

# Hematology Testing

## Advanced Clinical Parameters



### Automated Immature Granulocytes (IG)

Immature Granulocytes and Absolute Immature Granulocytes are reported at no additional charge as part of our automated differential (included with test code 3000 - CBC w/Diff, w/Plt)\*

#### White Blood Cells

**IG #**

(Immature Granulocyte Count)

**IG %**

(Immature Granulocyte Percent)



#### Identifies and Quantifies Immature Myeloid Cells

Counts 32,000 cells - More sensitive and precise than manual differential<sup>1</sup>

**IG = Metas + Myelos + Pros**

Early screen for sepsis

- o Better indicator for infection than WBC<sup>2</sup>
- o Comparable to Absolute Neutrophil Count<sup>2</sup>
- o IG% > 1% indicates a left shift
- o IG% > 3% may predict positive blood cultures with 98% specificity and 92% Positive Predictive Value<sup>2</sup>

Detects Myeloproliferative Disorders

**Neutrophil count includes bands**

Flags atypical cells and reflexes to manual review

### Automated Immature Platelet Fraction (IPF)

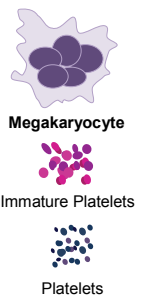
Immature Platelet Fraction (IPF) is reported as part of test 3511 - Platelet Count with IPF

#### Platelets

**IPF**

(Immature Platelet Fraction)

- o Evaluate mechanism causing thrombocytopenia<sup>3</sup>
- o Determine need for platelet transfusion
- o Predict platelet count recovery
- o IPF recovers ~3 days earlier than platelet count<sup>4</sup>



↓ Plts + ↑ IPF → *Peripheral destruction or BM Recovery*  
 ↓ Plts + ↓ IPF → *BM production disorder*

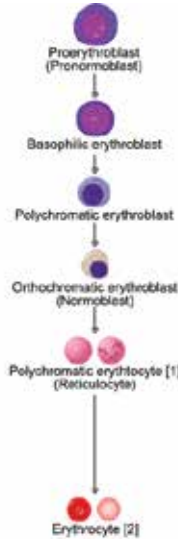
# Retic Comprehensive with RET-He & Immature Retic Fraction

Reticulocyte Count, Absolute Reticulocytes, Immature Reticulocyte Fraction (IRF), and Reticulated Hb Equivalent (RET-He) will be reported as part of test 3111 - Retic Comprehensive with RET-He & Immature Retic Fraction

## Red Blood Cells

### 3-Part Retic

- 1) Retic # & Retic %
- 2) IRF (Immature Reticulocyte Fraction)
- 3) RET-He (Reticulated Hemoglobin Equivalent)



## Reticulocyte Count and Percent (Retic # & Retic %)

### IRF (Immature Reticulocyte Fraction)

- o Quantitative measure of immature retics
- o Indicates bone marrow response to anemia
- o Elevated IRF indicates increased red blood cell response from bone marrow

### RET-He (Reticulated Hemoglobin Equivalent)

- o Qualitative measure of Hb in reticulocytes
- o Cellular evaluation of iron status
- o Diagnose iron deficiency and monitor response to treatment
- o Not effected by inflammation or uremia
- o Used by National Kidney Foundation clinical practice guidelines to detect iron deficiency anemia in chronic kidney disease<sup>5</sup>
- o Adopted by AHRQ for management of patients with End Stage Renal Disease
- o Cited in clinical guidelines for the diagnosis of iron deficiency anemia in children 0-3 years old<sup>6</sup>
- o Study<sup>7</sup>: Pre-op evaluation of anemia in orthopedic patients --> decreased red blood cell transfusions

## Automated Nucleated Red Blood Cells (NRBCs)

Automated Nucleated Red Blood Cells (NRBCs) will be reported at no additional charge as part of our automated differential testing performed at our main laboratories in Tempe and Tucson, as well as at our Health Diagnostics Laboratory (HDL) in Phoenix. Please note that for all other performing locations, NRBCs will continue to be reported as part of a manual differential if indicated.

## Red Blood Cells

### NRBCs (Nucleated Red Blood Cells)

### Automated Nucleated Red Blood Cells (NRBCs)

- o The appearance of NRBCs in the peripheral blood of children and adults signifies bone marrow damage or stress and potentially serious underlying disease
- o One NRBC in an adult is important finding<sup>8</sup>
- o Study<sup>9</sup>: ICU Mortality rate 3X higher if NRBCs present when patient moved from ICU to floor, compared to ICU patients with no NRBCs

#### REFERENCES:

1. Immature granulocyte measurement using the Sysmex XE-2100. *Am J of Clin Pathol*; 2003;120(5):795-799.
2. Automated Enumeration of Immature Granulocytes. *Am J Clin Pathol* 2007;128;454-463.
3. Assessment of an immature platelet fraction (IPF) in peripheral thrombocytopenia. *Br J of Haematology*. 2004; Jul; 126(1):93-9.
4. Immature platelet fraction as a predictor of platelet recovery following hematopoietic progenitor cell transplantation. *Lab Hematol*; 2006; 12(3):125-30.
5. [www.kidney.org/professional/KDOQI/guidelines\\_anemia/cpr12.htm](http://www.kidney.org/professional/KDOQI/guidelines_anemia/cpr12.htm).
6. Diagnosis and Prevention of Iron Deficiency and Iron-Deficiency Anemia in Infants and Young Children (0-3 Years of Age). *Pediatrics* 2010;126;1040-1050.
7. Protocol for Transfusion-Free Major Orthopaedic Operations using RET-He. *Sysmex Journal International* 2009. Vol 19, No 1.
8. The Clinical Relevance of Nucleated Red Blood Cell Counts. *Sysmex Journal International*, Vol. 10, No. 2 (2000).
9. Nucleated red blood cells in the blood of medical intensive care patients indicate increased mortality risk: a prospective cohort study. *Critical Care* 2007, 11:R62. <http://ccforum.com/content/11/3/R62>.

\*Excluding testing performed at our Prescott Valley laboratory