

EXERCISE 8: BLEEDING TIME

Skills: 20 points

Objectives:

1. Properly prepare patient prior to performance of the bleeding time procedure.
2. Ascertain prior to performance of the procedure whether or not the patient has taken aspirin or any other "blood thinners".
3. State and compare the four types of bleeding time methods.
4. Define "coagulopathy", "reproducibility" and "sensitivity".
5. List 5 coagulation tests which may aid in the diagnosis of coagulopathies.
6. List the 3 factors the duration of the bleeding time is dependent on.
7. Describe the interview process for preparing the patient for the bleeding time.
8. Describe the course of action which should be taken when the bleeding time exceeds 15 minutes.
9. Correctly perform the Modified Ivy Bleeding time procedure with 100% accuracy.
10. State the sources of error which may occur in the performance of the Bleeding Time test and indicate how this would affect the test results, ie, falsely increase or decrease the test.

Discussion

The **bleeding time test** is a useful tool for testing platelet plug formation in the capillaries. It is generally used in conjunction with other coagulation tests such as the prothrombin time, activated partial thromboplastin time, platelet count, fibrinogen and fibrin degradation products (FDP) to aid in the diagnosis of patients suspected of having a bleeding disorder. Coagulopathies (problems in hemostasis) such as thrombocytopenia, qualitative platelet defects, vascular abnormalities, and von Willebrand's disease may be diagnosed with coagulation tests.

The test is performed by making a minor standardized incision in either the forearm and recording the length of time required for bleeding to cease. The duration of bleeding from a punctured capillary depends upon the following factors: quantity of platelets, quality of platelets and the ability of the blood vessel wall to constrict.

Duke Method

There have been many methods used to measure the bleeding time, dating back to 1910 when **Duke** originally described a method in which a lancet was used to make puncture wounds in the earlobe. This test was difficult to standardize, did not allow space for repeat testing and often caused undue apprehension in the patient.

Ivy Method

In 1941, Ivy et al introduced the first major innovations for standardizing the bleeding time test. Ivy chose the forearm as the bleeding time site, and he applied a blood pressure cuff inflated to 40 mm Hg on the upper arm to control capillary tone and to improve both the sensitivity and reproducibility. The **sensitivity** of a test refers to its ability to detect borderline abnormalities. The more sensitive a test is, the more likely it is to detect small deviations from the normal. The **reproducibility** of a test refers to the reproducibility of the test results when 2 persons performing the same procedure under identical circumstances arrive at identical results. This method was also difficult to reproduce due to several variables (ie, depth of puncture, length of

puncture).

Mielke Method

The **Mielke Method** is a modification of the Ivy method. In this procedure a Bard-Parker or similar disposable blade is employed, along with a rectangular polystyrene or plastic template that contains a standardized slit. The blade is placed in a special handle containing a gauge in order to standardize the depth of the incision. The same procedure as describe for the Ivy bleeding time is employed. The advantages of the template/scalpel included the following: the "surgical" incision more closely approximated the patient's hemostatic response to surgery, when compared to the puncture wound made in the Ivy procedure; the large surface area of the template minimized skin displacement; and the depth of the incision could be controlled. This procedure was not widely used because the scalpel and template required sterilization after each use. In addition, the unconcealed scalpel caused patient apprehension, which was unpleasant for both the patient and the person performing the procedure. The phlebotomist also needed to inform the patient that small scars may be caused by this method.

Commercial Bleeding Time Devices

In 1978, a bleeding time device was made commercially available. The first bleeding time device introduced was the **Simplet**. Another popular brand is called **Surgicutt**. These are sterile standardized, easy-to-use, disposable instruments that makes a uniform, surgical incision. The instrument is a spring-activated surgical steel blade housed in a self-containing plastic unit from which the blade protracts and retracts automatically, eliminating the variable of blade incision. Here again, some patients may receive slight scarring at the incision site and should be so informed prior to performing this procedure. These devices make standardized incisions and are also sterile, disposable, and relatively inexpensive. This is the most standardized method of all of the bleeding time procedures and is the method of choice.

Preparation of the Patient

After proper greeting and identification of the explain that a "bleeding time" has been ordered by his/her doctor and is a test to see how long it will take for the patient to stop bleeding and a clot to form after a puncture is made in the forearm. Unless the patient is an infant, outline to the patient how the test will be done. Explain that the test will take approximately 10 to 20 minutes to complete. Let the patient know that he may experience some discomfort from the incision and the cuff of the sphygmomanometer. After explaining the procedure to the patient stop and ask if they have any additional questions. The phlebotomist may respond to any questions the patient has concerning the procedure **ONLY**. If the patient inquires about the significance of the test relative to his/her condition, he/she should be referred to the physician who ordered the test. The patient's physician can interpret test results within the context of each patient's condition.

It is critical that you ask the patient whether or not they have taken aspirin, aspirin containing compounds (many over the counter medications contain aspirin) or blood thinners such as heparin or coumadin recently. These drugs will cause a falsely abnormal bleeding time and **the test should not be done**.

Sometimes the test is less traumatic and the time passes faster for children if their assistance is solicited in watching the stopwatch and letting the laboratorian know when to blot the blood.

Overview of Procedure

Select a site on the patient's forearm approximately three fingers widths below the bend in the elbow that is free of visible subcutaneous veins. Avoid surface veins, scars, bruises and edematous areas. Apply the blood pressure cuff and inflate to 40 mm Hg. Perform the incision after the cuff has been in place 30-60 seconds. Apply the bleeding time device to the arm in a horizontal position, do NOT apply undue pressure as this will falsely increase the depth of the incision. Start the stop watch as soon as the incision is made. The blood is wicked onto the filter paper at 30 second intervals taking great care that the wound is NOT directly touched with the filter paper. Once blood no longer stains the filter paper the timing is stopped. The bleeding time is reported out to the nearest 30 seconds.

Normal Values

1.0 - 7.0 minutes

Sources of Error

1. If the patient has taken aspirin or aspirin-containing compounds 7 to 10 days prior to the procedure, the bleeding time may be prolonged. The phlebotomist must determine the patient's history concerning aspirin ingestion to ensure quality results.
2. Results may be affected by an improperly performed puncture. A puncture that is too shallow, too deep, or in an inappropriate location will adversely affect test results.
3. The alcohol must be completely dried before making the puncture. If residual alcohol is on a puncture site, the bleeding time will be erroneously prolonged.
4. If the phlebotomist does not initiate timing of the procedure simultaneously with the puncture, the results will be adversely affected.
5. If the phlebotomist allows the filter paper to touch the wound, the platelet clot may be dislodged, causing falsely elevated results.
6. If the stopwatch has not been appropriately calibrated, it may keep incorrect time. Stopwatches should be calibrated on a regular basis as a part of the quality assurance program.

NOTE: If bleeding continues for more than 15 minutes, the procedure should be discontinued, and pressure applied to the wound sites. The bleeding time should be repeated on the other arm. If bleeding has again not ceased within 15 minutes, the results are reported as greater than 15 minutes.

EXERCISE 8: Ivy Bleeding Time

Materials:

1. Blood pressure cuff
2. Sterile, disposable blood lancet, capable of a puncture 1 mm wide and 3 mm deep
3. Stopwatch
4. Circular filter paper
5. Alcohol pads
6. Gloves

Procedure:

1. Greet and identify the patient.
2. Explain the procedure to the patient.
3. Obtain a history about aspirin or aspirin containing compounds taken within last 7 - 10 days.
4. Select a site on the patient's forearm approximately three fingers widths below the bend in the elbow that is free of visible subcutaneous veins.
5. Cleanse the outer surface of the patient's forearm by moving the alcohol pad in concentric circles from the incision site outward; allow to air dry.
6. Place a blood pressure cuff on the patient's arm above the elbow. Turn the knob on the bulb of the sphygmomanometer until it stops. Squeeze the bulb to inflate the sphygmomanometer. Inflate the cuff and maintain pressure at 40 mm Hg.
7. Holding the skin tight, and depress the "trigger" on the bleeding time device. ***The puncture must be performed within 30 to 60 seconds of inflation of the blood pressure cuff.*** Simultaneously start the stopwatch.
8. After 30 seconds have passed blot (do **not** wipe) the blood with the filter paper. **The filter paper must not touch the wound on the arm.** Blot the site at regular thirty second intervals. Rotate the filter paper after each 30 seconds.
9. When bleeding ceases, stop the watch and release the blood pressure cuff by turning the knob next to the bulb in the opposite direction used to inflate the cuff. Remove the blood pressure cuff.
10. Record the bleeding time.
11. **IMPORTANT:** If bleeding continues for more than 15 minutes, the procedure should be discontinued, and pressure applied to the wound sites. The bleeding time should be repeated on the other arm. If bleeding has again not ceased within 15 minutes, the results are reported as greater than 15 minutes.
12. After ensuring that the bleeding has stopped, carefully bandage the site.
13. Appropriately discard all used materials and wash hands.

EXERCISE 8: The Bleeding Time

Name of Phlebotomist _____

Date _____

Name of Patient _____

INSTRUCTIONS: Place a check in the appropriate column based on the following

- A** **Performed**
B **Needs Improvement**
C **Not Performed**

A	B	C	Skill
			1. Washes or sanitizes hands and dons gloves before starting the procedure.
			2. Role play: Approach, greet and identify the patient.
			3. Role play: Explains the procedure to the patient.
			4. Role play: Questions patient concerning medications taken during the past 7 to 10 days.
			5. Selects, prepares and organizes equipment.
			6. Selects an appropriate site for the bleeding time test.
			7. Positions the blood pressure cuff on the proper location of the arm.
			8. Cleanses the incision site.
			9. Prepares lancet.
			10. Inflates the blood pressure cuff to 40 mm Hg.
			11. Makes incision within 30-60 seconds of inflating the blood pressure cuff, simultaneously starts stopwatch or timing.
			12. Appropriately wicks flow of blood onto filter paper from incision every 30 seconds.
			13. Observes for the cessation of bleeding and stops timing when bleeding has ceased.
			14. Releases gauge on blood pressure cuff, removes blood pressure cuff.
			15. Cleanses the incision site and applies a Band-Aid.
			16. Records time at the bottom of this form USING APPROPRIATE UNITS.
			17. Disposes of lancet in sharps container.
			18. Disposes of other used materials appropriately.
			19. Removes all equipment.
			20. Removes gloves, washes or sanitizes hands.
			21. Leaves patient courteously.

22. **Result of Bleeding Time:** _____

23. **Bleeding time is (circle one):** **NORMAL** **ABNORMAL**

EXERCISE 8: BLEEDING TIME

Name _____ Date _____

Points: 24

1. What is the bleeding time useful for (1 points)?

2. What other coagulation tests are used, in conjunction with the bleeding time, to diagnose bleeding disorders (2.5)?

3. **Briefly** describe the bleeding time procedure as outlined in the procedure. (2 points)

4. State the three factors the duration of bleeding is dependent on (1.5 points).
 - a.
 - b.
 - c.

5. Define the following terms (1 each):
 - a. coagulopathy

 - b. sensitivity

 - c. reproducibility

6. Briefly describe the Duke bleeding time method and state the drawbacks of this procedure (1.5 points).

7. How did the Ivy bleeding time method differ from the Duke bleeding time method (1 points).
8. What is the purpose of using the blood pressure cuff during the bleeding time procedure (1.5 points).
9. Briefly describe how the Mielke bleeding time method differs from the Ivy method (1 points).
10. List three advantages of the Mielke method over the Ivy method (1.5 points).
11. State why the Mielke method was not widely used (1 points).
12. Discuss the advantage of using a device such as Simplate or Surgicutt in the bleeding time procedure (1.5 points).
13. Why is it important to find out whether the patient has been taking aspirin or aspirin containing compounds (1 point).
14. How should the phlebotomist prepare the patient for the procedure (2 points).
15. What is the correct response to give to patients who inquire about the significance of the test result (1 points).

16. State the normal values for the bleeding time (1 point).

17. State the course of action which should be taken when the bleeding time exceeds 15 minutes (1.5 points).

18. List three sources of error in the bleeding time procedure (1.5 points).