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| **MORPH Morphology of Peripheral Blood** |
| **Purpose** | This procedure provides instructions for MORPH MORPHOLOGY OF PERIPHERAL BLOOD. |
| **Principle** | A morphology is ordered to study and evaluate red cells, white cells and platelets, as to their amount, size, shape, and inclusions. A morphology includes an ABC, Retic, and manual 200 cell differential (when autodiff criteria are not met). The individual tests should be ordered by the patient’s care provider. A pathologist can diagnose a variety of conditions from the morphology of the peripheral blood and make suggestions to a physician concerning the appropriate follow-up. |
| **Policy Statements** | * This procedure applies to all laboratory technologists performing hematology testing, the section supervisor, and section pathologist.
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| **Materials** | **Reagents** | **Supplies** | **Equipment** |
|  | * N/A
 | * Slides, Micro MS-101

Sysmex, chc# 30455* Sysmex SP-10 slide maker/stainer

reagents.* Cardboard or metal slide holder
* Biohazard wipes
* Plain capillary tubes
* Hematology Miscellaneous Log Sheet
* Printout from Sysmex XN 3000
* Sunquest printout of laboratory data (IRA, Interim Report by Accession Number)
* IQS printout from Sunquest (screen print for MCC).
 | * Sysmex XN 3000

( includes Sysmex SP-10 slide maker/stainer* Microscope
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| **Sample** | 1. Collect blood from a clean venipuncture, avoid foaming.
2. Whole blood anticoagulated with K3EDTA or K2EDTA
	1. Minimum volume: 0.6 mL
	2. Maximum volume: 2.0 mL
3. Invert and mix well (invert MAPS tubes 10 times, invert 2ml Lavender tubes 5 times). Transport at room temperature to Lab.
4. Check sample for clots with applicator stick.
5. Test within:
6. Most reliable data is obtained when run within 4 hours.
7. WBC, NEU, LYM, MONO, EOS, BASO, RBC, HGB, MCV, PLT and MPV are stable 24 hours at room temperature.
8. RETC is stable 24 hours at room temperature.
9. Samples stored at 2-8°C are stable for 48 hours.
10. If there is a delay in sample transport:
	1. Consult supervisor or pathologist for approval to perform test.
	2. If approval is given, append "-DELA" (transport delayed) to the result.
11. Reject the specimen if any of the following should apply:
12. Clotted
13. Tubes insufficiently filled or overfilled tube
14. Grossly hemolyzed, unless a new specimen cannot be drawn without causing the patient trauma, or a non-hemolyzed sample is unobtainable (post-op heart, etc.)
15. Specimen diluted with IV fluid
16. If you reject a specimen based on the criteria in (7) above, notify unit or physician that the specimen is unacceptable. Cancel test with the appropriate comment in the lab system.

NOTE: If a hemolyzed sample is tested, add the comment "-HP” (hemolysis present may affect results) or "-GRH" (gross hemolysis may interfere with testing) to the result. |
| **Quality Control** | Follow relevant QC procedures for the Sysmex XN 3000. |
| **Procedure** | Follow the activities in the table below for MORPH MORPHOLOGY OF PERIPHERAL BLOOD. |
|  | **Step** | **Action** | **Related Document** |
|  | 1 | Mix the sample well, make 4 slides. |  |
|  | 2 | Rapidly fan dry. |  |
|  | 3 | Label slides with the patient’s last name and accession number. |  |
|  | 4 | Manually stain two slides in the Sysmex SP-10 slide maker/stainer (SP-10 will make one when the CBC is run). |  |
|  | 5 | Place the remaining two unstained slides with the two manually stained slides in a slide holder. |  |
|  | 6 | Analyze sample on the Sysmex XN 3000 with testing for reticulocyte count selected. |  |
|  | 7 | Print a second copy of the printout. |  |
|  | 8 | If necessary, perform a 200 cell manual differential. If values are within the established guidelines for an automated differential, a manual differential is not needed. Instead, the pathologist will perform the manual differential, and the results will be included in the Pathology report. |  |
|  | 9 | Print an IRA (Interim Report by Accession #) and IQS (screen print). |  |
|  | 10 | Result the MORPH test with the coded comment COPA (Contact pathology for results, a separate report will be generated for this testing. For Minneapolis patients call 612-813-6711, for St. Paul patients call 651-220-6560). |  |
|  | 11 | Take the slides, Sysmex XN 3000 printout and Sunquest IRA and IQS printouts to Histology. |  |
|  |  12 | Additional Notes:1. Ordering a MORPH; When a morphology is ordered it includes two tests; a.) MCC – Morphology Clinical Comments b.) MCCO – Morphology Other Clinic Comments Documentation that includes the MCC must go to  pathology with the slides as part of the Interim Report. The MCCO is automatically resulted with HIDE in most  cases. If a morphology is added to a previous request, the ADDT or morphology order should include the MCC. Make sure  if you reorder under a new accession number that you  remember to add the comment for the MCC.  See example below; Morph ClinicalCommentsIQS Printout; Morph Clinical Comments |  |
|  |  |  |  |
|  |   | 2. A Morphology order includes an ABC, differential (Auto or Manual) and  retic, if these tests were not ordered originally they should be added to the  Morphology order by the lab.3. Do not take slides to Histology with any of the following:1. Slides with holes
2. Slides without a feathered edge
3. Slides that are short
4. Slides that are extremely long
5. Slides that are extremely thin
6. Slides that are extremely thick
7. Slides with central tail
8. Slides with a fingerprint
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| **Interpretation/****Results/Alert Values** | 1. The report is generated by a pathologist and reported in CoPath.
2. Age-specific normal ranges can be found in the Complete Blood Count. [Table L - CBC Reference Ranges.doc](http://khan.childrensmn.org/Manuals/Lab/SOP/Heme/Res/200723.pdf)
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| **Result Reporting** | 1. Enter the fluid count results in Sunquest as follows:

Function: MEMWorksheet: H2Test-1: <CR>CAP Method: (A)cceptWorkload Data: <CR>ACCN NO: Enter specimen ID #MORP: Enter coded comment COPA(A)ccept, (M)odify or (R)eject:: A |
| **Historical Record** | **Version** | **Written/Revised by:** | **Effective Date:** | **Summary of Revisions** |
| 1 | Deb Oman | 1992 | Initial Version |
| 2 | Laura Rachford | 07/2001 | System procedure |
| 3 | Al Quigley | 05/2008 | Acceptability of auto differentials for morphology requests |
| 4 | Al Quigley | 06/01/11 | Revised, reformatted, renamed |
| 5 | Al Quigley | 06/09/17 | Updated for Sysmex XN 3000 (SP-10 slide maker/stainer). |
|  | 6 | Al Quigley | 08/24/18 | New MORPH test code.Instructions for adding MCC. |