Winpette* FH-1800

For qualitative estimation of the Erythrocyte Sedimentation Rate (ESR or Sed-Rate), by Wintrobe's method.
For In Vitro Diagnostic Use Only

Contents: (sufficient for 100 ESR determinations)
100 Winpettes* plus 100 white filling reservoirs.

***Note:** The word Winpette(s) used throughout this document is the Trade Name for the disposable Wintrobe ESR Pipette manufactured by Guest Scientific AG.

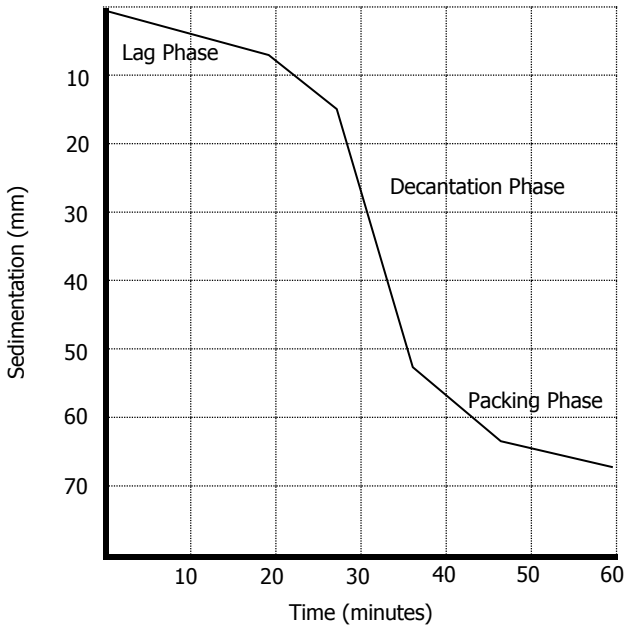
Storage Conditions:
The reservoirs and Winpettes may be stored at room temperature, which may be cold, cool or warm: However the test itself must be performed at temperatures between 18 – 25^{0}C (64 – 77^{0}F) see note c) on page 3.

Background: The erythrocyte sedimentation rate (ESR) is one of the most widely requested laboratory tests throughout the world and simple manual methods such as Dispette or Winpette that do not require expensive or complicated machinery are particularly popular in the outpatient's or Doctor's office setting.[1]
While infection may be the most common cause of elevated ESR results, many other conditions such as malignant tumors and renal disease have been associated with raised values; hence its role has become established in the Clinician's mind as a screening test for the presence of clinical illness.[2, 3, 4.]
Elevated ESR results correlate well to the severity of acute inflammatory disease and the test has been cited as a useful indicator of stroke severity and predictor of early relapse or survival in Hodgkin Disease.[5, 6, 7]
In 1926 Alf Westergren, published 'The Technique of the Red Cell Sedimentation Reaction', [8] based on the work of Robin Fahreus in 1918. His technique went on to be adopted as the reference method for erythrocyte sedimentation rate by the International Committee for Standardization in Hematology (ICSH) in 1973.[9]

Wintrobe devised his technique in 1935 with the stated aims of providing a 'standardized technique' that required a smaller blood sample that did not need to be diluted and a pipet that could be used for performing a Packed Cell Volume test by centrifuging it after performing the Sed-Rate.[10] Modern automated blood cell counters have negated this proposed advantage of the system; however the method still remains popular in some States of America. In 1993 the ICSH stated that a slightly modified Westergren method should be used for the reference method to which all other techniques, if not conforming, should be standardised.[11] The most recent review by the ICSH published in April 2011 confirms that the reference method for measurement of the ESR should be based on the Westergren method using diluted blood.[12] In similar manner the most recent CLSI Approved Standard (5th Ed.), for ESR recognises the Westergren method as the standardized or selected procedure.[13]
There is no precise correlation between the Westergren and Wintrobe methods as evinced by several failed attempts to devise nomograms. Therefore laboratories using this technique must clearly state that the Sed Rate value they report has been obtained by the Wintrobe method.

Physical basis of blood sedimentation: To this day the phenomenon of erythrocyte sedimentation is still only partly understood, however three definite phases of the process have been identified: During the first, or Lag Phase, the red cells form a characteristic rouleaux pattern and sedimentation is generally slow. The rate accelerates in the second period, the Decantation Phase and slows again in the final Packing Phase as the red cell aggregates pile up towards the lower part of the tube.

Fig1. The Phases of Blood Sedimentation.



Note: Sedimentation is not linear and the time taken over each of the Lag, Decantation and Packing phases will differ between patients, hence the observer must never try to 'estimate' the final result before the full 60 minute time period for the test has elapsed.
The size of rouleaux aggregates formed in the Lag Phase is the critical factor affecting the final result. Rouleaux appears to be mainly influenced by plasma proteins including fibrinogen, IgM and alpha$_2$-macroglobulin. Opinions vary as to the accelerating and retarding properties of glycoprotein and albumin. IgG appears to increase the sedimentation rate only at high concentrations.

Items required but not provided in the Winpette box:

1. Transfer pipettes.
2. A Guest ESR stand to hold the Winpette and reservoir assemblies in a vertical position, controlled by means of a levelling bubble and adjusting screws. (code FH 1705)
3. A laboratory or similar timer capable of alarming after exactly one hour (60 minutes) elapsed time.

Sample requirement:

Whole blood should be obtained by clean venipuncture over a maximum period of 30 seconds without excessive stasis.
A traditional syringe or a vacuum extraction system may be used. The blood sample must be anticoagulated with EDTA.

The blood sample and anticoagulant mixture must be immediately mixed gently, but thoroughly at least 8 times by complete inversion of the sample tube.

The most recent ICSH review[12] states that citrated blood samples must be tested within 2 hours if left at room temperature, or 4 hours if stored at 4^{0}C. **Note:** In the USA current CLSI guidance [13] states that the blood sample may be stored for up to 24 hours in a refrigerator. **Blood specimens stored in a refrigerator must return to room temperature naturally before testing starts.**
If a sample is left for any amount of time before testing, either at room or refrigerator temperature, it must be well mixed by at least 8 gentle inversions of the tube before transfer to the reservoir.