Do Social Determinants of Health Influence Receiving Timely Dental Surgery?

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Abstract

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Research supported by the University of Washington Center for Pediatric Dentistry

Purpose: This study describes social determinants of health (SDOH) in a group of children with special health care needs (CSHCN) planned for dental surgery at a pediatric hospital and explored association between SDOH and receiving surgery in the recommended timeframe.

Methods: SDOH were recorded for all patients planned for dental treatment under general anesthesia (GA) in 2019. Outcomes were 1) surgery completed in the recommended timeframe or 2) surgery not done within two years of planning.

Results: Dental surgery plans were made for 390 CHSCN: 190 were completed in recommended timeframe and 119 were not completed within two years. The SDOH associated with completing/not completing surgery were guardianship/household, and documentation of social work involvement with the family. Patients receiving optimally timed surgery more frequently had: two parents/one household and/or an active social work plan on the record. Those not receiving surgery were more frequently: two parents/two households, single parents and/or without a social work plan. Need for interpreter, ethnicity, and payer were not associated with receiving timely surgery.

Conclusions: SDOH have been shown to contribute to disparate health outcomes. In this group of CSCHN requiring hospital dental GA, guardianship and social work support impacted receiving dental surgery in an optimal timeframe vs not at all. The utilization of social work not only helps increase the chance of getting treatment completed, but also for the treatment to be completed in an optimal timeframe.

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Introduction:

The term “Social Determinants of Health” (SDOH) is used to describe conditions in the environment that affect health, functioning and quality of life. According to Healthy People 2030, SDOH can be grouped into five domains: economic stability, education access and quality, health care access and quality, neighborhood and built environment, and social and community contexts. Examples of SDOH are: language and literacy skills, employment opportunities and income, secure housing, and safe neighborhoods. SDOH have been found to affect social, medical, and dental outcomes throughout the lifespan (Rodriguez, 2023). A study using a dental data repository with over 57,000 patients found an association with caries with higher social deprivations (Rodriguez 2023).

Oral health in the United States (US) has steadily improved since the 1960s with water fluoridation, emphasis on preventative care, and better understanding of the caries process. However, more than half of children will get a cavity in one or more primary teeth before the age of eight years, and over half will also get at least one cavity in the permanent teeth before the age of 19 years. (CDC, 2021). When left untreated, oral disease can be linked to pain, missing school, and delays in physical development (Kassebaum, 2015).

SDOH contribute to the disproportionate caries experience of certain populations. According to the Centers for Disease Control and Prevention (CDC), children ages two to five years old from low-income households are three times more likely to have a cavity than children from high-income households (CDC 2021). SDOH impact what foods and preventative measures are available in the home, availability of dental and medical services, transportation barriers to getting dental care, and understanding and compliance with treatment recommendations.

The burden of oral disease, combined with SDOH, becomes even more critical for children with special health care needs (CSHCN). There are 14,000,000 CSHCN in the US, many with medical or behavioral complexity which can make providing dental care challenging and time intensive (Health and Human Services 2022). For this reason, it is often not feasible for CSHCN to receive dental care in a community dental practice, or in a community surgical setting. CSHCN who cannot receive dental care in their community may be seen at a pediatric hospital clinic such as Seattle Children’s Hospital (SCH).

SCH has an onsite pediatric dental program and accepts referrals of CSHCN from community dentists and clinics across a five-state region (Washington, Wyoming, Alaska, Montana, Idaho (WWAMI)).

Pediatric patients may require general anesthesia (GA) for dental treatment for the following reasons: mental, physical, or medical disability and/or uncooperative behavior related to a lack of psychological or emotional maturity. Dental treatment utilizing GA is considered an acceptable and desired option for parents, patients, and dentists (Douglas 2022).

There are approximately 250 children's hospitals in the US (Casimir, 2019). These hospitals provide essential care to a medically diverse population. Treatment provided at a tertiary children's hospital includes lifesaving cancer treatments, organ transplants, neonatal care, and other specialty services. Allocation of certain resources (operating rooms, procedure rooms, anesthesia services) determines patient access to surgical care. Understandably, lifesaving surgery is prioritized. Across the US, demand for pediatric surgeries and procedures under GA have outpaced available resources (Harris, 2015). Although dental treatment is considered medically necessary care, there are frequently more urgent surgeries that must be provided to critically ill or complex patients prior to addressing the dental needs of CSCHN.

Access to hospital operating rooms for pediatric dentists and their patients has declined in the US (Vo 2021). Wait times are increasing for children with complex medical histories who require dental care under GA in a hospital setting. In 2002 the average wait time for dental GA was 71 days, by early 2020 the average wait time was 12 months (Malden 2007, AAPD 2020). At the study hospital the average wait time for dental GA in 2019 was 15 months.

The purpose of this study was 1) to describe a group of CSHCN who were planned for dental surgery at a Pediatric Hospital, 2) include SDOH in data collected, 3) follow the patients for up to two years from the date that surgery was planned, 4) determine if patients received surgery within the recommended timeframe vs. not receiving surgery at all, 5) and identify SDOH that were bridges or barriers to receiving timely dental treatment under GA.

Methods:

This institutionally approved retrospective cohort study examined records of patients from Seattle Children's Hospital (SCH IRB #STUDY00003634). All patients who were planned for dental treatment under GA between January 1, 2019 and December 31, 2019 were included. Exclusion criteria were: 1) patients who were referred to another venue for dental GA, 2) patients who were able to accept treatment in the clinic and surgery was no longer needed, or 3) patients who died within the recommended time frame for dental surgery.

Data was collected from electronic health records (EHR) and entered into a research electronic data capture (REDCap) database hosted by Seattle Children's Hospital. EHR review was done by four calibrated examiners, with areas of complexity resolved by attending dentists familiar with the patients, treatment plans, and research. Fifty-seven data points were collected for each subject.

Patient data included demographics, dental home, language of care, medical comorbidities, and presence of dental pain or infection at time of treatment planning. Surgery planning data were: case time requested (hours); recommended timeframe for surgery; if combination surgery was needed; whether a specific dentist was required; if hospital admission was planned pre or post-surgery; and the source of dental surgery referral. Factors specific to SDOH were: race/ethnicity; status as a recent immigrant; language of care; insurance payer; number of parent(s) or guardian(s); number of households the child lives in; living in foster care; and presence of a social work plan requiring action such as documentation of a Clinical Action Safety Plans Evaluating Risk (CASPER) (Appendix 1). A CASPER alert is created by a social work team member to let medical staff know about potentially harmful and or disruptive social situations that should not be referenced to in patients' medical records such as: child is in protective custody and who has medical decision authority for child, family member is a known sex offender, family member has a drug/alcohol abuse disorder and a history of arriving at hospital under the influence, child and or family member is aggressive to staff. The CASPER alert documents concerns and give information on whom to contact if there are concerns regarding the alert that need to be addressed to keep all parties safe during clinical appointments.

Planned dental treatment was considered medically necessary as outlined by the American Academy of Pediatric Dentistry (AAPD) (AAPD, 2021). The timeframe recommended for treatment was based upon clinical examination supplemented by radiographs when possible. Scheduling timeframe categories were:

1. Urgent/within 3 months: dental rehabilitation was required prior to lifesaving medical care (e.g., chemotherapy, organ transplant), or pain or infection was present at time of exam.
2. Within six months: restorations and/or extractions of permanent teeth were indicated with no pain or infection at time of exam.
3. Within 12 months: restoration and/or extractions of primary teeth were indicated with no pain or infection at time of exam.
4. Within 12-18 months: patients unable to accept diagnostic quality radiographic and clinical examination where risk assessment indicated likely treatment needs. This category included adolescents with SHCN planned for transition to adult dental care.
5. Pending medical team guidance: subjects who had severe medical conditions which require dental care to be delivered only within a specific timeframe (e.g. patient receiving chemotherapy and waiting for recovery of absolute neutrophil counts prior to treatment).

Outcomes analyzed were: 1) was dental care under GA completed within the recommended timeframe, or 2) the patient did not receive dental GA within two years following creation of the dental surgery plan. Associations with patient demographic and dental surgery case planning factors were explored for patients having each of the above outcomes.

Statistical Plan:

Descriptive statistics were calculated for all patients. Outcome variables are: 1) was the surgery completed, 2) was the surgery completed within the recommended time. Bivariate analyses were completed using chi-squared tests for categorical variables and two sample t-tests for continuous variables. Logistic regression was utilized to determine the associations between patient demographics

and the two outcome variables with adjustments for confounding factors. The R statistical package was used for analysis (Harris, 2015). The significance level was preset at $P < 0.05$.

Results:

Three hundred and ninety-five patients were planned for dental surgery during 2019. Five patients died in the time period between surgery planning and the end of the recommended time frame and were excluded from the study. The final sample size was 390 patients. Mean patient age was 8.9 years (SD = 5.1, range 1.0 – 22.9 years). The majority of patients were male (222, 56.9%). Nearly half of patients were white (50.9%) and 20.6% were Hispanic; other ethnicities were much less frequent. A large majority of patients did not require an interpreter (83.6%). Insurance payers were 60.8% Medicaid, 38.5% private payors, and 0.8% had no insurance. Nearly all patients lived in Washington State (94.9%). Table 1

Patients could have a medical diagnosis only (70.1%), behavioral diagnosis only (3.1%), or a combination of medical and behavioral conditions (26.2%). The most commonly occurring medical diagnosis were cardiac conditions, trisomy 21/chromosomal disorders, or developmental delay. The most common behavioral diagnosis was autism spectrum disorder, anxiety, and attention deficit hyperactive disorder. The number of unique diagnoses ranged from one to ten (mean 2.7, SD 1.7). One hundred and one patients had a single diagnosis, 86 had two diagnoses and 203 had three or more. Figure 1, Figure 2

Slightly over half of patients planned for dental surgery had a social work plan recorded in the EHR (N= 200, 51.3%), with action needed for most of these patients (N=154, 77.0%). The most frequently identified issues were need for transportation assistance (23.2%), housing insecurity (14.4%), and food insecurity (13.4%). Many families had other issues (37.1%) including unsafe home, parent incarcerated, parent mental health crisis, and drug use in the home. Thirteen patients were recent immigrants to the US (6.7%).

Two hundred and sixty-five patients lived with two parents in one household (67.9%), 64 patients had a single parent (16.4%), 26 lived with two parents in two separate households (6.7%), eight patients had more than two guardians (2.1%) and three patients were in foster care (0.8%). Household

information was unavailable for 24 patients (6.2%). Table 2. A guardianship issue was noted for 7.9% of patients, and most of these patients were over the age 18 years, had a behavioral diagnosis and/or intellectual disabilities, and their parents had not completed the legal process for obtaining guardianship.

Timeframe recommended for surgery was: 26.6% urgent/within three months, 26.1% within six months, 28.7% within twelve months, 12.1% within 13-18 months, and 2.6% other timeframe based upon their medical team guidance. For 35 patients (9.0%) dental treatment was time critical prior to other surgical or therapy needs; these patients were categorized as urgent. Most surgical plans were created at the hospital (66.3%) and its affiliated clinics UW Center for Pediatric Dentistry (11.5%), Odessa Brown Clinic (2.9%). Fifty one percent of patients had been referred from another dental clinic to obtain the surgery plan, with 18 patients having visited two or more dental clinics prior to getting surgery planned.

Estimated surgery time was: 4.6% - one hour or less, 59.5% between one and two hours, 27.6% two to three hours, while for 8.0% surgery required longer than 3 hours. A specific dentist was needed for 40 patients (10.3%). Most patients were planned for day surgery (75.4%). Admission to hospital following surgery was planned for 18.4%, and 4.7% were inpatients when surgery was planned. Combination surgery with another surgical or diagnostic service was planned for 22.8% of patients. Most frequent combination requests were: oral and maxillofacial surgery (36%); otolaryngology (21.3%); endodontics (13.5%); and periodontics (11.2%). Table 3

Outcome 1: Patients Receiving Surgery within Recommended Timeframe

One hundred ninety patients (48.7%) received dental treatment under GA within the recommended time frame. The only demographic factor found to be statistically significant was patient age: mean age of optimally timed patients was 7.7 years (SD = 4.6) compared to 8.9 years (SD =5.1) for all patients planned (P = 0.00024). No other significant differences in demographics were found when comparing patients receiving optimally timed surgery (vs all patients planned): 53.7% male (vs 53.0%); 50.9% white, (vs 45.2%); 20.6% Hispanic (vs 22.1%); 19.5% needed an interpreter (vs. 16.4%); 58.4% Medicaid (vs 60.8%); and 94.2% lived in Washington State (vs 94.9%). Table 4

Significantly more patients who received dental treatment in the recommended timeframe had a social work plan with action needed when compared to all patients with surgery plans 64.1% (vs.40%) (*P=0.0471*). Of the 234 patients who did not have a social work action plan only 42.7% received treatment. Type of social work involvement with optimally timed patients (vs all patients planned) were: housing 50.0% (vs. 14.4%); 53.3% transportation needs (vs. 23.2%); CASPER alert notification 56.2 % (vs. 8.2%); food insecurity 50.0% (vs. 13.4%); 84.6% recent immigrants (vs 6.7%); 73.6% local lodging on day of surgery (vs. 9.8%); and 37.1% had other issues.

Guardianship status significantly affected optimally timed surgery. The majority of patients planned for surgery 67.9% had two parents in one household and 52% of these received optimally timed surgery *(P=0.0458)*. A guardianship issue was noted for 6.8% (vs. 7.9%) of patients who received dental treatment under GA, and most of these patients were over age 18 years. Table 5.

All who were inpatients at the time of surgery planning were completed within the recommended timeframe. One hundred percent of patients requiring dental treatment prior to other lifesaving care received treatment in the recommended timeframe. Ninety percent of those who required an organ transplant and 80% who were immunocompromised received dental treatment within the recommended timeframe. Other medical diagnoses most frequently associated with optimally timed surgery were: Oncology (71%); Cardiology (51%); and Craniofacial (50%). Figure 3.

Recommended interval to surgery for those receiving optimally timed care was: 42.1% urgent/within 3 months, 28.9% within 6 months, 15.3% within 7-12 months, 7.4% within 13-18 months, 4.2% based upon medical team guidance. Nearly seven percent of patients required a case time of one hour or less, 64.2% of patients required between one and two hours, 23.2% two to three hours, and approximately six percent of patients required greater than three hours for treatment. Table 6. Having an estimated case length of one hour or less was highly associated with receiving surgery in the recommended timeframe (*P > 0.001*). Figure 4.

Of the 301 patients not needing combination surgery, 54.1% were completed in an optimal timeframe. Specifying need for a particular provider did not influence receiving optimally timed surgery. Requiring admission post operatively did not impact access to optimally timed surgery: 44.5% requiring post operative admission were completed and 47.5% of those who did not need to be admitted were completed. Table 6

Outcome 2: Surgery Not Completed within Two Years of Planning

One hundred and nineteen patients (30.5%) did not receive dental surgery within two years of the date the plan was created. The mean age of patients who were not completed was significantly older than all patients planned, (11.1 years, SD 5.31 years vs. 7.9 years, SD = 4.65) (*P<0.001*). No other demographic differences were noted.

Forty-three percent of patients who did not have a social worker involved in their treatment did not receive treatment within two years. The lowest percentage of patients to receive surgery (vs all patients planned) had divided families with two parents in two separate households 34.6% (vs. 6.7%). Children with single parents received surgery less frequently 31.2% (vs. 16.4%) (*P=0.0458*).

The need for combination surgery significantly impacted receiving care in an optimal timeframe (*P* <0.001). When attempts were made to combine care with surgical or diagnostic services outside of pediatric dentistry the delivery of care rate dropped significantly (Figure 6). Only 30.1% of individuals were successful in completing treatment when combined with a non-dental specialty. Those who required more time in the OR were less likely to complete care in the recommended timeframe. Forty one percent who required 2-3 hours received surgery and 35.4% of those who require greater than 3 hours completed treatment. Table 7

Discussion:

Limited access to hospital ORs for dentists providing care to CSHCN is a nationwide challenge (Vo, 2021). At the study hospital, demand for dental services under GA exceeds the current hospital

surgical block allocation to pediatric dentistry. Therefore, not all patients who require dental surgery received care within an optimal timeframe. In this study, recommended timeframes were categorized based upon the patient's medical status and dental symptoms when planned (< 1 month, 1-3 months, 3-6 months, 6-12 months, >12 months). The purpose of this study of CSHCN was to identify SDOH that were bridges or barriers to receiving dental treatment under GA in a clinically acceptable timeframe. There was concern that socially vulnerable patients such as recent immigrants, those requiring social work services and/or interpreters, children of single parents, and/or having Medicaid insurance would receive optimal timed surgery less often than socially advantaged children.

Considerable time and resource commitment by both hospital and family is required to complete surgery. The hospital manages insurance authorization if needed, scheduling of pre-operative evaluations (e.g., anesthesia, cervical spine clearance), selecting patients for surgery to maximize use of allocated OR time on a given date, and contacting the family. Combination care with any specialty outside of pediatric dentistry requires collaboration between two surgery coordinators. The parent/guardian is responsible for completing pre-operative appointments, arriving with their child on the date and time set for surgery, and available to be reliably contacted by the hospital at all points in this process. For parents of many CSHCN, it may be challenging to schedule dental surgery related visits around other medical and therapy appointments, could require taking time away from work, and/or involve arranging childcare for siblings.

Critically Ill Patients:

This group of CHSCN planned for dental surgery was heterogeneous and included critically ill patients planned for life saving care as well as children with chronic non-life-threatening diagnoses. It was reassuring to find that all 32 patients requiring dental treatment to prepare for life-saving medical therapy or surgery (e.g., chemotherapy or organ transplant) received optimally timed surgery. These patients were prioritized regardless of the length or type of treatment necessary. As expected, SDOH did not impact access to care for critically ill patients.

Social Determinants of Health Analysis:

Surprisingly, in this study, SDOH of need for interpreter, race/ethnicity, insurance payer, had no significant association with receiving optimally timed surgery versus not receiving surgery within two years. SDOH of guardianship/household, and a documented social work plan for transportation, housing, food assistance or other needs were found to be both bridges and barriers to timely surgery.

Social Determinants of Health Facilitating Optimally Timed Surgery:

Patients receiving optimally timed surgery more frequently had two parents/one household and/or a social work plan on record. Studies have shown that children with two parent households are more likely to be of higher socioeconomic status, and more access to community resources (Musick 2010). At the study hospital, a social work plan is created in response to specific family needs. Examples within this patient cohort included plans created in response to parent incarceration, parent mental health crisis, and non-stable housing. When parent resources are inadequate or limited, having professional assistance can be a critical component towards receiving optimally time treatment.

Social Determinants of Health Creating Barriers to Optimally Timed Surgery:

SDOH for those not receiving surgery were: two parents/two households and single parents. Children living without both parents are more likely to experience poverty, are at greater risk of accidental injury, and have higher frequency of psychological/emotional disturbances (Musick 2010). These results indicate that if a parent of CHSCN is solely responsible for coordinating the logistics related to dental surgery, the surgery was less likely to be completed within the recommended timeframe. Examples of SDOH barriers found in the group of patients not completing surgery included: reliance on public transportation, coordination of childcare for siblings, and parent's own medical needs (e.g., impending childbirth, mental health conditions).

Other Factors:

This study examined other parameters in addition to SDOH. It was anticipated that patients with urgent needs at the time of planning would be prioritized for scheduling. Other factors expected to facilitate timely scheduling included: younger patients, shorter case lengths, and no need for a specific dentist, or for combination surgery. This data demonstrated that all of these factors were positively associated with receiving optimally timed surgery.

Non SDOH barriers to timely surgery were predicted to be: patients with extensive treatment needs/long surgical times, requiring combination surgery, and/or requiring admission post operatively. Patients with case times longer than three hours or needing combination with medical, diagnostic, or other dental specialists, faced delays in receiving surgery. Unexpectedly, the need for admission to hospital post-operatively was not a barrier to timely surgery.

Modifications to Dental Surgery Planning Process:

Modifications have been made in the dental surgery planning process in response to this study. Information in three areas related to SDOH is collected from the adult accompanying the patient to their surgery planning visit to identify barriers that a family may face in navigating the surgery process.

1. Guardianship/Consent/Scheduling surgery
    a. Who is the legal guardian of this patient?
    b. Is there a second legal guardian who must also consent for surgery?
    c. Who is the best person to contact when scheduling surgery?
    d. Can this person be contacted during weekday business hours between 8 am and 4 pm?
    e. What is the best time to contact this person?
    f. What is the best method for contact during weekday business hours?
    g. How much advanced notice is needed prior to surgery?
    h. Does an employer require Family Medical Leave of Absence documents in advance of surgery?
2. Day of Surgery Logistics
    a. What is the planned mode for travel to the hospital on the day of surgery?
    b. Could winter weather impact coming to surgery between November and February?
    c. If needing to spend the night before and/or after the surgery near the hospital, is assistance needed with lodging?
    d. Are there any other individuals who will need care arrangements for the day of surgery?
    e. Would it create extreme hardship for this patient to go without eating for 6-12 hours on the day of surgery? Specify nature of hardship.

3. Dental Monitoring Plan
    a. Has this patient been to another dentist while waiting for surgery at the hospital?
    b. Has this patient been to an emergency department (ED) with a dental problem while waiting for surgery at the hospital?
    c. Are you able to look inside your child's mouth?
    d. If requested, could you take a photograph inside the mouth and send for review?
    e. Are you able to take your child to the dentist every three months while waiting for surgery?
    f. If dental problems get worse while waiting for surgery the plan is to...
        i. Come to the hospital emergency department (ED)
        ii. Go to the dentist who referred my child to the hospital
        iii. Call the hospital to discuss with the on-call dentist
        iv. There is no plan
        v. Other (specify)

The plan for contact is fundamental for all arrangements related to surgery and appointments. Due to the limited allocation of OR time to dentistry, some patients will be treated outside of a clinically recommended timeframe. Establishing collaboration between the hospital, hospital and community dentists, and the patient's family creates a plan of how to wait safely for treatment (e.g., monitoring every three months, come to the ED if extra-oral swelling develops).

Limitations:

Data was collected retrospectively, and information was restricted to that available in the record. Surgery planning at the hospital was done by five attending dentists and nine residents with variations in notes. Less family information was available for the 24 cases planned outside of the hospital. It is likely some patients without a social work note or plan may have faced similar SDOH barriers to care that were not reflected in the data. Low patient numbers for certain SDOH variables may have contributed to non-

significant findings. This study was conducted at a single hospital which serves patients from a large geographic region. Some patients faced geographical barriers including mountains and oceans which may be irrelevant in other regions in the United States.

Future research should include the family perspective to understand their experience of challenges they faced in navigating a complex medical environment. It would be valuable for other pediatric hospital dental programs to examine the efficacy of their surgery scheduling process for CSHCN and sharing best practices.

Conclusions:

Social determinants of health (SDOH) contribute to disparate health outcomes. In this study of children with special health care needs requiring dental treatment under general anesthesia in a hospital operating room, certain SDOH affected both receiving optimally timed dental treatment under GA and not completing care within two years. Children with two parents in one household were advantaged and children with a single parent or divided households were disadvantaged. Children with SDOH challenges who had a social work plan of support were frequently able to overcome SDOH barriers to receive optimally timed dental surgery treatment.

List of Figures:

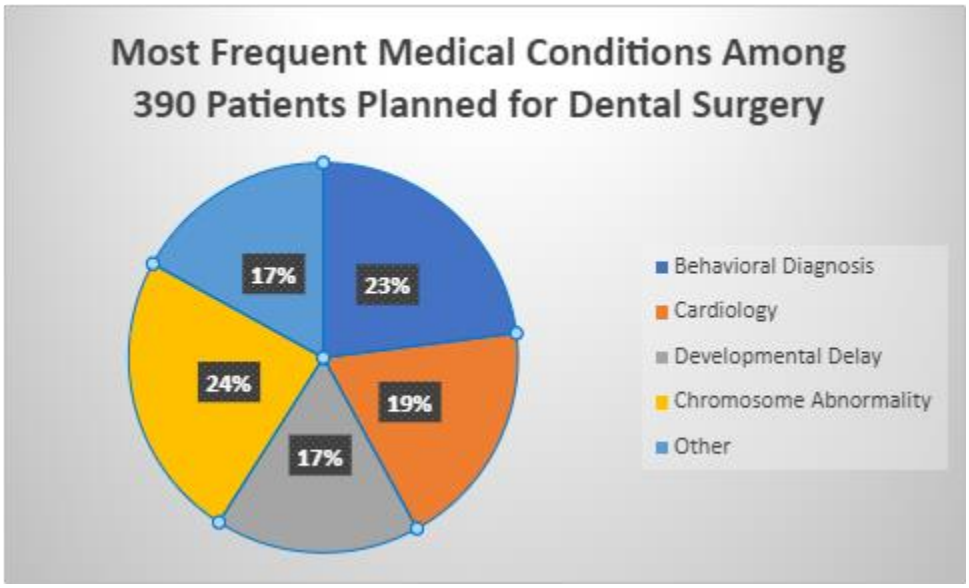

Figure 1

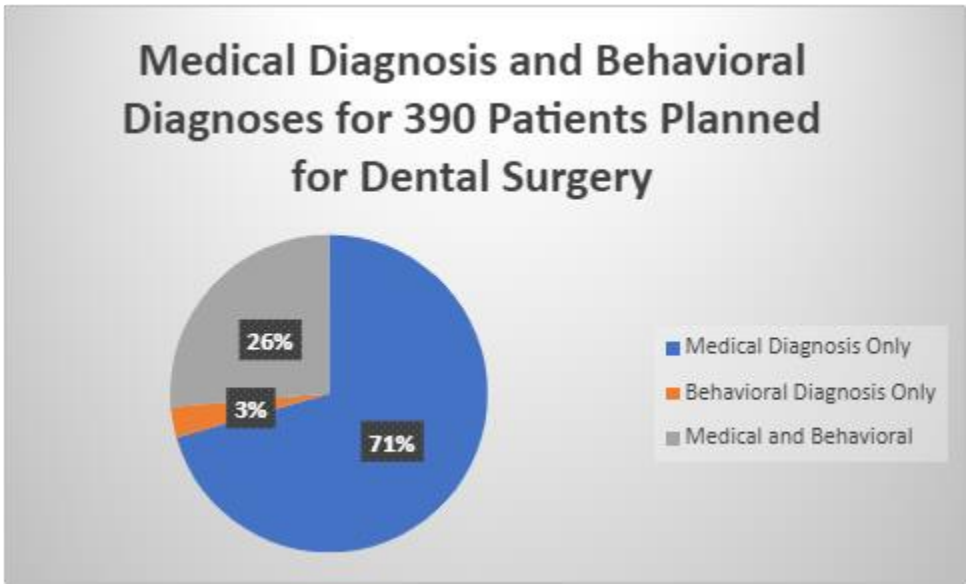

Figure 2

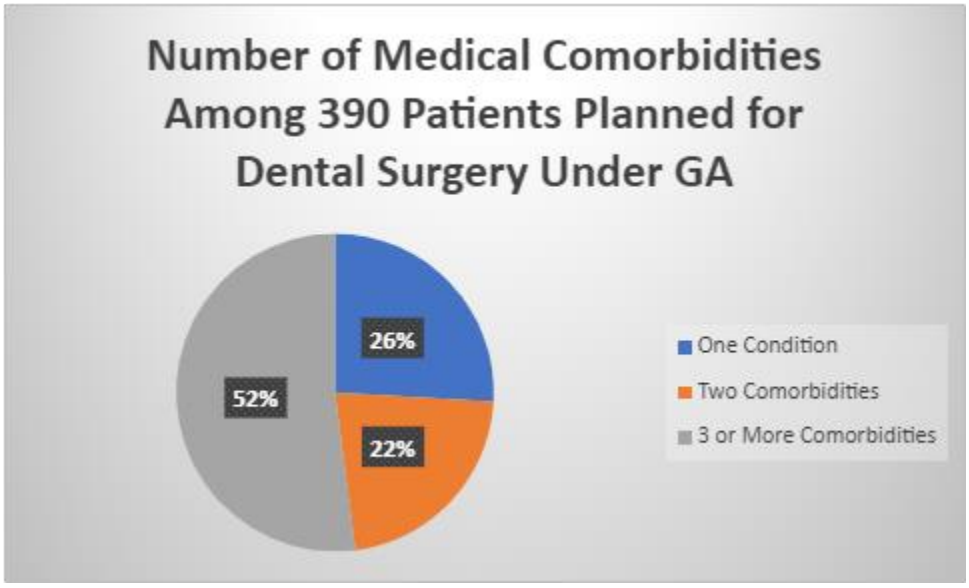
Number of Medical Comorbidities Among 390 Patients Planned for Dental Surgery Under GA
26%
22%
52%
One Condition
Two Comorbidities
3 or More Comorbidities

Figure 3

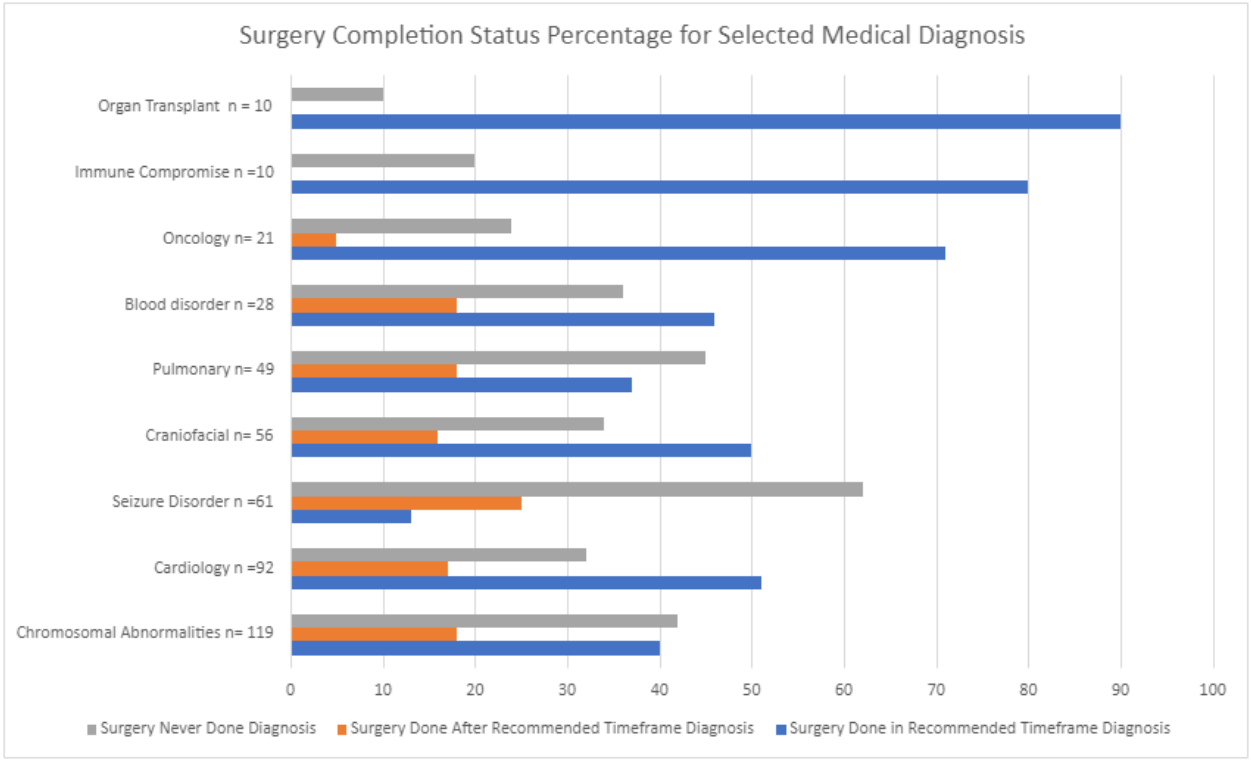
Surgery Completion Status Percentage for Selected Medical Diagnosis
Organ Transplant n = 10
Immune Compromise n =10
Oncology n= 21
Blood disorder n =28
Pulmonary n= 49
Craniofacial n= 56
Seizure Disorder n =61
Cardiology n =92
Chromosomal Abnormalities n= 119
0
10
20
30
40
50
60
70
80
90
100
Surgery Never Done Diagnosis
Surgery Done After Recommended Timeframe Diagnosis
Surgery Done in Recommended Timeframe Diagnosis

Figure 4

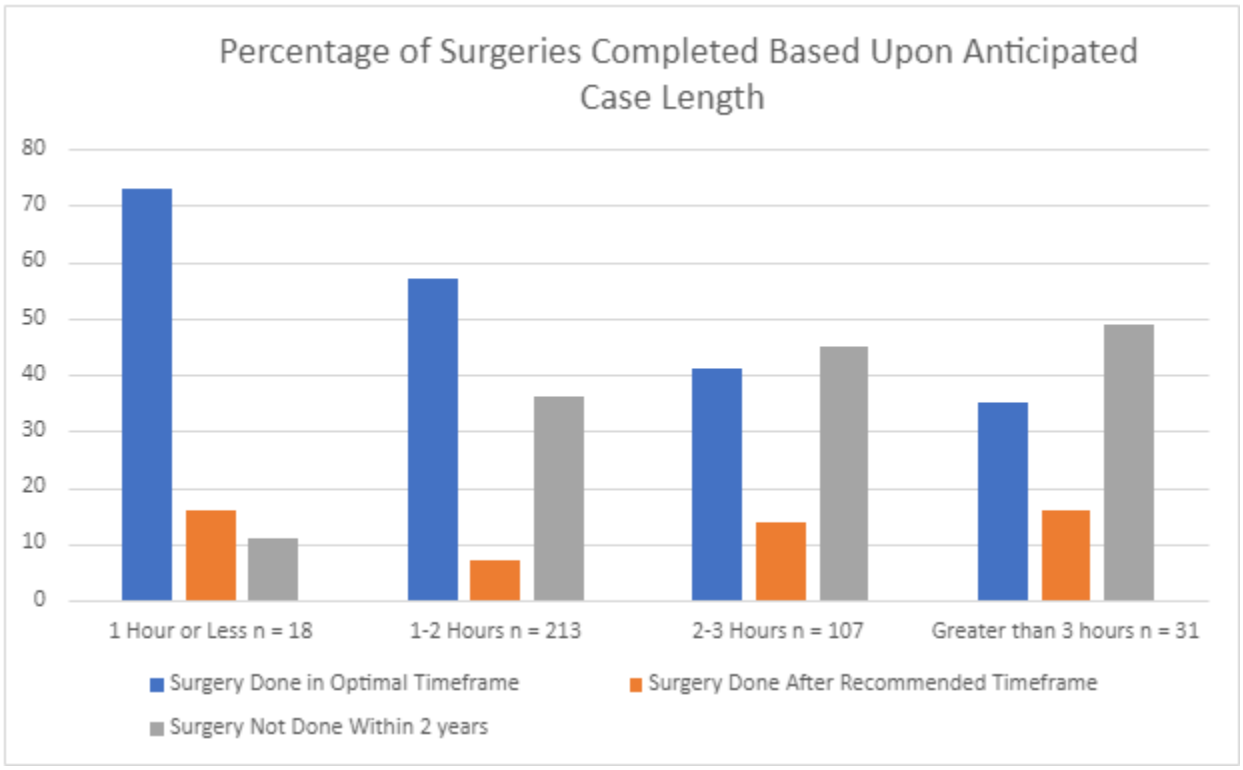

Figure 5

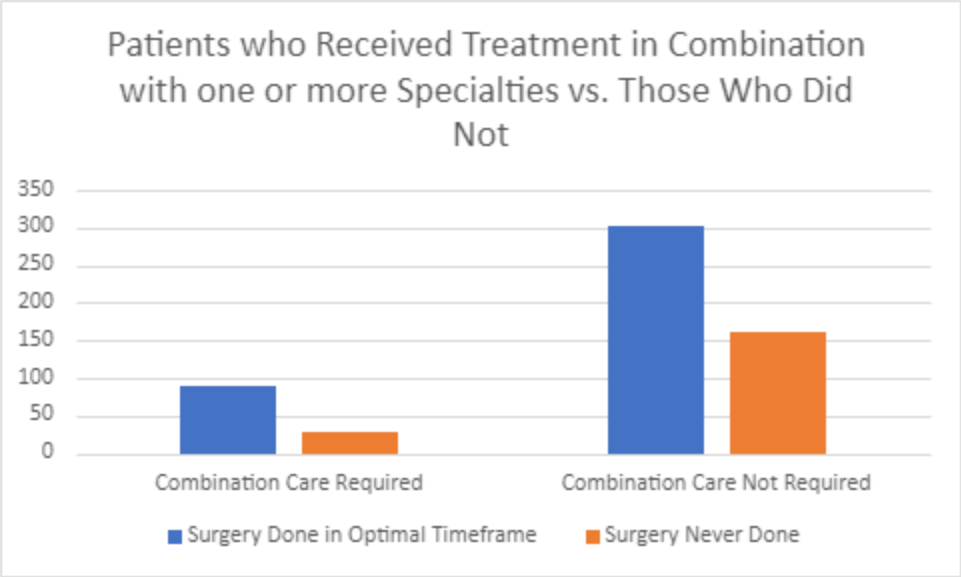

Figure 6

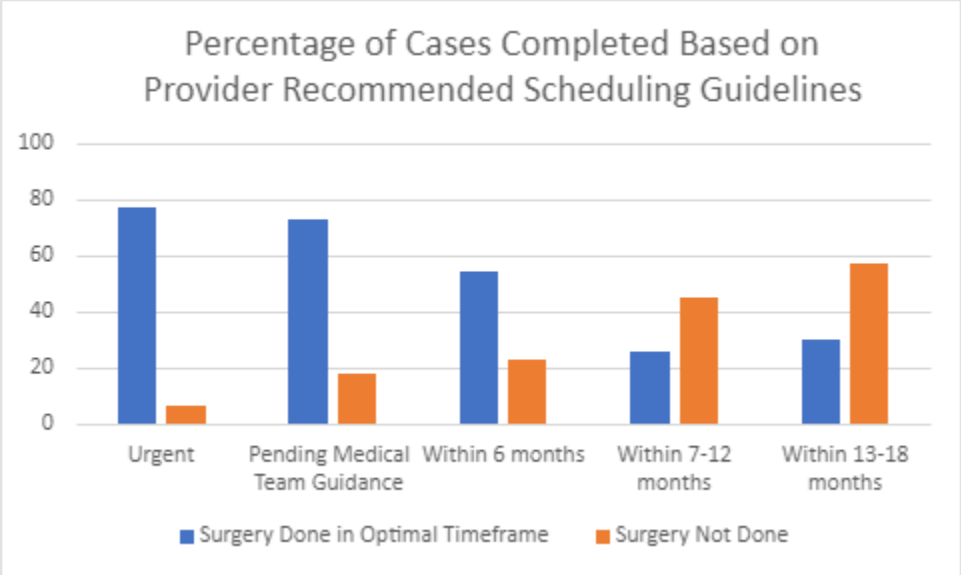

Figure 7

List of Tables:

Table 1: Demographics of all 390 Patients Planned for Dental Surgery in 2019 at a Children's Hospital			
		Patients N =390	
		Mean	**SD**
Age in Years at Plan		8.9	5.1
	Median Age [Min, Max]	8.0 [1.0, 22.9]	
		N	**%**
Gender	Male	222	56.9 %
	Female	168	43.1 %
Race Ethnicity	Caucasian/White	198	50.9 %
	Hispanic	80	20.6 %
	Asian	33	8.5 %
	Black	32	8.2 %
	Alaskan Native	16	4.1 %
	Mixed Race	8	2.1 %
	Native American	4	1.0%
	Prefer not to Disclose	11	2.8 %
Interpreter Needed	Yes	64	16.4 %
	No	326	83.6 %
Primary Language of those in need of interpreter	Spanish	40	58.0 %
	Vietnamese	3	4.3 %
	Somali	3	4.3 %
	Russian	1	1.4 %
	Other	19	27.5 %
Payer	Medicaid/Apple Health	237	60.8 %
	Private	150	38.5%
	Self-Pay	3	0.8%
Home of Record	Western Washington	317	81.3 %
	Eastern Washington	53	13.6 %
	Alaska	9	2.3 %
	Montana	5	1.3 %
	Idaho	2	0.5 %

		Other USA		4		1.0 %	
Table 2: Social Determinants of Health Surgery Never Done		**All Patients N =390**		**Surgery Never Done N=119**		**Column 2 #/ Column 1# N=119**	
		#	**%**	**#**	**%**	**#**	**%**
Social Work Plan Requiring Action	Yes	156	40.0 %	52	43.7%	52	33.3%
	No	234	60.0 %	67	56.3%	67	28.6%
Social Work note includes	Housing Insecurity	28	14.4%	6	11.8%	6	21.4%
	Transportation	45	23.2%	11	21.6%	11	24.4%
	CASPER	16	8.2%	5	9.8%	5	31.2%
	Food Insecurity	26	13.4%	7	13.7%	7	26.9%
	Recent Immigrant	13	6.7%	2	3.9%	2	15.3%
	Local Lodging Needed for Surgery	19	9.8%	1	2.0%	1	5.2%
	Other	72	37.1	22	43.1	22	30.5%
Interpreter Needed	Yes	64	16.4 %	20	16.8%	20	31.2%
	No	326	83.6 %	99	83.2%	99	30.3%
Legal Guardians	Two Parents, One Household	265	67.9%	76	63.9%	76	28.6%

	Two Parents, Two Households	26	6.7%	9	7.6%	9	34.6%
	Single Parent	64	16.4%	20	16.8%	20	31.2%
	More than Two Guardians	8	2.1%	3	2.5%	3	37.5%
	Foster Care	3	0.8%	1	0.8%	1	33.3%
	Other	24	6.2%	10	8.4%	10	41.6%
Payer	Medicaid/Apple Health	237	60.8 %	71	59.7%	71	29.9%
	Private	150	38.5 %	47	39.5%	47	31.3%
	Self-Pay	3	0.8 %	1	0.8%	1	33.3%

Table 3: Surgery Planning Details for all 390 Patients Planned for Dental Surgery at a Children's Hospital in 2019

		All Patients N =390	
		N	**%**
Recommended Scheduling Guidelines	As soon as possible/Urgent	103	26.4%
	Within 6 months	101	26.0%
	Within 7-12 Months	113	29.1%
	Within 13-18 Months	47	12.1%
	Pending Medical Team Guidance	11	2.8%
	Not specified	13	3.4%
Estimated Time Needed for Surgery	1 hour or less	18	4.6%
	1-2 hours	231	59.5%
	2-3 hours	107	27.6%
	Greater than 3 hours	31	8.0%
	No Data	1	0.3%
Specific Provider Needed	No	350	89.7%
	Yes	40	10.3%

Admit Following Surgery	No	303	77.7%
	Yes	74	19.0%
	Patient is already inpatient	17	4.4%
	Admit to ICU	4	1.0%
	Pre-admit for infusion	1	0.3%
Combination Care Required	No	301	77.2%
	Yes	89	22.8%
Combination Specialty	Oral Surgery	32	36.0%
	Endodontics	12	13.5%
	Periodontics	10	11.2%
	Orthodontics	8	9.0%
	Otolaryngology	19	21.3%
	MRI/CT	4	4.5%
	Plastics	3	3.4%
	Brainstem Auditory Evoked Response	2	2.2%
	Other Medical Services	15	16.9%
Origin of Plan	Seattle Children's Hospital	260	66.7%
	Center for Pediatric Dentistry	42	10.8%
	Odessa Brown	12	3.1%
	Private Practice	32	8.2%
	Community Health Centers	26	6.7 %
	Yakima Farmer workers	18	4.6%
Number of Dental Venues Prior to SCH Plan	0	190	48.8%
	1	181	46.5%
	2	12	3.1%
	3	5	1.3%
	4	1	0.3%

Table 4: Demographics of the Patients who Completed Surgery in Optimal Timeframe

	All Patients N = 390		**Surgery Done in Optimal Timeframe N = 190**		**Patients Done in Optimal Timeframe as Percentage of all Patients Planned**
	Mean	**SD**	**Mean**	**SD**	
Age at Plan	8.9	5.1	7.68	4.55	

	Median Age [Min, Max]	8.0 [1.0, 22.9]		6.3 [1.0, 21.7]			
		N	**%**	**N**	**%**	**N**	**%**
Gender	Male	222	56.9 %	102	53.7 %	102	45.9%
	Female	168	43.1 %	88	46.3 %	88	52.3%
Race Ethnicity	Caucasian/White	198	50.9 %	86	45.2 %	86	43.3%
	Hispanic	80	20.6 %	42	22.1 %	42	52.5%
	Asian	33	8.5 %	20	10.5 %	20	60.6%
	Black	32	8.2 %	13	6.8 %	13	40.6%
	Alaskan Native	16	4.1 %	8	4.2%	8	50.0%
	Native American	4	1.0 %	3	1.6 %	3	75.0%
	Mixed Race	8	2.1 %	6	1.5 %	6	75.0%
	Prefer not to Disclose	11	2.8 %	5	1.2 %	5	45.4%
Interpreter Needed	No	326	83.6 %	153	80.5%	153	46.9%
	Yes	64	16.4 %	37	19.5%	37	57.8%
Payer	Medicaid/Apple Health	237	60.8 %	111	58.4 %	111	46.8%
	Private	150	38.5 %	78	41.1 %	78	52.0%
	Self-Pay	3	0.8 %	1	< 0.01 %	1	33.3%
Home of Record	Western Washington	317	81.3 %	154	81.1 %	154	48.5%
	Eastern Washington	53	13.6 %	25	13.2%	25	47.1%
	Alaska	9	2.3 %	6	3.2 %	6	66.6%
	Montana	5	1.3 %	2	< 1.0 %	2	40.0%
	Idaho	2	0.5 %	0	0 %	0	0.0%
	Other USA	4	1.0 %	3	1.6%	3	75.0%

Table 5: Social Determinants of Health for the 190 Patients who Received Optimally Timed Surgery

		All Patients N =390		Surgery Done in recommended timeframe N=190		Patients Done in Optimal Timeframe as Percentage of all Patients Planned	
		N	%	N	%	N	%
Social Work Plan Requiring Action	No	234	60.0 %	90	47.4%	90	38.4%
	Yes	156	40.0 %	100	52.6%	100	64.1%
Social Work note includes	Transportation	45	23.2%	24	24.2%	24	53.3%
	Housing Insecurity	28	14.4%	14	14.1%	14	50.0%
	Food Insecurity	26	13.4%	13	13.1%	13	50.0%
	CASPER	16	8.2%	9	9.1%	9	56.2%
	Recent Immigrant	13	6.7%	11	11.1%	11	84.6%
	Local Lodging Needed for Surgery	19	9.8%	14	14.1%	14	73.6%
	Other	72	37.1%	28	28.3%	28	38.8%
Interpreter Needed	No	326	83.6 %	153	80.5%	153	46.9%
	Yes	64	16.4 %	37	19.5%	37	57.8%
Legal Guardians	Two Parents, One Household	265	67.9%	138	72.6%	138	52.0%
	Single Parent	64	16.4%	27	14.2%	27	42.1%
	Two Parents, Two Households	26	6.7%	9	4.7%	9	34.6%
	More than Two Guardians	8	2.1%	5	2.6%	5	62.5%
	Foster Care	3	0.8%	1	0.5%	1	33.3%
	Guardianship Issues	31	7.9%	16	6.8%	16	51.6%
	Other	24	6.2%	10	5.3%	10	41.6%

Payer	Medicaid/Apple Health	237	60.8 %	111	58.4%	111	46.8%
	Private	150	38.5 %	78	41.1%	78	52.0%
	Self-Pay	3	0.8 %	1	0.5%	1	33.3%

Table 6: Surgery Details of the 190 Patients who Received Optimally Timed Surgery

		All Patients N =390		**Surgery Done in Recommended Timeframe N= 190**		**Patients Done in Optimal Timeframe as Percentage of all Patients Planned**	
		N	**%**	**N**	**%**	**N**	**%**
Recommended Scheduling Guidelines	As soon as possible/Urgent	103	26.4%	80	42.1 %	80	77.6%
	Within 6 months	101	26.0%	55	28.9 %	55	54.5%
	Within 7-12 Months	113	29.1%	29	15.3 %	29	25.6%
	Within 13-18 Months	47	12.1%	14	7.4%	14	29.7%
	Pending Medical Team Guidance	11	2.8%	8	4.2%	8	72.7%
	Not specified	13	3.4%	5	2.6%	5	38.4%
Estimated Time Needed for Surgery	1 hour or less	18	4.6%	16	6.8%	16	88.9%
	1-2 hours	231	59.5%	122	64.2 %	122	52.8%
	2-3 hours	107	27.6%	44	23.2 %	44	41.1%
	Greater than 3 hours	31	8.0%	11	5.8%	11	35.4%
	No Data	1	0.3%	0	0.0%	0	0.0%
Specific Provider Needed	Yes	40	10.3%	19	10%	19	47.5%
	No	350	89.7%	171	90.0 %	171	48.8%
	Yes	74	19.0%	33	17.4 %	33	44.5%

Admit Following Surgery	No	303	77.7%	144	75.8 %	144	47.5%
	Patient is already inpatient	17	4.4%	17	8.9%	17	100%
	Admit to ICU	4	1.0%	2	1.1%	2	50.0%
	Pre-admit for infusion	1	0.3%	1	0.5%	1	100%
Does the patient require Combination care	No	301	77.2%	163	85.8 %	163	54.1%
	Yes	89	22.8%	27	14.2 %	27	30.3%
Combination Specialty	Oral Surgery	32	36.0%	4	14.8 %	4	12.5%
	Endodontics	12	13.5%	3	11.1 %	3	25.0%
	Periodontics	10	11.2%	3	11.1 %	3	30.0%
	Orthodontics	8	9.0%	5	18.5 %	5	62.5 %
	Otolaryngology	19	21.3%	6	22.2 %	6	31.5%
	MRI/CT	4	4.5%	3	11.1 %	3	75.0%
	Plastics	3	3.4%	3	11.1 %	3	100%
	Brainstem Auditory Evoked Response	2	2.2%	0	0.0%	0	0%
	Other Medical Services	15	16.9%	5	18.5 %	5	33.3%
Where does the Plan Originate	Seattle Children's Hospital	260	66.7%	120	63.2 %	120	46.1%
	Center for Pediatric Dentistry	42	10.8%	19	10.0 %	19	45.2%
	Odessa Brown	12	3.1%	6	3.2%	6	50.0%
	Private Practice	32	8.2%	28	14.7 %	28	87.5%
	Community Health Centers	26	6.7 %	9	4.8%	9	34.6%
	Yakima Farmer workers	18	4.6%	8	4.2%	8	44.4%

Number of Dental Venues Prior to SCH Plan Created	0	190	48.8%	95	50.3 %	95	50.0%
	1	181	46.5%	85	45.0 %	85	46.9%
	2	12	3.1%	5	2.6%	5	41.6%
	3	5	1.3%	3	1.6%	3	60.0%
	4	1	0.3%	1	0.5%	1	100%

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