University of Cincinnati Genetic Counseling Graduate Program

Section I: Introduction

Historical Overview

The Genetic Counseling Program (GCP) was established in 1982 in the Department of Biology in the College of Arts and Sciences at the University of Cincinnati. The Ohio Board of Regents approved the Genetic Counseling Program to confer an interdisciplinary Master of Science (M.S.) degree in Medical Genetics in 1992. From 1992 to 1994 the program was administratively based in the Department of Environmental Health in the College of Medicine. In 1994, the administrative home became the Department of Pediatrics in the College of Medicine. In 1998, the administrative responsibilities of the program were transferred to the College of Allied Health Sciences. Most recently, in 2010 the administrative home of the GCP returned to the Department of Pediatrics in the College of Medicine where the program is thriving. Throughout this time, the students' clinical activities have been based in the Division of Human Genetics at the Cincinnati Children's Hospital Medical Center.

Mission Statement

The mission of the Genetic Counseling Program of the University of Cincinnati and Cincinnati Children's Hospital Medical Center is to maximize the academic, clinical, research and professional development of genetic counseling students. Our goal is to prepare program graduates to provide high quality client-centered, culturally competent care, contribute to the advancement of knowledge and improved care through research, create new interdisciplinary niches, incorporate available genomic discoveries into practice, and serve as leaders in the genetic counseling field.

Program Outcomes

1. Graduates must demonstrate the practice-based competencies defined by the American Board of Genetic Counseling (www.abgc.net) to manage a genetic counseling case before, during, and after the clinic visit or session
2. Graduates should be able to independently design, carry out, and interpret experimental and observational research that yields replicable methods and valid results
3. Graduates should be able to provide high quality client-centered, culturally competent care

Organizational Relationship

The GCP is a joint program of the University of Cincinnati (UC) and Cincinnati Children's Hospital Medical Center (CCHMC). This collaborative relationship has been effective in allowing students to take advantage of faculty, courses, facilities, workshops, and other resources of both institutions. Within CCHMC, the GCP is located in the Division of Human Genetics, Department of Pediatrics. The Division of Human Genetics is a regional genetics center for the state of Ohio and is responsible for providing comprehensive genetics services (across the lifespan) to eight counties in southwest Ohio. The Division of Human Genetics provides the physical space that is the home of the GCP. Within UC, the GCP administratively resides in the Department of Pediatrics in the College of Medicine. The College of Medicine is committed to providing a curriculum for graduate and medical students which offers diverse learning opportunities. There is strong administrative synergy between the two institutions.

History of Accreditation

From 1985-1994 formal review of the GCP was performed by the American Board of Medical Genetics in conjunction with the accreditation of the Division of Human Genetics at CCHMC. In 1995, the GCP received interim accreditation by the American Board of Genetic Counseling (ABGC), and in 1999 the

GCP was granted full accreditation for six years with ongoing approval through annual reports. In 2005, the GCP received full reaccreditation by the ABGC for 8 years. In 2012, the newly formed Accreditation Council for Genetic Counseling (ACGC) became the specialized program accreditation board for educational training programs granting master's degrees or higher in genetic counseling. The ACGC establishes standards for graduate level genetic counseling education, evaluations educational programs to ensure compliance with those standards, and accredits genetic counseling training programs that meet the accreditation standards established by the Accreditation Council for Genetic Counseling (http://gceducation.org/Pages/About%20ACGC.aspx). The GCP received full accreditation by the ACGC in 2013.

Prior Institution Program Evaluation

In 2012-2013, the GCP underwent a University of Cincinnati external graduate program review. The GCP received an A rating overall. Strengths, weaknesses, and recommendations from the external review are noted below. In response to the recommendation to resolve faculty chair and committee membership from CCHMC, the GCP is working closely with the UC Graduate School to obtain approval of research committees and chairs.

Strengths

- The program is well positioned to develop new standards for training
- Nearly perfect record of employment for graduates
- Strong and effective recruitment results in high quality students, program is highly selective with an excellent yield rate
- Appropriate faculty-to-student ratio
- Program compares well with top programs in the discipline
- Meaningful use of student evaluations of faculty and courses
- Student and alumni satisfaction is high
- Scholarly productivity by faculty is admirable, particularly by Professors Myers and Saal
- Stimulating intellectual environment

Weaknesses

- Inadequate training in biostatistics (redundant with research methods course?)
- Inadequate space for cubicles and offices

Recommendations

- Resolve faculty chair and committee membership (theses)

Overall: **A**

Section II: Curriculum and Program Outcome Mapping

A. The following curriculum mapping is based on the required content for all accredited genetic counseling programs

ABGC Required Content Areas

Content Areas	Taught In…		
	Courses	**Rotations**	**Suppl. Activities**
Mendelian Inheritance	Human Genetics Fundamentals of Mol Gen Intro to GC	All	GC Student Case Conference Journal Club Human Genetics Refresher
Non-Mendelian Inheritance	Human Genetics Fundamentals of Mol Gen Intro to GC Emerging Topics	All	Human Genetics Refresher
Population and Quantitative Genetics	Human Genetics Fundamentals of Mol Gen Emerging Topics Epidemiology Biostatistics		Journal Club Human Genetics Refresher
Family History and Pedigree Analysis	Human Genetics Fundamentals of Mol Gen Intro to GC Advanced GC Cancer Genomics	All	GC Student Case Conference
Normal Development/Abnormal Development	Intro to GC Advanced GC Interdisciplinary studies in DD	Prenatal, Pediatric rotations	GC Student Case Conference Journal Club
Human Reproduction	Intro to GC Emerging Topics Embryology	All	Human Genetics Refresher
Cytogenetics	Human Genetics Emerging Topics	Prenatal, Pediatric, and Specialty Rotations	GC Student Case Conference Journal Club Human Genetics Refresher
Biochemical Genetics	Human Genetics Emerging Topics	Prenatal, Pediatric, and Specialty Rotations	GC Student Case Conference

Content Areas	Taught In…		
	Courses	**Rotations**	**Suppl. Activities**
	Advanced GC		
Molecular Genetics	Molecular Genetics Emerging Topics	All	Human Genetics Refresher
Embryology/Developmental Genetics	Embryology	Prenatal , Pediatric rotations	GC Student Case Conference
Immunogenetics	Human Genetics Fundamentals of Mol Gen Emerging Topics		
Teratology	Teratology	Prenatal, Pediatric rotations	GC Student Case Conference
Cancer Genetics	Cancer Genomics Fundamentals of Mol Gen	Cancer rotations	GC Student Case Conference Journal Club
Clinical Features and Natural History of Genetic Disorders	Intro to GC Advanced GC Emerging Topics	All	GC Student Case Conference Journal Club
Dysmorphology/Physical Assessment	Intro to GC Emerging Topics	All	GC Student Case Conference
Prenatal Diagnosis	Intro to GC Embryology Teratology	Prenatal Rotations	GC Student Case Conference Journal Club
Genetic Testing/Screening	Human Genetics Intro to GC Emerging Topics Cancer Genomics	All	GC Student Case Conference Journal Club
Risk Assessment	Human Genetics Fundamentals of Mol Gen Intro to GC Advanced GC Emerging Topics Cancer Genomics Teratology	All	GC Student Case Conference
Genetics literature, databases, and computerized tools	Intro to GC Advanced GC Human Genetics	All	Journal Club Master's Thesis Research

Content Areas	Taught In…		
	Courses	**Rotations**	**Suppl. Activities**
	Cancer Genomics		
Counseling theory and techniques	Practicum in Counseling Advanced GC	All	
Interviewing techniques	Intro to GC Advanced GC Practicum in Counseling	All	
Individual psychosocial development	Intro to GC Advanced GC	All	GC Student Case Conference Student Peer Supervision
Family Dynamics	Intro to GC Advanced GC	All	
Grief and bereavement	Intro to GC Advanced GC	All	
Multicultural Sensitivity and Competency	Intro to GC Advanced GC	All	GC Student Case Conference Community Placement (Starfire, Easter Seals) Community Education
Crisis Intervention	Practicum in Counseling Advanced GC	Consult Rotation Fetal Care Center Rotation	
Societal and Public Policy Issues	Intro to GC Advanced GC Bioethics Interdisciplinary Studies in DD		Journal Club
Ethical and Legal Issues	Bioethics Advanced GC	All	GC Student Case Conference Journal Club
Health Care Delivery Systems	Interdisciplinary Studies in DD Intro to GC Advanced GC	All	Journal Club Health & Human Services Placement
Community, Regional, & National Resources	Intro to GC Advanced GC Emerging Topics Cancer Genomics Interdisciplinary Studies in DD	All	GC Student Case Conference

Content Areas	Taught In…		
	Courses	**Rotations**	**Suppl. Activities**
Financial/Reimbursement Issues	Advanced GC	All	GC Student Case Conference
Principles of Public Health	Epidemiology		
Teaching skills	Intro to GC Advanced GC		GC Student Case Conference Community Education Journal Club
Laboratory Experience	Human Genetics Molecular Genetics	Laboratory Rotation	Journal Club Laboratory Observation
Research methodology	Research Design Epidemiology		Journal Club Master's Thesis Research

B. Assessment measures aligned with program outcomes

Program Outcome	Assessment Tools	Course/Experience	Timeline	Responsible Person
Graduates must demonstrate the practice-based competencies defined by the American Board of Genetic Counseling (www.abgc.net) to manage a genetic counseling case before, during, and after the clinic visit or session	Case summaries completed by the student after each case, formative evaluations (case evaluations) completed by clinical supervisor after each case, summary evaluations completed by clinical supervisors, and final clinical logbook submitted at end of training	Clinical Practica I-IV, Clinic conference	Duration of training. Students are evaluated on an increasing number of the competencies as they progress through the program.	Students, clinical supervisors, Clinical Coordinator, Program Director
	Successful completion of courses that address acquisition of clinical skills	Introduction to Genetic Counseling, Psychosocial Genetic Counseling, Advanced Genetic Counseling, Cancer	Duration of training. To facilitate a developmental approach, skills taught in class are immediately applied in clinic. More	Course Instructors, Clinical Coordinator, Program Director

		Genomics,	advanced classes teach more advanced skills	
Graduates should be able to independently design, carry out, and interpret experimental and observational research that yields replicable methods and valid results	Students complete a proposal to guide their master's thesis (including data collection tool), IRB submission is required of studies involving human subjects research, a master's thesis and final master's thesis presentation are required, evaluation of student's research skills is completed before Research Design, after Research Design, and at completion of the GCP	Research Orientation, Research Design, Research Rotation, Epidemiology, Biostatistics	Beginning in the middle of semester 1 of Year 1 and continuing through the training	Research advisors, research committee members, course instructors, Program Director
Graduates should be able to provide high quality client-centered, culturally competent care	Students give presentations on different cultures and religions and relate back to the genetic counseling process. Students are evaluated and receive written and verbal feedback on their presentations. Students complete role plays related to providing patient centered care. Students are evaluated on the role plays and provided verbal and written feedback on role plays.	Introduction to Genetic Counseling, Psychosocial Genetic Counseling, Advanced Genetic Counseling 1 and 2, and case conference Presentations from Pastoral Care Cultural competency lectures through LEND	Formal classroom requirement 2 times in Year 1 and 2 times in Year 2. Also through-out training in case conference on a weekly basis.	Course instructors, clinical supervisors, Clinical Coordinator, Clinical Instructor for Second Years, Assistant Program Director, and Program Director

	Client centered and culturally competent care are also inherent in elements of the genetic counseling process such as contracting and tailoring a session to meet the individual needs of the patient. Cultural diversity case analyses – students present a case where cultural competency was or needed to be addressed. Students formally present and write up elements of culture that were evident, and cultural factors that impacted the family or client and what the student did or should have done Religious diversity case analysis – same as above but relevant to religion			

C. Sequence of Required Courses and Clinical Rotations

1. Duration and timing of required courses corresponding to the month(s) of training as expected for a typical student

Courses (list below)	Month of Training																							
	First Year												Second Year											
	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S

Introduction to Genetic Counseling and Prenatal Genomics	--	--	--	--	--																					
Fundamentals of Molecular Genetics	--	--	--	--	--																					
Human Genetics	--	--	--	--	--																					
Counseling Techniques	--	--	--	--	--																					
Intro to Epidemiology	--	--	--	--	--																					
Emerging Topics in Clinical Genomics – Metabolic	--	--	--	--	--																					
Clinical Practicum I			--	--	--																					
Introduction to Cancer Genomics						--	--	--																		
Clinical Embryology						--	--	--																		
Research Design						--	--	--	--																	
Statistics & Experimental Design for the Biomedical Sciences						--	--	--	--																	
Emerging Topics in Clinical Genomics – Ethics and System-specific conditions						--	--	--	--																	
Clinical Practicum II						--	--	--	--																	
Introduction to Psychosocial Genetic Counseling								--	--																	
Clinical Teratology							--	--	--																	
Clinical Practicum – summer										--	--	--	--													
Advanced Genetic Counseling Issues I													--	--	--	--	--									

Emerging Topics in Clinical Genomics – chromosomal abnormalities, intellectual disability, and epigenetics													--	--	--	--	--								
Master's Thesis Research Semester 3													--	--	--	--	--								
Clinical Practicum III													--	--	--	--	--								
Interdisciplinary Studies in Developmental Disabilities													--	--	--	--	--	--	--	--	--				
Advanced Genetic Counseling Issues II																		--	--	--	--				
Emerging Topics in Clinical Genomics – neurogenetics, adult onset, connective tissue, growth																		--	--	--	--				
Master's Thesis Research Semester 4																		--	--	--	--				
Laboratory Genetic Counseling																		--	--	--	--				
Clinical Practicum IV																		--	--	--	--				

2. Duration and timing of required clinical rotations corresponding to the month(s) of training for a typical student.

Clinical Rotations (listed below)	Month of Training																								
	First Year												Second Year												
	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S
CCHMC General Genetics and Connective Tissue Clinic			--	--																						
CCHMC Hereditary Cancer Program				--	--																					
CCHMC Heart Institute						--	--																			
Bethesda North Prenatal Clinic							--	--																		
Lysosomal Disease Center								--	--																	
Summer Rotation (off-site – prenatal and cancer)										--	--	--														
CCHMC Pediatric Genetics and Huntington Disease Clinic													--	--												
Neurometabolic and Epilepsy Clinics															--	--										
Fetal Care Center																--	--									
Dayton Children's Pediatrics and Cancer																		--	--							
Trainee Clinic																			--	--						
Laboratory Rotation																				--	--					

How the Self-Study was Conducted for Accreditation Purposes

The self-study plan included review of each major component of the GCP (Admissions, Clinical Training, Coursework, and Research) as well as surveys of alumni and alumni employers. Committees were defined or expanded for assessment of the major program components. The GCP has a standing Curriculum Committee that undertook review of the coursework. The GCP has a standing Admissions Committee which undertook review of the admissions process. A student was added to this committee for the purposes of this review. Clinical and Research Committees were formed to review these program elements. Each committee met one to two times in the summer and fall of 2012. The alumni and employer surveys were designed in summer 2012 and administered in fall 2012.

Section III: Narrative

The information requested in the narrative is in parallel to the minimum requirements described in the Required Criteria*. For each of the following areas, the narrative should document how the program complies with the* Required Criteria*, noting any deficiencies and planned changes to achieve compliance. Additionally, the program should refer to the* Required Criteria *throughout the processes of evaluating itself and developing the self-study report.*

GENERAL REQUIREMENTS FOR ACCREDITATION

A. Sponsorship of Graduate Program in Genetic Counseling

Comment on the extent to which the sponsoring institution meets the requirements stated in the Required Criteria*, Section II.A, 1-4. If Section II.A, 3 of the* Required Criteria *is applicable. Note any deviations from the* Required Criteria*, explain the effect on the program, and summarize plans to correct any noted deviations.*

The academic and administrative home of the GCP is the College of Medicine, Department of Pediatrics at the University of Cincinnati. The University of Cincinnati is accredited by The Higher Learning Commission (http://www.uc.edu/about/accreditation.html).

The University of Cincinnati is the sponsoring institution for the GCP and is the institution applying for accreditation. The University of Cincinnati has primary responsibility for student admissions, curriculum planning, course content, coordination of classroom teaching, appointment of faculty, processing of admissions applications, and granting of the master's degree. The Division of Human Genetics provides the majority of clinical opportunities, including clinical supervision, needed for students to obtain cases for board eligibility. The Division of Human Genetics also provides physical space for the GCP. Instructors and lecturers in courses come from both UC and CCHMC.

B. Evaluation of Students

Describe how students are informed about the criteria for successful completion of the course of study. Describe how and when student performance is assessed in knowledge acquisition, problem-solving skills, and professional behaviors, by whom the evaluations are done, and how information regarding the evaluation is provided to students. Describe how remedial assistance is provided to students who do not progress satisfactorily.

The GCP maintains a GCP Handbook and a Clinical Handbook. These documents are updated annually and emailed to students accepted into the GCP prior to arriving in Cincinnati. They are also placed on the shared drive and reviewed during the GCP General Orientation and Clinical Orientation in Fall of the year students matriculate. These handbooks outline criteria for successful completion of the course of

study and include requirements to maintain in good academic and clinical standing, as well as expectations for professional behavior. Each clinical rotation site or clinical supervisor also maintains an electronic Clinical Supervisor Information form that outlines any site/rotation-specific goals and expectations and is updated at least yearly. These forms are collected and reviewed by the Clinical Coordinator and made available to all students. They are stored on a shared drive for students to review prior to rotating with a specified supervisor. Expectations of professional behavior as well as the need to come to the Faculty with potential solutions and not just problems (problem-solving skills) are specifically addressed as part of the GCP General and Clinical Orientations. In addition, they are modeled by all Program Faculty.

Professional behavior and clinical knowledge acquisition are components of the clinical evaluations. After each clinical encounter, supervisors evaluate the roles students assumed in that particular case (case evaluations). The case evaluations are considered formative evaluations. Summative evaluations are completed by supervisors at the end of each clinical rotation and are based on the practice-based competencies. The Clinical Coordinator and Clinical Instructor for Second Years review each evaluation to monitor each student's progress and follow-up with clinical supervisors if clarification is needed. All summative evaluations are also reviewed by the Program Director. If clinical concerns are noted and clinical remediation is needed, students generally are placed on clinical probation. The terms of their probation are individualized depending on the specific clinical concerns and may include additional clinical rotations, additional cases, role plays to demonstrate specific skills, or other requirements. This probation and the steps a student must take to end their probation are documented in writing. The Clinical Instructor, Clinical Supervisor, and Program Director will work together to determine what additional time and training a student may need to gain the needed skills. Depending on the circumstances, consequences of not meeting the terms outlined in writing could include dismissal from the program.

Knowledge acquisition is also evaluated based on grades in individual courses. To maintain good academic standing, students must receive a grade of B- or higher in all courses. If a student is at risk of receiving a grade lower than a B-, the student is encouraged to speak with the instructor to learn what can be done to improve his or her performance in the class. At the end of the semester if the student's final grade is lower than a B-, the instructor works with the student and the GCP to determine a remediation plan. In some cases, the student may be placed on academic probation and need to retake the course. In other cases, the student may receive an Incomplete and have to retake an exam or complete extra assignments. If a student is placed on academic probation, the probation and steps a student must take to end their probation are documented in writing. Depending on the circumstances, consequences of not meeting the terms outlined in writing could include dismissal from the program.

Professional behaviors, knowledge acquisition and problem-solving skills are also informally addressed through the advising program. Standard issues and topics to be discussed at each meeting are developed by the GCP staff prior to the start of the academic year and are based on the milestones the students are expected to achieve at different points in their training. Students are also encouraged to and often do propose issues to discuss. The advising program has proven invaluable at recognizing and responding promptly to student issues.

At the end of the first year in the GCP, students receive an Annual Progress Letter. This letter is written by the student's advisor with input from the GCP faculty, clinical supervisors, research advisor, and/or instructors. Advising meeting minutes and clinical evaluations are also reviewed prior to writing the progress report. The progress report is signed by the student's advisor and the Program Director. The

letter is addressed to the student and provides feedback on the student's overall performance in the program, including progress in clinic, class, and research, as well as noted strengths and areas to work on. The report also provides a summary as to whether or not the student is in good academic standing, and if not, what has to happen so the student can successfully transition to the second year of study. The feedback is intended to be used to help the student reach his or her full potential in the program.

C. Guidance/Advising

Discuss the availability of guidance for students in relation to didactic coursework, clinical rotations, research, program policies, or other academic or personal concerns that might affect student performance.

In 2010, the GCP implemented a formal advising program. The mission of the GCP advising program is to promote the improvement of services offered by the GCP and to enhance the quality of student learning and development (modified from the Council for Advancement of Standards in Higher Education www.cas.edu). The goal of the GCP advising program is to support students to achieve their maximum educational potential and personal development. We utilize a combined prescriptive and developmental approach. A prescriptive approach ensures students enroll in all required courses and advisors address program expectations based on the student's progress and placement in the GCP. A developmental approach is utilized to help promote student growth and professional development. The advising program is outlined in the GCP Handbook along with the advising forms.

Advisors work with students to: promote student growth and development; assist students in assessing their interests and abilities, examining their educational goals, making decisions and developing short-term and long-term plan to meet their objectives; discuss and clarify educational, career, and life goals; provide accurate and timely information and interpret professional, institutional, and program education requirements; assist students to understand the educational context within which they are enrolled; advise on the selection of appropriate courses and other educational experiences; clarify institutional and program policies and procedures; evaluate and monitor student academic program and achievement of goals; reinforce student self-direction and self-sufficiency; direct students with educational, career, or personal concerns, or skill/learning deficiencies, to other resources and program on the UC campus when necessary; make students aware of and refer to educational, institutional, and community resources (e.g. internships, scholarships, etc.); and collect and distribute relevant data about student needs, preferences, and performance for use in program decisions and policy. The advising program serves to monitor student progress in all major areas while also providing students with support and guidance in their training and professional development.

D. Program Design

1. Relation to Institutional Mission

Describe the relationship of the program's mission to that of the sponsoring institution, school/college, and department in which it is housed.

Mission of GCP:

The mission of the Genetic Counseling Program of the University of Cincinnati and Cincinnati Children's Hospital Medical Center is to maximize the academic, clinical, research and professional development of genetic counseling students. Our goal is to prepare program graduates to provide high quality client-centered, culturally competent care, contribute to the advancement of knowledge and improved care through research, create new interdisciplinary niches, incorporate available genomic discoveries into practice, and serve as leaders in the genetic counseling field.

Mission of CCHMC:
Cincinnati Children's will improve child health and transform delivery of care through fully integrated, globally recognized research, education and innovation. For patients from our community, the nation and the world, the care we provide will achieve the best medical and quality of life outcomes, patient and family experience and value today and in the future.

The GCP strives to be a leading program in the field by providing outstanding coursework, clinical experiences, and research opportunities. We teach students to embrace diversity and appreciate their role as part of the health care team. By so doing, our students provide high-quality, patient-centered care, and conduct ethical and relevant research.

The GCP physically resides within the Division of Human Genetics, Department of Pediatrics, at Cincinnati Children's Hospital Medical Center. The CCHMC Mission reflects the shared goal of improving child health through globally recognized research, education and innovation, and the critical importance of the family experience.

Mission of College of Medicine:
UNIVERSITY OF CINCINNATI – The Graduate School 3/04/2010
To improve health for all through personalized care embracing best clinical practices, innovative interdisciplinary research, premier clinical and scientific training, and creative community partnerships.

Mission of UC:
The University of Cincinnati serves the people of Ohio, the nation, and the world as a premier, public, urban research university dedicated to undergraduate, graduate, and professional education, experienced-based learning, and research. We are committed to excellence and diversity in our students, faculty, staff, and all of our activities. We provide an inclusive environment where innovation and freedom of intellectual inquiry flourish. Through scholarship, service, partnerships, and leadership, we create opportunity, develop educated and engaged citizens, enhance the economy and enrich our university, city, state and global community.

The GCP and the College of Medicine value personalized care, interdisciplinary research, and training students to provide high-quality patient care. These concepts are embedded within the program's design and requirements, as well as the activities of our faculty and students. UC's vision nurtured the development of the master's level training program for genetic counselors in 1982, as the sixth program to be developed in the US. UC's vision and mission continue to ground the GCP. Our challenging learning environment prepares students to approach the unique, personal questions and issues of genetic counseling practice with knowledge, enthusiasm, and confidence. UC's focus on excellence in academics and research in a supportive learning environment is consistent with the GCP mission that prepares our graduates for leadership roles. The UC/CCHMC partnership creates a true "draw" by offering specialized training that neither institution could accomplish on its own. Partnering and collaboration is role-modeled daily by the UC GCP. In addition, we are connected with the community by providing client care and education about important and sensitive topics. We reach out to the community by giving guest lectures about genetics, genetic counseling, ethical issues, etc. to high school classes, lay groups and classes at UC and other colleges in the region.

2. Instructional Plan

Discuss the integration of didactic coursework, clinical experiences, research, and supplementary experiences as they relate to the development of each of the four domains of clinical competence: Communication, Critical Thinking, Psychosocial and Interpersonal Skills, and Professional Ethics and Values. Describe the rationale for curriculum sequencing and its relationship to the development of clinical competencies. If the program requires a thesis, describe how the thesis relates to the instructional plan and development of clinical competencies.

The following discusses how each practice-based competency is covered through the integration of didactic coursework, clinical, and supplementary experiences.

Practice-Based Competencies

Domain I: Communication Skills

1. *Can establish a mutually agreed upon genetic counseling agenda with the client*.

   Setting a mutually agreeable counseling agenda is a skill that students work on throughout their training. In *Introduction to Genetic Counseling*, and *Counseling Techniques* students learn and practice active listening and basic interviewing skills. In *Introduction to Genetic Counseling* students learn psychosocial assessment skills. By participating in clinic students begin to see themes that emerge in prenatal, cancer, general genetics, and other settings. In *Advanced Genetic Counseling Issues* we also cover family systems theory, issues related to chronic disease, and various advanced counseling skills which further our students' ability to anticipate and assess their clients' needs and adjust sessions accordingly.

2. *Can elicit an appropriate and inclusive family history*.

   Students receive didactic instruction in pedigree nomenclature and drawing in *Introduction to Genetic Counseling*. Students are expected to begin taking pedigrees in clinic by the end of the first semester under the supervision of their clinical supervisor.

3. *Can elicit pertinent medical information including pregnancy, developmental, and medical histories*.

   This is another skill that students work on throughout their training. In *Introduction to Genetic Counseling* they learn various interviewing techniques and methods to obtain this information. They also learn to take a developmental history. Developmental issues are also covered in *Emerging Topics*, *Embryology, Teratology,* and *Interdisciplinary Studies in Developmental Disabilities*. Pregnancy related issues are covered in both *Introduction to Genetic Counseling* and *Advanced Genetic Counseling Issues*. Students also learn about pregnancy, development and pertinent medical information in clinic, by reviewing patient records, interacting with patients, presenting to clinical geneticists or obstetricians and by asking questions.

4. *Can elicit a social and psychosocial history*.

   Obtaining a social and psychosocial history are skills that students begin to work on in spring of their first year. In *Introduction to Genetic Counseling* students learn about the various components of a psychosocial assessment including assessing the areas of family and social support, sense of well-being, anxiety level, risk perception, family concept, coping skills and physical environment. Students learn the basic counseling skills necessary to obtain a detailed psychosocial history in

Introduction to Genetic Counseling and *Counseling Techniques*. These skills are further refined and new advanced counseling skills are taught in *Advanced Genetic Counseling Issues*. Family systems theory and coping strategies are also covered in *Advanced Genetic Counseling Issues*, which provide students with a framework in which to think about family and social support systems and how to assess a family's ability to cope. Students practice and refine these skills during their summer rotations and throughout their second year in the program in *Clinical Practica III-IV*. Additional instruction is provided to each student by his or her clinical supervisors on a case-by-case basis.

5. *Can convey genetic, medical, and technical information including by not limited to, diagnosis, etiology, natural history, prognosis, and treatment/management of genetic conditions and/or birth defects to clients with a variety of educational, socioeconomic, and ethnocultural backgrounds*.

   Students learn about the natural history and diagnosis of a wide range of genetic conditions in *Introduction to Genetic Counseling*, *Human Genetics*, *Emerging Topics in Clinical Genomics, Cancer Genomics,* and *Clinical Practica I-VI*. Attendance at student case conferences further exposes students to the diagnosis, prognosis, treatment and management of genetic conditions and birth defects. The London Dysmorphology Database and POSSUM are also available to students along with up-to-date reference texts and other computer resources. During fall of their first year students begin practicing their explanations of complex information in *Introduction to Genetic Counseling*, and when appropriate in clinic. They continue to work on this skill throughout the remainder of their training, drawing on their increasing clinical experience, in-class discussions and assignments that focus on the topic of cultural diversity. Cultural diversity assignments begin fall semester first year in *Introduction to Genetic Counseling* and continue in *Advanced Genetic Counseling Issues* the second year of training.

6. *Can explain the technical and medical aspects of diagnostic and screening methods and reproductive options including associated risks, benefits, and limitations*.

   Screening and diagnostic methods are covered in many courses through-out the curriculum. Epidemiology teaches students how to evaluate the risks and benefits of screening programs in the context of sensitivity and specificity, as well as societal and personal values. Further instruction in prenatal diagnosis and various diagnostic and screening methods is included in *Introduction to Genetic Counseling*. Cancer diagnosis and screening is covered in the *Cancer Genomics*, and newborn screening for metabolic disorders is covered in *Emerging Topics in Clinical Genomics*. In *Introduction to Genetic Counseling,* students begin practicing their explanations during role-play assignments. They gain additional experience in *Clinical Practica II-IV* while rotating through various clinics. In core courses such as *Human Genetics*, *Fundamentals of Molecular Genetics, Research Design,* and *Journal Club* students gain the knowledge base necessary to interpret and synthesize the scientific literature and test results. The medical and molecular aspects of different genetic disorders including their diagnosis, treatment, and reproductive options are addressed in *Fundamentals of Molecular Genetics, Emerging Topics in Clinical Genomics,* and the new *Laboratory Genetic Counseling* course.

7. *Can understand, listen, communicate, and manage a genetic counseling case in a culturally responsive manner*.

   Although the ethnic diversity in the Greater Cincinnati area is not as great as it is in other parts of the country, students gain experience working with Caucasian, Ashkenazi Jewish, African American

and Appalachian clients. As Cincinnati Children's Hospital is the regional children's hospital, students are also able to work with families from all socioeconomic backgrounds. These opportunities are further enhanced by rotations at our urban and outreach clinics. Additionally, as CCHMC is the third highest ranked pediatric institution in the U.S., patients are referred from all over the country and internationally as well. Didactic instruction in the cultural practices and beliefs begins fall of the first year in *Introduction to Genetic Counseling*. Students are required to do a cultural diversity assignment during their summer internship and report back to their classmates in the fall in *Advanced Genetic Counseling Issues*. In addition, there are case discussions regarding reactions families might have to crisis situations in genetic counseling and how to respond with empathy and cultural sensitivity in *Advanced Genetic Counseling Issues* and *Case Conference*. *Interdisciplinary Studies in Developmental Disabilities* focuses on how to help individuals with special needs regardless of their background and provide family-centered care. Many students also plan their summer internships in genetic centers with diverse patient populations to obtain additional exposure to, and opportunity for interaction with diverse patient populations. In these settings, they often gain experience counseling through interpreters.

8. *Can document and present case information clearly and concisely, both orally and in writing, as appropriate to the audience*.

   Students learn case presentation skills in *Introduction to Genetic Counseling*. They begin presenting cases to their peers in *Introduction to Genetic Counseling* in the fall and in the *Student Case Conference* in the winter of the first year. For the latter course, students are provided with a format to facilitate their delivery of a thorough and focused presentation. The oral presentation includes the reason for referral, family concerns, history (pregnancy, medical, developmental, family), physical examination, diagnosis/differential diagnosis, genetic counseling, ethical/psychosocial/cultural issues, management and follow up. In *Clinical Practicum I* students begin working on their presentation skills first quarter. They begin by presenting to their clinical supervisor what they have learned in preparation for a case. They also begin presenting information to the geneticists after they have obtained intake information or talk to patients in the prenatal and cancer genetics clinics. In these venues they receive feedback about their presentation and the information they choose to present. Letter and report writing skills are taught in *Introduction to Genetic Counseling* in spring. In *Clinical Practicum I and II*, students are required to write at least two reports or letters in follow up to cases they see in clinic. These are evaluated by their clinical supervisor and the Clinical Coordinator. The students also begin to receive feedback on the medical and family history portions of their case summaries from the Clinical Coordinator at this stage in their training. They continue to work on their writing skills throughout the summer and the following year. In *Advanced Genetic Counseling*, students work on writing other types of letters and communications such as letters of medical necessity, emergency letters, and school letters.

9. *Can plan, organize, and conduct public and professional education programs on human genetics, patient care, and genetic counseling issues*.

   Students begin working on their presentation skills in *Introduction to Genetic Counseling*. Over the course of the year they have many opportunities to do in-class presentations. Also in winter of the first year, students present their research topics to the Division of Human Genetics to get feedback and ideas on their projects. Formal instruction is provided in the *Advanced Genetic Counseling* course offered during the second year of training. Students receive in-class instruction on how to assess the needs of their audience, create goals and learning objectives, and develop assessment

strategies to determine whether they have been successful in achieving their goals. Over the course of the second year, students give two formal as part of a required community education experience. Following each presentation they are asked to submit a written critique of their experience. In their second year, students are required to present a formal one-hour journal club lecture to the Division of Human Genetics faculty. Some students also serve as teaching assistants in *Research Design* and *Introduction to Genetic Counseling* or other courses in their second year.

Domain II: Critical Thinking Skills

1. *Can assess and calculate genetic and teratogenic risks*.

   Genetic risk calculations are taught in *Human Genetics* and *Cancer Genomics*. Practical applications are reinforced in *Introduction to Genetic Counseling*, *Advanced Genetic Counseling Issues* and *Clinical Practica I-IV*. Students perform genetic risk calculations in cancer genetics using several relevant risk models. Teratogenic risk calculations are frequently a component of prenatal counseling sessions. Students are responsible for consulting Reprotox and the relevant literature to obtain the latest information regarding teratogenic risks. Students also take *Teratology* during Spring of their first year.

2. *Can evaluate a social and psychosocial history*.

   Formal instruction in psychosocial assessment skills begins in *Counseling Techniques and Psychosocial Genetic Counseling* in the first year. However, informal instruction occurs through observation and discussion with clinical supervisors each time a student goes to clinic. In class, students learn about the components of a psychosocial assessment and the various strategies they can use to obtain this information. Fall of their second year, students learn about a wide variety of counseling theories including family systems theory in addition to content on coping strategies, and living with chronic disease in *Advanced Genetic Counseling*. With this background they are better able to assess both the social and psychosocial history of the families they see in clinic. They continue to work on this skill in *Clinical Practica II-IV* where they receive specific feedback from their clinical supervisors and Clinical Coordinator.

3. *Can identify, synthesize, organize and summarize pertinent medical and genetic information for use in genetic counseling*.

   Students receive instruction in the use of fundamental medical genetic resources in the *Clinical Orientation, Research Orientation* and *Introduction to Genetic Counseling*. They learn how to abstract medical records, and obtain information from textbooks, databases, PubMed and the Internet. By developing, first fact sheets and then counseling outlines in *Clinical Practica I-II*, students learn how to synthesize and organize the information they acquire during their preparation for each case. Clinical supervisors and the Clinical Coordinator critique these fact sheets and counseling outlines and assist the students in determining what information is and isn't pertinent to the case. In clinic, students also receive feedback on their presentation to the physician, which further promotes the development of this skill.

4. *Can demonstrate successful case management skills*.

   Students begin working on the skills necessary for successful case management their first year. They learn and practice the various skills they need in *Introduction to Genetic Counseling* and *Counseling Techniques* and they begin using them in *Clinical Practicum I*. By the end of the first year, students should be able to prepare for a case; obtain the necessary information/medical records and anticipate and prepare for many of the lab tests that may be ordered. They should also be able to do routine follow up activities including calling for, and reporting out, lab results and writing patient reports and letters. At the conclusion of *Clinical Practicum IV* it is expected that the student will be responsible for handling the entire case from start to finish with only minimal input from their clinical supervisor. During their training, students also have the opportunity to work with a number of clinical supervisors who coordinate management clinics. From these individuals they learn about the on-going relationships that clinic coordinators have with their patients and the various roles they assume.

5. *Can assess client understanding and response to information and its implications to modify a counseling session as needed*.

   Assessment skills are taught in both *Counseling Techniques* and *Introduction to Genetic Counseling* through lectures, readings and role-playing activities. Practical experience is gained throughout their training in *Clinical Practica I-IV*. In the beginning, students learn through observation and conversations with their supervisors following each case. Post counseling feedback is provided, along with suggestions for improvement, as students begin to take on the various counseling roles. During their second year of training, students learn about the various responses people can have to information (guilt, shame, etc.), the myriad of coping strategies people employ, how genetic disorders/information can affect the family system and the various counseling strategies/techniques they can use to help families make "sense" of their experience in *Advanced Genetic Counseling Issues*. Students also learn about health literacy in *Advanced Genetic Counseling* and how to modify their counseling for individuals with low health literacy.

6. *Can identify and access local, regional, and national resources and services*.

   In *Introduction to Genetic Counseling, Clinical Practicum I, and Emerging Topics in Clinical Genomics,* students learn about the various databases that are available to genetic counselors in our program and on the web such as London Dysmorphology Database, POSSUM, OMIM, and GeneTests/GeneClinics. Didactic instruction is provided in *Introduction to Genetic Counseling* where students learn about genetic support groups and the resource materials that are available to families seen for genetic counseling. All of the first year students are required to participate in service learning activities with community groups. They then develop both an oral and written report of their experience, commenting specifically on the groups' structure, dynamics, psychosocial issues encountered, barriers to health care, and their personal reactions to each group.

7. *Can identify and access information and resources pertinent to clinical genetics and counseling*.

   The students learn about the various resources that are available to them in *Introduction to Genetic Counseling* and *Human Genetics*. They are expected to use these resources as they prepare to see patients. They must record the resources they use on their fact sheets/counseling outlines and they receive feedback from their clinical supervisors and the clinical coordinator if they are not making

full use of the resources that are available to them. They are also taught to evaluate the content and literacy level of the various resource materials that they collect for the families they see.

Domain III: Interpersonal, Counseling, and Psychosocial Assessment Skills

1. *Can establish rapport, identify major concerns, and respond to emerging issues of a client or family*.

   Establishing rapport and identifying a family's major concerns are skills students learn in *Counseling Techniques* and *Introduction to Genetic Counseling*. They obtain practical experience and supervisor feedback in the *Clinical Practica* series. In *Counseling Techniques*, they learn how to collect information related to the concern expressed by the client and describe a concrete counseling strategy as it applies to an individual client. Also in this course, students learn empathy, anticipatory guidance, self-disclosure, and confrontation. Starting spring of the first year, students begin writing patient letters and reports. They are also encouraged to call out test results or simply call the family after a visit, to answer questions or reinforce elements of the counseling session.

2. *Can elicit and interpret individual and family experiences, behaviors, emotions, perceptions, and attitudes that clarify beliefs and values*.

   Through course work, observation, and practice, students learn the various counseling techniques necessary to elicit a person's emotions, perceptions, and attitudes. Over the course of their two years of study students also learn a great deal about the diverse responses people have to information, options, and unwanted or unexpected news. They learn about the various health beliefs and values that people have and how these beliefs and values can affect a person's experience and his/her approach to difficult situations. Particularly these are covered in detail in *Introduction to Genetic Counseling, Introduction to Psychosocial Genetic Counseling, Advanced Genetic Counseling Issues, and Interdisciplinary Studies in Developmental Disabilities.* This knowledge provides a foundation that students can use to interpret a client's behaviors, emotions and perceptions in the *Clinical Practica*.

3. *Can use a range of interviewing techniques*.

   Students use a range of interviewing skills and techniques throughout the *Clinical Practica* series in management clinics, one-time counseling sessions, trainee clinic, and consults in the hospital. They have opportunities to interview children and their parents, pregnant women seeking risk information, adults with questions regarding hereditary cancer risks, adults seeking presymptomatic testing for Huntington disease, etc. Varied strategies, timing and interviewing techniques are needed in each of these settings. These skills are taught in *Introduction to Genetic Counseling*, *Advanced Genetic Counseling Issues*, and *Counseling Techniques*. Through didactic lectures, role-play activities, and supervised clinical training experiences, the students learn to appreciate the need to thoughtfully consider their approach to interviewing a client and their choice of words.

4. *Can provide short-term, client-centered counseling and psychosocial support*.

   In *Introduction to Genetic Counseling*, *Counseling Techniques*, and *Advanced Genetic Counseling Issues* students learn the skills necessary to provide short-term, client-centered counseling through didactic presentations, focused readings, in-class demonstrations and role-playing activities. In *Advanced Genetic Counseling Issues,* students learn and practice skills related to facilitating decision

making, addressing grief and mourning, addressing guilt and shame, assessing religious support, marriage and family counseling techniques, identifying transference and counter-transference, and appropriate self-disclosure. In this course, students also learn about various counseling theories and the interventions derived from these theories. In *Student Case Conference* students discuss individual cases and through this process learn more about the psychosocial stresses that individuals/families experience who are referred for genetic counseling services. They then use this information to better assess their clients' needs and provide appropriate support. Ultimately students are able to put this information to use in the *Clinical Practica* series. Additional instruction in these areas is provided by the supervisors working with the students in each of these settings.

5. *Can promote client decision-making in an unbiased, non-coercive manner*.

   The tenets of non-coercive and non-directive counseling are first presented in *Introduction to Genetic Counseling*. Additional discussion occurs in the semester of *Emerging Topics in Clinical Genomics* that focuses on ethics and in *Advanced Genetic Counseling Issues*. The skills necessary to promote client decision-making also presented in *Introduction to Genetic Counseling* when the students begin talking about prenatal diagnoses and the various testing options that are available to families. The topic of decision-making is also discussed in *Cancer Genomics* and in *Advanced Genetic Counseling Issues*. Through in-class discussions, role-playing activities, demonstrations and video-taped assignments, students are given the opportunity to learn and practice these skills before they begin using them in clinic. In clinic, they also gain experience and insight through observation of the genetic counselors they work with and their own practical experiences.

6. *Can establish and maintain inter- and intradisciplinary professional relationships to function as part of a health-care delivery team*.

   Many of the specialty clinics our students are involved in are staffed by other health care providers. In addition to the medical geneticists, genetic counselors and genetic nurse specialists, our students have the opportunity to work with social workers, speech pathologists, dentists, dietitians, and physicians from many specialties including neurology, otolaryngology, orthopedics, cardiology, etc. Through their interactions with members of the various health care teams, students learn about the roles genetic counselors can assume when working as a member of an interdisciplinary team. By doing consults with the genetics residents and clinics with the residents, advance practice nurses, and medical geneticists in the Division of Human Genetics, students also learn how to establish and maintain relationships with intradisciplinary team members. These relationships are fostered by the close proximity of our students' desks to the offices of our clinical faculty, making more casual collegial interactions possible. Also, in the *Interdisciplinary Studies in Developmental Disabilities* course, students have didactic content on the roles of other allied healthcare providers and the interdisciplinary approach to family-centered care.

Domain IV: Professional Ethics and Values

1. *Can act in accordance with the ethical, legal, and philosophical principles and values of the profession*.

   In the semester of *Emerging Topics in Clinical Genomics* that focuses on ethics, genetic counseling students learn about the Code of Ethics established by the genetic counseling profession. Through

case studies, students learn about issues of privacy, duty to inform, informed consent and discrimination. Research ethics is covered in the *Research Design* course. Cases presented in *Student Case Conference* may also include a discussion of the relevant ethical and legal issues. In clinic, ethical issues may also arise that require additional discussion within the Division or a consult from the Hospital Ethics team. Some students have chosen to participate in a Bioethics elective rotation.

2. *Can serve as an advocate for clients*.

   Students learn to advocate for clients in *Interdisciplinary Studies in Developmental Disabilities* and in *Introduction to Genetic Counseling*. In class, students learn how to evaluate materials developed by support organizations, genetics centers and companies. They learn about self-advocacy and how to help families and patients advocate for themselves. Through their service learning activities, they spend time exploring and volunteering at various support groups in the Greater Cincinnati area. Early on in their training, advocacy skills are demonstrated by their clinical supervisors. As students begin assuming more responsibility in clinic they then begin taking on the role of advocate.

3. *Can introduce research options and issues to clients and families*.

   Students learn about the elements of informed consent in *Research Design*. They also learn about research ethics and the "clinician" vs. "researcher" roles they may play when involved in clinical research. They also may work with clients who are participating in clinical trials and disease registries in clinic. This happens most frequently on rotations with the genetic counselors who staff the Lysosomal Storage Diseases Center. Students may make clients aware of various research studies in which they may participate, but unfortunately are rarely able to provide informed consent in clinic outside of their thesis work as it would require prior IRB approval. Regardless of their clinical experience, students do gain experience working with the institutional review boards at both Cincinnati Children's Hospital and the University of Cincinnati through *Research Design* and their master's thesis research.

4. *Can recognize his or her own limitations in knowledge and capabilities regarding medical, psychosocial, and ethnocultural issues and seek consultation or refer clients when needed*.

   Prior to clinic, students are required to meet with their clinical supervisors and go over their fact sheets/counseling outlines. Through guided discussions with their supervisors, students learn what additional information they might need for a given case. Following each case, students again meet with their supervisors to go over their performance and discuss what could have been done differently. Through this process, students learn to recognize the areas in which they can improve. Students are also required to reflect on their performance each time they write a case summary. By reading these case summaries it is possible for the clinical supervisor and Clinical Coordinator to assess each student's ability to recognize his or her own limitations and to provide guidance to promote continued growth.

   Issues related to ethnocultural differences and recognizing when a client should be referred for further counseling are topics that are covered in *Introduction to Genetic Counseling* and *Advanced Genetic Counseling Issues*. This information is integrated into clinical practice over time. Again, guidance is provided by the clinical supervisors through example, directed discussions, and both verbal and written feedback.

5. *Can demonstrate initiative for continued professional growth*.

   The vast majority of our students choose to attend both the regional meetings and national NSGC meetings during their training. Many students choose to become members of the student SIG and have even co-chaired the SIG. Other examples of continued professional growth include submitting abstracts for presentation and writing papers for publication during their training, writing grants to fund their research, participation in courses not required by our program, and taking advantage of the many learning opportunities at UC and CCHMC such as invited lectures, seminar series, grand rounds, etc. Many students also chose to apply for the Preparing Future Faculty (PFF) certificate program or to be a LEND trainee. Following graduation, most of our graduates present their thesis results at a national meeting. Several students have committed themselves to further study by going on to earn advanced degrees. Others develop their roles within their particular work setting by initiating or participating in clinical research or educational endeavors, writing grants, and developing new clinical programs. A number of our graduates have also developed their own position and job description.

<u>Describe the rationale for curriculum sequencing and its relationship to the development of clinical competencies.</u>
The curriculum sequencing integrates courses designed primarily for other graduate students with courses developed specifically for genetic counseling students. Overall, the curriculum plan strikes a good balance of integrating courses focused on the basic sciences, those primarily focused on counseling and genetic counseling issues, courses supporting the research requirements, and clinical practicum courses. The didactic curriculum is heavy in year 1, enabling the students to provide independent counseling of full cases by the time they are in their summer internship placements. The didactic curriculum is lighter in year 2, allowing the students more time to focus on their research and clinical requirements. Participation in clinic is integrated through the entire training period, allowing for optimal maturation/honing of clinical skills. The development of clinical competencies is assessed in clinics and classrooms, with the knowledge base being taught in both settings. Regular communication between the GCP and the clinical supervisors regarding course sequence and content enhances the students' ability to continuously work on building their clinical skills.

<u>Describe how the thesis relates to the instructional plan and development of clinical competencies</u>.
The thesis project is an integral part of the instructional plan. Several core courses provide the foundation for developing and implementing an independent research project, including, *Introduction to Epidemiology*, *Research Design* and *Biostatistics*. A required two week summer research rotation has successfully promoted student progress and submission of human subject research to the IRB in a timely manner. Depending on the thesis topic and the design of the project, students will gain experience in a variety of specific clinical competencies falling under the four domains. More broadly, the research experience helps students to understand components of the research process which will help them assess the research literature in a variety of future work settings.

The Master's Thesis Guidelines document is included in the GCP Handbook and outlines the general research plan and specific requirements. A thesis research project has been a requirement of the program since its inception. The thesis research must be driven by a hypothesis or research question. Potential research mentors present research topics which the students rank. Students are then assigned research topics in the Fall of Year 1. As part of *Research Orientation*, the Program Director currently works with the first year students to begin the research process in the Fall semester prior to the

Research Design class. She helps the students define their research questions, identify potential faculty to serve on their Research Advisory Committees and begin their literature review and background section of their research proposals. In the spring semester *Research Design* class, the students learn about research methods and research ethics, critically evaluate the literature, and write a research proposal including measurement construction, sampling strategies, and identification and location of study subjects. The class utilizes lecture, class discussion and exercises, and peer review for presentation and evaluation. Students use their proposal as the basis for grant applications, IRB protocols, etc.

3. Learning Objectives

Describe the methods by which students are made aware of course objectives for didactic coursework. Include student guidelines for master's thesis research, independent projects, comprehensive examinations, and/or other requirements.

Learning objectives, lectures outlines, course requirements, and grading criteria for each course are included in the syllabus for that course. Syllabi from past years are readily available to students at any time on the shared computer drive. Updated syllabi are provided to students at the beginning of each course. Nearly all course instructors use the UC Blackboard system to manage their courses and communicate with students.

Guidelines for Master's Thesis Research are provided to students as part of the UC GCP Graduate Student Handbook.

4. Clinical Training

Explain the program's method and rationale for assignment of clinical training experiences. Explain how the program ensures that each student can acquire an adequate number and variety of logbook cases. Explain how the students are evaluated during clinical rotation. Describe how the program evaluates the quality and adequacy of the clinical experience including teaching and supervision.

The GCP has dozens of clinical supervisors and clinical training sites that offer students a wide variety of clinical training experiences. Each student completes three 5-week clinical rotations per semester (with the exception of the first semester of the first year when students only complete two rotations), as well as a 7 week full-time summer internship for a total of 12 clinical training experiences. While no two students have the exact same clinical experience, each student will get experience in a wide-variety of clinical areas. The GCP has general learning objectives specific to all clinics which were updated at the most recent Clinical Review Committee Meeting and are included in the Clinical Handbook. In addition to the general learning objectives, each supervisor creates a "supervisor information form" that is specific to the clinics where the supervisor sees patients. These forms are updated annually and include supervisor contact information, location, clinical days and times, a description of the rotation, and expectations of students for the specific rotation including learning objectives for the clinic.

Expectations for student involvement and roles in clinical rotations are outlined in the GCP Clinical Handbook. Students are expected to review the clinical supervisor information forms prior to a rotation and contact the supervisor to schedule a time to meet to review expectations of the supervisor as well as the student's goals during the rotation. After the first observational rotation in Year 1, students are expected to take active roles in all cases.

Rationale for Assignment of Clinical Training Experiences

During the first year of training in the program, students are assigned to clinical rotations by the Clinical Coordinator. The Clinical Coordinator strives to introduce each student to the fields of pediatric, cancer, and prenatal genetic counseling as well as provide the students with experiences in specialty clinics. At the end of the first year, either through role plays or more often through actual clinical experience, students have had experience in all of the areas mentioned.

Students are encouraged by the Clinical Coordinator and their advisors to choose a summer internship placement between their first and second years where they can see a variety of cases, including cancer and prenatal cases as students have access during their yearly rotations to an incredible variety of pediatric and adult cases at Cincinnati Children's Hospital. After the students complete their summer rotations, the Clinical Coordinator reviews their evaluations and case summaries to note types of cases (pediatric, prenatal, adult, cancer) as well as variety of cases within those categories. The Clinical Coordinator then writes a summary of the student's progress during the summer and the types of cases/rotations the student will need for their 2nd year of training to assure an adequate number of logbook cases and well-rounded training in all areas of genetic counseling.

The students meet with their advisors who help them to choose an out-of-city rotation which will help them to meet their needs in their 2nd year and to discuss other rotations they may be interested in during their 2nd year. The Clinical Coordinator uses the summaries of the students' summer rotations and their interests, as reported by their advisors, to create the 2nd years' clinical rotation schedule.

During the 2nd year of training, the Clinical Coordinator reviews the logbook requirements with the students in orientation before classes and clinic begin. The Clinical Coordinator encourages the students to consider feedback and comments provided in their summer rotation summary and to utilize their assigned rotations to meet the requirements outlined in the logbook. Second year students are required as an assignment in their Advanced Genetic Counseling course to begin to complete the logbook template provided to them. The Clinical Coordinator reviews the students' logbooks at the end of fall of 2nd year. At the time of the review, the logbooks may not yet meet all requirements from the ABGC, depending on the order of the students' rotations. The Clinical Coordinator provides students with a written summary of the logbook and includes recommendations regarding the type of cases needed prior to graduation and suggestions for how to increase the diversity of cases in upcoming rotations. No student has had a problem seeing a sufficient number of patients to meet their logbook requirements and most students have seen over 100 cases. However, the Clinical Coordinator may anticipate that the student will need wider diversity to meet logbook requirements, and she will discuss alternative plans with the student such as modifying their rotation schedule.

Prior to graduation and assigning a grade for Clinical Practicum IV, the Clinical Coordinator and Program Director must review each student's complete logbook to assure the student has the appropriate amount of diversity in cases and that each student has met the requirements for the logbook.

<u>Clinical Evaluations</u>

The clinical rotations are part of the Clinical Practicum (CP) series offered each semester of the two year training program as well as during the summer: CPI, CPII, CP Summer, CPIII, and CPIV. Students are required to meet the learning objectives for each CP course before moving on to the more advanced CP courses.

Students are evaluated by their supervisor after each case (formative evaluation) as well as at the end of each five-week rotation (summative evaluation) to determine progress on mastering the ABGC practice-

based competencies. The content of these evaluations are based on the practice-based competencies and are used to evaluate students' clinical progress in the UC GCP. The evaluation form that supervisors complete after each case is one page in length. The supervisor shares the evaluation with the student at the conclusion of each case so the student knows what areas went well and any areas that need improvement. The case evaluation form asks supervisors to evaluate student performance on the management roles the student assumed during the case. At the conclusion of each rotation, supervisors complete a summary evaluation of the student's performance.

We take a developmental approach to clinical training and expect students to assume more roles in clinic as they progress through the CP series. Students are expected to expand and refine their skills through-out the series, thus students will be evaluated on an increasing number of the practice-based competencies as they progress through the program. We have developed summary evaluation forms specific to the year and semester in which the student is being evaluated. These forms were updated for clarity two years ago and have again been recently updated for the semester conversion process, both to fit the revised CP semester series and make the progression of skills from each CP course more visible.

The Clinical Coordinator or Clinical Instructor for Second Years reviews the students' formative and summative evaluations, as well as case preparation materials and case summaries at the end of each rotation. The Program Director also reviews each summative evaluation. Based on this review, the Clinical Coordinator and Clinical Instructor (with input from the Program Director and Assistant Director as needed) determine whether or not the student has met the learning objectives for the CP course in which they are enrolled and gives the student a Pass or Fail grade. Students may also receive an incomplete in a CP course if the Clinical Coordinator, Clinical Instructor and other Program Faculty feel the student needs additional practice or experience on one or several of the learning objectives for the course. The Program Faculty will work with the student to develop a remediation plan and the student will be re-evaluated on the learning objectives for the course after the remediation plan has been implemented and executed. At that time, the student's grade may be changed to a Pass or Fail. It is also possible at that time, that the student, if they were not able to meet the additional learning objectives, may be placed on clinical probation.

Students who are not making sufficient clinical progress are placed on clinical probation. The terms of their probation are individualized depending on the specific clinical concerns and may include additional clinical rotations, additional cases, role plays to demonstrate specific skills, or other requirements. This probation and the steps a student must take to end their probation are documented in writing. The Clinical Instructor, Clinical Supervisor, Assistant Director, and Program Director will work together to determine what additional time and training a student may need to gain the needed skills.

<u>Evaluating the Quality and Adequacy of the Clinical Experience</u>

In addition to evaluating students, the students anonymously evaluate supervisors after each rotation. The students evaluate each supervisor regarding accessibility, timing and effectiveness of written and verbal communication and feedback, expectations, independence allowed the student, and overall experience. The feedback the supervisor receives is compiled and provided to the supervisor annually to maintain student anonymity. We hold yearly Clinical Supervisor Meetings to update supervisors on changes to the program, including changes to the evaluation process and student expectations. The UC GCP also provides supervision training and orientation for new supervisors. In the past year, we implemented a Supervisor Support Program which was developed based on a needs assessment which indicated supervisors were interested in additional support and training from the program. The

Supervisor Support Program includes a Supervision Lecture Series, a New Supervisor Mentor Program, Peer Supervision, and Annual Supervisor Awards. This program will be maintained in the future. Additional feedback on the clinical training is solicited through advising meetings and exit interviews with graduating students.

F. Program Evaluation

Describe the program's system for continuous assessment of the effectiveness of the program. The ABGC recommends the establishment of an Advisory Board to review the effectiveness of the educational program, especially as measured by student achievement. Describe the role of the Advisory Board in the continuous assessment of the program and identify the members of the board. Please refer to the Required Criteria for further Advisory Board information. Describe the methods used to collect qualitative and quantitative data from sources such as employers, faculty, clinical supervisors, students and graduates, etc. Explain how the evaluation relates to the assessment of the students' development of practice-based competencies.

The Cincinnati Genetic Counseling Program has many formal and informal mechanisms of assessing the effectiveness of the program as described below. We strive to create a collaborative and transparent environment to maintain open communications and so that students, clinical supervisors, and faculty feel comfortable sharing any concerns as they arise.

Curriculum

The Curriculum Committee is a standing committee which meets annually to evaluate, review and update the curriculum. Meetings are held more often as needed, such as in preparation for semester conversion. The minutes from these meetings are shared with the committee and changes to the curriculum are made based on consensus. The curriculum is also evaluated by student completion of course evaluations. These course evaluations are completed electronically through Blackboard or Survey Monkey.

Admissions

The Admissions Committee meets annually to review and evaluate the admissions process. Meeting minutes are shared with the committee and changes are made based on consensus. The admissions process is also anonymously evaluated through electronic surveys of interviewees who do and do not choose to attend our program. Numerous changes have been made to the admissions process based on the applicant feedback, including making the informal gathering the night before the day of interviews optional and more informal (e.g. hosted by current students), streamlining the interview day (less down time), and reducing overlap in the questions asked by interviewers.

Clinic

The Clinical Supervisors meet annually to discuss processes, procedures and issues that impact clinical rotations. Students' clinical skills are assessed by clinical supervisors after each clinical rotation. The clinical evaluations reflect the skills outlined in the practice-based competencies (see section E.5 above). Clinical supervisors are also evaluated by students after each rotation. Evaluations of clinical supervisors are summarized annually and shared in aggregate with clinical supervisors to protect the anonymity of students.

Research

Student research skills are evaluated at least three times in the first year and again at the end of the second year using the same questions to monitor the development of research skills over time. Other

measures of research outcomes include abstracts submitted and accepted for platform or poster presentation at the annual NSGC meeting, and published manuscripts resulting from the students' thesis work.

Student Experience

The student experience is evaluated through the Advising Program and monthly group meetings with faculty and staff. To standardize the information collected in advising meetings, specific questions are asked to assess the students' progress. In addition, open-ended questions are asked to address any concerns the students may have. The student/faculty monthly meetings are meant to discuss any issues affecting the students or staff and also to facilitate communication. The University also conducts annual satisfaction surveys of graduating students which are summarized and returned to the program.

Daily Operations

The GCP Team meets twice per month to address and brainstorm solutions to any concerns, discuss and prepare for upcoming events, and to ensure smooth program operations.

Employment

Our graduates are employed all over the United States and in other countries.

Overall Program Assessment:

Face-to-face exit interviews are conducted with all graduating students. The exit interviews are systematically conducted by the Program Director and Assistant Director after all program requirements have been completed by the students. The results are summarized to determine consistent concerns that need to be addressed.

We also monitor ABGC board exam pass rates for patterns. The ABGC Board exam pass-rates for the UC GCP were at or above national pass rates between 2005-2011. In all but one of these exam cycles pass-rates were above 90% for graduates taking the exam for the first time. Correlations have been found with performance on the Board exam and GRE scores. The GCP is adding additional content to address study habits, including time needed to prepare for the Boards, and helpful study tips with students towards the end of their second year. We have also invited someone from Testing Services in the Academic Excellence and Support Services at UC to talk to the students about standardized testing and test anxiety. Finally, we are implementing monthly quizzes in Advanced Genetic Counseling to help with exam-taking skills.

The GCP surveyed alumni who graduated between 2005 through 2012 to assess perceived adequacy of educational training related to the practice-based competencies, as well as required content area for programs seeking accreditation. We also asked alumni to forward a similar survey to their first employer.

The Cincinnati Genetic Counseling Program formed an Executive Committee (EC) in 2008 to serve in an advisory capacity to the Cincinnati GCP. In addition to assessing program outcomes and processes, this committee monitors the GCP budget and facilitates communication between the University of Cincinnati and Cincinnati Children's Hospital Medical Center. The EC helps promote regular discussion and updates on the curriculum, students, accreditation, and research. Some specific program recommendations that have come directly from the EC in the past few years include hosting a celebration to recognize the 30th anniversary of the GCP, forming an alumni relations committee, fundraising activities, and conducting the surveys of interviewees to assess our interview process.

The EC meets quarterly during the Academic Year. To remain in ABGC compliance, an additional committee member who is not affiliated with the University of Cincinnati or Cincinnati Children's Hospital Medical Center was added in 2011.

SPECIFIC REQUIREMENTS FOR ACCREDITATION IN GENETIC COUNSELING

As part of the self-study process, the program should undertake a critical review of each course offered, the clinical rotation experiences, and other components of the curriculum (e.g., thesis). Describe how the program's offerings support the development of the clinical competencies.

We have structured our curriculum to take a developmental approach to learning. We gradually build upon and reinforce skills through-out the curriculum. In clinic, we expect students to assume more roles as they progress through the Clinical Practica (CP) series. Thus students are evaluated on an increasing number of the practice-based competencies as they progress through the program. We have developed summary evaluation forms based on the practice-based competencies that are specific to the year and semester in which the student is being evaluated. These evaluation forms were updated for clarity two years ago and have again been recently updated for the semester conversion process, both to fit the revised CP semester series and to make the progression of skills from each CP course more visible. Thus students learn new clinical skills every semester so that by the time they graduate they can take on roles in all four domains in clinic. In addition, what students learn in class (e.g. Introduction to Genetic Counseling), they can immediately apply in clinic (Clinical Practicum), thus reinforcing learned skills and knowledge. Similarly in the Research Design course, students learn about research methods, then develop a research proposal for their thesis, submit to IRB, and then carry out the research. Actual application of research methods allows for lifelong retention of knowledge and skills, professional development opportunities, and workforce marketability

A. Curriculum

1. Instructional Content

Provide the results of the program's assessment of each course and other components of the curriculum. Comment on the quality and appropriateness of the content, learning objectives, instructional methods, syllabi, and sequence in the course of study. Discuss the relationship of thesis research to the didactic curriculum. Summarize the strengths and concerns noted in the instructional content and indicate plans for correcting deficiencies.

The GCP conducts numerous programmatic assessments and uses results from these assessments to continuously improve the GCP. As noted above, results from these assessments include course evaluations of the Fall 2012 GCP semester courses, course evaluations of the Winter and Spring 2012 GCP quarter courses, summaries of exit interviews with students from 2010-2012, summaries of exit surveys conducted by UC, evaluation of the research process, graduate employment statistics, and the results from the recent surveys of alumni and employers.

The content, appropriateness and learning outcomes of each course were reviewed as part of the transition to semester conversion. As part of the semester conversion process, summaries of each semester-based course, the sequence in which they were taught, and learning objectives for each course had to be submitted first to the College of Medicine, then to the Graduate School, and finally to the Provost for approval. Learning outcomes are included in all syllabi. Instructional methods are left to the discretion of the instructor, however, the GCP owns a Personal Response System (PRS) which

instructors are encouraged to use. In addition, most instructors have received training in active learning techniques, and incorporate a variety of hands-on and small group activities in their courses. Both Introduction to Genetic Counseling and Advanced Genetic Counseling have service learning components. We are fortunate to be able to draw on the expertise of world-renowned clinicians, educators and researchers from both CCHMC and UC as guest lecturers in all of our classes.

The Curriculum Committee meets annually to discuss instructional content and includes representatives from the Division of Human Genetics, the College of Medicine, the GCP, and genetic counseling students. To plan for the transition to semesters, the Curriculum Committee met monthly between March 2010 and June 2010. Annual meetings were held thereafter.

At a recent Curriculum Committee Meeting, strengths and gaps in the instructional content were again assessed. Noted strengths included a well-rounded GCP in general (academic, clinical, research), a marked improvement in GC students research skills as a result of the Research Design course (first taught in Spring 2006), strong development of students' psychosocial skills, the breadth of clinical exposure available to students, an emphasis on management and natural history in clinic (not just diagnosis), and the number of additional training opportunities available to students (e.g. Preparing Future Faculty, Leadership and Education in Neurodevelopmental Disabilities, unique rotations such as those with the Fetal Care Center, Lysosomal Storage Diseases and Clinical Trials, and the Molecular and Cytogenetics Laboratory rotation). Areas needing to be addressed included improved lab content in the didactic training, and more practical and applied information in molecular genetics and biostatistics. These concerns had also been raised in exit interviews with graduating students and plans to address them are already being implemented. As noted in the meeting minutes, more applied courses in biostatistics and molecular genetics were found or developed and have replaced previous courses in the curriculum, and a new laboratory genetic counseling course was taught live for the first time in Spring semester 2012. The Laboratory Genetic Counseling course will be adapted and made available online to future classes and for CEU credits.

The survey completed in the fall of 2012 by 38 of 65 (58%) alumni who graduated between 2005 through 2012 noted some of the same gaps as those identified above (a need for more laboratory genetic counseling content and more practical molecular genetics and biostatistics). Of the 36 content areas assessed in the alumni survey, additional gaps noted by 6 (15%) or more of alumni included cytogenetics, biochemical genetics, immunogenetics, crisis intervention, societal and public policy issues, health care delivery systems, and financial/reimbursement issues. However, results from the employer's survey did not note similar concerns. In fact the only gap identified by employers was immunogenetics which was noted by 15%.

Currently, **cytogenetics** is covered extensively in the Human Genetics course that students take first semester of their first year. It was determined that this content needed to be made more applicable and reinforced later in the curriculum. To do this, a case-based discussion was added to the Human Genetics course. In addition, a review of cytogenetics methodologies and additional content on interpretation of cytogenetics results in the laboratory and clinical settings was incorporated into the new Laboratory Genetic Counseling class in the second year. To broaden exposure to **biochemical genetics**, one semester of Emerging Topics in Clinical Genetics now focuses on biochemical genetics and metabolic diseases (see instructional content below). Our biochemical geneticists, Dr. Andrew Burrow and Dr. Nancy Leslie are the primary lecturers in this series. Regarding **immunogenetics**, we have additional immunogenetics content covered in the new Fundamentals of Human Genetics course. We are also interested in expanding clinical opportunities for genetic counselors through a new

immunogenetics rotation. Interestingly, although immunogenetics is listed as a required content area for program seeking reaccreditation, it is not listed as a required content area for programs seeking accreditation.

Most students are exposed to **crisis intervention** prior to admission into the GCP, however, an additional lecture on crisis intervention given by a social worker from CCHMC was added this past year in Advanced Genetic Counseling. **Societal and public policy issues** (health care disparities, racism, income inequalities, regulation of genetic testing, and societal perspectives on genetic testing, such as those held by the disability community and the deaf and hard of hearing community) are covered in Introduction to Genetic Counseling, Advanced Genetic Counseling, Ethics and the Interdisciplinary Studies in Developmental Disorders course. Since "societal and public policy issues" is such broad terminology, and since the aforementioned topics are not labeled as "societal and public policy issues" during training, individuals responding to the survey may not have categorized the content we cover as "societal and public policy issues." We suspect that reframing the content that we already cover under this topic as "societal and public policy issues" may change responses to this question. Elective courses exist at the University of Cincinnati about **health care delivery systems**. Since not all students can take an elective, we are choosing to add additional readings and assignments to better address this content. The book "The Health Care Handbook: A Clear and Concise Guide to the United States Health Care System" has been recommended by another program director and will be required reading and the basis for a new assignment in the Interdisciplinary Studies in Developmental Disorders course. **Billing and reimbursement issues** are covered through existing course lectures and in clinical rotations. However, the challenge noted by alumni (and by employers) is that billing and insurance policies are institution-specific and are topics that generally have to be learned on the job. Regardless, we do plan to revise some of our existing lectures and to invite Jennifer Ruschman, a genetic counselor who now works as a regional manager in Business Development at CCHMC, to present to the genetic counseling students. Jennifer's role is to work with Business development to identify, research, and advise staff in the formulation of new business opportunities and/or partnerships for services provided by CCHMC.

The semester-based instructional content of the GCP is reviewed below in the order in which it is or will be taken by students.

FALL – YEAR 1

Introduction to Genetic Counseling I: Practical genetic counseling approaches and methods taught by means of hands-on activities, peer instruction, guest lectures, and role playing. Introduction to Genetic Counseling (IGC) focused on the fundamental knowledge, skills, and attitudes essential to the field of genetic counseling in the areas of clinical practice, cultural competence, lifelong learning and professionalism. Applications to pediatric and prenatal genetic counseling are emphasized. Skills and knowledge learned in IGC are immediately applicable to clinic (see Clinical Practicum I).

Human Genetics: Introduction to basic human genetics including mitosis, meiosis, chromosome structure and mechanisms of rearrangement, inheritance, modes / mechanisms, mutational mechanism, population / quantitative genetics and biochemical genetics (polymorphisms). Students gain an understanding of epigenetics, pharmacogenetics, emerging biochemical, cytogenetic, and molecular genetic tests, and treatment and research related to specific conditions. Course speakers also address the impact of genetic conditions on families and communities including relevant institutional, community and national resources.

Fundamentals of Molecular Genetics (New Fall Semester 2012): Genetic concepts, DNA structure, replication and repair, linkage, recombination, gene mapping, transcription, translation, regulation, cloning methods, immunogenetics, and gene expression.

Counseling Techniques: Supervised experiences and critiques of taped materials to learn opening, closing, and reflective techniques in counseling. This course focuses upon the skills necessary to counsel effectively. Students have the opportunity to learn, observe, and demonstrate effective counseling behaviors. Through work with the instructor, with an individual supervisor, and with one other, students develop and practice basic and advanced counseling skills and strategies.

Emerging Topics in Clinical Genomics I: Series of invited speakers present lectures on diverse topics related to the spectrum of clinical genetics, genetic counseling, molecular and biochemical testing, treatment of genetic conditions and other areas. Emerging Topics is offered every semester, although the content varies by semester. Fall semester of even years focuses on metabolic disorders, spring semester of odd years focuses on ethics, fall semester of odd years focuses on chromosome abnormalities, intellectual disability, and epigenetics, and spring semester of even years focuses on connective tissue disorders, growth, and neurogenetics.

Genetic Counseling Case Conference: A weekly clinical conference conducted by genetic counseling students. Second year students regularly present cases following a specified format for presentation. First year students begin to present during late Fall of their first year.

Clinical Practicum I: Observational and participatory genetic counseling practice under the supervision of board certified genetic counselors and medical geneticist. The goals of Clinical Practicum I (CPI) are for students to demonstrate appropriate case preparation skills, obtain basic medical and family history information, and discuss basic genetic concepts and testing procedures with patients/families. CPI begins with a five week orientation to introduce students to the clinical policies and operations of the GCP and the Division of Human Genetics (e.g. introduction to EPIC and medical records, clinical evaluations, how to record information about clinical cases for the GCP, expected professional behavior in clinic and in email communications, etc.). Content and skills learned in Introduction to Genetic Counseling are applied in CPI.

Introduction to Epidemiology: Methodology for studies of disease and disease risk factors in human populations. Examples include the distribution and determinants of chronic disease, infectious disease, occupational and environmental epidemiology. Diagnostic and screening tests, clinical trials, and the natural history of disease are also addressed.

Research Orientation: Students develop a research question, present their research question to the Division of Human Genetics, start their literature review, and write the first draft of the background section of their research proposals.

SPRING – YEAR 1

Introduction to Cancer Genomics: Molecular, clinical and counseling aspects of cancer with an emphasis on the role of genetic counseling. This course covers genetic, environmental, and epigenetic causes of cancer, hereditary cancer syndromes and the related genetic counseling issues (weeks 1-8).

Introduction to Psychosocial Genetic Counseling: A continuation of the Introduction to Genetic Counseling class focusing on psychosocial counseling skills (weeks 9-15).

Clinical Embryology: A course designed for understanding the process of usual human development in order to appreciate the timing and mechanisms underlying birth defects, chromosomal abnormalities and genetic syndromes. (Online option available) (Weeks 1-8).

Clinical Teratology: Basic principles of teratology are reviewed and discussed. Topics include drug testing, pharmacokinetics, retinoids, thalidomide, environmental chemicals, anticonvulsants, diabetes, behavioral teratology, fetal alcohol syndrome, therapeutic drugs, infectious diseases, radiation, and hormones. (Online option available) (Weeks 9-14).

Research Design: Students learn about and apply quantitative and qualitative research methods, as well as the conduct of ethical research and human subjects review. Students also critically evaluate the literature, and write a research proposal to guide their master's thesis research. An additional requirement of this course is that students meet regularly with their research advisors.

Emerging Topics in Clinical Genomics II: Continuation of Emerging Topics in Clinical Genomics I

Clinical Practicum II: Observational and participatory genetic counseling practice under the supervision of board certified genetic counselors and medical geneticist. The goals of Clinical Practicum II (CPII) are for students to obtain and present to the team relevant medical and family history information and the main psychosocial needs/concerns of the family. They will also present to patients/families, both verbally and in writing, information about basic genetic concepts and recommended laboratory tests. Information learned in Cancer Genomics and Psychosocial Genetic Counseling is immediately applicable to CPII.

SUMMER – YEAR 1

Clinical Practicum Summer Internship: Seven week summer internship where students hone genetic counseling skills and participate in all applicable aspects of genetic counseling. The internship can take place anywhere a certified supervisor agrees to work with a student.

AUTUMN – YEAR 2

Advanced Genetic Counseling Issues I: Advanced clinical practice and professional issues in genetic counseling. Students identify and practice psychosocial counseling skills; increase their ability to provide culturally competent genetic counseling; develop, deliver and evaluate effective educational and supervision methods, and develop and progress in a personal pathway of professional development.

Statistics and Experimental Design for the Biomedical Sciences: Statistics and Experimental Design for the Biomedical Sciences is a practical course designed to provide students with a solid foundation and intuitive understanding of statistics for the biomedical sciences. The course emphasizes experimental design, parametric and nonparametric statistics used in making between-group inferences, linear and nonlinear regression used in modeling physiological phenomena, effective data presentation, and graphic integrity.

Emerging Topics in Clinical Genomics III: Continuation of Emerging Topics in Clinical Genomics II

Clinical Practicum III: Observational and participatory genetic counseling practice under the supervision of board certified genetic counselors and medical geneticists. The goal in Clinical Practicum III is that students an active role in all aspects of a case.

Master's Thesis Research: Research for the Master's Thesis. Students receive credit for implementing, analyzing, and writing their research.

SPRING – YEAR 2

Advanced Genetic Counseling Issues II: A continuation of the Advanced Genetic Counseling Issues I. Students continue to receive supervised experience in counseling through role-playing, recorded interviews, observation analysis, and evaluation of interviewing techniques. Professional development issues also continued to be discussed.

Emerging Topics in Clinical Genomics - Ethics: Issues and conflicts in the field of genetics are examined and discussed in the context of a systematic framework, employing principles and concepts of ethics with consideration of legal implications. Part of the Emerging Topics in Clinical Genomics Series.

Clinical Practicum IV: Observational and participatory genetic counseling practice under the supervision of board certified genetic counselors and medical geneticists. Students are expected to take an active role in all aspects of a case. By the end of Clinical Practicum IV, students should have a complete logbook.

Interdisciplinary Studies in Developmental Disorders: The purpose of this course is to provide students with a rich exposure to the issues and relevance of interdisciplinary health care for individuals and families with neuro-developmental and related disabilities. The course also provides opportunities to gain awareness of interdisciplinary health care practitioners' roles and responsibilities and to explore future roles for genetic counselors in diverse practice settings.

Master's Thesis Research: Research for the Master's Thesis. Students receive credit for implementing, analyzing, and writing their research.

ADDITIONAL OPTIONS AND REQUIREMENTS

Journal Club (non-credit): In addition to the above, students attend the Division of Human Genetics Journal Club all semesters. In their second year, students present in Journal Club with a staff or faculty member. Journal Club has a molecular or research genetics focus and is attended by research geneticists, clinical geneticists, genetic counselors, cytogenetic and molecular laboratory technicians and trainees in the Division of Human Genetics.

Cardiovascular Genetics (Online elective): Students are able to apply concepts related to cardiovascular genetics to provide optimal health care. This course is clinically focused and provides genetic counselors with background about the syndromic, metabolic and acquired causes of congenital heart defects, arrhythmias, cardiomyopathies, and coronary heart disease. In addition, it covers the counseling issues related to these disorders.

Laboratory Genetic Counseling (New in Spring 2013): This course is designed for genetic counseling graduate students and will focus on the knowledge, skills, and content related to genetic counseling

practice in the genetic diagnostic laboratory setting. Content will include topics related to common testing methodologies and test interpretation, test result communication including report writing, as well as professional issues specific to this practice setting. The role of the genetic counselor in all aspects of the laboratory will be a theme throughout the course.

2. Clinical Training Content

Provide the results of the program's assessment of the clinical rotation experiences. Comment on the learning objectives, opportunity for student involvement, and student counseling role. Summarize the strengths and concerns noted and indicate plans for correcting deficiencies.

Clinical rotation experiences are assessed through exit interviews with graduating students, student-completed evaluations of supervisors, regular meetings between advisors and students, annual meetings with clinical supervisors, and meetings of the Clinical Review Committee. The recent survey of alumni and employers also asked about perceived adequacy of training based on the practice based competencies.

The clinical training is a major strength cited in GCP exit interviews with graduating students. Strengths of the clinical training include starting clinical early (in the first year), the diversity and uniqueness of available clinical rotations, the expertise and support of clinical supervisors, and the developmental approach to clinical skills (where students learn skills in class and apply them in clinic). The physical location in the Division of Human Genetics is also an often mentioned strength as it allows students ready access to clinicians and faculty.

Similar strengths were identified by the Clinical Review Committee formed to review the GCP clinical training as part of the self-study. Additional strengths noted by the Clinical Review Committee include the focus in clinic on management and natural history of genetic conditions at CCHMC, not solely on the diagnosis of genetic conditions. The focus on management and natural history allows students to see patients at different points in their care including prior to a diagnosis, when receiving a diagnosis, and for appointments following a diagnosis. The collaborative relationship between genetic counseling students and residents was a noted strength of the clinical training. The students and residents work together on two specific rotations, Consults Rotation and Trainee Clinic, allowing trainees to develop working relationships and also to better understand the expertise that each brings to the clinical encounter. Working as part of multidisciplinary teams was also a strength noted by the Clinical Review Committee, particularly in our specialty clinics which facilitate exposure in new and expanding areas of clinical practice. Finally, the rotations outside of CCHMC were noted as strengths of the clinical training. These rotations expand students' understanding of the different models and methods of providing genetics services as well as their exposure to multiple institutions with varying policies and protocols.

Concerns about the clinical training were also addressed by the Clinical Review Committee. Based on the current ABGC recommendations that students see patients for their logbook in the approximate proportion of practicing prenatal counselors from the most recent Practice Analysis, the number and the availability of prenatal patients currently limits the number of students the program can accept. To address the limitation, we currently encourage prenatal rotations outside of Cincinnati.

We are fortunate that clinical supervision is considered a job requirement and that education is part of the UC and CCHMC mission. We are also fortunate to have a large number of supervisors dedicated to working with students, however, there is always the potential for supervisor burn-out. To address this concern, we have implemented a supervisor support program which created a peer supervision meeting

four times a year to address supervision issues, a supervisor lecture series, supervisor awards, and a new supervisor mentoring plan. This program was developed based on a needs assessment of supervisors which was directed at identifying additional ways the program could support the supervisors.

Case summaries are completed by students after every case the student sees. This can sometimes be viewed as burdensome by the students. However, case summaries are an important part of documenting the students' clinical experiences and therefore we have chosen to continue creating case summaries. To reduce the burden, second year students are now given the option of writing a condensed case summary.

Alumni also commented on the strong clinical training in the GCP. The alumni did not identify any major gaps in training related to the four domains of 1) Communication Skills, 2) Critical-Thinking Skills, 3) Interpersonal, Counseling, and Psychosocial Assessment Skill, and 4) Professional Ethics and Values.

3. Research Content

Our students get extensive research experience through their master's thesis research and through coursework in research design, biostatistics, and epidemiology. In addition, students have the opportunity to do clinical practicum placements with genetic counselors who conduct clinical research and run clinical trials.

The GCP Handbook outlines expectations and timelines for the master's thesis research. As part of the Research Orientation and the Research Design course, students learn about research methods and ethics, develop and formalize their research question for their master's thesis, learn to critically evaluate the literature and write their research proposal to guide their master's thesis research. As part of the Research Design course, students meet with the Program Director to discuss the first draft of their research proposal. Based on feedback that students wanted more individualized attention on their thesis, students are also required to meet twice/month with their research advisor and submit minutes of these meetings to the Program Director and research advisor. A peer review of research proposals has also been integrated into the course. IRB submission (if human subjects research is involved) is required at the end of the first year, prior to beginning the summer clinical internship. A two week research internship at the end of the first year facilitates IRB submission. Research projects and data collection are closely monitored by a student's research advisor and research advisory committee. Research mentors, committee members, and advisors help students identify barriers in the research process and provide support or resources to overcome these barriers.

In Fall of 2010, the evaluation of the research process was modified to evaluate skills learned over time (e.g. the developmental approach to learning) in addition to evaluation of course content. Research evaluations are now conducted three times in the first year and one more time at the end of the second year. Results indicate that students had gained in research skills and abilities by the time of graduation.

The Research Review Committee met in summer of 2012 as part of the self-study for ABGC reaccreditation. The committee reviewed the process of finding research projects and matching research mentors and students. We also discussed the Research Orientation and Research Design classes, biostatistics preparation, the IRB submission process, and manuscript submissions. Thus far, the GCP had done a good job recruiting diverse research mentors and projects. Efforts to involve new members from other divisions or departments at UC and CCHMC in the research process will continue. The process of matching students and research mentors was a noted strength (research mentors present ideas orally and in writing and students rank their top five projects). The Research Orientation

and Research Design classes were also noted as strengths that facilitate the research process. The deadlines embedded in these courses are also helpful to keep students on track for graduation. It was suggested that more outcomes research be integrated into Research Design, particularly with the current NSGC emphasis on measuring GC outcomes. Regarding the IRB submission process, the GCP has good relationships with the UC and CCHMC IRBs which should continue to be fostered as delays in IRB approval could impact time to graduation. While publication rates increased to about 60% for the classes of 2007, 2008 and 2010, we would like rates to be even higher. The importance of publishing to students and research mentors will continue to be emphasized.

Section IV: Final Assessment and Conclusions

Summarize the major findings of the internal evaluation including strengths, weaknesses, concerns, and plans for modification. Describe the long-range (five year) plans for the genetic counseling program.

The Cincinnati GCP is a well-respected and highly successful program because of the many strengths from which our program draws. We have a dedicated and effective team that cares about the success and well-being of the students and all those involved in the training of students. We have consciously worked towards creating a collaborative and transparent work environment while at the same time fostering independence and professionalism among genetic counseling trainees. We are able to draw from the clinical and research expertise of CCHMC, the third-ranked pediatric institution in the country, and the academic and research excellence of the College of Medicine at UC which is ranked 19th in the country. Our program is rich in opportunities for students which reach beyond the clinic and classroom to include service-based learning, leadership, and teaching opportunities.

The depth and breadth of our clinical training continue to be major strengths of our GCP. We have a diversity in clinical opportunities that allows students many unique clinical exposures. Our clinical training starts early and the clinical supervisors and instructors are invested in mentoring students to be the best genetic counselors possible. Synergistic with our strong clinical training are the many research avenues being explored by clinicians and researchers at CCHMC and UC. Such diversity in research allows us to facilitate strong research opportunities and thesis experiences for over 12 genetic counseling students per year and members of the Research Committee have noticed continuous improvement in students' research skills in the past five years.

Plans to strengthen students' training include the new laboratory genetic counseling course to be implemented in spring 2013. Other newly implemented changes include a new "Fundamentals of Molecular Genetics" course and student enrollment in the "Statistics and Experimental Design for the Biomedical Sciences" course through the Department of Physiology. In addition, the Emerging Topics in Clinical Genomics series has been modified so that one semester now focuses on biochemical genetics.

Our many processes for evaluating components of our program will remain in place (e.g. advising program, course evaluations, program evaluations, monthly student/faculty meetings, exit interviews, clinical evaluations, executive committee and other committees, etc.) as they provide valuable insights and often multiple perspectives of what is working well and how we can improve. These practices also facilitate the involvement of students and instructors in the educational process and help create a supportive environment. In addition we will continue to evaluate the transition to semesters, considering the impact on students, faculty and the educational process. We will also continue to monitor the new courses we are introducing into the curriculum, whether it is a new course to replace an existing course, or a new course with new content. Finally, we also plan to continue to monitor students' success at finding new jobs, passing boards, and evolving leadership roles in the profession.

We are fortunate to be part of a strong training program and to receive ongoing support from both the University of Cincinnati and Cincinnati Children's Hospital Medical Center. Our administrative and academic home at UC truly and our physical home at CCHMC allows the Cincinnati GCP the best of both worlds. As a result we have a very well-rounded GCP and students graduate from our program with the clinical, research and academic foundation to go in any direction in the field of genetic counseling.