2020-2021 Island Health
Resident Orientation To Laboratory Medicine

"Phlebotomy or Patient Sample to Powerchart"

Monday, July 13th 2020

Overview

There is extensive involvement of Laboratory Medicine in the diagnosis, management and monitoring of disease states. Furthermore, laboratory measurements are frequently used in the therapeutic and safety monitoring of drug therapy. Therefore, pharmacy residents need to have some understanding of the department of laboratory medicine and its organization and function.

During your day of orientation the morning is spent with the Chief Laboratory Technologist at the Royal Jubilee Hospital. The residents will be given a tour of the lab and will be introduced to the various laboratory subsections: CORE Lab (Chemistry/Hematology), Special Hematology, Microbiology, Histology, Blood Bank, Special Chemistry (at VGH) and Accessions. The resident will review the rotation objectives before the rotation so that pertinent questions can be asked of laboratory personnel during the tour.

The second half of the day will be spent with lab physicians in the areas of Clinical Chemistry, Anatomical Pathology, , Hematopathology and Medical Microbiology. The resident will be then be oriented to the medical subspecialties in the lab and the roles they play in the health care system.

Overall Learning Objectives

1. **To understand the role the medical laboratory plays in the modern healthcare system.**
2. **To understand what takes place behind the scenes in the production of laboratory results.**
3. **To appreciate the journey a patient specimen takes from the bedside through the lab to the powerchart result and the professionals involved in the process.**

Learning Objectives

At the end of the laboratory orientation day the resident will be able to:

General Laboratory Medicine

1. Describe the allied health professional occupations that work in the lab: Medical Laboratory Technologists (MLT), Medical Laboratory Assistants (MLA), and Pathology Assistants. Describe the functions they perform in the laboratory and the training required for these occupations.

2. Describe the subspecialties of laboratory physicians that work in the lab: Clinical Chemists, Medical Microbiologists, Anatomical Pathologists and Hematopathologists. Describe the functions they perform in the laboratory and the resources they can provide. Describe the training required for these occupations.

3. Describe how medical laboratories are regulated and how laboratory technologists are registered

    a. Diagnostic Accreditation Program of The College of Physicians & Surgeons of BC
    b. Canadian Society of Laboratory Technology (CSLT)
    c. BC Society of Laboratory Technology (BCSLT)

4. Describe the path that a blood sample will take from the vein of a patient (inpatient and outpatient) to the reporting out of the results.

5. Describe the range of common test results seen in powerchart and identify the subsection of the lab where the testing takes place.

6. Describe the process the lab uses when a “critical result” is reported out. Describe what actions are taken when a critical result is reported for an outpatient after hours.

7. List which drugs have laboratory assays available for therapeutic drug therapy monitoring.

8. Describe how “normal ranges” are established for laboratory test results.

General Laboratory: Questions to Ask During Tour

a. What are the different tube types required for various blood tests?
b. What is the color coding system for the different tube types?
c. What colored tube is used for common test types (ie CBC, Chemistry, etc)
d. Describe the substances used in the blood collection tube to prevent the blood from clotting in the various tube types.
e. How are medical laboratories reimbursed by the medical services plan in BC for outpatient testing? How are inpatient lab services funded within the Health Authority.
f. Describe how laboratory tests listed on a clinical ordersets are reviewed and approved of by the department of laboratory medicine.
g. Describe how laboratory results get from the analyzer into powerchart for viewing by care providers.
h.

General Laboratory Quality Control

9. Describe what steps a clinician should take when he or she thinks a laboratory result is erroneous.

10. List common phlebotomy errors that can cause erroneous laboratory measurements.

11. Describe how quality control is conducted and managed in the testing of samples.

Hematology & Blood Bank

12. Describe the types of blood products and derivatives that are dispensed by the blood bank and some the situations that these products are used for.

13. Describe the surgery types that take place at the Royal Jubilee Hospital which are the largest consumers of blood products.

14. Explain the criteria used to decide if a blood transfusion is required.

15. Describe the similarities between the laboratories utilization management of blood products and laboratory tests and the pharmacy's oversight of drug therapy utilization.

Hematology & Blood Bank: Questions to Ask During Tour

a. How and why is a crossmatch is performed when a blood transfusion is required.
b. What is “flow cytometry”?
c. What is the Coulter principal is and how does it enable this method of measurement.
d. What process that takes place in the lab when there is a request for a new assay that is not currently available? For example, a request for anti-Xa levels for the monitoring of the DOAC drugs rivaroxaban, apixaban and edoxaban.
e. What is the autologous blood collection program?
f. Explain how whole blood is processed to create the blood derivatives that are used in the Canadian blood supply system.

Anatomical Pathology

16. Explain how autopsies are ordered and the circumstances where autopsies are mandatory.

17. Compare and contrast the role of the pathologist with the role of the coroner.

18. List common disease states where a tissue-based diagnosis is made by an anatomical pathologist.

Anatomical Pathology: Questions to Ask During Tour

a. How is tissue is prepared for pathologist review?
b. Describe what happens to body parts and tissues that are removed by a surgeon in a hospital setting.

Medical Microbiology

19. Describe how antibiotic sensitivities are determined.

20. Describe how blood cultures are processed.

21. Describe the role of a Medical Microbiologist and how they interact with the infectious disease team and other medical staff.

Clinical Chemistry

22. Describe the role and functions of a clinical chemist.
23. Describe what kind of training is required to become a chemical chemist.

Clinical Chemistry: Questions to Ask During Tour

a. What does the typical day of a clinical chemist look like?
b. What steps does the lab go through when a new test is going to be added?
c. How does the lab determine what testing is done in house and what is sent out?
d. How does the lab select what analyzer to purchase?