CATHOLIC HEALTH INITIATIVES

Franciscan Health System

LH RETIC COUNT

☐ **St. Joseph Medical Center Tacoma, WA**   ☒ **St. Clare Hospital Lakewood, WA**   ☐ **St. Elizabeth Hospital Enumclaw, WA**
☒ **St. Francis Hospital Federal Way, WA**   ☒ **St. Anthony Hospital Gig Harbor, WA**   ☐ **PSC**

PURPOSE

To provide instructions for running reticulocyte counts on the LH750 with random access using barcoded labels.

BACKGROUND

Reticulocytes are immature, non-nucleated erythrocytes, retaining a small network of basophilic organelles, comprised of RNA and protoporphyrin. The enumeration of reticulocytes provides a simple, effective means to determine red cell production and regeneration. Reticulocyte Production Index (also known as shift correction) provides further refinement to the CRC (corrected reticulocyte count). In patients with anemia, red blood cells will have a shortened maturation time in the bone marrow and a longer time circulating reticulocytes in peripheral blood.

RELATED DOCUMENTS

R-W-HEM1423   Reticulocyte Manual Count
M-W-HEM1302   Cycling Samples Using Manual Mode

SPECIMEN REQUIREMENT

Primary specimen type: Whole blood collected in a tube that contains K2 or K3 EDTA anticoagulant.

Auto Mode sample volume: 1 ml. Approximately 300 µl is aspirated.
Manual Mode sample volume: 200µl is aspirated, 250 ul needed in tube.

Specimen Stability: 48 hours.

QUALITY CONTROL

- Three levels of Retic-C Control - 1, 2 and 3
- All three levels run every 24 hours.

PROCEDURE

Samples are run in random access when received in hematology. Pediatric specimens may be run if specimen volume is adequate, minimum volume 250 microliters.

1. Place samples in cassette with barcodes showing, and run in automatic mode. Default should be set on CD. Random access box should be checked.

2. If sample is limited, run in the manual mode. Use the manual barcode reader, See Cycling Samples Using Manual Mode. Using the barcode reader enables the correct order to download. A double check that the status of the retic order is "Received", on the proper Outstanding Worklist and that the correct barcode container label is scanned is prudent in the case of limited sample size.

3. A manual review of the slide is required in the presence of any of the following:

- Retic % or Retic # has an "R" flag
- Suspect message "Verify Retic"
- Suspect message "Abnormal Retic Pattern"
- Retic % is < 0.2 or > 25.0.

4. If flagging or any of the problems listed above are present, send the sample to SJ for Automated or Manual Retic testing using the appropriate test transfer method. It may be necessary to have more sample collected if sample volume is too small. At least 250uL of sample is needed.

REPORTING RESULTS

LIS Resulting:

1. Validate results from Remisol.

2. Retic Raw Count: The % Retic results from the LH750 will cross to LIS after validation in Remisol.
   o The LH750 will give a value carried out 2 decimal places (i.e., 1.43)
   o This is reported on the patient's chart

3. Retic HCT: The patient's HCT obtained from the same sample, as the Retic count will cross to LIS after validation in Remisol.

4. Enter REF HCT using the following criteria and enter manually into the LIS:
   o Adult Male if patient Hct is less than 38, enter 45 for Ref Hct.
   o Adult Female if patient Hct is less than 38, enter 42 for Ref Hct.
   o In the event that either the adult male or female HCT is > or = 38%, enter the patient's own HCT as the REF HCT.
   o Pediatric- use the following table: If the baby/child's own HCT is > the HCT listed in the table, use the baby/child's own HCT as the REF HCT.

Patient type	And the HCT is <	REF HCT
Cord Blood	42	51
0 – 15 days old	41	53
15–30 days old	33	44
1-2 mos. old	28	35
3-4 mos. old	32	38
5-6 mos. old	31	36
7-12 mos. old	32	36
1-12 yrs.	33	37

5. Enter Mat Time using the following table and enter manually into the LIS:

Patient HCT	Maturation Time
≥ 40	1.0
30-39	1.5
20-29	2.0
10-19	2.5
<10	N/A

1. Retic Corrected Count: This is where the LIS calculates the "Corrected Retic%". This is the value that will be reported on the patient's chart.

2. RPI (Reticulocyte Production Index): This is where the LIS calculates the RPI, which is the value that will be reported on the patient's chart.

3. Interpretation comment is automatically added to all Retic results: "*INTERPRETATION: Reticulocyte Production Index (RPI) > 3.0 generally indicates an adequate bone marrow response to anemia, whereas an RPI < 2.0 represents an inadequate response.*"

REFERENCE INTERVALS

1. Corrected Reticulocyte %:
   - < 1 month = 2.5-6.5%
   - > 1 month = 0.5-1.5%

2. Reticulocyte Production Index (RPI):
   - Normal Hct 45/42: RPI of 1
   - Decreased HCT: RPI of >3 (adequate bone marrow response to anemia)
   - Decreased HCT: RPI of <3 (inadequate response to bone marrow)

REPORTABLE RANGE

0.2 - 25%

CALCULATIONS:

$$\text{Corrected Retic Count (CRC)} = \frac{\text{RETIC RAW COUNT x HCT}}{\text{REF HCT}}$$

$$\text{Reticulocyte Production Index (RPI)} = \frac{\text{RETIC CORRECTED COUNT}}{\text{MAT TIME}}$$

REFERENCES

LH750 Operator's Guide—Sample Analysis

Beckman Coulter Retic-C package insert

Clinical Hematology—"Principles, Procedures, Correlation, Cheryl A. Lotspeich-Steinger,

E. Anne Stiene-Martin, John A. Koepke, J. B. Lippincott Company, 1992, pp. 116-117.