
# Hematology

## *Specialty Courses for Phlebotomists*

National Center for Competency Testing

*7007 College Boulevard, Suite 385 | Overland Park, Kansas 66211*
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# Hematology Specialty Certificate Course For Phlebotomists

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NCCT is continually refining and creating professional development products for all certified allied health professionals. We are committed to your success. This mini course was designed to help healthcare professionals understand the special needs of the geriatric phlebotomy patient.

The course is divided into chapters. There is an open-book quiz at the end of every chapter to help you assess your understanding of that chapter's material. Upon completing all the chapters, you can access this mini course's final examination on-line at NCCT's website, www.ncctinc.com. Proceed to the ***Testing*** section, and choose the ***CE Test Login*** option, and log in. Choose the ***Hematology for Phlebotomy Final Exam***.

Seventy per cent or better is considered a passing grade for this course. Upon passing the course's final exam you will receive a Specialty Certificate and a sticker from NCCT signifying that you have successfully completed this course. This sticker should be placed in your NCCT *Professional Development Log Book*. You will also receive five clock hours of continuing education credit and the course title will be placed on your *NCCT Continuing Education Transcript*.

Acquiring new skills and pursing additional knowledge in your career field has always been the hallmark of a true professional. Read, learn, and most importantly, enjoy your profession more. Your new knowledge will not only increase your competence and importance to your team, but will also increase your own self-assurance in your ability and work.

## Learning Outcomes

Upon completion of the Competence Certificate Course, the professional will be able to:

1. Define Hematology
2. Relate appropriate prefixes and suffixes to hematologic terms
3. Differentiate whole blood from clotted blood.
4. Differentiate serum from plasma.
5. Discuss samples used for hematology and coagulation testing.
6. Define complete blood count (CBC).
7. List the components of a complete blood count.
8. List normal values for each component of a complete blood count.
9. Discuss red blood cells to include structure and function.
10. List and describe the three basic cell types found in a sample of whole blood.
11. List and describe 5 types of white blood cells.
12. Discuss the function of each of the major types of white blood cells.
13. Describe the structure of a platelet.
14. Discuss the function of platelets.
15. Describe an erythrocyte sedimentation rate test.
16. Define coagulation.
17. Produce a simple diagram of the coagulation cascade.
18. Differentiate the three major components of the coagulation system.
19. Discuss the role of platelets in the coagulation system.
20. Discuss the implications of under or overfilled sample tubes for coagulation.
21. Describe the steps involved in performing the bleeding time test.
22. Discuss anticoagulant therapy.

23. Relate anticoagulant therapy to complications of phlebotomy.

24. Briefly describe timed collections for patients receiving warfarin and heparin therapies.

# CHAPTER 1 HEMATOLOGY BASICS

Hematology is one of the four major disciplines of laboratory science. The tests performed in this discipline are among the mainstays of diagnostic medicine. The phlebotomist is a vital player in the hematology laboratory. Samples for hematologic and coagulation testing are collected frequently in inpatient, outpatient and home care settings. Improper collection may have a serious impact on the testing outcomes. Rapid turnaround times and accurate results are imperative for providing information on which practitioners base treatment decisions. At times, these decisions are made in rapid succession. The practitioner has to be confident that test results are accurate. In comparison to other physiologic parameters, the components of hematologic tests may change very rapidly. Repeat testing may be performed in an attempt to stay abreast of homeostatic changes. The phlebotomist must also understand the implications and value of timed collections.

Coagulation testing is performed in the hematology laboratory. This testing is critical to provide valuable information related to clot formation as well as bleeding tendency. Anticoagulation therapy requires a specific dosage of timed medication. Inaccurate results may produce disastrous patient outcomes. The phlebotomist must work with nursing personnel to obtain proper specimen collection for optimum diagnostic usefulness. Understanding the criteria for of proper specimen collection will help the phlebotomist educate other healthcare personnel who may not have a detailed understanding of this process.

## Unit A Terminology

The term "Hematology," when broken into component parts is defined as "the study of blood." "Hemo" or "hemato" is from the Greek work for blood and "ology" is "the study of." This broad definition is not an accurate representation of the true workings of Hematology as a discipline. Hematology is "the branch of medicine concerned primarily with studying the formed elements of blood (blood cells) and the blood-forming tissues." [(2)] Hematology, in practice, consists of enumeration, differentiation, and assessment of the cellular elements of blood. Chemical evaluation of the liquid portion of the blood is concentrated in the disciplines of clinical chemistry and immunology. Coagulation testing is routinely centered in the hematology laboratory. Coagulation is the assessment of blood clotting function. This testing is performed on plasma with the addition of essential elements to artificially simulate the coagulation process.

A general understanding and quick reference guide to suffixes and prefixes will aid in the understanding of hematology and associated terminology. The following tables will assist with this process:

Common Prefixes using the Vocabulary of Hematology

| Prefix | Meaning |
|---|---|
| a-/an | Lack, without, absent, decreased |
| aniso- | Unequal, dissimilar |
| cyt- | Cell |
| dys- | Abnormal, difficult, bad |
| erythro- | Red |
| ferr- | Iron |
| hemo-/hemato- | Pertaining to blood |
| hypo- | Beneath, under, deficient, decreased |

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