors influencing behavior] into five levels of influence: 1) the individual [intrapersonal] level, including beliefs, values, education level, skills and other individual factors; 2) the interpersonal level, including interpersonal relationships between individuals; 3) the organizational level, which covers the way relevant institutions are organized and managed; 4) the community level, including the communities that individuals operate in (e.g. professional networks, associations, neighborhoods), community attitudes and the relationship among different institutions within communities; and 5) the policy level, which refers to policies and regulations.^{81, p 284}

Implicit to the model is recognition that determinants of behavior are influenced by the interplay of intrapersonal, interpersonal, organizational, community, and policy factors. For example, the factors that affect a dental practitioner's ability to provide infant and toddler oral health care may be influenced by several interconnected factors related to the institution of dentistry and dental hygiene, and the historical organization and policy of health care.

Therefore, the ecological model provided a lens that offered a wide analytical spectrum to help understand the relationships among factors that facilitate successful adoption of infant and toddler oral health guidelines by dental practitioners. Accordingly, the ecological model was used as an a priori theoretical framework to guide development of the research questions and study interview guide. Also, as depicted in Figure 2, the study used blended inductive-deductive inquiry in which concepts and themes emerged from raw data and through the repeated examination, analysis, and comparison of new data with existing data and theory. In this context, the ecological model also helped to guide preliminary phases of data analysis based on intrapersonal, interpersonal, organizational, community, and policy factors identified by participants. Succinctly, the theoretical framework guided the formation and evolution of the study.

Interpretive Description Methodology

Interpretive description is a qualitative methodology, introduced by Thorne, Rimer Kirkham and MacDonald, that employs an inductive-deductive approach to understand characteristics, structures, and patterns of clinical phenomena to inform and influence clinical practice.⁸²⁻⁸⁴ Interpretive description was developed in recognition of the need for a rigorous qualitative methodology to understand meaning and to provide explanation of underlying clinical problems that have implications for health care practice.^{84,85}

As a research method that originates from the clinical field, interpretive description recognizes that health providers must “respect the dialectic between theory and practice.”^{84, p171} Thorne explains that interpretive description overtly seeks to address clinical problems through inquiry that describes and interprets patterns of experience related to the phenomenon.^{82,83} In acknowledging the dialectic between theory and practice, interpretive description emphasizes that a primary objective of the research inquiry is developing an in-depth understanding of a clinical phenomenon:

The foundation of interpretive description is the smaller scale qualitative investigation of a clinical phenomenon of interest to the discipline for the purpose of capturing themes and patterns within subjective perceptions and generating an interpretive description capable of informing clinical understanding.^{85, p 5}

Succinctly, the aim of interpretive description is the understanding and interpretation of common concepts and themes embedded within the lived experiences and perceptions of participants to help inform “constructed truths”⁸⁵ of a clinical phenomenon to provide immediate solutions to clinical problems.^{85,86} Therefore, experiential knowledge of individuals with close familiarity with the phenomenon is recognized as a fundamental source of clinical insight.⁷⁵

Because there is an emphasis on description and interpretation of a clinical phenomenon, Thorne et al. theorize that the inquiry “ought to be located within the existing knowledge so that findings can be constructed on the basis of thoughtful linkages.”^{84, p 173} This premise is congruent with the ecological model as a theoretical perspective and supports methodological coherence between the theoretical framework and an interpretive descriptive methodology. In essence, “existing knowledge represents an appropriate platform”^{84, p173} on which an understanding of factors that contribute to successful provision of infant and toddler dental homes can be built.

Accordingly, the theoretical framework and methodology together help to orient the inquiry and provide a rationale for anticipated boundaries that drive decisions in the interpretation of the data.⁸²⁻⁸⁵

In interpretive description, the research questions, sample selection and data collection are influenced by existing research, disciplinary knowledge, and current practice.⁸³⁻⁸⁵ Within the context of the this study, this forestructure led to inclusion of previously documented barriers (i.e. knowledge, attitudes, resources, practice environments) within the study's research questions, "What are the intrapersonal factors (such as, but not limited to knowledge and attitudes) that assist practitioners in the provision of an infant and toddler dental home? What are the interpersonal factors (such as, but not limited to provider relationships with patients, parents and caregivers, other dental and medical professionals and ancillary staff) that assist practitioners in the provision of an infant and toddler dental home? What are the external organizational, community and policy factors (such as, but not limited to enabling resources and practice environments) that contribute to the successful provision of a dental home for infants and toddlers?" Congruent with the tenets of interpretive description, inclusion of previous knowledge, such as identified barriers, provides grounding and forestructure for the research questions. As such, the beginning point for the inquiry is constructed based on linkages with existing research in the field with the aim of using inductive and deductive reasoning to interpret new data to understand factors that influence the success of dental practitioners who provide infant-toddler dental homes and to ultimately improve uptake in the broader dental community.

Sampling Strategy

In interpretive description, sampling choices are made to support the researcher in developing a deep, contextual understanding of the phenomenon.^{82,83} "Purposive" or

“phenomenal” sampling is a technique in which individuals (i.e. research participants) “are recruited by virtue of some angle of experience that they might help us [researchers] better understand”^{82, p 90} Purposive sampling employs information-rich cases with the purpose of providing in-depth data to illuminate the research and provide programmatic variation.⁸⁷ To inform the research questions formulated within this study, the researcher interviewed pediatric dentists, general dentists, and dental hygienists who currently provide infant and toddler oral health care within the province of Alberta. Inclusion of these professions in the sampling frame recognized that preventive care and diagnostic care are within the scope of practice of dentists and dental hygienists registered in Alberta.

This study also used maximum variation sampling within the defined population of dental practitioners. For example, sampling included male and female practitioners, with varied levels of clinical practice experience, and who worked in different practice settings (group and solo, pediatric, general dental and independent dental hygiene practices). Sampling spanned diverse jurisdictions within the province and included urban and rural practices. To facilitate a description of the sample, the first section of the interview guide, as found in Appendix A, was designed to obtain demographic information of participating clinicians including:

- Professional designation
- Gender
- Practitioner education
- Practice setting
- Practice location
- Year of graduation
- Professional development in pediatrics

Inclusion of this data was considered in looking for trends related to demographic commonalities or differences within the sample and also provided documentation of sample variation.

Participant recruitment. To obtain maximum sample variation, multi-pronged approaches to participant recruitment are often advantageous.^{82,83} All dental hygienists in Alberta were initially informed of the study through an electronic mail out distributed through the College of Registered Dental Hygienists of Alberta (CRDHA). Copies of the study information sheet and the electronic recruitment poster, which accompanied the recruitment notification, are provided in Appendices B and C, respectively. CRDHA distributed the initial electronic mail out on August 26, 2016, with a subsequent electronic reminder one month later. A parallel process was included in the study design to recruit dentists through their provincial regulatory body; however, this organization declined participation. As a result, the notification delivered through the CRDHA invited dental hygienists and their dentist colleagues to participate. Dentists were also informed of the study through a professional association electronic listserv that was disseminated through the Chair of Pediatric Dentistry at the University of Alberta in August 2016.

Through these notifications, participants self-identified their eligibility and interest in participating by contacting the principal graduate researcher either by e-mail or telephone. Subsequently, participants were screened during a brief telephone conversation to determine if participants met selection criteria and to explain the nature and purpose of the study.

Recommendation-based and snowball sampling procedures were also employed to identify key informants. Snowball sampling is an approach to help locate key informants to obtain “information-rich” cases.⁸⁷ In this process, well situated individuals, such as the chair of pediatric dentistry at the University of Alberta and the principal graduate researcher, who has herself worked in pediatric oral health, identified well-situated clinicians who routinely provide infant and toddler oral health care. These key informants were also asked if they could

recommend other practitioners to approach as interview participants, as consistent with snowball sampling procedures.

Sample size. A fundamental tenet of interpretive description is that the robustness of the collected data will lead to a rich description and contextual interpretation of a clinical phenomenon.⁸²⁻⁸⁵ In seeking to gain a deeper understanding of how dental practitioners have been successful in establishing infant-toddler dental homes and to obtain maximum phenomenon variation, the researcher anticipated requiring a sample of 10-15 participants. This estimation considered sampling across identified demographic variables of professional designation, gender, jurisdiction, practice setting, and practitioner experience to provide relevant variation and reflect the complexity of practitioners' experience. As consistent with the tenets of inductive analysis, the sample size and frame were adjusted as the study progressed and themes emerged. The final sample, as described in the results, consisted of 13 participants.

Data Collection and Data Analysis

Interpretive description is driven by inductive-deductive empirical inquiry to generate knowledge and understanding of a clinical phenomenon. Data collection and analysis are interconnected and concurrent.⁸²⁻⁸⁴ When initially entering the field, the researcher in an interpretive descriptive inquiry must initially "look broadly at the phenomenon, scanning a wide circle of possibly relevant information"^{82, p 123} with the preliminary purpose of understanding what constitutes data relative to the clinical problem. This understanding is illuminated through iterative data collection and data analysis where the researcher seeks to elicit depth and clarification within the data by asking "What is happening here?" and "What does this mean?"^{84,85} Through this process of intellectual inquiry and continuous immersion in the data,

both data collection and analysis are refined to build knowledge to address research questions posed in the study and to inform the identified clinical problem.

Data collection using interviews. Fetterman described interviewing as the most important data collection technique, which allows the researcher to enter into the other person's perspective.⁸⁸ As a form of data collection, Patton justifies the qualitative interview as a stand-alone procedure:

The fact of the matter is that we cannot observe everything. We cannot observe feelings, thoughts, and intentions. We cannot observe situations that preclude the presence of an observer. We cannot observe how people have organized the world and the meanings they attach to what goes on in the world. We have to ask people about those things.^{89, p 341}

In the context of this study, understanding factors that help dental practitioners provide infant and toddler oral health care can be best appreciated by adopting an emic view, in which Thorne describes the researcher as a curious learner.^{82,83} Together the dental practitioner as interviewee and the researcher as interviewer built an understanding of factors facilitating provision of dental homes through a guided discussion to discover subjective knowledge for clinical application. Kvale illustrates the interview literally as an "*inter view*, an inter change of views between two persons conversing about a theme of mutual interest."^{90, p 2} In this context, the interviewer and interviewee use a shared transactional and interactional experience to explore, articulate, and document existing practice and knowledge, as well as engage in interactions which build on what exists, and in essence, co-create new understandings and insights. It also aligns with the philosophical assumption of interpretive description that uncovering knowledge that is subjective and experiential is fundamental to clinical insight.^{82,83} This forestructure influenced the type of qualitative interview and the formation of the interview guide.

Olson posits that there are two basic types of qualitative interviews, namely formal and informal.⁹¹ Formal interviews “take place at a time jointly set aside for the interview and are generally recorded so that they can be transcribed to facilitate analysis,”^{91, p 35} whereas informal interviews occur as part of normal everyday conversation. One type of formal interview is the guided, semi-structured interview.⁹¹ A guided, semi-structured interview is one that has a set of pre-determined questions that are typically presented sequentially, but the interviewee has freedom to move to related issues and the interviewer can probe these issues to provide depth to the discussion.^{82,83,91,92} As stated by Bogdan and Biklen “qualitative (semi-structured) interviews offer the interviewer considerable latitude to pursue a range of topics and offer the subject a chance to shape the content of the interview.”^{93, p 95} This fluidity lends itself to hearing the “*inter view*”, and experiential account of the interviewee. In interviewing dental practitioners, a semi-structured interview was desirable as a mechanism for purposeful conversation to inform the research questions.

In creating the interview guide, as a tool to build a purposeful conversation between the interviewee and interviewer, it behooves the interviewer to create the questions to explore the context of the phenomenon in its holism.⁸⁹ It is recognized that in using semi-structured interviews it is common, and often desirable, for the interviewer to not strictly adhere to a rigid interview guide. Rather, the guide serves as a malleable template to provide rich information around the research question, and should not be considered a prescriptive and ordered set of questions. The interviewer is encouraged to follow the experiential narrative provided by the interviewee, while steering the discussion to ensure that the research questions are addressed through the discourse.⁹¹

The interview guide for this study, which is provided in Appendix A, was constructed to hear the stories and voices of practitioners through open-ended questions. As stated by Bogdan and Biklen, through using open-ended questions the interviewee is acknowledged as an expert in knowing and is encouraged to provide authentic responses.⁹³ Thorne also describes that breadth is more useful than precision in the initial phases of inquiry for interpretive descriptive studies so that the research does not omit factors important to the context of the phenomenon.^{82,83} The interview guide for the this study began with broad introductory questions: “Please walk me through what a preventive first year dental exam looks like in your practice.” “Please tell me what drew you into providing infant and toddler oral health care.” Probing questions were used to obtain more specific, in-depth information and to clarify an ambiguous or vague response. In effect, the preliminary stage of the interview was structured to establish comfort, encourage openness, and elicit a broad scope of responses.

The preliminary questions were followed by a series of more focused and specific queries related to individual factors that may influence practitioners’ care of infants and toddlers. These subsequent questions were constructed based on the three foundational factors, listed and detailed as follows:

- 1) **The theoretical framework adopted for the research:** In the creation of the interview guide, the researcher was conscious of ensuring methodological coherence between the interview design and the research questions. The adoption of the ecological model as a theoretical framework was one mechanism to strengthen methodological congruence. As a theoretical framework, the ecological model accounts for reciprocal interactions of behavior and the environment, and in doing so, points to multiple impacts on specific behaviors.⁷⁵ This is noteworthy because the interview

guide was constructed to examine predominant influences (individual, interpersonal, organizational, etc.) that may have impacted the dental practitioner's ability to routinely provide infant oral health care.

2) **Barriers identified in previous literature:** Existing literature has identified barriers that practitioners report limit their ability to provide infant and toddler dental care, such as lack of education related to early pediatric oral health.^{61-63,72,74} Thorne indicates that data collection and analysis in an interpretive descriptive study should be constructed on the basis of preexisting knowledge and research.^{82,83} It was anticipated that dental practitioners providing infant and toddler oral health care may have found strategies to overcome previously identified barriers. Accordingly, the interview guide included questions that were directed at understanding these facets.

3) **Language and context that would be appropriate for dental practitioners:**

Question clarity is critical for obtaining relevant data through interviews, and Bryman et al. caution researchers against using technical jargon and advocate for pre-testing or peer review of an interview guide for purpose of clarity, as well as relevance and representativeness of the interview questions.⁹⁴ The study information sheet and interview guide were constructed with language that would be common to the dental profession. The graduate researcher's supervisors completed the content and technical review of the interview guide. Additionally, the study information sheet and interview guide underwent pilot testing, and were modified based on feedback from these endeavors.

The following questions from the interview guide illustrate how the guide was constructed in accordance with these aforementioned principles (see Appendix A for the complete interview guide):

- Please walk me through what a preventive dental exam looks like in your practice.
- Please tell me what drew you into providing infant and toddler oral health care.
- What factors enable you to successfully provide routine care to infants and toddlers?
- Do you have any further recommendations that you feel would facilitate broader provision of infant and toddler oral health care in Alberta?

The interview guide also included specific questions which explored particular aspects related to provision of care that were identified as constraints or barriers in previous literature. Inclusion of these focused questions was important to understand how practitioners who provide infant-toddler dental homes may have overcome previously identified barriers. While the complete interview guide is appended, the following are examples that illustrate how these issues were probed:

- In your opinion what special attributes (skills, knowledge) are required for practitioners to provide infant and toddler oral health care? How did you acquire this knowledge/these skills?
- How do you inform parents and caregivers about the importance of infant and toddler oral health care?

Following the body of the interview, ending or concluding questions can provide an opportunity for the interviewee to add any information that he/she feels is pertinent or relevant to the research and can also help to “reground” the participant.⁹¹ The concluding question was

open-ended with the intent of encouraging participants to share experiences and was an invitation to further contribute to the richness and depth of data acquired, “Is there anything that I have missed asking you that you feel would be germane to the study or that you would like to share with me?” This concluding question also provided the interviewee with an opportunity to reflect on the interview process in its entirety. The guide concluded with an acknowledgement of the interviewee’s contribution to the study.

All interviews were conducted in person at a location and time that was convenient for the interviewee and interviewer. In person interviews were used because literature indicates that the depth of the discourse is enhanced through face-to-face interviewing and is also favorable for establishing rapport.⁹¹ Interviews were either conducted in the participant’s dental office or in a meeting room at the University of Alberta, based on the participant’s choice. Interviews were recorded with a digital audio recorder and were transcribed verbatim to facilitate data analysis.

Memo-writing. Memo-writing and reflexive notes provided a written record of what the researcher was learning during data collection and analysis.^{82,83} Thorne indicates that field notes and journals can help maintain reflexivity by situating oneself within the researcher role.^{82,83} Memo-writing and field notes, according to Mayan, “describe the researcher’s reflections, feelings, ideas, moments of confusion, hunches, and interpretations”^{86, p77} about what the researcher observes and how the researcher begins to find meaning in the data. In essence, reflexive journals and memos provide a written account of the researcher’s inner dialogue. The reflexive journal is an important mechanism to help ensure data integrity because it documents the researcher’s subjective experience through inductive analysis, and therefore allows a distinction between the researcher and the topic of research.^{82,83}

In the context of this study, reflexive journaling was used to record the researcher's reflections following each interview; document observations and understandings to support data acquisition and analysis; and to understand what the researcher had learned and what still needed to be explored to provide an interpretive description of factors influencing provision of infant-toddler dental homes. Reflexive journaling was used to refine future interviews, and document areas requiring further exploration. From a retrospective perspective, documentation and memo-writing was employed as a mechanism to create ongoing analytical notes. Memos helped to provide a continuous reference as data was collected and analyzed. As highlighted by Thorne, continual immersion in the data and notes that record the researcher's reflections produce questions, inspirations, and evolving interpretations to not only elucidate the researcher's role in data collection and construction, but also to strengthen the interpretation and description of the clinical phenomenon being studied.^{82,83}

Data analysis: A constant comparative approach. The objective of interpretive description is "a thematic summary or conceptual description"^{82, p 164} which generates knowledge that can be applied to a clinical context.^{82,83} To maintain methodological coherence to this intended purpose, Thorne indicates that the mechanics of data construction and analysis in interpretive description go beyond strictly coding and classifying, and include processes of comprehending, synthesizing, and theorizing to maintain the contextual nature of the data.^{84,85} Through concurrent data collection and data analysis, as previously depicted in Figure 2, as well as through repeated immersion in the data, thematic patterns and relationships within the data were developed and extracted to generate a new understanding.

Once well acquainted with the data, a process of coding was used to start interpreting the data for the purpose of developing patterns held in the data. Coding is the process of giving

labels, or ‘meaning units’ to identified patterns, phrases and concepts.^{82,83,86,94,95} While Thorne recognizes coding as a mechanism through which relational patterns are identified, she also cautions the researcher in interpretive description against using line-by-line or word-by-word coding that typifies other qualitative research methods.⁸²⁻⁸⁵ She rationalizes that inductive interpretation can be lost through use of complex coding systems such as fixed-form open, axial and selective coding.^{82,83} Rather Thorne suggests that “creative coding” can help the researcher develop patterns within the data to comprehend the overall picture of “what is happening” and “what the researcher is learning” from the data. The process of coding helps the researcher develop patterns and later to interpret relationships between the identified patterns.^{82,83} In this study, through iterative data collection and data analysis, the researcher sought to detail relationships and patterns within the data to illuminate commonalities and highlight variations for the purpose of addressing the research questions.

The constant comparison method that was used in analyzing the data is characterized by an inductively-deductively driven inquiry in which tentative concepts from preliminary analysis are tested against each subsequent iteration of data.⁹⁶ In this study, meaning units which captured salient aspects of the data were considered against new data for similarities and differences. This process was iterative, in that new meaning units were compared against previously coded meaning units, as well as existing research. By comparing new data with existing data, patterns and themes emerged that were then tested and further verified against new data. Thorne asserts that constant comparative analysis is best aligned with research whose purpose is to “uncover commonalities and patterns across cases with human experience.”^{82, p 151} Thorne suggests that grouping signifiers and referencing language used to orient similar data can also help the researcher compare similar or dissimilar elements held within in the data. In this context, memo-

writing and reflexive journaling serve to offer reminders about what is meant by the terminology used in coding and analysis, and additionally provide a trail of conceptual and theoretical reflections throughout data analysis.⁸⁶ A constant comparative method, remaining true to the tenets and philosophical underpinnings of interpretive description, enabled the researcher to identify, document, and detail factors influencing provision of infant-toddler dental homes.

To maintain methodological coherence, this research used these approaches described by Thorne to identify thematic patterns and relationships that characterize infant-toddler dental homes. Accordingly, the research questions recognized the concurrent existence of established knowledge and a gap in current knowledge resulting in dissonance between relevant policy and practice. Data analysis was shaped by the duality of existing research and the data collected from this study, and was therefore both inductively and deductively shaped.

Initial phases of the data collection and analysis focused on breadth and defining factors that elucidated the scope of infant-toddler dental homes as a clinical phenomenon. Through iterative data collection and analysis, relevant data from each interview was compared with existing interviews, journal notes authored by the researcher, and existing relevant literature. In early stages of analysis, data was also compared against the ecological model (i.e. intrapersonal, interpersonal, community, organizational, and policy factors) to help explain practitioners' provision of infant-toddler dental homes. As the research progressed, data collection and analysis became more focused to explain thematic commonalities, distinct variations, and interconnected relationships that provided understanding and offered context to factors that facilitate practitioners' provision of infant-toddler dental homes. In this process, subcategories and themes were developed to answer the research questions.

Establishing Trustworthiness

Research universally seeks to expand the body of current knowledge. Thorne acknowledges that in an interpretive descriptive study the research will lead to a “probable truth” because the findings uncovered through the study cannot be conclusively extrapolated to all practitioners. According to Lincoln and Guba, the validity or trustworthiness of a study concerns the defensibility of interpretations made by the researcher based on the collected data, and concisely describes the quality of the investigation and the evidence articulated in the findings.⁹² Conditions of trustworthiness encompass truth value, applicability, consistency and neutrality.⁹² Though language used by researchers varies, the desire to establish validity or trustworthiness is common, and criteria for evaluating the “truthfulness” of qualitative research includes credibility (internal validity), transferability (external validity), dependability (reliability) and confirmability (objectivity).^{89,92,94}

Credibility. Credibility refers to the truth of the findings and also considers if the findings are an accurate representation of the views offered by the research participants.⁹⁴ Thorne suggests that for an interpretive descriptive study the researcher apply epistemological integrity, representative credibility, analytic logic and interpretive authority as criteria to evaluate study validity.^{82,83} Epistemological integrity is a defensible line of reasoning, which is partially assessed by demonstrating methodological coherence so that the research process is consistent and congruent with the posed research questions, theoretical framework, interpretation of data, and analytical strategies.^{82, p 224} The framework laid out within this research has been structured to achieve epistemological integrity by documenting all processes to elucidate methodological coherence. Methodological coherence was reviewed through peer audit by the primary and co-

supervisor for this research project. The study design was also approved as part of ethics protocol through the University of Alberta.

Representative credibility, analytic logic and interpretive authority refer to criteria to assess the accuracy of the researcher's representation and interpretation of the participants' perspectives. In other words, the findings depicted by the researcher must show "representative credibility" of the clinical phenomenon.^{82,83} Representative credibility was achieved by seeking a purposive, maximum variation sample so that a range of practitioner experiences were represented in developing an understanding of factors facilitating practitioner provision of infant-toddler dental homes. For example, participants were selected from diverse demographic backgrounds and geographic locations throughout Alberta. Furthermore, accuracy and completeness of the data were maximized through prolonged engagement, verbatim transcription, and member checking areas of ambiguity.

Capturing the subjective experiences of practitioners is fundamental to demonstrating analytic logic and interpretive authority. Repeated immersion in the data is stressed in this process so abstractions and claims developed by the researcher elucidate an understanding of the clinical phenomenon that is grounded in the data and reflective of the participants' perspectives.^{82,83} Analytic logic refers to the process of showing integrity from the beginning to the end of the research process.^{82,83} This study used an audit trail to document the researcher's decision-making and reasoning throughout the study.

Through integration of findings with existing literature, as well as through a peer audit and member-checking, interpretive authority was addressed to provide assurance that the interpretations made by the researcher were trustworthy. Member-checking is a procedure in which the researcher returns to the study participants to ask if the participants agree with the

interpretation of their thoughts and perceptions as represented by the researcher.^{82,83,89,94} A two phase respondent validation was employed in this study to enhance credibility. Firstly, in areas where the transcript lacked clarity for purposes of initial coding, the researcher returned to participants to seek clarity and validate the initial interpretations made within coding. In this first phase of member-checking, the researcher returned to six of the 13 participants to seek clarification regarding specific aspects of the participant's transcript. Member feedback was also sought when the preliminary interpretation and description of the study results were prepared. In this second phase of validation, the researcher sought feedback from participants regarding specific interpretations of the data in areas where emerging subcategories overlapped, and or peer review suggested the researcher's interpretation required clarification. As the objective of the study was to understand factors that enable the provision of early pediatric care, it was imperative that the researcher accurately captured participants' perspectives, which this second phase of member-checking helped achieve.

Verifying the researcher's interpretations through member-checking was also critical for improving credibility. As suggested by qualitative theorists, while the researcher acts as a tool through which the perceptions of the participants are told and interpreted, ultimately it can only be the participants who are legitimately able to assess the credibility of the results.⁸⁹ Though member-checking can enhance credibility, Thorne also indicates that participants frequently cannot fully validate the researcher's analysis because participants may lack familiarity with research processes, theories, and contextual issues.⁸² Therefore, additional mechanisms such as peer debriefing were also incorporated in the study design to help achieve credibility and trustworthiness.

Peer debriefing, as a measure to develop study credibility, involves having an expert colleague who acts as an external auditor to assess the choice of methodological decisions, if descriptions and findings produced are grounded in the data, and if the interpretations and conclusions provided by the researcher are logical.^{80,86,89} To guide this process, the auditor must expertly understand the fabric of both the research methodology and the content.⁸⁰ For this study, the supervisors of the graduate student fulfilled requirements for peer debriefing to further establish rigor and credibility related to interpretive authority.

Transferability. Transferability considers if the study's findings can be applied and generalized to other contexts and populations.^{80,86,92,94} While generalizability by means of external validity is not a dictate of qualitative research, the implications of studying factors that facilitate participants' provision of dental homes within Alberta, may have important implications relevant to other practitioners or jurisdictions. Therefore, it is incumbent on the researcher to provide a thick description so that readers can judge transferability. Additionally, a range of practitioner experiences related to provision of infant-toddler dental homes was obtained through purposive sampling, which may also enhance transferability of findings to other comparable jurisdictions.

Dependability. Dependability parallels reliability as a measure of rigor. It speaks to having research processes that are logical and documented.^{86,92,94} To establish dependability, the researcher must make clear the methodological and analytic procedures and decisions that were adhered to throughout the study.⁸⁶ Reflexive journaling was used by the researcher to provide an audit trail of methodological decisions, such as creation of analytic codes, made during the course of the research study. Peer review by the supervisory committee was also employed.

Confirmability. Confirmability refers to the degree to which the results can be corroborated by others. As stated by Schwandt, “confirmability is concerned with establishing the fact that the data and interpretations of an inquiry were not merely figments of the inquirer’s imagination.”^{97, p259} Like dependability, confirmability is established through a reflexive journal and audit trail. These mechanisms can be used to verify that the analytic description and interpretation in the study’s results are grounded in the original data. This study used verbatim transcripts as confirmation of original source data.^{82,83} Memo-writing and an audit trail provide documentation of the researcher’s decisions, and peer review of these processes also establishes confirmability.

It is additionally incumbent on the researcher to provide an account of his or her orientation to the field of study, to show reflexivity by stating allegiances to the discipline.⁸⁶ The researcher’s orientation has been detailed previously in the thesis, and it is acknowledged that this research was conducted as part of my graduate work. My interest in infant-toddler oral health care has been influenced by my career as a dental hygienist, where I have witnessed a gap in access to care. I believe that a hallmark of sound research is adding to the body of knowledge about an issue of concern to help improve practice, and I have undertaken this research with this intent.

Ethical Considerations

The study was reviewed and received ethics approval from the Research Ethics Board through the University of Alberta (#Pro00061569). Ethical considerations guiding the research included data storage, confidentiality and anonymity, informed consent and protection from harm. Additionally, research within the province of Alberta must follow guidelines set out in the Freedom of Information and Privacy Act (FOIP).

Data storage, retention and disposal. All research data is stored in a locked storage in Room 5-555 in the Edmonton Clinic Health Academy at the University of Alberta. This includes printed interview transcripts, forms containing participant identifiers, reflexive notes and journals, and any other data sources used during the study. An encrypted laptop and USB were used to store electronic data sources. In accordance with University of Alberta policy, data will remain in locked storage for the mandatory five-year period. After this time, data will be disposed of by the Principal Investigator, who is the researcher's primary supervisor, in accordance with University of Alberta policy on the shredding of confidential materials. Electronic data will be disposed of in accordance with the Equipment Asset Disposal/Retirement procedure.

Confidentiality and anonymity. To maintain confidentiality, all personal identifying information was removed from transcripts and reports. Only the principal researchers had access to audiotapes, computerized data, written transcripts and any other identifiable data sources in association with the study. All transcription was done by the principal graduate researcher.

The number of dental practitioners providing infant-toddler oral health care within the province is limited, and furthermore many practitioners within the pediatric oral health community would be well-acquainted with their colleagues. In protecting participant anonymity, rather than using pseudonyms which typify qualitative reporting, the description of the participant sample provides only aggregate data. Similarly, neither participant pseudonyms nor participant numbers accompany quotations presented in the results and discussion of this thesis. While these procedures are frequently used as a mechanism to demonstrate analytic logic and representative credibility, the closeness of the community in which this research has been conducted might compromise participant anonymity if these conventional procedures were used.

Therefore, all identifiers were removed from the manuscript, in favor of presenting collective data.

Informed consent. In a qualitative investigation, Thorne suggests that providing a comprehensive description of the research to participants a priori can be challenging because the research is emergent, and therefore one cannot fully predetermine the outcomes of the research encounter.^{82,83} However, it is still incumbent on the researcher to inform participants about the purpose and scope of study, how the data will be used, and how anonymity will be protected.^{80,82}

In this study, informed consent was obtained according to the stated guidelines provided by the University of Alberta Research Ethics Board. Each participant received an explanation of the study, including an information sheet explaining the purpose of the study and involvement of the research participants (see Appendix B). Participants were informed of their right to refuse to respond to any question and of their right to withdraw from the study at any time. They were also informed that the interviews would be audio recorded, and that member-checking could be used to clarify ambiguities.

For the participant interviews, a consent form was attached to the study information sheet (see Appendix B). Participants were asked to sign the consent form after they read the information sheet, the study had been explained verbally by the researcher and all questions that the participant had about the research had been addressed. The consent form was explained by the interviewer, whose responsibility it was to ensure that participants understood the implications of participating. Participants were then asked to give informed consent by signing two copies of the consent form. The first copy was for the participant's records, and the second copy has been retained by the investigators in accordance with the data storage plan.

Protection from harm. Researchers have an ethical and moral obligation to safeguard participants, so they will not be harmed in any way by their participation in the study. There were no known risks associated with participating in this study, and ethical considerations have been established to protect participants from harm.

CHAPTER 4

THE FINDINGS

Study findings are based on the expertise of 13 dental professionals in Alberta, who provide infant-toddler oral health care. Their expertise was used to develop a description and interpretation of factors that facilitate provision of infant-toddler dental homes, along with recommendations to enhance uptake. This chapter begins with an aggregate profile of the study participants. Following introduction of the study participants, four interconnected themes are presented including: 1) Practitioner; 2) Practice; 3) Profession; and 4) Population. The first theme, “Practitioner” describes intrapersonal factors that enhance practitioners’ provision of infant-toddler oral health care. The second theme, “Practice” includes facilitating factors within the dental practice environment. The third theme, “Profession” describes the business of dentistry, professional obligations, professional guidelines, and how policymakers and legislators influence infant-toddler oral health care. The fourth and final theme “Population” represents societal factors which influence provision of infant-toddler oral health care.

In demonstrating analytic logic and establishing study rigor, direct participant quotations are included in study findings. To orient the reader, shorter quotations or word phrases have been placed in quotations within the findings chapter, while longer verbatim quotations appear as indented, single-spaced text.

Study Participants

Participants were eligible for the study if they held active registration as a dentist or dental hygienist in Alberta and provided care for children less than 18 months of age. Participants were selected using purposive, maximum variation sampling, and the resulting 13 participants

included two male practitioners and 11 female practitioners. The aggregate demographics of study participants are summarized in Table 4.

Table 4. Demographic profile of study participants

Demographic Characteristic	Category	Number of Participants	
Professional designation	Pediatric Dentist	6	
	General Dentist	2	
	Dental Hygienist	5	
Practice type	<i>Specialization</i>	Pediatric dental practice	8
		General dental practice	4
		Independent dental hygiene practice	1
	<i>Group or solo practice</i>	Group practice	11
		Solo practice	2
Practice Location	Urban	11	
	Rural	2	
Location of educational institute	<i>Entry-to-practice</i>	Canada	12
		United States	0
		International	1
	<i>Terminal degree (beyond entry-to practice)</i>	Canada	4
		United States	3
		International	1
Date of graduation from last dental or dental hygiene program	< 5 years	4	
	5-10 years	5	
	10-25 years	2	
	>25 years	2	

The final sample consisted of six pediatric dentists, two general dentists, and five dental hygienists. Six of the dentists were either principal owners or associate owners of the practice, and two were hired as employees. Within the dental hygiene participants, one dental hygienist owned an independent dental hygiene practice; two were employed in pediatric practices, and two worked in a general dental office. Three of the 13 practitioners had also gained work experience external to private clinical practice, either in academia or in community health.

Eleven participants worked in group practices and two in solo practices; and 11 participants were situated in urban practices and two in rural. The two rural-based practitioners included a general dentist and a dental hygienist. With respect to practice location, currently all pediatric specialists in Alberta are located in urban centers, and consequently participants from pediatric specialty practices were exclusively from urban locations. However, all eight participants in pediatric specialties (6 dentists, 2 dental hygienists) saw patients from rural areas, and many estimated a 50:50 ratio of urban to rural patients. Therefore, these participants' accounts reflected both patients coming from both urban and rural locations.

Twelve participants had pursued their entry-level dental or dental hygiene training in Canada, and one had trained internationally. Eight practitioners had undertaken formal education beyond entry-to-practice requirements: Two dental hygienists had completed bachelor degrees in dental hygiene in Canada. Six dentists had completed pediatric degrees; two in Canada, three in the United States, and one internationally. With respect to date of graduation from participant's last dental or dental hygiene program, two participants had graduated over 25 years ago, two had finished 10-25 years ago, five had completed within the last 5-10 years and four finished less than 5 years ago.

The 4 P's of Influence in Facilitating Provision of Infant-Toddler Dental Homes

The purpose of this study was to understand factors that facilitate or influence dental practitioners' provision of infant-toddler dental homes, and to develop recommendations to improve uptake based on the perspectives of dentists and dental hygienists who currently provide oral health care to the infant-toddler cohort. In developing a description and interpretation from the data, the ecological model was used as a theoretical framework for preliminary data analysis to identify intrapersonal, interpersonal, community, organizational, and policy factors. Through a constant comparative approach, new themes and subcategories that describe factors which facilitate and influence dental practitioners' provision of infant-toddler dental homes emerged, which are presented as study findings.

Ultimately, four core themes were developed from the data: 1) Practitioner; 2) Practice; 3) Profession; and 4) Population. These themes are not discrete entities, but are interrelated as denoted by the continuing arrows flowing and interconnecting these themes as shown in Figure 3. Together these four themes constitute the 4 P's that facilitate and influence in the provision of infant-toddler dental homes.

Figure 3. The 4 P's of influence in the provision of infant-toddler dental homes

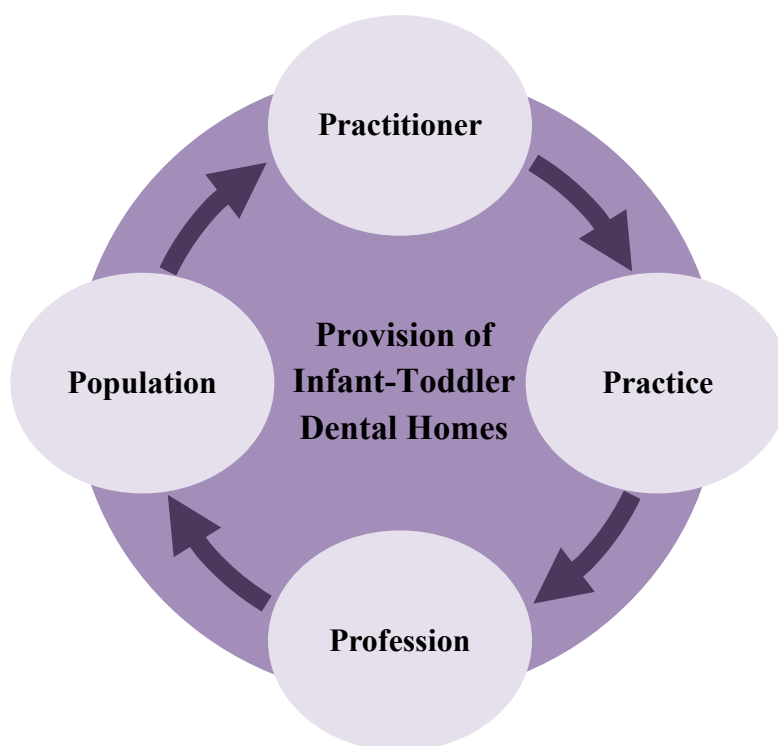


Figure 3. Diagrammatic overview of factors influencing dental practitioners' provision of infant-toddler dental homes through 1)Practitioner, 2)Practice, 3)Profession and 4)Population themes.

The Practitioner theme describes intrapersonal facilitating factors. This theme is associated with four identified sub-categories including: personal attributes, education, life and work experience with infants, and the practitioner's motivation for providing infant-toddler dental homes.

The Practice theme examines how dental professionals within a practice setting function as a team to facilitate and promote provision of infant-toddler dental homes. Five main subcategories are associated with "Practice" theme including: establishing contact with patients,

clinical aspects of provision of care, practice setting, the infant-toddler dental team, and the collaboration between dental practitioners and non-dental health care providers.

The Profession theme involves factors which guide the oral health profession. The Profession consists of four main subcategories: the business of dentistry, professional obligations, professional guidelines and regulations, and policy makers and legislators.

The Population theme describes the influence of population-level factors which affect provision of infant-toddler dental homes and details societal strategies which participants identified to advance uptake of early pediatric oral health care in Alberta. This theme includes two main subcategories: societal factors and promoting population awareness of infant-toddler oral health care.

The remainder of this chapter describes these themes in detail and is accompanied by data that reflects the experiences and perceptions of the 13 participants in this study.

Theme 1: Practitioner

Practitioner-based factors describe facilitators related to individual dentists or dental hygienists. The four subcategories within the Practitioner theme are illustrated in Figure 4 and include: personal attributes, education and training, experience, and motivational influences.

Figure 4. Subcategories associated with Theme 1: Practitioner

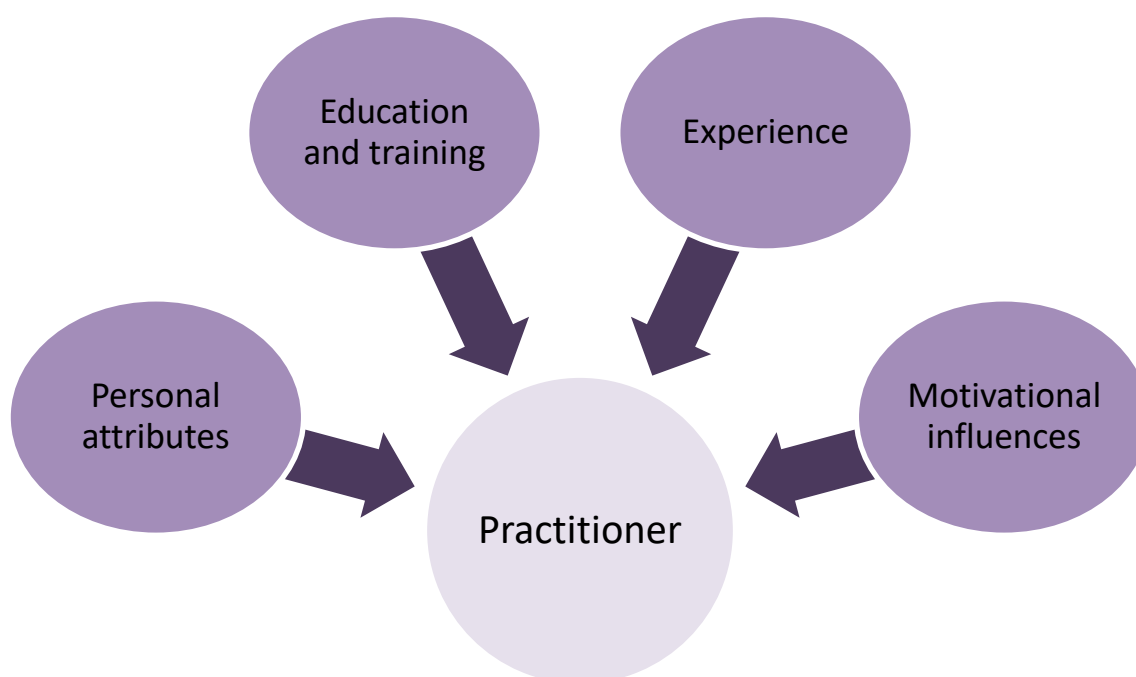


Figure 4. Diagrammatic overview of Practitioner subcategories: 1)Personal attributes, 2)Education and training, 3)Experience, 4)Motivational influences

Within the theme “Practitioner”, participants discussed how personal attributes enhance provision of infant-toddler dental homes either by the practitioner feeling more comfortable with children, and or by helping the practitioner to create a treatment environment in which the child and the child’s family are more comfortable. For some practitioners, these attributes such as

having an instinctive ability with children were described as being innate. Participants also indicated that other intrapersonal characteristics were instilled through mentors and other individuals of significance, such as the practitioner's parents, and that these inculcated values, philosophies and beliefs had influenced their provision of oral health care. Provision of infant-toddler oral health care is also facilitated by education. Practitioner education includes exposure to infant-toddler oral health care during the practitioner's formal training in dental or dental hygiene school, ongoing continuing education opportunities, as well as informal coaching and mentoring by an experienced dental colleague.

Participants emphasized how their comfort, ability, and motivation to provide infant-toddler oral health care is also increased through experiential familiarity with infants and toddlers that is gained through work experience and through informal life involvement with young children. For many participants, being acquainted with infant-toddler oral health care through education or clinical practice enhances comprehension underlying the rationale of the infant-toddler dental home as a mechanism to prevent oral disease throughout the life course and to mitigate systemic health impacts resulting from early childhood dental diseases such as caries.

Personal attributes. For the practitioner, participants described how personal attributes such as "being caring," "patient," "calm," "creative," "flexible," "empathetic," and "generous" facilitate provision of infant-toddler dental homes. They expressed that these attributes are common to many practitioners who treat this cohort. In the words of one pediatric dentist:

[a] natural attribute would be just [being] gentle and empathetic, to be caring, [a] caring person... to be calm... and creative and flexible because a baby will be, you know... it's not the same way that you would check the teeth in a normal way. So, you need to be someone that would be flexible and that's all attributes that usually a pediatric dentist would have.

These attributes appear to typify most members of the pediatric dental team. For example, one participant reflected on attributes of staff within her pediatric dental practice:

They are passionate about kids. They're naturally good with them. They enjoy their time. They're very patient and calm.

Similarly, a dental hygienist in a pediatric practice described her colleagues as “very caring people.”

Beyond identifying specific attributes that facilitate provision of care, participants also explained how these attributes facilitate provision of care. Many participants spoke about the attribute of having patience as facilitating because this trait was helpful in eliciting cooperation from the child and the child's parent. Furthermore, a participating dental hygienist suggested that patience was a derivative of being empathetic, as she situated herself in the place of the child:

...Patience. So much patience...patience and understanding that from their [the infant's] perspective this is terrifying. So really just empathy. Putting yourself in their shoes and knowing that this is weird. And that they probably don't want to look up at a man or a lady in a mask, you know, looking in their mouth and a bright light in their eyes. So, explaining, talking things through... show and tell... and just really understanding that this is scary for them and you have to go slow.

Having a natural affinity for children was also commonly emphasized in the context of how personal attributes helped practitioners to be successful in delivery of patient care. For some participants, this natural affinity was described as “being something that you're born with” or as a fundamental part of their character. For example, an independent dental hygiene practitioner's love for children not only helped her to be successful in providing infant-toddler oral health care, but also influenced her decision to include infant-toddler dental homes within her practice. She

reflected, “I love kids. I love children. I love babies. So, working with them is just fun...” and she also described this ability as something that “seems to come naturally because of who I am.”

Several participants identified gender as a factor which influences connection with infants, and one participant noted that more of her female dental colleagues provide care to young children compared to her male colleagues. Participants described how being of female gender facilitates provision of infant-toddler care because of an instinctive ability in which “women are more drawn to babies and more naturally know what to do” and that females may also have more exposure to infants and toddlers which subsequently creates practitioner comfort. From some participants’ perspectives, within the feminine, there is an associated gentleness which helps to elicit comfort for the child. Conversely, a male pediatric dentist had an awareness about how “little girls are sacred of a man”, and therefore he enhanced patient comfort by “being very friendly” and using comforting language so the child would not feel intimidated by his male gender.

Through participants’ narratives, intrapersonal attributes appear to facilitate provision of care by helping to create a dental home environment that is conducive to infant-toddler oral health care. In addition to helping practitioners be successful in provision of infant-toddler care, intrinsic attributes also influenced some practitioners’ decision to become involved in early pediatric oral health. For example, one participant described having an optimistic outlook in life facilitated her decision to become involved in infant-toddler oral health care. She remarked:

...that’s just the appeal of getting involved into this [infant-toddler oral health care]... being optimistic and idealistic that the world can be better, I guess. That’s driving me trying to fight infant [oral] care problems.

A participating general dentist also explained how her involvement in infant-toddler oral health care “stems from a personal level,” and simultaneously recognized that values inculcated from her family influenced how she practiced dentistry, which she described as “it’s just part of how I was raised.” In the same way, a male pediatric dentist related that his generosity had been instilled through values taught by his parents, and this translated into his provision of infant and toddler oral health care. He indicated his parents “engrained in me the value of generosity,” which he described as enabling because in providing infant-toddler dental homes, he stated “you have to be generous with your time and your clinic.”

From participants’ perspectives, intrinsic qualities, which can be innate or instilled into a practitioner, are significant in facilitating provision of infant-toddler oral health care and in initiating practitioners’ involvement in early pediatric dental homes. The extent of this influence is accentuated in the reflection of one study participant’s final comment:

The bottom line with any dentist or hygienist or assistant that works with children, that do it for a living, whether they be a specialist or not, the bottom line is going to have substantially less to do with how they’ve trained and more to do with who they are as people.

Based on the consistent recognition of participants regarding personal attributes as a facilitating factor, some participants suggested that university admission requirements for dental and dental hygiene programs should recognize the importance of these personal attributes. One study participant suggested that intrinsic attributes such as “being compassionate” and socially conscious may help to predict the proclivity of candidates to accept all patients, including infants, in future practice. Therefore, this participant proposed that educational institutions need to review admissions processes and assign “appropriate weight” to a prospective dental or dental hygiene candidate’s intrapersonal traits and qualities. In this dentist’s words:

It's coming up with a basis in non-academic criteria to identify people who are going to be well-rounded, honest and compassionate dentists or hygienists...

Findings related to the influence of personal attributes and recommendations related to this subcategory are explained and interpreted more fully in the discussion chapter.

Education and training. Personal attributes combine symbiotically with education to facilitate provision of care, and participants consistently identified that specific knowledge and skills, such as knee-to-knee examination techniques, aided in their provision of infant-toddler oral health care. Participants strongly emphasized that education regarding the fundamental principles and skills associated with provision of infant-toddler dental homes helps to equip practitioners with the necessary expertise to be competent and comfortable in delivering care. However, the breadth of education related to infant-toddler oral health care varied between participants. It included formal training within pediatric specialty graduate-level education, undergraduate dental and dental hygiene education, as well as ongoing education through career mentoring from an experienced dental colleague or through continuing professional education.

Participating pediatric dentists often detailed how pediatric dentistry is a branch and specialty in oral health, in which pediatric dentists have undertaken graduate-level education to be licensed as a specialist. Pediatric dentist participants frequently referenced that training in infant-toddler oral health care is comprehensive for pediatric specialists, and was described by one participant as a “big, big part of the training [i.e. in pediatric dental programs].” Another pediatric dentist commented within graduate education in pediatric dentistry, infant-toddler oral health care is “engrained as part of pediatric dental training” because it is an area of specialization.

Participants who were pediatric dentists described how graduate education in pediatric dentistry built their confidence and competence by providing comprehensive didactic education and clinical training in infant-toddler oral health. One pediatric dentist indicated that her pediatric graduate education gave her “the confidence to start seeing patients earlier on” by giving her “the knowledge to step in and to intervene earlier on... and be comfortable doing exams, taking x-rays and do a proper exam on a younger kid.” Another pediatric dentist described how his education and training as a pediatric specialist facilitated his provision of “infant oral exams” so that providing care to this cohort, once he transitioned to private clinical practice, “wasn’t stressful.” Furthermore, through his graduate education in pediatric dentistry he had gained “an appreciation for the other side of things, like when things go wrong [i.e. an infant develops S-ECC],” which motivated him to provide preventive care early in the child’s life by “driving home the message for prevention.”

Input from participants who were pediatric dentists universally indicated that practitioner comfort, confidence, and competence gained through graduate education in pediatric dentistry are developed through an educational approach which combines didactic education with extensive clinical experience. Through didactic education, the theory and knowledge underlying infant-toddler oral health care was taught to participants within their graduate education in pediatric dentistry. Several of the pediatric dentist participants described how theory and knowledge related to infant-toddler oral health care quickly moved into clinical application. In clinic, skills were developed through many opportunities to treat infants and toddlers. Acquisition of knowledge, skills, and clinical experience related to infant-toddler oral health during graduate education in pediatric dentistry was important in helping one recently graduated pediatric dentist provide infant-toddler oral health care. In commenting on how her graduate

education in pediatric dentistry facilitated her provision of infant-toddler oral health care she remarked on specific knowledge she gained during her education, and that she was also afforded opportunities during her pediatric program to apply this theory to clinical practice. For example, through her narrative she described gaining knowledge related to oral hygiene instruction and then applying this learning to clinical practice by having an opportunity to demonstrate brushing technique to a parent of an infant:

[graduate education in pediatric dentistry taught]...the knowledge of how feeding through the night, frequent feeding, bottle feeding, nursing and stuff like that have an effect on how to do proper oral hygiene instruction for the parents... [learning] how to brush properly for the kid, how to basically do knee-to-knees exams and show parents how to do knee-to-knee brushing for kids.

In contrast, she reflected how during her undergraduate dental education she was never shown how to do a knee-to-knee examination, which translated into her not providing infant-toddler oral health care as a general dentist:

...that's [knee-to-knee] something you're never told in general dentistry school. And then, I never practiced this [infant-toddler oral health care] as a general dentist.

Study participants unanimously emphasized that during their undergraduate education, training in pediatrics was limited and they had not had clinical experience with young children. As stated by a baccalaureate degree dental hygienist, her lack of education and training in early pediatric oral health within her dental hygiene program translated into not seeing young children within her clinic practice:

We were never taught it [early pediatric oral health], you know, it was never a subject in our school. And, again, even in clinic we didn't see little people, so, yeah, when I went out and started practicing it's like, "Oh, in the office [her general dental practice] we don't see little people"... and it was like okay.

Furthermore, within undergraduate education, participants described how the education they received in pediatric oral health care was largely didactic, and consequently provided limited preparation for provision of care in clinical practice. In comparison to her graduate education in pediatric dentistry, which integrated didactic and clinical training early on in the program, one participant expressed that the pediatric training within her undergraduate program did not present an opportunity to provide clinical care to young children. In her words:

I'm racking my brain and I cannot think of an occasion where I examined a baby in dental school; I don't think we ever did.

In addition to not having clinical experience with infants and toddlers, she addressed how the pediatric components of her general dental education were incongruent with her perception of the role of a general dental practitioner in infant-toddler oral health care, and that undergraduate education did not adequately prepare her general dental colleagues to feel comfortable in providing infant dental examinations:

When I went to dental school...we had pediatric lectures and they taught us about a little bit... very minimally about risk factors for cavities in children... very little about breastfeeding, ad lib breastfeeding, very little about juice, very little about fluoride in children, very little about all of those things. But what they did teach us a lot about is when you should do a holding arch, who should get stainless steel crowns, how you should do a stainless steel crown, how you should do all these things. Well, the reality is you're never going to get to that point if you haven't first examined the child.

She went on to advocate for a shift in undergraduate education. She recommended that undergraduate dental and dental hygiene education should develop competencies focused on disease prevention and recognition rather than doing restorative treatment on young children. She stated:

So, let's focus the education on what everyone [general dental practitioners] should be able to do, which is examine – feel comfortable examining a child... picking out which is a reasonable treatment for you as a general practitioner to do versus what should be referred...so in the process they [dental educators] haven't made students comfortable doing exams. And they [dental educators] also haven't made them [dental students] comfortable doing treatment either.

A recently graduated general dentist reinforced the inadequacy of clinical experience with young children in undergraduate clinical training. She stated, "I don't think we had toddlers and babies in school," and she recounted how in clinic during dental school the youngest patient she provided care for was school-aged, so that when she graduated and started private practice providing care to preschool aged children was "basically like a brand-new thing." She then added that there was a "learning curve going from dental school to private practice" related to providing care for the infant-toddler cohort. However, by working with a pediatric dentist she became more comfortable in providing preventive care and infant examinations, and referred restorative treatment to a pediatric colleague.

Though participants universally expressed that the educational content specific to early pediatric oral health care had been limited within their undergraduate education, several participants discussed that components of their undergraduate dental and dental hygiene education had application for all patient groups. One participant described that competencies gained through undergraduate education such as application of fluoride varnish were relevant for providing infant-toddler oral health care. Another participant discussed how the dental hygiene process of care model, AD-PIE, which incorporates assessment, diagnosis, planning, implementation and evaluation, forms the basis of dental hygiene therapy and is applicable to all patient cohorts. She explained that the AD-PIE framework was emphasized throughout her

dental hygiene education, and AD-PIE was helpful in providing care to young children and adults. As she stated:

...going through that whole process of AD-PIE... [you] don't just apply it to the adults but actually use that with children.

While she had not seen young children during her diploma dental hygiene program, she was able to translate the AD-PIE process to treating infants and toddlers in the general dental practice to help ensure a thorough process of care for all patient groups.

Participants whose terminal degree was at the undergraduate level had often been mentored by a practitioner experienced in infant-toddler oral health care, which facilitated development of their skill and knowledge base in early pediatric care. One dental hygienist who had transitioned from a general practice into a pediatric specialty practice recounted:

Most of the knowledge that I have, seeing the little ones, was taught to me when I got this job. It wasn't so much education that I received before.

The pediatric dentist with whom she worked had coached her, and she had also observed the dentist in practice to "see what they're doing" then "mimicked their questions" when conducting oral health counselling with parents of infant and toddler patients. Another dental hygienist first became aware of recommendations regarding age-one dental homes when she transitioned from a private general dental practice that did not provide infant-toddler care into a preschool community oral health program. Mentorship from an experienced infant-toddler oral health care provider facilitated her transition to deliver oral health care to young children. She stated:

I shadowed a couple of the hygienists that were already in the program [community oral health preschool program]. So that's where I saw what they were doing and [I] was able to model what they were doing for their appointments.

When she returned to private practice, she applied the skills she had learned from a mentor in community health to provide an infant-toddler dental home within the general dental practice.

Continuing education provides an opportunity for post-graduate education. Several participants in the current study had either undertaken or delivered continuing education sessions focused on pediatric oral health; however, in general they reported a paucity of continuing education related to infant-toddler oral health care being offered to general practitioners. One dental hygienist who had sought continuing education sessions in infant-toddler oral health for practitioners indicated:

You certainly don't see anything, like I don't recall seeing much of anything in this whole realm of how to provide care for these little people and infant and toddler checks.

Though several participants referenced that the Canadian Academy of Pediatric Dentistry and American Academy for Pediatric Dentistry host annual conferences; participants simultaneously indicated that typically only those in pediatric oral health participate in these specialty education conferences. Therefore, participants sensed that the utility of continuing education presented at pediatric oral health conferences was largely for those who were already in pediatric practice to stay abreast of clinical knowledge, and was seen to be less effective in mobilizing practice uptake of practitioners who did not provide early pediatric care. This reinforced participants' recommendation for increased inclusion of infant-toddler oral health within undergraduate curriculum to enhance practitioner comfort, and a participant provided the rationale that:

Students need to be exposed...to feel that it's important and to understand the rationale why it's important. And to do it and not be afraid to touch a baby.

Given the emphasis that participants placed on the need for greater inclusion of infant-toddler oral health care within undergraduate dental and dental hygiene curriculum, this recommendation was probed as the study progressed. In explaining their rationale underlying this recommendation, participants referenced that education within one's training sets the foundation for future practice. A dental hygiene participant who recently became aware of guidelines around infant-toddler oral health care after being hired into a pediatric practice described her rationale for recommending enhanced exposure to infants and toddlers during undergraduate education:

So that all hygienists are aware of this problem of early childhood caries and it's not something you go into a pediatric practice and then think it just applies to me now because I'm working with kids...it [infant-toddler oral health care] should apply to everybody [all dental practitioners]. And then everybody working in general practice can look out for these risk factors, can look out for, you know, these children.

She went on to explain that if education occurring after graduation from general dental or dental hygiene programs is primarily used to educate dental professionals regarding infant and toddler oral health care that only practitioners who have interest in this practice area will be reached:

And if you do that afterwards [educate dental professionals regarding infant oral health once they are practicing] well, only the people that are interested in that take that continuing education...whereas if you get everybody educated then they can watch no matter what practice they're in, they can watch for those risk factors [and] follow CDA [Canadian Dental Association] recommendations... Like I just don't want people interested in pediatrics to go do whatever course... like everybody should be educated in that realm so no matter what dental practice they are practicing in they can spread that knowledge and the recommendations [regarding age-one dental care].

Participants brought forward several possible recommendations that they felt would help to create an opportunity for students to treat infant and toddler patients. One participant

expressed a concern that limited availability of infant patients could be an impediment to short-term inclusion of infants within training, and therefore, proposed an interim measure of having undergraduate students practice clinical skills through simulation with a doll. Other participants indicated that training should move towards having full clinical opportunities to provide care to the infant-toddler cohort.

The majority of participants suggested that infant-toddler oral health care could be provided through existing university dental and dental hygiene clinics by marketing the availability of age-one dental examinations for infants and toddlers to new parents through the educational institute. Some suggested that this care could be offered at a reduced cost or free of charge to attract parents. As stated by one participant:

If you put out an ad saying that these dental students are going to examine your baby for their first dental exam, it's going to be free, I don't think you'd have a problem recruiting people [parents of infants] to come [to bring their infant to the university for a dental exam].

While one pediatric dentist expressed that inclusion of infant and toddler oral health care within undergraduate dental and dental hygiene curriculum would be beneficial for the student, she also acknowledged that change within an educational institution can present challenges, as she stated:

Everything is just, in an institution, is just a little bit more difficult than if it's just on a one and one basis outside [of the university]...But I think that could be helpful for the student [i.e. to have clinical experience with infants in school].

Other participants proposed that creating an interdisciplinary clinical opportunity where dental and medical students could access and treat children together would be advantageous in furthering holistic patient care; however, participants also acknowledged that logistically there could be challenges with coordinating care across disciplines. Developing partnerships with

existing community programs that serve new parents by having students provide preventive oral health care in conjunction with established community-based programs was also advocated for by several participants. One dental hygienist suggested that a possible community-educational partnership would be having students go to immunization clinics and provide oral health screenings. Coordinating with community programs was perceived by several participants as an opportunity for students to provide infant-toddler oral health care because families already access community programs, so infant-toddler patients might be more accessible.

Experience. Practitioners' provision of infant-toddler dental homes and their comfort as providers were also enhanced by work experience and by personal life involvement with children. Comfort was a common intrapersonal factor that study participants associated with provision of care. Conversely, participants articulated that a lack of practitioner comfort may create a propensity for avoiding treating this cohort. As one participant stated:

Are you comfortable holding a baby? If the answer is no, the person is probably just going to turn that kid away, so they [dental practitioners] have to get comfortable interacting [with] and examining babies.

Participant input consistently indicated that repeated clinical experience facilitates practitioners' clinical competence and also enhances comfort with respect to managing anticipated infant-toddler behavior. One participant described that through clinical experience provision of care "becomes second nature." In another participant's account she articulated that comfort in providing infant-toddler dental homes is a "skill you get when you work on kids all day and night."

A pediatric dentist also explained how she gained comfort through providing treatment for infants and toddlers:

I honestly think it's [gaining comfort in treating infants] just a matter of increased exposure. Cause the more you do something, the more it becomes automatic, right? So, after you do like thousands of lap-to-lap exams you're not even thinking about it, you're not even hearing the crying sometimes – the behavior in those patients [infants] is what we consider to be age appropriate behavior – so we sort of wash that from being uncomfortable for us [providers of infant oral health care]. Whereas I think for other people... it's not within their wheel house or everyday interaction, and they don't do a lot of it, in which case they're uncomfortable doing it, in which case they don't do it.

While participants stressed that extensive clinical experience facilitates practitioner comfort with provision of infant-toddler care, personal experience with young children extraneous to the dental setting also helped participants interact with infants. The nature of personal experience varied between participants and included parenting experience as well as previous professional experiences, such as treating special needs patients during a hospital residency rotation. However, in describing how personal experience facilitates provision of an infant-toddler dental home, participants commonly indicated that life experiences with infants and toddlers enhanced their comfort in providing care for this cohort in clinical practice. In particular, one dental hygienist remarked that in the absence of clinical experience in treating infants and toddlers during her undergraduate education that “life experiences really make a big difference.” For example, raising her own children had familiarized her with “normal” behavioral, dental and developmental milestones associated with infants and toddlers. While one of the participants was not a parent, he grew up surrounded by younger cousins, and he indicated this exposure made him comfortable with providing care for infants within his dental practice. Previous work experiences with children outside of the pediatric dental context also helped to develop this practitioner's comfort. A dental hygiene participant had been inspired to pursue a career in pediatric oral health after being a coordinator for children's day camps.

Participants acknowledged that many dental students entering the profession may not have previous educational or life experience with infants. A general dentist recalled that initially providing oral health care for an infant was “scary”. In her words:

As I’ve mentioned, actual exposure to a young child [in dental school]. They’re scary [infants are scary] for a dental student, the majority [who] have not been married and have not had any children... that’s freaking scary to have an eighteen-month-old on your lap. And what’s normal and what’s not normal and knowing what to say.

Once she gained experience through practice, she became more comfortable and familiar with typical infant-toddler behavior, which made providing care to young children easier:

I’m expecting them [the infants] to cry. Don’t be upset by that. If they cry that’s fantastic because then I can see [laughing] a little bit better, you know. And knowing those things [i.e. crying is normal]...It’s scary for someone to have a little precious one in your lap at that age! You have to expose them [dental students] to that.

Again, as study participants expressed that experience creates practitioner comfort in providing infant-toddler oral health care, the importance of integrating provision of infant and toddler oral health care in undergraduate education was strongly emphasized.

Motivational influences. Appreciating the importance of early pediatric oral health care and subsequently the importance of the infant-toddler dental home was described by several participants as motivating. From participants’ perspectives, experiential and intrinsic motivators were facilitating in that these influences helped practitioners appreciate the value of infant-toddler oral health care and the rationale underlying the age-one dental home. For several participants, valuing infant-toddler oral health care was described as a prerequisite to providing a dental home.

Many participants stated that seeing the ramifications of early childhood caries on children's oral and systemic health was an experience that enhanced their understanding of the rationale for infant-toddler dental homes, and motivated them to address prevention of early childhood caries through provision of infant-toddler oral health care. As one participant reflected:

I've seen them at three or four years old with disasters, so you know you need to see them earlier.

She went on to explain that her resolve to look at "the preventive side of things" was influenced by having seen young children with advanced dental disease. In her words, she was motivated to provide infant-toddler dental homes to prevent decay because:

[I am] doing full clearances on a four-year-old, which thankfully is rare, but I've done it cause you don't have a choice.

For other participants, appreciating the rationale underlying the infant-toddler dental home was focused on understanding that poor oral health could impact a child's overall health. For one of the dental hygiene participants, her work in early pediatric oral health led to her understanding that:

The effect of ECC on these children goes beyond just their teeth and just general overall health... [it affects] the ability to learn.

Through this understanding she became motivated to provide infant-toddler oral health care to prevent early childhood caries. A participating dentist reflected on how his own personal perspective of the oral health-systemic health connection evolved as he provided oral health care to young children with early childhood dental diseases. He described this evolution with respect

to his understanding of early childhood caries as a disease with broader biomedical and social impacts by stating:

... my thinking started changing... to start looking at the totality of the disease [ECC] as it impacts the child, as it impacts the family – and the interaction between the two. So, it has a direct effect on the child, as it has – as I learned over the years – a much bigger effect on long term health.

He went on to describe ECC as a “multifactorial issue”, because of the short- and long-term impact to the child’s health, which subsequently had a social impact on the family, as well as an economic impact, both for the family of the child and for dental plans paying premiums related to the cost of treating ECC. He described how, in their entirety, these observed consequences led him to become an “advocate” for recommending to dental colleagues, medical providers and his patients that “no child was too young to see a dentist.” Recognizing the relationship between oral health and systemic health, including broader social determinants of health, was facilitating for several study participants in that it motivated them to provide infant-toddler oral health care.

While many participants discussed that understanding the rationale supporting the infant-toddler dental home was facilitated through experiential factors, other participants addressed how valuing infant-toddler oral health care and their own rationale for providing dental homes was more closely linked with an intrinsic motivation. In reflecting on the intrinsic nature of their motivation, participants spoke about a conviction that dentists and dental hygienists have a responsibility to provide evidence-based care that encompasses infant-toddler dental homes, and that being a provider of care will result in positive changes to the child’s health. Recalling her motivation to provide infant oral health care, a pediatric dentist reflected:

...that’s what’s driving me to pediatric... was a light and a hope that things can be better and can be changed for the better good – for the whole life of the patient. So, if we start

on the right track very early on then hopefully it can stay this way and then the patient can have no cavities for all their life.

Another participating dental hygienist explained that her philosophy for providing infant-toddler oral health care was that:

...you [as a dental practitioner] could have a huge impact on the rest of their [the child's] life... for their [the child's] oral health.

She found the potential of this impact to be personally rewarding. This philosophy of preventive care was accentuated in how another pediatric dentist was motivated to provide care to infants and toddlers as a means to prevent disease, and how as a provider of infant-toddler oral health the ability to prevent disease created an internal feeling of happiness:

...you [the dental practitioner] will be happy [in providing infant-toddler dental homes] because the child will never have to come to dentistry to have a pulpotomy or a stainless steel crown or exo's or invasive treatment just cause you keep them healthy.

Practitioner's rationale for providing an infant-toddler dental home also included that it was part of a family practice model. For some participants, the concept of being a dentist or dental hygienist in a general practice was equated with being a 'family practitioner,' wherein one general dentist returned to discussing how undergraduate education shapes a clinician's future practice, "dental students need to be taught that the child is part of the family of people that you see for treatment." Another participant paralleled family medicine seeing patients across the life course to the desirability of family dentistry seeing patients of all ages:

Imagine if you had a family physician... and they see you, they see your husband, they see your seven-year-old daughter, and you have a new baby. And they're [the family physician] like, "Oh, we don't see the babies." You'd [the parents of the new baby] would be like, "Oh, damn, but our whole family is like coming in for a checkup." And

it's the same with dentistry. Parents like the concept of a home. This is where we go. We all go at this time...Parents like that. So, it's this idea of providing comprehensive [care]... I'll [the dental practitioner] will check your teeth, I will check your husband's teeth, and I will check your baby's teeth. You know what I mean? And parents like that.

The family practice model, inclusive of the infant, was part of the practitioner's rationale for supporting the infant-toddler dental home. In this same context, a motivating factor for participants' provision of infant-toddler dental homes included that it could help to build a practice by drawing other family members into the practice and by "creating a patient for life by investing in them at that young age," as explained through the rationale offered by an independent dental hygiene practitioner:

When you invest in a little one or a patient's family - because it is an investment because you're not being compensated in the way you are with any other patient who fills your chair- you'll see the dividends because you'll create a better relationship with them [the infant's family], and hopefully create a patient for life when you invest in them at that young age. I think that's why I do it [provide infant-toddler oral health care].

The rationale that inclusion of infant-toddler oral health could be a "practice builder" was also considered by another practitioner:

Do you realize that if you invite newborns to come to your practice with the mom, and the mom gets really excited about the fact that you care enough to see their newborns to prevent disease that mom may become your patient? And all the families related to that mom would learn Dr. Joe will help prevent disease in our babies, and [think] I'm [the mom] going to go to that guy [the dentist] because he cares. And it could be a practice builder.

Because participants articulated that provision of care to infants and toddlers can help build a practice, they also saw inclusion of the infant-toddler dental home within a dental practice as being mutually beneficial for the child and for the practitioner. A pediatric dentist who had recently opened a practice said that while it was a small motivator, she did feel that by

including infants in her practice she was “winning in the future” because the babies that she was “seeing growing all the way” would become “older” patients.

Factors which motivated participants’ provision of infant-toddler dental homes can be summarized as follows: Valuing the infant-toddler dental home was influenced by recognizing the relationship between oral health and systemic health, by perceiving an importance to early preventive oral health care, by appreciating the advantages of inclusive family based dental homes, and by identifying that the infant-toddler dental home could help build a practice. Examining these factors, it is evident that individual practitioner perspectives begin to overlap and reinforce some findings related to the broader theme the “Practice.”

Theme 2: Practice

The Practice theme has five associated subcategories that enhance practitioners' ability to provide infant-toddler dental homes, as illustrated in Figure 5. These include: establishing patient contact, clinical components of care, practice setting, the infant-toddler dental home team, and interprofessional practice.

Figure 5. Subcategories associated with Theme 2: Practice

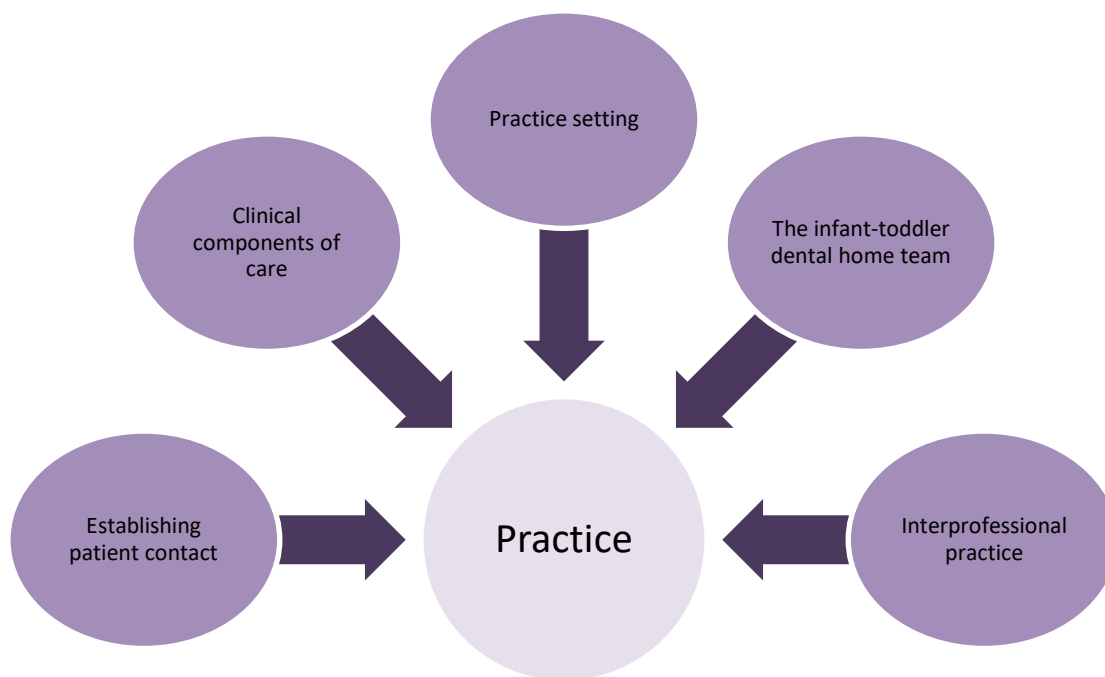


Figure 5. Diagrammatic overview of Practice subcategories: 1)Establishing patient contact, 2)Clinical components of care, 3)Practice setting, 4)The infant-toddler dental home team, 5)Interprofessional practices

The first subcategory within the Practice theme considers mechanisms that participants found facilitating to establish contact with the infant through contact with the infant's parent(s)

or caregiver(s) to initiate a dental home by one year of age. The second subcategory describes clinical components of infant-toddler oral health care. Within clinical components of care, participants highlighted that provision of an age-one dental home has an emphasis on parental education and preventive oral health care. According to participants, provision of the infant-toddler dental home involves establishing rapport and trust with the infant or toddler and the parent(s) through patient management strategies, which is also described within the second subcategory. The practice setting, the third subcategory, recounts how setting can help a practitioner efficiently provide care for the infant-toddler cohort, and can also enhance patient and parent comfort. Participants of this study provided care within a range of practice settings. The fourth subcategory, titled the ‘infant-toddler dental home team’, describes how a coordinated dental workforce facilitates comprehensive provision of infant-toddler oral health care. Additionally, participants explained that the ongoing relationship between the dental practitioner and the patient, that characterizes the dental home, is facilitated by having a coordinated philosophy in which all staff within the practice are supportive of infant-toddler oral health care and are encouraged to promote of the infant-toddler dental home. Interprofessional practice is presented as the final subcategory of the practice theme, in which participants portrayed how dental providers work collaboratively with non-dental health care professionals to facilitate implementation of oral health care by age one.

Establishing patient contact. All study participants identified that many parents remain uninformed about recommendations regarding infant-toddler oral health care. While parents on occasion self-initiate oral health care for their infant or toddler, participants indicated this means of establishing a dental home by age one is quite uncommon. Consequently, participants

emphasized that mechanisms for establishing contact with children by age one and their parent(s) are important for facilitating practitioners' provision of infant-toddler oral health care.

One of the most accessible mechanisms for establishing infant-patient contact that was used by all study participants was to engage in purposeful conversations with existing patients to encourage families to initiate care for infant and toddler-aged children. For different practitioners, the medium of communication varied. One participant's office used "informative e-mails," sent to all existing patients within the practice, to disseminate oral health information and in her words, "once in a while it will include, like, when to bring your child in, so that helps quite a bit." More commonly, participating practitioners had direct conversations with parents of an infant or toddler, which some participants likened to a form of anticipatory guidance. While providing treatment for adults or older siblings, dental practitioners often engage in purposeful conversations to encourage families to initiate care for infants and toddlers as highlighted in the account of one participating dentist:

... if I'm working on a five-year-old or I'm doing restorative treatment, I'm constantly talking to parents about, you know, diet, oral hygiene, what needs to happen ... doing this or that, or not [ad lib] feeding [during the night]... it's something that you generally increase the general public's knowledge about it [early pediatric oral health care] and I think in the long-term it does have some effect on the kids...

Another pediatric dental practice promoted the age-one dental visit by asking for sibling information when every new patient presented for an examination, "let's say they [the family] has a four or a five or a six-year-old with ECC... we do ask for sibling information when they fill in the new patient intake." If on the intake form, parents had identified that they had an infant or toddler, the hygienist would ask, "has she been or he been to the dentist yet?" Gathering this

information created an opportunity to converse with the parent about starting the dental home for the infant or toddler.

Because physicians contact with infants is common and often precedes initial contact with dental practitioners, physician referrals were another mechanism to establish contact. One participant, who had previously practiced in community health, identified that practice recommendations for physicians include a recommendation regarding the age-one dental visit. Though this participant expressed support for physicians referring children for a dental home by age one, most participants in this study indicated that physician referrals they received were often to treat an acute dental concern, rather than to establish a dental home. For example, one pediatric dentist described referrals that came to her practice through referring physicians:

For the most part, the younger kids that we see have either been seen by a pediatrician or had an obvious concern like obvious cavities or something, or a tongue-tie or frenum attachment or something that the pediatrician wanted them [the patient] to see a dentist for a specific concern rather than establishing a dental home for the child.

Many participants who received infant or toddler patients through physician referral, sensed that there was utility in having a close professional relationship with the physician. One pediatric dentist expressed that while “medical doctors as a whole” did not necessarily consistently refer infants in accordance with the age-one dental home recommendation, physicians who did refer based on the recommended guidelines were those “specific pediatricians we [the pediatric dental office] have almost personal relationships with at this point.” Having a relationship with physicians was mutually beneficial for one participating pediatric dentist. In his words, “the pediatricians that we’ve worked with over the years are sending their patients earlier,” and there was a reciprocal effect in that the pediatric dentist was able to efficiently refer his patients to a pediatrician:

There are certain pediatric practices around the city who I've known for years and I can phone up and the patients can be seen [snaps fingers], you know, that afternoon. But I can't do it with people I've never met before.

In contrast, participants who sought to establish contact with infant and toddler patients through physician referrals in the absence of an established relationship with the physician found the process less effective.

In trying to establish infant dental homes, a pediatric dentist who was new to Alberta had provided physicians in her area with referral pads, but was disappointed in the response she received from her medical colleagues:

There was very little opening about discussing about how important it is to be seen by a dentist by age one... and why it is important to refer to us [a pediatric dentist], so basically, we didn't get much referral, much out of it... it doesn't seem like dentistry is a priority for them [i.e. physicians].

An independent dental hygienist had similar experience with establishing referrals through physicians in her practice area, which she speculated was in part because physicians did not have adequate time to promote infant-toddler dental care within medical Well Baby examinations.

Some participants also discussed working and building relationships with community and public health programs to establish referrals. In particular, referrals from Alberta Health Services community oral health programs were mentioned as an effective and valued means of establishing contact with infant-toddler patients. Several participants called for expansion of community oral health programs so that all children could receive an oral health screening by age one, and then be triaged to a private dental practitioner to establish a more comprehensive dental home. One pediatric dentist articulated how she thought parents were more receptive to establishing care through this process:

So, these people who are screening, these hygienists, for instance, who are screening these patients, are assisting us in finding the patients who do need care and [are] sending them to us. So, I think that's very valuable because I think [a] barrier to care is that people assume dentistry is expensive so that they're more likely to go to one of these fluoride clinics or have kind of a more low risk, in their mind [parent's mind], interaction before they end up at our office. So certainly that's been helpful to access care for those patients.

Clinical components of care. From all participants' input, the age-one dental home is focused on disease and injury prevention to maintain the child's oral and overall health. Participants discussed how there are general components that typify an infant-toddler appointment including: caries risk assessment; counselling related to feeding, homecare, and injury prevention; knee-to-knee examination; preventive therapeutics; and preventive recommendations given to parents. A dental hygiene participant referred to using the AD-PIE framework (i.e. assessment, diagnosis, planning, implementation, and evaluation) to ensure that the care provided during the infant-toddler appointment was comprehensive. One pediatric dentist explained that caries risk assessment is a very important component of early pediatric oral health care:

And I think the biggest thing through this whole thing [provision of infant-toddler dental homes] is to be able to understand the caries risk of children and to be able to categorize them by, you know, mild, moderate or severe and higher risk for caries... and [to] understand that whatever socio-economic factors or like health factors this child is at higher risk for caries and needs to be seen more frequently, needs more aggressive treatment...

To determine a child's caries risk, this participant explained that caries risk assessment is based on a detailed medical and dental history, and completion of the clinical examination. The dental history includes diet and nocturnal feeding habits, information about the mother's oral health status, homecare, fluoride exposure, and injury prevention.

Participants universally voiced that parental education is a key component to infant-toddler oral health care, and is closely linked to the patient's caries risk assessment. One general dentist described the age-one dental appointment by saying:

... a lot of it [the age-one dental appointment] is just talking, right... Talking about habits... talking about juices only with meals and trying to make sure we're [the parent is] brushing before bed and only water after that... it's more education than anything.

A pediatric dentist also described that parental education is the main focus of an age-one dental visit, and that the examination is completed very quickly:

I spend a lot of time talking to the parent about specific milestones and issues relevant to that age range. I would say three to five minutes is going to be lying the baby back, checking the baby. The baby's going to be upset obviously and then the parent rescues baby and it's all fine... There's this interpretation that infant oral care is forty-five minutes of hands on hold, like restraining a baby. It's not. You'll do a knee-to-knee exam, it takes like all of maybe two minutes, when really the value of that visit is more in the counselling of the parent.

The focus on parental education as a significant component of infant-toddler oral health care was itself facilitating for some participants, especially general practitioners who had limited clinical exposure to infants and or toddlers, because the infant-toddler dental appointment(s) became "just like talking to the parents like as a normal conversation." A dental hygiene participant also utilized the age-one clinical appointment as an opportunity for parental education. She described the appointment as a "platform to have a really good chance to actually sit down and educate the parent."

Some participants sought to initiate the infant-toddler dental home before the child was born. For example, one participant discussed how most parents "don't know" that caries bacteria

is passed from the parent to the child, and therefore she advocated that clinical care should commence prenatally:

I start by saying [to expectant parents], “Okay, you’re having baby. Do you know how your mouth influences your baby? What is happening in your mouth is influencing your baby right away.” And I explain everything about, smoking, alcohol, oral hygiene, if she [the expectant mother] has caries, if she doesn’t brush her teeth properly and if she doesn’t reduce the *Streptococcus mutans*, not [to] kiss your baby when he’s born...that you will transfer all these microorganisms to them [i.e. to the baby]... all those things. So, I take a lot of time [i.e. in providing prenatal oral health education], it’s a lot of conversation, it’s a very nice appointment. Then when the baby’s born I tell them if they want to bring him [the baby] right away it’s okay with me. I can teach you [the infant’s parent(s)] how to clean the pads [gum pads] and everything and to keep him healthy. And then when they [the infant] gets the first tooth I tell them [the parent(s)] that’s when you have to [bring the infant for a dental exam]. It’s usually when they’re six months [old].

Another participating dentist also discussed starting clinical care prenatally, and she referenced her experience of starting infant oral health care prenatally as facilitating because she found expectant parents were receptive to receiving information that would be beneficial for their child’s health:

What I love about teaching, for example, expecting mommies or expecting mothers is that they are open for everything. They want the best for their child. They want to learn everything about everything.

Participants identified one unique aspect of pediatric care is that the child and parent are both clients in the care process. In this context, participants recounted that establishing a supportive and empathetic patient-practitioner-parent relationship facilitates provision of care, and that patient-parent management is an important part of providing clinical care to the infant-toddler cohort. Practitioners used patient management strategies including singing, exuding patience, and eliciting parental support to help put the child at ease. Selecting a time of day when the child was typically “most calm” was a patient management aspect employed by several

participating practitioners. For other practitioners, offering an age appropriate reward, such as bath toys, helped create trust with the child and parent alike. For one general dentist, providing infant-toddler care by the time the child was one year of age facilitated provision of care to the child in later preschool years because the age-one appointment was non-invasive and helped acclimate the child to receiving dental care, so at age three or four the child was less apt to be “plastered against the chair or [not] sit in the chair or cry before you’re [the dentist] even in the room.”

Participants also described that an important factor in being successful in provision of clinical care is working with the infant’s parent(s) as a practitioner-patient team. In working with the parent(s), several participants referred to creating parental trust as a component of providing an infant-toddler dental home. To facilitate this relationship, participants emphasized that a non-judgmental approach where the practitioner meets “where the parent is at” through motivational interviewing helps to create a successful experience. In this context, one practitioner emphasized that she always tried to ensure that “the parents are on your side.” She went on to say that the approach that the parent(s) had with their child helped her determine her “approach to how you’re [the practitioner] going to deal with that child.” Another dental hygienist described how she found it helpful to emphasize to the parent that they, the parent, knew their child better than anyone, and she asked the parent to tell her if there was anything that would “help that child respond better” because it “worked out better for both [all] of us [the practitioner, the parent and the child].”

Practice setting. Some participants identified physical aspects of their practice setting that enhanced provision of infant-toddler dental homes. Other participants had not made special

accommodations within their practice, and did not find that the practice setting significantly affected their ability to provide care to infants and toddlers.

Many of the participants who practiced in pediatric specialty offices, geared their practices to being child oriented by creating child-friendly spaces through having open concept areas with toys and wide corridors to accommodate strollers, which these participants described as features which enhance child and parent comfort. One participating pediatric dentist had made special accommodations by creating a place within the office for breastfeeding and diaper changing so parents could attend to their children's needs. Another dental office had installed a cushioned chair rail in the waiting area and wide corridors in the hallways for toddler safety. Several participants also cited that having accessible parking helped parents to access their clinic more easily. One participant explained that these accommodations within the practice helped to create a patient-parent friendly environment, which indirectly facilitated provision of an infant-toddler dental home by helping to build patient comfort and rapport.

Another pediatric dentist described how creating an open and bright, child-oriented physical environment was more about the perception of the parent than the infant:

I mean our office is very kid friendly, child oriented, but when a patient is coming in at that young age, they have no basis for opinion, in which case, the parents feel like they're taking their child somewhere that is better suited to meet their needs. But whether that's actually the case or not for an actual [infant-toddler aged child], I don't think it really matters in that age range.

This pediatric dentist also described the practice as being "very open-concept" with "child-friendly colors" and spaces which in her words, "instills some confidence in them [the infant's parent] about the way that you're going to treat their child." Most of the participating pediatric specialists indicated that having a child-oriented practice setting facilitated building patient

rapport, but the effect on provision of clinical care was less consequential. However, this was not the case for one dental hygienist. This participant worked both in a pediatric office and a general dental practice. She reflected that some of the specialized equipment in her pediatric office made treating toddler aged children “way easier”. For example, in the pediatric practice, they had props to support the child in the dental chair, which minimized strain on her body compared to when she was working on a toddler in her general practice. This setup was not relevant for knee-to-knee examinations of infants, but became significant when a toddler progressed to sitting in the dental chair independently.

With respect to practice resources, several participants identified that offices with access to sedation and or general anesthetic were better equipped to provide restorative care to infants and toddlers, and therefore could provide a more comprehensive dental home. For example, one general dentist reflected that if a young child needed restorative treatment for caries she referred to a pediatric dental practice with an onsite operating suite. Access to a full operating suite enabled the pediatric practitioner to provide “total care [to] kids under eighteen months.” Another participating dentist who did not have hospital privileges discussed how limited access to a practice setting where children could be treated under general anesthesia was a significant barrier to her ability to offer a comprehensive infant-toddler dental home:

...one barrier to treatment, though, to [providing an] infant [dental home] is that under the age of two, they [the child] can only be safely treated under general anesthesia at the hospital [names specific local hospital]. And then the access to care... I don't have privileges yet... at the hospital.

Several participants described how a dental home that provides complete care for infants, including preventive and restorative care, may necessitate, or at least be facilitated by, having access to resources such as general anesthetic. However, with respect to provision of preventive

care, participants equally emphasized that provision of infant-toddler dental homes requires no specialized equipment and can be conducted in any dental practice. As one participant stated:

...my office isn't set up in any special way. It is just a general office. It has no particular features that help me to see children.

A dentist hygienist, who was the primary provider of infant-toddler oral health care in her general practice, reinforced the finding that a specialized practice setting was not essential. She stated that factors related to the dental practice setting were relatively unimportant in facilitating provision of care. Moreover, within a typical dental practice, she did not perceive any practice setting factors that would impede provision of infant-toddler care. As she stated:

...in the physical environment, there's nothing that's preventing us [the dental community] from providing the care.

Another participant noted while "a well-organized clinic obviously makes your life easier," preventative care can be conducted in a community setting outside of a dental office, and she cited how she had provided preventive infant-toddler oral health care by laying a child on a desk or using small child-sized chairs within a community daycare setting. In her words, "be creative."

The infant-toddler dental home team. For many participants, providing an infant-toddler dental home is facilitated by engaging all staff within a practice so that the office is operating as a dental home team. One participant illustrated how this applied to her practice by stating:

Like the receptionists have to be knowledgeable about that [factors that facilitated provision of infant-toddler oral health care] too and understand... [It helps] them [the infant] have a positive experience in the office, getting them [the child] in a timely manner...I get a message there's a little one up in the waiting room, please see

promptly... so if they're very small...knowing to get them in a timely manner so they're happy when they're there.

In contrast, one of the participants in this study recounted an experience which illustrated the consequence of not having all staff informed about or engaged in promoting early pediatric care. While the parent had been told by one practitioner to bring the child for an age-one examination, when the patient called the practice to book the appointment she was told by the receptionist that children do not need commence care until age three. As told by the dental practitioner, this made the parent feel "silly" when she wanted to bring her twelve-month-old in for a first dental check. The participant expressed concern that inconsistent messaging within the office could cause confusion for parents, which might hamper provision of an infant-toddler dental home.

Several study participants also described how a practice culture where all staff members are supportive of the dental home philosophy enhances provision of infant-toddler oral health care. For example, both a general dentist, who was an associate in a practice and a dental hygienist who worked in a general dental office introduced their respective practices to the age-one dental home. In both cases, they felt strongly that having an office environment where their employers and other staff were supportive of this change facilitated the transition. In comparison, several pediatric dentists referenced that their general dental colleagues worked in practices in which their employer was not supportive of integrating early pediatric care into the practice. For example, one pediatric dentist cited that his general dentist colleague had indicated that in trying to bring infant-toddler care into the general office there had been resistance from the practice owner who felt that having infants crying in the office was disruptive. This led this individual to conclude that that having a supportive team was an important facilitator in the practice context.

Within the practice, participants also discussed how provision of care is facilitated by utilizing the entire dental team to deliver infant-toddler oral health care. For example, within a general dental practice, one participating dental hygienist was the primary provider of infant-toddler oral health care, and she indicated that the dentist did not typically see the patient until the child was in later preschool years. Another participant discussed how dental assistants in the practice were typically responsible for reviewing oral hygiene and dietary factors with the infant's parents, which she described as advantageous from "more of a business perspective." A participating dentist also described how her practice utilized dental assistants and or hygienists who initially saw the infant and their parent(s) to "go through a list of questions related to diet and oral health, so breastfeeding habits, bottle feeding habits, juice, milk, oral hygiene." Following this review, the pediatric dentist would provide a clinical examination, and review key messages with the parent(s). This dentist found working as a team to deliver care was beneficial in reinforcing critical messaging to parents, as she stated:

I think the more that someone hears it... the better it will be, the more likely they are to retain it cause my assistants will have also counselled them about what's high risk, what's not high risk.

In this context, several participants suggested that utilizing staff to their full scope of practice might be a strategy to help improve practice uptake.

Several participants stressed that there are insufficient pediatric dentists to address oral health needs of all infants and toddlers, and therefore involvement of all general practitioners is necessary to improve uptake of the age-one dental home. Many participants practicing in pediatric offices emphasized that growing the general dental workforce "willing to treat" infants is of particular importance as a strategy to enhance uptake of current practice guidelines regarding the age-one dental visit. Creating an 'infant-toddler dental home team' also helped

several participating general practitioners provide early pediatric care. For example, in several practices, general dentists and dental hygienists provided preventive and basic restorative care, but referred patients to a pediatric dentist for more complex procedures. One general dentist repeated several times throughout her interview that she could offer patients within her practice an infant-toddler dental home because she could refer restorative treatment and complex behavior management to a pediatric specialist. From the perspective of a practitioner in a pediatric office, working as a “dental home team” with a general practitioner and pediatric dentist was seen to “take a lot of pressure off of the system and pediatric offices” by allowing specialists to focus on children with more complex care needs.

Interprofessional practice. Participants also described collaboration with other health professionals related to provision of early pediatric oral health care. Some participants had established close relationships with community dental hygienists, pediatricians, and Well Child nurses who promoted awareness regarding infant-toddler oral health. These relationships went beyond establishing patient contact. Participants explained that interprofessional practice also includes a concerted effort to provide education and promote early pediatric care. One participant referred to interprofessional practice as collaborating at an organizational level, and in particular, this dental hygienist, who worked in a pediatric dental office, referenced having a collaborative relationship with community oral health:

...like I was describing the public health hygienists and assistant that go to different communities, I'd say that is a large one [organizational facilitator]. We do have some very knowledgeable assistants and hygienists [in community oral health] that are making the proper referrals and educating parents even before they come see us. I think that is a really big one [facilitator].

A pediatric dentist also referenced how community oral health programs educate parents regarding the age-one dental home:

...we [the pediatric dental office] work with a number of hygienists [i.e. community oral health] who are in a certain area of the city who have come to know us very well and we work pretty collaboratively with them.

She subsequently viewed this collaboration as facilitating her provision of care within a private practice by way of enhanced parental education and by having support to access coverage through publicly funded insurance. Other participants' collaboration was less extensive, and efforts to initiate collaboration had been limited by time and workload constraints of their medical colleagues.

For some participants, interprofessional practice was facilitating by creating an interdisciplinary appreciation of the role that each member of a health care team has in promoting a child's overall health. One participant described an opportunity he had in his career to work within a larger health care team to provide care for children with cleft lip and or palate. He referred to this interprofessional experience as facilitating because it created a reciprocal appreciation of the value that each discipline brought to the overall care of the child:

The cleft palate team was made up of plastic surgeons, social workers, ear nose and throat people, a pediatric dentist, a physiotherapist... I think that was pretty much the primary team. And we used to meet once a month with the patients, so that exposure to interacting was very, very positive... but again, you started to work with the same people, and it developed a good relationship, and then you were able to interact. And they could appreciate what you're doing [infant-toddler oral health care] and you appreciated more of what they're doing.

Likewise, another participant who practiced in a rural community considered her collaboration with immunization clinics to be helpful. In her words, "the collaborations with the nurses is

fantastic,” and she then stated, “nurses make my life easier.” She identified a symbiotic relationship of interprofessional practice between the participant and the Well Child nurses in her community in helping to create a more holistic approach to the infant’s or toddler’s health. Through this “unofficial collaboration” she was able to reinforce messaging around immunization, while the nurses helped support messaging regarding the importance of early pediatric oral health. Again, she described the interprofessional role of her nursing colleagues in helping her to educate the public in her community:

...the nurses in charge, like of each community, are quite aware [i.e. of early childhood caries]...[they, the nurses said] I’m willing to come help you out with this [provision of infant dental homes]... let me help you and help educate the population and the people...community members...

The important role of interprofessional practice was further clarified and emphasized as it related to looking towards strategies to advance uptake and promotion of infant-toddler dental homes. In this context, interprofessional practice between the dental community and non-dental practitioners was universally emphasized as important strategy. Several participants recommended expansion of community oral health programs, and also emphasized infant-toddler oral health education for non-dental health practitioners, such as public health nurses and physicians, as strategies to advance interprofessional practice and subsequently enhance infant-toddler oral health care. One participant provided this supporting rationale:

I think teaching medical students the importance of early childhood [oral] examinations is critically important. I think the statistics show that a child will see a physician on a Well Baby visit eight times before they’re two years of age. Well, during those visits, the physician should be trained to tell parents to take them to a dental office for a more thorough examination.

A pediatric dentist also discussed enhanced interprofessional collaboration with medicine by drawing a comparison between early pediatric oral health and the existing practice of medical providers recommending eye examinations for a young child:

for them [physicians and nurses] this is another step, same thing as your kid's gonna get an eye exam at a specific age, at age one they need to see a dentist...it's just a matter of them [non-dental medical providers] recommending this [age-one dental homes] as part of their [children's] general health.

Several participants advocated that prioritizing interprofessional practice within in remote communities is particularly desirable. One practitioner observed, "I've seen teeth in the north [i.e. northern Alberta] that were worse than when I went to work in [underdeveloped countries]." Participants articulated that the unique geographic influences in remote catchments necessitate an interprofessional approach to improve access because a dental provider may not be in close proximity. Limited access to a preventive dental home was a particular reason why one dentist supported enhanced interprofessional collaboration. From her experience of working in a remote community she found that:

I've got people coming from all those small communities [cites a specific community], which is three hours away. I think that's what *prevents* people from coming before a problem happens. That's usually when I see children, is when they [the child's family] come in and they say, "I see a hole." And usually by the time you see one hole, there's several.

The participant went on to say that "by the time these contract people [dentists or dental therapists] come up...they're so busy seeing the emergencies, they don't have time for prevention." Interprofessional practice with non-dental medical providers was seen as a partial solution to offering families preventive dental care by age-one. Therefore, interprofessional

practice was considered as a facilitating factor because of the potential to support dental providers' ability to fulfill practice standards related to age-one dental care.

Participants also described the value of working interprofessionally to bring a collective voice to support changes which practitioners felt were necessary to advance infant-toddler oral health care. The power of the collective was accentuated as a critical strategy to improve uptake of infant-toddler oral health care. While no participants in this study had been involved in a large interprofessional collaborative effort to address early pediatric oral health, some had contributed to other collective groups, which had been effective in changing practice and policy. One pediatric dentist was particularly passionate about the importance of having a unified, interdisciplinary voice brought to improve care. She had previously joined an interprofessional initiative in the hospital where she had worked to successfully change policy related to working conditions. She conjectured that advancing uptake of infant-toddler oral health would similarly benefit from an interprofessional approach to change policy level issues:

When you work with a group, first, when you team up, you have the power to make changes... like policies... you need leaders there. There are people who are stronger leaders than other ones... You need all kinds of leaders there... that's the only way you can change.

The concept of the collective was spoken of by other participants in the context of the larger dental profession, which emerged as the third theme "Profession".

Theme 3: Profession

The "Profession" is related to how the organizational and institutional ethos of dental hygiene and dentistry professions influences provision and uptake of infant-toddler dental homes. As depicted in Figure 6, there are four subcategories in the Profession theme including:

the business of dentistry, professional obligation, professional guidelines and regulation, and policy makers and legislators.

Figure 6. Subcategories associated with Theme 3: Profession



Figure 6. Diagrammatic overview of Profession subcategories: 1)The business of dentistry, 2)Professional obligation, 3)Professional guidelines and regulation, 4)Policymakers and legislators

pediatric oral health care, as detailed in the first subcategory, “the business of dentistry.”

Participants explained how practice guidelines regarding infant-toddler oral health care, which have been formalized through position statements, create a professional obligation to endorse the age-one dental visit by either providing care or referring to a dental professional who does see infants and toddlers. These findings are presented within the subcategory titled “professional obligation.” Additionally, participants offered feedback that professional guidelines, position

statements, and policies related to infant-toddler oral health care facilitate practitioners' provision of the age-one dental home by enhancing the strength and credibility of the recommendations that practitioners make to patients, and these findings comprise the third subcategory, "professional guidelines and regulations." Within the third subcategory, participants emphasized how enhanced awareness of practice standards related to infant-toddler oral health care from and within the dental community is necessary to help improve uptake by providing all stakeholders with consistent messaging. Participants identified that health professions' regulatory colleges and associations may be preeminently positioned to promote broader awareness of these recommendations. The final subcategory of the "Profession" theme, describes participants interpretations of the role that policymakers and legislators, who set standards for professional practice, have in promoting professional guidelines.

The business of dentistry. Many participants indicated that the fee-for-service model, under which dentistry largely operates, creates a challenge in providing an infant-toddler dental home because remuneration structures do not favor preventive treatment of young children. Many participants perceived that insufficient remuneration translated into a reason why many general dental practitioners do not routinely see infants for preventive care because as stated by one participant, "babies don't pay." Another participant expressed how "inadequate remuneration" potentially creates a propensity to not provide preventive infant-toddler oral health care within a general practice setting:

There's the idea that looking after a child isn't going to generate as much income when you have overhead to look after than maybe doing restorations on an older person, and therefore, why spend the time with that younger child?

Similarly, another participating dentist considered how restructuring remuneration models to favor early pediatric oral health care could potentially help advance implementation of infant-toddler dental homes:

I'm telling you, if infant oral exams paid a thousand dollars...these dentists would have signs on the street, "Bring your baby in. We're [the dental professionals] going to do an exam now [an age-one dental exam]." And they [dental professionals] would learn how to get good with those babies.

With respect to strategies to improve future uptake of infant-toddler oral health care by the dental community, revising remuneration structures was strongly emphasized by study participants. One participant offered the perspective that practices need to be financially profitable, which creates a need to balance a viable business model with meeting patients' needs.

Many study participants explained that the issue of remuneration was further complicated by the fact that some evidence-based procedures such as fluoride varnish are not universally covered by insurance plans for children less than four years of age, and consequently several participants provided these procedures gratis. This point was illustrated by a pediatric dentist who spoke about how publicly-funded dental programs, such as the Alberta Child Health Benefit, do not provide fluoride coverage for children less than 48 months of age. She identified that children from low-income families are often most at risk for caries compared to the general population, and consequently children covered through these programs would benefit the most from early preventive therapies. While, as she described, her altruistic drive led her to provide a preventive fluoride service gratis to patients whom she felt were in need, she also reflected that private dental practices "need to still be making money" which led her to reflect that "finances [related to provision of infant-toddler oral health care] are always an issue."

Therefore, while some participants considered provision of service gratis as a factor that facilitated provision of evidence-based therapies, they also recognized that this was not a sustainable long-term solution and relying on this mechanism may impede uptake within the broader dental profession. As explained by one participant, gratis services facilitate provision of care by way of encouraging patient-parent utilization of evidence-based therapies, which she described as her way of saying “thank you” to parents for bringing their child in early in life. However, several other participants recognized that under a private business model, dental practices need to be financially gainful; and therefore, dental practitioners may gravitate towards procedures that are financially rewarding, which does not favor preventive infant-toddler oral health care.

Several participants proposed universal public oral health coverage for children less than three years of age as a means to advance uptake. They provided the rationale that early childhood caries can affect a child’s overall health, and that oral disease can largely be prevented with early intervention. Participants also commented how precedent had been established in other provinces in which oral health care for children is universally government funded. Reflecting on this strategy, one participant commented:

I think Alberta is so far behind... they should be doing free exams under Alberta Health care... provide the opportunity for dentists to examine infants and pay for them... because the mouth is part of the body...

In discussing universal dental coverage for infants and toddlers, including preventive fluoride therapies, participants justified this recommendation by explaining this strategy could have potential to facilitate broader provision of infant-toddler oral health care because dental practitioners would be remunerated for the service and parents would not have any out-of-pocket

expense related to bringing their child for care by age-one. Addressing compensation models was a strongly emphasized reoccurring theme, but simultaneously many participants viewed provision of infant-toddler oral health care as a professional obligation that superseded financial considerations.

Professional obligation. Participants advocated that the profession needs to “take ownership” of advancing the provision of infant-toddler oral health care because it is “part of [professional] duty.” All study participants advocated that consistent messaging regarding the age-one visit needs to originate from within the dental profession and expressed concern that many dental practitioners do not recommend commencing care until later preschool years. In the words of one participant:

I would still say the vast majority of people [say], “Well, my dentist told me not to bring the kid in until they can cooperate...which is usually around age four or five.” And I’m like, “Okay, well that’s not true.” [i.e. a child should not commence dental care until age four or five].

A pediatric dentist reflected that parents who identified a concern with their child’s oral health presented to her practice after being told by their general dental practitioner that children cannot be seen for a dental examination until they were in later preschool years:

...some parents come in here [to the pediatric practice] and they’re angry because they have a three four-year-old child whose got a ton of cavities and they’ve [the parent(s)] said, “I asked my dentist - I’ve asked them, Will you look at my child? I think something is going on.” Or they’re [the child’s] in pain, or whatever. And they’re [the parent(s)] like, “My dentist always said they [the child] shouldn’t be seen until the age of three.” And without me throwing another dentist under the bus, what I say is “dentists, general dentists say that kids should be seen by the age of three... not because they shouldn’t be seen elsewhere, but because they don’t see them until the age of three. They just don’t necessarily provide you with the option that the child could be seen elsewhere.

This viewpoint was consistent with the experience of another pediatric dentist:

...and general [dental] practitioners a lot still say, “We [the dental profession] don’t fix baby teeth.” I would say I maybe had about, in the past year, ten [preschool] patients that had severe decay, and they [the patients] were under four, and they [the patient’s parents/caregivers] had been told by their dentist since they [the patient] was little that they [the dentist] don’t fix baby teeth, that you just monitor them and wait for them to fall out.

While insufficient awareness regarding practice guidelines was a perceived reason why some members of the dental profession may not recommend establishing a dental home by age-one, participants equally articulated that part of one’s professional obligation is staying abreast of standards of practice. Furthermore, several participants offered the perspective that it is a professional obligation of practitioners to inform patients of practice guidelines and endorse the age-one dental home as a standard of care. Perceived lack of awareness or lack of support for professional standards, as related to professional obligation, particularly concerned one pediatric dentist:

For a dentist to say to a parent, “We’ll check him [the child] when he’s four,” that should be malpractice... It should be because we [dental professionals] could prevent [decay] before four... and we’re [members of the dental profession] saying, “Oh, don’t worry mom about [bringing your infant-aged child for care] [even though] all your other kids have decay and there’s a high risk for caries in this family.” To say, “Don’t bring him in until he’s four,” that is malpractice.

Another pediatric dentist also emphasized the fundamental obligation to either provide age-one care or to make parents aware of this recommendation and refer to a practitioner that does treat infants and toddlers:

They’ll [i.e. some dental practitioners] say, “Oh, we’ll watch this decay.” Or teeth will be bombed out and they’ll say, “They’re just baby teeth...” because they [dental practitioners] don’t want to pass this patient on [to a pediatric dentist], and that’s not only morally unethical, but it’s also just blatantly wrong...

She went on to say that in her opinion failure to treat or refer was not always based on a lack of practitioner knowledge:

...it breaks my heart when I see parents come in and say, “Oh, my dentist said they’re just baby teeth, it’s fine [i.e. to not treat the decay.” I’m like if your dentist is saying that, how the hell are we [the dental profession] ever going to get through to just the general population. And every general dentist, every general dentist knows that’s not true [i.e. treatment of early childhood caries]... every single one knows in their heart that is not true. But they choose not to treat it [early childhood caries] because they want to hold on to the patient to the point they themselves can treat it instead of referring it.

Several participants expressed that provision of ethical care is a foundation for professional conduct of all dental professionals, and needs to be reinforced as a component of practice guidelines. One participant reflected:

As part of our practice guidelines and ethics there should be some highlight on the fact that if you’re [the dental professional] unwilling or unable to provide care to a child, that child should be referred to someone who is able to do it [provide treatment]. And if you choose, willingly choose, not to provide care to the child under the age of three or four whatever your threshold is that child should be referred to someone who does have the ability to do so. And I don’t think that’s been highlighted in which case people can turn a blind eye to it because it-no attention has been brought to it [the professional obligation of dental practitioners related to infant-toddler dental care].

Described by general dentist participant as “just part of the oath I took”, she expressed that it is the responsibility of all dental practitioners to either provide and or make referrals for care for all infants and toddlers in accordance with professional guidelines. The assertion that choosing to not provide care to infants creates a professional responsibility to refer was espoused by several participants:

If you don’t want to do this [provide infant-toddler oral health care], that’s fine, although I would encourage it, I’m not forcing you to see kids. If you choose not to, then you have to refer them [the infant] to the appropriate person [dental professional], that’s your moral, ethical obligation.

Even if you [as a dental professional] don't do it [infant-toddler oral health care] yourself, then you should make an appropriate referral to somebody [another dental professional] who will [provide infant-toddler oral health care].

And if you're not comfortable with a specific thing, if you're not comfortable doing a proper exam on a one-year-old, instead of, you know, delaying it, make sure this kid [the one-year-old] is being seen by somebody [a dental professional] who's able to do the proper exam or to do the proper treatment for this child.

As highlighted through these quotations, many participants viewed provision of care as more than just adherence to professional guidelines and regulations. They also viewed it as practitioners' professional and moral duty.

Professional guidelines and regulation. Participants identified that professional guidelines and regulations, augmented by government support can facilitate uptake of infant-toddler oral health care. One participant, who had practiced as a dentist for over three decades, stated that practice change is “an evolutionary thing” and that as the evidence base for oral health care evolves, so too must the professional standards which guide the profession. He recounted that, “When I first started to practice, the recommended age was three,” but that as evidence around the importance of early pediatric oral health care evolved, health professions' regulatory colleges and professional associations and or societies had published position statements to support children being seen by no later than age one.

Several other participants indicated that because an identified purpose of position statements is to provide guidance to practitioners with respect to standards of care, professional guidelines and regulations regarding early pediatric oral health care motivated their provision of infant-toddler dental homes. To illustrate this point, one general dentist spoke about how the Canadian Dental Association position statement on First Visit to the Dentist had motivated her to transition to providing infant-toddler oral health care. She reflected how the “first birthday first

dental visit” recommendation from her professional association “really make[s] you [practitioners] have to get kids [infants] in.” She then explained how the purpose of position statements issued by health professions’ regulatory colleges or professional associations is to address an evidence-based and up-to-date perspective on oral health issues that affect the practice of dentistry. The position statement was equated to a clinical practice standard, creating a professional responsibility for all practitioners to adhere to the guideline. She suggested that practitioners choosing not to practice in accordance with position statements from a health profession’s regulatory college or governing professional body could potentially lose credibility with patients. In this context, practice guidelines and regulations disseminated from professional regulatory bodies were described as policy factors that came from “an authority” that directed the profession.

For other participants, being able to reference position statements related to early pediatric oral health care was facilitating as a mechanism to introduce age-one care to parents and to reinforce credibility. A dental hygienist described how she would discuss the Canadian Dental Association’s guidelines with her existing patients who were parents of a young child. She reflected:

I usually tell them [patients in the practice] our professional associations all recommend bringing [children] in by one-year-old. Do you think that would be possible in your case? And [I] see if they’re [the patient/parent(s) of the infant] willing to go down that route [i.e. to have an age-one dental appointment]. Most of the time they’re very willing, so that [referring to professional guidelines] seems to open up the discussion [with patients regarding age-one dental care].

With respect to enhancing professional credibility, another participant explained:

I think that the Canadian Dental Association making a recommendation that all children should be seen by the age of one is very important and essential just because when

parents question whether that's necessary, I can retort with the Canadian Dental Association, that represents all dentists in Canada, suggests that children should be seen by age one.

A third participant expressed that she also used professional guidelines to add “weight” to her recommendations to parents because when the “main organization, the Canadian Dental Association is recommending this [i.e. first visit to the dentist]” parents think “these people [i.e. the Canadian Dental Association] they recommend this, so you really should follow up with that [i.e. having a first-year dental appointment].” However, she and other participants outlined that to increase effectiveness of professional guidelines and regulations, and to improve practice uptake of infant-toddler oral health care, a concerted effort focused on improving practitioner awareness and engagement was important. Additionally, participants expressed that “creating awareness” related to professional guidelines needed to include dental practitioners, but also needed to include parental and public awareness.

For example, participants conveyed that while professional guidelines enhanced their credibility, the reach of these guidelines is limited to patients who present for infant-toddler oral health care. Even though practice statements “give weight” to the recommendations that practitioners discuss with parents, which is facilitating, a participant voiced that:

Those policies right now are not doing anything for the general population because it's [the position statement] not reaching out to them... so that's [a] problem... [because the position statement]... it's not bringing people to the door [of her practice].

Health professions' regulatory colleges and professional associations were identified by participants as organizations that can and should strive to create awareness about practice guidelines and promote consistent messaging from and within the dental and broader medical community. Several participants advocated that professional bodies are in a position to serve as

knowledge brokers to members of the profession. Professional bodies already assumed this role by publishing position statements, but several participants felt that the regulatory bodies and associations who published the statements had not sufficiently disseminated information to create consistent awareness and messaging within the profession. One pediatric dentist remarked:

... and that recommendation [i.e. first visit to the dentist] I think it's about twelve to fifteen years old...even as a guy doing it [providing infant-toddler oral health care] I don't remember seeing it [the position statement regarding first dental visit] broadcast in a big sense...

Educational strategies were again emphasized by participants as the most effective and efficient means of creating professional awareness. Furthermore, participants returned to the premise that creating awareness and professional change would be easiest and most efficient by focusing knowledge translation efforts towards undergraduate education. For established practitioners, participants sensed that repeated feature articles in professional newsletters and journals could help enhance consistent messaging around infant-toddler practice standards. One participant spoke about how messaging around practice standards needs to be presented repeatedly because in oral health care there is so much to stay abreast of that the more "repeated exposure the better."

Participants also discussed that health professions' regulatory colleges and professional associations have an obligation beyond authoring and publishing practice guidelines. Participants advocated that professional authorities can also help facilitate implementation by advising how a practice can implement an infant-toddler dental home. In some participants' view, professional bodies had not fortified published position statements on early pediatric oral health by specifying how to provide an infant-toddler dental home in practice. One participant stated:

...they [the professional association] have a guideline, and it's very nice, it's very well written, but they don't say this is the infrastructure that you need to provide this [infant-toddler dental homes].

For example, a general dentist who was transitioning to include infant-toddler oral health care within her practice found she initially felt challenged to know how to implement the practice guideline published by her professional association:

So the CDA says we should be seeing them [infants] and providing a dental home by one, and maybe I missed the memo but they [CDA] don't follow that with [telling practitioners] this is what should be included in your discussions.... I think that's sort of the biggest place that something is missing.

Concisely, creating more specific and routine direction from regulatory bodies and professional associations was thought to be a potentially helpful mechanism to improve general practitioners' provision of infant-toddler oral health care. In summary, participants indicated that to improve uptake of infant-toddler oral health care by the dental profession, professional authorities can support change by enhancing participant awareness that guidelines exist, and by expanding guidelines to include more detailed direction about how to implement infant-toddler oral health guidelines within practice. In regard to policy, participants also identified that dental and dental hygiene professions are regulated by government, and therefore policymakers and legislators are important stakeholders with potential to facilitate practitioners' provision of infant-toddler oral health care.

Policymakers and legislators. Government legislation, such as the Health Professions Act (HPA), was referenced by several dental hygiene participants as a policy-level factor which facilitated their provision of infant-toddler dental homes. Dental hygienists articulated that HPA legislation facilitated their provision of infant-toddler dental care in that it empowered them to

provide complete preventive care to the child because, under this legislation, dental hygienists had the same authority as their dentist colleagues to diagnose caries. A participant who worked as an independent dental hygienist and owned an independent clinic considered how legislation which designates the dental hygiene profession as self-regulating enabled her to fill a gap in access to care in her community.

From the perspective of another dental hygienist, having legislation regulating dental practitioners “gives our profession more credibility and more strength.” She went on to explain how “having credibility and strength” facilitated her provision of infant-toddler oral health care:

...And that [having credibility and strength] helps us to gain the parents’ trust and support, and then if you have their support, then you’re going to gain more cooperation in working with their child too.

In this way, she stressed that legislation had an indirect, but consequential, function in facilitating her provision of infant-toddler dental homes.

At an organizational level, participants discussed having a provincial health authority, through Alberta Health Services (AHS), created by provincial government policymakers benefited infant-toddler oral health care. They cited AHS fluoride varnish program for at-risk infants and toddlers as an example. One participant also mentioned that as a government organization, Alberta Health Services had created a position for a Provincial Dental Public Health Officer. The participant saw the potential of this role to increase legislators’ and policy makers’ awareness regarding the importance of preventing of infant-toddler dental diseases, which subsequently had promise to advance future policy and legislation that would support provision of infant-toddler oral health.

Several participants emphasized that policy and legislation related to publicly-funded dental programs directly impacted practitioners' provision of infant-toddler dental homes. Participants recognized that publicly-funded dental insurance through Alberta Health provides coverage for children from lower socioeconomic families, which enhances provision of and access to care. However, participants also accentuated there are inadequacies in current coverage, especially with respect to preventive therapies. To provide context to this finding, participants explained that publicly-funded dental programs, such as Alberta Child Health Benefit, do not provide fluoride coverage for children less than four years of age. In contrast, diagnostic care and restorative care under general anesthesia are covered. All participants voiced that the age-restriction on coverage for topical fluorides is a shortcoming which needs to be addressed by policymakers. One participant discussed this age-restriction as a government inadequacy that affected his provision of early pediatric oral health care:

I think there's still issues even with Alberta Works... like Alberta Works is the social assistance program. They don't pay for fluoride under the age of four. I'm like well these are the people that benefit the most.... like this kid needs fluoride varnish, like why are we not paying for this?

This limitation was also accentuated by another participant who indicated that high risk children benefit from fluoride, and that the age restriction on this service potentially impacts provision of care:

...but they [publicly-funded dental programs] don't cover fluoride varnish [i.e. for children under four years of age]. And so, it's frustrating to me as a provider because...I'm doing it for my own reasons... as well but I'm also doing it because I know the child needs it...definitely it hinders my success and my motivation if I don't get compensated for it at all...so the fact that they have this age limit it just sort of doesn't make sense... it's frustrating...because... once they get their teeth [i.e. a child]... and they're high risk [for caries]... they should get coverage [i.e. for preventative fluoride therapy].

The expansion of government coverage was generally viewed as an important step to advance support for infant-toddler dental homes.

Theme 4: Population

The Population represents factors within a broader Alberta population milieu that facilitate provision of infant-toddler dental homes and consists of two subcategories: societal factors and promoting population awareness as shown in Figure 7.

Figure 7. Subcategories associated with Theme 4: Population

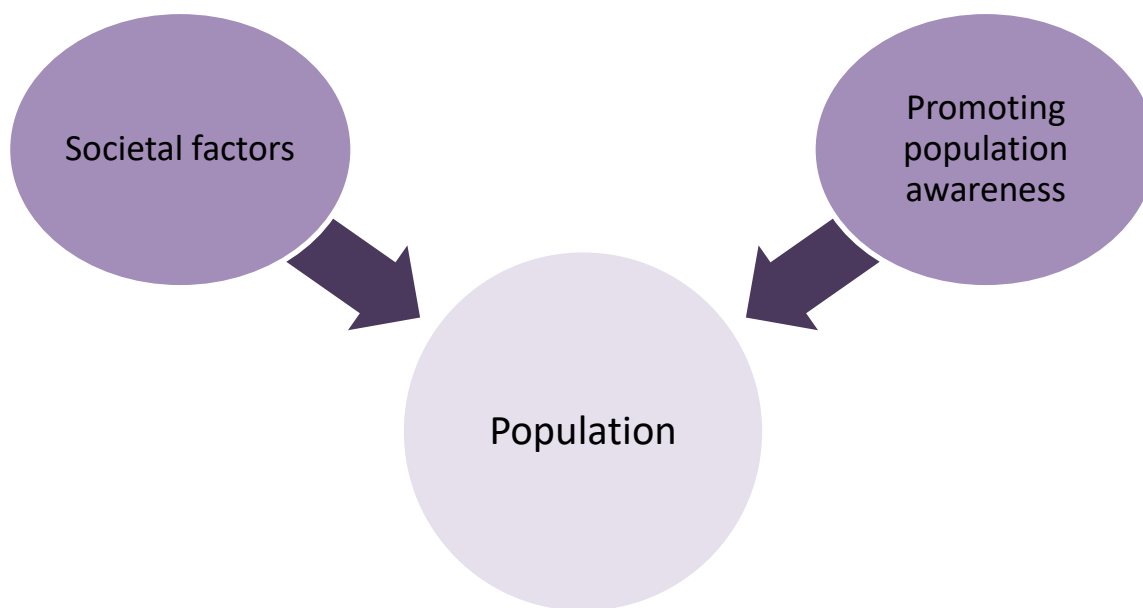


Figure 7. Diagrammatic overview of Population subcategories: 1) Societal factors, 2) Promoting population awareness

Study findings on societal factors highlight how the social environment within Alberta, as a provincial community, impacts infant-toddler oral health. Within this subcategory, participants considered that economic benefits associated with the infant-toddler dental homes provide an

impetus to improve population uptake of infant-toddler oral health care. Within the second subcategory, promoting population awareness, participants also identified that the rationale for and the importance of infant-toddler oral health care must be promoted so these recommendations are well understood and commonly recognized by the larger Alberta population. Participants unanimously expressed that enhanced population awareness is necessary to create a population-level shift towards improved uptake of age-one dental homes, and participants also proposed mechanisms to enhance population awareness in Alberta.

Societal factors. Encompassed within the subcategory societal factors, are influences within the social environment and sociocultural context which facilitate and affect delivery of infant-toddler oral health care. This subcategory assumes a broader population-based perspective in which participants acknowledged that the social milieu in which dentists and dental hygienists provide infant-toddler dental homes is consequential and can affect delivery of care. To illustrate this point, several participants described jurisdictional and catchment variances within Alberta that bring to bear important implications for the provision of infant-toddler dental homes.

Community levels of influence, such as discontinuation of water fluoridation in one jurisdiction was cited by several participants who practiced in this area as a societal factor which enhanced the need for provision of infant-toddler oral health care. This jurisdiction had been fluoridated, but their city council had elected to discontinue water fluoridation. Several participants commented that they had seen an increased incidence of children presenting with early childhood caries in their practices, which they associated with cessation of community water fluoridation. As stated by one participating dental hygienist who worked in a pediatric practice:

...the fluoride [lack of community water fluoridation] is a huge barrier for us. We've seen a huge increase in cavities in the population we serve.

Resultantly, the motivation to inform patients about the importance of establishing a dental home by age one was accentuated for this practitioner. Another participant found it ironic that the discontinuation of water fluoridation, which he believed had led to increased incidence and earlier onset of disease, resulted in families seeking care for their toddler-aged child, who in the absence of the disease might not have established care with a practitioner as early in life. While tangentially cessation of fluoridation 'facilitated' his provision of an infant-toddler dental home by way of families seeking care for their children at an early age, in these instances the dental home was usually established after the decay process had started, rather than for the purpose of disease prevention.

Several participants also expressed that the social environment within northern Alberta, where many communities are remote, also impacts provision of early pediatric oral health care. A practitioner, whose practice is situated in the north, expressed that residents often receive sporadic oral health care because access to a dental practitioner is limited. Consequently, for many of her adult patients, poor oral health was perceived as normal and not concerning, and they were unaccustomed to seeking preventive oral care, much less preventive care for a child by age one. Provision of health care was further complicated by a history in which patients lacked trust that health care providers would offer continuous care, as she stated:

I think the biggest thing [in being a health care provider in her community] is overcoming whether or not they [the community] can trust you to have longevity [to provide health service in the community] cause in some of those communities, people [health care providers] show up and say, "We're going to offer eye exams." And they [the health care providers] show up once and never come back.

She went on to explain that she sought to have a personal presence in the community by supporting community events, and additionally, because she had established her practice in this remote catchment she had gained the trust of community members. In her words, “I have a lot more respect than if I was just a new practitioner working there.” She described that being engaged in the community was valued by the population in her practice jurisdiction. Therefore, she emphasized that establishing community trust and personal relationships with parents who had infant- and toddler-aged children, translated into these families becoming patients in her practice. Gaining community trust was an important platform which she described as facilitating because she could then advocate within her community about the importance of establishing dental care early in a child’s life. She speculated that because she had trust, uptake of her recommendations was greater. Furthermore, she postured that engagement of non-dental health professionals, such as public health nurses, was easier in a remote community compared to working collaboratively in a large city where she felt professions would be more siloed.

This practitioner’s input explained how she recognized and adapted to the unique needs of the northern population she served, but other participants identified that factors within the social environment in northern Alberta communities continue to present challenges related to provision of oral health care. Participants who provided care for patients from northern Alberta communities expressed that societal factors such as poverty, lower education, cultural expectations, and remoteness impact provision of infant-toddler oral health care. For example, participants referenced that low socioeconomic status is a risk factor for early childhood caries. Accordingly, while practitioners recognized that early childhood caries affects all populations and children from all socioeconomic strata, the prevalence of disease is disproportionate in vulnerable communities. For example, a participant reflected:

Our Native communities quite often, sadly, you do see quite a bit of decay there so those are some levels of community that we work with and touch that sometimes other people don't see as often...

Another participant also emphasized that strategies to improve infant-toddler oral health must recognize the distribution of the disease related to socio-economic status. In her words:

...eighty percent of the decay...is in twenty percent of the population which is the low income, lower socio-economic status, so we need to help those people, we need to reach out for them.

Several participants sensed that prevalence of ECC in Alberta had reached, as they stated, "epidemic levels." A pediatric dentist postulated that historically each year in "Alberta between the public and private facilities we [dentists in Alberta] did over twelve thousand general anesthetics [to treat ECC]." He went on to consider the major economic impact of ECC, which he described as "multi-multi millions of dollars" as an incentive for a societal shift towards early preventive pediatric oral health care. Summarized through the reflections of another participant's interview, "just given that the rates of ECC are so high, you know, epidemic levels" accentuates the desirability of early prevention through improved implementation of infant-toddler dental homes.

Promoting population awareness. Participants universally identified a knowledge gap in the general population regarding early pediatric oral health care and the importance of preventing early childhood caries. A dental hygienist who had initiated provision of a dental home for infants and toddlers her general practice reflected:

I think for the most part the Canadian public is not aware of the recommendations of the Canadian Dental Association [i.e. regarding first dental visit by age one] and I think many dental offices don't follow it.

For the general population to value infant-toddler oral health care, participants expressed the advantage of using a population health approach to advance public awareness. Several participants identified gaps in the current knowledge base of the general population. In participants' empirical experience, the general population is inadequately informed about the importance of and mechanisms to access infant-toddler oral health care, as well as the etiology and prevention of early childhood caries. As one participant remarked:

Rarely do they [parents] know that it's one year or six months after [the] first teeth. But there's still a very prevalent view that three years is appropriate to see a child, so we're still working with that.

A participating pediatric dentist also commented about the need to promote population awareness around early pediatric oral health care based on her practice experience:

...when I say that, "Oh, kids should be seen by the age of one," there's shock [i.e. parents are shocked].

She furthered that in creating population awareness it was important to "extol the virtues" of a child being seen by one year of age. Another pediatric dentist reflected on promoting population awareness focused on specific aspects of infant-toddler oral health, such as disease etiology. She considered the complexity of early childhood caries etiology and prevention of the disease through early care as a "multifactorial problem", and expressed that enhanced population awareness regarding the nature of caries would subsequently help create value around establishing an infant-toddler dental home. She stated:

People don't know that caries is a bacterial infection. So that it [the bacteria] spreads [i.e. bacterial transfer from mother to child]...that's one thing related to infant care that's not well known. Most of the people don't know that...So there's still a lot of work that needs to be done [to educate the public]...

In perceiving that the general population is inadequately informed about the importance of infant-toddler oral health care, participants also had recommendations about strategies to promote population awareness. One participant referenced how she helped to create awareness about infant-toddler oral health recommendations by educating her existing patient base. She would utilize the time when she was treating older siblings to discuss oral health recommendations related to infant- and toddler-aged siblings with the parent. She considered that by educating parents within her practice there was potential to spread messaging regarding infant-toddler oral health and age-one dental care through informal parent networks. One participant reflected that if all dental practitioners who currently offer infant-toddler dental homes convey the importance of early pediatric care to their existing patient base, that over the long-term awareness will diffuse to the general population. Another participant discussed his effort to educate patients within his practice:

So for every parent who shows up here what I started a long time ago is I ask them to become an advocate [for infant-toddler oral health]...we explain the relationship of oral health to total health... And then they [the parents] become believers, here in the office.

He then discussed how inter-parental communication is an effective means to promote infant-toddler dental homes because parents trust information coming from other parents:

You [parents of infants who are not part of the practice] will trust your friend [who does have an infant-aged child in the dental practice] who's getting great advice and she will become an advocate for her family – her sisters', her brothers' children to get them [the children] in sooner and that prevention is the way to go... And, I don't have any solid data in the statistical sense, but certainly with the responses we're getting [in the dental office] the mothers will absolutely become advocates for their friends and others.

A dental hygiene participant likewise conveyed that parental networks could help build public awareness and facilitate improved uptake of early pediatric oral health. She hypothesized that not

only could sharing information through parent networks help to increase awareness, but also had potential to magnify demand and compel uptake within the profession:

They [parents] might be the best way to spread the message. They go, “In our office they’re doing it... you should ask your office why they’re not doing it...”

While participants promoted infant-toddler dental guidelines within their own practices and communities, they also emphasized that the opportunity to disseminate messaging at a population level was limited. Several participants also felt that individual practitioners educating individual patients and then relying on those patients to disperse information to their friends and other parents had a limited trickledown effect and that increased awareness at a population level would be slow.

Consequently, participants called for action at the “system level” to advance population awareness which included: expansion of community oral health programs, educational outreach through dental regulatory bodies and associations, and large-scale health campaigns through television, social media and radio to expedite public awareness. Leveraging community oral health as a means to promote population awareness of infant-toddler dental homes was accentuated by several participants because it was seen to offer a multimodal mechanism to build population recognition around infant-toddler oral health care. Participants referenced mechanisms including providing clinical screenings to triage patients to a risk-appropriate dental home, and coordinating with Well Child programs and non-dental medical providers to consistently disseminate messaging around infant oral health care. One participant expressed that dental and dental hygiene regulatory colleges and professional associations are well situated to promote awareness of the age-one dental home to dental practitioners, non-dental health care professionals, and the public. To illustrate this point, she referenced how stakeholders across the

health sector collaborate to provide consistent professional and public messaging regarding vaccinations and infant ocular examinations.

Other participants suggested that supporting infant-toddler oral health care and health promotion related to the age-one dental home through public financing would be advantageous because it would remove the perception that an individual dentist or dental hygienist was promoting infant-toddler examinations as a mechanism to advertise and promote their private business. By moving health promotion to the public sector, participants suggested that it might eliminate this potential misconception.

Participants recognized that mass media campaigns are expensive, but also advocated that investment in “grandiose advertising campaigns for first tooth-first visit” had the greatest potential to promote population awareness. To illustrate the effectiveness of large scale health promotion in creating societal awareness, participants cited “ParticipACTION” and campaigns warning about the effects of drinking alcohol during pregnancy as effective examples which created change in societal norms. One participant spoke of the power of media:

If I will have the power and the money, I will send messages on TV, on radio, on Facebook, all the media... that [infant-dental homes] becomes normal... so people know... this is your dental home. And the dental home is the new fashion. This is what you have to do.

Ultimately, in recognizing that the magnitude of change necessary to shift population awareness is substantive, participants emphasized the necessity of combined strategies and interventions. In one participant’s concluding comment she implored all stakeholders to spread messaging regarding the importance of infant-toddler oral health as a means to advance this agenda as she offered:

I'm just embarrassed at the state of children's oral health in Alberta... we're letting this particular segment of the population down... we're not doing as much for helping them... getting them into the dental homes earlier and younger... and I was part of that for twenty years, not purposefully, it was just my lack of knowledge... so that's why I took the torch and said we've got to rectify this. And certainly, I mean, I spread the message with all my friends and practitioners and try to spread it around [to] as many people as I could and I thought that was, you know, a place to start.

CHAPTER 5

DISCUSSION

Interpreting and Discussing the Findings

This study centered on the perspectives and expertise of 13 dental practitioners who provide infant-toddler oral health care in Alberta with the purpose of understanding factors that facilitate provision of infant-toddler dental homes and ultimately improving uptake of practice guidelines by the dental community. To identify and understand factors that facilitate practitioners' provision of infant-toddler dental homes, the researcher intentionally sought participants practicing in a wide-range of settings and jurisdictions throughout the province. While the resultant sample had considerable diversity, the factors which facilitate provision of infant-toddler dental homes centered around a core and common set of interconnected influences. Together, these factors, which were introduced in Chapter 4, form the 4 P's of influence in the provision of infant-toddler dental homes. The discussion in Chapter 5 analyzes and interprets the findings from the present study in the context of existing literature. In maintaining congruence with interpretive description methodology, which endeavors to understand the meanings and explanations of the findings in the context of implications for practice,^{82,83} the discussion considers the findings relative to strategies to achieve improved uptake. The discussion also highlights areas of priority based on prominent elements of the data. This chapter and thesis conclude by presenting considerations and implications for future research, and the significance of the study related to oral health practice and policy.

Practitioner: The Person Providing the Care

Within the practitioner theme, four key interrelated influences were identified as facilitating provision of infant-toddler dental homes: personal attributes of the practitioner, education and training in infant-toddler oral health, having experience with young infants and toddlers, and understanding and valuing the rationale underlying and importance of the infant-toddler dental home.

Personal attributes. Participants commonly connected intrapersonal attributes such as being empathetic, caring and warm with facilitating provision of infant-toddler oral health care. An intrinsic altruistic drive to help people and a natural affinity for children were also emphasized. For some participants, gender was identified as a factor that influences provision of early care, which is consistent with the findings of Santos and Douglass who found that female general dentists were more likely to see children less than two years of age compared to male colleagues.⁶⁵ Several participants expressed that other characteristics, such as “being caring” were inherent. For other participants, these facilitating qualities were garnered from values instilled by family or mentors. Regardless whether the attributes that participants identified were innate or learned, the importance of intrapersonal characteristics was described as facilitating because participants identified specific practitioner traits that help create a dental home atmosphere conducive to treating infants.

Practitioners’ intrapersonal attributes may help to optimize positive interactions between the clinician, the infant or toddler and the parent(s). Practitioners providing oral health care to young children must not only be adept in delivering technical aspects of care, but must also be cognizant of the child’s and parents’ emotions, movements and behaviors.⁹⁸ Sensitivity to the expression of the infant or toddler and parent(s) is not only important for creating patient and

parental comfort, but also for ensuring the safety and well-being of the infant during treatment. Relational skills may be of further importance in that infants have limited language skills, and therefore the practitioner must be proficient at using emotional and behavioral cues when providing care. For participants in this current study, intrapersonal attributes inherently shaped this awareness, and by extension facilitated provision of care.

Existing literature has also assessed intrapersonal attributes of dental practitioners, and reinforces the findings in this current study in substantiating the significance of practitioners' traits and characteristics. Needleman et al. used the Myers-Briggs Type Indicator (MBTI) to compare the personality profiles of pediatric dentists with other dentists and pediatricians. The MBTI is a psychometric instrument used to measure individual differences in personality based on four personality dichotomies, each with two opposite poles as follows:

- 1) extraversion (E) vs. introversion (I) - where one focuses one's attention;
- 2) sensing (S) vs. intuition (N) - the way one takes in information;
- 3) thinking (T) vs. feeling (F) - the way one makes decisions; and
- 4) judging (J) vs. perception (P) - how one deals with the outside world.⁹⁸

Through this study, Needleman determined that the personality profiles of pediatric dentists differed significantly from general dentists and pediatricians. While equally divided between extraversion and introversion, pediatric dentists generally preferred sensing over intuition, feeling over thinking, and judging over perceiving.⁹⁸ The feeling versus thinking aspect of MBTI illustrates the way that one prefers to make decisions. In this regard, pediatric dentists were significantly more likely to favor feeling over thinking when compared to related professions including general dentists, dentists in other specialties and pediatricians.⁹⁸

Needleman et al. posited this characteristic may be beneficial when working with children and parents because of the ability to make decisions based on “person-centered concerns”^{p550} such as the child’s behavior.⁹⁸ This research also suggested that the prevalent personality profiles of pediatric dentists aligned with attributes of being empathetic, having an interest in others, and being eager to serve others.⁹⁷ Research conducted by Al-Dlaigan et al. also used Myers-Briggs to compare personality profiles of dentists in different specialty disciplines (pediatric dentistry, periodontics, endodontics, prosthodontics, orthodontics, and restorative dentistry).⁹⁹ This research likewise confirmed that certain personality profiles had greater predominance in certain dental specialties including pediatric dentistry. Furthermore, the personality characteristics of pediatric dentists determined by Needleman et al. and Al-Dlaigan et al. were consistent.^{98,99} A study by Saline identified personality profiles of a dental hygiene cohort through MBTI, and determined that the most common personality characteristics included sensing, feeling, and judging.¹⁰⁰ Personality dimensions of dental hygienists, as determined by Saline,¹⁰⁰ closely align with the attributes of pediatric dentists.^{98,99} Since the research conducted by Saline identified personality profiles of dental hygienists, but did not relate personality profile to propensity to treat young children, future research focused on investigating this relationship is worthy of consideration.

Saline concluded that using personality assessment may help to identify prospective dental hygiene students.¹⁰⁰ Poole et al. also assessed personality as a predictor of dental school performance using a validated personality measure, the Five-Factor Model (FFM).¹⁰¹ The FFM assesses five personality characteristics including: conscientiousness, agreeableness, openness to experience, extraversion, and neuroticism.¹⁰² Poole et al. determined that “conscientiousness”, which is comprised of traits including organization, persistence and purposefulness, predicted

clinical and academic performance of undergraduate dental students throughout all years of dental school.¹⁰¹ Openness to experience, defined by actively seeking and appreciating new experiences also had some correlation with academic performance, but only in third year dental students.¹⁰¹ In relation to the current study, as participants identified that personal attributes such as empathy facilitated provision of infant-toddler oral health care, several participants also recommended that the propensity of dental practitioners entering into the profession to provide infant-toddler dental homes might be enhanced by developing admissions criteria to include personality profiling of attributes such as empathy. While existing literature has provided some preliminary information regarding personality profiles of pediatric dentists, general dentists, and dental hygienists, the recommendation from participants in the current study to change admissions processes to include assessments of personal attributes identified in this study requires stronger validation and does not fully consider the complexity of admissions processes. Additionally, this recommendation from participants does not reflect the pragmatic difficulties associated with inclusion of personality profiling.

Though dental and dental hygiene program admissions should continue to seek mechanisms to select candidates who are most likely to be successful future professionals, the current body of evidence related to personality profiling of dental candidates is insufficient to profile a candidate who has greater propensity to provide inclusive oral health care. This interpretation is consistent with the analysis of Poole et al. who also highlighted that additional testing on large samples of dental practitioners is necessary, with particular emphasis on the efficacy of personal facets to identify a profile of the ideal dental candidate.¹⁰¹

The most current review of dental admissions processes in Canada, conducted in 2014, evaluated the validity and reliability of admissions instruments for dental programs.¹⁰³ Though

the 10 dental schools in Canada used somewhat varied admissions criteria, most were based on a combined grade point average (GPA), the Dental Aptitude Test (DAT), as well as non-cognitive admissions tools, such as interviews.¹⁰³ The review of admissions processes found that DAT components, namely DAT-AA (academic average) and Science GPA scores are the most accurate and reliable predictors of academic performance.¹⁰³ The review also found that validity is increased by combining GPA and DAT with non-cognitive assessment tools; however, emphasized a high degree of variability in validity and reliability of non-cognitive tools used in dental admissions.¹⁰³ Results found that more structured interview processes such as the MMI (Multiple Mini Interview) considerably improve validity and reliability.¹⁰¹ Structured interview formats are used by the majority, but not all dental schools in Canada.¹⁰¹ One of the 10 dental schools in Canada uses a NEO-PI-R Personality Inventory Test, which is based on the FFM, as assessed by Poole et al.¹⁰¹; however, the review of Canadian admissions determined that there is currently a lack of evidence to substantiate its effectiveness as an admissions tool or as an instrument to predict how the candidate performs after graduating.¹⁰³ Based on existing literature, the relationship of the FFM in the NEO-PI-R has relatively weak validity for cognitive and non-cognitive measures used in admissions.^{103,104}

Of additional consideration, if the evidence-base related to personal attributes evolves to support the validity of personality profiling in admission processes, it is important to recognize that general dentists and dental hygienists fulfill a professional role of serving all members of the population, and therefore the personal attributes of those practitioners need to align with the propensity to provide care to patients at all stages of life. While the recommendations made by participants may not fully consider the complexity and challenges of developing admissions processes, what the contribution of findings from the current study does achieve is a relatively

common set of personal attributes that participants found to be helpful in providing infant-toddler dental homes. Additionally, many of these attributes are consistent with those identified in existing literature examining personality profiles of pediatric dental practitioners, which supports that future research regarding the influence of personality attributes on provision of care is merited.

Education and training. Personal attributes are symbiotic with education and training, and together they enhance professional stewardship. In understanding factors that facilitate the practitioner in provision of infant-toddler dental homes, one of the most emphasized findings from this study is the importance of education and training in infant-toddler oral health care. Since provision of infant-toddler oral health care is a clinical skill with underlying didactic theory, participants stressed the value of education that integrates didactic and clinical training in infant-toddler oral health. Study participants often used the terms education and training interchangeably. However, current literature in adult education often differentiates between education and training.¹⁰⁵ Education refers to “organized and sustained instruction” to develop knowledge and is commonly associated with the learner gaining theoretical knowledge and understanding.^{105, p17} Didactic instruction usually accomplishes this objective.¹⁰⁵ Training has more specificity than education in that it is the actual means or act of inculcating the learner with specific skills.¹⁰⁵ In the context of dental and dental hygiene education, this is best accomplished through a hands-on clinical component of the program.

Didactic education facilitates provision of infant-toddler oral health care by imparting theoretical knowledge and understanding, such as caries etiology and disease prevention. Clinical training focused on infant-toddler oral health care increases a practitioner’s ability, proficiency, comfort, and competency in providing patient care, by providing the learner with

experience in delivering skills associated with infant-toddler oral health care such as conducting a knee-to-knee examination. Laconically, provision of infant-toddler oral health care involves delivery of a series of clinical skills unique to this cohort. Study participants identified skills utilized in provision of preventative care for infants and toddlers including: taking a medical history, conducting a caries risk assessment, providing a knee-to-knee examination, and engaging parents in motivational counselling. Through clinical training, the student is afforded hands-on experience in providing care for an infant or toddler, which fosters competence and subsequently comfort. In order to provide clinical skills competently, the student must also acquire the knowledge and understanding of disease etiology and appropriate treatment protocols, which are learned through didactic education. The effectiveness of blending didactic education and clinical training in improving professional practice, compared to either method alone, was highlighted through a Cochrane review of continuing medical education.¹⁰⁶ Integrated didactic and clinical education was particularly more effective for more complex skills.¹⁰⁶ Provision of infant-toddler oral health care is complex in that the practitioner must concurrently manage the child and interact with the child's caregiver while delivering clinical aspects of care.

The results from the present study, describe the importance of having clinical exposure to infants and toddlers through oral health education and training. While most participants who graduated from their undergraduate dentistry or dental hygiene program within the last 10 years had received some didactic education in early pediatric oral health, no study participant had seen an infant or toddler during their undergraduate clinical training. For dentists who went on to have careers as pediatric specialists, their competence and confidence in providing infant-toddler oral health care was facilitated by having repeated exposure to young children, including infants and toddlers, through their pediatric dental program. The influence of clinical training as a facilitator

is underscored through the perspectives offered by several pediatric dentists, who despite having awareness of age-one guidelines through their undergraduate dental education, did not provide care to infants or toddlers as a general dentist because they lacked comfort in the clinical provision of care. Not until they had clinical training and exposure to treating infants and toddlers in their pediatric program did several pediatric dentist participants initiate provision of infant-toddler oral health care in their practices.

However, several participants were general practitioners whose undergraduate training did not provide an opportunity to treat an infant or toddler, yet they transitioned to providing care for this cohort within their practices. In the absence of clinical exposure to infants and toddlers through undergraduate education and training, general dentists and dental hygienists had most often gained clinical exposure through mentorship by a dental colleague who was an experienced provider of infant-toddler oral health care. Only one participating dental hygienist had not been mentored by a dental colleague, and had self-initiated provision of infant-toddler oral health care within her independent dental hygiene practice. However, she felt that her appreciable life experience with infants, toddlers and young children, in combination with her considerable experience as a dental hygiene practitioner afforded her sufficient knowledge and proficiency to provide oral health care to infants and toddlers.

Study findings that education and training in infant-toddler oral health care facilitate provision of care are broadly consistent with other studies that have assessed the importance of educating dental practitioners in infant-toddler oral health care.^{53,64,72,74,107} This current study builds on existing research by demonstrating that through education and training participants gained competency which subsequently facilitated comfort in providing infant-toddler dental homes. Similarly, McFarland et al. determined that comfort is a metric that significantly

correlates to practitioners' readiness to provide preventive oral health services to infants and toddlers.⁷²

In recognizing the role of education and training in facilitating provision of care, participants strongly endorsed greater inclusion of infant toddler oral health care in undergraduate curriculum for general dental and dental hygiene programs. Findings from previous research reaffirm this recommendation. Through a retrospective survey, Seale and Casamassimo demonstrated that students who performed dental examinations on children less than three years of age during undergraduate dental training were more likely to provide care to children in this age cohort as part of their career path in clinical practice.⁶⁴ In a prospective, pretest-posttest design Fein et al. examined the effect of change in dental students' knowledge, confidence, opinions and behaviors related to provision of infant-toddler oral health.¹⁰⁷ Through a clinical intervention fourth year undergraduate dental students received a series of lectures on infant-toddler oral health care followed by several hands-on clinical sessions in which students provided preventive oral health care to children up to age three. Students who participated in the educational intervention had higher adjusted average post-confidence scores than their counterparts.¹⁰⁷ Eighty-eight percent of students in the intervention group indicated that they were more likely to treat infants and toddlers after having clinical experience through their dental program.¹⁰⁷

In a Canadian context, Schroth et al. conducted the first national survey of dental and dental hygiene schools to assess how accredited programs prepare undergraduate students in the area of infant-toddler oral health care.⁵¹ This study found that less than a third of Canadian dental and dental hygiene programs offer clinical hands-on experience in performing infant-toddler oral health care. Lack of access to patients, program time, and resources were cited reasons for non-

inclusion.⁵¹ However, the scope of practice of general practitioners includes provision of care to all age cohorts; hence both Schroth et al. and participants in the current study expressed that undergraduate education and training need to provide students with opportunities to have exposure to all age cohorts.

Beyond identifying the need for education and training in undergraduate programs, participants also recommended possible opportunities to enhance students' exposure to infant-toddler oral health care. Simulations with a doll were proposed by study participants as a mechanism to familiarize undergraduate dental and dental hygiene students with how to position an infant and or toddler for a knee-to-knee examination. In interpreting the utility of this participant recommendation, an advantage of utilizing simulations to help familiarize students with provision of infant-toddler oral health care is that educational institutions have identified that access to infant and toddler aged patients is a barrier to inclusion in undergraduate dental and dental hygiene programs.⁵¹ Simulations with a doll eliminates this barrier. Existing research has also demonstrated that simulation experiences in preclinical training can help to provide a smoother transition to clinical provision of care.¹⁰⁸ However, even study participants who brought forward this suggestion identified that simulations should only be a transitory mechanism because there will be inadequacies associated with doll-based simulations. For example, management of infant and toddler behavior and interactions with parents cannot be realistically simulated. Therefore, the ultimate aim should be to have students exposed to clinical situations involving actual infant-toddler patients.

Several participants recommended integrating clinical training in infant-toddler oral health for undergraduate students by utilizing existing university dental and dental hygiene clinics. A potential benefit of this strategy is that care could be provided through the same

identified site where dental and dental hygiene students provide much of clinical care during their education and training, and therefore the infrastructure is already in place. However, for this strategy to be possible, universities must develop an adequate infant-toddler patient base. Universities that train pediatric dental specialists have found mechanisms to develop a pediatric patient base for their students, and conversing with directors of these programs may help elucidate strategies that could be used in undergraduate programs to access infant-toddler patients. A potential limitation of this strategy is that provision of care through existing dental and dental hygiene clinics may not enable provision of an ongoing patient-practitioner relationship which typifies the traditional dental home. However, the intent of undergraduate clinical training in infant-toddler oral health care is neither to create nor simulate a dental home. Rather, clinical training in infant and toddler oral health care prepares the student for creating or being part of a dental home that offers infant-toddler oral health care when they graduate and commence their working careers.

Other participants in the current study emphasized the utility of developing partnerships with existing community programs for families with infants and toddlers. Participants who made this recommendation highlighted that this strategy could increase accessibility to infant and toddler patients, and that families might be more receptive to having care for their child through a program or initiative that they have already accessed. Affording students clinical exposure to infants and toddlers through community-based clinical opportunities parallels the recommendation made by Schroth et al. who proposed that dental and dental hygiene educational institutions create collaborations outside of dental university clinics to afford students with opportunities to treat infants.⁵¹ Furthermore, Schroth et al. formulated this recommendation in consideration of findings from their study that Canadian dental and dental hygiene educational

institutions cited lack of patients as a significant reason for non-inclusion in undergraduate training.⁵¹

Beyond identifying community rotations as one potential mechanism to increase students' exposure to the infant-toddler cohort, Schroth et al. also discussed the need to balance the recommendation of educational institutions exploring innovative ways to include clinical instruction for students with the desirability of having a systems-level approach to education of dental and dental hygiene students.⁵¹ Schroth et al. describe a systems-level approach as the organizational systems supporting the educational structure of dental and dental hygiene education through processes such as accreditation.⁵¹ A systems-level approach through review and amendment of accreditation requirements by the Commission on Dental Accreditation of Canada to include infant-toddler oral health care may help to ensure that dental and dental hygiene education affords students with opportunities to provide care to the infant-toddler cohort during training, and is a specific recommendation from Schroth et al. study.⁵¹ Fundamentally, this means that coordination is required so educational outcomes are in accordance with accreditation requirements and stated policies, and meet the needs of the profession.

While training through undergraduate dental and dental hygiene education was viewed by participants of this current study to be the most effective means of creating awareness and promoting uptake of infant-toddler oral health within the dental profession, participants also advocated for continuing education (CE) for registered practitioners. Several participants in the current study had either undertaken or delivered CE, but they reported a paucity of CE related to infant-toddler oral health care relative to other aspects of oral health. Additionally, participants who had undertaken CE had done so after transitioning to inclusion of infant-toddler oral health in practice, and therefore, several participants questioned the extent to which CE opportunities

would effectively promote practice uptake. This supposition made by some participants, is somewhat inconsistent with the findings of McFarland et al. who determined that practitioners who have undertaken infant-toddler continuing education (CE) were more likely to provide care to this cohort.⁷² While the study by McFarland did not explore what motivates practitioners to pursue infant-toddler continuing education, participation in CE was found to be significantly related to practitioners' stage of readiness to offer infant-toddler oral health services.⁷² Furthermore, research has shown that time intensive CE such as small group workshops with standardized patients and role playing appears to be more effective than traditional CE courses (i.e. lecture only).^{72,109}

In January 2016, the Canadian Dental Association (CDA) launched the on-line First Visit First Tooth (FVFT) resource, which includes information for parents, non-dental primary health care providers, and dental practitioners regarding infant-toddler oral health care.¹¹⁰ The dental practitioner component includes a continuing education toolkit, and represents a national basis to educate practitioners in infant-toddler oral health. Included in the toolkit is a comprehensive presentation on infant-toddler oral health and a doll which can be used to demonstrate knee-to-knee positioning.¹¹⁰ A preliminary evaluation of FVFT showed that from January to June 2016, 716 dental practitioners had participated in this continuing education opportunity; however, uptake had considerable variation between Canadian provinces.¹¹¹ As reported, from January to June 2016, 10 practitioners in Alberta participated in the FVFT course, which represents 1.4% of all participants across Canada.¹¹¹ This assessment suggests that proportional participation by Alberta dental practitioners is lower than in most other provinces, and therefore, further evaluation of provincial variation in FVFT CE participation is merited.

Ultimately, a multi-pronged approach to practitioner education which encompasses undergraduate education and continuing education is desirable. Both of these aspects of training must be addressed to increase the dental community's understanding of the rationale underlying the infant-toddler dental home and the commitment and ability to provide care to all patients in this cohort.

Experience. Experience in provision of infant-toddler oral health care is perhaps the most influential intrapersonal facilitator. Through experience, the practitioner gains knowledge and competence in provision of care, subsequently enhancing practitioner comfort. The premise that experience enhances comfort parallels the adage that "repetition is the mother of skill." The effect of experience as a facilitator is consistent with the findings of Manski and Parker who determined that dental hygienists with more experience were more likely to be aware of appropriate treatment protocols related to ECC prevention in young children.⁷³ As articulated by many participants within this current study, experience is facilitating by way of enhancing practitioner comfort, and furthermore, lack of practitioner comfort and experience may create a propensity for avoiding treating infants and toddlers. Experience therefore becomes a positive feedback mechanism that facilitates provision of care, in which the output enhances the original stimulus. In other words, competence gained through experience increases comfort, which then increases propensity to provide care. Because this positive feedback is consequential, exposure early on in dental training was again emphasized as an important means to enhance practitioner uptake.

This finding is congruent with existing literature which assessed factors associated with dental practitioners' stage of readiness to provide infant-toddler oral health care. A practitioner's stage of readiness to provide preventive infant-toddler oral health care is most strongly predicted

by the practitioner's comfort.⁷² In fact, McFarland found that comfort emerged as a much more significant predictor of stage of readiness compared to practitioner knowledge. Likewise, Ruiz et al. determined that dental hygienists who were in an action stage of treating infant and toddlers were more likely to report higher levels of comfort compared to practitioners in a contemplative or pre-contemplative stage of readiness.⁷²

As existing literature reinforces the findings from this current study that comfort and experience increase proclivity of practitioners to provide infant-toddler dental homes, strategies to improve practitioner uptake must enhance practitioner comfort. Paralleled by findings in this current study, McFarland identified practitioner comfort, is developed through acquiring clinical competence and through the practitioner feeling confident in interacting with a young child and their parent(s).⁷² Specifically, in assessing clinical aspects of providing care, McFarland considered the practitioner's comfort in positioning and performing infant-toddler examinations, diagnosing dental caries, recognizing dental abnormalities, and providing preventive services such as fluoride varnish.⁷² This study also assessed patient management, as an aspect of comfort, through the construct of the practitioner's comfort in dealing with crying infants.⁷⁰ Practitioner-based communication competencies in the McFarland et al. study centered around explaining the infectious nature of ECC and bacterial transfer, as well as discussing proper infant feeding practices with parents.⁷²

The analysis conducted by McFarland et al. determined that comfort is a complex construct that is influenced by multiple and diverse factors, including provider training and experience in clinical skills, patient management, and communication strategies. However, no research to date has comprehensively assessed experiences and mechanisms through which practitioner comfort is enhanced. For participants within the current study, experience increased

self-efficacy. This finding can be interpreted in the context that provision of infant-toddler care involves a series of clinical and patient management skills that are developed experientially. Once a practitioner engages in provision of care, competence and comfort will grow in a complimentary evolution. However, if a practitioner's education and training do not advance the entry level practitioner to the threshold level of comfort necessary to engage in treating infants and toddlers, avoidance is a probable outcome. This again emphasizes the need to include clinical training and experience during undergraduate education.

Participants also expressed that life exposure to infants and toddlers facilitates provision of infant and toddler oral health care. Life exposure affords experience in understanding typical responses, behaviors and developmental milestones common to infants and toddlers such as crying, being fearful and being unable to communicate needs. A general dentist indicated that having recent familial exposure to young children (she was an aunt to two preschool aged children) had helped her feel more comfortable around infants, and latterly in providing care to young children in her dental practice. Knowing that crying is a normal response for infants and toddlers is an example of how life exposure enhanced her comfort. However, this participant also suggested that life experience with infants alone would not likely encourage many practitioners to transition to inclusion of infant-toddler oral health care because they still lack comfort in provision of clinical aspects of care, such as the knee-to-knee examination. Consequently, this participant affirmed that even those practitioners who have substantive life experience with infants and toddlers would benefit from clinical experience during their undergraduate education. Furthermore, dental and dental hygiene students enter into their careers at an age where many have not been presented with life opportunities to interact with infants and toddlers in a manner

which would enhance practitioner comfort, and therefore, the foundation of experience through education was again emphasized by study participants.

Motivational influences. All participants in this study were actively involved in provision of infant-toddler oral health care. Understanding the factors that influenced them to become involved in provision of care and the factors that motivate their continuing provision of care may provide insight regarding how broader uptake within the dental community may be achieved. Practitioners spoke of their understanding of why infant-toddler oral health care is important, how they developed this understanding, and how understanding the rationale underpinning the age-one dental home has influenced their personal involvement in infant-toddler oral health care.

As providers of infant-toddler dental homes, study participants expressed that early childhood caries prevention is important to the oral and overall health of a child. This was a common foundational rationale for practitioners choosing to provide infant-toddler dental homes. For many participants, this motivation was strongly influenced by treating children with early childhood caries and witnessing the consequences of inadequate care. Seeing these consequences developed the practitioner's awareness about the importance of infant-toddler dental homes as a mechanism to prevent ECC. One pediatric dentist described how seeing young children with caries, which he described as "the dark side of things", motivated him to provide infant-toddler dental homes because seeing children by age-one for preventive care enabled him to help inhibit the disease process and maintain the child's oral health. This participant's own rationale for providing early pediatric care was facilitated by his understanding of the need for and purpose of infant-toddler dental homes, which he gained experientially, and subsequently guided his intrinsic motivation to provide care to infants. Ultimately, experiential and intrinsic motivational

factors are not discrete entities. Rather, they co-exist as overlapping symbiotic inputs which together develop the practitioner's understanding and rationale for providing infant-toddler oral health care.

Existing research has assessed practitioners' values and opinions related to infant oral health as constructs to determine readiness to provide care.^{72,74} McFarland et al. found that the majority of general dentists who actively provided infant-toddler oral health care were significantly more likely to value preventive infant-toddler oral health care and rate provision of infant-toddler care as "very important."^{72, p143} Similarly, Ruiz et al. determined that dental hygienists who rated their intrapersonal value of preventive infant and toddler oral health care as "high" were considerably more likely to be actively providing care compared to their colleagues who were in contemplation or pre-contemplation stages of readiness.^{74, p150} A third study by Fein et al. considered practitioner opinion, defined as "beliefs and attitudes regarding prevention and restorative needs for infants and toddlers" as a construct related to provision of care.^{107, p1173} This study found that adjusted post-scores of dental students who were exposed to providing infant-toddler oral health care during their undergraduate training were higher than the control group, indicating that students who treated infants placed a greater importance on infant and toddler oral health after having clinical experience with this cohort.¹⁰⁷ This finding provides evidence that is congruent with the recommendation of participants in the current study that students need to be exposed to infant-toddler oral health to help develop an appreciation for the rationale underpinning infant-toddler dental homes. Fein et al. also found that students who provided infant-toddler oral health were significantly more likely to self-report anticipated future practice patterns which included provision of early pediatric oral health care compared to a group of control students who did not have exposure during their training.¹⁰⁷ A preliminary step in

developing practitioners' motivation to provide infant-toddler oral health care is having the practitioner understand and appreciate the rationale for the age-one dental home. This research by Fein et al. highlights that in addition to experience, education helps practitioners understand the rationale supporting provision of infant-toddler oral health care.

Practitioner rationale, experience, and education are interrelated facilitators, with these latter two parameters forming the exogenous components of practitioner rationale. A preliminary step in developing practitioners' motivation to provide infant-toddler oral health care is having practitioners understand and appreciate the rationale for the age-one dental home. Mechanisms such as education and training are important in formulating basal constructs of knowledge, confidence and rationale, which ultimately support practice uptake and are the basis for exogenous practitioner motivation. Participants also accounted for more intrinsic motivators. Intrinsic motivation, such as a desire to ensure that the child was free of disease for life or being motivated to build a practice, formulate the endogenous practitioner rationale. In analyzing motivational factors, it appears that altruistic factors have greater influence for participating practitioners than seeking financial gain as evidenced by some practitioners choosing to provide fluoride treatments and infant-toddler examinations gratis.

However, several participants suggested that accentuating the infant-toddler dental home as a means to build a practice could encourage non-providers to transition to inclusion. Participants formulated the rationale that investing in infant care was a good practice builder to draw other family members into a practice and also to create a long-term patient through investing in the child at a young age. Also, participants who were general practitioners considered infant-toddler care to be part of providing a family practice model. The merit of this finding must be balanced with the economic constraints related to lower remuneration structures

that were also identified by study participants. However, assuming the infant or toddler becomes a lifelong or long-term patient, over time they will contribute to the profitability of the practice. Of equal importance, participants conjectured that family members of the infant would recognize that practitioners who provide age-one dental homes are interested in best serving their patients' needs, and patients are therefore drawn to practices that offer client-centered care based on best practice evidence.

In summary of this subcategory, the findings from the current study and existing literature indicate that the practitioner is motivated to provide infant-toddler dental homes by valuing, appreciating, and understanding the rationale underlying early pediatric care recommendations.

Practice: The What, Where and How

The current findings show, establishing patient contact, clinical components of care, the practice setting in which care is provided, the infant-toddler dental home team, and interprofessional practice with other health providers facilitate provision of infant-toddler dental homes within the context of the broader theme the Practice.

Establishing patient contact. A basic prerequisite to providing care is finding mechanisms to establish contact between the dental home and potential patients. In analyzing the steps that facilitate practitioners in creating infant-toddler dental homes, it is evident that establishing a dental home must be concurrently accompanied by making potential patients aware of the existence of the dental home and educating them about the value of infant-toddler oral health care, so parents of infants and toddlers are motivated to establish care by age one.

Many participants in the current study had conversations with existing patients, who had an infant or toddler in the family, to encourage families to establish an infant-toddler dental home.

While treating existing patients, the dental practitioner asks if they have an infant or toddler in their family. If they do, the dental practitioner engages them in a conversation which is intended to make them aware of the concept of a dental home, educate them about the advantages of the dental home, and hopefully have them establish a dental home for their infant or toddler. It should be emphasized that the conversation must go beyond creating awareness and that parental education is critical to increase the probability the parent(s) will actually establish a dental home for their infant or toddler. This concept was supported by study participants and is consistent with an existing study conducted in Edmonton, Alberta.¹¹² A study involving a group of Canadian newcomers found that parental awareness of recommended practices related to their children's oral health did not correlate with dental attendance.¹¹² A similar qualitative analysis in Manitoba found that even when parents reported awareness regarding the age-one recommended dental visit that in the absence of perceived need they chose not to seek care because the parent(s) did not have any concerns with their child's oral health.¹¹³ This highlights the importance of providing education to parents regarding the rationale and benefits for the age-one dental home so the likelihood they will establish a dental home for their infant or toddler is enhanced.

Several participants also used direct conversations with parents as a form of anticipatory guidance. This meant that practitioners proactively counselled patients on oral health care recommendations for infants or toddlers. Existing meta-analyses provide support for using this approach to enhance patient engagement and adherence to practitioners' recommendations.¹¹⁴⁻¹¹⁶ Furthermore, research that has studied patient behavior change has demonstrated that coupling recommendations with anticipatory guidance can help patients adopt the recommendations by facilitating a conversation in which the patient appreciates the need for the change.¹¹⁷

In looking to advance uptake of infant-toddler dental homes, using direct conversations with patients relies on dental practitioners initiating these conversations. This strategy is therefore limiting in that existing research indicates that not all dental practitioners follow age-one dental home guidelines. Consistent with the findings of this study, research by Schroth et al. found many parents have been told by their dental practitioner to not to bring their child in for care until two or three years of age, and in some circumstances even later than age three.¹¹³ Furthermore, this strategy relies on counselling parents of infants or toddlers when care is provided for another family member. Therefore, if other family members do not access dental care, there is not an opportunity to engage parents in this conversation.

Participants identified referrals from non-dental medical professionals who see infants and toddlers as another mechanism to establish contact. However, they also emphasized that this mechanism worked best when there was an established professional relationship between the medical practitioner and the dental professional. With respect to participants' emphasis on the importance of having a professional relationship with the physician, it can be interpreted that the professional relationship had importance in that the physician had an identified dental colleague to refer patients to, and also likely heightened the physician's awareness about the importance of early preventive dental care. Conversely, in the absence of a professional relationship, when participants received physician referrals it was typically for an acute dental concern.

Establishing patient contact through physician referral to a dental home is a strategy that may have potential for future applied research in looking to improve infant-toddler dental home uptake. One reason is that nearly 90% of one-year-olds attend Well Baby examinations,¹¹⁸ which validates participants' comments from the current study that children often have physician contact early in life before dental care is established. Additionally, the Rourke Baby Record,

which is used as a standardized assessment guide for Well Baby examinations in Canada, includes oral health recommendations for physicians and medical providers.¹¹⁹ The Rourke Baby Record endorses the age-one dental visit.¹¹⁸

A recent call to action by the Canadian Pediatric Society indicated that physician uptake of the age-one dental recommendation was limited.^{11,57} Inadequate current information and knowledge related to infant-toddler oral health, as well as difficulty referring patients to an appropriate dental care provider are cited reasons.^{11,57,120} Consequently, physicians must be equipped with the requisite knowledge and resources to facilitate this referral process on a broader basis. Enhanced physician education regarding the rationale and evidence underlying the Rourke Baby Record recommendation for dental visits by age one is one area that should be prioritized. This recommendation is substantiated by a Canadian survey which indicated that nearly one quarter of pediatricians and family physicians reported not having any oral health training in medical school or residency, and 79% of pediatricians and 89% of family physicians reported receiving less than three hours of oral health care training in medical school or residency.¹²¹ Furthermore, assessment of pediatricians' and family physicians' knowledge regarding ECC indicates that both groups have limited understanding of this disease.^{11,121}

Another practical strategy to support physicians in referring infants for oral health care, as identified by Schroth et al., is providing physicians and other infant-toddler health care providers with a provincial list of dentists who provide infant-toddler oral health care.¹¹³ This is an example of a resource that may have potential to help physicians identify practices where they can send infants or toddlers for care.¹¹³ As participants within this current study identified that other health care professionals including Well Child nurses, as well as dental hygienists and assistants who provide care through community oral health programs in Alberta also refer

patients, equipping these providers with resources such as a directory of practitioners who offer infant-toddler dental homes within their practices is also merited.

Clinical components of care. Participants in this current study held a perspective that the dental home concept includes operational components of clinical care, which are focused on preventing oral disease or injury for the infant or toddler. Similarly, the American Academy of Pediatric Dentistry (AAPD) guidelines on the periodicity of dental care for infants and toddlers include oral health recommendations based on the child's age and caries risk.¹²² Study participants commonly patterned preventive appointments around these recommendations, and in particular, placed a strong emphasis on parental education as a key focus of the infant-toddler dental home.

In interpreting the emphasis on parental education as a facilitator of providing clinical care, participants' accounts had two strong commonalities. Firstly, for general practitioners who may not have had specific training in clinical skills such as knee-to-knee examination technique the emphasis on parental education is facilitating because the practitioner does have competence and experience in providing oral health education. While all participants in this study provided preventive care beyond parental education, they identified that many general practitioners may not have experience in examining an infant or toddler, and therefore, may lack comfort in providing a comprehensive infant-toddler dental home. However, in recommending strategies to advance uptake, participants emphasized that all dental practitioners should be equipped with the skills and competence to provide oral health education to parents. Oral health education is a conversation between the practitioner and the infant's or toddler's parent. While the content of oral health education is specific to infants and toddlers, oral health education is directed and delivered to the infant's or toddler's parent(s) who is an adult. Therefore, while some of the

content of the education is infant-toddler specific, the mechanism of delivering this content is a skill with which general dental practitioners have proficiency and competence. Comparatively, delivering restorative treatment or even a clinical examination involves many other competencies in patient management and clinical skills such as being able to position the infant or toddler, and general practitioners may not have this familiarity. Even for pediatric dentists who had considerable experience in providing preventive and restorative care to infants and toddlers, the emphasis on parental education was facilitating because, as they described, parental education is less stressful than doing restorative care on an infant or toddler. Participants therefore reiterated that all practitioners can initiate care for infants and toddlers through parental education, and thereafter either provide other components of care or refer.

Secondly, the emphasis on parental education was indirectly facilitating for all participants because they described education as an important strategy to prevent disease. Treatment of caries for an infant or toddler most often is more complex than for older children or adult-aged patients because of factors such as the infant or toddler not being able to fully understand verbal instructions so that the practitioner can elicit patient cooperation and comfort. Additionally, infant-toddler behavior management is challenging, therefore, restorative treatment usually has to be done under a general anesthetic, which reinforces the benefits and desirability of disease prevention. As described by study participants, parental education around common caries risk factors is a mechanism to help practitioners prevent disease by working with the parent to reduce risk factors. By managing factors such as the infant's or toddler's diet and proper homecare, parents can help reduce risk factors. Other clinical components of care, such as the caries risk assessment and prenatal oral health care were also discussed by several participants. Just as parental education is facilitating by means of providing the practitioner with

a strategy to mitigate disease, so too are these other clinical components of care focused on disease prevention.

Patient management was also described as a clinical component of care. From a developmental perspective, infants and toddlers are considered to be in a pre-cooperative stage, and fear of strangers is usually displayed by the time an infant is seven to twelve months of age.¹²³ Therefore, having age-appropriate patient expectations such as recognizing the normalcy of the infant crying and having patient management strategies help the practitioner make the infant or toddler and their parent feel more comfortable. Several participants described that an important part of patient management is patient trust. Through patient trust, the practitioner helps to manage the infant's or toddler's apprehension. Managing apprehension of the infant or toddler also puts the practitioner at ease, and therefore practitioners who have developed infant or toddler patient management strategies find these approaches facilitate provision of care. Furthermore, the way the practitioner interacts with the child also helps to elicit parental trust.

Working with the infant's or toddler's parent(s) is a defacto prerequisite to facilitating the infant-toddler dental home for the practitioner, the patient, and the parent. Therefore, provision of clinical care is also facilitated by parental trust. Managing the comfort of the infant or toddler is one component that facilitates parental trust, but practitioners also created parental trust by engaging the parent through a non-judgmental approach. Previous research has also established that parental management, as a clinical component of care, in which the practitioner develops a trusting environment for the infant and toddler and the parent(s), is important in creating a successful experience.¹²⁴⁻¹²⁷ Failure to establish this trusting environment may in turn delay or even prevent the patient and parent(s) from returning for continuous care.¹²⁴⁻¹²⁷ This potential

consequence reinforces the importance of patient management, for both the infant or toddler and the parent(s) as an influential factor in providing an infant-toddler dental home.

Another related aspect of the infant's caries risk is related to the mother's oral health status. Therefore, having a practitioner-patient relationship with the infant's mother also facilitates providing care because caries is a bacterial-driven disease, and the child is typically inoculated with the bacteria through the mother's saliva, in a process called vertical transmission. Prenatal oral health care facilitates provision of the infant-toddler dental home by providing an opportunity to detect untreated dental caries in the mother to mitigate bacterial transmission, and is also an opportunity to provide oral health education about establishing care by age one.

Practice setting. Participants' comments regarding practice setting were diverse which in fact is consistent with the varied practice settings of the participants. Some participants, especially pediatric dentists, identified components of their practice which facilitated provision of care. Practices which had access to an operating suite to provide restorative treatment described how they were able to offer a comprehensive dental home in which all care required by the infant or toddler could be delivered within the practice. Many pediatric dentists and some general practitioners identified components of their practice which had been set-up to be child-friendly. Child friendly spaces were created through having open concept areas with toys. Practitioners also considered how to accommodate parents by having wide corridors to accommodate strollers and an area for nursing and changing the infant or toddler. These accommodations within a practice facilitate provision of an infant-toddler dental home by enhancing the comfort of both the patient and the parent. As the patient and parent feel more at ease, provision of care is also easier because managing the patient is an important aspect of care.

Other participants acknowledged that while a child-friendly environment was beneficial, a preventive dental home could be offered through any practice setting. The majority of participants who were general practitioners had not made any special adaptations within their practice setting. Participants also indicated that provision of an infant-toddler dental home requires no specialized equipment, reinforcing that most practice settings can accommodate infants and toddlers. These findings suggest that while the practice setting can facilitate provision of care, absence of special accommodations does not appreciably impede provision of care. Accordingly, as participants discussed strategies to improve uptake of the infant-toddler dental home, they emphasized that the practice setting of typical dental offices can accommodate infants and toddlers. Other participants even suggested that the dental home did not require a dental office as a practice setting and that care could be provided in a community context.

The perspective of participants that the infant-toddler dental home can be provided in any practice setting should be interpreted within the context of models of care identified in the medical and dental community. An expert panel convened by the Maternal and Child Bureau in the United States to explore the concept of the dental home was tasked with defining and identifying how to establish dental homes based on promising practices and programs.⁷¹ One aspect of their review included models of care, which in part relates to the practice setting subcategory in this current study.⁶⁹ One of the guiding questions asked of the expert panel was, “Does the dental home concept apply more to a private practice or community setting?”^{71, p8} This guiding question shows that the concept of practice setting can be viewed from a broader perspective. This expanded focus looks at the concept of placing the dental home as an element of the community environment. The panel resolved that stand-alone dental homes in private dental practice settings may not adequately incorporate key components of the dental home

model inclusive of access to care, quality of care, and coordination of care. Several alternate models which expand on the traditional private practice setting were proposed. The health home model was one conceptualized practice setting in which medical care and dental care operate as a holistic unit to mitigate a silo approach to health care. In the dispersion model, the entire community serves as the dental home. Under this conceptual practice model, preventive care is delivered in community settings, risk assessment and education are coordinated by primary care professionals and restorative treatment is provided in a private dental clinic. Other models combined different aspects of the health home and dispersion models.⁷¹ These models largely exist conceptually, and further research is needed to evaluate the impact of alternate practice settings serving as a dental home. The diversity of these proposed models aligns with the diversity found in the practice settings of participants in the current study and reaffirms that the dental home concept is defined by providing continuous, comprehensive and family-centered care and not by the physical practice setting.

Furthermore, in relation to the current study in which participants proposed dental home practice settings beyond a standalone private practice, the report from the Maternal Child Health Bureau highlights that the connotation of the dental home practice setting is evolutionary.⁷¹ As the dental home evolves to potentially encompass alternate settings, implementation must be accompanied with close evaluation to ensure that the pillars of comprehensive, continuous, coordinated and family-centered care which are foundational to the dental home are preserved. However, an important preliminary step in looking for strategies to improve uptake of infant-toddler dental homes in Alberta is recognizing that current providers of infant-toddler oral health have been able to offer this care within a common general dental practice setting, and

accordingly, the practice setting is likely not a significant impediment to encouraging other general dental practices to provide this service.

The infant-toddler dental home team. A coordinated dental workforce facilitates a comprehensive approach to infant-toddler oral health care that characterizes the dental home model. A fundamental underpinning to a functional infant-toddler dental home team is ensuring that all dental staff within the practice provide consistent messaging to all patients. For participants who have introduced the infant-toddler dental home to their practice, having a practice culture in which the employer and other office staff were supportive facilitated this transition. In one participant's experience, when staff in the practice did not universally endorse infant-toddler dental homes, messaging was inconsistent and created confusion. Several participants identified that their colleagues did not provide infant-toddler oral health care because they worked in a practice that did not support provision of care. These findings concur with existing literature which indicates that working in a practice that is supportive of infant-toddler oral health care facilitates provision of care. Ruiz et al. found that dental hygienists' readiness to provide infant-toddler oral health care was inversely related to practice constraints, and discussed the need to motivate general dentists to embrace inclusion of infant-toddler oral health care.⁷⁴ Other than practitioner comfort, practice constraints were the only other significant metric that Ruiz et al. found to be predictive of stage of readiness to provide care to this cohort, and suggested implementation of broad and system-based strategies such as policy agendas supporting infant-toddler oral health care, improved remuneration and enhanced general practitioner education to ensure that individual practices and providers would be motivated to transition towards inclusion.⁷⁴

In moving beyond the consistent messaging from all office members, participants also emphasized the value of engaging all staff in the delivery of care to the extent their training and qualifications permit. For many participants, recognizing that the entire dental team contributes to the successful provision of infant-toddler oral health care was facilitating. While pediatric practices are recognized as specialty providers of infant-toddler oral health care, several of the pediatric specialists in this study echoed the findings of Seale and Cassamassimo that there are insufficient pediatric dentists to address oral health needs of all children, and therefore involvement of all general practitioners is necessary.⁶⁴ In this context, Seale and Cassamassimo reported that while general dental practitioners represent the largest proportional component of the dental workforce, data from the United States indicates that most general dental practices do not provide care for very young children.⁶⁴ As participants within the current study also supported the desirability of enhancing uptake of infant-toddler oral health care through general dental practices, strategies to encourage this transition are necessary. Based on findings from this current study, approaching provision of infant-toddler oral health care as an “infant-toddler dental home team” facilitates provision of care. For study participants who adopted this approach to care, one model of care that was utilized was having general dentists and dental hygienists provide preventive and basic restorative care, but referring more complex procedures to a pediatric dentist. This approach to care through a general practice-pediatric dentist dyad appears to be beneficial for the pediatric dentist, the general practice, and for patients. Operating as a general practice-pediatric dentist dyad is beneficial for pediatric dental practices because it allows them to focus on providing care which requires their specialized expertise. For the general dental practitioner, approaching provision of the infant-toddler dental home as a team with a general practice-pediatric dentist dyad is facilitating because the general practitioner can provide

preventive care and perform simpler procedures, and can refer infants and toddlers with more complex needs to the pediatric practice. As several general practitioners in this study indicated, having a pediatric specialist to refer complex care to helps them to feel supported and comfortable in providing an infant-toddler dental home. This model is also advantageous for the infant or toddler and the family because care is accessible and continuous through the family's general dental practitioner, and it is comprehensive because there is a referral pathway for more complex needs if required.

For this approach to care to be successful as a strategy within the broader dental community, the role of each member of the infant-toddler dental home team must be clearly defined, and practitioners need to be adequately prepared through their education. For example, one participating pediatric dentist emphasized that every general dentist and dental hygienist should be able to provide routine preventive infant-toddler oral health care including an examination, risk assessment, parent education, and application of preventive therapies such as fluoride varnish. In addition to education and training, mechanisms to inform parents about how to access an appropriate primary dental provider for their infant or toddler must also be established and be publicly accessible. These strategies are analyzed in more detail within discussion of the Population theme.

Approaching provision of infant-toddler dental homes as a team also encompasses utilizing dental hygienists' and dental assistants' full scope of practice to deliver patient care. In some participants' practices, the dental hygienist was the primary provider of infant-toddler oral health care. In another pediatric dental practice, the pediatric dentist explained how she worked in tandem with dental assistants and dental hygienists to reinforce critical messaging to parents and to improve operational efficiency. This operational model facilitated provision of care

because the practice operated as a team to assist the pediatric dentist, so she could focus her expertise on treatment needs that were outside of the scope of the dental hygienists and dental assistants. Additionally, the Canadian Dental Hygienists Association recently released a position statement, “Filling the gap in oral health care” which provides a proposed educational framework to place increased emphasis on having dental therapy provided by dental hygienists.¹²⁸ This statement provides national level support for utilizing the dental hygiene profession to help address unmet oral health needs, and could further enable dental hygienists to assume a primary care provider role within infant-toddler dental homes.

In Alberta, under the Health Professions Act, diagnostic care and preventive care are entirely within scope of practice of dental hygienists and dentists.⁷⁶ Optimizing scope of practice by having the dental hygienist as the primary provider of preventive infant-toddler care could help improve practitioners’ uptake of infant-toddler dental homes by way of managing operational costs and by reducing the burden of care on dentists who bring expertise in other aspects of oral health care that are outside of the scope of practice of dental hygienists. In the context of existing literature, to the best of the researcher’s knowledge, no research to date has evaluated the effectiveness of using midlevel dental providers (i.e. dental hygienists) as the primary provider of a preventive infant-toddler oral health care. However, a recent comprehensive literature review did synthesize international evidence related to using midlevel dental providers for direct patient access.¹²⁹ By definition, direct access is a term that describes the ability of patients to seek health care from midlevel dental providers without first seeing a dentist, and the impact of this provider model was assessed using domains of patient safety, patient satisfaction, social acceptability, professional acceptability, efficacy, cost effectiveness, efficiency, and profitability.¹²⁹ The review noted that there is limited experimental evidence and

most included studies were descriptive. However, all results were consistent in that midlevel dental providers performed to a similar standard to primary care dentists, inclusive of efficacy of treatment provided. Though results should be interpreted with caution due to high risk of bias, an analysis, included in the review, found an advantageous benefit to cost ratio for a clinic run by independent dental hygienists compared to a control clinic run by primary care dentists, where care was provided for children between 13 and 18 years of age.^{129,130} A descriptive telephone survey in Alberta, Canada reported that 65.8% of respondents would visit an independent dental hygienist, 58.4% desired the freedom to choose to see a dental hygienist, and 56.3% believed that seeking care with an independent dental hygienist would save money.¹³¹ Accordingly, piloting a model using dental hygienists as the primary provider of preventive infant-toddler oral health care within a dental home has further merit with respect to anticipated patient acceptability.

Strategies to improve uptake of infant-toddler care will benefit from research to address how all care providers can best contribute to improving access. With the intent of creating best practices for the dental community to provide care to the infant and toddler cohort, future research could assess patient acceptance of seeing a dental hygienist as a primary provider for preventive infant-toddler dental homes and the efficacy of care provided. Weintraub also recommended that dental hygienists should be utilized as primary preventive providers in infant-toddler oral health care.¹³² However, as stated by Manski and Parker, despite validation of dental hygienists as preventive specialists, dental hygienists need more education in infant-toddler oral health care.⁷³

Interprofessional practice. Interprofessional practice considers the nature of working collaboratively with other health professionals to facilitate provision of infant-toddler dental

homes. Currently, the nature of collaboration varies significantly based on factors such as geography and the readiness of other practitioners to work collaboratively. Practitioners who had professional relationships with community dental hygienists and dental assistants, as well as non-dental health care professionals, including physicians and Well Child nurses, were able to collaborate more effectively than practitioners who tried to initiate collaborations in the absence of a well-established relationship. To interpret this finding, having a relationship provides a platform in which the dental practitioner can educate the non-dental medical practitioner about the infant-toddler dental home, and also creates an identifiable dental practitioner for the physician or nurse to refer patients. However, this strategy relies on dental practitioners who provide infant-toddler dental homes having a working professional relationship with their medical colleagues, which may be limiting as an approach to advance interprofessional practice. In the absence of a professional relationship, participants who had sought to initiate collaborations with physician colleagues generally indicated that receptiveness had been limited, which participants speculated was in part resultant of physicians' heavy workloads and their not having adequate awareness of how prevention of oral disease can benefit a child's overall health and development. This aspect of interprofessional practice largely centered on non-dental medical providers being informed of the importance of infant-toddler dental homes and how to access an infant-toddler dental home, so that physicians or nurses would recommend to infant-toddler patients that they establish a dental home by age-one.

This description of how interprofessional practice facilitates provision of care may offer one strategy to promote the infant-toddler dental home to parents who are unaware of the recommendation and are unsure how to find a dental practitioner who will provide care for their child by age-one. Based on the Rourke Baby Record, physicians provide Well Baby

examinations on seven to eight different occasions prior to the first birthday.¹¹⁹ Establishing oral health care by age-one is currently part of the nine-month Well Baby examination.¹¹⁹ In Alberta, children typically see Well Child public health nurses at two, four, six and twelve months based on immunization schedules.¹³³ Consequently, medical practitioners are well positioned to recommend the age-one dental home to parents.

With regard to existing literature, Brickhouse et al. reported that while 100% of pediatricians surveyed saw children from birth to 12 months, only 5% recommended that children have an oral health examination by age-one, and as a result the authors concluded that this leaves “a significant gap in the awareness of caregivers about when to initiate dental care for their children.”^{62, p151} Of further consequence, a Canadian study found that only 18.2% of pediatricians and 37.7% of family physicians reported receiving education related to oral health during medical school.¹²¹ Again, for pediatricians and family physicians who do receive oral health education during medical school and residency the inclusion of oral health care is typically very limited.¹²¹ Over 90% of physicians identified they needed more information and resources on oral health,¹²¹ and it can be inferred that the level of physician education may be insufficient to reinforce the importance of and rationale behind the age-one dental home. Prakash et al. reported that pediatricians and family physicians who received more extensive education and training were about twice as likely to counsel parents regarding oral health compared to physicians with less than three hours of training.¹²¹ This is consistent with the findings of Herndon et al. who reported that physicians who had undertaken post-residency oral health education, that was delivered in-office, were significantly more likely to incorporate oral health recommendations compared to those with either no training or another format of training.¹³⁴

In the current study, several participants suggested that interprofessional practice could include expansion of community oral health programs and the role of community oral health with respect to infant-toddler oral health care, as well as inclusion of non-dental medical providers in the provision of infant-toddler oral health care. Participants viewed community oral health programs as a mechanism to educate parents and triage patients, who were at high risk, to a more comprehensive dental home, particularly in areas with remote access and for families who do not otherwise access routine dental care. The Alberta Health Services Action Plan currently includes a preschool fluoride varnish program for disadvantaged children,¹³⁵ and evidence concurrently supports that disadvantaged children are at a greater risk for developing early childhood caries.^{135,136} Though data specific to the infant-toddler cohort is not available, current Canadian data shows an inverse care phenomenon for access to dental care. Vulnerable, lower socioeconomic status Canadians, who are at a greater risk for oral disease, access dental care less frequently compared to higher income Canadians.¹³⁷ However, this inverse care phenomenon is not present for physician care.¹³⁷ This research may bear implications with respect to provision of infant-toddler oral health care. Targeted fluoride varnish programs through Alberta Health Services, which are free of charge,¹³⁵ may help infants with a high caries risk access care. The model of interprofessional practice between community oral health and private practice dental homes warrants further assessment to determine how to best maximize the effectiveness of this strategy.

Similarly, as the inverse care phenomenon does not impact access to physician care, bringing prominence to the importance of oral health care during physician, nursing and other allied-health education and training may help to encourage non-dental medical practitioners to promote the infant-toddler dental home. Current models of interprofessional involvement of

physicians and non-dental medical practitioners in infant-toddler oral health care varies from initiatives to foster physicians educating patients about the infant-toddler dental home to having the physician or nurse provide an oral health screening and preventive fluoride varnish therapy.^{134,138-144} Literature evaluating the effectiveness of interprofessional practice in infant-toddler oral health continues to find that lack of time, lack of education, and billing are barriers reported by physicians.^{139,143} However, as research also supports that interprofessional collaboration can be effective in improving a child's oral health,¹⁴² discussion and research in a local Alberta context is merited, especially for jurisdictions which are remote and where a dental practitioner is not easily accessible. Efforts to enhance interprofessional collaboration must recognize how suggested initiatives will affect all stakeholders. A specific example of how a stakeholder group could be impacted was recognizing that physicians, who already have significant workloads, would be impacted by any policy change that could potentially increase their role in the provision of infant-toddler oral health. Extrapolating from this specific example, it is relevant to emphasize that discussions to promote interprofessional practice must include all stakeholders including dental practitioners, medical practitioners, educators (both dental and medical), administrators of community health programs, regulatory colleges and appropriate levels of governments; and also recognize the potential impacts for individual practitioners and organizations.

Profession: Organizational Influences and Impacts

The business of dentistry, professional obligation, professional guidelines and regulation, and the influence of policymakers and legislators were identified as factors that affect provision of infant-toddler dental homes. A discussion of each of these subcategories is presented in the context of the Profession theme.

The business of dentistry. In the previous Practice theme, the advantages of operating as a general practice-pediatric dentist dyad were discussed. In this operational model, the role of general dentists and dental hygienists largely centered on provision of preventive and diagnostic aspects of care. Regarding the business of dentistry, participants often acknowledged that under a fee-for-service model, remuneration for preventative infant-toddler oral health care procedures does not compare favorably to procedures which general dentists and dental hygienists would often provide for older children and adult patients such as restorative and periodontal care. Based on the Guide for Dental Fees published by the Alberta Dental Association and College on September 1, 2017, the average fee for a first dental visit (code 01010) is \$74.63.¹⁴⁵ The description of this code is:

First dental visit: oral assessment for patients up to the age of 3 years inclusive.

Assessment to include: Medical history; familial dental history; dietary/feeding practices; oral habits; oral hygiene; fluoride exposure. Anticipatory guidance with parent/guardian.^{145, p1}

Participants in this study typically booked between 30 minutes to one hour for an initial infant-toddler appointment. Comparatively, the average billing rate for 30 minutes of scaling is \$141.62 (code 11102).¹⁴⁵ Study participants identified that current models of remuneration do not favor provision of infant-toddler dental homes, especially preventive care. This finding parallels existing research in which a cross-sectional survey showed that 26-30% of dentists reported that inadequate remuneration is a barrier to providing preventive infant-toddler oral health care.^{61,65}

Several existing studies have demonstrated that remuneration may influence practice behaviors of dental professionals.¹⁴⁶⁻¹⁵⁰ Existing literature has generally reported that dental practitioners do respond to financial incentives, but the magnitude of change is difficult to

predict.^{144,147} A four-arm (2x2 design) randomized control trial in Scotland investigated if incentivized fees and education influenced dentists' provision of pit and fissure sealants in adolescents.¹⁵⁰ While the intervention based on education alone had no statistically significant effect, there was a significant 9.8% increase in the number of sealants placed in the fee incentivized arm.¹⁵⁰ An associated challenge with respect to infant-toddler oral health care is identifying what constitutes adequate remuneration. Additional research is necessary to clarify remuneration structures which would promote uptake of preventive infant-toddler oral health.

Of further consequence, participants in the current study expressed that provision of infant-toddler oral health care is affected by age restrictions on fluoride treatments under publicly-funded dental programs. Under the Alberta Dental Health Services Corporation which administers dental benefits for low-income programs through the Alberta Government, fluoride treatments are not covered for children under 48 months of age.¹⁵¹ While several participants in this current study chose to provide fluoride treatments gratis to their infant and toddler patients because they identified the benefit for the patient, this is not a sustainable long-term strategy for current providers and will not favor improved uptake in the broader dental community. Analogously, Bubna et al. reported that the most common problem identified by pediatric dentists related to provision of infant-toddler oral health care was insurance not covering aspects of treatment for children under a specific age.¹⁵² In Alberta, Amin et al. identified that insufficient coverage was the most common challenge reported by users of publicly-funded dental programs.¹⁵³ Findings from the current study on the influence of remuneration for provision of infant-toddler oral health care are corroborated by existing literature and highlight the need for future research in this area.

Another recommendation from several study participants was for the Alberta Government to provide universal dental insurance for all children. In Alberta, some children receive dental coverage for listed procedures through the provincial government; however, coverage is income based and not universal.^{151,154} Other provinces in Canada, including Quebec, Nova Scotia and Newfoundland, provide universal dental coverage for children starting from birth.⁵⁷ Assessing the impact of universal coverage on infant-toddler oral health is difficult because in the absence of national surveillance data of the preschool population the capability of providing cross-provincial comparisons in infant-toddler oral health status is limited. A study in Alberta, conducted in 2008, explored utilization of dental services by low-income families who had publicly-funded coverage, and found that 5.1% of children had a dental examination by age one.¹⁵⁴ In Nova Scotia, an epidemiological study published in 2001 determined that 8.4% of children had visited a dental office before two years of age.¹⁵⁵ This study also determined that having access to a universal publicly funded dental insurance program since birth did not eliminate disparities in caries experience.¹⁵⁵ Despite children in Nova Scotia having universal dental coverage, less dental decay was significantly associated with higher levels of parental education, optimal fluoride concentration, daily tooth brushing, and regular dental visits.¹⁵⁵ To the best of the researcher's knowledge, no study to date has assessed the impact of universal coverage on provision of infant-toddler oral health care.

Several participants in this current study recommended reevaluating remuneration for preventive infant-toddler oral health care. This recommendation must focus on developing remuneration structures that are most likely to encourage practitioners to transition towards provision of infant-toddler dental homes, and also provide the greatest benefit for the oral health of infants and toddlers. Factors related to remuneration presented within the business of dentistry

subcategory have potential implications for policy and legislation, which are discussed and detailed in the policymakers and legislators subcategory of the profession theme.

Professional obligation. Professional obligation refers to the ethical and moral obligation of all members of the dental and dental hygiene professions to be accountable to their patients, to the public and to the profession.^{156,157} Consistent with existing research findings from Schroth et al.,¹¹³ participants in the current study confirmed that some dental practitioners do not recommend commencing care until later preschool years, and participants advocated that consistent messaging regarding infant-toddler oral health care and the age-one visit needs to originate from within the dental profession.

Codes of ethics for dentists and dental hygienists in Alberta provide “a set of principles of professional conduct”¹⁵⁶ which guide and govern all registered members.^{156,157} Within the College of Registered Dental Hygienists of Alberta (CRDHA) Code of Ethics, there are six fundamental principles that form a foundation for the professional obligations of members.¹⁵⁷ Professional conduct set out through these principles highlights that dental hygienists’ primary responsibility is to the client (individual patient or community), and brings to bear implications for provision of care to all patient cohorts, inclusive of infants and toddlers. Principle 5, Accountability, states “Accountability pertains to the acceptance of responsibility for one’s actions and omissions. Dental hygienists practice competently and professionally in conformity with relevant principles, standards, laws, and regulations and accept responsibility for their behavior and decisions.”^{157, p2} The sixth principle of professionalism states, “the commitment to use and advance professional knowledge and skills to serve the client and the public good” and encompasses dental hygienists professional obligation to “maintain and advance their [the dental hygienists] knowledge and skills in dental hygiene.”^{157, p8} These ethical principles are mirrored in

the Alberta Dental Association and College Code of Ethics for regulated dentists. Specifically, under Article A2, “Current/Continued Competence,” dentists are obligated to “keep their knowledge of dentistry current and must provide treatment in accordance with currently accepted professional standards.”^{156, p6} Participants in the current study explained that the oaths they took as dental practitioners create an ethical and moral obligation to practice in accordance with professional guidelines which recommend commencing dental care by age one. Participants also unanimously expressed that professional obligation exists for all members of the dental and dental hygiene professions, and subsumed under this obligation is the responsibility to be aware of and practice in accordance with recommendations with respect to infant-toddler oral health care.

Previous research has found that within the dental professions insufficient awareness and support for practice guidelines related to the age-one dental home, as well as discomfort in providing care to infants and toddlers are cited reasons for not following practice guidelines.^{63,72} However, ethical principles for dentistry and dental hygiene effectuate change within the profession to practice in accordance with current practice guidelines, inclusive of published position statements and best practice evidence related to infant-toddler oral health care. Codes of ethics also direct practitioners to practice within their own competence, and therefore, practitioners who lack comfort in providing infant-toddler oral health care can fulfill their professional obligation by referring to a practitioner who is a provider of infant-toddler dental homes while simultaneously endorsing and promoting age-one practice guidelines within their practices. This recommendation from participants in the current study is consistent with the responsibilities of dental practitioners as outlined in the respective dental and dental hygiene code of ethics.^{156,157} As stated within the CRDHA Code of Ethics, dental hygienists can

“consider a referral to another health care provider”^{157, p5} when care required by the patient is not within the practitioner’s area of practice. Likewise, the ADA&C Code of Ethics, Article A4: Competence, Consultation and Referral affirms that it is the professional obligation of dentists to “provide assessment and/or treatment for a patient only when currently competent to do so by reason of his or her education and training, experience, or demonstrated continued competence; otherwise the dentist should consult with another dentist or dental specialist with the appropriate competencies and/or refer the patient to an appropriate care provider for assessment and/or treatment.”^{156, p6} These statements reinforce that dental practitioners are obligated to practice within areas of self-competency and if practitioners are not comfortable treating infants or toddlers there is a duty to refer. Professional obligation is symbiotic with and supported by professional policies and regulations.

Professional guidelines and regulation. Practice change is evolutionary. As the evidence base for oral health care evolves, so too must the professional guidelines and regulations which guide practice change to support dental professionals. Practice guidelines are developed to assist health care practitioners and patients with making health care decisions that are aligned with best evidence.¹⁵⁸ Practice guidelines aim to close a research-practice gap so provision of care is aligned with evidence-based recommendations.¹⁵⁹ In the context of the current study, analyzing how professional guidelines and regulations associated with regulatory colleges and professional associations facilitate practitioners in provision of care, two predominant factors were revealed. Firstly, because position statements are, in part, purposed to provide guidance to practitioners with respect to standards of care, participants referenced that guidelines related to infant-toddler oral health motivated their provision of infant-toddler dental homes. Secondly, when recommending age-one care to patients, participants referenced the position statements to

reinforce credibility by identifying that the recommendations practitioners were providing to parents come from organizations that are responsible for national and or provincial representation of the profession.

In analyzing the role of health professions' regulatory colleges and professional associations, it is important to recognize the mandates of these organizations. The role of health professions' regulatory colleges is primarily governing and regulating its regulated members in a manner that protects and serves public interest, which in Alberta is outlined through the Health Professions Act.⁷⁶ Dental and dental hygiene professional associations seek to advance the professions, and to provide leadership to further the interest of those engaged in the profession as well as the best interests of the public.^{1,110} The Canadian Dental Association and Canadian Dental Hygienists Association are a national voice for dental and dental hygiene professions; however, they have no regulatory function. The primary role of the Alberta Dental Association and College, and College of Registered Dental Hygienists of Alberta is regulatory; however, both organizations have a professional association arm at the provincial level. Since these organizations have a professional association arm, they serve a dual role. The regulatory function is mandated by the Health Professions Act, which delineates regulatory functions must supersede functioning as a professional association.⁷⁶ The role of advancing the profession and providing leadership is controlled by and is at the discretion of the associations. In this context, the role of the regulatory colleges could evolve to include policy to support evidence-based practice with respect to infant-toddler oral health care. Professional associations can support the profession through professional guidelines and resources to encourage practitioner uptake, but do not assume a regulatory function.

However, participants referenced that guidelines from the Canadian Dental Association (CDA), were important in facilitating provision of infant-toddler oral health care. These published position statements include “First Visit to the Dentist” and “Early Childhood Caries,”^{4,53} as well as other position statements such as the use of fluorides for caries prevention.¹⁶⁰ The latter addresses recommendations specific to the infant-toddler cohort such as the use of fluoridated toothpaste for children under three years of age.¹⁶⁰ Provincially, while the Alberta Dental Association and College (ADA&C) has not published a position statement, there is information on their website recommending that children commence care by age one.⁵⁶ Many participants also commonly referred to the guidelines published by the American Academy of Pediatric Dentistry (AAPD). The American Academy of Pediatric Dentistry has produced a specific policy on the dental home,¹⁶¹ and policies and guidelines through AAPD are perhaps the most comprehensive with respect to infant-toddler oral health care and include a definition of the dental home, oral health policies related to the dental home, and clinical practice guidelines on infant-toddler oral health care.¹⁶²

Dental hygiene participants also used and referenced practice guidelines and information from the ADA&C, CDA and AAPD, as well as oral health guidelines from medical associations such as the Canadian Pediatric Society. While the Canadian Dental Hygienists Association (CDHA) supports the practice of infant-toddler oral health care,¹⁶³ CDHA does not currently have a position statement specific to infant-toddler oral health care or the age-one visit, which may be one reason dental hygiene participants referred to CDA and AAPD position statements. As participants in the current study referenced that position statements help provide professional credibility to recommendations given, position statements from dental hygiene regulatory

colleges and professional associations may help to reaffirm that dental hygienists have an important role in improving access to care for the infant-toddler population.

Practice guidelines, such as position statements, provide a platform on which other knowledge translation strategies can be built to advance uptake within the profession.

Participants in the current study identified that regulatory bodies and professional associations are organizations that have a responsibility to create awareness about practice guidelines and promote consistent messaging from and within the dental and broader medical community. With respect to professional regulation, the Health Professions Act legislates the role of colleges regulating health care professions, and states in Section 3(1)(b) that colleges “must provide direction to and regulate the practice of the regulated profession by its regulated members.”^{76, p14} Health professions’ regulatory colleges are also responsible for governance of the profession in a manner that protects and serves public interest.⁷⁶ Protection and service of public interest encompasses evidence-based practice, and professional guidelines as a means through which ADA&C and CRDHA, as the provincial regulatory bodies of dentistry and dental hygiene, can promulgate consistent messaging to the profession and public. Professional associations can also support the professions through professional guidelines.

While participants in the current study expressed the importance of practice guidelines in facilitating provision of care, existing literature suggests that publication of practice guidelines is not a sufficient strategy to create a shift within the dental profession. A past survey in Manitoba, Canada showed that only 58% of dentists had awareness that the CDA and AAPD recommended first dental visit by age one.⁶¹ This finding is consistent with a similar survey of general dental practitioners in the United States which reported that only 53% of respondents were aware of American Dental Association and AAPD guidelines on age-one visit, and furthermore, of those

who were aware, 60% did not agree with the recommendation.⁶⁴ These survey results may help partially explain why participants in this current study identified that many of their dental colleagues did not provide infant-toddler oral health care, and commencing care when the child was older, at age three, four or five, was often the recommendation given to parents. Existing research also substantiates that uptake of practice guidelines in dental and medical professions varies amongst professionals.¹⁶⁴⁻¹⁶⁶

While there are inherent challenges in monitoring adoption of best practices related to infant-toddler oral health care, practice guidelines provide an important basis for professional practice. Consequently, a salient recommendation from findings of the current study is that participants emphasized that practice guidelines regarding infant-toddler oral health care need to not only be well promoted by health professions' regulatory colleges and associations, but furthermore professional colleges and associations have a responsibility to incorporate guidelines on implementation. As described by participants, this equated to having strategies to educate practitioners about how to provide infant-care in practice. Research from other fields has evaluated the effectiveness of accompanying position statements with implementation strategies to enhance uptake. For example, a Cochrane systematic review evaluated effectiveness of implementation strategies accompanying publication of professional guidelines for medical procedures.¹⁵⁸ Based on four included randomized control trials, this review indicated that when healthcare professionals receive practice guidelines they are more likely to adopt the new practice guidelines if they are accompanied by implementation strategies.¹⁵⁸ At a practitioner level, examples of implementation strategies include, but are not limited to educational materials and reminders related to the practice guideline.¹⁵⁸ In essence, guidelines not only need to focus on what should be done but also should focus on how it can be done.

One potential resource which could accompany position statements and potentially advance uptake is a dental directory identifying practitioners who do provide infant-toddler dental homes. For example, the British Columbia Dental Association has a web-based dental locator which assists the end-user to locate a dentist based on a diverse range of needs, amongst them practitioners who provide care for children three and under (<https://www.bcdental.org/yourdentalhealth/findadentist.aspx>).¹⁶⁷ This selection is further separated into children three and under – diagnose and refer; and children three and under – diagnose and restorative.¹⁶⁷ As a resource that could accompany a position statement, a comprehensive dental directory could help practitioners who do not see infants or toddlers to provide information to parents about how to access care. Additionally, the division of diagnosis and referral, and diagnosis and restorative could be expanded to include preventive care on the basis that participants in the current study emphasized that the role of general practitioners in improving uptake could be to assume the function of offering a preventive infant-toddler dental home, and work as a team with pediatric dentists for children requiring more complex care. The ADA&C currently has a dentist finder, which is publicly available, and enables the end-user to search by practitioner name, city, postal code and specialty.¹⁶⁸ The College of Registered Dental Hygienists of Alberta has a dental hygiene finder which can be searched by practitioner registration number and name, as well as a list of individual dental hygiene practices.^{169,170} Expansion of the ADA&C and CRDHA directories to include identifications of providers of infant-toddler oral health care is merited and has precedence in other Canadian jurisdictions.

Policymakers and legislators. Government legislation and policy direct regulatory responsibilities related to standards of professional practice, and provide direction and support for the provincial health system through Alberta Health Services and for publicly-funded dental

programs through Alberta Health. The Health Professions Act (HPA) provides common legislation for regulated health care professions in Alberta.⁷⁶ Under HPA dentists are governed under the Dentists Profession Regulation and dental hygienists under Dental Hygienists Regulation.⁷⁶

In the Practice theme, HPA legislation was discussed in context of dental hygiene participants serving as primary care providers of preventive infant-toddler dental homes, either within a dental practice or in an independent dental hygiene practice. Health Professions Act legislation also has relevance for provision of infant-toddler oral health care in the Profession theme. A specific example of how HPA legislation has bearings on the profession is related to the position statement issued by the Canadian Dental Hygienists Association which identifies educational frameworks with the potential for dental hygienists to assume a role in provision of dental therapy.¹²⁸ Should this position statement move forward to implementation, the provision of dental therapy could further enhance the ability of dental hygienists to serve as primary care providers of infant-toddler dental homes. This possible evolution of the profession has potential implications with respect to policy and legislation to ensure that any expanded scope is supported through HPA legislation. For this reason, engaging policymakers and legislative stakeholders is important so that any future frameworks to integrate dental therapy into the dental hygiene profession are attentive to policies related to provision of restricted activities under HPA and Dental Hygienists Regulation legislation. Concisely, working with policymakers and legislators is important so that policy and legislation support the desired outcome of addressing gaps in the delivery of oral health care.

Participants also expressed that having a Provincial Public Health Officer, through Alberta Health Services, could help the profession bring a strong voice to policy and legislation

around infant and toddler oral health care. The Provincial Public Health Officer works within the Provincial Oral Health Office (POHO), which collectively leads and facilitates initiatives to improve the oral health of Albertans.^{135,p3} Within the core functions of the POHO Oral Health Action Plan is oral health advocacy,^{135,p8} and initiatives which include provision of fluoride varnish to preschool aged children and oral health surveillance. These initiatives signify that Alberta Health Services is an important provincial stakeholder in early pediatric oral health, with the implication that strategies to advance infant-toddler dental homes in Alberta need to be developed in concert with organizations such as AHS so that the approach to improve care is coordinated and inclusive of all stakeholder groups.

Participants generally viewed the expansion of government coverage as an important step to advance support for infant-toddler dental homes. This recommendation specifically included removing age restrictions for fluoride treatments. As an incremental step forward, inclusion of fluoride treatments for infants and toddlers who are insured through publicly-funded dental programs, such as Alberta Child Health Benefit, may be a viable advancement of policy and legislation supporting infant-toddler oral health care. Firstly, there is evidence supporting the efficacy of fluoride varnish as a treatment to prevent early childhood caries.¹⁷¹⁻¹⁷³ Secondly, at the time of this current study, the Minister of Health in Alberta is reviewing dental fees in Alberta and utilization of dental programs.^{174,175} This review presents an opportunity for stakeholders, including dental and dental hygiene regulatory colleges and professional associations, to recommend to policymakers and legislators within the provincial government that removing age limits on fluoride treatments may help dental practitioners provide evidence-based preventive care for infants and toddlers. Moreover, as socioeconomic status is a risk factor for early childhood caries,^{57,136,176} and eligibility for the Alberta Child Health Benefit is based on family

income,¹⁵¹ children who receive coverage through this program may be at the greatest risk for early childhood caries, and therefore benefit the most from early preventive care.

Population: Factors within Alberta as a community

Factors identified at the population level influence provision of infant-toddler oral health care and have implications for creating a population shift in which infant-toddler dental homes are considered a common standard of care within society. Amongst these considerations are societal factors and population awareness.

Societal factors. Encompassed within the subcategory societal factors, are influences within the social environment and sociocultural context of Alberta which facilitate and affect provision of infant-toddler dental homes. Participants described societal factors affecting provision of care inclusive of discontinuation of water fluoridation in a major Alberta municipality; a milieu within a remote northern Alberta community where trust of the practitioner affected provision of care; and a disproportionate burden of disease in vulnerable communities. In analyzing these findings, this current study accentuates that not only do societal factors impact provision of care, but also that the range of such factors is diverse within Alberta. As a corollary, future strategies and research to improve uptake of infant-toddler dental homes in Alberta must address factors relevant to both the entire Alberta population, such as adequate coverage, awareness and access to infant-toddler dental homes, and must also be responsive to societal factors specific to local communities and jurisdictions.

In examining the input of study participants, it is evident that findings in the current study related to societal factors can be interpreted within the context of a conceptual model developed by Fisher-Owens et al, which depicts that individual-, family- and community-levels of influence impact children's oral health, and therefore strategies of disease prevention should comprise a

multilevel approach.⁴⁷ Societal factors are particularly pertinent to community-level influence in Fisher-Owens model. Community-level influences on children's health incorporated in the model include: social environment, social capital, physical safety, physical environment, community oral health environment, dental and health care system characteristics, and community culture.⁴⁷ In relation to the current study, factors within the physical environment, such as water fluoridation as a public health measure, have a societal impact on infant-toddler oral health and the need for preventive oral health care.^{47,177} The importance of infant-toddler dental homes is also circuitously related to the social environment because, as depicted by Fisher-Owens, factors such as neighborhood poverty rates affect prevalence of ECC and dental morbidity.⁴⁷

The effect of culture as a societal factor also influences provision of infant-toddler dental homes. Fisher-Owens defined culture as the cultural norms, values and practices, inclusive of belief systems, behaviors and practices, within a community.⁴⁷ An example coming from participants' perspectives in the current study is that early childhood caries are culturally acceptable in some northern communities, and therefore, the approach to caries prevention through infant-toddler dental homes must consider this cultural norm. This finding is congruent with a study by Baghdadi which investigated prevalence, risk factors and preventive strategies to address early childhood caries in Aboriginal Canadian children.¹⁷⁸ Baghdadi offered that system-level interventions are necessary to address social determinants associated with ECC such as cultural traditions, economic security, food security, and housing status.¹⁷⁸ Furthermore, interventions to address ECC in Aboriginal communities have enhanced success through local community engagement to understand the distinctness of groups with different cultural contexts.

From a broad systems level, participants expressed that early childhood caries affects infants, toddlers, and children from all social strata, and therefore ultimately a societal shift towards whole-population uptake of infant-toddler dental homes by age one is desirable. The CDA position statement advocates that all children should have their first dental visit by age-one,⁵³ and does not differentiate the time at which care should be established based on other risk factors. However, while participants in the current study advocated for a population shift in which all children establish a dental home by age-one, several participants also acknowledged that prevalence of ECC is disproportionate in vulnerable communities. Early access to oral health care is particularly important for infants and toddlers who are at a high-risk for early childhood caries.⁵⁵ A study by Schwendicke et al. which found that application of preventive therapies, specifically fluoride varnish, was more effective as a caries preventive strategy in high-risk populations.¹⁷⁹ This aforementioned study was conducted on children 6-18 years of age,¹⁷⁹ and one can postulate that similar results would be evident for younger children. However, future research is necessary to evaluate this targeted approach for preschool-aged children. Participants in the current study emphasized that access to infant-toddler oral health care and preventive therapies should be prioritized for vulnerable children within Alberta's population who are most at risk for disease.

Further to this rationale, participants identified societal factors such as poverty and remoteness impact disease prevalence and provision of care in northern Alberta. Material deprivation is more prevalent in some northern Alberta communities,¹⁸⁰ and there are also many Aboriginal communities situated in this area of the province.¹⁸¹ Participants descriptions in the current study that ECC prevalence is greater in some northern communities is congruent with a national report from the Canadian Institute for Health Information which found that

neighborhoods with high Aboriginal populations have an increased rate of day surgery to treat ECC by a factor of 8.6 compared to neighborhoods with low Aboriginal populations.¹⁶ Similarly, the rate of day surgery for ECC treatment is 3.9 times higher in children from least affluent communities compared to most affluent communities.¹⁶ The Inuit Oral Health Survey and First Nations Oral Health Survey found that compared to non-Indigenous Canadians, Inuit and First Nations Canadians report higher levels of poor oral health.^{182,183} Nearly 86% of children aged 3-5 have experienced dental caries and over 35% of caries are untreated.¹⁸³

Several participants in the current study expressed that prevalence of ECC had reached “epidemic levels” and referenced that treatment of caries is the most common day surgery procedure in Canada with in-hospital costs exceeding \$21 million per annum,¹⁵ which accentuates the desirability of early prevention. With this consideration, several participants expressed that the economic benefits associated with preventing early childhood caries could help motivate a societal shift towards prevention. A previous Canadian report similarly suggested that ECC prevention is more cost-effective than treatment, and cited that every dollar spent on preventive oral healthcare saves \$50 on restorative and emergency procedures.¹⁸⁴ Similarly, Baghdadi referenced that costs for providing dental treatment (i.e. restorative care) for young children must not only consider the direct cost of the procedure, but also health risks and logistical difficulties of access, especially for children and families residing in remote areas where there are significant costs associated with travel to access a practitioner who can provide care under general anesthesia.¹⁷⁸ However, while the scoping review presented as Chapter 2 of this study found that infant-toddler dental homes are generally cost effective, there is currently insufficient evidence to quantify this benefit.¹⁸⁵ Therefore, further cost-benefit analysis is merited to evaluate the economic impact of ECC prevention.

Promoting population awareness. As the dental profession, policymakers, regulatory bodies, and other contextual stakeholders look towards strategies to improve the oral health of infants and toddlers in Alberta and advance uptake of infant-toddler dental homes, an important finding from the current study is that, in participants' empirical experience, the general population in Alberta and in Canada are inadequately informed about infant-toddler oral health care. Participants unanimously indicated that population awareness regarding recommendations for first dental visit by age one, the rationale underlying these recommendations with respect to early childhood caries prevention, and the effects of untreated ECC on a child's overall health are knowledge gaps within the broader population. Consequently, just as participants advocated for education for dental professionals, they also advocated that to improve uptake of infant-toddler dental homes, concurrent strategies to educate the population are necessary.

Findings related to inadequate population awareness, are consistent with existing research in other Canadian jurisdictions. Stijacic et al. previously published a study in which dentists self-reported barriers encountered in providing care to infants and toddlers in their practices in Manitoba, Canada.⁶¹ The first two most common barriers were related to the practitioners' ability to feel comfortable in managing the child, namely respondents identified child's behavior (77.1%) and child crying (51.1%) as challenges in providing care for this cohort.⁶¹ The third most common factor was low parental interest or lack of parental awareness, which 47.9% of respondents reported as a barrier.⁶¹ This latter finding strengthens the perspective offered by participants in the current study that inadequate population awareness impacts provision of infant-toddler dental homes, and consequently strategies are needed to improve awareness of Albertans in relation to infant-toddler oral health.

Knowledge translation has emerged as a paradigm to address the need for facilitating the implementation of research and evidence into practice,¹⁸⁶⁻¹⁸⁸ and has been defined by the Canadian Institutes of Health Research (CIHR) as, “a dynamic and iterative process that includes the synthesis, dissemination, exchange and ethically sound application of knowledge to improve the health of populations, provide more effective health services and products and strengthen the health care system.”¹⁸⁶ While an extensive review of knowledge translation frameworks and theories are beyond the scope of this study, two basic elements of knowledge translation, namely knowledge users and knowledge dissemination¹⁸⁶ are presented in the context of recommendations made by participants with respect to improving population awareness of infant-toddler dental homes.

The first of these elements, the knowledge user is defined by CIHR as the individual or individuals who use knowledge generated through research to make decisions about health.¹⁸⁶ In the translation of knowledge to practice, it is important to recognize that there are multiple knowledge users including but not limited to practitioners, policymakers, academic educators, health care administrators, community leaders, patient groups, and other members of the population. It is recognized that in seeking to advance uptake of infant-toddler dental homes a knowledge translation plan, which considers the needs of all aforementioned knowledge users is an important step for future research. Through participants’ emic view and existing research on infant-toddler oral health care, the current study has identified several targeted “users” who need to be informed of the importance of infant-toddler dental homes and presents possible mechanisms to move forward with translating research and evidence on infant-toddler oral health to several user groups. For example, previous sections of the discussion chapter have highlighted strategies to translate knowledge to dental practitioners, such as educating dental and

dental hygiene students. Within the subcategory promoting population awareness, knowledge translation is focused on exchange and utilization of research and knowledge related to infant-toddler oral health care by the broader population of Alberta.

The act of spreading knowledge and or research to knowledge users is referred to by CIHR as knowledge dissemination.¹⁸⁶ Participants in this study currently sought to improve awareness of infant-toddler dental homes by having individual conversations with patients, and then asking parents to become advocates of infant-toddler oral health care by way of informing other parents about the importance of establishing an age-one dental home. Also, several participants had provided continuing education sessions to their medical colleagues and urged them to adopt interprofessional practices in which the physician promotes the age-one dental home to parents. An intuitive advantage of having direct conversations with patients or colleagues as means to disseminate knowledge related to infant-toddler oral health is that minimal costs are incurred. It may also help the individual practitioner establish rapport with patients and colleagues. For example, participants referenced position statements enhance practitioner credibility by showing that the knowledge shared with the patient or colleague is evidence-based. However, despite these inherent advantages and the expression of several participants that they felt these individual conversations were important, all study participants also expressed that knowledge dissemination through individual practitioner-patient conversations was slow and would inadequately mobilize awareness within the general Alberta population. This interpretation is supported by the comments of one pediatric dentist who stated that even though she educated her existing patients about the age-one dental home and that the recommendation has evidence supporting its efficacy through the CDA position statement, individual conversations were not bringing a substantive number of age-one patients into her

practice to establish a dental home. Based on participants' experience, this process to disseminate information had limited effectiveness as a population-based strategy.

Therefore, participants recommended broader strategies to develop population awareness. Mass media campaigns through television, radio and social media were commonly identified as means to expedite population awareness, and many participants discussed advantages of using professional associations and government health authorities to actively disseminate the information. From many participants' perspectives an advantage of leveraging professional associations and government health authorities to advocate for infant-toddler dental homes is that members of the public would recognize that these organizations have the mandate of providing evidence in the population's best interest, thereby removing the perception of bias. Conversely, when an individual practitioner promoted the age-one dental home, participants expressed concern that patients might construe it as a means to gain business for the practice. This perception is supported by the findings of Milne et al. who published a recent critical content analysis of parents' online discussions about dental caries in children, and found evidence of tension between parents' views and those of dental professionals.¹⁸⁹ As stated, mothers who participated in the on-line forums expressed a "disconnect when communicating with dental professionals."^{189, p265} This analysis by Milne et al. offers some support for recommendations from participants of the current study that information delivered through a public authority may be advantageous to eliminate or reduce the perception of dental professionals "selling infant-toddler dental care" for profit.

Participants also expressed that to expedite population awareness, professional bodies and health authorities could consider use of large mass media health campaigns to shift societal familiarity with the age-one dental home. Though mass media campaigns are accompanied by

significant monetary and resource expenses, there is some preliminary research to substantiate the effectiveness of mass media campaigns in knowledge translation.¹⁹⁰⁻¹⁹⁵ Research that assessed effectiveness of mass media campaigns as a knowledge translation tool for a range of health issues, amongst them tobacco use; cancer and stroke prevention; and protection from HIV, generally supports effectiveness of mass media in improving knowledge and awareness regarding an issue.^{187,190-195} Within the context of population knowledge translation surrounding infant-toddler oral health care, the use of multi-media messaging was employed in Manitoba's FFV program to help increase public and dental professional awareness about accessing care by the time a child turns one year, and the importance of preventive care was also emphasized.¹¹³ The initiative used multiple forms of communication and various mediums to promote awareness including advertisements on buses, television, radio, newspapers, magazines, posters in doctors' offices and community centers, and through word of mouth from parents and parenting groups.¹¹³ In the program evaluation, parents' perceptions were assessed through three focus groups.¹¹³ Parents who participated in the focus group evaluation indicated they had all heard about the program and agreed it had been well advertised.¹¹³ These existing evaluations provide support for the recommendations made by participants in the current study with respect to employing mass media campaigns to raise public awareness; however, participants did acknowledge the expense incurred in this strategy.

Further research regarding the cost effectiveness of using mass media interventions for promotion of infant-toddler dental homes is merited because while evidence generally supports the effectiveness of mass media in changing population awareness, evidence with respect to changing behavior is inconsistent. Several mass media campaigns to change behavior related to health issues have demonstrated cost effectiveness, while others have reported a limited effect in

changing behavior.¹⁹⁵⁻¹⁹⁸ In the same focus group study which assessed parents' perspectives of Manitoba's FFV program, Schroth et al. found that while all parents in the focus groups were aware of the initiative, not all parents chose to seek care for their infant or toddler. In fact, of the 21 families who participated in the focus groups, 11 families had taken their child for a Free First Visit appointment and 10 had not.¹¹³ Reasons for non-participation included: parents did not identify that their child had a dental problem so chose not to seek care; and parents had been advised by their general dentists to not bring the child for an examination until age three or older.¹¹³ In interpreting the latter of these findings from Schroth et al. in the context of the current study, both studies are congruent in reinforcing the need for strategies to promote consistent messaging within the dental profession to the public. Evaluation of the FFV program also provides evidence that increased awareness does not inevitably connect to adoption of the recommendation or innovation.^{113,199} For example, parents who chose to not seek care for their child in the absence of a perceived problem may not have valued or fully understood the importance of preventive care.

Consequently, while participants in the current study have universally recommended mass media campaigns and large health promotion initiatives, future research related to population awareness of infant-toddler dental homes in Alberta should not only have a focus on population awareness, but also should consider knowledge translation strategies which enhance adoption of the age-one dental home. This assessment is beyond the scope of this current study; however, a meta-analysis study determined that health promotion approaches directed to individuals are less impactful than those which involve public engagement and community development.²⁰⁰ Approaches that integrate public engagement and community development appear to be more effective in attaining adoption of a behavior because they enhance the capacity

of all stakeholders and also involve members of the population to whom the change is directed to help set priorities and strategies; thereby enhancing the success of adoption.¹⁹⁷⁻²⁰³ Based on this current study and corroborating previous research, future initiatives to enhance population awareness must recognize that awareness alone does not automatically enhance uptake; must recognize the need to engage all stakeholders; must consider cost effectiveness; and ultimately must incorporate research and evaluation to validate that the desired outcomes have been achieved.

Study Implications

This current study developed an understanding of factors that facilitate and influence provision of infant-toddler dental homes with the intent that the description and interpretation of data will help to improve uptake of infant-toddler oral health care in Alberta. Accounts from participants in the current study accompanied by existing research from other jurisdictions reaffirm that provision of infant-toddler oral health care is subject to multi-faceted influences including factors related to the professional, educational, social, economic, and political environments. Recommendations below focus on achievable next steps to improve infant-toddler oral health outcomes:

The strongest recommendations from this study have an educational focus including: education of the public; education of the dental, dental hygiene and medical professions; and greater inclusion of infant-toddler oral health care in undergraduate dental and dental hygiene curriculum, with an emphasis on providing students with clinical experience. There is a need to develop all of the aforementioned areas; however, an essential incremental step forward is improving undergraduate education in infant-toddler oral health care. Comfort and competencies associated with provision of care, as well as valuing the importance of infant-toddler dental

homes are prerequisites for improved uptake. Following the paradigm that what we are taught is how we practice, educational institutions are best positioned to develop future dental and dental hygiene professionals' knowledge, skills, and attitudes about all areas professional practice, inclusive of best practices in infant-toddler oral health care.

Changing curriculum can be a complex process, involving multiple levels of coordination and approval. However, through a survey conducted by Schroth et al. it has already been determined that most dental and dental hygiene educational institutions across Canada recommend a first dental visit by 12 months of age, and infant-toddler oral health was included in most schools' curriculum.⁵¹ Therefore, substantive changes to didactic curriculum may not be necessary. Rather, undergraduate education needs to focus on inclusion of experiential learning opportunities with infants and toddlers so dental and dental hygiene students have some clinical experience treating children in this age cohort. This recommendation was put forward by and is strongly endorsed by study participants. It is also supported by the survey conducted by Schroth et al., which determined that less than one third of students provide care for an infant or toddler in their undergraduate dental and or dental hygiene education.⁵¹ This survey also identified barriers such as lack of patients, teaching staff, and time.⁵¹ The current study provides some considerations for mechanisms to address inclusion of infant and toddler patients. Suggestions include opportunities through existing university clinics or through partnerships with community programs.

Educational institutions have a history of enhancing knowledge and advancing practice through education and research. The current disconnect between stated policy with respect to infant-toddler oral health care and uptake of the policy should be viewed as an opportunity for educational institutions to assume a role in addressing this undesirable gap. It may be unrealistic

for the dental and dental hygiene professions to achieve greater uptake of infant-toddler practice standards in the absence of education that models best practice of infant-toddler oral health care. Consequently, this current study supports the recommendations published by Schroth et al. that the Commission on Dental Accreditation of Canada review and amend current accreditation requirements to include infants and toddlers,⁵¹ and possibly specify basic competencies such as examination of an infant or toddler aged patients. Educational strategies may also benefit from coordination between dentistry, dental hygiene and dental assisting to maximize scope of practice, and support dental professionals in providing consistent messaging and having good role clarity with respect to areas of practice that each profession can offer to support uptake of infant-toddler oral health care.

In parallel to undergraduate education, at the level of the profession, the Canadian Dental Association has published a position statement endorsing first dental visit by age one, and has further encouraged professional awareness through resources such as First Visit, First Tooth. Mechanisms to encourage adoption of these policies within the dental profession are an important area of future research. Dental hygiene associations and regulatory colleges can strengthen their support for infant-toddler dental homes by also developing position statements and policies to encourage adoption by dental hygienists as primary care providers of preventive infant-toddler oral health care. As an incremental step, published position statements have potential to offer guidance to dental hygienists regarding best practices, function as a resource to enhance consistent messaging, and serve as a foundation to build strategy and policy to develop initiatives to promote professional education and uptake.

The current study also highlights the desirability of improved interprofessional collaboration in infant-toddler oral health care. The Rourke Baby Record used by pediatricians,

family physicians, and Well Child nurses already recommends that physicians provide guidance to parents of infants regarding the age-one dental visit,^{57,119} and therefore an incremental step is to support physicians and other health care providers to have consistent messaging to parents regarding the age-one dental home. The current study suggests that this aspect of interprofessional practice is most successful when the dental practitioner has an established professional relationship with the non-dental practitioner (i.e. physician, nurse) because the dental practitioner can provide education to the non-dental practitioner regarding the importance of the age-one dental home, and the non-dental practitioner also has an identified dentist or dental hygienist to whom he or she can refer patients. There is also a benefit in that the dental practitioner has an identified non-dental practitioner to whom he or she can refer patients to for other systemic health concerns. In the absence of an established professional relationship, several participants were less successful in working collaboratively across health disciplines. This implies that broader system-based mechanisms are desirable to facilitate interprofessional practice. One important aspect is non-dental health care practitioner education regarding infant-toddler oral health care. Current literature supports that physicians and allied health care professionals may not have sufficient undergraduate education to be aware of the evidence supporting infant-toddler oral health care and the age-one dental home.^{11,57,120,121,204} Again, educational institutions are well positioned to promote the importance of and rationale for infant-toddler dental homes to students during their undergraduate education in medicine, nursing or other health disciplines. Program directors in dentistry, dental hygiene, medicine, nursing and other health disciplines are likely best positioned to have interprofessional discussions at a faculty level to identify mechanisms to facilitate consistent messaging across all medical

professions regarding the age-one dental home, and to explore potential roles of non-dental health care professionals in infant-toddler oral health care.

Another aspect of supporting interprofessional practice is having mechanisms and resources which help to identify dental practitioners who do provide care to the infant-toddler cohort. A provincial dental directory is a strategy that other provinces have implemented through the dental regulatory college to facilitate access to care. This could be replicated through the ADA&C and CRDHA practitioner locators. Not only could this resource be useful to help non-dental practitioners support patients in accessing an age-one dental home, it could also help support dental practitioners who do not provide care to this cohort fulfill their professional obligation to provide or refer care in accordance with practice guidelines.

There is a need to develop oral health promotion strategies to improve population level awareness. The aforementioned strategies to support consistent messaging across all health disciplines are important so that information provided to parents of infants and toddlers is consistent. As evidence supports that awareness alone may not change behavior, a multi-faceted approach that includes community engagement and health promotion at a population level, complimented by individual practitioners sharing evidence-based information with their patient cohorts can facilitate this evolution. While mass media health campaigns may expedite population awareness, the significant cost and resources necessary to achieve this awareness is recognized. Additionally, educational strategies to increase population-level awareness need to be appropriately timed to ensure that there are sufficient numbers of dental practitioners to offer infant-toddler dental homes. While acknowledging all suggested initiatives have the potential to improve uptake, it is recognized that it is beneficial to focus on efforts that have the greatest potential to achieve desired outcomes. Consequently, this study proposes that strategies to

improve uptake should initially focus on advancing education of dental, dental hygiene and other health care professionals.

In parallel to implications for education, there is a need to re-evaluate how preventive oral health care is remunerated. Some participants in the current study proposed substantive changes, such as universal coverage through the provincial government. However, a stronger body of evidence with respect to the costs and benefits of universal coverage is necessary to justify lobbying for this change; hence, this initiative requires further consideration but may not be actionable at the present time. Conversely, there is an existing body of evidence that provides good support for removing age restrictions on preventive fluoride applications. This recommendation may also be timely with the current review of dental fees and public dental programs in Alberta. Public health, educational institutions, regulatory colleges and professional associations are well positioned to share this evidence with government stakeholders.

With the valued input of study participants, several recommendations have been identified. However, it is recognized that efforts to address and translate all recommendations into actionable outcomes would result in ineffective diffusion of time and resources. Therefore, the following initiatives are highlighted as areas of focus with the highest potential for advancement:

- Inclusion of clinical experience for students to provide oral health care to infants and toddlers during undergraduate education;
- Removal of age restrictions for preventive fluoride therapies through publicly-funded dental programs, specifically the Alberta Child Health Benefit; and
- Revision of provincial dental directory(ies) through ADA&C and CRDHA to include practitioners who do provide infant-toddler oral health care.

Study Limitations and Implications for Future Research

This study sought to advance knowledge to influence provision of infant-toddler dental homes in Alberta. Through understanding factors that have facilitated practitioners who currently provide infant-toddler dental homes, this study provides a model that could help to shape future strategies for improved implementation and uptake. The 4 P's of influence in the provision of infant-toddler dental homes highlight that provision of care is facilitated by complex and dynamic factors, which are often interrelated. Amongst the strengths of this study are the breadth of participant demographic profiles and the broad-based understanding of factors facilitating provision of infant-toddler dental homes. Additionally, participants' comments are current, address the problem in a local context, and are experiential. However, inquiry through research is a continuous process, and no single study completes the knowledge base but rather raises new questions to help illuminate and advance practice.

To the best of the researcher's knowledge, this is the first study to explore dental practitioners' perspectives regarding provision of infant-toddler dental homes in Alberta. With the intent of looking for strategies to improve practice uptake, this research focused on factors that facilitate provision of care based on subjective accounts of practitioners who are currently providing care and also considered their recommendations to encourage the larger dental community to adopt practice standards for the age-one dental home. While previous research in other Canadian jurisdictions has explored reasons why dental practitioners choose not to participate in initiatives to improve early pediatric oral health care,⁵⁸ these factors may be subject to local influences within provincial cultures. Findings from the current study did not include perspectives of practitioners who do not provide care for the infant-toddler cohort in Alberta. Research that focuses on the perspectives of non-providers could potentially illuminate why they

do not provide care in accordance with the practice guidelines. From the current findings, one might hypothesize that reasons for choosing not to provide care are also multifaceted and include lack of awareness, insufficient knowledge and or competence, that remuneration is considered insufficient, and that the public does not seek this service. However, this hypothesis would need to be examined through future studies.

While several participants spoke of their transition from non-provider to provider after proceedings such as becoming a pediatric dentist, being hired into a pediatric dental office or working with a colleague who encouraged provision of care, it is important to highlight that at the time the research was conducted, participants in this study were already providers of infant-toddler oral health care. Longitudinal case studies that follow individuals based on transtheoretical readiness to change models may support understanding of factors and resources that help practitioners during the transition from non-provider to provider.

The impact of demographic variability was not explored in this study. The extent to which demographic variability affects provision of infant-toddler dental homes may potentially have implications for transferability of findings to other provincial and territorial jurisdictions. There may be important differences that affect provision of care between provinces that are yet to be explored to understand infant-toddler oral health in a more comprehensive national context.

This interpretive description was based on a maximum variation sample. While participants were purposively selected to have diversity in practice setting, designation and experience, it is important to highlight that the majority of participants were newer professionals who mostly practiced in urban centers. Six of the 13 participants were pediatric dentists. While pediatric dental practices provide treatment to both urban and rural populations, and no pediatric dental practices in Alberta are located in rural settings. Only two of the study participants were

situated in rural practices, and their feedback suggested that unique circumstances may exist in remote rural jurisdictions. Additional study to fully explore the commonalities and disparities based on the influence of practice location may be valuable. Consequently, the factors that facilitate and influence provision of infant-toddler dental homes based on the perspectives of participants in the current study may not be representative of all providers of infant-toddler oral health care. Therefore, readers are encouraged to consider transferability of study findings in this context.

It is important to acknowledge that qualitative research interviews are a dynamic interaction between the researcher as an instrument in the research and the participant. While this interaction is a major strength of qualitative research in developing rich data and intellectual reasoning to improve provision of infant-toddler oral health care within an applied health discipline, researchers must be attentive to how this interaction and the unintended influence of the researcher may impact study findings. Chapter 1 includes a statement of reflexivity where I have discussed my own biases and disciplinary lens.

Future research related to implementation and evaluation of strategies to improve uptake is an important future step. An important step in the process towards advancing infant-toddler oral health care is additional research focused on undergraduate education. Previous research by Schroth et al. has determined that the majority of undergraduate dental and dental hygiene students are not provided with clinical opportunities to treat infants and toddlers, and calls for action to address this gap in current undergraduate education.⁴⁹ This current study reinforces this call based on participants' accounts of the importance of education in facilitating practitioners in the provision of infant-toddler oral health care. Next phases of research need to transition into implementation and testing of educational models to address this gap.

Participants in this study identified that bringing a collective voice to advance infant-toddler oral health care is important to support policy and practice changes. Participants spoke about how having a collective of stakeholders working towards a common vision creates commitment and increases the power to create change in practice and policy. Community-engaged research may provide a platform to share stakeholder knowledge and achieve advancement of early pediatric oral health practice and policy. Community-engaged research aims to precipitate transformational change in health care through stakeholder engagement. It is well suited to research pertaining to collective change processes because it empowers the stakeholders as co-researchers, and could be a future area of study to promote broader uptake of infant-toddler dental homes in Alberta.

Conclusion

Evidenced-based policies regarding establishing infant-toddler oral health care by age one have not been sufficiently integrated as a routine practice standard. It is incumbent on dental professionals to provide leadership to improve access to infant-toddler dental homes. The present study provides a foundational understanding of factors that facilitate dentists' and dental hygienists' provision of infant-toddler dental homes in Alberta. Understanding these factors is a critical underpinning towards achieving improved uptake of the age-one dental home within the dental community.

It is clear that provision of infant-toddler dental homes is influenced by complex factors which are interconnected and multi-faceted; and therefore, improving uptake within the dental community and Alberta population will take time and will be an evolutionary process. However, many of the lessons learned from this study can help to inform strategies to enhance this evolution. A concerted effort to provide dental and dental hygiene students with experience in

treating infants and toddlers during their undergraduate education is strongly recommended. Awareness of the recommendations regarding the age-one dental home and the rationale supporting these recommendations must be promoted and strengthened for dental professionals, physicians, nurses, and other non-dental allied health professionals who provide care for the infant-toddler cohort. Parents of infants and toddlers must be informed regarding the purpose and benefits of seeking age-one dental homes and subsequently how to access care for their infant or toddler. Health professions' regulatory colleges and professional associations can help achieve consistent messaging across health care professions, and can also develop policy and strategies to help advance awareness and uptake within the profession and the public.

Practitioners, their practices, the profession to which dentists and dental hygienists belong all exist to serve the population, and together factors identified in each of these four themes provide a model for future research focused on implementation strategies that could help advance practice and policy. The 4 P's of influence offers a model which could support future implementation research and reforms to policy to improve uptake of infant-toddler dental homes. However, it is also recognized that health care is dynamic and fluid. Consequently, ongoing evaluation related to implementation of proposed recommendations is also desirable. Accordingly, the model must evolve and be adapted to support a paradigm shift in which the age-one dental home is common societal norm that is embraced by dental professions.

A historical examination of dental and dental hygiene professions and standards of care would show that there has been continuous evolutionary improvement of oral health. It is entirely reasonable to expect that this evolution will continue, and that today's high standard of care will become even better in the future. It is hoped that this study will contribute to this advancement by identifying and promoting mechanisms to improve oral health care for infants

and toddlers. Upon achieving this, it can then be said that this study has served a vital purpose to better the oral health of infants and toddlers in Alberta.

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APPENDIX A:
INTERVIEW GUIDE

INTERVIEW GUIDE: EARLY PEDIATRIC DENTAL HOMES

Introduction:

Thank you for meeting with me today. To share a little bit about myself, I am a graduate student who is part of a pediatric oral health research team at the University of Alberta. From our previous conversation and the information sheet we provided you, you may know that the aim of the research is to help understand what factors facilitate dental practitioners to successfully provide routine dental care for infants and toddlers in Alberta. The reason that we have asked to interview you is because you indicated that you routinely provide early pediatric preventive dental care. I hope that the discussion today will be insightful and beneficial to both of us, and that by sharing your experience it will help us within the broader dental community to understand what helps dentists and dental hygienists provide care for young children.

I anticipate that the interview will take about 60 minutes. Before we begin, I want to discuss a few important things about the study with you. I want reaffirm your willingness to participate in this study and ask if you have any questions or concerns before we commence. The interview consists of a series of questions to help me understand what factors have helped make it possible for you to provide infant oral health care. During the interview, please ask me for clarification if there is a question that you do not understand. If there is any question that you do not wish to answer, please let me know. You may stop or discontinue the interview at any time without consequence.

I want to ask your permission to tape record the interview, so that it can be transcribed to help with data analysis. All of the information you provide will be kept confidential. You will also have an opportunity to review and revise the written transcript from this interview. The findings from the research project will be used for my graduate thesis, and for presentations and written articles that result from the study, but your name will not appear in the research. Also, the University of Alberta requires that we securely store the data that we collect for 5 years following the study, but only members of the research team will have access to this information. Do you have any questions about the study or how we will use the information you share before we get started?

Qualitative Interview Guide

1. Please walk me through what a preventive first year dental exam looks like in your practice.
 - *Prompt:* What services are a typical part of a first year preventive dental visit?
2. Please tell me what drew you into providing infant and toddler oral health care?
 - *Prompt 1:* Please tell me about how you came to provide preventive oral health care for infants and toddlers?
 - *Prompt 2:* Please tell me about how you came to practice infant and toddler oral health care?
 - *Prompt 3:* Tell me about your career as a provider of infant and toddler oral health care.
3. What factors enable you to successfully provide routine care to infants and toddlers?
4. In your opinion, what special attributes are required for practitioners to provide infant and toddler oral health care?
 - *Probe:* What special skills are required in early pediatric oral health care? How did you acquire these skills?
 - *Probe:* What special knowledge is required to successfully provide infant oral health care? How did you acquire this knowledge?
 - *Probe:* What special courses or mentorship helped you to acquire these skills?
5. What in your opinion are special features within your office or any other physical parameters (such as the location of your office) that help you to provide infant and toddler oral health care?
 - *Probe:* What special or unique features in your practice are necessary, if any, to accommodate infants and toddlers?

6. The existing research and literature identifies that there can be organizational or policy factors such as reimbursement for services, practice guidelines or codes of conduct from an association or governing body, or billing protocols from insurance companies or publicly funded programs that may influence how a practitioner provides oral health care to patients. Please tell me how you successfully manage these factors as they relate to your provision of care for infants and toddlers?
 - *Probe:* With respect to these types of policies and constraints, can you suggest any changes or modifications that in your opinion would enhance your ability to provide infant and toddler oral health care? First year dental exams?
7. How do you inform parents and caregivers about the importance of infant and toddler oral health care?
 - *Probe:* To what extent do you find parents are generally adequately informed about current practices and recommendations of infant and toddler oral health care and are able to follow these recommendations?
 - *Probe:* How are you involved in aspects of parent/caregiver education around infant and toddler oral health?
8. What, if any, specific things or factors related to your staff help to contribute to successful provision of a dental home for infants and toddlers, and what are these factors?
9. To what extent is collaboration necessary with other medical professionals for you to provide of infant and toddler oral health care? Can you please share with which professionals you collaborate and how these interpersonal relationships impact your provision of early pediatric care?
 - *Probe:* How do you connect with these professional colleagues?

10. What would you say to a new dental practitioner to encourage practice of routine infant and toddler oral health?

- *Probe:* In your opinion, what is the best way to educate and inform dental practitioners about infant and toddler oral health?
- *Probe:* What do you think would help other dental practitioners to provide dental care for children by age one?

11. What, if any, recommendations do you have that you feel would facilitate broader provision of infant and toddler oral health care in Alberta?

12. Is there anything that I have missed asking you that you feel would be germane to the study or that you would like to share with me?

Thank you very much for sharing your experience in providing early pediatric oral health care with me. That is really all the questions that I have for you. Do you have any questions that you would like to ask me?

APPENDIX B:

STUDY INFORMATION SHEET AND CONSENT FORM

**DRAFT: INFANT AND TODDLER DENTAL HOME STUDY
PARTICIPANT INFORMATION LETTER AND CONSENT FORM**

Project Title: Factors facilitating dental practitioners in the provision of infant and toddler dental homes in Alberta: An Interpretive Description

Principal Investigators:

Dr. Sharon Compton, PhD 780-492-6331

Dr. Maryam Amin, PhD 780-492-7354

Graduate Student Researcher:

Jacqueline VanMalsen, RDH, BSc 780-492-4479

Background

- For over a decade the Canadian Dental Association (CDA) has recommended a child's first preventive dental assessment should be no later than age one. Previous research indicates uptake of the CDA position statement of first dental visit has been limited; however, there are dental practitioners in Alberta who currently provide routine early pediatric oral health care.
- You are being asked to participate in this study because you currently provide oral health care for infants and toddlers.
- Understanding what facilitates provision of early pediatric oral health care may help to create a framework to further support access to infant and toddler oral health care for Alberta's children.
- This study is being completed in partial fulfillment of a graduate thesis at the School of Dentistry, University of Alberta.

Purpose

- The purpose of this study is to help the investigators understand what factors help dental practitioners to successfully provide routine dental care for infants and toddlers in Alberta. This information has the potential to help develop strategies to improve oral health for young children in our province.

Study Procedures

- The study will involve a primary interview of approximately 60 minutes in length and will take place at a location that is mutually agreed upon.
- Your input on a series of issues about provision of infant and toddler oral health will be sought, but you can choose to not participate any portion of the interview should you wish to do so.
- The researcher(s) will request your permission to audio record the interview so it can be transcribed to help with analyzing the data.
- In addition to participating in the scheduled interview, you may be asked to review the interview transcript and data to ensure the investigators have accurately captured your input.
- Secondary interviews may be scheduled if necessary, but not need to be face-to-face interviews.

Benefits

- By participating in this study you may develop a greater understanding of factors that impact dental practitioners' ability to successfully provide infant and toddler oral health care.
- Participants will not receive any remuneration for participating in the survey.

Risks

- There are no known or anticipated risks to you as a participant in this study.

Voluntary Participation

- Your participation is greatly appreciated, but involvement in the study is strictly on a voluntary basis.

Freedom to Withdraw

- You may withdraw at any time from the study without consequence.
- Participants who wish to withdrawal from the study should contact the research team directly.
- Omission of data provided may not be viable after the data analysis phase of the study has been completed. The last date at which participants may have their data withdrawn from the research study is December 1, 2016.

Confidentiality & Anonymity

- Interview data will be confidential. All data will be kept in a locked cabinet with the Principal Investigator. Data will be stored on a password protected computer and the files will be encrypted.
- No data that includes your name or any other form of personal identification will be released or published by the researchers.
- Direct quotations from the interview transcripts, with any identifiers removed, may be published and presented within the graduate thesis, journal publications and presentations that come from this study.
- Only the study team (researchers and transcriptionists) will have access to the data.
- The Research Ethics Committee may ask to review the study and may, in accordance with University of Alberta policy, have access to the data.
- After the data analysis is complete, all master lists containing participant identifiers will be disposed of in accordance with University of Alberta requirements on the shredding of confidential materials. Anonymized data (i.e. interview transcripts) will be securely stored for 5 years in accordance with University of Alberta protocol.

Further Information

- If you have further questions regarding this study, please do not hesitate to contact Dr. Sharon Compton at 780-492-6331.
- The plan for this study has been reviewed for its adherence to ethical guidelines by a Research Ethics Board at the University of Alberta. For questions regarding participants rights and ethical conduct of research, contact the Research Ethics Office at 780-492-2615.

We hope that the results of the study will benefit study participants and of utmost importance our hope is that the study will have a positive impact on the oral health of Alberta's youngest citizens. Our research team looks forward to speaking with you, and thank you in advance for your participation, input and assistance with this study.

INFANT AND TODDLER DENTAL PROVIDER PARTICIPANT CONSENT FORM

Study Title: A qualitative assessment of factors facilitating dental practitioners in the provision of infant and toddler dental homes in Alberta: An Interpretive Description

Principal Investigators:

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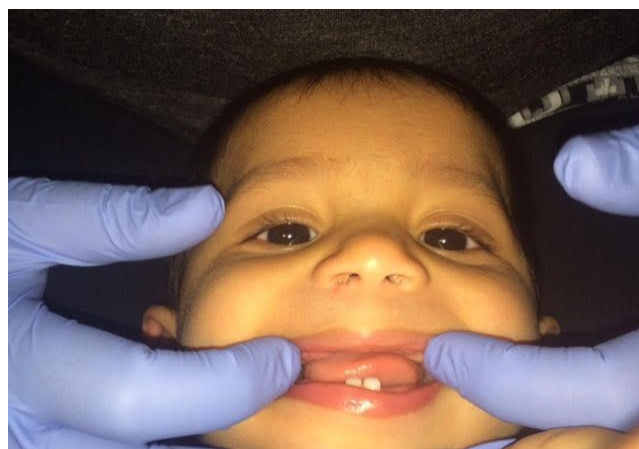
	<u>Yes</u>	<u>No</u>
Do you understand that you have been asked to be in a research study?	<input type="checkbox"/>	<input type="checkbox"/>
Have you read and received a copy of the attached Information Sheet?	<input type="checkbox"/>	<input type="checkbox"/>
Do you understand the benefits and risks involved in taking part in this research study?	<input type="checkbox"/>	<input type="checkbox"/>
Have you had an opportunity to ask questions and discuss this study?	<input type="checkbox"/>	<input type="checkbox"/>
Do you understand that you are free to withdraw from the study at any time without having to give a reason and without consequence?	<input type="checkbox"/>	<input type="checkbox"/>
Has the issue of confidentiality been explained to you?	<input type="checkbox"/>	<input type="checkbox"/>
Do you understand who will have access to the data you share, including information collected during the study?	<input type="checkbox"/>	<input type="checkbox"/>
Who explained this study to you? _____		
I agree to take part in this study: Yes <input type="checkbox"/> No <input type="checkbox"/>		
Signature of Research Participant: _____		
(Printed Name): _____ Date: _____		
I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.		
Signature of Investigator or Designee: _____ Date: _____		
THE INFORMATION SHEET MUST BE ATTACHED TO THIS CONSENT FORM AND A SIGNED COPY GIVEN TO THE RESEARCH PARTICIPANT		

APPENDIX C:
ELECTRONIC RECRUITMENT POSTER

RESEARCH PARTICIPANTS NEEDED

Researchers at the University of Alberta are studying factors that help dental practitioners provide care for infants and toddlers.

General and pediatric dentists and dental hygienists in Alberta who currently provide oral health care for children under 18 months of age are invited to take part in this research project by participating in an interview to share your experience.



If you or a dental hygiene colleague or the dentist(s) you work with would be willing to participate or would like more information about this study, please contact:

Infant and Toddler Dental Home Study

Phone:780-492-6884 E-mail: jvanmals@ualberta.ca