

Eighth Annual Dr. Benjamin Goldberg Developmental Disabilities Research Day

Program

Presentation Schedule

- 11:00 am Welcome and Opening Remarks.
Dr. Rob Nicolson and Dr. Benjamin Goldberg.
- 11:15 am Management of Needle Pain and Fear in Autistic Children: Qualitative Perspectives from Caregivers
Olivia Dobson,
University of Guelph.
- 11:30 am The Impact of Early Postnatal Environment on the Cntnap2-knockout Rat Model for Autism Spectrum Disorder.
Ella Dooraert.
Western University
- 11:45 am Sibling Care Relationships in Canada
Pamela Block, PhD & Dina Kassem.
Western University.
- 12:00pm Lunch and poster viewing session.
Great Hall, Somerset House.
- 1:00pm **Keynote Address**
Dr. Daphne Korczak, MD, M.S.c,
FRCPC (Paediatrics), FRCPC (Psychiatry).
Department of Psychiatry, Temerty Faculty of Medicine,
University of Toronto.
- 2:00pm Break
- 2:15pm A Hyperexcitability Phenotype in Human Stem Cell Derived Neuronal Networks of Rett Syndrome
Kartik Pradeepan
Western University

- 2:30pm The Uses and Effectiveness of Occupational Therapy Physical Activity Intervention in Young Children with Developmental Disabilities: A systematic review
Leah Taylor
Western University
- 2:45pm Single Nucleus Multi-omics of the Down Syndrome Brain Identifies Accelerated Oligodendrocyte Precursor Cell Senescence
Bianca Rusu
University of Toronto
- 3:00pm Break
- 3:15pm Auditory Processing in *Cntnap2*-knockout Rats Treated with R-Baclofen During Critical Period of Auditory Development.
Gurwinder Johal.
Western University
- 3:30pm Impact of the COVID-19 Pandemic on the Mental Health of People with Intellectual Disability
Amandi Perera
Western University.
- 3:45pm Award Presentations.
Dr. Rob Nicolson

Keynote Address



Daphne Korczak, MD, FRCPC

Dr. Korczak is the SickKids' Chair in Child and Youth Medical Psychiatry, Director of the Children's Integrated Mood and Body (CLIMB) Depression Program, and an Associate Scientist at the SickKids Research Institute. She is also a Child and Adolescent Psychiatrist and an Associate Professor in the Department of Psychiatry at the University of Toronto.

Her research activities focus on depression and suicide prevention among children and adolescents, and the association of adolescent-onset depression with premature cardiovascular disease. Since the COVID-19 pandemic, Dr. Korczak has led a large collaborative initiative examining the impact of the pandemic on the mental health of children with and without pre-existing mental health conditions.

Dr. Korczak is the author of over 80 publications and book. She is the Chair of the Research and Scientific Committee for the Canadian Academy of Child and Adolescent Psychiatry, and Chair of the Mental Health Task Force of the Canadian Paediatric Society.

Poster Presentations

- Poster #1 Examining Individualized Participatory Approaches to Care for Individuals with Intellectual and Developmental Disabilities
Megan Dong
School of Health Studies, Western University
- Poster #2 Virtual Education and Mental Wellbeing in Students with Neurodevelopmental Disorders during COVID-19
Aditya Thakur
Schulich School of Medicine & Dentistry, Western University.
- Poster #3 Synaptic Alterations in the Startle-Mediating Neurons in the Caudal Pontine Reticular Nucleus of Cntnap2 KO Rat Model of Autism.
Rajkamalpreet Mann
Schulich School of Medicine & Dentistry, Western University.
- Poster #4 Perceptions of Inclusion in Informal Education Settings
Israa Ibrahim
Faculty of Education, Western University
- Poster #5 Factors Predicting Depressive Symptomology Among Children, Youth and Young Adults with Intellectual Disabilities: A narrative review and call to action.
Kailee Liesemer
Faculty of Education, Western University.
- Poster #6 Practices for Supporting Participation in Informal Education Settings for Children with Neurodevelopmental Disorders: A scoping review.
Monica Sadowski
Faculty of Education, Western University
- Poster #7 Engagement and Oral Science Skills in Students with Neurodevelopmental Disorders Taking Part in a Video-Enhanced Intervention Package
Laurie Marchand
Faculty of Education, Western University
- Poster #9 A Clinical Fellowship in the Psychiatry of Developmental Disabilities
Sarah O'Flanagan
Department of Psychiatry, Schulich School of Medicine & Dentistry,
Western University

- Poster #10 The Impact of the COVID-19 Pandemic on Access to Care Among Autistic Children and Their Families.
Nathalie Hader
School of Medicine, Queen's University
- Poster #11 Grey Matter Glutamatergic Deficits in Autism.
Rob Nicolson
Department of Psychiatry, Schulich School of Medicine & Dentistry,
Western University.
- Poster #12 Globalization of Transverse Relaxation Time Abnormalities in Autism.
Rob Nicolson
Department of Psychiatry, Schulich School of Medicine & Dentistry,
Western University.
- Poster #13 Riluzole for the Treatment of Autism Spectrum Disorder.
Rob Nicolson
Department of Psychiatry, Schulich School of Medicine & Dentistry,
Western University.
- Poster #14 Cognitive Functioning and Adaptive Behaviour in Autism.
Rob Nicolson
Department of Psychiatry, Schulich School of Medicine & Dentistry,
Western University.

Abstracts – Oral Presentations

Management of Needle Pain and Fear in Autistic Children: Qualitative Perspectives from Caregivers

Dobson, O., Symons, F.C., & McMurtry M.,
University of Guelph.

Study Objectives: Autistic children commonly have difficulty undergoing needle procedures and their needle-related pain and fear is frequently underrecognized and undermanaged. Despite available guidelines for helping children cope with needle pain and fear, it is unclear whether these guidelines are appropriate for autistic children and their caregivers. Therefore, the objective of this study was to explore caregiver perspectives on making needle procedures more comfortable and coping strategies more appropriate for them and their autistic child.

Methods: Twenty Canadian caregivers of autistic children completed semi-structured interviews that included open-ended questions about their child's needle procedure experiences and the appropriateness of strategies from the guidelines. Interviews were transcribed and analyzed using reflexive thematic analysis to identify themes.

Results: Four main themes were identified from what caregivers said: 1) autistic children's sense of autonomy is important, such as children participating in decisions; 2) external factors impact autistic children's comfort, including the environment, the child's sense of familiarity, and healthcare providers; 3) caregivers play a key role by preparing themselves and others before needle procedures, such as by communicating with healthcare providers, and 4) coping strategies must be tailored to the needs of autistic children.

Conclusions: Autistic children and their caregivers require a child and family-centered approach to make needles comfortable for them. It is also clear that individualization is required in order for coping strategies to be optimally effective for autistic children. Practical recommendations are provided to help healthcare providers and caregivers support autistic children undergoing needle procedures.

The Impact of Early Postnatal Environment on the Cntnap2-knockout Rat Model for Autism Spectrum Disorder

Doornaert, E., Möhrle, D., El-Cheikh Mohamad, A., Johal, G., Allman, B., & Schmid, Susanne.

Schulich School of Medicine & Dentistry, Western University

Autism spectrum disorder (ASD) is a neurodevelopmental condition affecting one in 160 children worldwide. The Cntnap2-knockout rat is a preclinical genetic model for studying ASD-related phenotypes. Previous work has demonstrated that homozygous Cntnap2-knockout (Cntnap2^{-/-}) rats exhibit differences in communication patterns when bred and reared by a Cntnap2^{-/-} compared to a heterozygous Cntnap2-knockout (Cntnap2^{+/-}) dam.

Study Objective: The present research investigated if differences in postnatal environmental conditions imposed by breeding with a Cntnap2^{+/-} or Cntnap2^{-/-} dam also affect other ASD-related phenotypes in the Cntnap2^{-/-} rat including auditory processing, sensorimotor gating, and social behaviour.

Methods: We implemented a cross-fostering paradigm in which Cntnap2^{-/-} offspring were bred from a Cntnap2^{-/-} dam but transferred to be reared by a Cntnap2^{+/-} dam.

Results: We found subtle differences due to parental genotype and rearing conditions in measures of the auditory brainstem response, the startle response, and prepulse inhibition. Notably, although cross-fostering did not appear to affect juvenile play alterations observed in the Cntnap2^{-/-} rats, it did restore social memory as assessed by a three-chamber social behaviour test.

Conclusions: This research provides evidence that certain ASD characteristics observed in the Cntnap2^{-/-} are not fixed by genetic predisposition but can be malleable by environmental conditions. Furthermore, the results have implications for how all researchers conduct breeding when using genetic animal models to study neurodevelopmental conditions.

This research was funded by a CIHR and NSERC-USRA grant.

Sibling Care Relationships in Canada

Block, P., Kassem, D., Schneider, S., Sebbude, A., Atalla, M., Ries, H.K., Rossi, R., McKinley, G.

Department of Anthropology, Western University.

Study Objectives: The objective of this ethnographic research project on mutual care relationships between adult siblings (disabled and nondisabled) is to learn how sibling duos experience their present lives and imagine their futures together by highlighting recurring themes and shared values. Research questions include:

1. What care relationships are formed between disabled and nondisabled siblings with the loss or withdrawal of parents?
2. What policy, social support, and economic aspects of sibling care relationships are important to participants?

Methods: Data is collected through a series of ethnographic video interviews to study various formulations of care relationships existing in Canada. The duos are also invited to create and share photos documenting their lives together. In this way we study verbal and nonverbal data (e.g., body language in images and videos) about the sibling relationships.

Results: Preliminary themes that have emerged from this study include:

1. Interpersonal communication and relationships between siblings
2. Building meaningful daily lives for both siblings
3. Paid and unpaid personal assistance work
4. Supports and challenges in negotiating service and health systems
5. Housing
6. Grief and Distress

Conclusion: We will consider how what we have learned might inform future interventions and policy initiatives to enhance the wellbeing and quality of life of both disabled and nondisabled siblings in Canada. We hope to stimulate future research partnerships with sibling activists to facilitate change on regional and national levels to better support disabled people who have lost parents and who must now create new care relationships with siblings

A Hyperexcitability Phenotype in Human Stem Cell Derived Neuronal Networks of Rett Syndrome.

Pradeepan, K., McCready, F., Wei, W., Ellis, J., & Martinez-Trujillo, J.
Robarts Research Institute, Western University.

Study Objectives & Methods: Rett Syndrome (RTT) is a neurodevelopmental disorder caused by a loss-of-function mutation in the X-linked gene methyl-CpG-binding protein 2 (MECP2). Using human stem cell (hSC)-derived models of RTT, researchers are investigating the reenactment of MECP2-mutant altered brain development. Previous multielectrode array research has shown hSC-derived neuronal networks exhibit patterns of activity resembling fundamental features of in vivo networks. Here, we present a temporally complex bursting pattern termed reverberating bursts (RB), a phenomenon never reported before in RTT. We examine the development of RBs in the context of MECP2-mutant excitatory networks. Furthermore, we use pharmacological treatment to probe underlying mechanisms at play in our RTT networks.

Results: RBs appear as a large initial activity burst across the network, followed by several high-frequency lower amplitude bursts. RTT networks began to reverberate earlier and in greater proportion compared to isogenic controls. RBs marked a transition of the network from a slow to a faster network state. RBs were abolished by the application of EGTA-AM (Ca²⁺ chelator), but not bicuculline (GABA receptor antagonist). The latter indicates the mechanism of RB production likely depends on asynchronous neurotransmitter release driven by calcium.

Conclusions: Taken together, reverberating bursts (RB) present as a temporally complex dynamic that warrants careful consideration when defining bursts. Our results show that RBs emerge early in developing neuronal networks of RTT, likely a consequence of enhanced excitability in single neurons and networks. Early emergence of RBs may be linked to disorders of hyperexcitability such as epilepsy, frequently observed in patients with Rett syndrome.

Funding: Simons Foundation Autism Research Initiative (SFARI) Research Grant #514918 (J.M.-T., J.E.), NSERC Postgraduate Scholarship-Doctoral Program (K.P.), SickKids HSBC Catalyst Research Grant (J.E.), John Evans Leadership Fund Grant (J.E.), Autism Speaks Predoctoral Award #11879 (F.P.M.), Canada Research Chair (Tier 1) in Stem Cell Models of Childhood Disease (J.E.), Provincial Endowed Academic Chair in Autism and Behavioural Science (J.M.-T.).

The Uses and Effectiveness of Occupational Therapy Physical Activity Interventions in Young Children with Developmental Disabilities: A systematic review.

Taylor, L.G., Primucci, M., Irwin, J.D., & Tucker, P.

Physical activity (PA) is often used to support the development of young children (< 5 years) with disabilities. The effectiveness of PA as an occupational therapy (OT) treatment approach in this population has not yet been systematically examined. This research aimed to explore the uses and effectiveness of OT PA interventions on developmental indicators in young children with developmental disabilities.

Methods: A systematic review of peer-reviewed publications (from 2000 onward) across six electronic databases was conducted. The Grading of Recommendations Assessment, Development, and Evaluation (GRADE) framework was used to assess study quality. Narrative synthesis (vote counting and structured reporting of effects) was employed to summarize the findings.

Results: Eight studies with heterogeneous interventions were included. A total of 131 participants were represented. All participants had a diagnosis of a developmental disability, which included Down Syndrome, autism spectrum disorder, developmental delay, or intrauterine spinal cord infarct. One study included participants with more than one diagnosis, and another included participants with differing diagnoses. Evidence demonstrated positive trends of participation in the PA interventions on physical, cognitive and social-emotional indicators, with significance varying. There was no association between interventions and communication indicators, or negative effects related to participation in the interventions. Overall, the studies were low-quality when judged by GRADE.

Conclusions: PA may be a promising avenue for OT interventions among young children with developmental disabilities. Rigorous research is needed to determine the magnitude of effect PA has on developmental indicators.

Funding: Dr. Benjamin Goldberg Grant, Canadian Institutes of Health Research (CGS-D).

Single Nucleus Multi-omics of the Down Syndrome Brain Identifies Accelerated Oligodendrocyte Precursor Cell Senescence

Rusu, B., Kukreja, B., Wu, T., Dan, S.J., Yi Feng, M., & Kalis, B.T.
Hospital for Sick Children and the University of Toronto

Down Syndrome (DS), the leading genetic cause of intellectual and physical disability, is caused by the triplication of human chromosome 21 (HSA21). The DS brain is marked by neuroinflammation and hypomyelination and results in lifelong cognitive, learning, and memory impairments alongside near-ubiquitous incidence of early onset neurodegeneration. However, the molecular mechanisms underlying cognitive decline in DS remain largely unknown. Using the Ts65Dn mouse model of DS, we performed an integrative single-nucleus RNA- and AA-seq analysis of the 6-monthy cortex. We identified cell type-specific mRNA and chromatin-associated changes in the DS cortex, including regulators of transcription, translation, neurodevelopment, and inflammation. Changes in gene expression were evident, but not restricted to trisomic regions, suggesting complex global cascades that contribute to genome-wide regulatory and dosage compensatory mechanisms. We further discovered enrichment of a senescence-associated transcriptional signature in DS oligodendrocyte precursor cells (OPCs) and epigenetic changes consistent with a loss of heterochromatin. Markers of senescence were also visible on a cellular level, with DS OPCs exhibiting upregulated senescence-associated β -galactosidase (SA- β -gal) activity, loss of LaminB1 (Lmnb1), and reduced proliferation. Treatment of Ts65Dn mice with the senescence-reducing flavonoid, Fisetin, rescued cortical microenvironment. High-resolution confocal microscopy paired with 3D cellular reconstruction evidenced phagocytic dysfunction and impairments in synaptic refinement in both OPCs and microglia, suggesting a resulting disruption in glia activation and engulfment behavior. Together these findings suggest that cortical OPC senescence may be an important driver of neuropathology in DS.

Auditory Processing in Cntnap2 Knockout Rats Treated with R-Baclofen During Critical Period of Auditory Development.

Johal, G., Maroon, M., & Schmid, S.

Schulich School of Medicine & Dentistry, Western University.

Study Objectives: Individuals with certain neurodevelopmental disorders, such as autism spectrum disorder, often have altered sensory processing and, therefore, may have exaggerated startle responses to sudden, loud sounds. A previous study found that various aspects of this altered auditory processing in Cntnap2 homozygous knockout rats—a model of autism-like symptoms—were reversed by acute administration of the GABA- β receptor agonist R-Baclofen; however, the long-term effects of R-Baclofen administered during auditory development are unknown. The objective of this study was to investigate the startle response and prepulse inhibition (PPI)—measures of auditory reactivity and sensorimotor gating, respectively—of adult Cntnap2 knockout (KO) and wildtype (WT) rats that were treated with R-Baclofen from age post-natal day (PND) 14 to 21, covering a period of high auditory developmental plasticity.

Methods: Half of the rat pups in the KO and WT groups were injected daily intraperitoneally with 0.5 mg/kg R-Baclofen, while the other half were injected with 0.9% saline, serving as controls. These groups were then tested for baseline startle response and PPI on PND 38 and 78 using sound-attenuating boxes with pressure-sensitive platforms.

Results: So far, the results (n=6) suggest a reversal of the Cntnap2 knockout phenotype as no differences were found between R-Baclofen-treated KO and saline-treated WT rats in either of the aspects of auditory processing analyzed.

Conclusions: This suggests pharmacological interventions during a critical phase of auditory development can change the developmental trajectory and have lasting beneficial impacts on sensory symptoms associated with neurodevelopmental disorders.

Funding was provided by Western University, the Canadian Institute of Health Research (CIHR), and the Natural Sciences and Engineering Research Council of Canada (NSERC).

Impact of the COVID-19 Pandemic on the Mental Health of People with Intellectual Disability.

Perrera, A., Campanella, S., Koch, L, & Thakur, A.

Schulich School of Medicine & Dentistry, Western University, Azrieli Adult Neurodevelopmental Centre, and Temerty Faculty of Medicine, University of Toronto.

Study Objectives: This systematic review aimed to summarize the impact of the COVID-19 pandemic on the mental health and psychosocial wellbeing of adults with intellectual disability (ID).

Methods: This review protocol was registered with PROSPERO and literature searches were conducted in December 2020 and April 2021, with search strategies developed by a medical librarian. Full-text screening was done by two independent reviewers with any conflict resolved by discussion. Studies that quantitatively or qualitatively assessed the mental or psychosocial impact of the COVID-19 pandemic on adults with ID aged 18 years or older were included. A quality appraisal of articles was conducted using the Mixed Methods Appraisal Tool (Hong, et al. 2018).

Results: The studies included in this systematic review highlight the negative impacts of the pandemic on the mental health, social support, and social connection within this community. These studies included the perspectives of not only people with ID, but also formal and informal caregivers.

Conclusions: The COVID-19 pandemic impacted the mental and psychosocial wellbeing of adults with ID. These findings illustrate the importance of including those lived experience, people with ID, and their caregivers in discussions about pandemic response strategies and solutions.

Abstracts - Poster Presentations

Examining Individualized Participatory Approaches to Care for Individuals with Intellectual and Developmental Disabilities: A scoping review.

Dong, M., Young, G., Dunne, B., Antony, D., Armstrong, R., Ryan, B., Matthews, M., & Sibbald, S.

School of Health Sciences, Western University.

Study Objectives: Individuals with intellectual and developmental disabilities experience complex health needs and face challenges in finding care that fits their needs and effectively support them. Person-centred plans (PCPs) have been identified as a favourable upstream intervention for community-care populations to address the inequities in care. Our study examined individualized participatory approaches to care planning in health and social care services.

Methods: Utilizing an integrated knowledge translation approach, knowledge users (PHSS, a London, Ontario-based community-care organization) and researchers participated in all aspects of the research design. We conducted a scoping review guided by Arksey and O'Malley's framework to examine the state of the evidence for individualized participatory approaches to care planning. Specifically, we looked for the types and features, factors that support or hinder, and the effectiveness and impact of participatory approaches to developing individual care plans in the community-care sector.

Results: The scoping study review found limited literature and demonstrated diversity in the types and features of implemented practices considered person-centred and participatory, focusing on topics ranging from finances, education, relationships, and community engagement goals. Additionally, there was scarce evidence supporting the effectiveness and impact of individualized participatory approaches to care planning, with limited studies focusing on the evaluation of practices.

Conclusions: Our results illustrate a gap in the evidence on operationalized participatory approaches to care planning, despite the Ontario mandate for PCPs within the community-care sector. We hope our findings will encourage care professionals to evaluate their services to promote the potential impacts of individualized participatory approaches to care planning

Virtual Education and Mental Wellbeing in Students with Neurodevelopmental Disorders during COVID-19.

Thakur, A., & Loh, A.

Schulich School of Medicine & Dentistry, Western University & Temerty Faculty of Medicine, University of Toronto.

Objectives: Virtual education has been implemented in education systems worldwide, however, its impact on mental wellbeing has not been explored extensively in school students with neurodevelopmental disorders (NDD). The aim of the present study was to evaluate the perspectives of students with NDD's on virtual education and their mental wellbeing during the COVID-19 pandemic.

Methods: This was an observational cross-sectional study conducted in a high school student sample. A survey including the Warwick-Edinburgh Mental Wellbeing Scale and a questionnaire to understand experiences of virtual education was distributed to parent-patient advocacy groups for NDD. Results from students with NDD were included in the present study.

Results: The survey was conducted among a sample of 101 students in Ontario, Canada. Sixteen participants had an NDD. All students with NDDs had access to internet and technology resources to support virtual education. Mental health challenges related to virtual education were also reported. Those who were not able to achieve their academic goals and experienced feelings of isolation, had significantly lower mental wellbeing scores. The majority of the students in this sample preferred in-person learning options.

Conclusion: In summary, virtual education has enabled continuity of learning during the COVID-19 pandemic, but high school students with NDDs face challenges. Further research with larger samples is needed to confirm the study's findings and develop targeted interventions that prioritise the mental wellbeing of students with NDD.

Synaptic Alterations in the Startle-Mediating Neurons in the Caudal Pontine Reticular Nucleus of Cntnap2 KO Rat Model of Autism.

Mann, R., & Schmid, S.

Schulich School of Medicine & Dentistry, Western University.

Study Objectives: Disruptions in the Cntnap2 gene are known to cause language impairments and symptoms associated with autism spectrum disorder (ASD) in humans.

Importantly, knocking out this gene in rodents results in ASD-like symptoms that involve auditory processing deficits, including increased acoustic startle and impaired startle habituation. To assess the cellular basis of these behavioural alterations, this study used in vitro electrophysiology to examine alterations in the startle-mediating giant neurons of the caudal pontine reticular nucleus (PnC), which is a brainstem structure that receives inputs from the peripheral auditory pathway and directly innervates motor neurons.

Methods: Whole-cell patch-clamp recordings were conducted in young (post-natal days 8-P14) wildtype and Cntnap2^{-/-} rats, and auditory afferents that synapse onto giant neurons were stimulated to measure synaptic depression, which is hypothesized to mediate startle habituation.

Results: There were no differences in measures of intrinsic membrane properties such as resting membrane potential, input resistance, membrane capacitance, action potential thresholds, and rheobase between wildtype and Cntnap2^{-/-} rats. Moreover, preliminary results show that amplitudes of the auditory afferent evoked EPSCs (eEPSC) decreased (compared to the first eEPSC) in wildtype rats, but the eEPSC amplitudes did not significantly decrease in Cntnap2^{-/-} rats, indicating the latter exhibit impaired synaptic depression.

Conclusions: These results show that while the intrinsic cell properties of startle-mediating giant neurons were unchanged, the synaptic inputs from the auditory pathway were altered in Cntnap2^{-/-} rats. This may provide us with a mechanism for the increased acoustic startle and decreased short-term habituation seen in the Cntnap2 KO rat model of autism.

This research was funded by: NSERC, CIHR, Simons foundation autism research initiative (SFARI), and the C. Kingsley Allison Research Grant

Perceptions of Inclusion in Informal Education

Ibrahim, I., Withers, A., & Neil, N.

Faculty of Medicine, Western University.

Study Objectives: Informal education experiences are those that occur outside of a traditional classroom and are critical for developing new skills, sharing experiences with family members, and fostering a sense of community. However, children with intellectual and developmental disabilities (IDDs) often have fewer opportunities to participate in informal education experiences than their typically developing peers. The objective of this study was to evaluate stakeholder perceptions of the inclusion of children with IDDs in an informal education setting; a children's museum.

Methods: Using a mixed-methods approach, we interviewed 13 stakeholders including families attending the children's museum (with and without children with IDDs) and staff members. 67 unique statements were extracted from the interviews and participants engaged in the analysis using group concept mapping.

Results: A seven-cluster solution was obtained reflecting the themes of physical accessibility, functionality, universal design, inclusive learning, targeted accommodations, representation and inclusion, and supportive staff. Participants indicated that the most important elements for supporting inclusion were statements in the inclusion and representation, physical accessibility and inclusive learning opportunities clusters.

Conclusions: Families want to feel like they belong without having to ask to belong. They feel included when they see themselves represented in the museum, and when the museum offers accommodations and is easily accessible to children with various needs. Children's museums should implement changes that are based on designing inclusive spaces with a focus on targeted accommodations.

This project is supported in part by funding from the Social Sciences and Humanities Research Council.

Factors Predicting Depressive Symptomology Among Children, Youth and Young Adults with Intellectual Disabilities: A narrative review and call to action.

Liesemer, K., & Neil, N.

Faculty of Education, Western University.

While children, youth, and young adults with intellectual disabilities (ID) are at a greater risk for developing depression, there remains a lack of research disentangling factors contributing to depressive symptomology among this population. In turn, there is a critical need to respond to this research gap to guide the preventative work of clinicians, researchers, and policymakers to better support people with ID and their families. The current paper provides a narrative review of recent literature examining predictor variables of depressive symptomology in children, youth, and young adults with ID. Informant methods (e.g., caregiver, self-report, observation) used to assess predicting variables and depression within this population were further examined as a secondary question. Eight studies published between 2014 and 2022 were reviewed. Factors related to five main themes were identified: (1) negative life events, (2) family characteristics, (3) co-occurring health conditions, (4) sociodemographic characteristics, and (5) ID functioning level. Further, caregiver report was the most frequently used informant method. The findings aim to build awareness of depression in children, youth, and young adults with ID among researchers, practitioners, service agencies, families, and policymakers. Similarly, the results are a step towards better-informing screening, prevention, and intervention services to align with the mental health needs of people with ID and their families. More research focused on predicting variables of depression in children, youth, and young adults with etiology-specific ID is required. The results of this review should be interpreted cautiously due to several limitations in the methodology.

Practices for Supporting Participation in Informal Education Settings for Children with Neurodevelopmental Disorders: A scoping review.

Sadowski, M., Ranieri, J.M., Azzam, M.B., & Neil, N.
Faculty of Education, Western University.

Objectives: Informal education settings (IES) include museums, camps, or aquariums, and can provide powerful learning opportunities for children. While IES have made improvements in the inclusion of people with disabilities, efforts have primarily focused on physical accessibility, and individuals with neurodevelopmental disabilities continue to experience exclusion from informal education opportunities. Given the challenges children with neurodevelopmental disorders face in IES, continued research is needed to understand the facilitators and barriers to participation in these settings. Understanding these factors can support the design of inclusive IES and enhance children's experiences.

Methods: We used Arksey and O'Malley's six-stage scoping framework to review literature on the inclusion of people with neurodevelopmental disabilities in IES examining (1) What is known about the participation of individuals with neurodevelopmental disabilities in IES? (2) What strategies are used to foster participation in IES for children with neurodevelopmental disabilities? (3) What are the outcomes of these strategies on participation? Study characteristics, practices used to promote inclusion, and outcome measures were extracted.

Results: Forty-eight studies were included, including mixed method evaluations, quantitative, and qualitative designs. The majority of the studies were conducted in camp settings in the United States. Twenty-two studies took place in non-inclusive settings or programs. Study outcomes included increased interactions between campers, increases in target goals and social, cognitive, and emotional development, and changes related to identity.

Conclusions: Findings from this review underscore the need for more and better-quality research. Further work is needed to reduce and eliminate barriers toward inclusion for children with neurodevelopmental disabilities in IES.

Engagement and Oral Science Skills in Students with Neurodevelopmental Disorders Taking Part in a Video-Enhanced Intervention Package.

Marchand, L., Liesemer, K., & Neil, N.

Faculty of Education, Western University.

Study Objectives: Without supportive tools, students with neurodevelopmental disorders (NDD) are at risk of underachieving in academic science goals due to mainstream teaching methods being most well-suited for neurotypical students. This study investigated the effects of a video-enhanced intervention package for teaching science skills to students with NDD on engagement and oral science skills.

Methods: Two students with NDD (9-year-old girl with attention-deficit/hyperactivity disorder, 10-year-old boy with autism spectrum disorder and an auditory processing disorder) each participated in 16 sessions of 5 science experiments in a multiple probe across participants design. Well-supported tools were introduced post-baseline and consisted of audiovisual activity schedules, a knowledge chart, prompting from the instructor, and naturalistic reinforcement. From the video recordings of sessions, the students' scientific utterances were measured using event recording and further analyzed for mean lengths of utterances (MLU) and the presence of newly uttered and re-used scientific words. The duration of off-task and on-task active or passive engagement behaviour was also coded.

Results: The number of scientific utterances per session increased post-baseline. Although the MLU did not increase, the quality of the statements, inferred from the scientific vocabulary, did increase. Most of the newly uttered scientific words were repeated. The three engagement behaviours showed no consistent changes from baseline to post-baseline sessions.

Conclusions: The increase in the number of scientific utterances suggests that the intervention package was successful in improving communication skills in the students. There are certain limiting factors that could have influenced the engagement percentages.

A Clinical Fellowship in the Psychiatry of Developmental Disabilities.
O'Flanagan, S., Loba-Gutierrez, G., & Nicolson, R.
Schulich School of Medicine & Dentistry, Western University.

Background/Introduction: Although psychiatric disorders occur at a higher rate in people with Developmental Disabilities (DD) the lack of training opportunities with this population has led to most clinicians feeling inadequately trained to assess and treat such patients. This study examined the impact of a clinical fellowship in psychiatry of DD in the Developmental Disabilities Program at Western University which was designed to increase the capacity of psychiatrists in this area.

Methodology: The fellow completed three-month rotations in neurology, developmental pediatrics, genetics, and rehabilitation medicine. Rather than spending blocks of time in psychiatry, the fellow spent four days each week throughout the academic year in two psychiatry clinics, one for children and one for adults with developmental disabilities. Surveys regarding the role and the impact of the fellow were completed by supervisors at the completion of the fellowship and the fellow was interviewed about her experience.

Results/Outcomes: Supervising physicians surveyed reported that having a Clinical Fellow in the Psychiatry of Developmental Disabilities was extremely beneficial to their clinics and their patients. They, and the fellow also reported that the longitudinal, multi-disciplinary approach was critical to training the fellow.

Discussion: The purpose of the fellowship was to increase the number of physicians with expertise in DD. Based on the results from our first fellow we have achieved this goal, although continuation of the fellowship will allow us to collect more data. Based on the results from this study, the longitudinal model is integral to training, as is the participation in inter-disciplinary clinics.

The Impact of the COVID-19 Pandemic on Access to Care Among Autistic Children and their Families.

Hader, N., Mockler, C., Coo, H., Samdup, C., & Smith, G.
School of Medicine, Queen's University.

Study Objective: This study aims to investigate the impact that the COVID-19 pandemic has had on access to care among autistic children and their families in Ontario.

Methods: A survey was developed with the help of developmental pediatricians and a caregiver of an autistic child within the community. Participants were recruited via social media. Parents or legal guardians of autistic children between the ages of 2-12 residing within Ontario were eligible. The survey was divided into 4 sections: (1) Demographics and Clinical Characteristics. (2) PedsQL Parent proxy report. (3) PedsQL Family Impact Module. (4) Access to Care and Services during the Pandemic. Frequency distributions were used to summarize the quantitative data in SPSS. Responses to the open-ended questions were imported into NVivo for thematic analysis.

Results: We had 46 responses to our survey. Three-quarters of respondents (74%) reported having had a virtual visit with a care provider during the pandemic. Among patients who lost access to services during the pandemic, the proportions who have not regained access to specific services are as follows: family physician, 23%; speech language pathologist, 46%; occupational therapist, 62%, applied behavioral therapist, 44%; and pediatrician, 21%. About one-third (30%) of families experienced a decrease in respite hours during the pandemic, and 100% of those have not returned their pre-pandemic level of support.

Conclusion: This study highlights that the COVID-19 pandemic greatly impacted access to services among families with autistic children, with many still reporting that they have yet to achieve pre-pandemic levels of support.

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The CPD Psychiatry Academic, Clinical and Educational Round Series are a self-approved group learning Activity (Section 1) as defined by the Maintenance of Certification program of The Royal College of Physicians and Surgeons of Canada. (3.5 Credits)

Each participant should claim only those hours of credit that he/she actually spent participating in the educational program.

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The Developmental Disabilities Program, Western University is approved by the Canadian Psychological Association to offer continuing education for psychologists. The Developmental Disabilities Program, Western University maintains responsibility for the program..