

Research Curriculum

Educational Goals & Objectives

The research curriculum at Community Memorial Health System is designed to introduce residents to thoughtful investigation of medical and psychosocial questions that affect individual and/or population health. Emphasis is on familiarity with basic research methodologies and their application in the practice of evidence-based medicine. GME provides assistance to residents as they identify a mentor and design and implement a project. Residents are strongly encouraged to present their work in a public forum through poster, presentation, and/or publication.

The longitudinal research curriculum includes dedicated formal research and applicable quality improvement didactics, journal clubs, research and quality improvement projects, participation on hospital committees, and evidence-based clinical work at the bedside.

Patient Care

Residents will:

- I. Identify questions that impact daily patient care and use information management tools at the bedside to support clinical decision-making

Medical Knowledge

Residents will participate in scholarly activity. In the course of this work, they will:

- I. Learn guidelines for conducting different types of research
- II. Learn basic clinical concepts such as study design, types measurement, and variety of analysis types
- III. Learn how to complete an Institutional Review Board (IRB) application and to respond to IRB inquiries
- IV. Become certified in the protection of human subjects through Good Clinical Practices certification
- V. Gain basic statistical skills to interpret evidence-based medicine, such as:
 - descriptive analyses
 - p-values
 - confidence intervals
 - power analysis
 - univariate, bivariate, and multivariate analyses
 - sensitivity and specificity
 - type I and II errors
 - odds, hazard, and risk ratios

- VI. Identify opportunities for scholarly inquiry, define a clinical question, and understand how to develop and execute a research plan
- VII. Develop skills to facilitate critical appraisal of published medical research

Practice-Based Learning and Improvement

Residents will:

- I. Learn to analyze the strengths and weaknesses of published trials and apply the results of relevant clinical trials to their practice
- II. Foster intellectual inquiry through self-directed learning via accessing current clinical practice guidelines, electronic databases, published studies, and computer-based diagnostic reasoning programs to answer clinical questions

Interpersonal and Communication Skills

Residents will:

- I. Develop their presentation skills and be able to competently answer questions in a public forum (e.g. journal club, research forum)
- II. Learn to distill salient information from published studies to counsel patients regarding impact on their care
- III. Hone writing skills by providing a narrative description of their scholarly activity and where appropriate, writing a scientific paper suitable for publication
- IV. Obtain informed consent for research when appropriate

Professionalism

Residents must:

- I. Demonstrate a commitment to using evidence-based medicine in their care for patients
- II. Meet the research requirements of their specialty college

System-Based Practice

Residents will:

- I. Invest in research and quality improvement activities to improve care within our health system

Resources

- I. CMHS intranet resources
 - CMHS Medical Library, <https://cmhslibrary.blog/>
 - CMHS Research Support <https://cmhslibrary.blog/research/>
 - CMHS Statistical Concept Links <https://cmhslibrary.blog/statistics/>

- GME Institutional Authorship of Research Policy <https://cmhslibrary.blog/wp-content/uploads/2022/02/Institutional-Authoship-of-Research-2021.pdf>
- CMHS Institutional Review Board website <http://cmhintranet.cmhs.org/eIRB/Index.htm>

II. Journals and texts

- Guyatt G, Rennie D, Meade M, Cook D. *Users' Guides to the Medical Literature*. McGraw-Hill Professional; 3rd ed. 2015.
- JAMA Guide to Statistics and Medicine. <https://jamanetwork.com/collections/44042/guide-to-statistics-and-medicine>
- Frakt, A, and Carroll, A. "Can This Treatment Help me? There's a Statistic for That." *New York Times* 26 Jan. 2015.

III. Online educational resources

- American College of Physicians (ACP) High Value Care Curriculum: Utilizing Biostatistics in Diagnosis, Screening, and Prevention. <https://www.acponline.org/clinical-information/high-value-care>
- ACP Writing a Research Abstract <https://www.acponline.org/membership/residents/competitions-awards/acp-national-abstract-competitions/guide-to-preparing-for-the-abstract-competition/writing-a-research-abstract>
- American Osteopathic Association (AOA) Research and Grants <http://www.osteopathic.org/inside-aoa/development/research-and-development/Pages/grant-opportunities.aspx>
- Agency for Healthcare Research and Quality (AHRQ): Comparative Effectiveness Research <https://www.effectivehealthcare.ahrq.gov/topics/cer-methods-4th-symposium/executive>
- CONSORT Transparent Reporting of Trials <http://www.consort-statement.org/>
- International Committee of Medical Journal Editors (ICMJE) Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals. <http://www.icmje.org/recommendations/>
- PRISMA Transparent Reporting of Systematic Reviews and Meta-Analyses <http://www.prisma-statement.org/>
- The NNT: Quick summaries of evidence-based medicine. www.thennt.com
- STROBE Statement Strengthening the Reporting of Observational Studies in Epidemiology <http://www.strobe-statement.org/>
- Vandembroucke JP, von Elm E, Altman DG, et al. STROBE Explanation and Elaboration. *Ann Intern Med*. 2007;147:W-163-W-194.
- Western States Medical Monographs <https://sites.google.com/site/cahead5/>

IV. Qualitative research resources

GME will provide support to residents interested in conducting qualitative or mixed method research studies. Introductory resources include:

- Qualities of Qualitative Research: Part I <https://jgme.org/doi/pdf/10.4300/JGME-D-11-00221.1>
 - Qualitative Research Part II: Participants, Analysis, and Quality Assurance <https://jgme.org/doi/pdf/10.4300/JGME-D-11-00307.1>
 - Thematic analysis <https://www.psych.auckland.ac.nz/en/about/thematic-analysis.html>
- V. Specialty college resources
- American College of Physicians guideline for poster presentations http://www.acponline.org/education_recertification/education/program_directors/abstracts/prepare/pos_pres.htm
 - AOA Guidelines for the Resident Literature Review, Case Report, Scientific Paper, or Poster Presentation <http://www2.aoao.org/pdfs/residents/ResidentPaperPosterGuidelines.pdf>

Evaluation

- I. Residents must meet CMHS scholarly work requirements to graduate.
- II. Residents will complete an online training program for protecting human research participants and earn certification prior to completion of orientation. The Program Coordinator will provide information to incoming interns.
- III. Residents must present their ideas for scholarly work to their Program Director and the research team for approval *prior to starting a research project*.
- IV. Residents conducting research involving human subjects must complete a QI Primary Investigator form or IRB application.
- V. Residents will provide Program Directors and the research team with a narrative description outlining their proposed project. Residents will work with their Program Coordinator to log their project in New Innovations.
- VI. Research mentors will provide formative verbal feedback on resident performance to both the resident and the Program Director intermittently throughout the project. Program Directors as well as the research team will meet at minimum semi-annually with residents to discuss research progress.
- VII. Residents must present their work at GME's Research Symposia (3-Minute Scholarly Summary and Resident Research Forum).
- VIII. Residents are required to present an organized critical review of an approved research article during Journal Club sessions

Curriculum Structure

- I. Residents must attend research didactic sessions, Journal Clubs, and Patient Safety/Quality Improvement learning sessions. Topics are added or modified based on the needs and skill sets of different resident classes.

- II. Residents will identify a research mentor in the first half of their intern year. Subsequently, they will meet with their mentor regularly to discuss development and execution of a project. For residents involved in subsequent or ongoing projects, they may have different mentors for different projects. Residents are encouraged to work with faculty who are currently engaged in active research projects.
- III. Residents will do a focused literature search as part of their project and may be asked to do presentations during the course of the project in addition to their final presentation.
- IV. Specialty Colleges may have specific requirements for research and quality improvement projects by year. Residents must adhere to those requirements.
- V. All educational sessions will occur within the bounds of resident work hours as per ACGME requirements.

CMHS Intersection of Patient Care, Quality, & Scholarly Activity

Our curriculum is designed to foster practical application and reinforcement of research and concepts through individual research and quality improvement projects.

