MASTERS DEGREE PROGRAMS
DESIGNED TO PREPARE
GENETIC COUNSELING ASSOCIATES

An Honors Thesis (ID 499)
by
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(advisor's signature)

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Introduction

One-half of each person's genes (the determiners of heredity) are contributed by the mother through her egg and one-half by the father through his sperm. Therefore every baby born carries two sets of blueprints for his or her growth and development.

Every organism, including the human organism, has deleterious genes that may or may not become manifest in a lifetime and that have a definite probability of being passed to offspring, where again they may or may not become manifest, depending on their combination with other genes. Some of these can be classified merely as nuisances, such as near-sightedness or a tendency to baldness. Others may cause diseases and defects that may or may not be treatable. Some may be life threatening; others are invariably fatal . . . (Lamb and Shaw, 1978)

Recognizing genetic disorders as an important health problem came after important advances were made in cell biology and biochemical genetics (Lamb and Shaw, 1978). The medical profession has increasingly become aware of the importance of genetic disorders, and genetic services are now available for parents who want to know about heredity and the possible consequences of their deleterious genes on their offspring. One of the medical professionals that aids in the delivery of genetic services is the genetic counselor. The Genetic Associate is a master's level professional trained in human genetics, developmental disabilities, child development, and counseling (Brochure from the University of California at Irvine). The counselor's major goal is to convey understanding of birth defects and genetic mechanisms to affected families, and to enable prospective parents to make informed decisions about child-bearing (Genetic Counseling, March of Dimes).
Historically, no one was really prepared to do genetic counseling because inheritable disorders were not recognized as such and not well understood for many years. Physicians were the professionals most aware of human genetic defects, and consequently they were the main group of people that provided genetic counseling services in the past. Also, priests, pastors, and clergymen were approached by parents in the search for advice in genetic-related problems. Although the clergy provided a source of emotional support and commonality of religious beliefs, they did not know (and for the most part still do not know) about the scientific and medical aspects of genetic disorders, and therefore were limited in what help they could give to parents.

As more and more genetic disorders were diagnosed and/or treated by the medical profession, the need for a professional who could provide genetic counseling increased. Consequently, many professionals at one time or another found themselves informing people to a greater or lesser degree about genetic disorders; professionals such as physicians, geneticists, social workers, nurses, psychologists, dietitians, and religious leaders (Godmilow et al., 1979).

Although many professionals in the medical and public health fields had some awareness and understanding of genetic disorders, they were not specifically trained to counsel lay people on the mechanisms of heredity. The need for someone who was prepared to do this was recognized and acted on by faculty at Sarah Lawrence College in Bronxville, New York, as described later in this paper.
There are now twelve different colleges and universities in the United States that prepare students to become Genetic Counseling Associates. The Associates' major roles in the delivery of genetic services are that of counseling and educating people about genetics.

One of the major purposes of genetic counseling is to provide counselees with pertinent genetic and biomedical information so that they can make informed decisions and choices. This information may concern specific diseases as they relate to particular individuals or families—the prognosis, consequences, treatment, risk of recurrence and prevention—or the information may concern genetic diseases in general as material for public or professional education or consultation. The genetic counselor is frequently instrumental in helping individuals and couples a) reach personally relevant health and reproductive decisions, b) deal with the psychosocial concomitants of genetic disease, and c) respond to the challenges that these disorders pose for them. (Brochure from the University of California at Berkeley)

One can get a good idea of what a Genetic Counseling Associate might be expected to do on the job by examining the following list of competencies expected of graduates on completion of the genetic counseling master's degree program at the University of California at Irvine:

1. To understand genetic concepts concerning the structure, function and transmission of genetic material as well as the clinical manifestations and natural history of birth defects and genetic diseases.

To be able to communicate genetic material in terms understandable to the lay person.
To conduct or participate in conducting genetic counseling interviews in which information is gathered and imparted, the patient's reactions and understanding are explored, and help is given with clarification and decision-making.

To provide a written account of each patient contact and of information provided and to compose written reports to patients and physicians.

To have experience in providing information on genetics and developmental disabilities to parent and community groups, agency personnel, students and medical personnel.

To develop administrative skills to facilitate provision of service, including intake and clinic organization.

2. To be sensitive and able to respond to the patient and family facing genetic disease and its implications.

To observe marriage and parent-child relationships and identify serious problem areas.

To have knowledge of major health-related and welfare resources and when and how to make referrals.

3. To have and apply a knowledge of normal and abnormal child development.

To have an understanding of mental retardation and developmental disabilities, the range of potential and the problems of affected persons.

4. To learn basic cytogenetic and biochemical theory and skills.

5. To learn how to do library research related to patients and genetically-related topics and to report findings to staff and to others.

6. To participate actively as a team member.

7. To have an awareness of the ethics and philosophy of genetic counseling.
History of the Origin of Genetic Counseling Programs

Human genetic services have become an important part of contemporary health care. This, however, was not always the case. Before 1968, clinics offering genetic services were few and far between. The human genetics field did not start to bloom until the latter half of the twentieth century. Although information on genetics is said to double every two or three years, it has taken considerable time for this information to reach the medical professionals who serve the general public. The need for genetic services had to be recognized by the medical profession, as well as the public itself, before human genetic clinics came to be widely demanded. The last two decades have seen human genetic clinics sprout up all over the country.

Today, genetic clinics are found in many medical facilities associated with schools of medicine, as well as in a number of non-affiliated hospitals and medical centers. Also, genetic services are now offered through centers designed to deal just with a specific genetic disease, such as sickle cell anemia, hemophilia, or muscular dystrophy. Specialized clinics for these and other genetic diseases are becoming more common due to the special need they serve (Genetic Associates: Their Training, Role, and Function, 1979).

Because of the uniqueness and seriousness of genetic disease, supplying these services requires a team of professionals which commonly includes the clinical geneticist (M.D.), specialists in cytogenetics, biochemical genetics, other medical disciplines, and a variety of individuals trained and skilled in the area of genetic counseling (Genetic Associates: Their Training, Role, and Function, 1979). Those skilled in genetic counseling require a
broad range of knowledge and a combination of skills to deal effectively with the public.

Families must be helped not only to comprehend medical facts, but to understand the way heredity contributes to a specific disorder and the risks that family members will transmit, or will themselves be affected by that disorder. These families also need help in understanding their reproductive options, in choosing a course of action which seems to them appropriate, and in making the best possible adjustment to the disorder or to the risk of recurrence. (Genetic Associates: Their Training, Role, and Function, 1979)

The estimated 50 million Americans who are affected by genetic conditions often do not find their needs for information and treatment adequately met (Marks, 1980). Producing more professionals to provide the required genetic services seemed imperative. A professional that could communicate the facts in a way that lay people could understand; who was trained specifically to deal with the psychosocial aspects of genetic disease; and who also had enough knowledge in medical genetics to work successfully with clinical geneticists would require unique training. For this reason, in 1969, a program was started at Sarah Lawrence College to train a professional at the master's degree level, the genetic associate, who would embody this expertise.

Sarah Lawrence College was the forerunner in the effort to respond to this need. It developed the first program to train people for the sole purpose of filling this unoccupied niche. One of the founders of this program was Joan H. Marks, who has been the Director of the Human Genetics Program at Sarah Lawrence since 1972. She has published several articles on the Sarah Lawrence program and what follows is a
synopsis of this prototype program taken directly from one of her articles:

Our institution is a small (1000 students) liberal arts college in a Westchester suburb of New York City. The program was developed with the support of an advisory board of prominent medical geneticists; the continuing guidance offered by these educators has helped us to incorporate in our program the latest advances in the understanding of genetic mechanisms and the application of this understanding to all aspects of care and counseling of patients and families with genetic disorders (Marks and Richter 1976).

The two-year program leads to a Master of Science degree. It prepares graduates to enter careers as genetic counselors, public educators in medical genetics, and researchers in the delivery of genetic services. The program is interdisciplinary, with faculty members from Sarah Lawrence College and several New York City medical schools, including the College of Physicians and Surgeons of Columbia University and Albert Einstein College of Medicine. Thirty-six academic credits and 12 field-work credits are offered. Field work involves over 400 hours of supervised clinical work in one of 19 hospitals in the New York area that offer clinical training for students enrolled in this program.

The program is open to both women and men, though the majority of students have been women, whose ages range from 22 to 45. Initially, the students enrolled in the program were from the greater New York metropolitan area; but recently, students have come from throughout the United States and from several foreign countries.

The program emphasizes the psychological dimensions of the presence of genetic disease (McIntyre 1977); for that reason, we seek students who have both an aptitude for working with people and a broad academic background, which includes good training in the sciences but ranges beyond the field of biology. We require applicants to demonstrate limited experience in the counseling field--for example, previous work as a peer counselor or family-planning counselor, or experience with a crisis hot-line.
To date, of those entering the Human Genetics Program, 67% are science majors; 13%, social science majors; and 20%, humanities majors. Twenty-five students are accepted yearly. At present, we have five qualified applicants for every vacancy in the program. (Joan H. Marks, 1980)

By 1979, five additional programs had been established. These, in order of their development, were: Rutgers University, University of California at Berkeley and Irvine, University of Colorado at Denver, and the University of Wisconsin at Madison (Marks, 1979). At the present time, (May, 1985), a total of twelve programs that offer a master's degree in genetic counseling have been identified, as follows:

1. Howard University in Washington D.C.
2. Sarah Lawrence College in New York
3. University of California at Berkeley
4. University of California at Irvine
5. University of California at Los Angeles
6. University of Colorado in Denver
7. University of Iowa at Iowa City
8. University of Michigan at Ann Arbor
9. University of Oklahoma at Oklahoma City
10. University of Pittsburgh in Pennsylvania
11. University of Tennessee at Memphis
12. University of Wisconsin at Madison

Two schools have terminated their programs in genetic counseling: Rutgers University in New Jersey and the State University of New York at Stony Brook. Currently, the University of California at Los Angeles has a temporary hold on its program that could lead to a termination if appropriate funding cannot be obtained. A new program at
the University of South Carolina at Columbia is presently awaiting final approval, which, if given, would allow that institution to accept its first class of six students for the fall of 1985.
Purpose and Methodology of Study

The purpose of the study reported in this paper was two-fold. First of all, I began investigating genetic counseling programs because I was personally interested in making genetic counseling my career. Before I could make any definite decisions, I wanted to find out all I could about the various genetic counseling programs in the country. I encountered problems, however, because apparently, information on these programs has never been gathered together and presented in a concise and comparative way. In fact, there was even a discrepancy from various sources as to how many Genetic Counseling Associates programs actually existed.

This lack of an easily accessible consolidation of program information was my second reason for writing this paper. I realized how useful a handbook on these programs would be to both students and faculty. So I decided to collect all the information myself and present each program in an outline form, focusing on seven different aspects of each program as follows:

1. Person contacted
2. Program description
3. Admission requirements
4. Curriculum
5. Student enrollment
6. Cost
7. Financial aid available

The methodology for this study included three related projects. First of all, I wrote a letter to the director of the genetic counseling program at each school and requested information on the Genetic Counseling Associates program.
The information that was sent to me about each of the programs was outlined in a uniform format so that the various programs could be easily compared and contrasted.

My second project was to review the literature available to me on these counseling programs. Unfortunately, not much attention seems to have been given to these programs and thus not much literature was available to review. Significant articles encountered in this literature search have already been cited in this paper.

My third project involved an interview with Kim Harden, Genetic Associate, who is a graduate of the genetic counseling program at the University of California at Berkeley. From the interview I wanted to obtain firsthand knowledge from someone who had actually experienced an associate program. My questions for her were designed not only to bring more insight into my understanding of the program, but also to answer some questions I had in my own mind about genetic counseling as a possible career.
Outlines Summarizing
Significant Information
about the Twelve Genetic
Counseling Associates Programs
in U.S. Colleges and Universities
HOWARD UNIVERSITY, Washington, D.C.

Person Contacted:

VERLE E. HEADINGS, M.D., Ph.D.
Director, Graduate Studies
Division of Medical Genetics
Howard University, College of Medicine
520 "W" Street, N.W. Box 75
Washington, D.C. 20059
(202) 636-6381

Program Description:

Howard University offers a program that leads to an M.S. degree in Human Genetics. The student is expected to take the full complement of courses offered in the area of human genetics and to acquire the full range of experience in genetics clinic with respect to diagnosis, risk assessments and counseling. It is anticipated that the graduate will be qualified for certification as a Clinical Geneticist. This degree option is individually tailored for each interested candidate and a director will assist the student in designing an individually tailored plan of study.

Admission Requirements:

* Three letters of recommendation.
* A written statement of current activities.
* A written statement of interest in genetics as a profession.
* Bachelor of Science or Arts degree.
* "B" grade average or its equivalent.
* GRE scores.
* Undergraduate course requirements:

1. Modern biology.
2. Chemistry through organic chemistry.
4. Mathematics through calculus.
5. General genetics course.

Students may be accepted conditionally if:

1. Student has less than a "B" average (no less than a C), but has high GRE scores and/or very excellent recommendations.
2. Student does not have all required undergraduate courses.

Curriculum:

* Minimum of 36 semester credit hours.
* Student must pass a written preliminary examination at end of first year as a full-time student.
* Most M.S. degree candidates will engage in a well circumscribed research project assigned to them by a thesis director.
* A grade average of B or its equivalent must be maintained.
* Two alternative master's degree options are offered:

1. General Program Option: designed to prepare student for roles as a member of a research team or teacher in secondary school or junior college.

2. Medical Genetics Option: designed to prepare student for roles as a member of a research or clinical genetics laboratory team or member of a genetics clinical team with particular expertise in the skills of history-taking and counseling.

Student Group:

The program in Genetics and Human Genetics is new and slowly growing. It currently enrolls about 26 graduate students (M.S. and Ph.D. candidates) and expects a maximum enrollment of 30.

Cost:

Tuition is about $2,900 per year, plus fees in the amount of $315 for all students.

Financial Aid:

Financial support is available in forms of competitive fellowships, graduate and research assistantships, and loan programs for both M.S. and Ph.D. degrees.

Source: Program Brochure from Dr. V.E. Headings, Program Director October, 1984
Program Description:

Sarah Lawrence College offers a two-year program leading to a Master of Science degree. It prepares graduates to enter careers as genetic counselors, public educators in medical genetics, and researchers in the delivery of genetic services.

Admission Requirements:

* Personal interview.
* Undergraduate B.A. or B.S. degree with a high level of academic achievement.
* General biology class.
* Developmental biology class.
* General genetics class (mendelian and molecular).
* Basic chemistry.
* Probability and statistics.

Recommended: Courses in organic chemistry, Spanish and psychology of personality.

Curriculum:

* 36 semester course credits.
* Minimum of 600 hours of field work in a supervised rotation of three genetic counseling clinics.

Student Group:

The program at Sarah Lawrence is the oldest and current enrollment is between 50-60 students in M.S. degree counseling program.

Cost:

$278 per credit hour
Financial Aid:

Scholarships and loans are available, including Department of Education Graduate and Professional Opportunities Program Fellowships.

Source: Program Brochure from Joan Marks, Director October, 1984
UNIVERSITY OF CALIFORNIA, Berkeley

Person Contacted:

DR. SEYMOUR KESSLER, Ph.D.
Director
Genetic Counseling Program
University of California
Building T-7, Room 221
Berkeley, CA 94720
(415) 642-6553 or 642-6328

Program Description:

The Berkeley Program in Genetic Counseling at the master's degree level was initiated in 1973 as a response to the need for skilled personnel to provide direct human services in facilities concerned with genetic disease. The program is designed to be fully interdisciplinary between the biological and social sciences. The curriculum reflects strong concern with the moral/ethical issues that underlie genetic interventions.

Admission Requirements:

* Autobiographical essay/statement of purpose.
* Bachelor's degree in a biological science, social science, or related field.
* GRE scores (requirement of the graduate division and will not be a deciding factor for admission to this program).
* Minimum 3.0 G.P.A.
* One course in biological science.
* One course in social science.
* Demonstrated interest and experience in working with people. For example: crisis intervention, teaching or tutoring.
* Be prepared to take and pass biochemistry upon entering program.

Curriculum:

* Complete satisfactorily courses in the following areas: genetics, human development, counseling, bioethics, biochemistry and field work.
* Ten hours per week preceptorship and at least one other ten week experience in a clinic or agency dealing with genetic disease and prenatal diagnosis.

* Total of 600 to 1,000 hours of genetic counseling field work.

**Student Group:**

1977-78 report (Marks, Joan. 1979) stated that 16 students were enrolled in the M.S. program.

**Cost:**

Per semester, resident - $703.25  
Per semester, non-resident - $2,485.00

**Financial Aid:**

Fellowships, graduate scholarships, teaching and research assistantships are available for outstanding graduate students.

**Source:** Program Brochure from  
Dr. S. Kessler, Program Director  
October, 1984
UNIVERSITY OF CALIFORNIA, Irvine

Person Contacted:

ANN P. WALKER, M.A.
Division of Development Disabilities &
Clinical Genetics
Department of Pediatrics
University of California at Irvine
Medical Center, Route 81
101 The City Drive
Orange, CA 92668
(714) 634-5791

Program Description:

Irvine's Genetic Counseling program offers a master's level professional training in human genetics, developmental disabilities, child development and counseling. The graduate may function either as part of a genetics counseling team or in conjunction with a medical geneticist.

Admission Requirements:

* Bachelor's degree in biological science, social science or related field.
* Minimum of a 3.0 G.P.A. (B average).
* Three letters of recommendation.
* Course in biology.
* Course in chemistry.
* Course in social or behavioral science.
  Recommended: Courses in genetics, biochemistry, counseling, psychology and human development.

Curriculum:

* Master's thesis and/or dissertation.
* Six to eight academic quarters of study.
* Clinical and laboratory experience.
* Maintain a 3.0 G.P.A. (B average).

Student Group:

1977-78 report (Marks, Joan. 1979) stated five people enrolled in the M.S. program.
Cost:

Per quarter, resident - $468.50
Per quarter, non-resident - $1,120.00

Financial Aid:

The Graduate School at U.C.I. offers financial support for the graduate students in the form of fellowships and teaching and research assistantships. Recommendations for these awards are initiated by the faculty of the student's academic department and are based primarily upon academic qualifications.

Source: Program Brochure from Dr. Kenneth Dumars, Program Director October, 1984
U. C. L. A., Los Angeles, CA

Person Contacted:

ALFRED H. KATZ, D.S.W.
Director
Genetic Counseling Program
School of Public Health
University of California
Los Angeles, CA 90024
(213) 825-5333

Program Description:

The U.C.L.A. program leads to a Master of Public Health Degree. This program is presently inactive and is not processing applications. They hope to reopen in the future, and this is the reason it is included in this report.

Admission Requirements:

* Bachelor's degree from a regionally accredited institution.
* "B" average or above expected from last two years of undergraduate study.
* GRE scores.
* Letters of recommendation.

Curriculum:

* School of Public Health required courses.
* Genetic Curriculum core courses.
* Electives.
* Independent research project.
* Field work:
  1. First year - total of 50 hours.
  2. Second year - total of 150/200 hours of supervised field training.
* Written comprehensive examination plan or thesis plan.

Student Group:

No information given.
Cost:

Per academic year, resident - $1,413.00
Per academic year, non-resident - $4,773.00

Financial Aid:

No information given.

Source: Program Brochure from Dr. A.H. Katz, Director April, 1984.
UNIVERSITY OF COLORADO, Denver

Person Contacted:

M. S. MORSE, Ph.D.
Program Director
Genetic Associate Program
University of Colorado School of Medicine
Health Sciences Center
Department of Biophysics and Genetics
4200 East Ninth Street
Denver, CO 80262
(303) 394-8202 or 394-8442

Program Description:

The Genetic Associate program leading to a master of science degree will provide training in the fundamentals of human genetics as well as certain technical and clinical aspects of medical genetics. The training is intended to provide graduates with the background necessary to assist physicians and scientists in medical genetics programs either in their clinical or research aspects.

Admission Requirements:

* Baccalaureate degree or its equivalent from a college or university of recognized standing.
* Minimum G.P.A. of 2.75 or its equivalent.
* GRE scores.
* One year of biology.
* One year of general physics.
* Physical chemistry or biochemistry.
* Differential and integral calculus.
* Organic chemistry.
* Genetics.

Recommended: 1. Courses in statistics and embryology.
2. Interview.
3. Letters of recommendation.

Curriculum:

* One quarter's work in a cytogenetic laboratory.
* One quarter's work in a biochemical genetics laboratory.
* One quarter's work in a genetic counseling clinic.
* Acquire a grade of B or above in all courses required.
* M.S. degree earned by each of 2 routes:

Plan I (more laboratory orientated)

* 36 quarter hours.
* Comprehensive oral examination.

Plan II

* 45 quarter hours.
* Comprehensive oral and written examinations.

Student Group:

1977-78 report (Marks, Joan. 1979) stated that 7 enrolled in M.S. program.

Cost:

Resident - $165/6 hours/quarter
Non-resident - $1209/quarter

Financial Aid:

The genetic program currently offers no formal support. Every effort, however, will be made to find summer jobs in one of the laboratories associated with the Medical Genetics program. The Graduate School of the University of Colorado offers two types of assistance: doctoral fellowships and graduate grants.

Source: Program Brochure from Dr. M.L. Morse, Program Director
October, 1984
UNIVERSITY OF IOWA, Iowa City

Person Contacted:

ASSISTANT DEAN, GRADUATE STUDIES
COLLEGE OF NURSING
University of Iowa
College of Nursing
Iowa City, IA 52242
(319) 353-4555

Program Description:

The graduate program offers a Master of Arts degree in nursing. The curriculum is designed to help the student develop an area of nursing specialization in adult health, child health or community/family health nursing. The major allows for role preparation in clinical human genetic counseling for those who are interested.

Admission Requirements:

* Baccalaureate degree in a nursing program accredited by the National League for Nursing.
* Maintained a G.P.A. average of 2.70 (4.00 scale) in an undergraduate program.
* GRE scores.
* Miller Analogies Test scores.
* Current U.S. nurse licensure.
* Three references from persons qualified to evaluate the applicant's academic and professional performance.
* A career goal statement.
* Satisfactory completion of a statistics course is necessary before enrolling in the research component.

Curriculum:

* A 45 semester hour program which includes 17 semester hours of advanced nursing core courses.
* Thesis on Genetic Counseling.
* A final written comprehensive examination and successful defense of the thesis.

Student Group:

No information given.
Cost:

Per semester, resident - $736
Per semester, non-resident - $1,800

Financial Aid:

Awards are made on the basis of merit competition, but limited funds are available in the form of tuition grants to assist graduate students having substantial financial need.

Source: Program Brochure from Nursing Department March, 1985
UNIVERSITY OF MICHIGAN, Ann Arbor

Person Contacted:

ROBERT P. ERICKSON, M.D.
Genetic Counseling Program
University of Michigan
Department of Human Genetics
4708 Medical Sciences II
Ann Arbor, MI 48109
(313) 764-5490

Program Description:

Since 1979, a master's degree program in genetic counseling has been offered through the Department of Human Genetics. The program's objective is to train master's level genetic counselors by providing a solid academic experience, combined with a variety of supervised clinical internships. Students are expected to function quite independently within this setting, which enhances their ability to perform responsibly and productively when their training is completed.

Admission Requirements:

* Three letters of recommendation.
* GRE scores plus biology subject test scores.
* Bachelor's degree.
* Course in genetics.
* Course in organic chemistry.
* Course in calculus.

Curriculum:

* 30 semester credit hours of study with minimum of 12 hours in human genetics.
* Field work required; at least 50 distinct supervised counseling experiences.
* Four consecutive semesters (1½ years) of required and elective course work.
* Four clinical internships completed during summer semester.
Student Group:

Each year one or two students are admitted into the Master's Genetic Counseling program at University of Michigan.

Cost:

- Per academic year - resident - $3,300
- Per academic year - non-resident - $7,000

Financial Aid:

The genetics department has no formal sources of support for master's degree students, although such students can usually find part-time work on campus or in the community.

Source: Program Brochure from Dr. R. P. Erickson, Program Director, October, 1984.
UNIVERSITY OF OKLAHOMA, Oklahoma City

Person Contacted:
WAI-YEE CHAN, Ph.D.
University of Oklahoma Health Sciences Center
Genetic Counseling Program
Biomedical Sciences Bldg., Room 856
P.O. Box 26901
Oklahoma City, OK 73190

Program Description:

The master's program in genetic counseling is provided by the Biochemistry and Molecular Biology Department at the University of Oklahoma. The graduate degree programs in the Human Biochemical Genetics Section are administered by graduate faculty in this department as well as the Departments of Medicine, Pediatrics and Pathology. The full spectrum of the discipline is covered, including molecular events in the chromosome, metabolism, cell development and genetic counseling.

Admission Requirements:

* Three letters of recommendation.
* GRE scores including verbal, quantitative, analytical and advanced (biology or chemistry). Candidates who score less than 1000 on the GRE or less than 585 on the Advanced Standing Test will not be considered for conditional admission unless their G.P.A. is greater than 3.5 and their coursework is adequate.
* G.P.A. of 3.0 over the last 60 semester (90 quarter) hours of graded undergraduate work, or 12 semester (18 quarter) hours of graded graduate work.
* Personal interview. (This may be waived by department.)
* Brief autobiographical sketch.
* Candidates must have taken adequate science, chemistry or other coursework as prescribed in the Graduate College Handbook. (This information was not sent to me.)

Curriculum:

* A thesis or a non-thesis program is offered. The decision as to which of these programs is followed rests with the student and advisor.
* A minimum of 32 total credit hours in courses such as Biochemistry, Human Genetics, Computer Methods for Biology and Medicine, Principles of Epidemiology, Biostatistics, Clinical Interviewing and Counseling Techniques, etc.

Student Group:

No information was given.

Cost:

No information was given.

Financial Aid:

The Graduate College and the department have several financial assistance programs. These include competitive fellowships, fee waiver scholarships, Oklahoma State Regents' programs and Doctoral Study Grants for Minorities.

Source: Program Brochure from Martin Levine, Graduate Admissions April, 1985.
UNIVERSITY OF PITTSBURGH, Pennsylvania

Person Contacted:

KENNETH L. GARVER, M.D., Ph.D.
Director
Department of Reproductive Genetics
Magee-Women's Hospital
Forbes and Halket Streets
Pittsburgh, PA 15213
(412) 647-4168

Program Description:

Since 1974, a program specifically in genetic counseling has been available at the University of Pittsburgh. The Genetic Counseling Program is a two-year (five term) program leading to a Master of Science in Hygiene degree. The program reflects the view that the genetic counselor must have the sensitivity and communication skills to work with individuals or families who have concerns arising from genetic disease or the risks of genetic disease. The program is designed to be fully interdisciplinary, integrating the biological and social sciences. The curriculum emphasizes the moral and ethical issues that underlie genetic interventions.

Admission Requirements:

* Bachelor's degree in biological science, social science or related field.
* Minimum of a 3.0 G.P.A.
* Interview with director of program.
* GRE scores, a requirement of the graduate school, but scores are not a deciding factor in the admissions process.
* One course in social science.
* Sufficient courses in mathematics and biology.

Recommended: a course in counseling techniques.

Curriculum:

* Core courses in human genetics program.
* Internship requirements.

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* Research project.
* Master's degree thesis.
* Pass a final comprehensive examination on all phases of training.

**Student Group:**

It is the intent of the program staff to accept ten students each year into the human genetic counseling program.

**Cost:**

No information given.

**Financial Aid:**

No information given.

**Source:** Program Brochure from Dr. K.L. Garver, Program Director, October, 1984
UNIVERSITY OF TENNESSEE, Memphis

Person Contacted:

NELLIE P. TATE, Ph.D
Memphis Branch Interim Director
University of Tennessee
847 Monroe Avenue
Memphis, Tennessee 38163
(901) 577-4463

Program Description:

The University of Tennessee School of Social Work is a fully accredited two-year graduate professional school. Satisfactory completion of the school's educational program leads to the Master of Science in Social Work degree.

Currently, they have an opportunity for one student each year to qualify for training with the University of Tennessee Genetics Clinic. They umbrella this under their health care elective concentration in the school of social work. A student in field placement with the Genetics Clinic will take courses in genetics at the College of Medicine and these credit hours count as electives in the Social Work Program.

Admission Requirements:

* A strong overall undergraduate preparation plus heavy emphasis on physical science courses is needed to be able to pass the necessary courses successfully.
* Bachelor's degree from an accredited college or university; at least three-fourths of the applicant's undergraduate work should be in the social sciences, humanities and physical sciences.
* Three recommendation/reference forms.
* Personal interview may or may not be required. Student may request a personal interview.
* G.P.A. of 2.5 on a 4.0 scale. Preference is given to applicants with a 3.0 average in undergraduate work who has substantial preparation in the social sciences.
* Personal qualifications that are found acceptable for entrance into the professional practice of social work.
* The placement of a particular student for internship with the University of Tennessee Child Development
Center and the Genetics Clinic is a joint decision with the school and training clinics. Involves placement interviews.

Curriculum:

* Foundation curriculum: a 30 quarter hour sequence of five basic courses required of all students before entering either of the concentration programs.
* Twelve hours of the concentration program in either social work treatment or social welfare administration and planning.
* Elective concentration in genetic counseling with an internship at the University of Tennessee Child Development Center and the Genetics Clinic.
* An overall G.P.A. of 3.0 or better on all graded courses.
* Completion of each required course with a grade of C or above. Graduate courses may not be repeated to raise a grade.
* Performance at a satisfactory level in field practicum.
* Successfully passing a written comprehensive examination or completing a research thesis, which must be defended in an oral examination.

Student Group:

Currently an opportunity exists for one student each year to qualify for training with the University of Tennessee Genetics Clinic.

Cost:

Per quarter, resident - $469
Per quarter, non-resident - $1,127

Financial Aid:

The university receives and awards a limited number of stipends and scholarships that pay fees and tuition and/or a monthly payment. The school's Alumni Association and other interested groups provide a small number of scholarships and loans. The school also has a selected number of graduate assistantships.

Source: Program Brochure from Dr. Nellie Tate, Program Director April, 1985
UNIVERSITY OF WISCONSIN, Madison

Person Contacted:

JOAN BURNS, M.S., M.S.S.W.
University of Wisconsin
Department of Medical Genetics
Waisman Center
1500 Highland Avenue
Madison, WI 53706
(608) 263-5611

Program Description:

The University of Wisconsin offers an M.S. degree in Medical Genetics in a program specifically designed to train Genetics Associates. It is possible for students admitted for graduate study in genetics to take selected academic courses and practicum experiences in social work and other relevant departments to gain counseling skills in addition to the knowledge base in genetics required to prepare for the genetic associate profession.

Admission Requirements:

* GRE scores plus biology subject scores.
* Three letters of recommendation.
* Written statement of reasons for graduate study in genetic counseling.
* Combination of 30 social sciences and/or social work credits.
* One year of zoology or biology.
* One year of general chemistry.
* One semester of organic chemistry.
* One semester of calculus or statistics.
  Recommended: Courses in anatomy, biochemistry and embryology.

Curriculum:

* Clinical research and/or case report of publishable quality.
* Field work for first year (16 hours per week).
* Field work for second year (supervised work in genetic clinics).
* Genetics practicum taken during summer session.
* Pass final written examination similar to Board of Medical Genetics Certification Examination.

**Student Group:**

The standard enrollment in the genetics counseling program is 9-10 students. Normally, about five new students are admitted to the program each year.

**Cost:**

- Per semester, resident - $838
- Per semester, non-resident - $2,536

**Financial Aid:**

There is no formal financial aid for students in the master's program, but students can be helped to find jobs in genetic-related areas.

**Source:** Program Brochure from Joan Burns, Program Director October, 1984
INTERVIEW with a PRACTICING GENETIC COUNSELING ASSOCIATE

PERSON INTERVIEWED: KIM HARDEN, Genetic Associate
State Board of Health
Indianapolis, Indiana 46223

DATE: March 29, 1985

PLACE: Ms. Harden's office
State Board of Health
Indianapolis, IN

TIME: 5:00 PM to 6:30 PM

INTERVIEWED BY: KATHLEEN KENKEL, Student
Ball State University
Muncie, IN 47306

NOTE: Kim Harden's answers to the following questions have been paraphrased for easier reading, due to the lengthy nature of the interview.

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Q. How did you first hear about genetic associates and what made you decide to go into a program preparing you to be a genetic associate?

A. I was graduated from Indiana University with a bachelor's degree in psychology. I then moved back to Indianapolis and got a job working for the Medical Genetics Department at the Indiana University Medical Center. I met a graduate student there who had graduated from the genetic counseling program at Irvine, California. I had been exposed to human genetics at the Medical Center and became increasingly interested in one of these counseling programs. So, after two years of working, I decided to go back to school.

Q. How did your expectations of the genetics program fit the reality of the program once it began?

A. I went into the program at Berkeley, California, with a very strong interest in genetic education. On the other hand, Berkeley's main emphasis was on counseling training. I feel it enriched me and stretched me tremendously in what I learned. I have been able to apply my counseling knowledge to some of the educational work that I've done. But, I do feel it would be helpful for me to have some basic training in educational methods.

Q. How did the program train you to deal with bioethical issues involved in genetic counseling?

A. We were required to take a course in ethics at Berkeley. Principles that were introduced in that class I have certainly thought of many times in my work. During the field work phase of the training, bioethical issues frequently came up and I would discuss them not only with my Medical Geneticist Supervisor at the clinic, but also with my supervisors back on campus. There was always someone to turn to in difficult situations.

Q. How did the clients react to you when they knew you were in training?

A. Well, we usually introduced ourselves as Genetic Counseling Interns. We didn't come out and say we were students but we certainly wouldn't hide the information if someone asked. People would sometimes ask how old I was and how long I'd been doing this, and I was instructed in ways to respond to these questions. I really can't remember having any bad experiences with clients during my field work.
Q. Did the program have any way of screening out students once they were enrolled and participating in it?

A. Yes, in the one preceptorship that we were all required to do during our second year, we went through in pairs. My "pair" or other half, was asked to leave in our last quarter of the program. It was pretty unreal. None of us felt it was handled very well. It has since turned out that this man was allowed to finish the program at Berkeley a few years later. However, there have been a handful of students who were not allowed to finish.

Q. How well do you think the program prepared you for what you were expected to know and do once you got your first job?

A. The counseling training I received was very good. We had an excellent course in medical genetics, and I feel it would have been helpful to have a few more classes like that one. Embryology is very important and has come in handy for me many times. I do feel, though, that more training in education was needed. There are many times when you find yourself going out into the community and educating the public about human genetics and the related services that are available. This "outreach" work is common and unfortunately, it wasn't stressed in the Berkeley program.

Q. How well are you accepted by physicians and other staff at your place of employment? Have you ever felt discriminated against because you don't have your medical degree?

A. That is a good question! It varies from place to place. There are genetic professionals - clinicians - who work very much as a team, which is great. Some M.D.s realize how important it is that the "team" deal with the issues of how the family is coping and what resources are available to them. Not all M.D.s are like that. There were times for me when I was extremely frustrated working with certain M.D.s. Either these physicians don't see any point in dealing with psycho-social issues, or they just plain don't want to deal with these issues.

Q. So, what do these M.D.s see your role as?

A. I wonder sometimes. Maybe an information gatherer, and sometimes I don't feel like it is clear to them. The Berkeley program made me appreciate the importance of the psycho-social
aspects of genetic disease. I wish some M.D.s would realize
the importance of these aspects too.

Q. Do you ever get clients that don't trust in your
competence and want to deal with the doctor instead?

A. Not very often. There were a few exceptional couples
here and there that would insist on seeing the physician.
If that is a problem with them and they insist, then I send
them to the physician.

Occasionally, people will ask my age or how long I've
been doing this . . . in a sense feeling me out to see if I
am someone they could trust. Sometimes I could deflect the
questions and respond in a way that instilled some confi­
dence in them, rather than feeding their anxiety.

Q. Does the counseling get pretty emotional for you and
the clients?

A. Oh yes, for me as well as the couples. There is a lot
of anxiety and fear that a client will try to "keep a lid
on", but it usually surfaces sooner or later and you see the
emotional turmoil.

My most rewarding experience as a genetic counselor
has been when a couple comes in and I realize they are not
communicating well with each other and haven't been for some
time; when I can start that process or open it up again, it
is extremely rewarding for me. The Berkeley program was
instrumental in teaching me how to do this.

Q. How hard or easy is it to find a genetic counseling job?

A. It all depends on where you are willing to go. In the
backs of most genetics journals, such as The American Journal
of Human Genetics, there is usually a list of job openings
in genetics-related jobs. At least one or two genetic
counseling positions are listed in every issue. The question
comes down to where, and if, you are willing to relocate.

Q. Do you feel that the present salary of genetic counselors
is reasonable?

A. No, not at all. I feel the salary is too low. Some
states are better than others, but Indiana is not one of the
better ones. One of the most frustrating things about this
field is that there is very little growth potential. It is
not like in a business where you can climb the ladder -
there is nowhere to go. Until there are more genetic counselors who are integrated into policy-making; or until there are supervisory positions open to genetic counselors, there is no upward mobility. I find this very frustrating.

Q. What is involved in the certification process* for genetic associates?

A. First you have to apply for the certification test. This application procedure requires that you submit a log/journal of 50 case studies of counseling consultations that you have instructed. There is also an application form documenting your educational background, work experience, recommendations from supervisors, etc. If you are then granted permission to take the certification examination, you may pick a location. When I took the test it was only offered in about nine cities in the country, so I had to travel to Chicago.

The general exam is given first and lasts about three hours. It was easier than I had expected. Then you are required to take a sub-specialty exam, and of these four, I was required to take the genetic counseling exam. This exam also lasted three hours. I felt it was much more difficult. All in all, it was a pretty intense experience.

Q. If you don't pass the examination, can you take it over?

A. Yes, you can. But the cost to take the exam was around $175, so it could get pretty expensive to take it over and over.

Q. Do you think there should be some way of evaluating the job performance of the graduates of genetic counseling programs?

A. I think that this is taken care of by the certification process. I wanted to mention before that in the past it was thought that certification would eventually lead to licensure of genetic counselors. Well, licensure isn't going anywhere right now. There aren't enough genetic professionals in any one state to make that a priority in the state legislature. Hopefully, licensure will be a possibility in the future.

Licensure would definitely help for reimbursement of counseling services by a third party. If you can demonstrate that you have a license to do genetic counseling, then maybe insurance companies would go along with reimbursement of the counseling.

*Appended as pages 42, 43 and 44 is a statement concerning training and certification in genetic counseling.
APPENDIX to Interview

TRAINING AND CERTIFICATION IN GENETIC COUNSELING: (Adapted from the 1978 Report of the Council on Accreditation and Certification of the American Society of Human Genetics.)

An individual certified as a Genetic Counselor must work as part of a clinical genetics program, under the direct supervision of a Clinical Geneticist of Ph.D., Medical Geneticist.

Required Skills: Competence in this area implies that the Genetic Counselor:

-- is able to elicit interpret individual and family histories;

-- has sufficient appreciation of the medical aspects of the problem;

-- has sufficient knowledge of genetic and mathematical principles to understand the clinical, genetic and mathematical bases for genetic risk estimates;

-- is able to integrate clinical and genetic information in order to appreciate the limitations, interpretations and significance of specialized genetic and laboratory procedures;

-- has sufficient awareness and skill in the communicative process that he/she is able to transmit pertinent information effectively, i.e., in a way that is meaningful to the individual or family;

-- has the skills in interviewing the counseling techniques required to: (1) elicit from the patient or family the information necessary to reach an appropriate conclusion; (2) to anticipate areas of difficulty and conflict; (3) to help the family or individual recognize and cope with their (his/her) emotional and psychological needs; and (4) to recognize those situations requiring psychiatric referral;

-- has sufficient knowledge of available health care resources that, when necessary, he/she can formulate programs of action and sources of services available to individuals and families.

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MINIMUM REQUIREMENTS FOR CERTIFICATION:

Master's Degree in Genetics, Social Work, Public Health, Nursing, or individuals with doctoral degrees who are either not eligible or do not wish to apply for certification as a Clinical Geneticist or Ph.D. Medical Geneticist.

Coursework: In the principles of human genetics, including basic principles of genetic transmission and gene action, cytogenetics, immunogenetics, biochemical genetics and developmental genetics; applied human genetics or clinical genetics, including clinical cytogenetics, inborn errors of metabolism, congenital malformations; methods in human genetics/clinical genetics, including laboratory techniques, amniocentesis, pedigree analysis and estimation of genetic risk.

Coursework/Seminars/Tutorials/Clinical Conferences: in the behavioral sciences, including psychological aspects as they relate to genetic counseling of patients and their families, interviewing and counseling techniques; crisis intervention; clinical medicine; medical record systems; community services and health care agencies (local, state and federal).

Supervised Experience in Genetic Counseling: There should be at least 50 distinct supervised counseling experiences in families with a wide variety of disorders reflecting the scope of a general Genetics Clinic. A log book must be submitted. Work experience in a clinical genetics program can possibly be used as an alternative for the supervised experience in a training program.

-- Recommendation by the Training Program Director as to the candidate's academic record.

-- Recommendation by the Director or Supervisor of a Clinical Genetic Training Program (in whose program they are doing the practical training) certifying that the individual is competent in communicative and counseling skills under a wide variety of circumstances.

-- Following approval of the individual's course work and experience by the certifying body, the candidate will be admitted to a written 2-part examination. Part 1 will cover basic genetic principles. Part 2 will be involved with counseling techniques and practical and theoretical aspects of genetic counseling.

We recognize that there are individuals, often called "genetic assistants", performing limited disease specific
counseling, under the direct supervision of the Clinical Genetics, Ph.D. Medical Geneticist, or Genetic Counselor, for whom certification will not be available.

Source: This memo was included in the Program Brochure from Dr. R. P. Erickson, University of Michigan, October, 1984.
A Personal Postscript

When I chose to do a study of master's degree Genetic Counseling Associates programs, I did not fully realize that I was the first person, at least to my knowledge, to compile information about the twelve programs in the United States. The most anyone else had done prior to this study was to prepare a listing of the programs, their directors, and the college or university in which each was located.

I thought I might have trouble collecting information from all twelve schools, but, for the most part, everyone was very cooperative. Some directors requested a copy of my paper on its completion, for their own files and personal use. Some of the program directors even wished me luck and made me feel confident that I was doing something worthwhile with my time and effort.

I do hope this paper will be helpful for students who are considering a career in genetic counseling. My thesis advisor, Dr. Thomas Mertens, is of the opinion that my findings will be useful in helping other students make career choices. This study has helped me immensely in my decision to apply to some of these programs and to pursue a career as a Genetic Counseling Associate.
Literature Cited


HARDEN, KIM. Personal interview. 29 March 1985.


