Preamble
Cytogenetics is a branch of laboratory medicine concerned with the study of chromosomes and how chromosomal anomalies relate to human disease and phenotype.

At the completion of training, the cytogenetics fellow will have acquired the competencies described and will function effectively as a clinical cytogeneticist. The fellow will develop full competency to function as an independent cytogeneticist through graded responsibility during the training program.

The CCMG training guidelines are modeled after the CanMEDS framework\(^1\). This framework includes the competencies required of specialists and the role of the specialist beyond that of the specialty medical expert. The other roles of the specialist are now recognized as that of communicator, collaborator, manager, health advocate, scholar, and professional. The detailed objectives describe minimal standards and in no way exclude the necessity for mastery of additional knowledge, skills or attitudes necessary for the practice of cytogenetics.

Required Background
Trainees in CCMG-accredited programs must have either a PhD or an MD degree.

A candidate’s PhD must have a strong genetics content. The required educational experience would approximate that required for an MSc in genetics and molecular biology, or the laboratory specialty. If this experience is lacking, the trainee must gain this knowledge through suitable courses and/or private study.

Individuals with an MD degree must have completed at least 3 years of residency training in a program accredited by the Royal College of Physicians and Surgeons of Canada (RCPSC) and/or Collège des Médecins du Québec (CMQ).

Administrative Aspects
1. Supervisory committee:
   a. Each trainee’s program will be supervised by a committee, headed by a Fellow of the CCMG in cytogenetics who takes primary responsibility for the training.
   b. The committee will consist of the head and a minimum of two additional members. Other members might consist of molecular and clinical geneticists, although the structure of the committee can vary depending on the background of the trainee.
   c. The committee ensures the trainee is registered with the CCMG Credentials Committee by submitting a registration form to the CCMG Secretariat by August 1 of the first year of training.
d. The committee takes responsibility for ensuring the training program is in keeping with CCMG guidelines, including graduation of responsibility in the laboratory and clinical setting. The committee must submit an outline of completed and planned training with the trainee’s application for credentialing.

e. The committee meets every six months with the candidate, and ensures that in-training evaluation forms are completed and discussed with the trainee. If remedial work is needed by the trainee, the committee must ensure that this is provided.

f. The committee completes and submits the Final In-Training Evaluation Report (FITER) to the CCMG secretariat by August 1 of the final year of training.

2. Location of training
   a. Cytogenetics training must take place in a centre accredited by the CCMG for training in Cytogenetics.
   b. Elective training may be done at non-accredited centres at the discretion of the supervisory committee.
   c. In the event of termination of accreditation of a centre during the candidate’s training, the trainee will be allowed a maximum of six months to move to an accredited center for completion of training.

3. Training in foreign centres
   a. Training in American centres accredited by the American Board of Medical Genetics (ABMG) is recognized by the CCMG.
   b. As the ABMG and CCMG have different credentialing requirements, it is the responsibility of the trainee to ensure completion of all requirements of the CCMG.

4. Part-time training
   a. Part-time training is recognized by the CCMG, provided it conforms to all requirements in this document and the trainee spends a minimum of 50% of time in the program.
   b. The total amount of time must equal two complete years in training.

Content of Training
Two year program, including:

Mandatory training:
1. Minimum of 12 months in a primary CCMG-accredited Cytogenetic laboratory that provides cytogenetic diagnostic services. Training will include:
   a. Technical skills: Hands-on experience with all wet and dry bench cytogenetics tasks, with a logbook recording a minimum of 20 cases in which there was significant participation of the trainee in the laboratory. Cases may include wet bench (culture, harvest, slide preparation in tandem with qualified laboratory personnel) and/or dry bench (microscopic analysis, digital image capture and karyotyping) involvement. It is the responsibility of the local fellowship committee to determine if the trainee requires more cases to become familiarized with all technical aspects.
b. **Interpretative and consultative skills**: Experience in interpretation and communication of results, with a logbook recording involvement in a minimum of **200 cases**. It is the sole responsibility of the local fellowship committee to determine the total number of cases to be reviewed by the candidate to ensure a high level of competence. The candidate is required to request special stains as appropriate, review karyotypes and/or FISH data, write the correct ISCN nomenclature, and write the interpretation.

**Case distribution**: The representation of each tissue type amongst the 200 cases is as follows: prenatal (amniocentesis and/or CVS); tissue (skin biopsy and/or products of conception and/or fetal autopsy); oncology (unstimulated blood and/or bone marrow and/or soft tumor); and peripheral blood leukocytes (pediatric and adult samples). A **minimum of 30 cases is required in each category** and must cover all current cytogenetic technologies.

**Abnormal/Illustrative cases**: At least **120** representative abnormal cases are required. A minimum of 20 cases from each tissue type is required and no more than 2 of each abnormal/illuminative scenario may be used. Illustrative scenarios may include any of the following: maternal cell contamination; contamination of cell cultures; handling of mislabeled specimens; level I mosaicism; and acrocentric polymorphism. In order to meet the abnormal/illustrative minimums in each category, archival material may be used (to a maximum of **40 archival cases**). A complete cytogenetic interpretation (including ISCN nomenclature and report) of all of the abnormal cases should be performed. However, only the ISCN karyotype need be submitted.

c. **Management skills**: Experience in management of a cytogenetic diagnostic laboratory.

2. Rotations in other medical genetics specialties, including:

a. **Molecular genetics laboratory training**: a minimum of **three months** to be spent in a CCMG-accredited training laboratory providing molecular genetic diagnostic services. This may be reduced to two months if the local fellowship committee deems that the candidate has sufficient relevant experience.

b. **Clinical genetics training**: a minimum of **two-months** to be spent in clinical genetics, with a CCMG certified clinical geneticist, but not necessarily in a CCMG accredited centre. This may be reduced if the local fellowship committee deems that the candidate has sufficient relevant experience. The trainee should keep a logbook recording participation in a **minimum of 25 counselling sessions**, representing a variety of clinical scenarios. Participation must include developing an understanding of the issues through researching the literature and discussions with clinical colleagues.

3. Courses/conferences

a. Documented participation in educational events and courses prescribed by the trainee’s supervisory committee.

b. Documented attendance at one national or international genetics meeting each year.
4. Research training
   a. Minimum **six months** involvement in a research project related to
cytogenetics, ideally culminating in submission of a publication to a refereed
journal. The supervisory committee must approve the area of research. The
research project can be in any of the following: basic research; a clinical case
report with a literature review; a review of the literature; or research and
development of a technological area.
Given that promotion and career development will depend not only on clinical
service responsibilities, but also on published research, research training
should be encouraged to include clinical aspects of cytogenetics, in addition to
basic science. Trainees with little or no previous research experience should
be encouraged to take an extra year in research. The extra year need not be in
an approved CCMG centre.

**Elective training:**
1. Rotations in related fields, such as biochemical genetics, embryopathology/
developmental genetics, oncology, haematology, pathology, and relevant aspects of
obstetrics.
2. Rotations in other cytogenetic diagnostic service laboratories or CCMG training
centres.

**Documentation required for qualification to write CCMG Cytogenetics examination:**
The paper or electronic logbook should contain documentation of:
1. Trainee technical participation;
2. Cytogenetic cases (only the ISCN karyotypes need be submitted);
3. Clinical counselling sessions;
4. Educational activities.

Logbook column descriptions for cytogenetic cases and trainee technical participation:
1. Entry # and Date: Ordered entry from 1-200 with date performed;
2. Case #: Use for familial cases (for example, entry # plus family member a, b, c, etc);
3. Specimen Type: Use the following codes: PND (prenatal); ON (oncology); BL
(blood); T (tissue);
4. Reason for Referral: Enter brief description of diagnostic situation;
5. Procedures Formed: Use the following codes: WL (wet lab); DL (dry lab); RM
(report management);
6. Result: Indicate A (abnormal); N (normal) or AR (abnormal archived case);
7. Abnormal Results: Using a separate sheet, list the Entry # with the karyotype in ISCN
nomenclature for each abnormal case.

The CCMG ‘Logbook of Technical Experience’, ‘Logbook of Consultative Experience’,
and ‘Logbook of Clinical Experience’ forms are available on the CCMG website for
documentation of laboratory and clinical activities.

Patient confidentiality must be guarded. Therefore, cases submitted to the CCMG must
not be traceable and have all identifiers removed.
Cytogenetics Training Guidelines

Key and Enabling Competency Statements

Note:
The 7 Roles are the thematic groups of competencies that organize the CanMEDS format (Medical Expert, Communicator, Collaborator, Manager, Health Advocate, Scholar, Professional).

The Key Competencies are the overall culminating objectives of training. They are meant to be summative and cumulative, while also being observable and measurable.

The Enabling Competencies are the skills that allow the Key Competencies to be achieved. The Enabling Competencies break-down the Key Competencies into observable and measurable statements.
MEDICAL EXPERT

Key Competencies

By the end of training, Cytogenetics Trainees will demonstrate the ability to:
1. Appropriately and proficiently use general medical genetic and specialized cytogenetic knowledge and laboratory skills for ethical and effective generation of patient results as outlined below;
2. Access and apply relevant information to cytogenetic cases;
3. Demonstrate effective consultation services with other health care professionals.

Enabling Competencies

1. Explain advanced concepts in human cytogenetics, molecular biology and medical genetics.

To achieve this, the Cytogenetics Trainee will be able to:
1.1. Describe fundamental cytogenetic principles:
   1.1.1. Historical development of clinical cytogenetics;
   1.1.2. Chromosome and DNA structure and function;
   1.1.3. Fundamental concepts of mitosis, meiosis, including behaviour and segregation of normal and structurally altered chromosomes;
   1.1.4. Cytogenetic techniques used in gene mapping, and their limitations;
   1.1.5. Principles of population genetics, patterns of inheritance, genetic variation and polymorphisms;
   1.1.6. Theories relating to the origin of numerical and structural anomalies;
   1.1.7. Gametogenesis and fertilization;
   1.1.8. Oocyte and sperm contributions to genetic and cytogenetic abnormalities;
   1.1.9. Basic embryology;
   1.1.10. Genetic basis of sex-determination and X inactivation;
   1.1.11. Chromosome breakage/instability syndromes and fragile sites;
   1.1.12. Genetics and cytogenetics of carcinogenesis;
   1.1.13. Imprinting and uniparental disomy;
   1.1.14. Evolution of human chromosomes (in broad terms);
   1.1.15. Mosaicism.

1.2. Describe fundamental molecular genetic principles:
   1.2.1. The interrelationship between cytogenetic and molecular genetic based testing. Recognize the advantages, limitations and overlaps of the two methodological approaches in the diagnosis of common genetic conditions;
   1.2.2. The uses and limitations of molecular genetic testing of all specimen types;
   1.2.3. The molecular basis of common genetic, metabolic and mitochondrial diseases;
   1.2.4. The principles of current commonly used molecular genetic techniques;
   1.2.5. The use and limitation of linked DNA markers in disease diagnosis including haplotype analysis and the use of simple Bayes analysis in the calculation of risk;
1.2.6. The uses and limitations of mutation analysis and mutation screening;
1.2.7. The genetic linkage and sequence databases used in molecular genetics.
1.3. Describe fundamental biochemical genetic principles:
   1.3.1. The interrelationship between cytogenetic testing and testing for biochemical diseases;
   1.3.2. The major groups of biochemical diseases and the common techniques currently used to diagnose these diseases.
1.4. Understand fundamental clinical genetic principles:
   1.4.1. The importance of gathering an accurate and targeted prenatal, medical, developmental and family history;
   1.4.2. The physical examination, basic dysmorphology, measurement and biopsy techniques used in the clinic;
   1.4.3. The ethical issues related to genetic testing and genetic counselling with respect to confidentiality, autonomy, disclosure and privacy.

2. Demonstrate expertise with standard and advanced cytogenetic concepts, techniques and methodology.
   
To achieve this, the Cytogenetics Trainee will be able to:

2.1. Demonstrate specialized cytogenetic knowledge:
   2.1.1. The indications for performing cytogenetic analysis on all tissue types including the choice of methodology, limitations and advantages of testing. This should be evidence-based and best practice, taking into consideration current CCMG guidelines and scientific literature;
   2.1.2. The full range of clinically important constitutional and acquired cytogenetic anomalies;
   2.1.3. The aetiology (including stage or parent of origin and mechanism of formation) of the various aneuploidies and polyploidies;
   2.1.4. The incidence, clinical phenotypes, natural history and reproductive consequences and recurrence risks of aneuploidies;
   2.1.5. The aetiology (including stage or parent of origin and mechanism of formation) of structural chromosome anomalies of all types (including translocations, deletions, inversions, markers, microduplication/deletions etc);
   2.1.6. The reproductive consequences, recurrence risks and the potential imbalances arising during meiotic segregation/gametogenesis in carriers of structural anomalies;
   2.1.7. The incidence, clinical phenotypes and natural history of the well characterized unbalanced structural anomalies (such as 5p-, 4p-, iso12p etc);
   2.1.8. The incidence, clinical phenotype and natural history of recurring microdeletion and microduplication syndromes;
   2.1.9. The differential diagnoses of non-cytogenetic conditions that may phenotypically resemble specific chromosomal anomalies (phenocopies);
   2.1.10. The diagnostic approach to chromosomal mosaicism in all tissue types, especially in prenatal diagnosis, including criteria for inclusion and confidence levels for exclusion;
2.1.11. The classification and differential diagnoses of haematological malignancies;
2.1.12. The classification and the differential diagnoses of those solid tumours in which cytogenetic analysis is of clinical use;
2.1.13. The chromosomal anomalies that are of diagnostic and prognostic importance in cancer, including the most appropriate applicable technology and the advantages and limitations inherent in each test. This includes the interrelationship between cytogenetic and molecular testing as it applies to cancer diagnosis and management;
2.1.14. The appropriate principles of cytogenetic nomenclature (ISCN rules);
2.1.15. The types and clinical significance of fragile sites;

2.2. Demonstrate specialized cytogenetic laboratory skills:
2.2.1. The principles, applications, limitations and trouble-shooting aspects of all techniques and stains used in diagnostic conventional and molecular cytogenetics;
2.2.2. Fluorescence in situ hybridization (FISH) including probe types, selection, hybridization, washing, detection and fluorescence microscopy;
2.2.3. Validation, sensitivity and specificity issues as they relate to any cytogenetic technique e.g. metaphase versus interphase FISH;
2.2.4. ‘Homebrew probes’ including design using database sources, labelling and validation for clinical use;
2.2.5. Comparative genomic hybridization (CGH) arrays in terms of applicability in the clinical laboratory setting and the future trends in cytogenetics;
2.2.6. Recognition and interpretation of cytogenetic polymorphisms/heteromorphisms including those found with molecular cytogenetic methodology.

3. Design and implement effective cytogenetic testing.
To achieve this, the Cytogenetics Trainee will be able to:
3.1. Karyotype and identify normal and abnormal chromosome complements, both under the microscope and by analysis of prints of G-banded chromosomes at all band levels;
3.2. Appropriately recommend further cytogenetic analysis/other cytogenetic techniques required to complete a particular case;
3.3. Recommend other genetic/non-genetic laboratory testing that would be of clinical benefit;
3.4. Use the medical/scientific literature when compiling a report;
3.5. Perform the basic techniques used in the clinical cytogenetic laboratory such as tissue culture, harvesting, fixing and banding of metaphases, special stains and FISH;
3.6. Understand the basics of computerized karyotyping;
3.7. Act as a specialty consultant competent in the application of clinical cytogenetics to current medical practice.
COMMUNICATOR

Key Competencies

By the end of training, Cytogenetics Trainees will demonstrate ability to:
1. Develop rapport, trust and ethical relationships with the health care team;
2. Accurately elicit required relevant clinical information from the health care team;
3. Accurately convey appropriate verbal and written information to the health care team;
4. Develop a common understanding on issues and problems (such as financial constraints and or test limitations);
5. Write cytogenetic reports that are complete, accurate, and understandable;
6. Use appropriate ISCN nomenclature and include clinically relevant comments in cytogenetic reports.

Enabling Competencies

1. Provide consultation for cytogenetic diagnostic cases to other health care providers, laboratory staff, patients and others.
To achieve this, the Cytogenetics Trainee will be able to:
1.1. Collate information about cytogenetic diagnostic testing for relevant diseases;
1.2. Communicate with referring health care providers or other individuals regarding appropriate cytogenetic diagnostic investigations for clinical cases.

2. Collate required clinical and other laboratory information to facilitate decision making for appropriate cytogenetic test utilization.
To achieve this, the Cytogenetics Trainee will be able to:
2.1. Recognize the importance of clinical or other laboratory information for cases referred for cytogenetic diagnostic testing;
2.2. Utilize clinical and other laboratory information to make decisions regarding appropriate cytogenetic diagnostic testing to be performed.

3. Report results and implications of cytogenetic diagnostic testing to relevant healthcare providers.
To achieve this, the Cytogenetics Trainee will be able to:
3.1. Correlate results with clinical and/or other laboratory information;
3.2. Communicate cytogenetic diagnostic results and implications in both oral and written forms;
3.3. Maintain patient confidentiality and privacy in the reporting of results;
3.4. Provide consultative services regarding implications of cytogenetic testing results and additional recommended investigations.
COLLABORATOR

Key Competencies

By the end of training, Cytogenetics Trainees will demonstrate ability to:
1. Consult effectively with physicians and health care professionals;
2. Contribute effectively to other interdisciplinary team activities;
3. Demonstrate a respectful attitude to other colleagues of an interprofessional team.

Enabling Competencies

1. Participate effectively as a team member with relevant health care providers in collaborative decision making.
To achieve this, the Cytogenetics Trainee will be able to:
1.1. Describe the role and responsibilities of a clinical cytogenetics professional to other health care providers;
1.2. Participate as a team member in activities related to cytogenetic testing, including education, research and clinical care;
1.3. Demonstrate respect for other health care professionals and their role in health care teams;
1.4. Network with other cytogenetic diagnostic laboratories.

2. Mediate decision-making in interprofessional teams.
To achieve this, the Cytogenetics Trainee will be able to:
2.1. Demonstrate appropriate conflict resolution skills;
2.2. Facilitate communication within interprofessional teams to prevent and resolve conflicts.
MANAGER

Key Competencies

By the end of training, Cytogenetics Trainees will demonstrate ability to:

1. Utilize cytogenetic testing resources effectively;
2. Manage staff, equipment and sample resources in a cytogenetic diagnostic setting;
3. Promote quality assurance in a cytogenetic diagnostic testing;
4. Maintain complete and accurate records of cytogenetic diagnostic testing;
5. Manage time effectively and prioritize required activities.

Enabling Competencies

1. Utilize cytogenetic testing resources effectively.
   To achieve this, the Cytogenetics Trainee will be able to:
   1.1. Use cytogenetic testing resources to balance costs with potential implications of results;
   1.2. Organize multiple cytogenetic diagnostic investigations in an appropriate concurrent or sequential manner;
   1.3. Coordinate cytogenetic diagnostic testing with other diagnostic investigations;
   1.4. Determine what constitutes an unacceptable or suboptimal specimen or result;
   1.5. Determine what constitutes the most appropriate specimen for a specific diagnostic question and how such a specimen should be procured and processed in the cytogenetic laboratory;
   1.6. Advise on the principles of establishing new technologies in the cytogenetic laboratory including but not limited to the cost/benefit ratio, sensitivity and specificity of the test and the validation of the test method and the results;
   1.7. Demonstrate knowledge of the CCMG Cytogenetic Practice Guidelines.

2. Manage staff, equipment and sample resources in a cytogenetic diagnostic setting.
   To achieve this, the Cytogenetics Trainee will be able to:
   2.1. Describe equipment and supplies used in cytogenetic testing and their associated costs;
   2.2. Prepare a laboratory budget;
   2.3. Demonstrate familiarity with bids and service contracts for laboratory equipment;
   2.4. Explain the technical training requirements for laboratory technologists;
   2.5. Develop appropriate laboratory protocols for cytogenetic diagnostic laboratory staff;
   2.6. Demonstrate knowledge of the use of work load units;
   2.7. Ensure safe laboratory operating procedures consistent with the Workplace Hazardous Materials Information System (WHMIS) biohazard regulations;
   2.8. Demonstrate knowledge of the provincial requirements for accreditation of cytogenetic and general hospital laboratories, and the cytogenetic requirements for CCMG accreditation of centres.
3. Promote quality assurance in cytogenetic diagnostic testing.

To achieve this, the Cytogenetics Trainee will be able to:

3.1. Explain the concepts of laboratory quality assurance programs, including methods of implementation and monitoring;
3.2. Describe issues in quality assurance that are particular to cytogenetic diagnostic testing.

4. Maintain complete and accurate records of cytogenetic diagnostic testing.

To achieve this, the Cytogenetics Trainee will be able to:

4.1. Describe methods to implement and maintain an efficient system to manage laboratory information, data and reports;
4.2. Maintain complete records for all cases, including written, electronic and oral information. Demonstrate knowledge of laboratory information systems for patient tracking and record maintenance;
4.3. Maintain confidentiality for all cases, including written, electronic and oral communication;
4.4. Explain the medico legal implications in the practice of cytogenetics and appropriate use of medical records.

5. Manage time effectively and prioritize required activities.

To achieve this, the Cytogenetics Trainee will be able to:

5.1. Prioritize and manage time to balance required activities;
5.2. Recognize critical aspects of certain activities and allocate time appropriately.
HEALTH ADVOCATE

Key Competencies

By the end of training, Cytogenetics Trainees will demonstrate the ability to:
1. Interpret specific public health practices or policies that affect provision of cytogenetic testing services;
2. Respond to the health care needs of individuals, communities and populations served by cytogenetic diagnostic testing.

Enabling Competencies

1. Interpret specific public health practices or policies that affect provision of cytogenetic testing services.
To achieve this, the Cytogenetics Trainee will be able to:
1.1. Explain how health care governance influences resource allocation for cytogenetic services at the local, regional, provincial and national level;
1.2. Describe the roles of national and international organizations in the determination of guidelines affecting cytogenetic diagnostic testing;
1.3. Participate in discussion regarding public policy and decision making processes with respect to current and future cytogenetic diagnostic testing.

2. Respond to the health care needs of individuals, communities and populations served by cytogenetic diagnostic testing.
To achieve this, the Cytogenetics Trainee will be able to:
2.1. Recognize and respond to those medical genetic issues where advocacy is appropriate;
2.2. Identify community resources and related patient support groups for individuals and families affected by cytogenetic disorders;
2.3. Liaise with individuals, communities and populations on issues applicable to cytogenetic diagnostic testing.
**SCHOLAR**

**Key Competencies**

*By the end of training, Cytogenetics Trainees will demonstrate the ability to:*
1. Conduct ongoing learning activities to maintain and advance professional knowledge;
2. Facilitate the learning of other health care professionals, students, laboratory staff, the public and others regarding cytogenetic diagnostic testing;
3. Conduct research projects for the advancement of the field of cytogenetic diagnostics.

**Enabling Competencies**

1. **Conduct ongoing learning activities to maintain and advance professional knowledge.**
   *To achieve this, the Cytogenetics Trainee will be able to:*
   1.1. Critically assess the literature as related to human genetics, cytogenetics and diagnostics;
   1.2. Attend continuing education events, including conferences, rounds, clinical and research seminars, patient conferences;
   1.3. Recognize limitations of current knowledge base and seek appropriate continuing educational activities.

2. **Facilitate the learning of other health care professionals, students, laboratory staff, the public and others regarding cytogenetic diagnostic testing.**
   *To achieve this, the Cytogenetics Trainee will be able to:*
   2.1. Deliver effective lectures and presentations on human genetics and cytogenetic concepts;
   2.2. Present concise and audience appropriate summaries of cytogenetic diagnostic methodologies, clinical situations related to cytogenetic diagnostic testing and case reports or presentations.

3. **Conduct research projects for the advancement of the field of cytogenetic diagnostics.**
   *To achieve this, the Cytogenetics Trainee will be able to:*
   3.1. Plan and conduct a minimum **six month research project** related to human cytogenetic diagnostics;
   3.2. Summarize results in a format suitable for publication in a refereed journal;
   3.3. Identify personal limitations with respect to previous research experience and conduct appropriate activities to address these limitations.
**PROFESSIONAL**

**Key Competencies**

*By the end of training, Cytogenetics Trainees will demonstrate the ability to:*

1. Conduct ethical practices in cytogenetic diagnostic testing;
2. Act in a respectful manner consistent with the role of a clinical cytogenetic diagnostician.

**Enabling Competencies**

1. **Conduct ethical practices in cytogenetic diagnostic testing.**
   *To achieve this, the Cytogenetics Trainee will be able to:*
   1.1. Maintain confidentiality and ensure appropriate release and protection of cytogenetic diagnostic samples, data and reports;
   1.2. Recognize ethical issues in cytogenetic diagnostic testing, including but not limited to testing of minors, impact of cytogenetic test results on extended family members, and prenatal testing;
   1.3. Recognize the sensitive nature of genetic samples and information and act to minimize potential harms;
   1.4. Identify personal limitations and the necessity of seeking the opinions of colleagues or other professionals when required;
   1.5. Identify technical laboratory limitations requiring referral to other laboratories.

2. **Act in a respectful manner consistent with the role of a clinical cytogenetic diagnostician.**
   *To achieve this, the Cytogenetics Trainee will be able to:*
   2.1. Demonstrate a professional attitude to clinical and laboratory colleagues, to laboratory staff, students and trainees, and patients;
   2.2. Demonstrate the ability to recognize and respond appropriately to abuse, gender bias, discrimination, intimidation, and disrespect;
   2.3. Demonstrate the knowledge of how to sustain career satisfaction.

**REFERENCE**