CASE WESTERN RESERVE UNIVERSITY
School of Medicine

Department of Genetics & Genome Sciences
Case Western Reserve University

GENETIC COUNSELING TRAINING PROGRAM

GRADUATE STUDENT HANDBOOK

2025 - 2027

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WELCOME TO THE GENETIC COUNSELING TRAINING PROGRAM IN THE DEPARTMENT OF GENETICS & GENOME SCIENCES AT CASE WESTERN RESERVE UNIVERSITY! This handbook is designed to provide you with general information about the program and the clinical training you will receive. It also contains helpful general information about the Department of Genetic and Genome Sciences and Case Western Reserve University (CWRU). Please feel free to expand and add information to it as you proceed through your program. **YOU WILL USE IT REPEATEDLY OVER THE NEXT TWO YEARS!**

WE ARE EXCITED THAT YOU ARE HERE AND LOOK FORWARD TO WORKING WITH YOU!

"GENETIC COUNSELING is the process of helping people understand and adapt to the medical, psychological and familial implications of genetic contributions to disease. This process integrates:

- Interpretation of family and medical histories to assess the chance of disease occurrence or recurrence.
- Education about inheritance, testing, management, prevention, resources and research.
- Counseling to promote informed choices and adaptation to the risk or condition.

National Society of Genetic Counselors, 2005

Responsibilities of genetic counselors are defined by the NSGC Scope of Practice and include:

- To provide expertise in clinic genetics
- To counsel and communicate with patients on matters of clinical genetics
- To provide genetic counseling services in accordance with professional ethics and values

Please refer to the NSGC Scope of Practice publication at nsgc.org for details regarding specific responsibilities in the areas of Clinical Genetics, Counseling and Communication, and Professional Ethics and Values.

Mission & Guiding Principles of the Genetic Counseling Training Program

The mission of the Genetic Counseling Training Program is to prepare students with the appropriate knowledge and experiences to function as competent and empathetic genetic counselors in a wide range of settings and roles. With unprecedented advances in our understanding of the genetic and molecular control of gene expression and development, and in our ability to apply this knowledge clinically, the program strives to train students who can interface between patients, clinicians, laboratories, and molecular and human geneticists. Students gain insightful and multifaceted skills that will enable them to be effective genetic counselors, aware of the many new technical advances and often-difficult ethical, legal and social issues that have surfaced in light of the continuous advances in the field. Graduates of the program will be prepared to work in a variety of settings including both adult and pediatric genetics clinics, specialty clinics such as cancer genetics, cardiovascular genetics, and metabolic clinics, and prenatal diagnosis clinics, as well as in areas of research, clinical laboratory, or commercial genetics laboratories relevant to genetic counseling and human genetics. The curriculum has been developed in a framework that is based on the following principles:

1. The core concepts of genetics, genomics, genetic counseling, and health and disease prevention are fully integrated into the curriculum.

2. Graduate education in genetic counseling is experiential and emphasizes the skills for scholarship, critical thinking and lifelong learning.

3. Educational methods are chosen to stimulate an active interchange of ideas among students and faculty.

4. Students and faculty are mutually respectful partners in learning.

5. Students are immersed in a graduate school educational environment characterized by flexibility and high expectations for independent study and self-directed learning.

6. Students acquire a core set of competencies in the knowledge, mastery of clinical skills and attitudes that are pre-requisite to genetic counseling education.

7. The genetic counseling program fosters the development of professional skills to provide students with the tools to become knowledgeable, competent and caring genetic counselors and emphasize personal growth including:

- Humanism, compassion, integrity, and respect for others; based on the characteristics of an empathetic genetic counselor
- A sense of duty and accountability to patients, colleagues, society, and the genetic counseling profession
- High standards of ethical behavior which includes maintaining appropriate professional boundaries
- Self-awareness of one's own knowledge, skill, and emotional limitations that leads to appropriate help seeking behaviors
- Trustworthiness that makes colleagues feel secure when one is responsible for the care of patients

OVERVIEW

During the 21 months you will spend as a graduate student in the Department of Genetics & Genome Sciences, you will learn the principles of genetic counseling, human and medical genetics and genomics and their application to clinical genetics health care. Ultimately, you will acquire the knowledge and clinical skills to function as a competent, effective and caring genetic counselor in a wide range of settings and roles. The curriculum of the program has been designed to provide you with in-depth knowledge regarding principles of human and medical genetics and genomics, the psychosocial impact of genetic risks and disorders, and the research process in genetic counseling. You will obtain basic content through course work and learn to apply the information through clinical rotations and your research project. In addition, you will gain experience through attendance and presentations in conferences, seminars, and journal club. All of these activities will enable you to meet the practice-based competencies as outlined by the Accreditation Council for Genetic Counseling (ACGC).

The overall academic goals of the program include:

1. Prepare students to be compassionate, independent, and competent genetic counselors with all populations and cultures in a variety of workplace settings.
2. Provide students with coursework that includes a balance of psychosocial, medical, genomic, scientific, and research components.
3. Develop students' independent critical thinking skills and professional ethics.
4. Develop students' teamwork, professionalism (both inter-and intra-disciplinary), self-motivation, and self-evaluation skills.
5. Develop students' oral and written communication skills across digital and in-person platforms.
6. Prepare students for the ABGC board certification examination.

Upon graduation, each student is expected to demonstrate:

1. Knowledge of genetics and genomics, including the molecular basis of inheritance, molecular technologies, quantitative genetics, principles of risk assessment, and an understanding of the etiology and natural history of common genetic disorders.
2. Ability to conduct a genetic counseling session by assessing the patient/family's needs, concerns, and genetic risks; communicating appropriate genetic and medical information; facilitate informed decision-making; providing psychosocial support and assisting the family in obtaining necessary services and support.
3. Skills in case management, including communication to patients and referring health care professionals.
4. Awareness of local, state, and national resources designed to assist patients and professionals.
5. Familiarity with sources of information including the medical and genetic literature, and the ability to obtain new information through databases and other sources, critically evaluate journal articles and sources of information, and perform research.
6. Knowledge of the entire research process from the initiation of a thesis project to successful completion or an oral defense and a written manuscript.
7. Knowledge of genetic counseling principles and the related social, legal, and ethical issues.
8. Psychosocial and cultural sensitivity to families with genetic conditions.

REQUIREMENTS FOR THE MASTER OF SCIENCE DEGREE (PLAN B)

The Department of Genetics & Genomic Sciences offers a Master of Science degree in Genetics/Genetic Counseling. There are 43 credit hours required for completion of the genetic counseling training program: 24 are didactic courses; 11 are clinical rotations and 8 hours are devoted to research.

Curriculum Requirements
Students MUST receive a grade of B or better throughout the Program. Each course in the Program has specific requirements and evaluation processes. If any course grade is below a B (C or less constitutes a failing grade), the student will be required to demonstrate his or her mastery of the material (for example, retaking the course and earning at least a B or other remediation) as decided by the Co-Directors and the course faculty in order to successfully complete the program. Any individual exam grade below 65% will need to be retaken, and an incomplete will be awarded as a grade for the course until the exam is redone. A score of 75% or higher is required on any exam that is retaken. Additionally, each student must demonstrate appropriate development of clinical skills and competencies during rotations. Successful completion of EACH clinical rotation is required. Program Leadership will closely monitor student progress. If there is a concern regarding academic or clinical performance, they will work with the student and faculty to remedy such difficulties on a case-by-case basis. Tutoring is available. CWRU also offers assistance in developing study skills, time management skills, and test taking strategies via in-person or zoom consultations.
https://case.edu/studentsuccess/academic-resources/individual-consultations

Comprehensive Examination (PLAN B)
To meet the requirements under Plan B of the School for Graduate Studies, there is a comprehensive examination given in the beginning of spring semester of the second year for all students.

Written: The written exam is a 200-question multiple-choice examination that covers the didactic courses and clinical genetic counseling material covered during the genetic counseling program and is taken by all second-year students who have performed satisfactorily in all aspects of the program. The examination is patterned after the board certification examination given by the American Board of Genetic Counseling. The test is given on-line and is 4 hours in length. Questions are mapped back to the curriculum, and each student will receive a report outlining relative strengths and weaknesses covering various genetics topics.

Oral: The oral exam is given shortly (1-2 weeks) after the written examination (if needed, see requirements below). This portion of the Comprehensive Exam allows students to expand on their knowledge base of human and medical genetics and genetic counseling. The oral exam committee is composed of Program Leadership. Students are given genetic counseling scenarios to prepare for and discuss, asked general knowledge questions in any area of the curriculum as well as to clarify answers given in the written examination.

Requirements: Students receiving a score of 80% of greater on the written exam have earned a pass for the comprehensive exam. No additional requirements are needed. Students receiving a score between 70-80% on the written exam receive a conditional pass and must also pass the

oral exam portion to meet graduation requirements by the Program. The student's oral exam committee will come to a consensus regarding a student's performance on the written and oral examination and will decide if the student has passed the comprehensive examination, or if remediation is required. Students scoring below a 70% on the written exam must complete the oral exam and must pass a second written exam with a score of at least 75%.

If a student does not pass one or both sections of the examination, the examination committee will provide avenues for the student to rectify the deficiency, such as having the student take another written examination or repeating the oral section. Committee members may also decide that additional course or clinical work is necessary to meet the graduation requirements of the Program. If a student is unable to pass the comprehensive examination either written, oral or both following remediation, the student will be required to withdraw from the Program.

Clinical Practicum (Gene 532)

Students must satisfactorily complete all fieldwork rotations of the clinical practicum. Rotations include the following areas: General Genetics (pediatric and adult patients, and specialty clinics), Prenatal Genetics, and Cancer Genetics. Clinical rotations are held at multiple sites: University Hospitals, MetroHealth Medical Center, Cleveland Clinic, Promedica, and Akron Children's Hospital. In addition to the above rotations, students will have opportunity to choose elective rotations, which may include additional exposure in a specific area such as ophthalmologic genetic counseling, or an advanced rotation in areas such as metabolism, cardiomyopathies, or in-patient consults. In addition, electives may include an opportunity to work with genetic counselors in industry or commercial companies. Finally, each student will have the opportunity for a laboratory experience, currently held at the Cleveland Clinic Pathology and Laboratory Medicine Institute. Clinical rotations begin during summer between first and second year and continue through second year. Students are formally evaluated twice during each rotation, at the mid-point of the rotation and at the end of the rotation. The evaluations are based on a student's ability to demonstrate mastery of the ACGC practice-based competencies. The Associate Director, Monica Nardini, will be present at all mid-point and end of rotation evaluations to monitor student progress.

Research Project (Gene 601)

The program requires completion of a formal thesis research project. This scholarly project may be a clinical or counseling project, a project designed for professional issues in the genetic counseling field, or a laboratory-based project, and should relate to some aspect of genetic counseling. During fall semester of the first year, students meet on a regular basis with Program Leadership and Dr. Goldenberg to discuss the research process, potential topics, and faculty research interests. You will be assigned a research mentor early in the fall semester of your first year – your mentor will be either Michelle or Becky. Your mentor will later assist each student in identifying other faculty members from the Department of Genetics & Genome Sciences or affiliated institutions to compose the student's thesis committee. The thesis committee is charged with assisting the student in defining the area of research and carrying out the project. Thesis committees are usually chosen in February of the first year, and at least one member of program leadership will sit on each student's committee.

Students begin to develop ideas considering possible projects during the first semester of the first year and begin to write their proposals toward the end of first semester and throughout the

spring semester. Students register for 2 credits of Gene 601 in the fall of the first year, and 1 credit of Gene 601 in the spring of the first year. A major component of the Research seminar, which will meet regularly during the first year, is to prepare a research proposal in an NIH grant format, give students time to develop their projects, and obtain guidance and feedback from peers and course faculty. The written proposal is expected to be completed and defended to their thesis committees in approximately May/June of the first year. Failure to have drafted the thesis proposal by the last week of April will result in receiving an "incomplete" grade for GENE 601. Students are expected to defend their thesis and submit their projects for approval over the summer in between their first and second year. Failure to submit to the IRB by mid-August will result in an incomplete for the summer, and failure to submit by September 15, 2025 will result in a "no pass" for the summer research credits. These credits will be made up the following summer.

Students are encouraged to meet with their research mentor at least monthly to discuss the purpose of the study and specific aims of the project. Students will later defend their thesis proposal to their thesis committee. Students whose projects involve human subjects must submit their proposals to Case Western Reserve University Institutional Review Board (Case IRB), University Hospitals Cleveland Medical Center's Institutional Review Board (UH IRB) and/or to other institutional IRBs as appropriate as soon as their committee approves the project. During the summer semester, students continue to work on their chosen projects. Students may meet periodically with their committee for ongoing guidance and recommendations. As students near completion of their projects, they will schedule a data review meeting to discuss their preliminary results to the committee, who will guide the student on possible additional analyses needed and can help the student brainstorm possible interpretations of the data. In late April – early May of the 2nd year, the student will schedule an oral defense with their research committee. The committee then makes the decision as to whether the student has successfully passed the oral defense. The final research project will be submitted to the committee in manuscript format suitable to submit for consideration for publication. All students will present their work formally to the department faculty, staff and students at the annual departmental retreat in the spring of their 2nd year as a poster presentation. More information about the research process can be found later in the Handbook.

Maximum Time Allowed

All the requirements for the master's degree must be completed within five consecutive calendar years. While students usually complete the didactic and clinical course work within five semesters of the program, additional time may be necessary to finish a research project, which could in turn, extend the time that a student remains in the program. It is anticipated however, that the majority of students will be able to finish within two academic years.

Remediation Plan:

Should a student's performance in any of the following areas be deemed insufficient, a formal remediation plan will be initiated as described below.

Academics:

Students are expected to achieve a grade of B or better in every academic course. If a student receives a grade of C or lower as the final grade in any course, the student will be placed on academic probation, and a remediation plan will be initiated. This plan will be formalized by the Co-Directors on an individualized basis, and may include tutoring (from either the Co-Directors,

or other course instructors), retaking all or portions of a class again, retaking exams, or being required to do extra coursework as needed. In addition, if any score on an individual exam or assignment is below an 80%, the Co-Directors will meet with the student to discuss his/her approach to learning and reviewing the material, understanding of the concepts, and plans for improvement of academic performance. All exam scores falling below 80% require written exam corrections with annotated references. Any individual exam grade below 65% will need to be retaken, and an incomplete will be awarded as a grade for the course until the exam is redone. A score of 75% or higher is required on any exam that is retaken.

Clinical Rotations*:*

If it is determined by a rotation supervisor that a student is not progressing at the desired rate in a clinical rotation, one or both of the Co-Directors and the Associate Director will meet with the student along with the rotation supervisor to determine an intervention strategy. The student's specific area of weakness (counseling skills, genetic knowledge, time management, etc) will guide the development of the remediation plan. Interventions may include role-playing sessions, choosing specific patients to help the student focus on a challenging area, helping a student review coursework or attend additional review lectures if needed, or reducing the number of managed cases per week. If extra clinical time is needed, this will be built into the final semester of the program, prior to graduation, or in some cases a delay of graduation to August in order to accommodate additional clinical rotations will be discussed.

Thesis Project*:*

The student is required to have several meetings with his/her thesis committee during the development and execution of the thesis project. If at any time the thesis committee has concerns regarding the progress of the project, the committee will discuss ways to remedy the situation. If the progress is lacking due to the student not putting forth the appropriate effort, then a timeline for completion of the project and graduation may need to be adjusted, which may include delaying graduation until August. Occasionally through no fault of the student the project will encounter unforeseen delays and challenges. If this is the case, the committee will discuss other options for completion including focusing on a portion of the project, altering some aspect of data collection, or significantly limiting the scope. The student's research committee will make these decisions with input from the Co-Directors.

ORGANIZATIONAL STRUCTURE

Department of Genetics & Genome Sciences

Zhenghe John Wang	Chair	368-3806	zxw22@case.edu
Michelle Yanick	Dept Manager	368-8539	mxy36@case.edu
Suzy Brannon	Education Mgr	368-1891	sxb1595@case.edu

Genetic Counseling Training Program

Rebecca M. Darrah, PhD	Co-Director	368-4911	rjm11@case.edu
Michelle Merrill, MS	Co-Director	368- 4895	mcm9@case.edu
Monica Nardini, MS	Associate Director	778-5081	mdn18@case.edu
Aaron Goldenberg, PhD,MPH	Bioethics		ajg10@case.edu
Anna Mitchell, MD,PhD	Medical Director	844-3936	anna.mitchell@uhhospitals.org

Center for Human Genetics (UH)	**216-844-3936**
Cancer rotation – Joanna Horn, MS	joanna.horn@uhhospitals.org
General rotation – Rachel Rabenn, MS	rachel.rabenn@uhhospitals.org
Prenatal rotation – Larisa Rippel, MS	larisa.rippel@uhhospitals.org
Observation (all) – Emily Massiello, MS	Emily.massiello@uhhospitals.org

Center for Human Genetics Laboratory	
Shashirekha Shetty, PhD	Director, Cytogenetics shashirekha.shetty@UHhospitals.org

MetroHealth Medical Center	**216-778-4444**
Cancer rotation – Timothy Trobenter, MS	ttrobenter@metrohealth.org
Prenatal rotation – Monica Nardini, MS	mnardini@metrohealth.org
General rotation – TBD	

Akron Children's Hospital Medical Center	**330-543-8792**
Rotation coordinator (all) -Maddie Frederick	mfrederick@akronchildrens.org

Genomic Medicine Institute/Cleveland Clinic	**216-445-7862**
General rotation - Amy Shealy, MS	shealya@ccf.org
Cancer rotation – Maribeth Golm, MS	golmm@ccf.org
Prenatal rotation – Olga Latosh, MS	latosho@ccf.org
Lab rotation – Chris Wensel, MS	wenselc@ccf.org

Promedica	**419-824-8852**
Cancer rotation- Kelly Morse, MS	Kelly.morse@promedica.org
Prenatal rotation – Maddie Allen, MS	Madeline.Allen2@promedica.org

CONFERENCES AND CLINICAL ROUNDS

REQUIRED

CLINIC CASE CONFERENCE:
4:00 -5:00 p.m. Tuesdays (UH, Rainbow Amphitheater, Zoom option)
Selected patients seen during the preceding week, or patients scheduled to be seen during the upcoming week, are presented to the clinical genetics team for comments and suggestions regarding diagnosis and management. Abnormal laboratory results are also discussed. Second year counseling students are required to attend and present one patient per week at this conference while rotating at UH. First year students are required to attend case conference weekly during the entire first year.

CLINICAL GENETICS ROUNDS:
1:00 – 2:00 p.m. Fridays (UH, Rainbow Amphitheater, Zoom option)
Clinical Genetics Rounds are presented by the genetics faculty, genetic counselors, residents and fellows or invited speakers. Topics relevant to the practice of clinical genetics and genetic counseling are presented. Presentations may be case based, review of current knowledge regarding a particular topic or a researcher's current endeavors. Once a quarter, the conference is held jointly with the Department of Bioethics & the Center for Genetic Research Ethics and Law to discuss social, ethical and legal issues regarding genetics and genomics topics.

PROFESSIONAL ISSUES SEMINAR – 2ND YEAR
~ 2 x monthly (TBD)
The second-year professional issues seminar is an opportunity for students to discuss professional issues as they prepare to graduate at the end of their 2nd year. The intent of the seminar is to a forum to discuss pertinent and timely topics regarding professional practice. The seminar covers such topics as an overview of the professional societies (NSGC, ABGC, ACGC, AGCPD, ABMG, ACMG, ASHG), billing & reimbursement for genetic services, writing effective resumes, tips on interviewing and negotiating for genetic counseling positions, developing effective talks & slide presentations, examining non-traditional roles in genetic counseling, aspects of clinical supervision and preparing for their first genetic counseling position.

REQUIRED CONFERENCES & SEMINARS DURING ROTATIONS
During clinical rotations students are required to attend a number of clinical conferences and seminars as part of the requirements for successful completion of the rotation. During orientation to each rotation, student responsibilities and expectations regarding these seminars and conferences will be outlined. Some examples include:

ROTATIONS AT UNIVERSITY HOSPITALS:
FETAL BOARDS
This monthly conference is directed toward genetics topics of interest to the obstetricians and neonatologists. Genetic counseling students will attend this conference when appropriate as directed by the supervising genetic counselor during their prenatal diagnosis rotation. They are invited to attend during the rest of their program as time permits.

MULTI-DISCIPLINARY TUMOR BOARDS
Newly diagnosed and follow-up patients with cancer are presented for consensus of treatment care paths. Medical specialty groups attending include Genetics, Surgery, Oncology, Radiation Oncology, Pathology, Radiology, and Clinical trials. Genetic counseling students may be required to attend this conference during their Cancer genetics rotation.

METROHEALTH MEDICAL CENTER:
In addition to attending the weekly Genetics Case Conference, students attend one lecture/educational session per week at MetroHealth depending on their rotation emphasis – cancer, prenatal**.** This may include Pediatric Morning Report, Pediatric lectures, Cancer Genetics lectures, Neurology lecture series, OB grand rounds, OB clinical conference, Breast tumor board and GI tumor board.

GENOMIC MEDICINE INSTITUTE – CLEVELAND CLINIC:
Students attend Case Review Conference and Grand Rounds as well as attending at least one other multidisciplinary meeting during General Genetics rotation. During the Cancer Genetics rotation students attend Family Review conference & tumor boards.

ADDITIONAL CWRU GENETICS DEPARTMENT SEMINARS – OPTIONAL

STUDENT/POSTDOC RESEARCH SEMINAR:
9:30 a.m. Mondays BRB105
Graduate students, postdoctoral research students and clinical fellows present their research to the rest of the department. Genetic counseling students are encouraged to attend to support their fellow doctoral students and to be informed of the newest areas of research happening in the department.

DEPARTMENTAL RESEARCH SEMINAR:
11 a.m. Wednesdays BRB105
Faculty from within and outside the institution discuss their research. This is an opportunity to hear highly accomplished researchers discuss state of the art genetic research in a wide range of areas. The Co-Directors will inform students of invited speakers which they feel would be of particular interest to genetic counselors and students.

BIOETHICS SEMINARS:
Varies
The Department of Bioethics holds a number of "conversations"/seminars during the academic year that relate to ethical issues in genetics and genomics. These are presented by faculty, students and invited outside speakers. The bioethics department's major area of research and interests are to address some of the most pressing ethical, legal and social questions raised by recent advances in genetic and genomic research. The Co-Directors and Dr. Goldenberg will inform students of invited speakers which they feel would be of particular interest to genetic counseling students.

SUPPLEMENTARY REQUIRED ACTIVITIES

CLINICAL OBSERVATION EXPERIENCE:
First year, first and second semester
Starting in first semester and continuing throughout the second semester of the first year, each student will have an opportunity to observe cases in a variety of clinical settings, including prenatal genetics, general genetics (pediatrics & adult genetics) and cancer genetics. Observations typically begin in late September of the first year. Each rotation block is 6-8 weeks in length; students will be provided with their individual observation schedule early in the first semester. Each student will observe one case per week during the rotation. The student is expected to prepare for the case by reviewing the patient chart as well as reading appropriate literature to familiarize themselves with the diagnosis, etc. Students may be asked by the genetic counselor to participate in the counseling session such as collecting history information or taking the family pedigree. In addition, each rotation site may have other requirements for the student to successfully complete during the observational experiences such as writing clinic notes, patient letters, researching and presenting on a specific topic, and/or attending procedures (CVS, amniocentesis, etc).

Students will log each case in Typhon and provide written feedback of each case observed during the semester as part of that case log. Discussion time regarding these experiences will be provided during GENE 528 Principles and Practice of Genetic Counseling and GENE 529 Psychosocial Issues in Genetic Counseling. In addition, students will prepare a counseling outline for specific assigned role play cases. Specific guidelines for developing these counseling outlines will be discussed during the early part of fall semester.

MEDICAL GENETICS, TERMINOLOGY & ANATOMY, and INHERITANCE PATTERN REVIEW:
First year, during orientation week of fall semester – with Michelle Merrill
This required seminar at the beginning of fall semester is devoted to reviewing fundamental concepts in medical genetics. The review includes common medical terminology and a brief overview of the physical examination process using a systems approach. Inheritance patterns will also be reviewed.

FIELDWORK REFLECTION AND PROCESSING GROUPS
2nd year, 5-6 times per semester
This is intended to create a space for students to process clinical cases, give and receive feedback to each other in a small group setting, brainstorm together ideas, potentially identify psychosocial counseling theory and techniques used in patient scenarios, and share personal and professional experiences with the aim of supporting growth, improvement, and maintenance of skill development. The time in class should be utilized for students to explore and develop their professional self and gain deeper insight into their own and their patients' experiences, while also taking on more clinical responsibilities for each case. Ideally, students should work on processing how their own thoughts, attitudes, traits, and biases impact a genetic counseling appointment.

TEACHING/PUBLIC PRESENTATIONS: variable
Students have the opportunity to formally present topics of interest during clinical rotations and at the CHG Clinical Genetics Rounds throughout their training. Students may also have the opportunity to gain experience in presenting information regarding genetic counseling, the career of genetic counseling or some aspect of clinical genetics to lay, student and/or professional audiences outside of the department. As requests are received by the Department of Genetics & Genome Sciences,

students will be asked to present. Under the guidance of the Co-Directors, the student will have an opportunity to prepare and give such a talk. As the number of requests for such talks is variable, students may or may not have this experience. All students also participate in DNA Day and provide lectures and demonstrations at high schools in the Cleveland area.

Students also do presentations as part of the requirements of a number of courses. This allows students to present on a number of topics to their classmates and the faculty. All second-year students prepare posters of their research projects for a poster presentation, which is held at the annual Genetics departmental retreat in spring semester.

COURSES AND CREDITS

FIRST YEAR

All first-year students in the genetic counseling tract are expected to complete the required courses of the first year of the program for a total of 21 credits, receiving a minimum of a B grade. Students will also participate in other activities such as clinical conferences and departmental seminars. Students will begin to identify suitable projects for consideration for research projects. It is expected that the research proposal will be presented during spring semester as part of the research course, Gene 601.

Year 1- FALL (11.5 credits)

GENE 524: Advanced Medical Genetics: Molecular & Cytogenetics (2 credits)
Becky Darrah, Michelle Merrill, and Anna Mitchell
Molecular aspects of gene structure; mechanisms, detection and effects of mutations; imprinting; triplet repeat disorders; X-chromosome inactivation. Fundamental principles regarding clinical cytogenetics including discussion of autosomal numerical and structural abnormalities; sex chromosome abnormalities; mosaicism; uniparental disomy; contiguous gene deletions and current laboratory approaches will also be covered.

GENE 525: Advanced Medical Genetics: Clinical Genetics (3 credits)
Michelle Merrill and Monica Nardini
Fundamental principles regarding congenital malformations, dysmorphology and syndromes. Discussion of a number of genetic disorders from a systems approach: CNS malformations, neurodegenerative disorders, craniofacial disorders, skeletal dysplasias, connective tissue disorders, cardiovascular disorders, etc. Discussions also include diagnosis, etiology, genetics, prognosis and management. Students begin to develop a knowledge base from which to develop differential diagnoses, syndrome recognition and diagnostic approaches along with specific information needed for providing appropriate genetic counseling.

GENE 528: Principles and Practices of Genetic Counseling (3 credits)
Michelle Merrill
Fundamental principles needed for the practicing genetic counselor. Topics include skills in obtaining histories (prenatal, perinatal, medical, developmental, psychosocial and family); pedigree construction and analysis, physical growth and development; the genetic evaluation; the physical examination and laboratory analyses; prenatal issues, prenatal screening and diagnosis; and teratogenicity.

GENE 534: Preparing for Genetic Counseling Practice (1 credit)
Michelle Merrill and Monica Nardini
This course is designed to provide students with a practical foundation in preparing for clinical participation in various practice areas. This hands-on course will build on and mirror the didactic content learned from Gene 528: Principles of Genetic Counseling and Gene 529: Psychosocial Genetic Counseling and will serve as an applied course. Students will have the opportunity to practice empathy and listening skills, patient education, and counseling techniques through patient role plays. In addition, students will attempt practical skills such as chart review, interpretation of screening and testing reports, pedigree risk assessments, online risk models, simulated coordination of testing, application of practice guidelines in a clinical context, completion of requisition forms, and identification of genetic testing options based on insurance considerations. This practice-based exploration of clinical genetic counseling will be a safe space to practice counseling skills and will equip students to participate in patient care on clinical rotations.

GENE 535: Genetic Counseling Journal Club (0.5 credits)
Michelle Merrill
This in-person seminar course will discuss current topics in genetic counseling by reading and reviewing recently published articles in the scholarly literature. This will allow students to practice and hone critical appraisal of the literature and apply recently published literature to genetic counseling practice. The format is a group seminar, problem-based learning in which a student will lead a semi-structured interactive presentation and facilitation of group discussion of the research article. Articles chosen for discussion will include an area of genetic counseling with a focus on access, service delivery, diversity, disability, social determinants of health, education, religion, culture, equity, inclusion, justice, or belonging issues relevant to the field. For each session, students choose articles with the instructor's guidance, prepare discussion questions, and lead the group discussion. Articles can be selected from any peer-reviewed journal. Typically, relevant literature is selected from The Journal of Genetic Counseling, Genetics in Medicine, The American Journal of Human Genetics, The American Journal of Medical Genetics, Genetics, Clinical Genetics, Journal of Medical Genetics, New England Journal of Medicine, Journal of Clinical Oncology, Journal of Health Economics and Outcomes Research, International Journal of Clinical and Health Psychology, or other related journals.

GENE 601 Research Seminar (2 credits)
Becky Darrah, Michelle Merrill, Monica Nardini & Aaron Goldenberg
This required seminar begins in early fall of first year. The purpose of the fall seminar meetings is for students to have an opportunity to begin exploring the research process and to discuss potential research projects. Discussion will begin regarding quantitative, qualitative and mixed research approaches, approaches to identifying projects and presentations from faculty about their research interests. Discussion also includes identifying research questions and writing specific aims for projects. Initial discussion of the research process timeline will also be included. Students are asked to draft a research question and aims to submit at the beginning of spring semester.

Interprofessional education (IPE) (0 credit)
University Faculty and others
IPE is crucial in healthcare because it fosters collaboration and teamwork, leading to improved patient care, better communication, and reduced medical errors. By learning with other health professionals, students develop skills to work effectively as part of a team. Genetic counseling

students will join PA, nursing, and speech/language pathology students in a classroom setting once a month during their first year. Students will also be required to attend a centralized IPE session once per month during the first year.

Embryology (certificate)
This online course is sponsored by the Genetic Counseling Program at the University of Cincinnati and provides the student with an understanding of normal human development/embryology and the processes by which developmental anomalies occur. The course is divided equally into basic embryology and clinical application presentations. Each lecture is presented using a combined audio/video format and detailed PowerPoint slides. There are self-assessment activities and a final examination. Students will have access to the course starting in June, prior to classes beginning in August and will be required to complete the online course by the end of September of the first year. All students who successfully pass the course will receive a certificate of completion. The fee for the course will be paid for by the Department of Genetics & Genome Sciences.

Year 1- SPRING (9.5 credits)

GENE 529: Psychosocial Aspects of Genetic Counseling (3 credits)
Michelle Merrill
Fundamental principles regarding the psychosocial aspect of birth defects and genetic disease, its psychological and social impact on the individual and family are presented. Topics include the genetic counseling interview process, issues regarding pregnancy, chronicity, death and loss. The impact of cultural issues is addressed, along with working with angry patients and working with teens. Resources and support groups for families are also explored. In addition, legal issues for practicing genetic counselors will be discussed, and topics exploring burnout, compassion fatigue, and the importance of self-care will be reviewed.

GENE 531: Clinical Cancer Genetics (2 credits)
Michelle Merrill
This required seminar during spring semester discusses basic concepts in cancer epidemiology, principles of cancer genetics, inherited cancer syndromes, pedigree analysis for familial cancer risk, approaches to differential diagnosis, risk assessment, genetic testing, screening and management of patients with familial or inherited cancer disorders and psychosocial issues.

GENE 527: Advanced Medical Genetics: Biochemical Genetics and Quantitative Genetics
Michelle Merrill and Rebecca Darrah (2 credits)
The first half of this course will provide a foundation in quantitative genetics and the course covers concepts related to risk assessment and calculation and its application to medical genetics. Principles and application of Hardy Weinberg equilibrium as a means of estimating disease incidence and carrier frequency, and apply Bayes' Theorem as a mechanism to refine risk assessment based on data specific to the patient will also be addressed. The second half of the course will cover fundamental principles of metabolism including amino acid disorders; organic acid disorders; carbohydrate disorders; peroxisomal disorders; mitochondrial disorders are discussed. Major metabolic disorders are covered in regard to their phenotypes, genetic testing, differentials and treatment. Discussion of screening principles and newborn screening as well as therapy for metabolic diseases is included.

GENE 601 Genetic Counseling Research Seminar (1 credit)
Becky Darrah, Michelle Merrill, Monica Nardini and Aaron Goldenberg
This required research seminar is a continuation of the fall research seminar. The major focus of the spring semester will be to provide guidance regarding the development of a research proposal. Discussion continues regarding quantitative, qualitative and mixed research approaches except now in the context of specific research projects. Students will identify their specific research question and specific aims, discuss issues regarding review of the literature, develop the appropriate research design (study population, data collection, data analysis) to answer the research question, discuss the required format of the proposal, human subjects' protection (IRBs) issues and the proposal defense. The end product of the seminar will be a written research project proposal.

GENE 534: Preparing for Genetic Counseling Practice (1 credit)
Michelle Merrill and Sarah Grimes Hodges
This course is designed to provide students with a practical foundation in preparing for clinical participation in various practice areas. This hands-on course will build on and mirror the didactic content learned from Gene 528: Principles of Genetic Counseling and Gene 529: Psychosocial Genetic Counseling and will serve as an applied course. Students will have the opportunity to practice empathy and listening skills, patient education, and counseling techniques through patient role plays. In addition, students will attempt practical skills such as chart review, interpretation of screening and testing reports, pedigree risk assessments, online risk models, simulated coordination of testing, application of practice guidelines in a clinical context, completion of requisition forms, and identification of genetic testing options based on insurance considerations. This practice-based exploration of clinical genetic counseling will be a safe space to practice counseling skills and will equip students to participate in patient care on clinical rotations.

GENE 535: Genetic Counseling Journal Club (0.5 credit)

IPE (0 credits)

SECOND YEAR
Second year students will complete the remainder of course work, an additional 6 semester hours. Students will also register for research hours during the second year, 5 hours over 3 semesters. Additionally, they will register for 11 credit hours of clinical practicum – 2 hours in summer semester, 5 hours in fall semester and 4 hours in spring semester. During January, second year students will sit for the Comprehensive Examination (written and oral).

Year 2 - SUMMER (3 credits)

GENE 532	**Clinical Rotation I**	(2 credits)
GENE 601	**Research**	(1 credit)

Year 2 FALL (9.5 credits)

GENE 526: Advanced Medical Genetics: Genomics and Therapeutics (2 credits)

Becky Darrah, Anna Mitchell, Michelle Merrill
The purpose of this course is twofold: first, to focus on genomic approaches and technologies which have greatly expanded our understanding of not only rare genetic disorders but common ones as well. The first half of the course will focus on understanding the clinical implications of the interpretation of next generation sequencing results, identify limitations of genomic technologies, and practice curation / annotation and interpretation of genomic testing results. In addition, resources and bioinformatics tools including national databases and clinical labs to aid in the interpretation of genomic test results including variants of uncertain significance are discussed. The second half of the course will focus in-depth understanding of the benefits, limitations, and risks of therapeutics for common and rare genetic disease.

GENE 532: Clinical Rotations II (5 credits)

GENE 601: Research in Genetics (2 credits)

GENE 535: Genetic Counseling Journal Club (0.5 credit)

Year 2 - SPRING (9.5 credits)

BETH 412: Ethical Issues in Genetics & Genomics (3 credits)
Lynnette Gerido and Monica Nardini
Ethical, legal and professional issues inherent in medical genetics, genomics and genetic counseling are addressed including predictive genomic screening and testing, prenatal diagnosis, genetic privacy, implications for incidental findings, human genetic variation research, health disparities, research ethics and legal issues. Basic bioethical principles as they relate to genetic issues such as confidentiality, privacy, discrimination, autonomy and informed consent will also be discussed.

GENE 532: Clinical Rotations III (4 credits)

GENE 601: Research in Genetics (2 credits**)**

GENE 535: Genetic Counseling Journal Club (0.5 credit)

SUMMARY OF CLASSES BY YEAR

YEAR 01 -FALL

Gene 524	Advanced Medical Genetics: Molecular & Cytogenetics	2
Gene 525	Advanced Medical Genetics: Clinical Genetics	3
Gene 528	Principles & Practices of Genetic Counseling	3
Gene 601	Research Seminar	2
Gene 534	Preparing for Genetic Counseling Practice	1
Gene 535	Genetic counseling Journal Club	0.5
	Interprofessional education	0
	Embryology -Online course - summer prior to Year 1	Certificate
		Total credits= 11.5

YEAR 01- SPRING

Gene 529	Psychosocial Issues in Genetic Counseling	3
Gene 527	Advanced Medical Genetics: Metabolism and Quant	2
GENE 531	Clinical Cancer Genetics	2
Gene 601	Genetic Counseling Research Seminar	1
Gene 534	Preparing for genetic counseling practice	1
Gene 535	Genetic couneling journal club	0.5
	Interprofessional education	0
		Total Credits = 9.5

YEAR 02 SUMMER

Gene 532	Clinical Rotation	2
Gene 601	Research	1
		Total Credits = 3

YEAR 02 - FALL

Gene 526	Advanced Medical Genetics: Genomics and Therapeutics	2
Gene 532	Clinical Rotations	5
Gene 601	Research	2
Gene 535	Genetic Counseling Journal Club	0.5
	Fieldwork reflection and processing groups	0
	Professional issues seminar	
		Total Credits = 9.5

YEAR 02 - SPRING

BETH 412	Ethical Issues in Genetics & Genomics	3
Gene 532	Clinical Rotations	4
Gene 601	Research	2
Gene 535	Genetic counseling journal club	0.5
	Fieldwork reflection and processing groups	0
	Professional issues seminar	0
		Total Credits = 9.5

TOTAL CREDITS = 43 CREDITS

CASE WESTERN RESERVE UNIVERSITY
GENETIC COUNSELING PROGRAM THESIS RESEARCH PROJECT

GOALS:

The goals of the research experience are to:

1. Familiarize the student with the literature in genetics, genetic counseling, and related disciplines.
2. Enable the student to critically review and synthesize relevant literature.
3. Help the student formulate research questions.
4. Acquaint the student with the research methods that can be used to address these questions.
5. Expose the student to other aspects of conducting research, such as the IRB approval process.
6. Give the student practice in collecting, analyzing, and presenting research data.
7. Develop scientific writing skills.
8. Improve organization and time-management skills.

PROCESS:

1. Begins when students arrive. Students are encouraged to think about ideas that would lead to a research project. During the start of the fall semester of the first year, we will begin to identify a research question and study purpose.

2. You will be paired with a Research Mentor (Michelle Merrill, Monica Nardini or Becky Darrah) who will assist you with developing your research project, and serve on your committee throughout your thesis work. It is expected that you meet **at least** monthly during the first year with your Research Mentor.

3. We encourage you to keep a list of topics that pique your interest. Venues that may offer possible research topics and questions include:
    - Case Conference and Clinical Rounds – hear about cases and research going on from the clinical side
    - Journal Club – students present and critique articles in the literature; discuss other questions that could be asked regarding the topic
    - Lectures and class discussions
    - Browsing through relevant journals
    - Reviewing future directions from past student research projects
    - Reviewing abstracts from the NSGC Annual Education Conference
    - Faculty provide ideas to us, and we will discuss those ideas during the Research Seminar time

4. Students are encouraged to talk to faculty about their research – and discuss ideas for being involved. We will do this during fall semester.

5. During seminar in the fall, we will hash out what might and might not work; what faculty might be helpful, doing a quantitative vs qualitative study; clinical vs lab, etc. At the end of fall semester 1st year – the first assignment as part of the Research Seminar (GENE 601) will be for

students to have drafted a study question/purpose and specific aims (due during the first week of classes following winter break).

6. Once a question is identified – students will begin to form their research committees: a minimum 3 faculty members and discuss during seminar. Once the student has approval from the seminar faculty, the student will ask faculty to be on their committee.

7. The chair of the committee will depend on topic and area of research. EX: If the study is a lab project – then the PI of the lab is usually the chair. If a clinical project – depends on the project. Faculty will help identifying the appropriate committee chairs. Your Research Mentor will be on your committee and may be your chair if deemed appropriate.

8. The written proposal will be in written in a specific format (below). Each specific section of the research proposal will be discussed during the Research Seminar.

   Research proposal is presented in a NIH proposal format:

   1. Specific aims page: a brief background, the purpose of the study, hypothesis if appropriate and study aims

   2. The Research Strategy, which includes:
      a. Background & Significance
      b. Innovation – why this is different from other similar studies
      c. Approach – the study design, study sample, instruments, statistical analyses, timeline, and future directions

9. The written draft of the proposal should be reviewed by the student's Research Mentor, followed by your committee members. We anticipate that you will have at least one meeting with your committee prior to the proposal defense to present your research question and specific aims and to get their guidance in writing your research proposal.

10. The written proposal must be completed by the end of spring semester. Each student will schedule a proposal defense for the end of spring semester/beginning of summer semester (May-July). The proposal is submitted to the student's committee members at least **7 days** ahead of the date set for the proposal defense.

11. If Becky/Michelle/Monica decide that adequate progress has not been made during the spring semester, a grade of "incomplete" may be assigned for GENE 601. This is typically due to lack of progress on the written proposal. A full draft of the proposal is due to your Research Mentor at the end of the second semester. During the summer semester, the student will have an opportunity to get back on track, and if the student successfully develops a research proposal and defends the proposal, the grade will be changed to "pass". If the student does not defend the proposal by the end of summer semester, the grade will be changed to "no pass" and the expectation is that those credits will be made up the following summer, therefore delaying graduation until August of the second year. Submission to IRB is required by September 15, 2025. If IRB submission does not happen over the summer, an incomplete grade will be given. Students will have until mid-September to complete submission to the IRB. Failure to submit by

this deadline will result in a "no pass" for the summer credits, which will be made up the following summer. This would also delay graduation until August of year 2. Each of these situations will be handled on an individual basis, and specific consequences will be determined by Michelle and Becky. Exceptions to this are students pursuing the dual degree in bioethics, where proposal defense is required to take place by the end of November of the 2nd year.

Proposal Defense

1. The student will schedule a 2-hour session with their research committee members to defend their research proposal.

2. The committee meets with the student. There is an initial executive session in which the committee members discuss the proposal without the student present in the room. The committee then asks the student to rejoin them.

3. The student will make a brief presentation (~15-20 minutes) about the project and then there is open discussion and questions by committee members

4. During this meeting, faculty will provide guidance and recommendations to the student regarding the purpose of the study/research question, the specific aims of the project, significance and background of the literature, previous work in the area and the chosen methodology for achieving the research aims.

4. The committee then goes into executive session and a decision is made as to whether or not student needs to have an additional meeting in ~ 1-2 month's time to discuss changes, etc.

Following study approval

1. Once the research committee has approved the study aims, research design and methodology, the student prepares an IRB proposal, if appropriate, under the direction of the committee chair.

2. Following IRB approval, the student carries out the project with data collection, data analysis and writing of the research project.

3. The Program or Lab PI is responsible for costs associated with the project. Students will be encouraged to apply for funding as well.

4. Students must meet with (or be in touch with) their Committee Chair at least once a month. In addition, the student should keep their research committee informed as to the progress of the research. The full committee should meet at least every 3-4 months after the proposal defense to discuss student progress. The student and/or the committee chair should call a committee meeting sooner if needed.

5. The final research document is formulated in a manuscript format. The student should work with their committee chair and/or committee members to identify an appropriate journal for the study. The student will then write the manuscript according to that journal's specifications.

Committee defense

1. Once data collection is complete, analysis done – the student gives a rough draft(s) to their Committee Chair and other appropriate committee members to critique and edit. On approval of the committee chair, the student may schedule the committee defense – committee members receive a final draft of the research manuscript a minimum of 10 days prior to committee defense.

2. Committee Defense – the student will schedule a 2 hour session with research committee members to defend their research project. The format is similar to the proposal defense with executive sessions before and after a short presentation by the student and committee member questions regarding the research. Following this defense, the research committee will make a recommendation as to whether the student has successfully defended their research project. During this time, all changes to the manuscript draft need to be made and the revised manuscript resubmitted to all committee members.

3. All final manuscript drafts must also be submitted to the Michelle so that they can be added to the student's file.

NOTE: Perhaps one of the most difficult aspects of the research process is selecting a time that all your committee members are available to meet - faculty schedules fill very quickly and far in advance. The student must take the initiative to schedule committee meetings, which often means contacting faculty 2-3 months in advance.

Public Presentation

1. All students will present their research projects at a departmental research poster symposium in May of their 2nd year. Faculty and student peers attending the departmental poster symposium will vote on a Best Student Poster Award.

Additional Expectations:

1. All students should work with their Committee Chair/Research Mentor to refine the manuscript to be submitted for publication.

2. All students should submit abstracts to NSGC, ACMG or ASHG (wherever appropriate) for platform or poster presentation at the next year's meetings.

The CREC Program and Research Education

All genetic counseling students are **required** to take the on-line Case Western Reserve University's Continuing Research Education Credit (CREC) Program which "provides investigators documented training in the protection of human subjects in research" (CREC website – below). **This training must be completed by January 31, 2026.** The program outlines the ethical principles of human subjects research and prepares the researcher, in this case the student, to "protect the rights, dignity, welfare and privacy of human research participants" (UHCMC IRB website – below).

The main page for Case research programs can be found at: http://ora.ra.cwru.edu/research/orc/ or you can go directly to the Continuing Research Education Credit Program (CREC) link –

https://case.edu/research/faculty-staff/education-and-training/continuing-research-education-credit-crec

On this page you will find a link for the Collaborative Institutional Training Initiative (CITI) - this is the program used to become certified re: human subjects research to conduct your research projects. Obviously, if you elect to do a lab-based study - you do not need to have this type of certification, but we require all students to complete the course regardless of the type of project you elect to carry out.

Sparta IRB is the electronic IRB submission system for both CWRU and University Hospitals Cleveland Medical Center. Information is located at:

https://case.edu/research/faculty-staff/education-and-training/spartairb-info

Role of the Research Mentors, Committee Chair, and Committee:

1. **Research Mentors** will be assigned during the first semester and will be available to help guide you through the development and execution of your research project. Your research mentor will be either Michelle Merrill, Becky Darrah, or Monica Nardini.
2. You are expected to meet with your Research Mentor at least monthly during the first year.
3. Research **Committees** will consist of your Research Mentor and a minimum of 2 additional people. At least one person on the committee should be a genetic counselor (not including Michelle, Becky, or Monica). The composition of the committee will be guided by the instructors during the GENE 601 seminar course.
4. The students will ask each potential member of the committee if they are willing to serve.
5. Once the committee is established, the student will work with the committee to set up a minimum of 4 meetings:
    a. First meeting is typically early in the process (February-April of the first year) to get input on writing the initial proposal, and on study design.
    b. Second meeting is typically the proposal defense (detailed above).
    c. Third meeting is typically after data collection, to get input from the committee regarding data analyses
    d. Fourth meeting is typically the final defense.
6. Students should feel free to schedule additional meetings as needed.
7. **Committee Chairs**:
    a. The Chair of the committee is the person who is most closely related to the project, and will be the primary contact for the student. The Research Mentor may or may not be the committee chair, depending on the project. The chair will be involved in helping the student edit the proposal, do day-to-day troubleshooting, and answer questions that do not require the input from the whole committee.
    b. The student should keep the committee chair up to date on the aspects of the project during the second year, and check in via email or meeting in person on the progress at least once per month.

PAST THESIS PROJECTS - GENETIC COUNSELING TRAINING PROGRAM
(* = dual degree student in MS in genetic counseling/MA in bioethics)

Year of Graduation

2000

Jeanne W Brunger	"Parental Attitudes toward Genetic Testing for Children Who Are Hard-of-hearing or Deaf"
Rebecca J Marsick	"The Relationship between Cystic Fibrosis Pulmonary Phenotype and IL-10 and TNF-α Promoter Polymorphisms
Shannon M McGuire	"Phenotype/Karyotype Correlations and Definition of a Critical Region in Duplication 9p Syndrome"
Ann Weiss	"Investigation of NAT2 Polymorphisms Associated with Increased Risk for Colon Neoplasia"

2001

Rhonda Nation Dugan	"Genetic Counselor's Experience with the Conflict between Patients' Right to Confidentiality and the Duty to Warn at-risk Relatives"
Erica Burner	"Attitudes and Feelings of Siblings Towards Having a Brother or Sister with Prader-Willi Syndrome"

2002

Joanna L Bohl	"Attitudes and Perceptions of the Public Toward DNA Sampling for Research"
Cheryl Turansky Hess	"Genetic Conditions During Adolescence: Knowledge Levels and Communication Patterns of Parents and Teens"
Arlene B. Ilagan	"Defining the Role of Genetic Counseling in Reproductive Medicine"
Michelle Merrill	"An Examination of the Impact of Genetic Discrimination on Genetic Testing and Medical Management Decisions among Persons at Risk for Hereditary Breast and Ovarian Cancer"
Susan L. Thompson	"Phenotype/Karyotype Correlation in Inv Dup(15) Marker Chromosomes: Update and Review of the Literature"

2003

Sarah J Grimes	"Explorations of the Neurobehavioral Aspects of Marfan Syndrome"
Elizabeth Regier	"Attitudes toward Genetic Testing and Genetic Research in an African American Population"

Stavit Biton	"Molecular and Phenotypic Characterization of 9p23-p24.3 deletions"
2004	
Elyce Carson	"A Description of Current Prenatal Genetic Counseling Practice with Regards to Sonographic Markers for Down Syndrome in the Second Trimester of Pregnancy"
Devon Lamb	"An investigation of current parent experiences with the Ohio Newborn Screening Program since the implementation of the Supplemental Newborn Screening Program"
Azita Sadeghpour	"Ashkenazi Jewish Community-Based Genetic Education and Counseling for Hereditary Cancer: Coping Styles, Psychological Distress, Discrimination Concerns and Satisfaction"
Mary Topping	"A description of current genetic screening practices of donor gamete programs in the United States including the utilization of guidelines and recommendations published by the American Society of Reproductive Medicine (ASRM)"
Heidi Vance	"Further Characterization and Phenotype/Karyotype Correlations in the 9p Syndrome"
2005	
Erin Fink	"Family Medical History and Genetic Research"
Stacey Fiorillo	"Utilization of Genetic Testing for Carrier Status in the Ashkenazi Jewish Population of Cleveland"
June Malkiewicz	"Practices of Genetic Counselors and Obstetricians in the Counseling of Women Diagnosed with a Fetal Anomaly"
2006	
Ryan Bisson	"Correlation of Second-Trimester Ultrasound and Biochemical Markers When Screening for Down Syndrome"
Cassandra Gulden	"Folate Pathway Polymorphisms and Colorectal Neoplasia Risk"
Diana Katz	"Genetic Screening of Egg Donors for In-vitro Fertilization"
Bronson Riley	"Polymorphisms in the Transforming Growth Factor Beta1 Gene and their Association with CF Pulmonary Disease"
2007	
Jennifer Glass	"Current Pediatricians' Practices Regarding Testing for Metabolic Disorders among Internationally Adopted Patients".

Elizabeth Lindsey	"Attitudes of Adults with Osteogenesis Imperfecta Towards Pre-Implantation Genetic Diagnosis"
Nichole Morman	"Pregnant Women's Preferences Regarding First Trimester Screening for Down Syndrome".
Kristan Moxley	"Impact of Carrier Screening on Pregnant Women's Knowledge of Sickle Cell Anemia"

2008

Megan Doerr	"A systematic review of ENDRA polymorphisms and disease HGE/GA"
Vandana Sharma	"Parental Experience with Ohio's Cystic Fibrosis Newborn Screening Program"

2009

Pinchia Huang	"Implications of False-Positive Trisomies 18 or 21 Test Results in Predicating Adverse Pregnancy Outcomes"
Corissa Manou	"Evaluation of an Alternative Method of Providing Written Information to Individuals Attending Genetic Counseling for Hereditary Breast and Ovarian Cancer"
Willonie Mendonca	"Impact of Characteristic Behaviors of Patients with Prader Willi Syndrome on Caregiver Self-esteem, Mental Health and Family Functioning"
Marissa Smith	"Genetic Counselors' Views and Current Practice with Regard to the Use of Array-CGH for Prenatal Diagnosis"

2010

Sarah Bragg	"Correlation of Poor Growth and Decreased Liver Fatty Acid Synthesis in Cystic Fibrosis Conditional Knockout Mice"
Karen Buser	"Parental perceptions of the benefits and risks associated with newborn screening for Duchenne Muscular Dystrophy"
Hannah Colabrese	"Impact of Cleft Lip with or without Cleft Palate on Parental Knowledge of Risk and Opinions of Genetic Testing"
Meghan Marino	"Genetic Disorders Misdiagnosed as Multiple Sclerosis: A Systematic Review of the Literature"

2011

Elizabeth Hogan	"Impact of genetics professionals' involvement in the care of individuals with cystic fibrosis in regard to genetics knowledge and reproductive decision making"
Amy Linn	"Evaluation of the validity and utility of direct-to-consumer genetic testing for the autoimmune diseases: systemic lupus erythematosus"

2012

Brittney Knyszek	" Impact of Visual Aids on Prenatal Genetic Counseling Session Patient Outcomes"
Brittany Psensky	"Factors impacting attendance of patients with hypertrophic cardiomyopathy for cardiovascular genetic counseling"
Christine Shuss	"Student perceptions of genetic counselor supervision in the clinical setting"
Krista Sondergaard	"Non-vascular Ehlers-Danlos syndrome and pregnancy complications"

2013

Erika Holt	"Impact of Disease Severity on Quality of Life for Parents of Patients with Hemophilia"
Theodora Jacobson	"Health, Social and Daily Living Skills: An Assessment of Adults with Down Syndrome"
Agnes Machaj	"Breast Cancer in PHTS: Can a Predictive Fingerprint be Identified?"
Monica Nardini	"Genomic Counseling in the Newborn Period: Are Genetic Counselors Ready?"

2014

Evelyn Crawford	"Efficacy of Genetic Testing in Cases of Ambiguous Genitalia Detected on Prenatal Ultrasound"
Jeannie Klavanian	"Low Adiposity in Cystic Fibrosis Mice"
Andrea Lutter	"The Impact of Rosa's Law on Describing Persons with Intellectual Disability"
Rebekah Moore	"Provision of Genetic Services: Is It Time to Embrace Social Media"
Danielle Mouhlas	"Parental Experiences with Whole Exome Sequencing"

Rebecca Nelson	“Growth Deficiency in Cystic Fibrosis is Observable at Birth & Predictive of Early Pulmonary Function”
2015	
Lauren Bokovitz	”Impact of Cystic Fibrosis on Women’s Reproductive Decision-Making”.
Lauren Maline	“Non-invasive prenatal testing: Its influence on pregnancies established through in vitro fertilization”.
Carolyn Piccinin	“Fundamental Philosophies and Professional Demands: Exploring Evidence of Genetic Counseling Models of Practice”.
Adriane Shorkey	“Anxiety in Women Undergoing Noninvasive Prenatal Testing”
Kristin Zajo	“Knowledge and Patient Satisfaction following genetic counseling for inherited retinal dystrophies”
2016	
Jenny Frey	“Two polymorphisms and their association with Cystic Fibrosis pulmonary disease severity”.
Jenna Huey	“Analyzing lincRNAs as a possible mechanism of trastuzumab resistance and target for dual therapy in HER2+ breast cancer.”
Hannah Mianzo	“The role of the circadian rhythm in cystic fibrosis”.
Hailey Pinz	"Psychosocial Aspects of Prenatal Genetic Counseling (PAPGC) questionnaire: Development of a screening tool for use in prenatal genetic counseling".
Leah Rogers	“The patient’s prospective: Is there a role for religious/ spiritual assessment in genetic counseling?”
Elana Wishnefsky	“The Impact of hyperphagia and food restriction on siblings of individuals with Prader-Willi syndrome”.
2017	
Megan Cermak	"The Patient Experience of a Moderate-risk Breast/Ovarian Cancer Susceptibility Gene Mutation“
Sarah Harter	“Down Syndrome Information Acts: Knowledge, Opinions, and Practices of Medical Professionals“
Megan Horn*	“Patient Perspective of the Informed Consent Process for Noninvasive Prenatal Screening.”

Jennifer Preslar	“Generating a Cellular Model for Evaluation of Pyruvate Dehydrogenase Complex Deficiency”
Nive Rajakumar*	“Factors Influencing Cultural Competency in Genetic Counselors”
Allison Thomsen	“Practices in Synagogues Regarding Jewish Genetic Disease Education".

2018

Katie Clayback	"Is Less Really More? The influence of Demographic Factors on Multi-gene Panel Testing Choice for Inherited Breast Cancer Syndromes.”
Stephanie Gerber	“Assessing the Effects of Renin Angiotensin System Drugs on Lung Function in Patients with Cystic Fibrosis.”
Morgan Hnatiuk	“The Current State of Genetic Counseling Assistants.”
Annelise Page*	“Lived Experiences of Individuals with Cystic Fibrosis on CFTR Modulators”
Ali Robzen	"Evaluating Patient Satisfaction with Genetic Counseling Sessions: What is the Impact of Genetic Counseling Trainees?“
Amy Siemon	“Progress of Newborn Screening Educational Materials”

2019

Alex Bakos Haseley	“Kleefstra Syndrome: Its Impact on Parents”
Emily Creque	““On the fringe:” clinical application of less commonly used ultrasound markers for Down syndrome”
Molly Ford	“The meaning of preparation: Parental experiences following the prenatal diagnosis of aneuploidy”
Sharisse Jimenez*	“Spanish-Speaking Patients’ Perspectives on Interpersonal Relationship, Communication, and the Decision-Making Process in Genetic Counseling Sessions”
Caroline Linke	“Influences on uptake: carrier versus aneuploidy screening”
Cortlandt Martin	“Factors Influencing Compliance with National Comprehensive Cancer Network (NCCN) Guidelines following Positive test result for a Pathogenic Gene mutation”
Kristy Nguyen	“Functional Studies of Variants of Unknown Significance in GSD 1a”

Maddie Williamson	"Challenging the Huntington Disease Paradigm: Evaluation of Psychosocial Issues in Persons at-risk for Genetic Prion Disease"

2020

Paul Crawford	"Thoracic aortic aneurysms and dissections: Clinical and genetic findings of individuals pursuing gene panel testing"
Zoey Freedman	"The potential incorporation of pharmacogenetic testing into genetic counseling practice"
Hannah Garn	"Genetic counselors' practices and perceptions when counseling Native clients" General/Pediatric Genetics
Joseph Liu	"Impact of ancestry-related limitations on informed consent and pre-test genetic counseling"
Emma Lynch	"Barriers and facilitators to undergoing genetic testing: A study of women with ovarian, fallopian tube or primary peritoneal cancers".
Hannah Sigurdson	"Are genetic counseling graduate students prepared to counseling on health insurance coverage and costs of genetic testing with patients?"
Emma Stocker	"Frequency of embryos appropriate for transfer following preimplantation genetic testing for monogenic disease"
Tim Trobenter	"Non-thoracic aneurysms and genotype-phenotype correlations in molecularly confirmed Marfan syndrome".

2021

Alexandra (Lexi) Hubbel	"Genetic counselors' approach to assessing and using ancestral information"
Kristen Matson	"Prenatal Genetic Counseling Appointment Timing Following an Abnormal Ultrasound"
Jordyn Koehn	"Describing the Use of Adoptive Parents' Health Information During the Adoption Process in the United States
Miki Stovarsky	"Investigation of Genotype-Phenotype Correlation in Patients with *USH2A*-related Diseases
Lexys Sandman	"The association of placental growth factor on maternal serum screen and adverse obstetric outcomes"

Cameron Friedman	“Case Report: 2-year-old with Wilms Tumor, familial heterozygous DIS3L2 mutations, & CMTC”
Madeline (Maddie) Fredrick	“Genetic Counselors' Mental Health Literacy and Self-Efficacy in Recognizing and Referring Patients to Mental Health Services”
Jillian Doyle*	“Counseling gender- and sex-diverse patients in the prenatal setting: Genetic counselors' comfort, knowledge, and perception”

2022

Emily Marckini	“ Program leadership and clinical supervisors’ perception of and strategies used to address genetic counseling student anxiety”
Kristy DiLoreto	“ Physicians’ practices and barriers in pancreatic ductal adenocarcinoma germline genetic testing and referrals: differences in clinical practice location”
Tania Montenegro	“Transgender patient experiences with cancer genetics”
Nikki Dumigan	“Testing the effects of variants that alter actin polymerization: a methodology using CTNNA1 missense variants”
Alexa Weiss	“Levels of vicarious trauma in genetic counselors”
Jordan Johnson	“An analysis of the impact of annual cancer genetic testing guideline updates on a past patient population”
Megan Mayers*	“ The current state of genetic counseling for hematologic malignancies”
Emma Nelson*	“Sponsored genetic testing and patient decision making”

2023

Sydney Bruggeman	“The experiences, attitudes, and opinions of genetic counselors on healthy genetic testing”
Kayla Johnson	“Male opinions and preferences of expanded carrier screening”
Christina Mealwitz	“Understanding parental perspectives and attitudes toward newborn screening education following false positive results”
Brynn Riley	“Evaluating psychosocial support in a genetic counseling session when a patient and counselor are language discordant”
Natali Semerad	“Factors that contribute to the recent movement and retention of genetic counselors in non-clinical positions”

Hannah Singerline	“Homozygous achondroplasia with long-term survival: growth patterns, medical interventions, and practice implications”
Erin Soule	“Identification of the prevalence of imposter phenomenon and perfectionism in North American Genetic Counseling trainees”
Justin Yeater	“Cancer genetic counselors’ attitudes and opinions towards testing minors for adult-onset cancer predisposition”

2024

Megan Conlon	“The utilization of a web-based video to provide genetic information for parents of pediatric cancer patients”
Garrett Edinger	“ Discussing treatments for genetic conditions in the prenatal setting: a study of sickle cell disease”
Alyssa Fasano*	“Prental genetic counseling in a post-Roe America”
Cameron Hayes	“Variant reinterpretation within an aortopathy cohort”
Amanda Liddicoat	“Holistic evaluation of the test-ordering strategies and processes of clinical genetic counselors”
Danielle Maulucci	“Parental anxiety before and after receiving genetic testing results for autism spectrum disorder”
Abby Smith	“Investigation into the melatonin biosynthesis pathway in relation to loss of CFTR protein function”
Jenna Ward	“ Exploring the roles, benefits, and barriers of prenatal genetic counselor involvement in perinatal palliative care”
Miura Wiley	“Psychiatrists’ perceptions of psychiatric genetic counseling and it’s potential integration into the field of psychiatry”

2025

Mia Dragich	“Are imposter feelings contributing to maladaptive work-related behaviors amongst genetic counselors?”
Deirdre Hall	“Patients’ preferences surrounding disclosure of misattributed parentage”
Elle Holland	“Expanding genetic counseling services within rural communities: perspectives on the establishment process, challenges, and rural patient population”

Macie Hricovec	“Parental experiences with genetic counseling after a true positive newborn screen for recently added genetic conditions on the recommended uniform newborn screening panel (RUSP).
Alyssa Palumbo	“Variant of uncertain significance practices amongst cancer genetic counselors”
Madison Prindle	“Exploring the usefulness of genetic testing for adoptees: what to consider”
Alyssa Riggle	“Exploring the lived experiences of individuals with Cystic Fibrosis after the implementation of CFTR modulators for treatment”
Shubhangi Sharma	“How has the recent affirmative action ruling impacted genetic counseling admissions?”
Isabelle Westcott	“Exploring genetic counselors utilization of psychosocial counseling by telephone”

2026

Olivia Bales	"From CFTR-Related Metabolic Syndrome to Cystic Fibrosis and ` CFTR-Related Disorders: Observing Clinical and Genetic Factors Associated with Disease Reclassification".
Michelle Benson	“Identification of Factors Associated with Passing the American Board of Genetic Counseling Certification Examination on the First Attempt.
Rae Dwyer	“Living with Alternating Hemiplegia of Childhood: Experiences of Families”
Sarah Eisen	"Exploring the Co-Occurrence of Cystic Fibrosis and ATR-X Syndrome"
Renee Engels	"Genetic Counselor Utilization of Information Blocking Provisions Under the 21st Century Cures Act"
Anna Fulbright	“Identifying Outcomes of Genetic Counselor Recontact Following PALB2 NCCN Management Changes”
Shelby Harding	“What is the Relationship Between Empathy Level and Years of Experience in Genetic Counseling?”
Chloe Maffei	“Identification of Parental Attitudes Towards Differing Provider Delivery Models of Whole Genome Sequencing in the Neonatal Period”

Carly Miller	“The Fate of Multi-State: A Licensure Survey Among Genetic Counselors Who Provide Direct Patient Care”
Caitlin Wahal	“The Preferred Genetic Testing Practice for Patients with Autism Spectrum Disorder: Perspectives of Genetic Counselors”
Karis Wang	"Identifying Factors That Influence Pregnant Individuals’ Genetic Counseling Appointment Time Choice After an Abnormal Ultrasound".

CLINICAL ROTATIONS

Description

Students must satisfactorily complete all rotations of clinical practicum. Rotations include the following areas: General genetics (pediatric and adult patients, including specialty clinics), Prenatal genetics, and Cancer genetics. Clinical rotations are held at multiple sites: University Hospitals, MetroHealth Medical Center, Cleveland Clinic, Promedica, and Akron Children’s Hospital. Additionally, each student will rotate through the Cleveland Clinic Pathology and Laboratory Medicine Institute. In addition to the above rotations, students will have opportunity to choose two elective rotations, which may include additional exposure in a specific area such as ophthalmologic genetic counseling or an opportunity to work with genetic counselors in areas such as industry or commercial companies.

The first rotations occur in the summer between first and second year. There is a 6-week rotation held at Akron Children’s Medical Center, MetroHealth Medical Center, or the Cleveland Clinic, as well as a 1-week in-person rotation at the Cleveland Clinic Pathology & Laboratory Medicine Institute. There will be a didactic portion (1.5 hours for 5 consecutive weeks) of the lab rotation held in the spring semester of the first year. The remaining 4 rotations are scheduled in 8-week blocks (fall 1, fall 2, spring 1 and spring 2) during the second year of the program. Typical rotations are:

Summer rotation: General Genetics, Prenatal, Cancer (6 weeks total, 2 weeks in each specialty)

CC Pathology & Laboratory Medicine Institute Rotation (2 weeks)

MetroHealth Medical Center: Prenatal, General, and Cancer Genetics

University Hospitals: Prenatal, General, Cancer Genetics

Cleveland Clinic: Prenatal, General, Cancer Genetics

Promedica: Prenatal, Cancer Genetics

Akron Childrens Hospital: Prenatal, General, Cancer Genetics

*General Genetics includes Pediatric, Adult, Metabolic & Specialty Clinics

Elective rotation opportunities are variable from year to year. This represents an example of what might be available. Cardiogenetics, Neurogenetics, Ophthalmology, Inborn errors of immunity, Renal genetics, Metabolism, In-patient consults, Fetal care center, Variant interpretation, clinical trials, program leadership, bioethics, DDC clinic, Industry rotations, Advanced prenatal, cancer, or general genetics.

The specific rotational schedule for each student will be assigned by the Co-Directors and the Associate Director during the spring semester of the first year and over the summer prior to year 2. Most clinical rotations are located within 0-30 miles of campus; however, there are a few rotation sites that require longer travel time (Promedica in Toledo, Akron Children's in Akron). Parking fees at MetroHealth, Promedica, and Akron Children's Hospital can be reimbursed at the end of each rotation. Each clinical rotation will provide students with opportunities to have first-hand experience with individuals and families affected by a broad range of genetic disorders. The intent of each rotation is to expose students to the natural history and management of common genetic conditions and birth defects and to the relevant psychosocial issues involved in each case. During these clinical experiences students will be required to observe and practice a range of genetic counseling functions, including preparing for cases; obtaining medical and family histories; determining risks; performing psychosocial assessments; communicating information about disease characteristics, inheritance, and natural history; providing anticipatory guidance and supportive counseling; identifying and using medical and community resources; communicating information to other health care professionals; and case management and follow-up.

Each student, over the period of 3 semesters, will be able to complete a Logbook of Supervised Cases and other materials documenting their clinical training. These materials become a permanent part of the student's portfolio and will be collected by the Co-Directors at the end of each clinical rotation. In each clinical setting, the student will have direct supervision by a certified genetic counselor. During the laboratory rotation, the student will be under the supervision of the laboratory genetic counselors and directors of the laboratories. The student must register for a total of 11 credit hours of Gene 532 (2 credit hours in summer; 5 hours in fall and 4 credit hours for the final spring semester) for a total of 36 clinical rotation weeks (average of 900-1000 hours of clinical practicum and an additional 70-80 hours laboratory experience). For graduation, a minimum of 60 participatory (core) cases must be logged in Typhon.

Grading

Grading is on a Pass/No Pass basis. Successful completion of **EACH** clinical rotation is required to graduate from the program. Specific requirements for successful achievement in clinical rotations are those listed in the Handbook and outlined by your clinical supervisors during each rotation. These include, but are not limited to, preparing for a minimum of 3-4 cases per week (chart review, literature search on appropriate topics pertaining to each case, obtaining additional information – lab data, hospital records, etc), and meeting with the supervising counselor prior to each case (at a time agreed upon by the student and the counselor) to discuss counseling issues and strategies. In addition, the student will prepare a pre-case counseling outline and write-up. The pre-case write-up will be the basis for case review and discussion with the supervising counselor. The pre-case must be completed and reviewed (see individual clinical rotation requirements) prior to seeing the patient in order for the student to actually see the case.

Following each case, clinic notes, letters, post case write-ups and other additional information requested must be submitted in a timely manner (see specific clinical rotation information). Failure to meet expected deadlines more than 3 times for case write-ups, letters, etc, will result in a no pass grade for the rotation and the student will either need to repeat the rotation or be asked to withdraw from the program. In the event that a student does not perform satisfactorily and meet the requirements of the practice-based competencies, the student will meet with the supervising genetic counselor(s), the clinical coordinator and the Co-Directors to decide how deficiencies will be rectified. This may be, but is not limited to, doing additional clinical work which in turn may prolong the student's program.

Practicum Objectives

The clinical practicum supports the development of practice-based competencies as outlined by the Accreditation Counsel for Genetic Counseling and represents practice areas that define activities of a genetic counselor. These competencies fall into the following domains: 1) Genetics expertise and analysis; 2) Interpersonal, psychosocial and counseling skills; 3) Education; and 4) Professional Development & practice. During each rotation, students will be assessed on skills necessary for achievement of each competency as outlined in specific objectives (see attached ACGC Practice-Based Competencies for Genetic Counselors).

LOGBOOKS

Each student will keep a logbook in Typhon of **ALL** patients he/she sees **including all observations**. This log should include all information needed to satisfy documentation of the student's role in each case as well as detailed notes on the cases and counseling strategies. The logbook should reflect the depth and breadth of the student's clinical experience. All clinical encounters will be logged in Typhon, and each case will be reviewed and approved by the supervising genetic counselor. Logbooks will be reviewed by the Co-Directors at the end of each clinical rotation. Patient identifiers (such as name or patient medical record number) must never be used on the logbook. Typhon will assign a unique identifier for each case seen. You will have an exit interview with the Co-Directors to review your logbooks and other materials before leaving CWRU.

Specific expectations during each rotation for each clinical site will be given to the student prior to starting the rotation. In addition to the pre and post case write-ups for each case, the student will check off in typhon the elements of the counseling session that were attempted during the session. The student will also complete their self-reflection of their performance during the case, documenting what went well and ideas for improvement in the next case. After the case is finalized, the student will have the supervisor review the entry in Typhon, sign and date it.

Finally, prior to starting each rotation, each student will identify specific goals that the student wishes to accomplish during that rotation. Students will continue to add and build upon the list of goals at the beginning of each new rotation and will review them with the supervising counselor(s) at the beginning and end of a rotation. It is anticipated that by the end of the Program, the students will have achieved the goals that they set for themselves.

LOGBOOK and CASE ENCOUNTER FORMS

During your clinical rotations (including observations of counseling sessions) you will need to document your patient involvement in order to demonstrate that you have had a breadth and depth of counseling experiences. All cases that you see, whether as an observation or a case that meets

criteria to count toward a required logbook of 60 participatory (core) cases must be maintained in Typhon. These will be reviewed by the Program Co-Directors at the end of each rotation.

As part of the logbook entry, students will document the type of counseling case. These include the following:

A. Preconception counseling
B. Prenatal counseling (age, abnormal US or serum screening, maternal disease, teratogen, etc)
C. Pediatric genetics (general, disease-specific, dysmorphic evaluation)
D. Adult genetics (cardiovascular, neurogenetics, individuals affected with genetic conditions, etc)
E. Cancer genetics (personal hx, family hx, risk assessment, genetic testing, etc)

Note: If multiple family members are evaluated and / or counseled - these sessions may only count as one (1) case.

Students will also document the roles they performed during each case. **To be considered a "participatory case (aka core case)", the clinical interaction must include active student participation in at least 1 role in each of the 3 categories of Fundamental Counseling Roles (Management, Education, and Counseling) must be documented.** The details of each role are listed below:

a. **Management Roles**:

- **Case preparation** involves reviewing all relevant information about the client and the indication for genetic counseling prior to the session.
- **Collection/documentation of medical, developmental and/or pregnancy history** implies the eliciting of pertinent medical information including pregnancy, development and medical histories and environmental exposures.
- **Collection/documentation of family history/pedigree** involves the eliciting of information for and construction of a complete pedigree.
- **Risk assessment** involves pedigree analysis and evaluation of medical and laboratory data to determine recurrence/occurrence risks.
- **Evaluation/coordination of genetic testing** includes determining the appropriate genetic test(s), evaluating laboratories, and/or coordinating the testing.
- **Clinical documentation (clinic notes, letters)** implies writing clinic notes or letters about the appointment
- **Other follow-up (calls, referrals)** includes but not limited to conducting further literature review, maintaining contact with the family to address any additional concerns, or identification of other health care professionals or resources for patient care.

b. **Education Roles**

- **Inheritance pattern** involves educating patients about modes of inheritance.
- **Risk counseling** involves educating patients about their personal and/or familial risks
- **Diagnosis/prognosis/natural history** includes conveying genetic, medical, and technical information about the diagnosis, etiology, natural history and prognosis of genetic conditions and/or birth defects.
- **Medical management/prevention/treatment** includes discussing current medical management, prevention, and treatment of genetic conditions and/or birth defects.

- **Genetic and/or prenatal testing options and possible results/benefits/limitations** includes explaining the technical and medical aspects of diagnostic and screening methods and reproductive options, including associated risks, benefits, and limitations.
- **Results disclosure** involves interpreting the results and discussing them with the patient; can include the development of teaching aids and the provision of educational materials
- **Research options /consenting** involves discussion about research opportunities and/or consenting the patient for the study.

c. **Counseling Roles**

- **Establishing rapport/contracting** refers to initiating the genetic counseling session, eliciting client concerns and expectations and establishing the agenda.
- **Psychosocial assessment** includes eliciting and evaluating social and psychological histories and assessing clients' psychosocial needs.
- **Psychosocial support/counseling** involves providing short term, client-centered counseling, psychosocial support, and anticipatory guidance to the family as well as addressing client concerns.
- **Resource identification/referral** includes helping the client identify local, regional and national support groups and resources in the community.
- **Case processing/self-assessment/self-reflection:** involves critical thinking about the session; what was done successfully as well as areas to improve. The following questions should be answered in Typhon for every case:
    - What do you think went well during this session? Please provide specific examples.
    - Describe your perception of your interactions with the patient:
    - Your feelings about your performance during the session:
        - Developing rapport:
        - The patient's understanding of the information you presented:
        - Your feelings about the patient:
    - What did I avoid in this session?
    - What would I have done in this session if I was taking more of a risk?
    - Describe any aspects of the session that you think did not go well during the session.
    - Provide suggestions for improving this aspect of your performance in subsequent sessions.

FIRST YEAR CLINICAL OBSERVATION ENCOUNTERS

During each clinical observation experience, in addition to logging the case in Typhon, students will reflect on each patient encounter by answering the following questions:

1. Brief summary of the case – reason for referral, pertinent family history, etc. Should be no more than a paragraph in length.

2. Contracting and client expectations: Did you feel client/family understood the reason for the visit? Was this different from the genetic counselors' understanding of why the client/family was there?

3. What was the emotional demeanor at the start of the session (upset, anxious, not interested, etc)? How did the emotional demeanor change throughout the session?

4. Did the client/family have an opportunity to "tell their story"? If yes, what emotions or reactions did you notice while they were telling their story? How did the GC use the patient's story during the genetic counseling session?

5. When the GC was obtaining the medical and family histories, what were the patient reactions? Did they express any emotions during this process?

6. What was the client's/family's emotional response to the information given during the session? What do you think their level of understanding was?

7. Describe the working relationship between the GC and the client/family? What were the strengths? What did you observe that was challenging for the client/family?

8. What goals did the client/family seem to have for this session? Do you feel those goals were accomplished? Was there anything that you feel could have benefited the client/family?

9. What types of communication used by the GC worked best for this family? (rephrasing, open-ended questions, silence, active listening, etc)

ADDITIONAL INFORMATION

University Academic Calendar & Holidays

Graduate students in the Department of Genetics & Genome Sciences are officially registered for the entire year and as such are expected to dedicate full-time (9 am – 5 pm) Monday through Friday) to course work, clinical training and research. Graduate students in the professional schools (including the Genetic Counseling Training Program) may follow the University Graduate School Calendar, and we will make you aware of changes to this calendar as needed. Official holidays include Labor Day, the week of Thanksgiving, at least 2 weeks for Winter break, Martin Luther King Day, 1 week spring break in March, Memorial Day, Juneteenth, and July 4th. We will not observe fall break and instead will have a full week off at Thanksgiving. Additional vacation times will be planned and discussed with the appropriate clinical faculty or supervising genetic counselors. Final approval must be given by the Co-Directors.

Attendance

Students are expected to attend all required conferences, classes and clinical assignments. Attendance is required whether or not the student is actively involved in a rotation, even when the rotation is off campus. If the student is ill or must miss a conference, class or clinical assignment, the student must contact the appropriate supervising genetic counselor, professor or one of the Co-Directors to notify them that they are ill. **During clinical rotations, if a student misses more than 6 days during the rotation, the student will be expected to repeat that rotation to receive a passing grade.** If the student misses a significant portion of required attendance at clinical conferences or classes, the student may be asked to extend their program to make up deficiencies.

In the first year, students are allowed to miss one case conference and one grand rounds session per semester for a mental health break. Students must notify Michelle in advance that they will not be attending. Days must be used during the semester and cannot roll over to the following semester. First year students are also allowed to miss one rounds session per semester for an interesting patient you would rather see in clinic. In the 2nd year, students are allowed to miss one grand rounds session per semester for an interesting patient session you'd rather see in clinic. Second years are also allowed to miss one grand rounds session per year for a mental health break. You must notify Michelle in advance that you will not be attending.

Graduate Student Stipends

The Genetic Counseling Training Program is supported by departmental funds. For the class of 2024-2026, each student will receive a stipend of $6,000.00 per year for a total of $12,000.00. Students will receive a monthly stipend check on the last day of each month starting on September 30th during the first year (a 10 month period) and continuing through May of Year 2, which begins July 1 (an 11 month period). In addition to the stipend, the Department also covers the Technology fee of $426 per year (which is subtracted from the tuition bill each semester), the $495 registration fee for the on-line embryology course, expenses associated with research projects and $1000.00 to attend the NSGC meeting in fall of the 2nd year. The department also covers registration for Typhon (clinical case logging system) and ExamSoft (for the written comprehensive exam).

Financial Aid

Each student is responsible for obtaining his or her own financial aid. The Office of University Financial Aid should be able to assist you. The telephone number is (216) 368-4530. Financial arrangements should be made by the time the student registers for each semester. Tuition for the 2025-26 academic year is $2316.00 per credit hour. Fall and spring semester tuition bills are sent directly to the student. Summer tuition must be paid "up front" at the time of registration (the University does not mail out tuition bills – they collect at the time you register for classes – which is 3 credit hours in summer).

Other expenses include the CWRU Medical Plan fee which is automatically billed at the beginning of both fall and spring semesters (spring semester covers summer). The cost is $1,993 per semester. Students who have alternate medical insurance may waive the CWRU Medical Plan fee each semester by completing a waiver form, which is available at the University Health Service (368-2450). There is an activity fee of $25 each semester. Finally, there is a fee for membership to One to One Health Fitness Club on campus ($146 for fall semester and $182 for spring semester). **You are automatically enrolled in One to One and are billed accordingly unless you opt-out of the program**.

Students may work part time as long as it does not interfere with program requirements including didactic coursework and class times, clinical rotation responsibilities and thesis work. Students may contact the Office of Student Employment which assists students seeking part-time employment on and off campus during the academic year and summer term. The website is part of the financial aid site and can be found: https://case.edu/financialaid/student-employment

Student Space

The genetic counseling students have designated cubes in the Department of Genetics & Genome Sciences on the 6th floor of the Biomedical Research Building. There are open cubical areas (the "Cube"), where you have desk space and computers available. The computers are connected to

CWRUnet, which allows students to access the Internet as well as email. Each student at CWRU receives free access to email services through Case gmail. You will receive an ID number and directions for accessing the Internet from home after you receive your official acceptance by the School of Graduate Studies. Moreover, the campus is wireless, so students should be able to access the Internet from anywhere on campus if their laptops have wireless capability.

Mailboxes
Students will each have their own mailbox in the cubical area in which faculty will be able to leave materials and messages for each student. Please check mailboxes for messages or other related program activities. Announcements and activities in the Department are usually posted by the elevators and on bulletin boards on both the 6th and 7th floors. Most program related information will be communicated by email.

Libraries – Case and Student Office
Students have access to all of the libraries on the Case campus. Many journal subscriptions relevant to genetics and genetic counseling are available to CWRU students online. There are copies of textbooks and reference books in the BRB 632 conference room library for use by genetic counseling students as well. Some textbooks are available by PDF and will be posted on canvas.

Student Office Space at Rotation Sites
Office space (cubicle area or other arrangement) is available to students when they are involved in clinical rotations at the various institutions. Each genetics center will provide students with access to patient records and materials including computer access to on-line databases as appropriate. Most rotation sites do not provide remote access to their systems, so students will need to be on campus to access medical records and clinic schedules. In order to remain HIPAA compliant, **absolutely NO PATIENT RECORDS ARE TO BE REMOVED FROM ANY GENETICS CENTER – NOR MAY ANY PATIENT DATA BE COPIED AND TAKEN OUT OF THE FACILITY.** Office space at the various institutions is not large. Please do NOT use hallways or secretaries' office areas as gathering or meeting places. Students should **NEVER** telephone patients or do telephoning of patient related matters from any area other than those that have been designated by your supervisors. NO personal calls should be made or received at your rotation site unless there is an emergency.

Confidentiality Agreements and HIPAA Training
Students must sign Confidentiality Agreements with the various institutions prior to participating in any clinical activities including observations and clinic conferences. This is to preserve patient confidentiality. Due to regulations under HIPAA (Health Insurance Portability and Accountability Act) – guidelines regarding maintaining patient confidentiality have been instituted. In this regard, students may **NOT** copy and maintain any patient records including the pedigree. All pre-case and post-case write-ups must have patient names or any other identifying information blacked out.

Clinical Rotations
Students will be oriented to each of these institutions by the supervising genetic counselors at the time of their rotations. Institutional services, expectations, roles and responsibilities will be addressed in detail at that time.

Dress
Appropriate attire and demeanor is expected when seeing patients or when otherwise engaging in professional activities at all clinical rotation sites. Students should wear their issued hospital ID badge at all times when involved in any patient situation. Check with the clinic you are assigned to regarding dress codes, as some facilities are stricter than others. In general, business or business casual attire is appropriate when seeing families in the clinic area. NOTE: Blue jeans, shorts, t-shirts or tank tops, very short skirts or tops that are low cut or do not cover the abdomen, heavy boots or shoes, sneakers, etc., are not appropriate clothing for the clinical areas. Some hospitals will require that body piercing and tattoos be not visible to patients. Additionally, if you will be in the patient areas working (but not scheduled to see patients), you should be dressed as if you were seeing patients. Chewing gum, eating or drinking when seeing patients is unprofessional and should never be done. Dress during classes in your first and second year within the department is casual and you may wear jeans or other casual clothing.

Cell Phones
Cell phones should be silenced and put away prior to classes, meetings, seminars, and rotations. Some hospitals may have prohibitions on any cell phone use in their buildings.

Email etiquette
The genetic counseling program will send all email via your CWRU account. You should check email at least once per day. Announcements and schedule changes are almost always communicated by email. You should respond within 24-48 hours to any email from the program leadership. Your ability to handle email well is a significant part of your professional reputation. As such, please consider the following when communicating by email:

- Emails are most effective when they are short and concise. Consider communicating by phone or in person when there are multiple subjects or issues, issues are complex and need detailed explanations, or issues are sensitive in nature.
- Use appropriate salutations and sign-offs and a descriptive subject line.
- Use your spell checker but also re-read your emails for correct spelling, grammar, and punctuation.
- Do not use text abbreviations in an email or in other more formal means of written communication.
- Avoid typing in all capital letters.
- Remember – emails last forever, so consider this before you send an email when angry or when having another strong emotion.

Social Media Etiquette
How you represent yourself digitally is an important part of your professional reputation. Be intentional with your online profile. Below are some tips:

- Consider completing a LinkedIn profile
- Keep a well-maintained blog, website, Instagram, Twitter, Threads, or FaceBook page
- Avoid an uncensored, overly personal, or controversial Twitter history
- Beware of negative comments you have made using your name
- Remove inappropriate photos tagged with your name
- In general, do not complain about bosses, coworkers, patients, program leadership, faculty, classmates, etc online.

Textbooks
We have tried to keep highly recommended texts to a minimum. Many of these texts are useful references for the courses you'll be taking or will be useful in your clinical rotations. There are copies of ALL of these textbooks in the student library – this allows you to review them before purchasing yourself.

HIGHLY RECOMMEND:
Jane L. Schuette, Beverly M. Yashar, Vivian Pan, Karen E. Wain. **A Guide to Genetic Counseling.** 3rd edition. John Wiley & Sons, New York, 2024.

Other medical genetics texts to consider:

1. Cohn R, Scherer S, and Hamosh A. Thompson & Thompson Genetics in Medicine 9th edition, W.B. Saunders, 2024.

2. Kenneth Jones, editor. Smith's Recognizable Patterns of Human Malformations. 8th ed. W.B. Saunders Company, Philadelphia, 2021.

3. Jorde LB, Carey JC and Bamshad MJ. Medical Genetics. 4th ed. Mosby Elsevier, Philadelphia, 2010.

4. Korf BR and Irons MB. Human Genetics and Genomics, 4th ed. Wiley-Blackwell, 2013.

5. Mathiesen A & Roy K, editors. Foundations of Perinatal Genetic Counseling. Oxford University Press, 2018

6. MacFarlane IM, McCarthy Veach P, LeRoy BS. Genetic Counseling Research: A Practical Guide. Oxford University Press, 2014.

7. Katherine Schneider. Counseling about Cancer: Strategies for Genetic Counseling. 4th ed. Wiley-Liss, 2023

The following are also excellent references (all available in student office as well):

1. Gardner RJ, Sutherland GR and Shaffer L. Chromosome Abnormalities and Genetic Counseling. 5th ed. Oxford University Press, 2018.

2. Strachan T, Goodship J, Chinnery P. Genetics and Genomics in Medicine. Garland Science, 2014.

3. William Reardon. The Bedside Dysmorphologist. Oxford University Press, New York, 2007.

4. Greenwood Genetic Center. Genetic Counseling Aids. 6th ed. 2013. Order directly from Greenwood Center Genetics.

5. Medical dictionary – any good medical dictionary is fine. Example: Stedman's Medical Dictionary, 28th ed. Williams & Wilkins, 2005.

6. Creswell, JW. Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. 3rd ed. Sage Publications, Inc. 2008.

7. J Fernandes, JM Saudubray and G van den Berghe, editors. Inborn Metabolic Diseases. 4th ed, Springer, New York, 2004

8. Bennett, Robin. The Practical Guide to the Genetic Family History. 2nd ed. Wiley-Blackwell, 2010.

9. Cassidy, Suzanne and Allanson, Judith. Management of Genetic Syndromes. 3nd ed. Wiley-Liss, 2010

10. Love, Susan Dr. Susan Love's Breast Book. 5th ed. Merloyd Lawrence Books, 2010. (Good for cancer course)

11. Gersen, SL and Keagle MB. Principles of Clinical Cytogenetics. 3rd ed. Springer Press, 2013.

12. Young, Ian D. Introduction to Risk Calculation in Genetic Counseling. 3rd ed, Oxford University Press, 2006

Most of the above texts are available to you in the BRB library, 632. You will have assigned readings from A Guide to Genetic Counseling for the genetic counseling courses during first and second semesters. The visual aids flip chart book is very helpful for role plays and in your clinical rotations. Nussbaum et al., Thompson and Thompson, *Genetics in Medicine* is the medical genetics text most people use here - it is used in a number of courses – GENE 524, 525, and 526. The cancer genetics course has a number of assigned readings in the Schneider book. A PDF copy of many of these texts will be provided.

Disability Accommodations

In accordance with federal law, if you have a documented disability, you may be eligible to request accommodations from Disability Resources. In order to be considered for accommodations you must first register with the Disability Resources office. Please contact their office to register at 216.368.5230 or get more information on how to begin the process. Please keep in mind that accommodations are not retroactive.

Academic Integrity

The importance of academic integrity cannot be over-emphasized. Throughout the course of their professional careers, genetic counselors are expected to maintain academic integrity. The School for Graduate Studies has prepared a detailed document about Case's academic integrity policy. It is the responsibility of each incoming student to read this document, available at this URL: http://case.edu/gradstudies/about-the-school/policies-procedures/. Any violation of the University's Code of Ethics will not be tolerated. University policy states, in part, "All forms of academic dishonesty including cheating, plagiarism, misrepresentation, and obstruction are violations of academic integrity standards." Anything you write, whether it is for a course, clinical rotation or thesis document, must be entirely in your own words. Students who copy the words of others are engaging in plagiarism, which is a form of academic dishonesty which can lead to loss of

credit or dismissal from the program. Whether intentionally or unintentionally, making extensive use of sources without acknowledging them (including the internet) are all interpreted as acts of plagiarism. Quotations, paraphrases and borrowed information must be properly referenced.

Advising

The student's major advisors for the Program will be Michelle Merrill and Becky Darrah, the Program Co-Directors. The leadership team is available to assist students with all aspects of the Program as well as personal issues, as needed. During clinical rotations, Monica Nardini is available to assist with any issues that may arise. In addition, the supervising genetic counselors are very willing to assist students, and the second-year students often serve as a welcome resource as well. You will also be paired with a 2nd year student mentor who can act as your primary second year contact. The purpose of a 2nd year contact is to increase communication and foster relationships between the 1st and 2nd year cohorts. They will likely have answers to several of your questions, as they have had similar experiences during their time here at CWRU. Specifically, they can be very helpful with logistical issues like identifying an area to live in and/or finding an apartment. However, your 2nd year mentor does not speak on behalf of the program or the program directors. You should always ask program leadership specific questions regarding program administration, classes, rotation schedules, etc.

You are required to meet with program leadership at least twice per semester, and formal mid-semester and end of semester meetings will be scheduled. These meetings are designated times to review academic performance, progress on your thesis project, and rotations. You should expect to receive regular feedback (both positive and constructive) regarding all areas of the program and can help you address any concerns you have about your own academic or fieldwork performance. Resources such as the writing center or counseling services may be discussed as possible sources of assistance. Following completion of the comprehensive exam in the Spring of your second year, a formal graduation readiness meeting will be held with program leadership.

During clinical rotations, the supervising genetic counselor of that rotation should be the student's first choice for a resource person. However, a student may also wish to discuss counseling styles, strategies, etc., with Monica, Michelle, Becky or other counselors to get a broader perspective. If a counselor feels that information brought to their attention by the student should be shared with the Co-Directors, the counselor will inform the student of such.

Other

Please address faculty formally as Dr. ..... unless they instruct you that you may do otherwise. In the clinical setting when seeing patients, **ALWAYS** address the faculty member as Dr. ..... . Also, be sure to ask the counselors how they would like to be addressed in a professional setting – many counselors do not use a nickname when seeing patients.

Background Checks

Students are required to have criminal background check as they enter the program. Case Protective Services will do this for a fee of $70 (credit card only). This fee covers both the electronic National Webcheck (FBI) and the electronic Ohio Webcheck (BCI) fingerprinting. Results are sent directly to the student. A positive response on the background check will not automatically preclude admission, however, such findings will be reviewed by the Genetics Department Graduate Program committee who will make a recommendation regarding acceptance into the genetic counseling program. More information is here:

https://case.edu/publicsafety/services/fingerprinting

CWRU PD currently does this by appointment only at the main campus police department, 1689 E. 115th Street. There is a google calendar link on the website that you can use to schedule an appointment. Please note that results of any of the criminal background checks may be shared with any of the affiliated hospitals at their request. Students may also need to undergo additional background checks according to policies of affiliated hospitals as well.

TB Testing/Immunizations

TB testing/Immunization Records: **Students are required to have an annual TB (Tuberculin)** test as well as to submit documentation of current immunization records. TB screening is available at University Health Service, 2124 Cornell Road. For hours, scheduling, and other information, call 216-368-2450 or go to: https://students.case.edu/wellness/info/newstudents/

CWRU recommends vaccination against COVID-19, which currently includes the first two dose series, as well as a booster shot. Additional booster shots may be required. Updates to this policy can be found here:
https://case.edu/studentlife/university-policies/covid-19-vaccination-policy

All students are required to log in to myhealthconnect.case.edu and to fill out the Health History, Immunization History and to acknowledge the privacy policy, whether or not they plan on using University Health Service for their medical needs. In addition to filling out the online forms, students in the Case School of Medicine – the **Genetic Counseling Program follows the School of Medicine requirements - are required to submit supporting documentation for their Immunization History so the information can be validated to satisfy clinical requirements of your program.** Supporting documentation should be directly uploaded using the 'Add immunization record…' button located near the bottom of the online Immunization form. You will also upload these to your Typhon account.

Graduation time

Believe it or not, there will come a day when you will graduate and become our colleagues. The School for Graduate Studies (http://gradstudies.case.edu/) has information about important dates and deadlines for submitting graduation information. Also, when the time comes – there are a few things that you will need to do when you leave CWRU.

> **Exit Interview & Forwarding Information**: You will need to provide us with your contact information following graduation. You will have an exit interview with the Education Manager to review the program, key elements that were helpful, what could be changed, any other suggestions.
>
> **Keys and ID Badges**: You will turn in your hospital ID cards and any keys issued once your rotations are complete at Metro, Cleveland Clinic, Promedica, UH and Akron. Each hospital will inform you about when you need to do this following your rotations.

CAMPUS RESOURCES

The Case campus has a number of resources available to graduate students. Information about resources can be found at the Case website: http://www.cwru.edu. In particular, graduate students have access to:

Student Health Insurance

Information about the CWRU student health insurance plans can be found at the website below. All students must have health insurance unless they have health insurance through their family, in which case, they may request a waiver of health care.

https://www.aetnastudenthealth.com/stu_conn/student_connection.aspx?groupID=474889
University Health and Counseling Services, is a division of Student Affairs. Health Services is staffed by several professionals including physicians, nurse practitioners, psychologists, psychiatrists, social workers, and registered nurses. A number of the physicians are affiliated with University Hospitals of Cleveland and with the CWRU School of Medicine. Call 216-368-2450 for an appointment.

Counseling Services offers help to students who experience a variety of difficult personal and interpersonal challenges. Graduate school can be very demanding and adjusting to these challenges is not always easy. The UCS office is staffed with psychologists, psychiatrists, social workers, counselors, and doctoral-level counseling trainees. We recommend that students feel free to utilize these no cost services at any time. Call 216-368-5872 for an appointment. UCS also has walk-in hours and emergency assistance. Please refer to the Counseling Services website for additional information https://students.case.edu/departments/wellness/

School for Graduate Studies

The School for Graduate Studies main website is found at https://case.edu/gradstudies/. There is information for new students as well as current students. Under Current Students you will find resources for the "Program Plan of Study", "Dates and Deadlines", the CWRU Bulletin and the Graduate Student Newsletter". In addition, major policies and procedures of the Graduate School are listed on their website at https://case.edu/gradstudies/about-the-school. The website lists a number of areas germane to graduate students. Those most pertinent to master's students, and thus, students in the Genetic Counseling Training program include Academic Integrity Standards, Graduate Student Grievance Procedures and Graduate Student Holiday, Vacation and Leave policies.

Case Student Handbook: University 401: contains lots of information about life as a graduate student – understanding academic resources; living off campus – tips from graduate students about where to live, etc; being involved in campus life; healthcare options for graduate students, finances, etc. http://studentaffairs.case.edu/handbook/university401/

International Student Office: Ensures international students have a quality educational experience – and that the campus community learns and benefits from you and your cultural experiences. This office can assist with admissions, maintaining your visa status, student employment, and more. https://case.edu/visa/international-students

Office of Academic and Community Engagement: Case Western Reserve University School of Medicine strives for innovative discovery and education that builds a sense of community while embracing the rich perspectives and experiences within our culture. Together with faculty, trainees, staff and students, we build a culture of excellence in scholarship based on integrity, respect, professionalism, and kindness.

The School of Medicine's Office of Academic Community and Engagement fosters this supportive environment where everyone can reach their full potential in their academic and research pursuits, and where their personal contributions to our institution are recognized.

Community engagement, both within the School of Medicine and more broadly across Greater Cleveland, is critical to enhance our ability to conduct research and utilize research findings to benefit others. We build relationships with our affiliate academic medical centers—Cleveland Clinic, Louis Stokes Cleveland VA Medical Center, MetroHealth System and University Hospitals—and partners throughout Cleveland, across the country and around the world.

In addition, the Genetic Counseling Program is committed to fostering an environment in which all members of our community are free from discrimination and harassment, including sexual misconduct. Such conduct violates our values and disrupts the living, learning, and working environment for students, faculty, staff, and other community members. If you experience, witness, or are made aware of any mistreatment or conduct not conducive to an optimal learning environment, the following avenues are available for reporting:

- Course evaluations in canvas
- Rotation evaluations
- Program leadership – Michelle, Becky, Monica, or Suzy
- Any faculty member affiliated with the program
- Departmental leadership
- Submitting an Accountability report: https://case.edu/medicine/about/accountability-management-system
- Case Western Reserve University Police Department: Non-emergency phone number = **216-368-3300**; Emergency-only number = **216-368-3333**

THE UNIVERSITY, UNIVERSITY CIRCLE and CLEVELAND

Case Western Reserve University (CWRU) is a private nondenominational institution. It was established in 1967 by the joining of Western Reserve University (founded in 1826) and its neighboring institution, Case Institute of Technology (founded in 1880). CWRU is located four miles east of downtown Cleveland in University Circle, one of the largest cultural and educational centers in the nation. Over thirty educational, scientific, medical, cultural, social service and religious institutions are located here. The Cleveland Museum of Art, the Museum of Natural History, the Museum of Modern Art, the Historical Museum, the Botanical Gardens, The Cleveland Institute of Music, the Cleveland Institute of Art, and Severance Hall, home of the world-famous Cleveland Orchestra, are located adjacent to the University campus within the 500-acre University Circle community. The University also maintains an active program of theater, films and music at nominal cost to students. Athletic facilities at the University are excellent and there are active intramural programs in various sports.

Cleveland is a cosmopolitan community of 2 million people richly endowed with a wide range of cultural and recreational opportunities, including an extensive park system. Cleveland is home of professional sports teams in baseball, football, basketball, hockey and soccer. Lake Erie and the camping, sailing, and skiing areas of Ohio, western Pennsylvania and western New York are readily accessible.

You can find additional information about living in Cleveland here:
https://case.edu/medicine/about/life-cleveland

HOUSING

Most graduate students live off campus in one of the pleasant residential neighborhoods within walking or biking distance of the University. There is a variety of very reasonably priced housing available in these areas. Information about off-campus housing can be obtained from: Off Campus Housing at (216) 368-3780 or the CWRU housing website http://housing.cwru.edu.

MASTER OF SCIENCE IN GENETIC COUNSELING &
MASTER OF ARTS IN BIOETHICS
Dual Degree Program

Dual Degree Program Directors: Rebecca Darrah, PhD & Aaron Goldenberg, PhD

If you are interested, the Departments of Genetics & Genome Sciences and Bioethics offer a dual degree program between the Masters in Genetic Counseling and the Masters in Bioethics Programs. The dual degree program provides a comprehensive curriculum integrating foundational principles of genetics and ethics. The goal of the program is to train Genetic Counselors who wish to able to apply additional Bioethics expertise into their clinical practice and/or research.

Advances in next generation sequencing technologies, such as whole exome and whole genome sequencing and multiplex testing, have the potential to spur better integration of genetics and genomics into patient care. However, appropriate utilization of these technologies will require the capacity to manage, interpret, and communicate very large amounts of personal genetic information. The integration of such genomic technology into clinical and research settings raises a number of ethical issues related to privacy of genomic data, the impact of genomic information on families, and utility of genomic information. Additionally, there are a number of important questions regarding equity and access to these new technologies among underserved or uninsured families. This raises questions about the potential negative impact that differential access to these technologies may have on health disparities. Addressing these issues requires comprehensive education and counseling for patients and families going through various forms of genetic screening. Genetic Counselors will need to not only interpret the genetic/genomic findings themselves, but to contextualize those findings within the broader social and ethical impact of these technologies.

We are very fortunate at Case to have prominent Masters Programs in both Genetic Counseling and Bioethics. The collaborative nature between the two programs is well established. While the Genetic Counseling Program provides some ethics training, the dual degree program allows students to pursue a broader exploration into bioethics scholarship, development of methodological empirical ethics skills, and deeply explore topics of genetics and health systems, genomics research, and public health genomics. The dual degree program allows graduates to engage in both contemplative analysis and application of knowledge in the counseling of patients, for example, deciding whether to pursue genomic screening with a trained eye for the personal and ethical implications of the results. The dual degree program should allow graduates to be more prepared to participate in the ongoing national dialogue about the ethical, legal, and social implications of advances in genomic technology as well as research within their home institutions and with other counselors nationwide regarding issues of new genomic testing technology, concerns about genetic services, and issues related to genetic discrimination, privacy, and the return of genetic and genomic results. All of these topic areas raise unique ethical, legal, and social implications. Thus, the dual bioethics-genetic counseling degree should fuel careers in every aspect of genetics, genomics and health, clinical genetics, and health policy.

We have now had seven students graduate from the dual degree and have one 2nd year student entering her 3rd year. If you are interested in hearing more about this program, please let Drs. Darrah and Goldenberg know. We would be happy to discuss it with you (and our graduates and students are happy to discuss this with you as well).

Per one of our graduates:
I just wanted to send an e-mail with a couple of examples of how wonderful the MS/MA dual degree can be post-graduation if you would like to share with any students who may be interested in enrolling.

I attended an ethics meeting at my hospital as an observer to see if I would be interested in joining the board. The committee members were immediately impressed by my MA (we don't have a sole ethicist on the team) and encouraged me to immediately join. They also requested that I give a presentation about ethics and genetics at the next meeting! Another time I found the dual degree helpful was within my own GC department. We are actually designing our own informed consent for genetic testing. Writing an informed consent was an assignment that I had with Patty in research ethics! I explained the importance of the main elements of informed consent to the team, ethical concerns I had about the context in which it was being used, and re-wrote a lot of the form to try to get it down to a 6th grade reading level. My fellow GCs were very appreciative of the explanation and edits.

The dual degree was a wonderful experience and is so useful in practice! I hope more students continue to join.
Sincerely, Annelise Page, Graduate 2018

Master of Science in Genetic Counseling & Master of Arts in Bioethics Dual Degree Curriculum

Total Credit Hours = 65

	FALL Course # Name Credit Hrs	SPRING Course # Name Credit Hrs	SUMMER
YEAR 1	GENE 524 AMG: Cyto/Molecular Genetics 2 GENE 525 AMG: Clinical Genetics 3 GENE 528 Principles Genetic Counseling 3 GENE 534 Preparing for GC practice. 1 GENE 535 Journal Club 0.5 GENE 601 Research 2	GENE 529 Psychosocial Genetic Counseling 3 GENE 527: Metabolism and Quant 2 GENE 531 Clinical Cancer Genetics 2 GENE 534 Preparing for GC practice 1 GENE 535 Journal club 0.5 GENE 601 Research 1	GENE 532 Clinical Practicum 3
	Total Credit Hours = 11.5	Total Credit Hours = 9.5	Total Credit Hours = 3
YEAR 2	GENE 532 Clinical Practicum 4 GENE 526: Genomics and Therapeutics 2 BETH 401 Foundations in Bioethics I 6 GENE 601 Research 1 GENE 535 Journal club 0.5	GENE 532 Clinical Practicum 4 BETH 412 Ethical Issues Genetics / Genomics 3 BETH 402 Foundations in Bioethics II 6 BETH 402c Capstone Project 1.5 GENE 535 Journal club 0.5	GENE 601 - Research 2
	Total Credit Hours = 13.5	Total Credit Hours = 15	Total Credit Hours = 2
YEAR 3	GENE 601 Research 3 BETH 405 Clinical Ethics Rotation I & II 3 BETH Elective 3 BETH Mini Elective 1.5		
	Total Credit Hours = 10.5		

PROGRAM LEADERSHIP

Rebecca Darrah, MA, MS, PhD, LGC is **the Co-Director of the Genetic Counseling Program**. She is a Professor in the Department of Genetics & Genome Sciences. Dr. Darrah received her master's degree in biomedical ethics from Case Western Reserve University in 1998, her master's degree in genetic counseling from Case Western Reserve University in 2000, and PhD in genetics in 2010. Dr. Darrah, who is board certified by the American Board of Genetic Counseling, teaches in a number of courses in the Program and is a chair or member of a number of student research committees. Dr. Darrah's research is focused on modifier genes involved in cystic fibrosis and pulmonary disease.

Michelle Merrill, MS is the Co-Director for the Genetic Counseling Training Program. Michelle is a board certified and licensed genetic counselor and an Assistant Professor in the Department of Genetic & Genome Sciences. Michelle has previously served as the Associate Director of Genetic Counseling for the Center for Human Genetics at University Hospitals Cleveland Medical Center, and as the Director of Clinical Training with the Genetic Counseling Training Program. Michelle earned her master's degree in genetic counseling in 2002 from Case Western Reserve University. She worked at MetroHealth Medical Center until 2012 and founded their Hereditary Cancer Clinic. At MetroHealth, Michelle also directed the clinical rotation experience for genetic counseling students, residents, and fellows during their time seeing patients in Clinical Genetics. In 2012, Michelle moved to University Hospitals where she has continued counseling patients and families at risk for hereditary cancer, and supervising clinical rotation experiences in the Cancer Genetics Clinic for genetic counseling students, residents and fellows. Michelle participated in the initiative to bring telemedicine genetic counseling services for inherited cancer risk assessment at University Hospitals, and piloted genetic counselor billing. At UH, she was awarded the Linda Vinney endowed chair in Clinical Cancer Genetics. Michelle became Director of Clinical Training in the Genetic Counseling Training Program in 2018, and implemented the elective rotations.

Monica Nardini, MS, MA, LGC is a board certified and licensed genetic counselor, and is an Instructor in the Department of Genetics and Genome Sciences. Monica is also a prenatal genetic counselor at MetroHealth Medical Center. Monica earned her master's degree in Bioethics in 2011 and her master's degree in Genetic Counseling in 2013, both from Case Western Reserve University. She first worked at The Cleveland Clinic, practicing both general and cancer genetic counseling from 2013-2016, where she also served roles in several clinical subspecialty clinics including neurocardiology, myelomeningocele, cystic fibrosis, and cancer outreach. When joining MetroHealth in 2016, Monica became the clinical rotation supervisor for the prenatal genetics rotation for the genetic counseling students, as well as education coordinator for the OBGYN residents and Maternal Fetal Medicine fellows. She also developed a clinical observation rotation in prenatal genetics for the CWRU Bioethics Master's Degree students. She has continued to become more involved with CWRU's Genetic Counseling Training Program through sitting on several student research committees, being a member of the CWRU Genetic Counseling Master's Program Advisory Board, and she was appointed as the Director of Clinical Training in 2020. In 2025, she became Associate Director for the Genetic Counseling Training Program.

Aaron Goldenberg, PhD, MPH is an Associate Professor in the Department of Bioethics and Genetics & Genome Sciences at Case Western Reserve University School of Medicine and Co-Director of the Genetic Counseling & Bioethics dual degree program. He earned his PhD in

Bioethics at Case Western Reserve University. Since joining the faculty at Case Western Reserve University, Dr. Goldenberg's work has focused on the ethical, legal, and social implications of genetics and genomics in clinical and public health settings. His research program has been grounded by a number of major project areas, including: 1) ethical implications of expanding newborn screening programs; 2) storage and use of perinatal and pediatric biological specimens for future research; 3) implications of genetics and gene-environment interactions for racial/ethnic minorities and other communities experiencing health disparities. Dr. Goldenberg is currently the Co-PI of a project funded by the Health Resources and Services Administration (HRSA) to explore the ethical and programmatic challenges of integrating genomic technology into Newborn Screening Programs. He is also the Principal Investigator on a project funded by the NIH National Human Genome Research Institute to examine parental attitudes regarding the research use of biospecimens collected from newborns. He is also leading a project to assess how genomic advances may impact medically-underserved communities, and how clinicians and public health agencies could better assess biological and social determinants to account for gene-environment interactions. In addition to these scholarly initiatives, Dr. Goldenberg Director for Ethics, Policy and Practice for the National Newborn Screening Clearinghouse, also known as Baby's First Test. He is a member of the Ethics and Legal Workgroup for the Newborn Screening Translational Research Network and the Legal and Legislative Workgroup for the American Public Health Laboratory Association. He is a member of the Pediatric Task Team for the Global Alliance for Genomics and Health.

Anna Mitchell, MD, PhD – Medical Director, Clinical Supervisor and Faculty Associate Professor, Department of Genetics & Genome Sciences; Medical Director, Center for Human Genetics, UHCMC

Dr. Mitchell joined the Department of Genetics & Genome Sciences and the Center for Human Genetics in 2005. Dr. Mitchell received her MD degree and her PhD in Human Genetics from the University of Michigan. She completed a residency in Pediatrics and a fellowship in Medical Genetics at the University of Washington. Dr. Mitchell's research interests have been primarily in the area of connective tissue disorders. She is board certified by the American Board of Pediatrics and the American Board of Medical Genetics in Clinical Genetics. Dr. Mitchell became the Medical Director of the Genetic counseling Training Program in 2018. She supervises counseling students in Cancer Genetics, General Genetics and Marfan Clinic and sits on a number of student research committees. She co-directs and teaches in GENE 525 Clinical Genetics, GENE 524 Cytogenetics and Molecular Genetics, and GENE 526 Genomics and Therapeutics. She also co-teaches quantitative genetics in Gen 527.

Suzy Brannon, BS – Education Program Manager

Suzy is a Cleveland native and has a BS in journalism from Ohio University. She previously worked in online publishing which led to a career in tech product management in San Francisco. Post-Covid she returned to Cleveland and launched a gluten-free baking business. In her free time she enjoys baking, traveling and reconnecting with Cleveland. She is works closely with the students, faculty and alumni, connecting everyone to resources within the department, School of Medicine, and the University.

PROFESSIONAL ORGANIZATIONS

NATIONAL SOCIETY OF GENETIC COUNSELORS (NSGC)
The National Society of Genetic Counselors (NSGC) was organized in 1979 for the purpose of providing a network of communication between practicing genetic counselors. The Society holds annual education meetings at the national and regional levels (which you are eligible to receive a reduced registration rate as a NSGC student member), publishes a quarterly journal, The Journal of Genetic Counseling, and a quarterly newsletter, Perspectives (also part of membership). NSGC addresses issues pertinent to genetics and genetic counselors. A job hotline is available to members. There is a one-time application fee of $15. Students receive a reduced membership fee (currently $120.00). *Information and an application can be found at www.nsgc.org*

NSGC CODE OF ETHICS: The NSGC Code of Ethics was established to affirm the ethical responsibilities of genetic counselors and "provide them with guidance in their relationships with self, clients, colleagues, and society". Please review the Code of Ethics on NSGC's website. During your course of study, you will have numerous occasions to call upon the Code for discussion and guidance.

AMERICAN BOARD OF GENETIC COUNSELING / CERTIFICATION: The mission of ABGC is to establish the standards of competence for clinical practice and advance the role of Genetic Counselors in healthcare through accreditation of graduate programs in genetic counseling and certification and recertification of genetic counseling professionals. It is expected that upon completion of the Program, students will be eligible for certification as a genetic counselor. Certification is awarded by the American Board of Genetic Counseling through a written examination given yearly. To be eligible to sit for the ABGC genetic counseling examination, the student must show documentation of graduating from an accredited genetic counseling program and have 50 documented logbook cases. As students begin their clinical rotations, we will discuss in-depth the guidelines and specific requirements for logbook cases.

ACCREDITATION COUNCIL FOR GENETIC COUNSELING
The Accreditation Council for Genetic Counseling (ACGC) is the accrediting body for educational training programs granting master's degrees or higher in genetic counseling. ACGC's purpose is to provide leadership by protecting the interest of the students, public and the integrity of the genetic counseling profession through: 1) establishing standards for graduate level genetic counseling education; 2) evaluating educational programs to ensure compliance with those standards; and 3) accrediting genetic counseling training programs that meet the accreditation standards established by the Accreditation Council for Genetic Counseling

AMERICAN SOCIETY OF HUMAN GENETICS: The ASHG was organized in 1948 to encourage research in human genetics and to bring into closer association investigators from Canada, Mexico and the United States. The Society publishes the American Journal of Human Genetics and holds an annual educational meeting every fall.

AMERICAN COLLEGE OF MEDICAL GENETICS: The ACMG is the professional organization of medical and laboratory geneticists, similar in scope to the NSGC. Genetic counselors are associate members. The ACMG holds its annual education meeting in the spring of each year. The College publishes Genetics in Medicine.