



**PEDIATRIC RESIDENTS
RESEARCH TRAINING HANDBOOK**

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Introduction

Residency programs across the country are placing more emphasis on learning objectives and competencies related to research. The pediatric residency program at Memorial prides itself on the level of training it gives its residents in this area, which many residents find to be one of the most rewarding parts of their program. This handbook outlines the learning objectives and the different activities related to research which pediatric residents at Memorial need to complete during their residency program. It also provides information about how this part of your program is evaluated.

The Royal College of Physicians and Surgeons sets learning objectives for residents related to research. The Canadian Pediatric Resident Research Network (CPRRN) is an organization that joins together the faculty members responsible for research across all of Canada's pediatric residency programs. One of its main goals is to ensure consistency in the learning objectives related to research across pediatric programs. It has recently published guidelines on the tasks and experiences that pediatric residents should have throughout their program.¹ In Appendix 1, there is a table that maps our program objectives to the Royal College objectives, the required tasks set out by the CPRRN, and CanMed competencies. Our residency research training program is designed to cover all these learning objectives.

Pediatric Residency Program Research Learning Objectives

- To develop and conduct a medical/scientific research project.
- To demonstrate knowledge of the basic principles of health research.
- To demonstrate how to critically appraise and review literature in an area of interest.
- To effectively communicate scholarly material to an intended audience via publication of scientific articles, poster presentations, or oral presentations.

¹ Pound C, Robinson J, Giglia L, Rodd C, Sharma A, Chafe R, Collet JP, Ulanova M, McGavock J. (2019) Scholarly training objectives and requirements for paediatric residents in Canada. *Paediatrics and Child Health* May; 24 (2):76-80. doi: 10.1093/pch/pxy070 .

The Importance of Research to Resident Training

Being a medical resident will help you develop the skills and experience you need to be a practicing physician. While your residency program is primarily focused on clinical training, research also plays an important role. The purpose of completing a resident research project is to give you the skills to better assess medical research and to prepare you for the research-related parts of your career. It will expand your competencies in key areas like management, scholarship, collaboration, advocacy and communication. These skills will help you be a better and more informed pediatrician. In an age where patients have easy access to medical research articles, your research training may also help you better address patient inquiries.

From a career perspective, having a strong research background will give you greater flexibility around the type of practice that you will have and where you can work. Your project will give you a new perspective on the topic and the patient population you selected to learn more about. Undertaking a research project in a particular area both highlights your interest in the subject matter and gives you an opportunity to work with clinical staff in that area. If you are hoping to do a fellowship, completing a relevant research project could offer you an advantage over other residents applying for the same fellowship.

Completing a research project is a way of giving back. Our residents have always made a significant contribution to the health research that is conducted at Memorial and within our regional health authorities. They expand local knowledge in many disease areas and have created resources which directly help our patients and future medical trainees. Resident research also contributes to better understanding of the issues our patients face and the care they receive.

While research may sometimes feel like just another task that needs to be completed, completing a well-done research project is one of the easiest ways to distinguish yourself within a residency program. Many residents look back with pride at what they were able to accomplish and contribute. With a little commitment, your resident research training can offer you a great deal in return.

Key People

Before you start your resident research training, you should know that you are not alone. There are people you can reach out to for help and support. Two people who will play an important role in the development and execution of your research project are the Pediatric Resident Research Director (PRRD) and your Project Supervisor. It is important to understand the role of each as it relates to your research project and training.

Pediatric Resident Research Director (PRRD)

The PRRD is the faculty member responsible for organizing the research part of your residency program curriculum. This includes ensuring that all residents have a research project as well as organizing other training opportunities related to research (e.g., academic half days on research-related topics), organizing a Pediatric Residents' Research Day, and ensuring that the program meets all the Royal College of Physicians and Surgeons of Canada's objectives related to resident research training. The PRRD will work with all the residents in the program to ensure they are meeting their research learning objectives. He or she is also responsible for reporting residents' progress related to research to the Residency Program Director and completing evaluations for research rotations and selectives.

The current PRRD is **Dr. Jo-Anna Hudson**. She can be contacted at Joanna.hudson@easternhealth.ca

Your Project Supervisor

Each resident will also have a faculty member or clinical staff person who serves as their research project supervisor. Your project supervisor will advise you and help supervise your specific research project. For some projects, residents may have more than one supervisor. The supervisor will have research or clinical expertise in the topic being studied and can advise you about issues related to the type of research you are conducting. Your supervisor can also help you find other people with expertise in specific areas. Identifying a good supervisor is a key step to ensuring that your project is completed as smoothly as possible. Some tips for finding a topic and a supervisor are presented below.

Residency Program Research Tasks

There are six main components which residents need to complete over their residency program. These components are:

1. Complete an independent research / academic project
2. Present your project proposal at Pediatric Residents Research Day (2nd Year)
3. Present your project results at Pediatric Residents Research Day (4th Year)
4. Complete the TCPS 2 Ethics Certificate
5. Regularly attend pediatric journal club
6. Regularly attend academic half days on research

Each component is described in more detail below.

Research / Academic Projects

Each resident is required during their program to complete either a research or academic project. Research projects aim to add knowledge in a particular area related to pediatric health. Often these projects add to our knowledge of our local pediatric population and the care provided to them. Academic projects aim to develop a resource for a medical program or for resident education. In either case, resident research or academic projects need to have an evaluative component and be of sufficient scope so that residents can illustrate their ability to develop and conduct a medical/scientific research project.

In most cases, residents will develop their own research question and design their own research project with assistance from their project supervisor. Residents can join an existing research project as long as the resident has a clear role and their work on that project allows them to demonstrate their ability to complete an independent research project. Similar consideration is given if multiple residents plan to work on the same project.

Examples of potentially appropriate study designs for resident projects are listed in the table below. Consideration can be given by our program's resident research director for residents to pursue additional study designs.

Potential study designs for pediatric resident research projects

Quality Improvement*
Medical Education Evaluation/Project*
Knowledge translation activities*
Advocacy projects*, †
Surveillance studies
Case Series Study
Prospective Qualitative Study
Retrospective, hypothesis-driven clinical or epidemiological
observational research using an existing database
Systematic or scoping review
Prospective, hypothesis-driven clinical or epidemiological
observational or experimental study

*Must include an evaluation component; †must have significant individual contribution.

Most research projects completed as part of the Certificate in Medical Teaching (MED6100: Teaching and Learning in Medical Education), offered through the Faculty of Medicine's Office of Professional and Educational Development, do meet the requirements for a resident research project.

If there are any questions about whether a proposed project can qualify as a resident research project, the resident should contact the PRRD to discuss.

In all cases, residents should have their research project topics approved by the PRRD before the end of the first year of their residency program.

Tips on Finding a Resident Research Project Topic and Supervisor

One of the challenges that new residents face, especially when coming to a new hospital and new program, is how to identify a resident research project and a project supervisor. The program recognizes this situation and gives residents until the end of the first year of their residency program to confirm your project topic and supervisor. With that said, the earlier you get your topic identified, the better.

Residents can help start the process of selecting their project topics in several ways. In fact, the research project is perhaps the part of the residency program's content over which you have the most control. Think about what medical topic or topics you may be interested in exploring more. Some residents may know what they would like to do after residency and aim to do a project or work with a person in that area. For example, someone wanting to do an endocrinology fellowship may want to do their research project in some area related to endocrinology, which can give you an advantage during a fellowship interview. Similarly, maybe there is a staff person that you like or would like to work more with. You could ask them about their research interests. The more reflection you put into what you want to do, the easier it will be to find something you want to study.

The program has several approaches to help you find an appropriate topic. We regularly check with the clinical staff about potential research topics and interest in mentoring a resident. The PRRD contacts all 1st year pediatric residents in the early Fall of your first year to discuss your research interests and these potential staff projects. Most good project ideas take a little time to develop. It is usual for the resident to have several meetings with either their supervisor and/or the PRRD to discuss and clarify a topic.

Finally, in Appendix 2, you can look at a list of research projects completed by residents to get an idea of the types of questions and the scope of projects that other residents completed.

If you have any concerns or are having difficulty finding a research project, please contact the PRRD to discuss.

Pediatric Residents' Research Day

Residents are required to present their projects twice at the annual pediatric residents' research day. The first presentation, usually given in the 2nd year of the program, outlines their project idea, methods and progress to date. In their second presentation, usually in 4th year, residents will present their completed projects including the results and the conclusion. Abstracts will be printed in a booklet which will be available on the research day. For the first presentation, abstracts should include a Background section, outlining the rationale for your project; an Objectives section, stating what you aim to discover; and a Methods section, describing how you are planning to conduct your project. For completed projects, the abstract should also include Results and Conclusions sections.

TCPS 2 Certificate

Knowing how to conduct research ethically is an important part of learning to be a researcher. In order to complete a research project, in most cases, the resident will need to get approval for their project from the Newfoundland and Labrador Health Ethics Research Authority (HERA) (<https://hrea.ca>). In order to apply to the HERA, residents need to complete an on-line ethics course: the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS 2) (<https://tcps2core.ca/welcome>). This on-line module takes approximately 3 hours to complete. After the completion of the TCPS2 course, a PDF copy of your certificate of completion should be e-mailed to the program's PRRD.

Pediatric Journal Club

The program organizes a regular journal club, in which residents lead the discussion of articles on a relevant pediatric health topic. Residents are required to regularly attend and participate in journal club. The time of journal club sessions will be circulated to residents throughout the year.

Academic Half Days on Research

As part of the regular academic half day (AHD) schedule, there will be approximately three AHDs per year on research topics. The AHD lectures will follow a three-year schedule to ensure that all topics are covered. Residents are required to regularly attend and participate in these AHD sessions.

Research Rotations / Selectives

During 2nd year, residents are assigned one rotation for research. The specific learning/work objectives for this rotation are dependent on the point at which the resident is with their research project. Residents need to contact the PRRD the week before the start of the rotation to set out the specific objectives for the rotation. Depending on the resident's project and how closely they are working with their mentor, the resident will either meet regularly with the PRRD or their mentor throughout the rotation, and at the end to complete the evaluation and discuss the resident's performance.

Residents may choose to do a selective in research at another point of their program. This needs to be approved first by the PRRD and the program director. Research selectives work the same way as regular research rotations, with specific objectives being assigned before the start of the selective.

Evaluation

Every resident needs to submit annual updates on the progress they are making with their research projects. Expected milestones for completing the program's research learning objectives are presented below. The research rotation and selectives in research will be evaluated using the One45 system, based on the objectives set by the PRRD for that specific rotation.

Expected Milestones

1st Year	
October	<ul style="list-style-type: none"> • Meet Research Director
By April	<ul style="list-style-type: none"> • Identify Mentor • Select Research Project Topic • Complete TCPS 2 Ethics Certificate • Complete Short Description of Research Project
By June/July	<ul style="list-style-type: none"> • Apply for Janeway Funding (if applicable)
2nd Year	
By December	<ul style="list-style-type: none"> • Complete Literature Review
By March (after research rotation)	<ul style="list-style-type: none"> • Draft Research Protocol • Submit Ethics Application • Present Protocol at Pediatric Resident Research Day
3rd Year	
By April	<ul style="list-style-type: none"> • Complete Data Collection • Analysis Data
4th Year	
September	<ul style="list-style-type: none"> • Prepare results for publication / conference (if merited by the project)
January - March	<ul style="list-style-type: none"> • Present Results at Pediatric Resident Research Day

Appendix 1: Research Learning Objectives of Residency Program

Rotation Objectives	Royal College Pediatric Competencies	CPPD Tasks
To develop and conduct a medical/scientific research project.	<ul style="list-style-type: none"> • Contribute to the creation and dissemination of knowledge and practices applicable to health (Scholar 4) • Pose questions amenable to scholarly investigation and select appropriate methods to address them (Scholar 4.4) • Identify ethical principles for research and incorporate them into obtaining informed consent, considering potential harms and benefits, and vulnerable populations (Scholar 4.2) • Contribute to the work of a research program (Scholar 4.3) • Participate in the conduct of scholarly work (Scholar 4.4.1) 	<ul style="list-style-type: none"> • Carry out a research project(s) as per the Royal College of Physician and Surgeons expectations. • Develop or help develop a Research Question/Aim. • Select a study design that is considered acceptable. • Develop or help develop a scholarly evaluation protocol. • Complete the Interagency Advisory Panel (Tri-Council Policy Statement, TCPS) on Research Ethics Tutorial and provide a copy of the “Certificate of Completion” for Resident records. • Prepare an Ethics Submission (if applicable) to ensure it passes the local ethics review panel. • Have the project approved by local resident research committee/coordinator and faculty mentor/ supervisor. • Carry out the project (collect data and analyze).
To demonstrate knowledge of the basic principles of scientific research.	<ul style="list-style-type: none"> • Demonstrate an understanding of the scientific principles of research and scholarly inquiry and the role of research evidence in health care (Scholar 4.1). 	<ul style="list-style-type: none"> • Understand the basic principles of health research methodology.
To demonstrate how to critically appraise and review literature in an area of interest.	<ul style="list-style-type: none"> • Integrate best available evidence into practice (Scholar 3). • Recognize practice uncertainty and knowledge gaps in clinical and other professional encounters and 	<ul style="list-style-type: none"> • Able to describe the basic principles of biostatistics and be able to apply them in evaluating journal articles (includes presenting at Journal Club between PGY1 and PGY3 years). • Able to describe the basic principles of epidemiology and be able to apply them in

	<p>generate focused questions that can address them (Scholar 3.1).</p> <ul style="list-style-type: none"> • Identify, select, and navigate pre-appraised resources (Scholar 3.2). • Critically evaluate the integrity, reliability, and applicability of health-related research and literature (Scholar 3.3). • Integrate evidence into decision-making in their practice (Scholar 3.4). 	<p>evaluating journal articles (including presenting at a Journal Club between PGY1 and PGY3 years; critical appraisal activities).</p>
<p>To effectively communicate scholarly material to an intended audience via publication of scientific articles, poster presentations, or oral presentations.</p>	<ul style="list-style-type: none"> • Teach students, residents, the public, and other health care professionals (Scholar 2). • Summarize and communicate to professional and lay audiences, including patients and their families, the findings of relevant research and scholarly inquiry (Scholar 4.5). 	<ul style="list-style-type: none"> • Present an interim progress report to committee/coordinator (i.e. works in progress) during PGY2 or early in PGY3. • Present mid-term report to committee/fellow residents to determine progress to date • Present findings and final project at the Department’s Annual Research Day or equivalent. • Write up scholarly findings and submit scholarly reports to the satisfaction of the resident research coordinator/program director and faculty mentor/ supervisor (Faculty mentor should sign off on manuscript). • Strongly Recommended: Abstract submitted to local/national research competition. • Advanced: Peer-reviewed publication prepared and submitted to medical journal. • Advanced: Presentation of final project at national or international conference. This may serve as an alternative to presenting at the local Research Day or equivalent.

Appendix 2: Sample List of Completed Pediatric Resident Research Projects

Resident	Title	Supervisor(s)
Dr. Katie Smith	Retrospective Analysis of Unintentional Pediatric Injuries Resulting in Hospitalization and Death in Newfoundland and Labrador	Drs. Chafe and Shah
Dr. Brandon D'eon	Improving children and families' healthcare experiences through a Community Social Pediatrics model	Dr. Gardner
Dr. Hilary Price	Breastfeeding medicine in Pediatric Residency training: A needs assessment survey	Dr. Drover
Dr. Camila Carneiro de Lima	Celiac Disease in Children: Correlation Between tTG Levels and Severity Based on Marsh Criteria	Dr. Sathya
Dr. Noelle Marsh	Janeway Pediatric Emergency Department Asthma Clinical Pathway	Dr. A. Shah
Dr. Sarah Spenard	Vertebral Compression Fracture Monitoring in Children with Cerebral Palsy Supervisors	Drs. O'Dea and Power
Dr. Tracey Dyer	Choosing Wisely for Infants with Physiologic Gastroesophageal Reflux in NL	Drs. Newhook and Sathya
Dr. Jo-Anna Hudson	Identifying and characterizing extracellular vesicles in pediatric acute lymphoblastic leukemia	Dr. Moorehead
Dr. Michael Forrester	Checklist Vs. Global Rating Scale: Re-Designing OSCE Assessment Rubrics	Drs. Dubrowski and Goodridge
Dr. Samantha Woodrow Mullett	Assessment of Knowledge and Attitudes of Health Care Professionals and Determining Barriers to Implementing Immediate Skin to Skin Contact following Cesarean Section Delivery in the Health Sciences Centre Case Room Operating Room, Eastern Health	Dr. Newhook
Dr. Louise Guolla	Perceptions of Incorporating Reflection in a Pediatrics Training Program: A Pre-Implementation Assessment	Drs. Drover and O'Dea
Dr. Erin Maszczakiewicz	Health Care Provision to Street-Involved and At-Risk Youth and Young Adults in St John's: How are We Doing?	Dr. Chafe
Dr. Megan Burke	Assessing the need for a wellness curriculum in pediatric residency training program at Memorial University	Drs. Chafe, Curran, and Power
Dr. Sergei Reznikov	ECG and Echocardiogram Findings in Patients with Restrictive Eating Disorders Presenting to the Janeway Eating Disorders Program	Drs. Chafe and Dominic
Dr. Danielle Adam	Resident Teaching on the Inpatient Pediatrics Wards: Assessing Potential Barriers and Exploring Effective Learning Strategies	Dr. Drover

Dr. Joy Clements	Effect of a handover tool on resident and staff attitudes toward patient handover in a general Paediatrics inpatient unit	Dr. O’Dea
Dr. Kescha Kazmi	Assessing resident attitudes toward advocacy training in a Canadian pediatric residency program	Dr. Curran
Dr. Jennifer Davis	Impact of Hearing Loss on Development: An education tool for primary physicians	Dr. Chafe
Dr. Tracy Tan	Development and assessment of a web-based learning module on pediatric nephrology for pediatric residents	Drs. Chafe, Martin, and Tee (Dal)
Dr. Amanda Marsh	Development, Dissemination and Implementation of Preprinted Physician Orders in a Pediatric Intensive Care Unit to Promote Best Practice and Safety	Drs. Barter, Krmptotic, Waheed
Dr. Liam Fardy	The Effect of Oral Debriefing Combined with Video Assisted Self Reflection on Pediatric Resident Performance in High Fidelity Simulation	Drs. Chafe, Dubrowski, Waheed
Dr. Alison Lopez	Antibiotic Use in Bronchiolitis	Drs. N. Bridger, Chafe
Dr. Peter MacPherson	Ethics Learning Needs of Pediatric Residents: An Interprofessional Needs Assessment	Dr. Emberley
Dr. Robyn LeDrew	Development of Patient and Physician Resources for Ketotic Hypoglycemia	Drs. Chafe, Healey
Dr. Katharine Herrington	Asthma Transition Guide For Adolescents Entering Adult Health Care	Dr. Smith
Dr. Caroline Weisser	Improvements in the Management of Severe Anaphylaxis in Children since 2011: A Case Series of Children Requiring Admission to Paediatric Intensive Care at a Canadian Institution	Dr. Krmptotic
Dr. Alana Newman	Correlation of biochemical, molecular, and clinical phenotypes in very long-chain acyl-CoA dehydrogenase deficiency (VLCADD): The Canadian Maritime provinces newborn screening experience	Dr. Dyack (Dal)
Dr. Omer Hamud	Deliberate self harm by drug ingestion in children and adolescents; patient’s characteristics, intensions and short term morbidities and outcome	Drs. Dominic and Newhook
Dr. Jennie Morrison	Exploring the reasons why cesarean section is a risk factor for Type 1 Diabetes Mellitus in Newfoundland and Labrador	Dr. Newhook
Dr. Emery Weber	Effective use of e-learning modules to supplement pediatric postgraduate medical education	Dr. Curran
Dr. Amanda Hogg	Assessment of antiemetic usage for chemotherapy induced nausea and vomiting in the pediatric acute lymphoblastic leukemia (ALL) population on maintenance chemotherapy in Newfoundland and Labrador	Drs. Chafe and Goodyear

Dr. Peter MacPherson	Medical Students' Oral Case Presentation Skills: A Survey of Medical Students, Residents and Attending Physicians	Dr. Drover
Dr. Jillian MacCuspie	Online Social Communication by Adolescents with High-functioning Autism Spectrum Disorder	Drs. Chafe and Vardy
Dr. Katie Soper	Evaluation and Implementation of Multisource Feedback for Memorial University's Pediatric Residency Program	Drs. Chafe and Drover
Dr. Carolyn Cashin	Validation of a Medication Questionnaire for Cystic Fibrosis	Dr. Smith
Dr. Anna Kubow	Exposure to Food and Beverage Television Advertisements among Children of Newfoundland and Labrador	Dr. T. Bridger
Dr. Heather Power	Development and Evaluation of Two Case Based Modules for Self-Directed Learning During a Pediatric Subspecialty Endocrinology Rotation	Dr. T. Bridger
Dr. Rikin Patel	Bridging The Gap: Comparing pediatric faculty and residents perspectives on the In-Training Evaluation Report (ITER)	Dr. Drover
Dr. Colleen Nugent	A retrospective review of outcomes of mild and moderate pediatric diabetic ketoacidosis admissions: Is intermittent rapid acting subcutaneous insulin comparable to low dose continuous intravenous insulin?	Drs. Chafe, Healey, and Newhook
Dr. April MacPhee	Teaching residents procedural skills: Are resident teachings an effective alternative to traditional procedural skills training?	Dr. Drover
Dr. Alison Haynes	Effects of Early Nutrition in the Prevention of Allergic Disease: Consultation Practices of General Pediatricians and Dietitians in Atlantic Canada	Drs. Chafe, Chan (UBC), Leo (UBC), and Newhook
Dr. Alison Haynes	Review of food challenges in a pediatric tertiary care centre	Drs. Kapur (Dal), Rex (Dal) and Watson(Dal)
Dr. Erin Peebles	Incidence of community-associated methicillin-resistant Staphylococcus aureus in skin and soft tissue infections in a pediatric emergency department	Dr. Morris
Dr. Lorine Pelly	Characteristics of Autism Spectrum Disorders in the Avalon Peninsula, Newfoundland and Labrador, Canada	Drs. Newhook and Vardy
Dr. Lana Soper	Asthma Logbook	
Dr. Melissa Langevin	"A case control study: Do neonatal and maternal characteristics identifiable at delivery predict future ED visits to a tertiary care center within the first 14 days of life?"	Dr. Drover

Dr. Jennifer Hilliard	Parenteral Antibiotic use in the treatment of Skin and Soft tissue infections in the Pediatric Emergency Department: A Chart Review	Dr. Morris
Dr. Carolina Escudero	Accuracy of Pediatric Electrocardiogram Interpretation by Canadian General Pediatricians	Dr. Templeton
Dr. Carolina Escudero	Do the National Board of Medical Examiners (NBME) Subject Examinations Predict Success on the Medical Council of Canada Qualifying Examination (MCCQE) Part I?	Dr. Drover