**UW Medicine - Pathology**

400-09-01-12

Medical Genetics Resident Rotation in Cytogenetics Policy

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| Adopted Date: 05/2004  Review Date: 06/2006  Revision Date: 03/2007 |

PURPOSE

The goals of the Cytogenetics rotation are: (1) to help residents understand the principles and concepts of Cytogenetics, including the basis of chromosomal disorders for which clinical laboratory testing is available; (2) to provide residents with practical experience in Cytogenetics, including interpretation of diagnoses; (3) to provide residents with some technical knowledge including possibilities and limitations of the procedures; (4) to understand how clinical laboratory services are provided; and (5) to understand the ethical and psychological issues affecting cytogenetic testing.

POLICY

1. **Objectives**

The objectives are presented below, organized by the general competencies defined by the Accreditation Council for Graduate Medical Education (ACGME) as expected of all residents.

* 1. **Patient Care**

The resident will demonstrate ability to:

* + 1. Gather appropriate and accurate clinical information
    2. Interpret laboratory test results within the clinical context
    3. Use clinical decision-making concepts and techniques in interpreting results
    4. Advise clinicians on choice of clinically appropriate, cost-effective tests
    5. Advise clinicians on appropriate follow-up for unexpected test results
  1. **Medical Knowledge**

The resident will demonstrate:

1. Knowledge of chromosomal mechanisms and chromosomal disorders
2. Knowledge of cytogenetic tests and their medical application and correlation
3. Knowledge of the characteristics and limitations of major laboratory techniques used for cytogenetic testing
4. Ability to collect and evaluate medical evidence related to test selection, interpretation, and reporting, such as mode of inheritance of chromosomal abnormalities, evaluation of risks, and genotype/phenotype correlation
5. Ability to use a variety of resources to investigate cytogenetics questions
6. Development of a personal strategy to regularly maintain and update medical knowledge
   1. **Practice-Based Learning and Improvement**

The resident will demonstrate:

* + 1. Ongoing identification and remediation of gaps in personal medical genetics knowledge
    2. Ability to use laboratory problems and clinical inquiries to identify process improvements that may minimize opportunities for medical errors
  1. **Interpersonal and Communication Skills**

The resident will demonstrate:

1. Ability to communicate clearly and effectively with clinicians, cytogenetic technologists and other medical personnel
2. Ability to use appropriate modes of communication (direct, telephone, e-mail, written)
3. Ability to prepare and deliver effective presentations
   1. **Professionalism**

The resident will demonstrate:

* + 1. Knowledge and understanding of ethical, privacy, social and psychological issues affecting cytogenetic testing
    2. Maintenance of confidentiality of patient information
    3. Respectful behavior towards all patients and medical personnel
    4. Prompt and courteous response to all pager and telephone calls
    5. Regular, punctual attendance and participation in conferences and meetings and rotation responsibilities
  1. **Systems-based practice**

The resident will demonstrate:

1. Understanding of the role of the laboratory in the health care system, and the importance of reliable, cost-effective and timely laboratory results in clinical decision-making
2. Ability to work with clinicians, administrators and others to determine the role of the laboratory in specific situations to optimize patient outcomes
3. Understanding of CLIA, CAP and ACMG requirements that pertain to cytogenetic laboratories

### Responsibilities

* + 1. Orientation to Laboratories

The resident will receive an initial orientation to key areas and personnel on their first day in the Cytogenetics laboratory.

* + 1. Laboratory Responsibilities

The resident will:

* + - 1. Participate in daily sign-out (approximately at 1pm-varies). This session includes a review of about 10 or more files of cases being signed out by cytogeneticists who are board-certified by the American Board of Medical Genetics.
      2. Learn the basic principles of cytogenetic nomenclature (ISCN) for the definition of specific chromosomal abnormalities. The most current ISCN nomenclature book is available in the Cytogenetic laboratory.
      3. Learn about indications for specific cytogenetic tests, types of abnormalities, and risks to the patient carrying a chromosomal abnormality. The resident will be assigned reading of specific chapters in books on Cytogenetics, available in the laboratory.
      4. Review the written test protocols to understand the methodologies (including sample log-in, culture set-up, harvesting, slide making, staining, microscopy, image capture and karyotyping) employed to obtain cytogenetic diagnoses. Observe cytogenetic technologists to learn the methodologies applied to different sample types (e.g. blood, amniotic fluid, bone marrow and solid tissue) as well molecular cytogenetics (fluorescence in situ hybridization).
      5. Set up his (her)-self a blood culture, harvest it and do the microscopic analysis to establish a karyotype using G-banding. Other banding techniques and FISH analyses will be demonstrated.
      6. Learn karyotyping by cutting at least 10 photographs of G-banded metaphase cells to establish diagnosis.
      7. Analyze and interpret test results, search the relevant literature and review written reports with the cytogeneticists who are signing out.
    1. Presentations, Course, Conferences, and Meetings

1. Case sign out: Residents will meet with the cytogeneticist on duty for case sign-out daily (at about 3pm).
2. Pathology 530--This graduate course on Human Cytogenetics is held alternate years in the spring quarter. Residents are required to attend.
3. Cytogenetics meeting: Meetings (bimonthly on Tuesday at 11 am) alternate between Journal Club and Laboratory meetings. Residents are encouraged to present.
4. Prenatal Diagnosis Conference: Friday at 11am weekly: review of current cases in terms of ultrasound, cytogenetic (or genetic) and pathology findings and patient management.
   1. **Portfolio**

The following items should be in the resident’s portfolio at the end of the rotation:

* + 1. A case log of 10 representative cases or problems handled or resolved by the resident. This should consist of a description of the case or problem, reason for referral, information and data collected by the resident, and the resolution with appropriate follow-up. All patient data should be “de-identified.”
    2. A file that contains the information gathered by the resident on the blood case he (she) set up. This file should include records of culture set up, harvest, slide making, staining, microscopy analyses and karyotype, using the forms used in the laboratory for regular cases. A final diagnosis should be obtained including ISCN (2005) nomenclature and interpretation of results.
  1. **Additional Requirements for ABMG Accreditation**

The following additional requirements are a part of the Cytogenetic Specialty Training for Medical Genetics residents or fellows:

1. ABMG required log of 150 cases
2. A special project emphasizing investigation into improvements in the clinical or research mission of the department and/or laboratory. The end result should be at least one of the following: 1) A submission for publication to an approved journal, 2) Original unpublished research used for method improvement and as a reference citation in the laboratory manual, 3) Development and/or implementation of a new clinical (or research) service, assay or test, 4) A departmental level (or larger) presentation.

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Other references as recommended by the Directors.

Written By: Director Approval:

(Signature and Date) (Signature and Date)

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Cytogenetics Supervisor