



**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 Program Directors (CPPD) is an organization that joins together the faculty members responsible for research across all of Canada's pediatric residency programs [<http://www.cppd.ca/>]. One of its main goals is to ensure consistency in the learning objectives related to research across the programs. It has recently published guidelines on the tasks and experiences that pediatric residents should have throughout their program.¹ In the *Appendix 1*, there is a table that maps our program objectives to the Royal College objectives, the required tasks set out by the CPPD, and CanMed competencies. Our residency research training program is designed to meet both the Royal College and CPPD learning objectives.

Memorial Pediatric Resident Research Program 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 .

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.

The Role of the Pediatric Resident Research Director

Memorial's pediatric residency program has a faculty member who is designated as the Pediatric Resident Research Director (PRRD). His or her role is to work with the pediatric residents to help ensure they are meeting the learning objectives of the research aspects of their program. The PRRD is also responsible for reporting residents progress related to research to the Residency Program Director and completing evaluations for research rotations and selectives. All residents are required to meet with the PRRD and/or provide regular updates on their progress. You can also contact the PRRD at any point that you have a concern with the research part of your program.

Research / Academic Projects

Each resident is required during their program to complete either a research project or an academic project. Research projects aim to add to our knowledge in a particular area related to pediatric health. Many times these projects add to our knowledge about the local pediatric population. Academic projects aim to develop a resource for a medical program or for resident education. Some projects have elements of both.

Residents can select a project topic in several ways. 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. In other cases, clinical faculty may have a project identified which they are seeking a resident to work with on or a resource they would like to develop for their patients. The PRRD can help you identify these opportunities. Sometimes, it is through discussion with the PRRD, various clinical faculty and the resident that a topic is identified. In selecting a topic, residents should think about what they would like to study and learn more about. The resident research/academic project is in many ways the aspect of the program that residents have most control over selecting the content, so you should find something that is of interest to you.

In selecting a topic, the resident should meet and confirm their topic with the PRRD. He or she will help form a project idea into a project which meets the program's requirements and can be completed within the time a resident has within their program for research.

At the end of the project, residents are required to complete a report describing the project idea, objectives, methods, results, and conclusions.

Project Mentors

Each resident will have a faculty member who serves as a project mentor. The mentor will advise the resident and help supervise their research / academic project. This person may or may not be the PRRD. For some projects, residents may have more than one mentor. It is important that residents identify an appropriate mentor for their project topic.

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. 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.

Research Modules

Residents have a wide range of prior experiences with research depending on the program in which they completed their undergraduate training. Many residents have received no formal training in research before their residency program. In order to ensure that all residents receive basic information, the program has developed four on-line modules covering key topics residents are required to know related to research. Each module is designed to take less than 30 minutes to complete and present sufficient information for the resident to begin their research project. The four online research modules are on:

- a. Introduction to research
- b. Developing a research question
- c. Searching the medical literature
- d. Common types of study designs

Modules are available through Memorial's Desire to Learn system or in PDF format.

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) (<http://www.hrea.ca/Home.aspx>). 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)* (<http://www.pre.ethics.gc.ca/eng/education/tutorial-didacticiel/>). 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. A schedule for journal club will be circulated to residents at the beginning of each 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. The schedule is presented in Appendix 2. 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 for the 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
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"> • Submit Final Report • 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

Memorial's Rotation Objectives	Royal College Objectives	CPPD Tasks	CanMeds Competency
To develop and conduct a medical/scientific research project.		Carry out a research project(s) as per the CanMEDS expectations	Scholar/ Collaborator/ Professional
	Pose a scholarly question (Scholar 4.2)	Develop or help develop a Research Question/Aim	
	Select and apply appropriate methods to address the question (Scholar 4.4)	Select a study design that is considered acceptable	
		Develop or help develop a scholarly evaluation protocol	
	Work with others to assess, plan, provide and review other tasks, such as research problems, educational work, program review or administrative responsibilities (Collaborator, 1.5)	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 mentor	
	Carry out the project (collect data and analyze)		
Maintain a questioning and inquisitive attitude towards medical information (Scholar 2.2)			
To demonstrate knowledge of the basic principles of scientific research.	Describe the principles of research, research ethics and scholarly inquiry (Scholar, 4.1)	Understand the basic principles of health research methodology	Scholar/ Collaborator

To demonstrate how to critically appraise and review literature in an area of interest.	Apply the principles of critical appraisal to address a clinical question (Scholar, 2.1)	Understand 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)	Scholar/ Collaborator
		Understand the basic principles of epidemiology and be able to apply them in evaluating journal articles (including presenting at a Journal Club between PGY1 and PGY3 years; critical appraisal activities)	
	Conduct a systematic search for evidence (Scholar 4.3)		
To effectively communicate scholarly material to an intended audience via publication of scientific articles, poster presentations, or oral presentations.	Demonstrate the ability to give an effective lecture or presentation (Scholar 3.3)	Present an interim progress report to committee/coordinator (i.e. works in progress) during PGY2 or early in PGY3	Scholar/ Communicator
		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	
	Disseminate the findings of a study appropriately (Scholar 4.5)	Write up research findings and submit working documents for the research project(s) to the satisfaction of the resident research coordinator/program director and mentor (Faculty mentor should sign off on manuscript)	
		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	
		Strongly Recommended: Abstract submitted to local/national research competition	
		Advanced: Peer-reviewed publication prepared and submitted to medical journal	

Appendix 2: Academic Half Days on Research Schedule

LECTURE 1: INTRODUCTION TO CONDUCTING MEDICAL RESEARCH

Lecture Learning Objectives:

- To discuss the role of medical research in improving patient care
- To discuss the importance of research to medical residency education
- To review the research requirements of our pediatric residency program
- To review common types of research designs
- To learn how to develop a research question
- To learn how to develop a research project proposal

LECTURE 2: CRITICAL APPRAISAL

Lecture Learning Objectives:

- To introduce the idea of critical appraisal
- To review the goals of critical appraisal
- To review guidelines for helping to appraise research articles
- To practice appraising research articles

LECTURE 3: THE ETHICS OF RESEARCH

Lecture Learning Objectives:

- To discuss ethical issues involved in pediatric research
- To introduce the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans*
- To review the researcher's obligation to research subjects
- To discuss consent for adults and children
- To learn about the need for ethics approvals
- To learn how to apply to the Health Research Ethics Authority (HREA)

LECTURE 4: MEDICAL LITERATURE AND SYSTEMATIC REVIEWS

Lecture Learning Objectives:

- To learn how to search for relevant medical literature
- To learn about systematic reviews, meta-analysis, clinical practice guidelines and health technology assessments
- To learn how to assess the quality of a literature review
- To discuss using reviews to improve patient care
- To discuss tips for conducting a literature review

LECTURE 5: CLINICAL TRIALS

Lecture Learning Objectives:

- To discuss the structure of a clinical trial
- To discuss clinical trial protocols
- To discuss the issue of patient recruitment
- To review biostatistical measures of outcomes for clinical trials
- To review assessing the quality of a clinical trial

LECTURE 6: SECONDARY USES OF PATIENT DATA – CHART REVIEWS, DISEASE REGISTRIES AND ADMINISTRATIVE DATABASES

Lecture Learning Objectives:

- To learn how to conduct research using various sources of secondary data
- To discuss issues related to the secondary use of patient data for research purposes
- To review study designs that rely on the secondary use of patient data
- To review common biostatistical measures of outcomes for secondary use studies
- To learn how to write a case report

LECTURE 7: QUALITATIVE RESEARCH: IMPORVING PATIENT CARE BY TALKING WITH PATIENTS

Lecture Learning Objectives:

- To introduce qualitative research
- To discuss how qualitative research can improve patient care
- To learn how to start a qualitative research study
- To practice coding qualitative interviews and the analysis of qualitative data
- To review how to assess the quality of qualitative research

LECTURE 8: BIOSTATISTICS

Lecture Learning Objectives:

- To review of basic concepts and measures in biostatistics

LECTURE 9: COMMUNICATING RESEARCH RESULTS

Lecture Learning Objectives:

- To discuss writing a research report
- To review how to give a conference presentation
- To review how to develop an academic poster
- To discuss how to submit an article for publication