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Examinations under anesthesia for children and youth with behavioral complexity

Medical evaluations of children with behavioral complexity should be coordinated to minimize the trauma of repeat sedations and to identify situations that lead to inequitable care.

ABSTRACT

Background: In British Columbia, a significant proportion of children with neurodevelopmental disorders are unable to access recommended medical investigations/assessments due to behavioral complexity such as aggression and self-injury; consequently, examinations/investigations under anesthesia are often required. However, difficulties in coordination result in fragmented and traumatic service provision.

Methods: Within a larger quality improvement project, an initial chart review of patients aged 2 to 18 years who underwent anesthesia at BC Children's Hospital was conducted to describe the current state of sedation in children with behavioral complexity. Patients were identified from the operating room slate for a randomly selected week in January 2021.

Results: Seventeen percent of patients (31/185) who accessed the operating room during the review period met the criteria for behavioral complexity. Of these, 16% received an add-on procedure in the operating room. Fifty-two percent of patients had not had any blood work done for at least 1 year before the date of their procedure.

Conclusions: It was impossible to efficiently characterize all missed opportunities to conduct physical examinations and medical assessments of children with behavioral complexity who are seen at BC Children's Hospital for sedated procedures, which highlights significant gaps in care optimization for these patients.

Background

Children and youth with autism spectrum disorder and other neurodevelopmental disorders often have associated behavioral complexity. We use the term behavioral complexity to align with the current pediatric understanding of “children with medical complexity,” which includes aggression, irritability, bolting, and self-injurious behaviors. This definition identifies the need for individualized approaches and acknowledges the unique care needs of this population, which frequently includes multiple medical and psychiatric comorbidities, associated intellectual impairment, challenges in communication, and polypharmacy.

Patients with neurodevelopmental disorders often have higher rates of comorbidities and thus require more frequent inpatient, outpatient, and emergency department visits and complex pharmacological management than patients without these disorders.¹⁻³ In these populations, routine physical examinations, laboratory investigations, and medical imaging are often integral to understanding the etiology of behavioral issues, determining appropriate treatment pathways, conducting routine health surveillance, and monitoring for side effects of medications. Nevertheless, access to such evaluations can be challenging due to the potential for behavioral escalations, which necessitates that assessments and investigations be performed under anesthesia.^{4,5} Unique challenges and considerations also exist when using sedation in these populations, which necessitates the use of flexible approaches whereby primary planned procedures (such as a dental assessment) may require additional secondary assessments and are completed opportunistically to reduce the need for repeat sedations.^{6,7}

Challenges in ensuring equitable access to care in populations with neurodevelopmental disorders and behavioral complexity have been documented.⁸ Children with these disorders and behavioral complexity are more likely to have difficulties in obtaining referrals, despite their greater needs, or to have delayed or missed investigations.^{3,9}

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In a recent provincial survey conducted in British Columbia, 36/48 (75%) and 19/50 (38%) of families of children with self-injurious behaviors reported being unable to access physician-recommended assessments and investigations, respectively, due to behavioral complexity (Richardson A. Identifying gaps in care: Perspectives from caregivers of children with intellectual impairment and self-injurious behaviours [under review]). The medical environment, for example, can be a source of distress for children with autism spectrum disorder due to difficulties with transitions and changes in routines, sensory sensitivities, and challenges in communication, which result in the inability to verbally articulate emotion, pain, and distress or to comprehend necessary procedures.^{6,10,11} Studies based on parent-as-proxy reports have also reported that children with autism spectrum disorder experience three times as many specific fears of medical consultations and physical examinations as children without the disorder and more anxiety about medical procedures than age-matched peers.^{12,13}

These factors present a unique set of challenges when striving to provide routine care that is trauma informed and have impacts on the child, their family, and health care providers.¹⁴ The increased health care needs of children with neurodevelopmental disorders place a greater burden of care on parents and caregivers to coordinate, attend, and prepare for repeat visits, which is compounded by the psychological and social challenges encountered when accessing care.^{2,3,7} Current systems in BC rely on parent/caregiver advocacy and their awareness of outstanding examinations and investigations to bring this to the attention of the surgical or anesthetic team when planning for a primary procedure under anesthesia. Our experience suggests that this results in many missed opportunities due to the lack of a centralized and formalized pathway. The fragmented communication and information technology systems between community and hospital providers also contribute to challenges in obtaining simple but necessary assessments. Moreover, when such

tests are missed opportunistically, repeat sedation and anesthesia are required—a system that is inefficient and additionally traumatic and stressful for children and their families.⁷

Our project, embedded within a larger quality improvement initiative, arose from the commitment of a group of physicians and health care providers who work with children with severe behavioral complexity at BC Children's Hospital (BCCH), a pediatric quaternary care centre in BC. This working group of providers included clinicians and representatives from administration; operations; general pediatrics (community- and hospital-based); neuropsychiatry; anesthesiology; dentistry; ophthalmology; ear, nose, and throat; medical genetics; complex care; child life; laboratory; radiology; and family immunization clinics. The project aimed to streamline and optimize examinations under anesthesia for children with neurodevelopmental disorders and behavioral complexity to improve clinical outcomes and efficiency and reduce the physical and psychological trauma currently experienced and associated with these procedures. A multipronged approach was used to establish the current state of coordination of examinations under anesthesia for children with behavioral complexity at BCCH, which, at present, is largely unknown. This included: (1) a 1-week retrospective review of electronic and paper charts to generate a snapshot of the current state at BCCH, (2) a subsequent 2-month extended chart review to build on the initial scoping review, (3) structured interviews with families of children with behavioral complexity who have recently had sedation, (4) structured interviews with service providers involved in coordinating sedation for children with behavioral complexity, and (5) the generation of a patient journey map that amalgamated information obtained from these sources. The results presented are the first step in establishing the current state of examinations under anesthesia and focus on the initial 1-week retrospective chart review component of the initiative.

Methods

The clinical records of all patients aged 2 to 18 years who had behavioral complexity and underwent an elective procedure under anesthesia within a randomly selected week in January 2021 were identified from the operating room slate. Inclusion criteria were defined as an indication of behavioral complexity from the slate based on the presence of a labeling “tag” used by the surgical service to indicate potential extra considerations needed for the patient. All patients with any of the following tags were included: autism, behavior, developmental delay, cerebral palsy, needle phobia, Down syndrome, purple dot (concern for violence), and Canuck Place (hospice) alert, and those who had a completed screening BALANCE tool for behavioral complexity (a tool used to formulate an individualized care plan for children with challenging behaviors). Patients were excluded if they were under 2 years of age or if there was no evidence of behavioral complexity on review of their clinical records.

The following data were collected:

- The patient's demographics (age, sex, ethnicity, postal code), current diagnoses, developmental or functional level (Gross Motor Function Classification System level where available, verbal/nonverbal), current medications, and specialties involved in ongoing care.
- Whether premedication was given (at home or in hospital) prior to entering the operating room.
- Operating room procedural-related information: nature of primary and secondary procedures; specialties involved; and time (1) from entering the operating room to the start time of the first procedure (duration of induction), (2) from the start time of the first procedure to the end time of the last procedure (duration of procedure), and (3) into and out of the anesthetic care unit (duration of anesthetic care unit admission).
- The nature of other procedures completed in the operating room or anesthetic care unit (e.g., physical examination, growth

parameters, laboratory or radiological investigations, ECG).

- Immunization status (up-to-date; if not, whether opportunistic immunizations were administered). Sources of information included the patient’s electronic record (PowerChart and CareConnect) and paper charts, and data were entered into an Excel spreadsheet for analysis with descriptive statistics. Consultation with the University of British Columbia Children’s and Women’s Research Ethics Board indicated that ethics approval was not required because this was a quality improvement initiative.

Results

In total, 185 patients were seen in the operating room for elective procedures from 11 to 15 January 2021. Multiple stakeholders confirmed that this week was reflective of a typical week in the operating room. Thirty-five (19%) of these patients met the inclusion criteria and had behavioral complexity according to tags on the operating room slate; however, based on a review of

the patients’ electronic charts, four patients were excluded from the study. As a result, the electronic and paper charts, including intraoperative records, of 31 patients were reviewed [Figure].

Demographics

The mean age of the children included in the review was 9.1 years [Table 1]. Females comprised 52% of the group. Thirty-nine percent of patients lived 50 km or more from BCCH. Although every effort was made to collect data on self-identified ethnicity, this information was not available due to a lack of documentation across all three data sources.

Diagnoses and comorbidities

The most common diagnoses were autism spectrum disorder (58%), global developmental delay or intellectual disability (52%), and attention deficit hyperactivity disorder (22%) [Table 1]. All six patients (19%) who had cerebral palsy were noted to have a Gross Motor Function Classification System score of 3 or higher. Almost one-third

of patients with behavioral complexity were unable to communicate verbally (32%).

An average of three specialties were involved in the care of each patient. The most common specialties were general/developmental pediatrics; orthopaedics; ophthalmology; dentistry; neurology; cardiology; respiratory; ears, nose, and throat; and neuropsychiatry [Table 1]. Other specialties involved in the care of these children were medical genetics, biochemical diseases, pediatric surgery, neurosurgery, plastic surgery, urology, oncology, hematology, endocrinology, gastroenterology, immunology, dermatology, rheumatology, Eating Disorder Clinic, and orthodontics.

Each child was taking an average of 2.5 regular medications; one-third of the group was taking more than 3.0 (range = 0 to 15) [Table 1].

Perioperative- and procedural-related information

The most common specialties involved in the procedures performed during the week evaluated were orthopaedic surgery (25%),

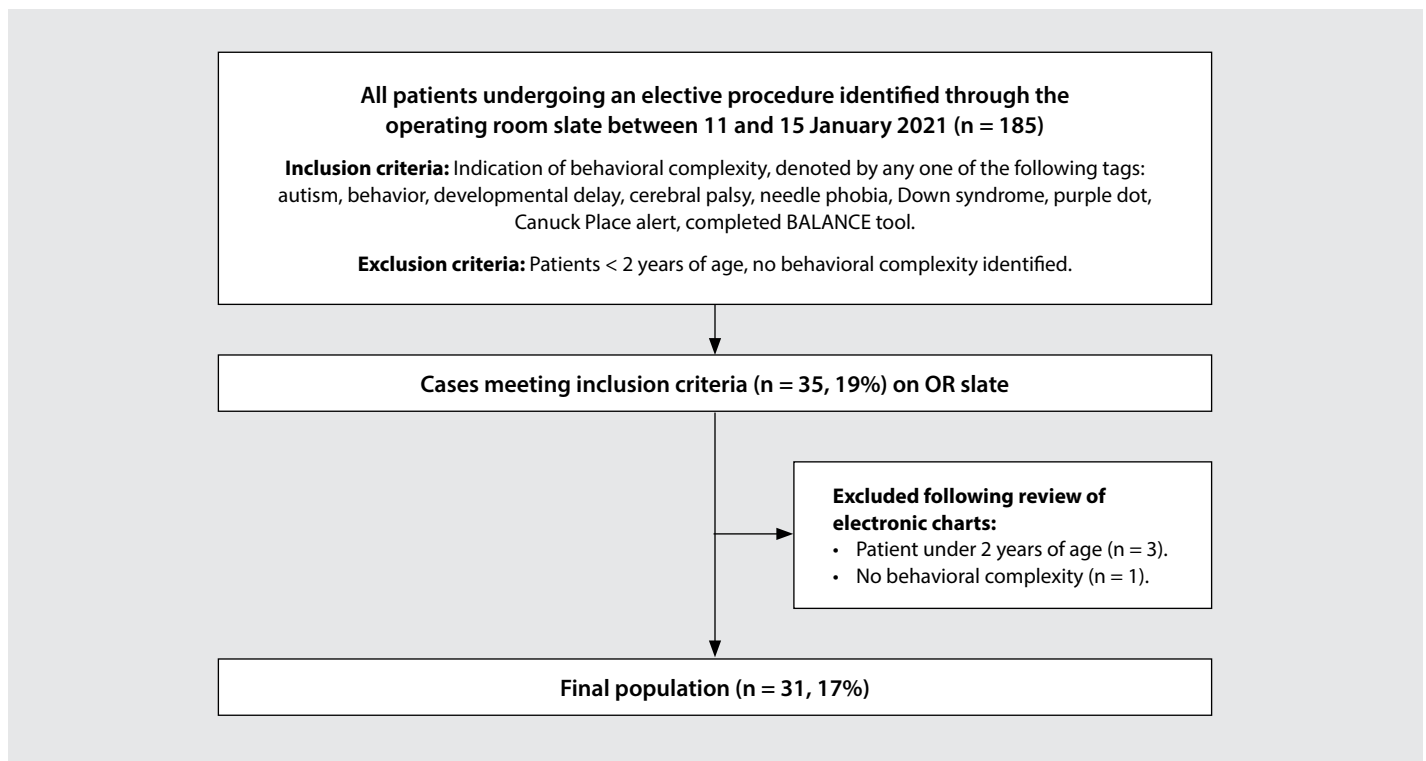


FIGURE. Population sample for examination under anesthesia project.

dentistry (23%), plastic surgery (11%), and radiology (9%), followed by general surgery, ophthalmology, and cardiology (6% each) and ear, nose, and throat surgery; plastic surgery; neurosurgery; psychiatry; gastroenterology; and dermatology (3% each) [Table 2]. Thirty-nine percent (n = 12/31) of children received premedication while in hospital; the number who received premedication at home could not be determined due to a lack of documentation. The average duration of induction (between entry into the operating room and induction of anesthesia) was 26 minutes (range = 7 to 86 minutes), the average duration of procedure was 87 minutes (range = 8 to 451 minutes), and the average duration of admission to the anesthetic care unit was 86 minutes (range = 5 to 204 minutes) [Table 2].

Intraoperatively, 16% of patients received an add-on procedure, the most common being ear, nose, and throat (n = 3); ophthalmology (n = 1); and a lumbar puncture (n = 1). In the anesthesia care unit, additional examinations and procedures were completed for seven patients (23%) and included imaging (n = 6), blood work (n = 1), and an echocardiogram (n = 1).

A comprehensive review of each patient's clinical records was undertaken to determine whether there were any outstanding examinations or investigations to be completed. In two cases, tests had been requested, but there was no record of them being completed to date or at the time of anesthesia. This information was obtained only after conducting an in-depth review of all previous documentation across all three sources for each patient, which took a significant amount of time (approximately 2 hours per patient chart).

Screening and surveillance blood work was completed for 39% of patients while under anesthesia. Fifty-two percent (n = 16) of patients had not had any blood work done for at least 1 year before the date of their procedure [Table 2]. Fifty-two percent (n = 16) of patients had up-to-date immunizations; the immunization status of the other 48% could not be determined from their clinical record. There is no indication that

TABLE 1. Patient demographics and clinical characteristics.

Patient demographics	n	%
Total number of patients	31	—
Female	16	52
Male	15	48
Mean age (years)	9.1	—
Distance from BC Children's Hospital		
< 50 km	19	61
50–100 km	7	23
>100 km	5	16
Clinical characteristics	n	%
Most common diagnoses		
Autism spectrum disorder	18	58
Global developmental delay/intellectual disability	16	52
Communication issues (nonverbal)	10	32
Attention deficit hyperactivity disorder	7	22
Orthopaedic issues	8	26
Cerebral palsy	6	19
Dental caries	6	19
Anxiety	2	6
Down syndrome	2	6
Visual impairment	2	6
Most common specialties involved in care		
Pediatrics (general/developmental)	21	68
Orthopaedics	13	42
Ophthalmology	9	29
Dentistry	8	26
Neurology	7	23
Cardiology	7	23
Respirology	5	16
Ear, nose, and throat	5	16
Neuropsychiatry	3	10
Most common medications prescribed		
Antiepileptics/mood stabilizers	7	23
Benzodiazepines	5	16
Alpha agonists	4	13
Stimulants	3	10
Sleep aids	3	10
Asthma medications	3	10
Antireflux medications (e.g., omeprazole)	3	10
Nutritional medications (e.g., vitamin D, iron)	3	10
Endocrine medications (e.g., thyroxine, desmopressin)	3	10
Selective serotonin reuptake inhibitors/serotonin and norepinephrine reuptake inhibitors	2	6
Pain medications	2	6
Diuretics	2	6
Antipsychotics	1	3
Antihypertensives	1	3

any of the 31 patients received opportunistic immunizations in the operating room.

Discussion

Although we had no preconceptions about rates of behavioral complexity in children who accessed the BCCH operating room, we were surprised to find that approximately 20% of patients who received scheduled sedations at BCCH had pronounced behavioral complexity (which required some accommodation). Several studies have explored the prevalence of diagnoses such as autism spectrum disorder in patients who access care that requires anesthesia, as well as the incidence of postoperative maladaptive behaviors.¹⁵⁻¹⁷ A retrospective chart review of outcomes in dental procedures at a dental surgical centre reported that 12% of patients had a diagnosis of autism spectrum disorder, and 18% were diagnosed with developmental delay (global developmental delay/intellectual disability).¹⁷ In our study, 10% of children who underwent an elective procedure had a diagnosis of autism spectrum disorder, and 9% were diagnosed with global developmental delay/intellectual disability. In contrast, a retrospective review by Swartz and colleagues indicated that 1 in 74 cases (1.35%) of anesthetic use occurred in patients with autism spectrum disorder, although this result was extrapolated from the number of anesthetic procedures conducted (251 of 18 568 procedures).¹⁸ To our knowledge, our study is the first to attempt to determine the rates of behavioral complexity and to identify them preoperatively, although we recognize that complex behavior in the setting of neurodevelopmental disorders often crosses diagnostic boundaries and is not restricted solely to specific diagnoses.

Patient demographics

In this study, almost 40% of families traveled 50 km or more to BCCH. Inequitable access to care due to geographical isolation has been well documented.¹⁹⁻²¹ A recent systematic review highlighted the existence of socioeconomic and ethnic disparities in autism diagnosis and indicated

TABLE 2. Perioperative-related patient information for children and youth with neurodevelopmental disorders and behavioral complexity who underwent elective anesthesia.

Perioperative-related patient information	n	%
Primary perioperative specialties		
Orthopaedic surgery	9	25
Dentistry	8	23
Plastic surgery	4	11
Radiology	3	9
General surgery	2	6
Ophthalmology	2	6
Cardiology	2	6
Ear, nose, and throat surgery; plastic surgery; neurosurgery; psychiatry; gastroenterology; dermatology	1 each	3 each
Duration of induction*		
< 15 min	10	32
15–30 min	12	39
> 30 min	9	29
Duration of anesthetic care unit admission†		
< 30 min	11	35
30–60 min	11	35
> 60 min	9	29
Time since last blood work		
< 6 months	11	35
6–12 months	4	13
13–24 months	5	16
> 24 months	11	35

*mean = 26 minutes (range 7–86 minutes)
 †mean = 86 minutes (range 5–204 minutes)

that children from low-income families and ethnic minority groups had less access to acute care and specialized educational and community services compared with higher-income and Caucasian families.²² Parents of children with neurodevelopmental disorders are also less likely to be employed than parents of children with no health limitations, which adds to the time and financial impacts of travel to access care.²³ We suggest that a streamlined process that is aimed at reducing the need for multiple sedations at BCCH could be shared with tertiary centres, which would reduce the travel requirements for families that are already impacted by inequitable access. Due to the limitations of the retrospective nature of this review, we made every effort to collect data on self-identified ethnicity. However, the lack of routine

recording of such data in patient records limited our analyses; thus, this is an identified gap in equity research.

Degree of medical complexity

The degree of medical complexity in our population of patients was significant, as evidenced by their comorbidities, the number of subspecialties involved in their care, and their polypharmacy. The contributions of medical and psychiatric comorbidities to maladaptive behaviors in children with neurodevelopmental disorders such as autism spectrum disorder have been well documented. Current recommendations highlight the need for comprehensive evaluation of these children, which includes gastrointestinal; neurological; psychiatric; sleep; ear, nose, and throat; ophthalmological; dental; genetic; and metabolic disorders.²⁴⁻²⁷ In a

study of adolescents and adults with autism, Medication Regimen Complexity Index scores (a risk assessment tool for identifying patients on potentially problematic medication regimens) were significantly higher for patients with comorbid seizures, intellectual disability, and a history of aggressive behavior than children without these comorbidities.²⁸ The common classes of medications taken by children in our study were comparable to those in a study by Saqr and colleagues,²⁸ which included antiepileptics, benzodiazepines, stimulants, selective serotonin reuptake inhibitors/serotonin and norepinephrine reuptake inhibitors, and antipsychotics. Our results suggest that one-third of the children in our study were taking more than three medications. Jones and colleagues found that more than half the adults with autism in their study were taking four or more medications.²⁹

Perioperative- and procedural-related findings

A previous study reported that 34% of children with autism spectrum disorder required premedications when they were incorporated into an individualized perioperative management plan.¹⁸ In contrast, Arnold and colleagues reported that 85% of children with autism who underwent dental procedures under anesthesia received premedication; however, this high rate was likely attributable to a standard of care in the institution, given that 92% of children without autism were also offered premedication.¹⁷ In our study, 39% of children received premedication; this was likely driven by current processes in which decisions regarding premedication are based on each anesthesiologist's discretion. Furthermore, the average time to induction in our study was 25 minutes (range up to 86 minutes), compared with the allocated standard time to induction at BCCH of 15 minutes. This is likely suggestive of a complex induction process that is attributable to a range of factors when compared with neurotypical patients, and a reasonable assumption is that this may be related to the patient's behavioral complexity. Literature on the time

for induction of anesthesia in children with behavioral complexity is limited; however, a survey of procedural sedation programs in the US indicated that 28% allotted extra time for this population, and 33% reported scheduling these children as the first sedation of the day.³⁰ In addition to considering the need for premedications as part of a standardized approach, our preliminary

Children with autism spectrum disorder experience three times as many specific fears of medical consultations and physical examinations as children without the disorder.

findings suggest that it may be necessary to allocate extra time for induction in patients who are identified perioperatively to have behavioral complexity.

In reviewing the patients' clinical records, we tried to determine whether each child had outstanding required examinations or investigations that could have been added opportunistically during the anesthetic procedure. Although this was noted in two cases, this information was obtained only after an in-depth review of all previous documentation for each patient was conducted and required a significant amount of time, which would be difficult to perform as part of routine care. Ultimately, it was impossible to determine effectively and efficiently whether each child had outstanding tests that should have been performed while under sedation or what is required by other specialties involved in the care of the patient when providers attempt to maximize the number of procedures to be completed under one sedation. This finding highlights the challenges in care coordination for health care providers in attempting to determine outstanding evaluations from a patient's clinical records and is compounded by current systems that place the onus of advocacy and care coordination primarily

on the parent/caregiver, who is often already stretched in capacity.

Children with behavioral complexity currently experience inequitable access to care.³¹ Given that this patient population is seldom able to access routine and medically necessary or recommended procedures, optimizing planned sedations may present an opportunity to improve this inequity gap. We examined routine and medically necessary information, rather than exceptional investigations, that could improve care. More than 50% of the children in our study who had behavioral complexity and were seen in the operating room had not obtained blood work for at least 1 year prior to the date of their procedure. Guidelines on the usage of antiepileptics such as sodium valproate, psychostimulants, alpha-2 adrenergic agonists, and antipsychotics require routine monitoring, including physical examinations and surveillance blood work; this may have been a missed opportunity within the operating room for a proportion of our patients.^{32,33} Also, it was not possible to determine whether children seen in the operating room were up-to-date on their vaccinations and whether they received additional vaccines while under anesthesia due to a lack of documentation in their clinical record. This may have been another missed opportunity in health promotion, particularly given the challenges with providing immunizations for children with severe behavioral complexity.

Implications of results

The impact of an anesthetic on family and physician burnout is substantial. Participating in and witnessing sedation in a child who does not comprehend what is being done to them is a source of trauma, both physical and emotional, for all involved.³⁴ Parents have highlighted the direct impacts of being involved in such procedures, including behavioral escalations that incrementally worsen with repeated attempts to sedate the child.²⁴ Establishing a trauma-informed pathway would be pertinent when delivering health care to such populations. Furthermore, repeat

sedations due to missed opportunities result in inefficient use of limited health care resources, given that any procedures that require sedation result in longer hospital visits and increased costs.³⁵ While current systems capture the degree of complexity of the child based on their diagnosis, we argue that complexity should also be captured through an additional functional lens, given that common behavioral phenotypes span diagnoses; this presents an opportunity for future research, particularly in considering analyses from an economical perspective.

Study limitations and future directions

We note several limitations in our study. Our study population was drawn from operating room slates and, therefore, would not have captured a significant proportion of behaviorally complex children who require assessment and investigations but have not been actively scheduled for a procedure in the operating room. We anticipate that this may be better evaluated through our other data sources that are being used for this quality improvement project, including qualitative interviews with parents, caregivers, and providers (such as physicians, surgeons, allied health team members, and administrators). Our preliminary results are also limited in their generalizability, given that we examined only 1 week of operating room slates. Nevertheless, this week was chosen at random, and multiple stakeholders confirmed that it was representative of a typical week in the operating room at BCCH.

This study is the first step in a larger, multipronged, quality improvement project that is examining how to improve the coordination of examinations under anesthesia for children with behavioral complexity. Our preliminary chart review highlights an unmet need for access to routine care, with 1 in 6 children seen in the operating room at BCCH being identified as having behavioral complexity. The next phases of the project involve establishing the current state of coordinating examinations under anesthesia and optimizing current approaches, with data drawn from qualitative interviews

with families of children with neurodevelopmental disorders and behavioral complexity who have recently received sedation, and with providers such as physicians and administrative staff involved in coordinating examinations under anesthesia. A 2-month extended chart review that will build on this initial scoping exercise is also currently underway. Amalgamation of the data from these four sources will permit the development of a detailed patient journey map to comprehensively characterize the current pathway to receiving coordinated examinations under anesthesia and the facilitators and barriers involved. This will ultimately inform the development of a streamlined regional approach to examinations under anesthesia at BCCH in a patient-centred and trauma-informed manner that will be individualized to each patient and also draws from recommendations in the literature.

Emerging approaches that incorporate practical aspects for consideration within the perioperative setting that are tailored to populations with autism spectrum disorder and behavioral complexity have recently been published.³⁶⁻³⁹ A pilot study that used a protocol for enhanced perioperative management of children with autism spectrum disorder and incorporated a multidisciplinary approach contributed to positive anesthesia induction experiences,

with positive feedback obtained from both parents and health care providers.³⁸ This involved practical components such as separate quiet rooms as opposed to waiting rooms, child life support for the patient and family, and individualized sedation plans. Our aim is to implement a similar process at BCCH that incorporates sensitivity to the specific behavioral needs of patients with neurodevelopmental disorders and ways to minimize negative experiences. We also suggest that the clustering of care be considered by all clinicians involved with children and youth who have behavioral complexity. By coordinating multiple assessments, investigations, and opportunistic interventions under one sedation, efficiency and quality of care can be improved, and the need for repeat traumatic sedations and clinical risk can be reduced. Drawing from our current experiences, we propose that the examinations and investigations listed in the **Box** be coordinated when a child with behavioral complexity presents for sedation or examination under anesthesia. Ultimately, this study provides the first steps to doing so by establishing the absence of current coordination and missed opportunities for coordinated sedations. Our findings highlight a significant gap in equity research and an increased need to define children with behavioral complexity as an equity-deserving population.

BOX. Recommended assessments, investigations, and interventions to consider for children with behavioral complexity and neurodevelopmental disorders, to be coordinated under a single sedation/examination under anesthesia.

Assessments, investigations, and opportunistic interventions

- Growth parameters (weight, height, head circumference).
- Vital signs (including heart rate and blood pressure).
- Physical examination (including dysmorphology, skin/neurocutaneous stigmata, cardiovascular, respiratory, abdominal, neurological, and joint examinations).
- Dental examination.
- Ear, nose, and throat examination.
- Ophthalmological examination.
- Laboratory investigations (including genetic testing; screening for associated medical conditions, where relevant; and monitoring/surveillance of adverse effects of pharmacological agents).
- Radiological investigations (including X-rays, ultrasound, CT, and MRI).
- Electrocardiogram.
- Electroencephalography (dependent on modality and nature of sedation).
- Opportunistic immunizations (including routine scheduled, COVID-19, and influenza immunizations).

Conclusions

Further research must be conducted to characterize missed opportunities for children with neurodevelopmental disorder behavioral complexity who are seen at BCCH for sedated procedures, given that current systems are ineffective in efficiently determining outstanding evaluations for these children. Changes need to be implemented to create a system wherein medical evaluations for these children can be coordinated to minimize the trauma of repeat sedations, as well as missed opportunities that lead to inequitable care. The results of this study confirm that children with behavioral complexity make up a significant proportion of children seen in the operating room at BCCH on a weekly basis and highlight a need to prioritize optimization of care, not only for patients and families, but also for providers involved in coordinating sedations, to improve clinical outcomes and efficiency of current systems. ■

Competing interests

None declared.

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