Instructions for Use:

Note: *Always wear appropriate personal protective clothing as indicated by Good Laboratory Practice. If blood is spilled follow your laboratory policy or national guidance, for safe disposal.*

1. Mix the blood sample thoroughly but gently, by at least 8 full inversions of the container.

2. **Pre-citrated blood sample**: using a transfer pipette or micro-pipettor, add 300µl of the well mixed sample to a suitable test tube, (go to step 4).

3. **EDTA blood sample:** In a small test tube add 4 parts EDTA blood sample to 1 part Normal saline (0.85% - 0.145mol/L, NaCl). The minimum requirement is 240µl blood sample plus 60µl of Normal saline. Mix very thoroughly, but carefully, by at least 8 full inversions of the test tube (diagrams 1 & 2).

4. Insert a Micro-Plugged Dispette to the bottom of the test tube (diagram 3) and together place them into a correctly levelled ESR stand ensuring that the Dispette is perfectly vertical.

5. Aspirate the blood sample up the micro bore of the Dispette using a suction pump and ensure the blood has soaked into the cotton plug (see diagram 4).
   Immediately start the timer.

6. At the end of the timed hour, the result is read by aligning the eye to the level where the red cell column has dropped – leaving clear plasma above (see illustration d on page 3). Record the number of mm the red cells have dropped from the mm scale printed on the Dispette.

7. Record the result as ESR = *x* mm
   or Sed-Rate = *x* mm

   Note: It is common, though an incorrect practice, to record ESR results as *x* mm/hour or *x* mm per hour. Both the ICSH and CLSI point out that despite the common title Erythrocyte Sedimentation *Rate*, it is not in fact a rate but a measurement at one hour. Hence both these official organisations currently recommend that results should be reported as: ESR = *x* mm.

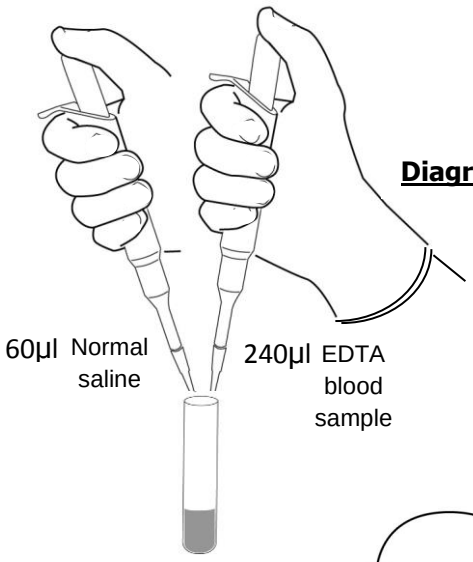

Diagram 1.

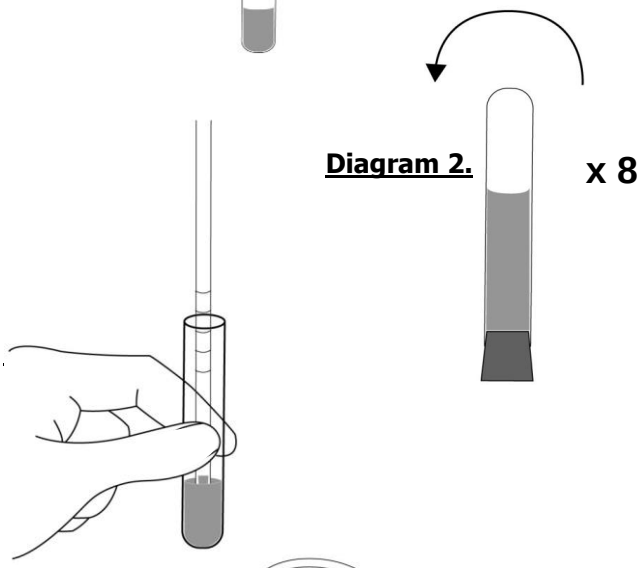

Diagram 2.

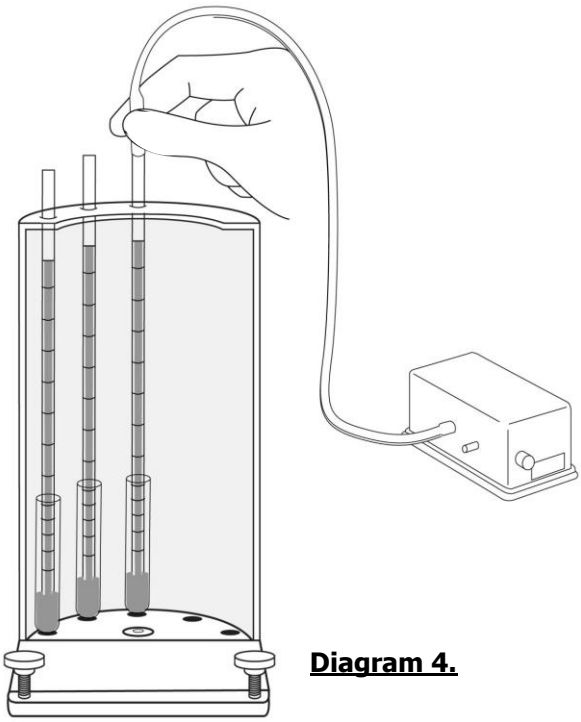

Diagram 4.

PRECAUTIONS:

a) Thorough mixing of the blood sample before adding to the reservoir is essential. However it must be done gently, shaking the sample will result in haemolysis which may obscure the end point.

b) Vigorous mixing may also create bubbles which will seriously affect the result. If bubbles are present in the micro-Dispette repeat the test with a fresh sample that has been more carefully mixed.

c) The ESR must be performed at room temperature (defined by the ICSH as 18 to 25^0C or 64 to 77^0F). Do not place the stand near a window, in direct sunlight or where it may be subjected to drafts.
Note: Should it be impossible to perform the test within this temperature range request a temperature correction chart from Arkray USA Inc.

d) The ESR is affected by vibration; ensure the stand is isolated from machinery and that the bench is not subjected to knocks. Remember that vibration mat only occur intermittently and/or may be as a result of machinery (e.g. a centrifuge) sited in another part of the building.

e) Do not pick up the stand to read the result as this will affect other tests in progress. Bring the eye to the level of the red cells to read accurately from the scale (see illustration d).

f) If the result falls below 165mm, the exact end point may be obscured by the filling reservoir. In this case report the result as >165 mm. If a numerical value is requested estimations can be made, by reading from the scale of an unused Dispette pipet held next to the test assembly.
Note: Before reporting an estimated result be sure to verify that this complies with your laboratory's best practice and standards; record and report that the result has been estimated.

g) Occasionally the level of the red cells is not clear-cut and a 'Christmas Tree' effect may be observed. In such cases the level where the red cells become fully concentrated should be recorded (see illustration e).

h) In cases of serious infection or leukemia a heavy layer of white cells may be present on top of the column of red cells. This should be ignored and the reading taken from the level of the red cells only.

i) It must be remembered that the red cells will continue to settle after one hour has elapsed. Therefore it is most important to read the test at exactly one hour after setting up the test in the stand (e.g. the test reading will generally be higher at 1 hour 15 minutes than at 1 hour).

j) It must not be assumed that the reading at 60 minutes will be twice that at 30 minutes because the rate of fall is not linear (see Physical basis of blood sedimentation on page 1)

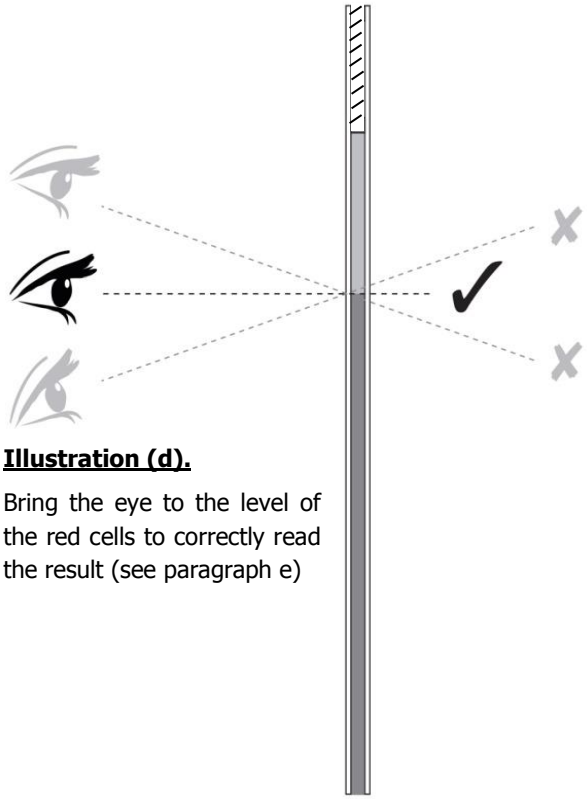

Illustration (d).

Bring the eye to the level of the red cells to correctly read the result (see paragraph e)

Please note: Illustrations are not to scale

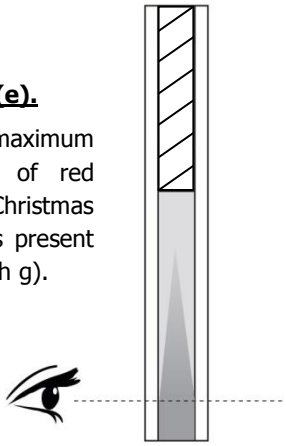

Illustration (e).

Reading the maximum concentration of red cells where 'Christmas Tree' effect is present (see paragraph g).

Please note: Although some workers have suggested that the micro-method can be used with venous or capillary blood[1], it is our experience that capillary blood samples will only give accurate results under the most strictly controlled conditions of sampling; a situation that can be organized in a research laboratory but is unlikely to be practical in an emergency situation or where an unwilling or distressed child is involved.