

# BRISK

## NEWS

Towards Excellent Customer Service • Utas Maju Sdn Bhd Newsletter



# ESR

# 20

## SECOND

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# from the **MANAGING DIRECTOR**



**Assalamualaikum dan Salam Sejahtera.**

Alhamdulillah. Sama-sama kita panjatkan kesyukuran kepada Allah S.W.T diatas kesempatan menghidupkan Ramadhan dan menikmati Syawal yang penuh barokah ini. Saya doakan segala amalan kita diterima Allah dan menjadikan kita insan yang mulia di sisi-Nya.

Setelah melalui tahun yang begitu mencabar pada 2016, kami membuka tahun baru 2017 dengan perancangan yang lebih teliti dalam memastikan kelangsungan perniagaan - dengan memberi lebih penekanan kepada aspek paling penting iaitu sistem sokongan kepada para pelanggan - untuk terus dipertingkat dan ditambahbaik. Dan kami amat bersyukur, pencapaian setakat suku ke-2 tahun ini, amat memberangsangkan.

Saya ingin mengucapkan terima kasih yang tidak terhingga kepada para pelanggan yang berterusan memberi sokongan serta kerjasama positif kepada kami. Saya amat berharap agar kerjasama positif ini dapat terus dikembangkan dalam pelbagai bentuk. Saya yakin, kerangka asas kerjasama yang dilaksanakan selama ini seperti perkongsian pengetahuan, perkembangan teknologi, penyelidikan, pengurusan organisasi dan pembangunan sumber manusia - boleh di'inovasi'kan dan dapat memacu perniagaan ke aras yang lebih tinggi.

Kami juga begitu menghargai sebarang bentuk maklumbalas - cadangan penambahbaikan, kritikan membina dsb. - dalam usaha kita bersama mencapai matlamat organisasi masing-masing.

Untuk makluman, pada tahun ini juga, Utas Maju telah membuat perancangan khusus untuk menyumbang kembali kepada masyarakat melalui beberapa program CSR (Corporate Social Responsibility) - dengan memberi fokus kepada inisiatif pendidikan, kerjasama dengan NGO untuk penyakit kritikal, dan sumbangan kepada golongan kurang bernasib baik. Antara contoh program yang sedang dalam pelaksanaan adalah Program Biasiswa Utas Maju - dengan kerjasama salah sebuah IPTA utama negara. Kesemua ini tidaklah dapat dilakukan melainkan dengan kerjasama para pelanggan yang amat-amat kami hargai.

Akhir kata, saya mewakili warga Utas Maju ingin mengambil kesempatan untuk memohon maaf atas segala kekurangan dan salah silap sepanjang kita berurusan dan berhubungan selama ini. Saya juga mendoakan kejayaan berpanjangan untuk semua. Semoga kehadiran Eidulfitri kali ini mengeratkan hubungan kita sesama insan dan terlebih utama hubungan kita dengan Allah Yang Maha Esa.

***"Minal Aidil Wal Faizin"***

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# ADVANCEMENT OF ERYTHROCYTE SEDIMENTATION RATE (ESR) TECHNOLOGY

Article by: **EBBY ANUAR BIN BAHARI** (Application Specialist)



## Introduction to ESR

The erythrocyte sedimentation rate (ESR) is general and still widely used laboratory tests in clinical practice as a screening and as the indicator of inflammation, infection, trauma, or malignant disease. ESR used an anti-coagulated blood sample which allowed to stand undisturbed in one hour, and the red blood cells (RBC) will normally settle down to the bottom of the tube. The distance in millimeters (mm) of that red cells fall were measured and reported as per unit of time, which is usually one hour; millimeters per hour (mm/h). An elevated of ESR value may be due to the production of interleukin-1, which induces by the synthesis of acute phase of the proteins in liver that enhances the RBC aggregation and sedimentation. Besides that, elevated value of ESR may also due to a variety of different pathological processes in the body, acute, chronic and also any unspecified diseases.

ESR value is affected by several factors such as red cell surface charges and the frictional forces around the red cells. The surface of erythrocytes normally has net negative charges which repel each other. The presence of the high molecular weight proteins, which usually positively charged, will increase the blood viscosity and favor in Rouleaux formation as well as increase the rate of erythrocyte sedimentation. Thus, ESR can be a very useful tool for the screening of certain diseases especially in Rheumatoid arthritis and other autoimmune conditions. In addition, high ESR also may indicate the other diseases like Temporal Arteritis, Inflammation, Polymyalgia Rheumatica, Multiple Myeloma, and other Paraprotein related diseases. ESR may also tested in unknown condition, which generally ordered on the patient with minor and undetermined complaints. The whole blood sample will be used in the ESR analysis, which usually performed by the clinical laboratory personnel.

## High ESR Test Results

| Common Causes                                                                                                                                                                                                                                                                                               | Autoimmune Disorder                                                                                                                                                                                                                                                                          | Infection                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Anemia</li><li>• Kidney Disease</li><li>• Lymphoma</li><li>• Multiple Myeloma</li><li>• Old Age</li><li>• Pregnancy</li><li>• Temporal Arteritis</li><li>• Thyroid Disease</li><li>• Waldenstrom's Macroglobulinemia</li><li>• Certain types of Arthritis</li></ul> | <ul style="list-style-type: none"><li>• Systemic Lupus Erythematosus</li><li>• Rheumatoid Arthritis</li><li>• Giant Cell Arteritis</li><li>• Polymyalgia Rheumatica</li><li>• Primary Macroglobulinemia</li><li>• Hyperfibrinogenemia</li><li>• Allergic or Necrotizing Vasculitis</li></ul> | <ul style="list-style-type: none"><li>• Bone Infection</li><li>• Heart Infection</li><li>• Heart Valve Infection</li><li>• Rheumatic Fever</li><li>• Skin Infection</li><li>• Systemic Infection</li><li>• Tuberculosis</li></ul> |

## Standard Method of ESR Measurement

Westergren was selected as the reference technique for ESR measurement by the International Council for Standardization in Hematology (ICSH). However, this method takes 60 minutes and results in difficulty in quality control. In addition, there are many variables in the Westergren method such as specimen collection, time and temperature of specimen storage, sedimentation equipment, and methodological variables. Error in dilution steps, poor temperature control during analysis, vibration and verticality of the tubes may affect the sedimentation rate of the red blood cells. The internal diameter of Westergren pipette also must be greater than 2.5 mm, otherwise it may produce a spurious result especially in the sample with a hematocrit greater than 35%. Besides that, the biohazard risks from the sample must be concerned which closed blood collection tubes should be used along the testing process. Thus, there were lots of variables that need to be considered for the measurement of the erythrocyte sedimentation rate.

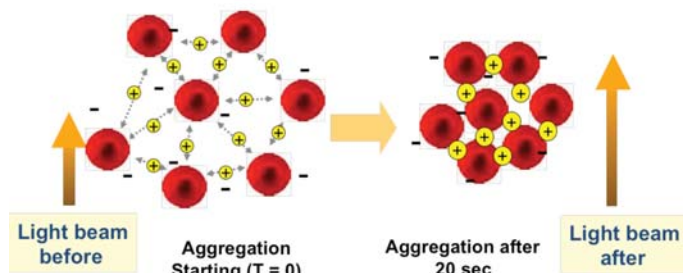
## Automated ESR Analyzer

Nowadays, there are lots of automated ESR systems that provide faster results and more convenient especially in laboratory safety by minimizing contact with blood samples. Alifax is one of the companies, based in Italy that specialized in the development, production and distribution of clinical diagnostic instrumentation for laboratory automation. Consistent with the market development, Alifax introduced an automated analyzer for ESR measurement which capable of **providing the results within 20 seconds**. Alifax ESR analyzer is the **ONLY** automated analyzer that measures the RBC aggregation by using Capillary Photometry Technology. That analyzer also able to overcome the variables and limitations of the sedimentations method as listed in Clinical & Laboratory Standard Institute (CLSI) document.

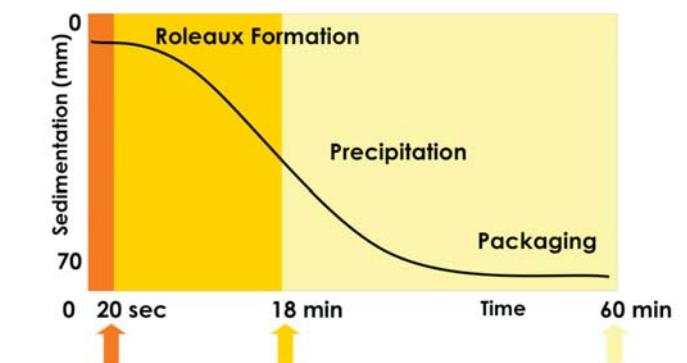


**ALIFAX ROLLER 20PN**  
Automated ESR Analyzer

## Principle of 20 Seconds ESR Measurement Using Capillary Photometry



Every sample is read 1000 times in 20 seconds



Alifax -  
Measurement of  
RBC Aggregation  
within 20 Seconds.

Westergren -  
Measurement of  
Complete Phases of  
ESR in 60 Minutes.

## Advantages of Alifax ESR Capillary Photometry

| SEDIMENTATION ESR                             | CAPILLARY PHOTOMETRY                                |
|-----------------------------------------------|-----------------------------------------------------|
| Temperature variability                       | Temperature control 37°C                            |
| Hematocrit influence                          | Independent from Hematocrit value                   |
| Dilution problems using Sodium Citrate        | No dilution, use of EDTA tube                       |
| Inadequate materials and pipettes variability | Use of the same capillary for all samples           |
| Vibrations and pipettes vertically            | No influence of vibration or other external factors |
| Not standardized sample mixing                | Automated mixing step                               |
| Controls and Calibrators lack                 | Latex Controls and Calibrators available            |
| Poor reproducibility                          | High reproducibility                                |



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# Risk Management in the Medical Laboratory: Reducing Risk through Application of Standards

by SHASHI KUMAR A/L VIJAYAKUMAR

(Continued from previous edition)

## STEP 2b: RISK RATING

Risks need to be prioritized to ensure the most serious risks are dealt with first. There are many methods of risk rating and the following is an example that can be used. Risk rating usually uses a formula to help prioritisation. The formula given below is based on an assessment of the consequences and the likelihood of the hazard resulting in harm.

**USING THE RISK RATING FORMULA** Assign a rating from box 1 (frequent to improbable) to denote the probability level of harm or consequences of the hazard. Assign a rating from box 2 (catastrophic to negligible) to denote the severity levels of the event occurring. Look up the combination in the risk rating chart (table 2) and link it to the action phrase.

## STEP 3: RISK MITIGATION

Pathways include in Controlling and mitigating the risk are planning, implementation, and progress monitoring. For any risk that is deemed unacceptable, the lab should identify ways to reduce the probability of harm, using prevention and detection methods, in order to bring the risk down to an acceptable level. This may be through a variety of means such as revised operator training, posted warnings, more robust QC rules, greater surveillance of the process, or even repeat testing for values exceeding a specified threshold. In cases where the test manufacturer indicates that certain aspects of the test are monitored through built-in controls, the lab may wish to conduct a study to verify the effectiveness of the control before including it as a control measure.

Probability Levels **BOX 1**

| LEVEL # | COMMON TERMS | DEFINITION                               |
|---------|--------------|------------------------------------------|
| 5       | Frequent     | Once per week                            |
| 4       | Probable     | Once per month                           |
| 3       | Occasional   | Once per year                            |
| 2       | Remote       | Once every few years                     |
| 1       | Improbable   | Once in the life of the measuring system |

Severity Levels **BOX 2**

| LEVEL # | COMMON TERMS | DEFINITION                                                                                     |
|---------|--------------|------------------------------------------------------------------------------------------------|
| 5       | Catastrophic | Could result in patient death                                                                  |
| 4       | Critical     | Could result in permanent impairment or life-threatening injury                                |
| 3       | Serious      | Could result in injury or impairment requiring professional medical intervention               |
| 2       | Minor        | Could result in temporary injury or impairment not requiring professional medical intervention |
| 1       | Negligible   | Could result in inconvenience or temporary discomfort                                          |

| RISK ASSESSMENT MATRIX  |                     |                 |                 |                   |
|-------------------------|---------------------|-----------------|-----------------|-------------------|
| SEVERITY<br>PROBABILITY | Catastrophic<br>(1) | Critical<br>(2) | Marginal<br>(3) | Negligible<br>(4) |
| Frequent<br>(A)         | High                | High            | Serious         | Medium            |
| Probable<br>(B)         | High                | High            | Serious         | Medium            |
| Occasional<br>(C)       | High                | Serious         | Medium          | Low               |
| Remote<br>(D)           | Serious             | Medium          | Medium          | Low               |
| Improbable<br>(E)       | Medium              | Medium          | Medium          | Low               |
| Eliminated<br>(F)       | Eliminated          |                 |                 |                   |

**Table 2.** Risk Screening Based on Impact and Probability

**Monitoring sheet:** Risk Identification, Risk Evaluation and Risk Control for Laboratory Activities

| Risk Identification |                  |                         |                           | Risk Evaluation           |   |   |     | Risk Control                     |   |   |     |                 |                                  |
|---------------------|------------------|-------------------------|---------------------------|---------------------------|---|---|-----|----------------------------------|---|---|-----|-----------------|----------------------------------|
| S/N                 | Process Step     | Risk                    | Possible non-conformities | Existing Risk Control     | S | P | RPN | Additional Risk Control Measures | S | P | RPN | In-Charge Name: | Remarks                          |
| 1                   | Transport Sample | Delayed transportation  | Delayed report            | Standard Technical Manual | 2 | 4 | 8   |                                  |   |   |     |                 |                                  |
| 2                   | Report E-mailing | Incomplete transmission | Delayed report            | STM & PER-PAT-301         | 3 | 5 | 15  | Consignment form introduce       | 3 | 3 | 9   | Shashi kumar    | Retrieval module – web base-2017 |
| 3                   | Collect Sample   | Insufficient sample     | Delayed Diagnosis         | Standard Technical Manual | 1 | 3 | 3   |                                  |   |   |     |                 |                                  |



**Risk Management Principles**

## CONCLUSION

Risk management simply encompasses management processes focused on the delivery of quality laboratory medicine, which has historically been performed on a daily basis. Having performed risk identification and risk assessment sequentially, laboratory staff can move on to framing the ultimate outcome of the process—risk mitigation—which will result in the successful completion of an IQC Plan. Developing a risk management process does not ensure the complete elimination of risk. However, implementing a thorough risk management process that includes detailed risk identification and assessment will contribute to the reduction of risk and result in the continued delivery of quality patient care.

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# ANALYSIS OF SAMPLE REJECTION AT NEWLY ESTABLISHED PATHOLOGY LABORATORY OF THE INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA MEDICAL CENTRE (IIUMMC)

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## INTRODUCTION

- Preanalytical errors contribute to about 70% of all the mistakes in diagnostic laboratory. (Plebani, 2012)
- Stringent rejection criteria are therefore necessary as pre-analytical error may significantly affect patient's safety and care.
- This subject is of main concern in a newly established pathology laboratory of a new hospital.

## OBJECTIVE

- The aim of this study was to determine the rate, type, cause and time of sample rejections at our laboratory since its operation in October 2016.

## METHODS

- All samples received at the common specimen receiving counter, Department of Pathology and Laboratory Medicine, IIUMMC were included. The records of sample rejection were retrieved from the Laboratory Information System and analysed.

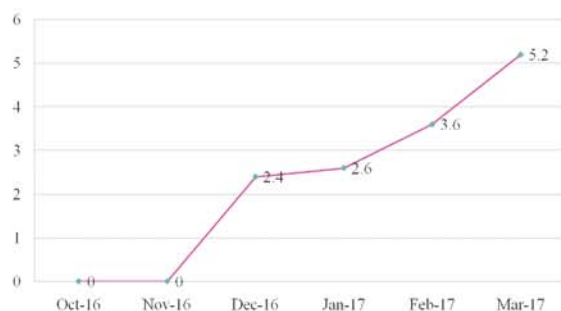
## RESULTS

- A total number of 1419 samples were received from October 2016 to March 2017, with 54 rejections (3.8%).
- The rate of sample rejection showed an upward trend each month (0%, 0%, 2.4%, 2.6%, 3.6% and 5.18% respectively from October 2016 to March 2017).

Table 1: Number of Samples Received and Rejected

| Month  | Number of Sample Received | Number of Sample Rejected |
|--------|---------------------------|---------------------------|
| Oct-16 | 15                        | 0                         |
| Nov-16 | 44                        | 0                         |
| Dec-16 | 125                       | 3                         |
| Jan-17 | 266                       | 7                         |
| Feb-17 | 390                       | 14                        |

Figure 1: Rate of Sample Rejection



## RESULTS

Figure 2: Type of Sample Rejected

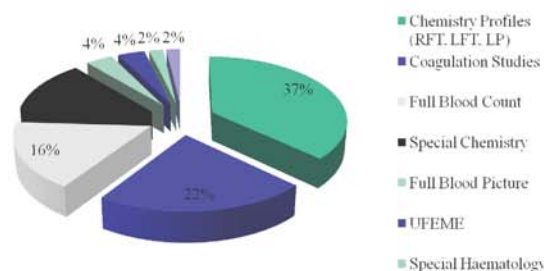


Figure 3: Causes of Sample Rejection

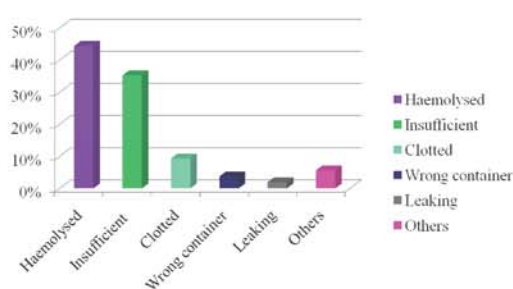
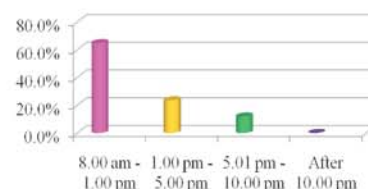


Figure 4: Time of Sample Rejection



## DISCUSSION

- Haemolyzed and insufficient samples are among the most common causes of sample rejection in this study which is in line with other reported study (Atay 2014; Gimenez-Marin et al., 2014; Najat, 2017).
- Although sample rejection rate at IIUMMC (3.8%) is still far from the national target of 0.83%, the rate is rather low as compared to the other reported data (Dickmen et al, 2015; Najat, 2017)
- The increasing trend of rejection rate could be due to the increasing number of new inexperienced staff combined with unfamiliarity with new hospital setting.
- This is one of the challenges faced by any new hospital.

## CONCLUSION

The increasing rejection rate in our newly established Pathology Laboratory warrants further investigation and improvement on proper sample collection and handling.

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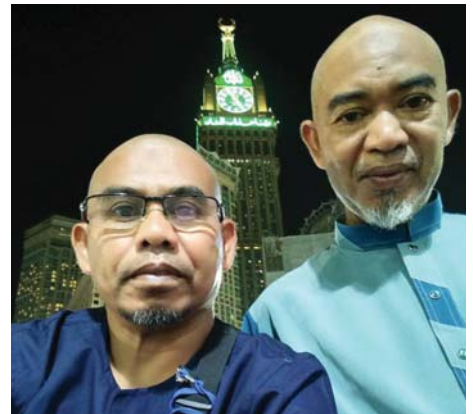
# EVENTS

Compilations by:  
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## TRAINING BY BEACON CONSULTANT (8th & 9th May 2017)

Aim for nurturing future talents and capabilities of staff members, Utas Maju Sdn Bhd had scheduled a training package throughout the years. Utas Maju would strive to meet challenges of continue development to the best and meet the company's goals "Towards Excellent of Customer Service".



## INCENTIVE UMRAH (23rd May - 7th June 2017)

Umrah is one of the beautiful sunnah of the Prophet Muhammad (SAW). It is a particular act of worship that now millions of Muslim performs every year. As a form of appreciation for staff that had given their services more than 10 years, Utas Maju will give an opportunity to perform Umrah. This year, En Mohd Isa and En Baharudin have been selected for the wonderful reward.



## PRE-RAMADHAN DISCOURSES (26th May 2017)

Throughout Ramadhan, fasting reminds you the importance of self-control and the suffering of the poor which helps to cleanse your body and mind. Utas Maju Sdn Bhd has invited Ustaz Long Kechik to give an informative lecture on the true lessons to be learnt from Ramadhan as a preparation for the special month.



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