

4. Circular filter paper.
5. Alcohol sponges.

#### PRINCIPLE

Two standardized punctures of the forearm are made, and the length of time required for bleeding to cease is recorded.

#### PROCEDURE

1. Place a blood pressure cuff on the patient's arm, above the elbow. Increase the pressure to 40 mm of mercury and hold this exact pressure for the entire procedure.
2. Cleanse an area on the volar surface of the forearm with an alcohol sponge and allow to dry.
3. Choose an area approximately three finger widths below the bend in the elbow. Hold the skin tightly by grasping the underside of the arm firmly. Make two skin punctures, 3 mm deep, avoiding any subcutaneous veins. Start the stopwatch.
4. Blot the blood from each puncture site on a separate piece of circular filter paper every 30 seconds. The filter paper should not touch the wound at any time.
5. When bleeding ceases, stop the watch and release the blood pressure cuff.
6. Record the bleeding times of the two puncture sites and report the average of the two results. The normal bleeding time is 1 to 7 minutes, with bleeding times of 7 to 11 minutes considered borderline.

#### DISCUSSION

1. 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.
2. The greatest source of variation in

this test is largely due to difficulty in performing a standardized puncture. This usually leads to erroneously low results. On the other hand, if a small vein is punctured, the bleeding time will be prolonged. Therefore, if the bleeding time is less than 1 minute or greater than 7 minutes, the procedure should be repeated using the other arm.

#### Mielke Method

A modification of the Ivy bleeding time has been described by Mielke and associates (Mielke, C.H., Kaneshiro, I.A., Maher, J.M., Weiner, J.M., and Rapaport, S.I.: The standardized normal Ivy bleeding time and its prolongation by aspirin, *Blood*, 34, 204, 1969). 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 slit in the template will standardize the length of the incision. The same procedure as described for the Ivy bleeding time is employed, utilizing the blood pressure cuff. Two incisions 9 mm long and 1 mm deep are made. The average of the two bleeding times is reported. Normal values for this procedure are 2.5 to 10 minutes. It should be noted, however, that small scars may be caused by this method.

#### Simplate Method

The bleeding time, utilizing the Simplate bleeding time device (manufactured by General Diagnostics, Division of Warner-Lambert Company), is a modification of the Ivy procedure and gives results similar to those obtained in the Mielke test. The Simplate contains a spring-loaded blade within a white plastic case. When the *tear-away tab* (Fig. 127) is removed, the trigger may be depressed and the edge of the blade (5 mm in length) will spring 1 mm forward out from the housing. The



FIG. 127. Simplate bleeding time device.

incision made is 5 mm long and 1 mm deep. A Simplate bleeding time device is also available in the form of two blades in one housing (for duplicate testing).

#### REFERENCE

General Diagnostics: *Simplate Bleeding Time Device*, General Diagnostics, Morris Plains, New Jersey, 1977.

#### REAGENTS AND EQUIPMENT

1. Blood pressure cuff.
2. Simplate bleeding time device.
3. Stopwatch.
4. Circular filter paper.
5. Alcohol sponges.
6. Butterfly bandage.

#### PRINCIPLE

A uniform incision, 5 mm long and 1 mm deep, is made on the forearm, and the length of time required for bleeding to cease is recorded.

#### PROCEDURE

1. Place a blood pressure cuff on the patient's arm, above the elbow. Increase the pressure to 40 mm of mercury and hold this exact pressure for the entire procedure.
2. Cleanse an area on the volar surface of the forearm with an alcohol sponge.
3. Remove the tear-away tab on the Simplate and place it firmly on the

forearm, either perpendicular or parallel to the fold of the elbow. (Make certain the area is free of scars, surface veins, and bruises.)

4. Depress the trigger and start the stopwatch. Remove the device approximately 1 second after making the incision. (The incision should be made within 30 to 60 seconds after the blood pressure cuff has been inflated to 40 mm mercury.)
5. Blot the blood from the puncture site on a clean section of the filter paper every 30 seconds. The filter paper should not touch the wound at any time.
6. When bleeding ceases, stop the watch and release the blood pressure cuff. Record results. The normal range for this procedure is 2.3 to 9.5 minutes.
7. Place a butterfly bandage over the puncture site and advise the patient to keep the bandage in place for 24 hours.

#### DISCUSSION

1. Some patients may receive slight scarring at the incision site and should be so informed prior to performing this procedure.

#### COAGULATION TIME OF WHOLE BLOOD

The whole blood clotting time theoretically measures all stages of coagulation in the intrinsic system. Its usefulness as a screening test is limited, however. In the coagulation of blood in this procedure most of the time is consumed in the production of the prothrombin activator (plasma thromboplastin). It requires only a matter of seconds to convert prothrombin to thrombin, and fibrinogen to fibrin. Therefore, moderate deficiencies in stages 2 and 3 of the coagulation process do not significantly prolong the clotting time. The coagulation time is influenced mainly by defects in stage 1 of the clotting process.