Holland Bloorview
Kids Rehabilitation Hospital

Bloorview
RESEARCH INSTITUTE

BRI Self-Guided Tour

[***Stop 1*** *– stand in front of BRI by the main entrance on 4th floor]*

Welcome to the Bloorview Research Institute.

The research institute is housed in Holland Bloorview Kids Rehabilitation Hospital, Canada's largest children's rehabilitation hospital.

Holland Bloorview is one of Canada's top 40 research hospitals and is fully affiliated with the University of Toronto.

Thanks to the generosity of our donors, $32-million was raised to create additional space, equipment and scientific talent to support the growth of the BRI.

In this research space, the BRI brings together teams of top researchers and trainees to work collaboratively with clinicians as well as clients and families to co-create meaningful and healthy futures for children living with developmental differences and disabilities as well as their families through ground-breaking research and innovations.

BRI's pediatric research covers a wide gamut, including understanding developmental diversity, studying the brains, bodies and pathways of the lived experiences of children and youth with disabilities, and the co-creation and evaluation of interventions that can promote health and wellbeing.

The BRI also provides research opportunities to students and scholars with disabilities and who are racially diverse through programs such as the Empowering Black Academics, Researchers and Knowledge creators program and the lived experience and Indigenous streams within the Ward Family Summer Student Research Program.

The research institute's discovery hubs are shared research core facilities containing fully accessible, state-of-the-art research equipment that equip scientists, researchers and trainees to work on cutting-edge scientific discoveries around childhood disability.

These shared research spaces support research in areas that include diversity in brain development, children's mobility and physical activity and assistive technologies among other areas.

Scan the QR code on the poster in front of you to watch a video about the BRI.

***[Stop 2**: Walk into open BRI research space in 4 West]*

Our research spaces are intentionally designed to support inclusive data collection with children who experience a range of differences and disabilities such as cerebral palsy, autism, brain injury, amputations, spina bifida, and muscular dystrophies among other conditions.

In 2023, our research space was re-imagined to accommodate the current and future needs of our diverse research teams.

To accomplish this, we focused on creating a fully accessible space with wider doors and hallways, touchless door openers, fully adjustable desks and workspaces and using colour contrast between walls, floors and doors.

We also created dynamic and flexible workspaces that can easily grow and contract with the needs of research teams and promote collaboration and innovation.

Finally, we democratized access to natural light and natural views to support the health and wellbeing of all staff.

The research institute's commercialization team work to turn innovative ideas developed by researchers and clinicians into real-world products and services that can benefit children, youth and families.

***[Stop 3** - Psychosocial Ecological Discovery Hub – BRI, 4th floor]*

This hub provides a data collection site for researchers who study topics including, but not limited to developmental and behaviourial diversity, community participation and experiences with rehabilitation services.

Researchers also use this space to examine societal issues around stigma, ableism as well as a person's quality of life and interventional outcomes.

Scan the QR code on the poster in front of you to see this hub in action!

*[**Stop 4** - Brain & Body-Machine Interfacing Discovery Hub – BRI, 4th floor]*

This hub is where research teams study how our brains and bodies interact with our surrounding environment. For example, the researchers using this hub are studying how our brains interface with computers to help us communicate, which is leading to the development of ground-breaking technologies to help kids with limited speech and motor abilities interact with their environment.

This hub houses state-of-the-art instrumentation that allows researchers to monitor brain activity non-invasively by using different measurement modalities such as electrical, optical and ultrasound.

The equipment can also measure changes in the body such as the beating of your heart, how fast you breathe, the electricity of your skin, the temperature of your face and the activity of your muscles.

DEMO (noon to 1:15 pm) : Head over to the board room on the 4th floor (4W245) to see our pediatric brain computer interface in action! Take the elevator to the 5th floor and one of our volunteers can assist you.

Scan the QR code on the poster in front of you to see this hub in action!

***[Stop 5** – Neuromodulation Discovery Hub – BRI, 4th floor]*

This hub is where research teams work to better understand how our brain activity changes together with our bodies' thoughts, emotions, and movements.

By understanding better how brain activity controls our bodies, research teams can create new treatment options using targeted brain stimulation techniques to enhance a person's rehabilitation therapy.

DEMO (12:15 to 1:15 pm): Head into this hub to see this research in action and chat with members of the CONNECT Lab team to learn more!

Scan the QR code on the poster in front of you to see this hub in action!

***[Stop 6** - Rapid Prototyping Discovery Hub – BRI, 4th floor]*

This hub is where research teams can test, customize, evaluate and prototype specialized devices, textiles, assistive technologies and instrumentation, which are then used in research studies and real-world applications.

The Rapid Prototyping Discovery Hub serves as the 'backbone' of any research lab at the Bloorview Research Institute where researchers are doing research or developing novel devices. This hub is like a one-stop shop for mechanical, electrical and textile design and testing for our research teams.

Scan the QR code on the poster in front of you to see this hub in action!

*[**Stop 7** - Gaming/App Development Discovery Hub – BRI, 4th floor]*

This is where scientists can develop child-friendly technology such as 'mixed-reality' video games and apps. 'Mixed-reality' is where kids can use everyday objects, such as colourful building blocks or musical instruments to interact with and play video games and apps. These accessible games and apps can be used to help kids with disabilities achieve their therapy goals or just have fun.

The hub provides scientists with the space to develop and pilot new project ideas and to work with families to fine-tune them to help them achieve their goals.

Scan the QR code on the poster in front of you to see this hub in action!

DEMO (12:15 to 1:15 pm & 4 to 4:30 pm: Check out a demo of BootleBlast and Bootle Band, mixed reality video games designed to help kids with disabilities meet their therapy goals while having fun, by our research team in the Grocery Foundation Resource Centre on the main floor and try out these games!

[**Stop 8** - Data Science Discovery Hub – *BRI, 4th floor*]

Researchers in this hub are developing new ways to analyze many different kinds of data. These might be data about biology (for example, our brains and genes), data about behaviour (for example, how we act, move or interact with our world), data from children's health records, and data about how our health system is being used.

Researchers using this hub will study personalized treatments related to childhood disability and health system utilization using artificial intelligence. This hub will also help researchers share data and partner with companies.

Scan the QR code on the poster in front of you to see this hub in action!

[Stop 9 - High Performance Discovery Hub – 5th floor in research tower]

This hub provides research teams with the core facilities to discover new insights into the motor skills and physical activity of kids with disabilities.

Researchers using this hub are developing and evaluating innovative treatments to enhance physical performance and motor learning through assistive technologies such as prosthetics, orthotics and wearable systems.

The hub comes equipped with state-of-the-art robotic technology that promotes gross motor skills, walking mobility, and physical activity.

DEMO (12:40 to 1:15 pm): Watch our research team demonstrate the Trexo Exoskeleton, a wearable skeletal system powered by robotics that can give children with mobility issues the chance to stand and walk.

Scan the QR code on the poster in front of you to see this hub in action!

[***Stop 10*** *– Imaging Discovery Hub – take elevator across from pool to basement level and follow signs*]

This hub houses our research MRI, or 'Kevin' as it's affectionately called by our clients. Our research MRI is Canada's first child-friendly, customizable, immersive and fully accessible research MRI. Scientists can use this high-tech research equipment to study how the human brain develops in children, youth and adults.

The research MRI was designed with kids in mind and co-created by scientists, clients, youth leaders and Holland Bloorview's youth council. To make the MRI scanning experience not just comfortable, but a fun experience, kids can change images projected on various screens in the scanner room and even on the scanner itself so it resembles an ocean or outer space.

DEMO (12:15 to 1:15 pm): Watch Canada's first child friendly, fully accessible, immersive and customizable research MRI in action! Our senior MRI technologist will be on hand to show you all the cool features of this new MRI suite.

Scan the QR code on the poster in front of you learn what kids can expect during a research scan inside the MRI.

[*Stop 11* *– accessible playground – go to back of cafeteria to view playground*]

In partnership with the Bloorview School Authority and Kindercircle, the hospital's daycare, and with the generosity of our donors, Holland Bloorview has built a state-of-the art, fully accessible playground.

This playground is used by our students as well as our clients to express their creativity through play. The playground has many accessible play structures such

as wheelchair swings and therapeutic play equipment, all surrounded by natural elements.

Kids can also create music with various musical instruments and play panels.

This concludes the self-guided tour. We hope you enjoy the rest of the symposium!