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| Purpose  | This procedure describes how to do an automated body fluid cell count using the SYSMEX XN-3100 Hematology analyzer. |
| Scope | This procedure is intended for the use of Clinical Laboratory Scientist (CLS) that will use the XN-3100 to perform an automated body fluid cell count and other laboratory personnel who may need to review the assay as part of quality management. |
| Safety | Refer to the safety manual for general safety requirements. |
| Reagents | XN-3100 ReagentsRefer to Policy & Procedure Sysmex® XN-3100™ Series Procedurefor details on XN-3100 reagents. |
| Equipment / Supplies | Sysmex® XN-3100™ 12x75 mm TubesCalibrated MLA Pipettes for dilutions Sysmex® CELLPACK DCLHyaluronidase |

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| Specimen Requirements | Acceptable Body Fluid Types are:* + 1. Cerebrospinal Fluid (CSF) – The use of anticoagulant is not required nor recommended.
		2. Serous Fluids (Peritoneal, Pleural, Pericardial etc.) – Collected in EDTA-2K anticoagulant.
		3. Synovial/Joint Fluid – Collected in EDTA-2K anticoagulant with added hyaluronidase to break up mucous.

Required sample volume: 1.0 mL or more.Aspirated sample volume: approximately 88 µL.Body Fluid counts should be completed within 1-2 hours of specimen collection.Refer to RIV-PPP-0456 for Body Fluid Analysis: Cell Count policy for specimen collection and storage requirements.**NOTE:** Clotted and highly viscous specimens will not be run automated due to the mucous material that could clog up the instrument. |
| Quality Control | **Frequency of Control use and review**1. XN CHECK BF Automated Body Fluid controls: The 2 levels will be performed daily, on each shift, for XN-R and XN-L in Manual BF mode.
2. Body Fluid analysis will be done primarily on XN10-R, XN10-L will be the backup.
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| Procedure |  |
| Analysis Preparation |
| **Step** | **Action** |
| 1 | Check the status of the analyzer. Check the Status indicator LED on the analyzer to confirm analyzer is in **READY** state. |
| 2 | Press the mode switch to eject the tube holder. |
| 3 | Select the Change Analysis Mode button on the control menu. |
| 4 | Select **BODY FLUID.** |
| 5 | Analyzer automatically perform a Background Check.**Note**: The analyzer will automatically perform a background check three times (3X). |
| 6 | Select **[OK].** |
| 7 | Ensure **Background Check** passes, then proceed to QC analysis. |
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| **Body Fluid Analysis** |
| **Step** | **Action** |
| 1 | Place a well-mixed patient body fluid in a vial with the correct sample barcode for analysis in the sample tube holder. |
| 2 | Click the **Manual Analysis** button in the analyzer area. |
| 3 | Confirm that **READ ID** is checked. |
| 4 | If sample tube is uncapped, click **CAP OPEN**. If sample tube is capped ensure the **CAP OPEN** box is unchecked. |
| 5 | Click **[OK]** and press the start switch (Blue Button).**Perform AUTORINSE between sample runs.** |
| 6 | Verify that the body fluid result is acceptable and there are no flagging present such as “**@,** **\***, etc.) |
| 7 | Report TCBF and RBCBF, Appearance, Color and Differential in WAM Middleware and verify results in Cerner LIS.**NOTE:** TC-BF result of ≤ 0.010 X 103 µL (≤ 3 µL) AND/OR RBC-BF result of < 0.002 X 106 µL (< 2000 µL), perform the Cell Count manually. |
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| Result Reporting |  |
| **WAM Middleware Reporting** |
| **Step** | **Action** |
| 1 | From the Sysmex WAM Main Menu screen, select the **Sample Explorer** icon  |
| 2 | In the **Selection Criteria** screen, enter the Sample ID in the **“From Sample ID”** field to retrieve the Sample ID that require manual validation |
| 3 | Click **[SEARCH]** icon to retrieve the Sample ID |
| 4 | The **Result Validation** screen will display the searched Sample ID and review of results.

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| **Test Code** | **Interpretation** |
| **TCBF** | **TOTAL NUCLEATED BODY FLUID**Total Nucleated Count result from automated BF analysis |
| **RBCBF** | **RED BLOOD CELL BODY FLUID**Total RBC Count result from automated BF analysis |
| **BFVOL** | **BODY FLUID TOTAL VOLUME**Manually enter BF total volume, if applicable |
| **APPBF** | **BODY FLUID APPEARANCE**Manually enter BF appearance, double click on the field for choices.* BLOODY
* CLEAR
* CLOUDY
* CLOTTED
* HAZY
* SLIGHT HAZY
 |
| **COLBF** | **BODY FLUID COLOR**Manually enter BF color, double click on the field for choices* COLORLESS
* YELLOW
* PINK
* RED
 |
| **XANTHR** | **XANTHOCHROMIA (If indicated)**Manually enter Xanthochromia response, double click on the field for choices* YES
* NO
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| 5 | Perform manual cell count, if necessary, otherwise proceed to step 7.* Click on the [**Action**] icon
* Select by clicking on the selection box

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| **TNCBFM** | For manual total nucleated count (hemocytometer count) |
| **RBCBFM** | For manual total red blood cell count (hemocytometer count) |

* Select the **[ADD]** button. This will add additional result field in the **Result Validation** screen.
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| 6 | Manually enter the hemocytometer result in the following result field

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| **Test Code** | **Interpretation** |
| **TNCBFM/ RBCBFM** | **TOTAL NUCLEATED / RED BLOOD CELL MANUAL COUNT** Calculated field for TNC or RBC. **WAM will automatically calculate.** |
| **TNCCALC/ RBCCALC** | **TOTAL NUCLEATED / RED BLOOD HEMOCYTOMETER CHAMBER SQUARES COUNTED**Select which square counted on the hemocytometer* Large
* Small
 |
| **TNCSD1/ RBCSD1** | **RAW COUNT ON ONE CHAMBER OF THE HEMOCYTOMER**Manually enter the TNC or RBC raw count of one chamber of the hemocytometer |
| **TNCSD2/ RBCSD2** | **RAW COUNT ON THE OTHER CHAMBER OF THE HEMOCYTOMER**Manually enter the TNC or RBC raw count of the other chamber of the hemocytometer**NOTE**: The counts from each chamber must agree within 10% or the count must be repeated.  |
| **TNCAVE/ RBCAVE** | **AVERAGE COUNT OF THE TWO CHAMBERS OF THE HEMOCYTOMETER**Calculated TNC average for both raw counts. **WAM will automatically calculate.** |
| **TNCDIL/ RBCDIL** | **DILUTION FACTOR** Manually enter the dilution factor. If no dilution performed enter 1 |
| **TNCSQ/ RBCSQ** | **NUMBER OF SQUARES COUNTER IN EACH CHAMBER OF THE HEMOCYTOMETER**Manually enter the number of squares counted |

Select the **[SAVE]** icon  to calculate all the automated calculations by WAM  |
| 7 | Select the **[MANUAL DIFFERENTIAL]** tab to perform the BF differential.In the Manual Differential screen, change the default **[MDIFF]** and select **[FDIFF]** in the drop-down menu for Select Keyboard to switch the counter key to body fluid mode. |
| 8 | Using the counter key, perform the Body Fluid Differential. Counting will automatically stop at 100 cell count.

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| TEST | COUNTER KEY |
| FNEUT | **+** |
| FLYMPH | **6** |
| FMONO | **5** |
| FMESO | **4** |
| FEOSI | **7** |
| FBASO | **8** |
| FOTHER | **1** |

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| 9 | Select the [SAVE] icon  to save all the changes made. |
| 10 | Select **[Val All]** icon  to validate the responses.  |
| 11 | Verify body fluid cell count and differential results in Cerner LIS. |

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| Reference Range | Refer to **SCPMG-PPP-0105 Reference on LabNet** for reference ranges. |

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| Controlled Documents | The following controlled documents support this procedure. |

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| **Reference** |
| 1. Sysmex XN-3100 Series Instructions for Use (North American Edition), Sysmex Corporation, Kobe, Japan.
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| **Related Documents** |
| 1. RIV-PPP-0455 Body Fluid Cell Count Hemocytometer Quality Control
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| 1. RIV-PPP-0456 Body Fluids Analysis Cell Count
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| 1. Sysmex® XN-3100 Series Procedure
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