

## Differentials: Automated Versus Manual Differentials

Margaret Jenkins, MT (ASCP), SH

Due to the outstanding precision and accuracy offered to our clinical laboratory by the Sysmex XE-2100 hematology analyzer and the depth of coverage provided by the reflex criteria in use by the laboratory, the need to order manual differentials by patient care providers is no longer necessary.

The reliable screening of normal blood samples and the detection of pathological blood samples is of major importance for the clinical laboratory and for aiding clinicians in the diagnosis of disease. The aim of the modern hematology analyzer is to reduce the need for visual differential leukocyte (WBC) counts while retaining optimal diagnostic security with precision and accuracy.

The Sysmex, XE-2100 analyzer (as utilized in the Danbury Hospital clinical laboratory) uses a combination of impedance, laser detection and flow cytometry technology to provide the most accurate representation of the cellular composition of a blood sample. The XE-2100 produces a differential that uses as little as 130 $\mu$ L of an EDTA whole blood sample (minimum 1mL draw) and analyzes as many as 32,000 blood cells. This allows the instrument to achieve excellent performance even for leukopenic samples. During each multiparametric analysis the XE examines every cell type and, with the use of specific flagging messages, alerts the technologist to any abnormalities that may be present. Following the results of each abnormal – flagged sample – a slide is made and reviewed by microscopy. The technologist must examine 10-15 fields using both a scanning and oil magnification. The technologist will perform a manual differential if any of the criteria listed below are present.

- WBC abnormal scattergram (which signifies that the instrument is unable to perform a differential)
- Bands/Stabs >10 %

### ***KEY POINTS***

- Current technology in use at the Danbury Hospital Laboratory provides the most accurate representation of the cellular composition of a blood sample available.
- There is no need to order a manual differential
- Manual differentials will be performed as required by procedure when parameters are flagged.

In addition, a slide will be prepared and separated for review by a pathologist when any of the following criteria are met.

- Absolute white blood cell count  $\leq 2.0$
- Absolute platelet count  $< 50K$  or  $> 800K$
- Absolute lymphocyte count  $> 4.0$  (patients  $>60$  yrs.)
- Atypical lymphocytes
- Immature Granulocyte (IG) number is  $> 1.0$  (myelocytes, metamyelocytes, and promyelocytes)
- Blasts (not previously observed or significantly increased from previous smears)
- Unidentifiable cells
- Any RBC or WBC inclusions i.e. bacteria or parasites
- Possible Lymphoma/Leukemia cells (e.g.: immature lymph's (rule out CLL) prolymphocytes, cleaved cells, hairy cells, Sezary cells, etc.)
- Any unusual findings (Examples: Pelger – Huet anomaly, Alder – Reilly anomaly, Chediak – Higashi anomaly, May – Hegglin anomaly, etc.)
- Abnormal and /or unusual findings of a clinical nature (examples: schistocytes, spherocytes, elliptocytes)

Additionally, manual differentials are performed when abnormal red cell morphology including the presence of cells such as sickle or schistocytes, is observed. Questions regarding manual differentials may be directed to Dr. Leonel Edwards at 203-739-7527.

## **Kappa and Lambda Testing**

Free Kappa and Lambda light chains testing is the best method to detect increasing concentrations of monoclonal kappa and light chain in the serum or urine of patients with evolving or relapsing myeloma. Testing for total Kappa and total Lambda light chains will be replaced with the more clinically useful free light chains test. The test will be performed by the laboratory twice weekly. Questions may be directed to Dr. Leonel Edwards at 203-739-7527.

## **To Review Past Issues for Technically Speaking**

Please consult the website at [www.danburyhospital.org/body.cfm?id=779](http://www.danburyhospital.org/body.cfm?id=779)

**Please see attached chart of insurance programs that are accepted by the Danbury Hospital Laboratory.**

