Proposed European Curriculum for MSc Genetic Counselling

Eligibility to register – Master level education

Introduction

The EBMG proposes that all genetic counsellors be educated at Master level and this should be a Master degree in genetic counselling.The topics to be included in the curriculum for a Master degree in genetic counselling are included in Table 1.

Practical Component

The practical component of the course (placements) should account for at least 50%of the course teaching hours. A minimum of 25% of the course teaching hours (50%of the practical placement hours) must be spent by the student in a genetics centre under the mentorship of a genetic counsellor (or where this is not possible, the mentorship of an experienced medical geneticist).

During the genetic counselling placement, it is expected that the student will progress from observation of practice (initially) to partial involvement in deliveringcare, through to management of cases (under supervision).

The placements in clinical genetics contexts should offer students the opportunity to:

- Develop awareness of the professional role of the genetic counsellor.
- Develop communication and counselling skills.
- Facilitate application of theory to practice.
- Develop skills in caseload management.
- Understand the roles of members of the multi-disciplinary team.

Students should have experience during the placement period in reproductive genetics, genetics related to adult onset diseases, paediatric genetics and cancer genetics.

Table 1. European Core Curriculum for the Master programme in Genetic Counselling

N.B. The number of the relevant European competence is included in brackets after each topic.

Topic	Knowledge	Skills	Attitudes
Counselling skills	Enable the student to acquire knowledge on: - philosophy of genetic counselling (including a non-directive counselling approach) (1,5,13,15) - relevant counselling theories (1,5,13,15) - core and advanced counselling skills (1,3,4,5,7,13,14,15) - the range of potential psychological and emotional reactions to living with a genetic condition in the family or living at risk (3,4,7)	Provide adequate opportunity for students to develop the ability to: - use of a range of appropriate communication and counselling skills (1,3,5) - communicate effectively with the patient and family (1,3,4,5,15) - assess the patient's psychological state (prior/current) (1,3,4,5,7) - facilitate decision-making (1,3,4,5) - reflect on own practice (12,13,14,15) - adopt a non-judgemental approach (5) - develop self-awareness to reflect on and inform own practice (11,12,13,14) - use clinical and counselling supervision (13,14,15).	Provide an environment in which the student can develop: unconditional acceptance of each individual (1,3,5,13).
Psychological issues	Enable the student to acquire knowledge on: - relevant psychological theories including grief and loss, responses to risk, impact of event (3d, 5) - impact of family history on	Provide adequate opportunity for students to develop the ability to: - prepare a patient for the potential outcomes of a genetic test (3b, 3c, 5) - make the patient aware	

	individual and family(3d, 5) - impact of positive and negative test results on individual and family (3d, 5) - potential reactions of individuals such as siblings, parents, obligate carriers to genetic risk or test results (3d, 5) - impact of living with disease and test result (4,5) - the nature of pre-symptomatic testing and differences to diagnostic testing (1,3) - the issues related to family communication, including the possibility of non-disclosure of information between family members (3b, 3d).	of possible psychological responses to their situation (5) - support individuals to disclose genetic information to family (3c, 4) - facilitate decision making (5) - use counselling[1] and clinical[2] supervision (10,14) - use skills to explore patients' past and current psychosocial situation (1, 5).	
Medical Genetics	Enable the student to acquire knowledge on: - inheritance patterns (2) - common genetic conditions (symptoms, prevalence, penetrance, testing options, inheritance pattern, condition management), including cardiac, neurological, oncology, dysmorphology, metabolic./endocrine, haematology conditions (2, 7) - types of mutations (2) - interpretation of test results (2, 7)	Provide adequate opportunity for students to develop the ability to: - draw and interpret pedigrees (2) - explain inheritance and genetic concepts in patient appropriate language (3a) - access relevant medical information (2, 7) - Interpret test results (7,14,17) - prepare patients for testing and offering post-test support (3d, 4, 5) - assess genetic risk (2).	

	- technologies for testing (7) - different uses of testing (PST, carrier, PND, diagnostic) (3a, 3b, 7) - application of testing (3b, 7) - research methods (16) - embryology including normal embryology and its relationship to congenital malformations (7) - therapeutic technologies (3b, 14) - Impact of consanguinity (2, 3a)		
Human genetics	Enable the student to acquire knowledge on: - structure of DNA, genes and chromosomes (and common terms) (7) - transcription, translation, protein synthesis (7) - mutations and their effects (7) - meiosis and mitosis (7) - gametogenesis (7) - recombination, non-disjunction, sister chromatic exchange (2, 7) - X-inactivation (2, 7) - inheritance patterns and mechanisms (2, 7) - chromosomal aberrations,structural and numerical (2, 7)	Provide adequate opportunity for students to develop the ability to: -Draw and interpret a family pedigree (2, 6, 7) -Explain genetic concepts and concepts or risk/probability to the patient in appropriate and culturally sensitive language (1, 3) -Correlate mutations and chromosomal abnormalities to disease (2, 7).	

	- mitochondrial inheritance (2, 7) - patterns of inheritance (2, 7) - multifactorial disease (2, 7) - non-traditional types inheritance eg imprinting (2, 7). - techniques for detecting abnormalities (7) - methods of finding a disease gene (7) - epigenetics (2, 7).		
Genomics	Enable the student to acquire knowledge on: - Next generation sequencing, whole exome and whole genome analysis (8). - Analytical and clinical sensitivity and specificity of these tests (8). - How bioinformatics strategies can be applied to genomic and genetic data (8). - Potential application of emerging technologies development of Genomic services in your country and Europe (8, 11).	Provide adequate opportunity for students to understand: - The theory of sequence analysis and the use of genome analysis tools and bioinformatics databases (8). - Types of sequencing, applications and limitations (8). - Visualising sequencing outputs with Genome browsers such as IGV (8). - Types of sequencing performed - Processing the output - genome assemblies as the key to many analyses - Analysis, annotation and interpretation of genomic information of VUS (2, 3, 8, 10). -The different Guidelines	

		and Standards for the Interpretation, classification and Report of Sequence Variants (2, 3, 8). -The limitations and challenges faced by current sequencing technologies and additional, incidental and secondary findings from whole genome sequencing (3, 8).	
Ethics/Law Sociology	Enable the student to acquire knowledge on: - ethical principles for healthcare practice (13) - components of informed consent (1,16) - human rights (including those of the fetus) (13,14) - genetic law and guidelines (12,13,17) - cultural competence (3,4,5,15) - impact of illness and/or disability on the individual, family and society (3,4) - insurance, employment and discrimination issues relevant to genetic conditions (12,16).	Provide adequate opportunity for students to develop the ability to: - work within the ethical and legal framework relevant to their practice and national setting (13) - obtain and record informed consent (6, 14, 16) - practice in a reflective manner (14, 15, 17) - be aware of their own limitations and seek help or guidance when appropriate (14, 15) - deliver non-directive care in a supportive manner (5) - utilise listening skills (1, 7) - be sensitive to the patient's concerns and	Provide an environment in which the student can develop: - respect for the individual's culture, values and beliefs.

		psychological needs (4, 5, 15).	
Practical preparation	Enable the student to acquire knowledge on: - the health service structure in the country of training (4) - sources of support and information for self and patients (4, 17) - the impact of a genetic condition on individual, family and society (3) - effective functioning of the multi-disciplinary team (10) - the role of health and social care professionals involved with an individual with a genetic condition (4, 10) - counselling skills (1, 5) - communication skills, including contacting patients face to face, by telephone and in writing (1, 5).	Provide adequate opportunity for students to develop the ability to: - manage a genetic caseload (9) - develop an empathic relationship with the patient (1, 5, 15) - work collaboratively within the multi-disciplinary team (11) - manage cases safely and effectively (8, 14) - produce clear correspondence including referral letters and post-consultation summary letters (3a, 6, 7) - make clear and contemporaneous health records (6) - work within the professional code of conduct for genetic counsellors (13) - work safely as an autonomous practitioner (14, 15, 17) - gain broad experience in different relevant areas of healthcare and/or social care[3] (12, 17) - obtain broad experience in provision of genetic services (11) - develop counselling and communication skills (14,	

		15, 17) - understand limitations of own skills and knowledge (13).	
Education and research	Enable the student to acquire knowledge on: - a range of relevant research methods in relation to genetic counselling practice[4,5] (16, 17) - tools for use in adult education (10, 15).	Provide adequate opportunity for students to develop the ability to: - conduct critical appraisal of relevant research evidence (7) - conduct a research study related to genetic counselling[4] (7) - provide education to patients (10) - provide education to other health professionals (10).	Provide an environment in which the student becomes a lifelong learner.

1. Counselling supervision is 'a contracted, professional relationship between two or more individuals engaged with counselling activities, which leads to reflection on the counselling situation and its structure'[1].
2. Clinical supervision is formalised support offered within the clinical team to ensure patient safety and the development of the practitioner. It usually involves case discussion and review.
3. The purpose is to help the student understand the impact of a genetic condition on the life of the individual and family.
4. The research should be focused on genetic counselling, and should not include laboratory research.
5. Social science research methods should be included.

Reference

1. European Association for Counselling (2012) Counselling Supervision. Accessed at http://www.eacnet.org/index.php?/Standards-and-Ethics/counselling-supervision.html on 27 February, 2012.