screening test for bleeding from coagulation disorders), are discussed below.

But before that, a few words about the method of collection of blood for coagulation studies are essential. Blood for coagulation studies is colleted by venepuncture in 3.8% trisodium citrate in the ratio of 1:9, i.e. 4.5 ml of blood is added to a clean collection tube containing 0.5 ml of citrate. Care must be taken that the sample is neither haemolysed nor clotted.

Bleeding Time

Bleeding time is duration of bleeding from a standard puncture wound on the skin which is a *measure of the function of the platelets as well as integrity of the vessel wall*. This is one of the most important preliminary indicators for detection of bleeding disorders. This is also the most commonly done preoperative investigation in patients scheduled for surgery.

Principle. A small puncture is made on the skin and the time for which it bleeds is noted. Bleeding stops when platelet plug forms and breach in the vessel wall has sealed.

METHODS FOR BLEEDING TIME

1. Finger tip method
2. Duke's method
3. Ivy's method

1. *Finger Tip Method*

Procedure

- Clean the tip of a finger with spirit.
- Prick with a disposable needle or lancet.
- Start the stop-watch immediately.
- Start gently touching the pricked finger with a filter paper till blood spots continue to be made on the filter paper.
- Stop the watch when no more blood spot comes on the filter paper and note the time.

Disadvantages

i. It is a crude method.
ii. Bleeding time is low by this method.

Normal bleeding time 1-3 minutes.

2. *Duke's Method*

Procedure

- Clean the lobe of a ear with a spirit swab.
- Using a disposable lancet/needle, puncture the lower edge of the earlobe to a depth of approximately 3 mm.
- Start the stop-watch immediately.
- Allow the drops of blood to fall on a filter paper without touching the earlobe and then slowly touching the blood drop gently on a new area on the filter paper.
- Stop the watch when no more blood comes over the filter paper and note the time.

Advantages of the method

i. The ear lobule has abundant subcutaneous tissue and is vascular.
ii. Flow of blood is quite good.

Normal bleeding time 3-5 minutes.

3. *Ivy's Method*

Procedure

- Tie the BP apparatus cuff around the patient's upper arm and inflate it upto 40 mmHg which is maintained throughout the test.
- Clean an area with spirit over the flexor surface of forearm and allow it dry.
- Using a disposable lancet or surgical blade, make 2 punctures 3 mm deep 5-10 cm from each other taking care not to puncture the superficial veins.
- Start the stop-watch immediately.
- Go on blotting each puncture with a filter paper as in Duke's method.
- Stop the watch, note the time in each puncture and calculate average bleeding time (Fig. 53.2).

Advantages of the method

i. This is the method of choice.
ii. It is a standardised method.
iii. Bleeding time is more accurate.

Normal bleeding time 3-8 minutes.

Clinical Application of Bleeding Time

The bleeding time is *prolonged* in following conditions:

i. Thrombocytopenia
ii. Disorders of platelet functions
iii. Acute leukaemias
iv. Aplastic anaemias
v. Liver disease
vi. von Willebrand's disease
vii. DIC
viii. Abnormality in the wall of blood vessels
ix. Administration of drugs prior to test, e.g. aspirin

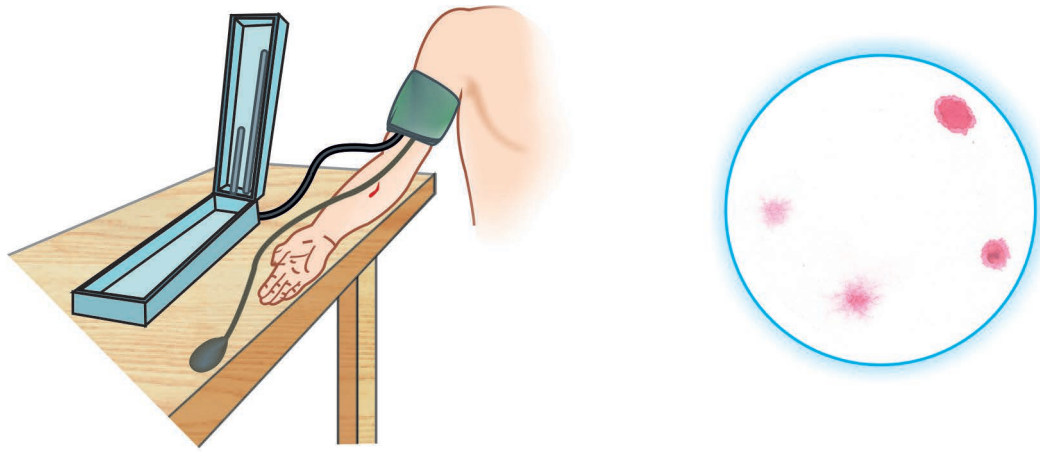

FIGURE 53.2 ◆ Ivy's method for bleeding time.

Clotting Time

This is also known as whole blood clotting time and is a *measure of the plasma clotting factors.* It is a screening test for coagulation disorders.

Various other tests for coagulation disorders include: prothrombin time (PT), partial thromboplastin time with kaolin (PTTK) or activated partial thromboplastin time with kaolin (APTTK), and measurement of fibrinogen.

METHODS FOR CLOTTING TIME

There are two methods of whole blood clotting time:
1. Capillary tube method
2. Lee and White method

1. *Capillary Tube Method*

Procedure
- Clean the tip of a finger with spirit.
- Puncture it upto 3 mm deep with a disposable needle.
- Start the stopwatch.
- Fill two capillary tubes with free flowing blood from the puncture after wiping the first drop of blood.
- Keep these tubes at body temperature.
- After 2 minutes, start breaking the capillary tube at 1 cm distance to see whether a thin fibrin strand is formed between the two broken ends.
- Stop the watch and calculate the time from average of the two capillary tubes.

Disadvantages
i. Method is insensitive.
ii. Method is unreliable.

Advantages
It can be performed when venous blood cannot be obtained.

Normal clotting time 1-5 mintues.

2. *Lee and White Method*

Procedure
- After cleaning the forearm, make a venepuncture and draw 3 ml of blood in a siliconised glass syringe or plastic syringe.
- Start the stopwatch.
- Transfer 1 ml of blood each into 3 glass tubes which are kept at 37°C in a water bath (Fig. 53.3).
- After 3 minutes tilt the tubes one by one every 30 seconds.
- The clotting time is taken when the tubes can be tilted without spilling of their contents.
- Calculate the clotting time by average of 3 tubes.

Advantages
i. More accurate and standard method.
ii. Test can be run with control.

Disadvantages
i. It is also a rough method.
ii. There can be contamination of syringe or tubes.

Normal clotting time 5-10 mintues.