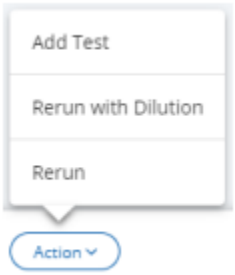
Attachment: Caresphere Workflow

A. **HIGH MCHC:** If there is a high MCHC (>38) result on first run of sample:

1. If warming sample to 37 degrees:

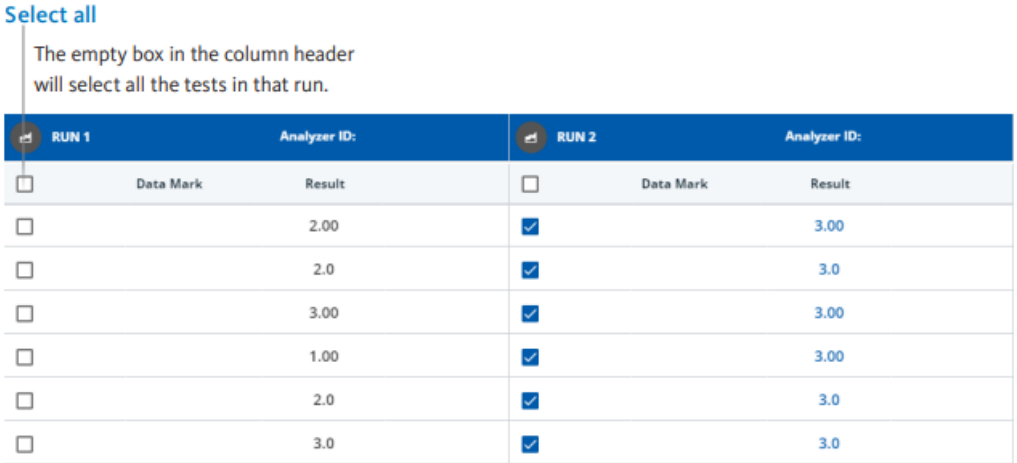
   a. Do not validate sample. Click on the Actions button and select Rerun. (All tests will be rerun if no tests are selected).



   b. After warming, run sample in manual mode on analyzer (to prevent specimen cool-down). If MCHC is acceptable, choose Run 2 from the Rerun tab.

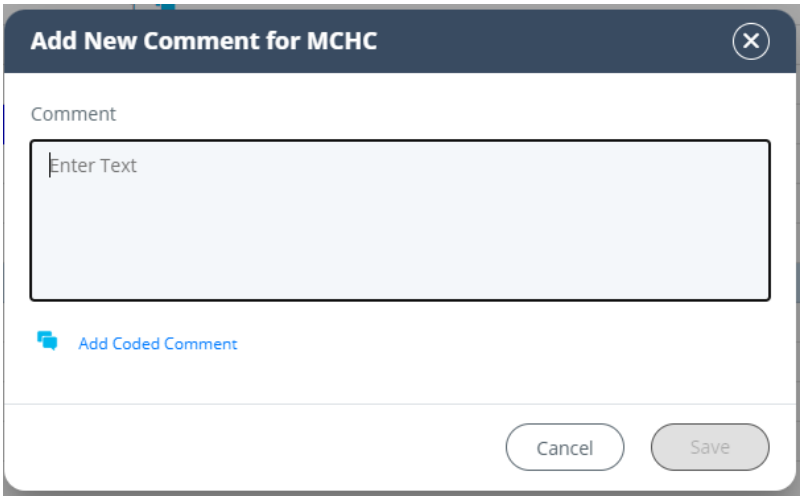
   c. Click the Rerun hyperlink on the Results Validation screen to open the Rerun table.

   d. Select all tests by clicking on the select all checkbox, or select specific tests by using the individual check boxes.



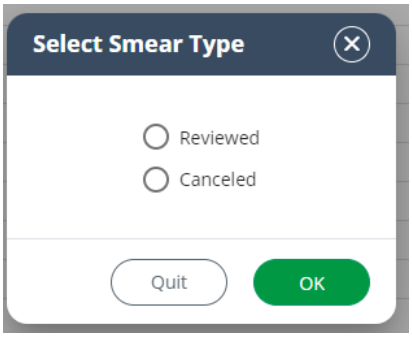
RUN 1	Analyzer ID:	RUN 2	Analyzer ID:
Data Mark	Result	Data Mark	Result
	2.00	☑	3.00
	2.0	☑	3.0
	3.00	☑	3.00
	1.00	☑	3.00
	2.0	☑	3.0
	3.0	☑	3.0

   e. Add ‘’possible cold agglutinin” comment by clicking on the comment icon in the result line of the test code.



f. Validate CBC or Validate All according to the procedure.

g. If smear does not need review, select Canceled in the pop-up box.



2. If you perform a HCT manually:

a. Replace the analyzer HCT value with the manual result by editing the analyzer results. Click on the result to be edited and backspace the result.

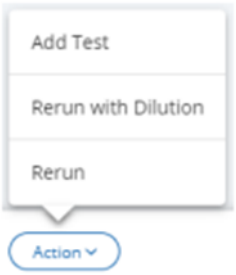
b. Replace the MCV and MCHC indices with the recalculated values.

c. Add internal comment: “Manual HCT. RBC indices recalculated.”

d. Save and validate as appropriate.

B. <u>If 1:5 dilution is made</u>:

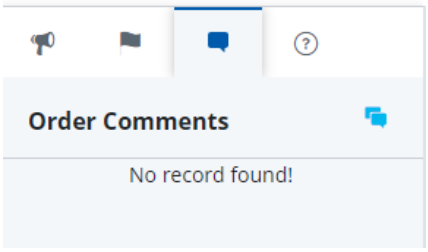
1. Do not validate sample. Click on the Actions button and select Rerun with dilution. (All tests will be rerun if no tests are selected).



2. Input the dilution factor.
3. Prepare dilution then run dilution in manual mode with the original barcode label.
4. Click the Rerun hyperlink on the Results Validation screen to open the Rerun table.

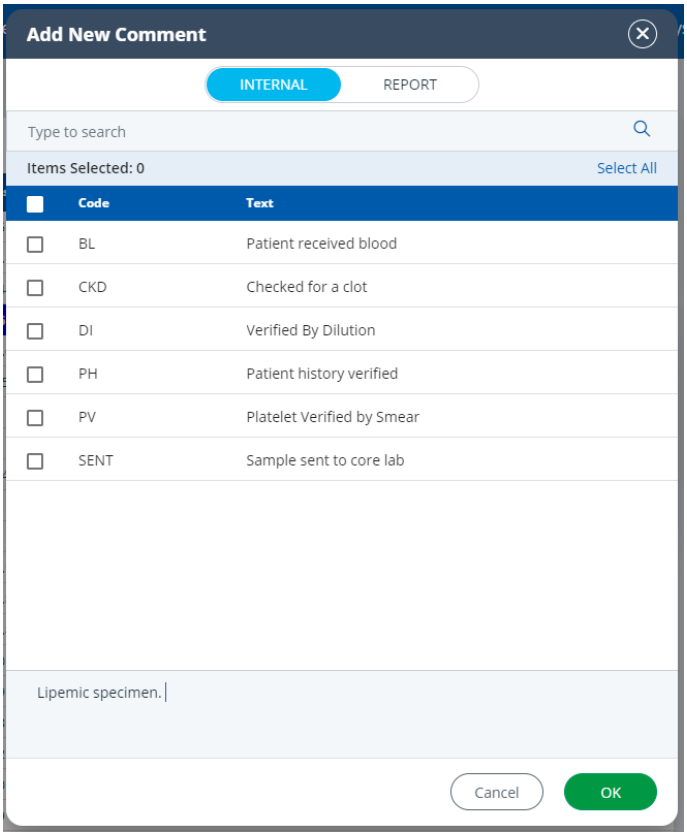
5. The dilution rerun will automatically calculate the final results. Note: The dilution rerun will not display that a dilution was performed. The only way to view if a dilution was performed is in the audit trail.
6. Check the boxes next to the values that should be released from the original and diluted run.

7. Add appropriate correction comment (lipemic, icteria) as internal comment and validate as appropriate. Click on the comment icon on the left of the screen. Then click on the light blue comment icon.

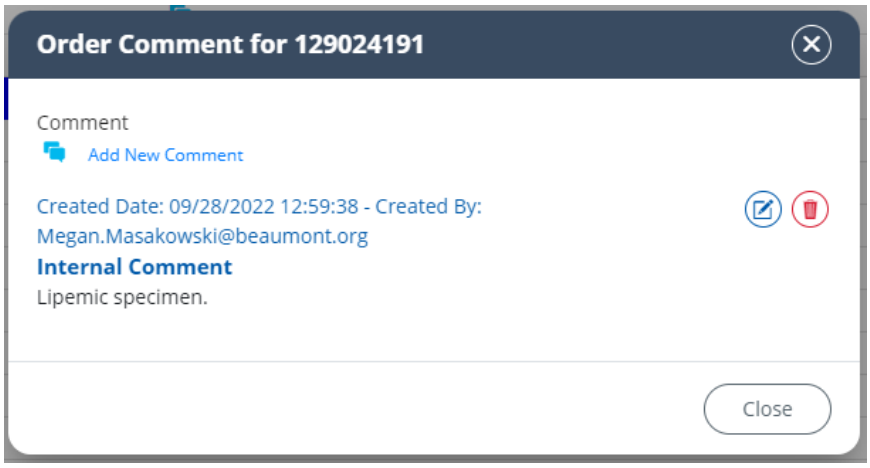


8. The order comment box will appear. Click on Add New Comment.

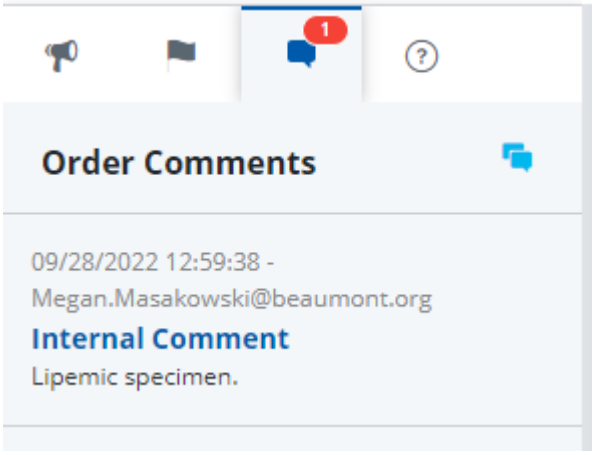
9. Add New Comment box will appear. Select internal or report comments. Select from the list of canned comments or free text a comment. Click OK when complete.



10. Order comment appears in pop-up box. Click Close.



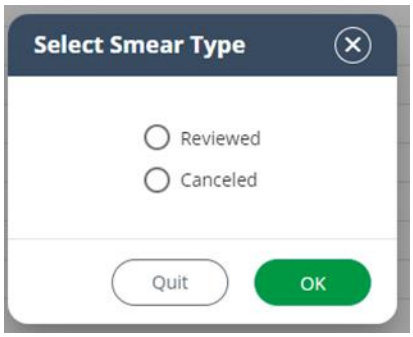
11. Comment now appears on the left side of the screen.



12. An Action on Smear pop-up box will appear. If slide is to be reviewed by morph bench, QUIT. If a slide does not need review, Cancel Smear.

13. Validate CBC or Validate All according to the procedure.

14. If smear does not need review, select Canceled in the pop-up box. Click OK.

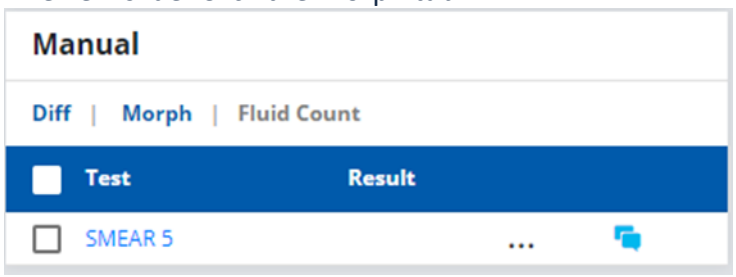


15. If smear needs review, select quit for the pop-up box.

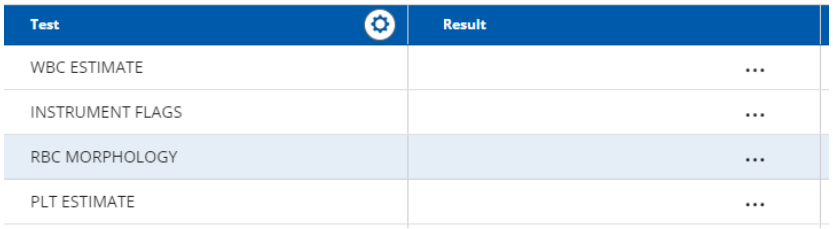
C. CBCND THAT REQUIRES WBC or PLT SLIDE REVIEW

1. If all parameters except WBC or PLT autoverify:

   a. Review slide. Click the Morph tab.



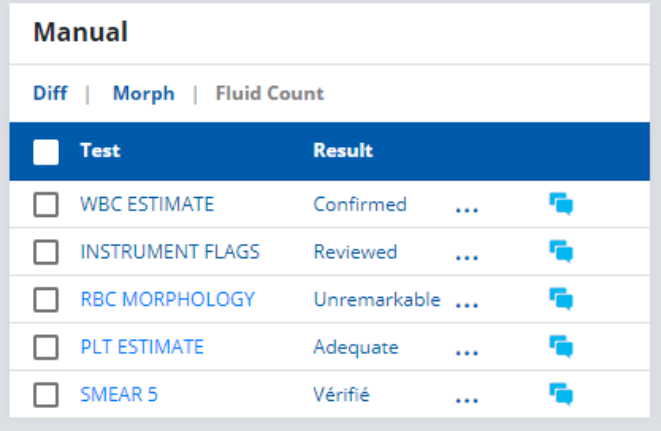
   b. Perform “Morphology Checks” by clicking on the three dots in the result fields and selecting appropriate responses for WBC estimate, instrument flags, RBC morphology and platelet estimate.



   c. If significant RBC morphology is present, you may enter appropriate grading in Diff Comment field (since morphology doesn’t go to LIS on a CBCND.)

   d. Click Save when complete.

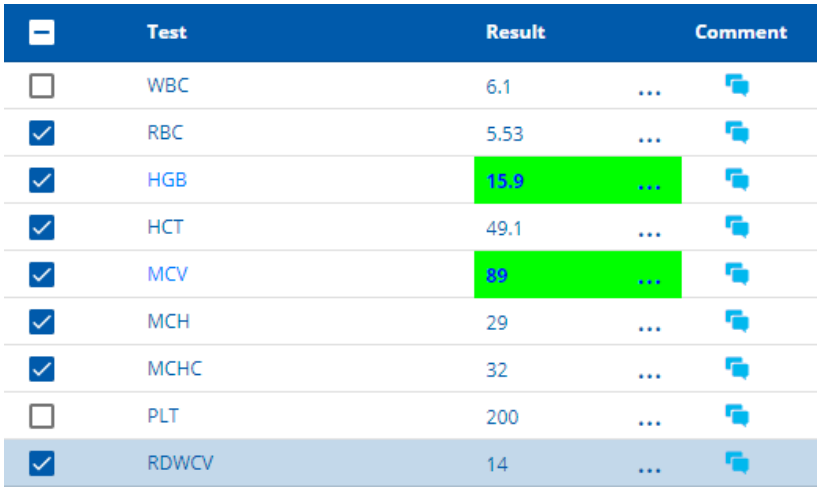
   e. The morph results will display on the right side of the screen.



f. Validate All.

2. If none of the CBC parameters autoverify:

a. Select the parameters to be resulted immediately before slide review.

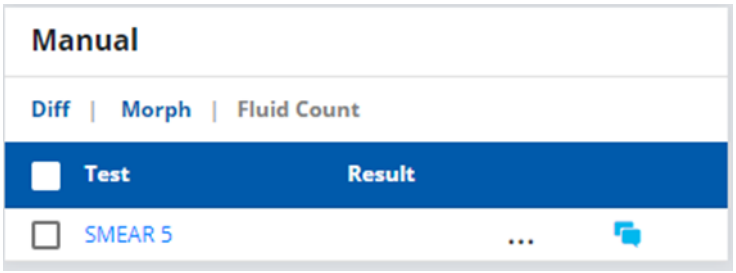


b. Click Validate selection.

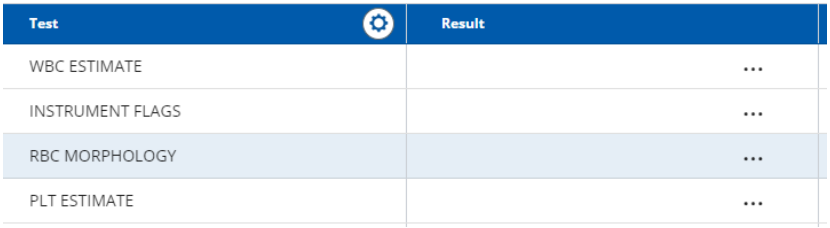
c. The result fields will turn grey indicating the results crossed to the LIS.

	Test	Result		Comment
☐	WBC	6.1	...	
☐	RBC	5.53		
☐	HGB	15.9		
☐	HCT	49.1		
☐	MCV	89		
☐	MCH	29		
☐	MCHC	32		
☐	PLT	200	...	
☐	RDWCV	14		

d. Review slide. Click the Morph tab.



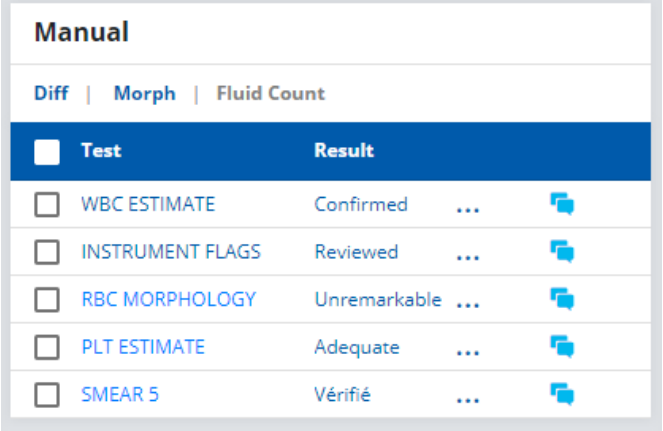
e. Perform “Morphology Checks” by clicking on the three dots in the result fields and selecting appropriate responses for WBC estimate, instrument flags, RBC morphology and platelet estimate.



f. If significant RBC morphology is present, you may enter appropriate grading in Diff Comment field (since morphology doesn’t go to LIS on a CBCND.)

g. Click Save when complete.

h. The morph results will display on the right side of the screen.



i. Validate All.

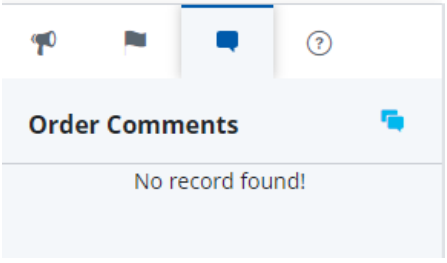
D. <u>PLT < 75</u>

1. Platelets less than 75 bill/L will automatically reflex for a fluorescent PLT (If applicable to the instructions in use).

2. The fluorescent PLT result will appear in the PLT field with a &F symbol.

3. Note that the Op Alert states to check for a clot and review a smear.

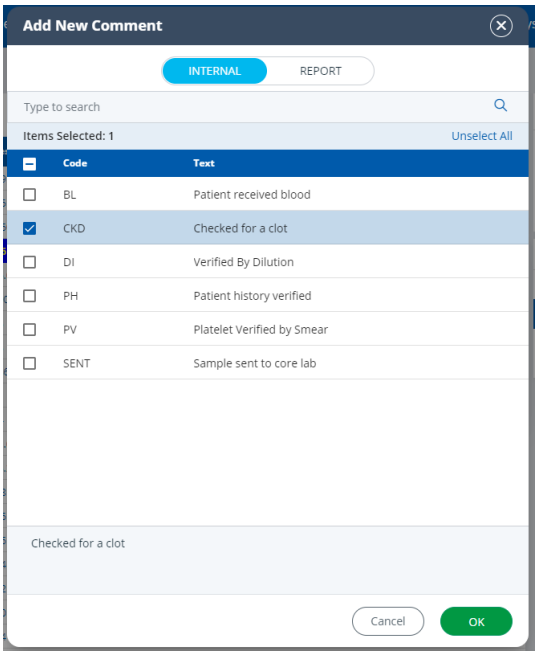
4. Retrieve specimen and check for a clot. If no clot is found, add an internal comment. Click on the comment icon on the left of the screen. Then click on the light blue comment icon.



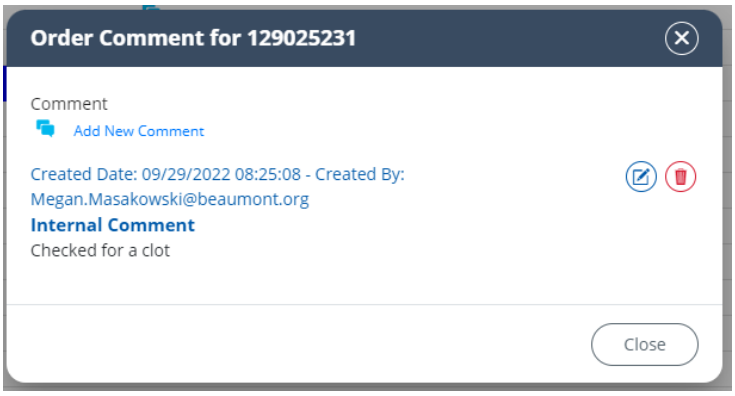
a. If a clot is found, follow steps for canceling specimen both in Caresphere and the LIS. Document contact information in the LIS. See notes section of procedure for more information.

5. The order comment box will appear. Click on Add New Comment.

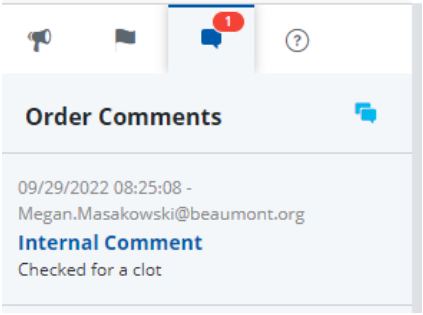
6. Add New Comment box will appear. Select internal or report comments. Select from the list of canned comments or free text a comment. Click OK when complete.



7. Order comment appears in pop-up box. Click Close.



8. Comment now appears on the left side of the screen.



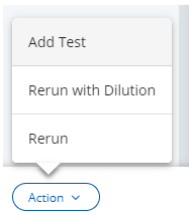
9. The XN line will not automatically make a smear on PLTs < 75. Check previous results to determine if the patient had a previous PLT less than 75 that was verified by a smear. Be sure to scroll down to see if previous results had a smear looked at (e.g. RBC morphology, Platelet field resulted).

10. If previous results are present for a sample ID the most recent set of previous results will be displayed on the Result Validation screen.

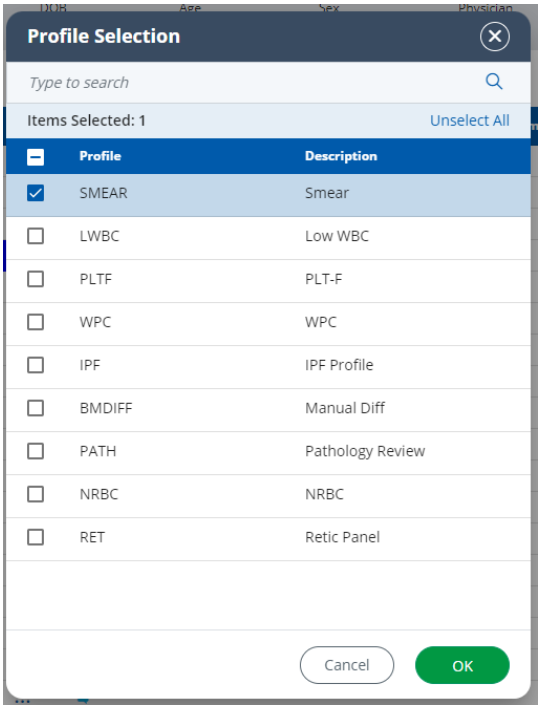
11. Click the Prev Res hyperlink to open the Previous Results popup.

12. The list is sorted in reverse chronological order. The most recent previous result is considered as Prev Res 1.

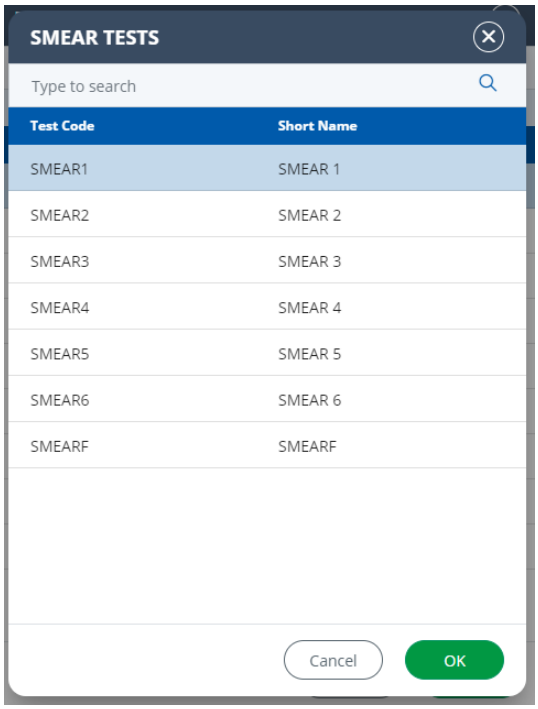
13. If unable to determine that a smear was previously reviewed for a PLT less than 75, click on the Action button, then click Add Test.



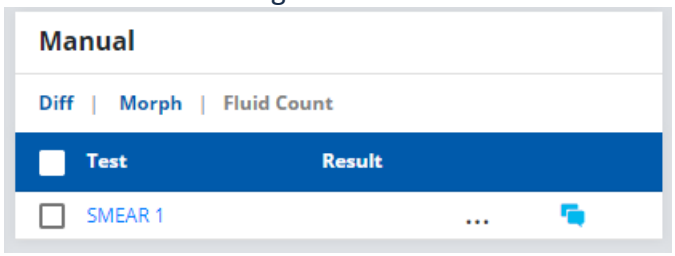
14. Check mark the box next to Smear. Click OK.



15. Click on Smear 1 for one slide to be made. Click on Smear 2 for two slides to be made. Click OK.



16. The smear is added to the right side of the screen.



17. Retrieve specimen and place back onto the XN line so that a smear is made. Or make a manual smear.

18. Select all but the PLT and fluorescent PLT (if ran) parameters, then click on Validate Selection.

Test	Result	Comment
WBC	4.9 ...	
RBC	5.15 ...	
HGB	15.6 ...	
HCT	45.3 ...	
MCV	88 ...	
MCH	30 ...	
MCHC	34 ...	
PLT	250 ...	1
RDWCV	13 ...	
NEUTRE	56.0 ...	
LYMPRE	33.1 ...	
MONORE	6.7 ...	
EOSIRE	2.4 ...	
BASORE	1.4 ...	
IGRE	0.4 ...	
NRBCRE	0.0 ...	
NEUTAB	2.7 ...	
LYMPAB	1.6 ...	
MONOAB	0.3 ...	
EOSIAB	0.1 ...	
BASOAB	0.1 ...	

19. After the smear is made and stained, access the case in Caresphere (through the To Validate portal or the Manual Review portal).

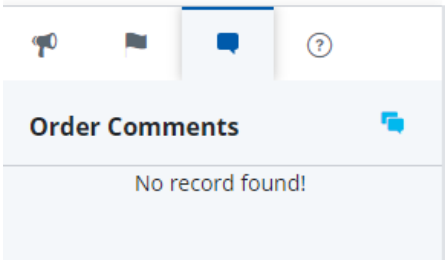
20. Perform the “Morphology Checks” by clicking on the Morph tab and entering results for WBC Estimate, Instrument Flags, RBC Morphology, and Plt Estimate.

21. Click on Validate All. This will finalize all results in Caresphere (all fields, including morphology responses will be gray) and in the LIS.

E. CLUMPED PLATELETS OR PLATELET SATELLITOSIS

1. If the XN analyzer gives any clumped platelet flags or OP Alert for Platelet Satellitosis, check sample for clots.

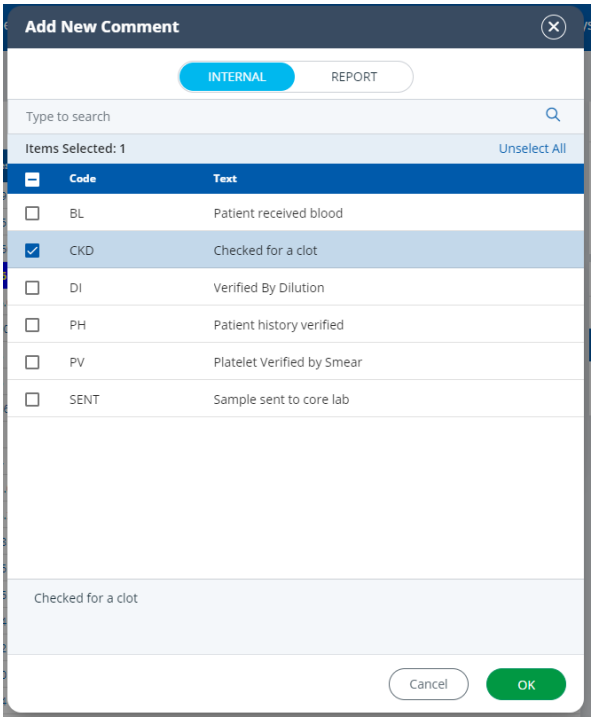
2. Retrieve specimen and check for a clot. If no clot is found, add an internal comment. Click on the comment icon on the left of the screen. Then click on the light blue comment icon.



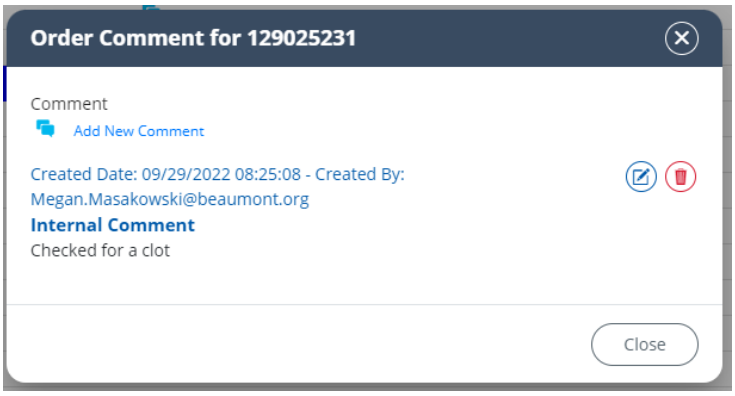
a. If a clot is found, follow steps for canceling specimen both in Caresphere and the LIS. Document contact information in the LIS. See notes section of procedure for more information.

3. The order comment box will appear. Click on Add New Comment.

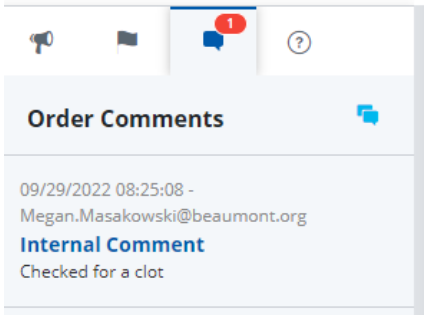
4. Add New Comment box will appear. Select internal or report comments. Select from the list of canned comments or free text a comment. Click OK when complete.



5. Order comment appears in pop-up box. Click Close.



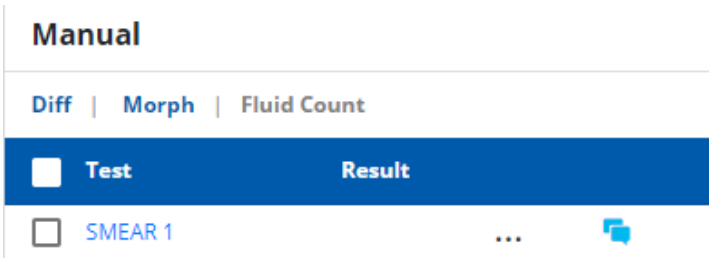
6. Comment now appears on the left side of the screen.



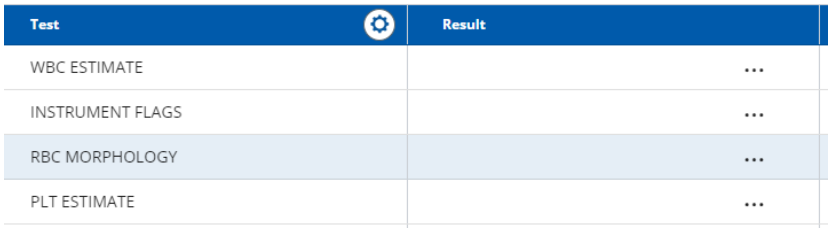
7. Select all but the PLT and fluorescent PLT (if ran) parameters, then click on Validate Selection.

Test	Result	Comment
WBC	4.9 ...	
RBC	5.15 ...	
HGB	15.6 ...	
HCT	45.3 ...	
MCV	88 ...	
MCH	30 ...	
MCHC	34 ...	
PLT	250 ... 1	
RDWCV	13 ...	
NEUTRE	56.0 ...	
LYMPRE	33.1 ...	
MONORE	6.7 ...	
EOSIRE	2.4 ...	
BASORE	1.4 ...	
IGRE	0.4 ...	
NRBCRE	0.0 ...	
NEUTAB	2.7 ...	
LYMPAB	1.6 ...	
MONOAB	0.3 ...	
EOSIAB	0.1 ...	
BASOAB	0.1 ...	

8. Review slide. If platelet clumps or platelet satellitosis are present and your platelet estimate differs from the instrument count, click on the Morph tab.



9. In the PLT estimate result field, choose the appropriate platelet estimate (increased, decreased, normal). Result all the required morphology fields appropriately.



10. Click Save when complete.

11. Remove the platelet result by clicking on the platelet result field and backspacing the result.

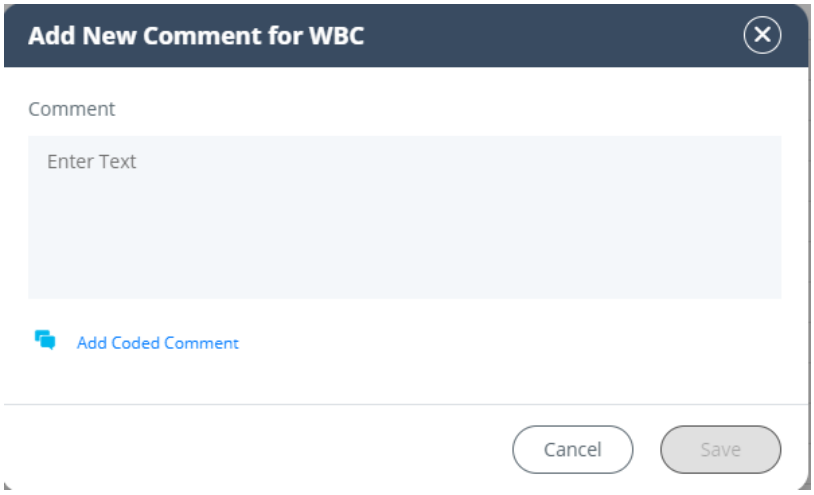
12. Click on the three dots next to the platelet field to select the appropriate clumped platelet/ platelet satellitosis comment that correlates with the platelet estimate. Click Okay. Click Save.

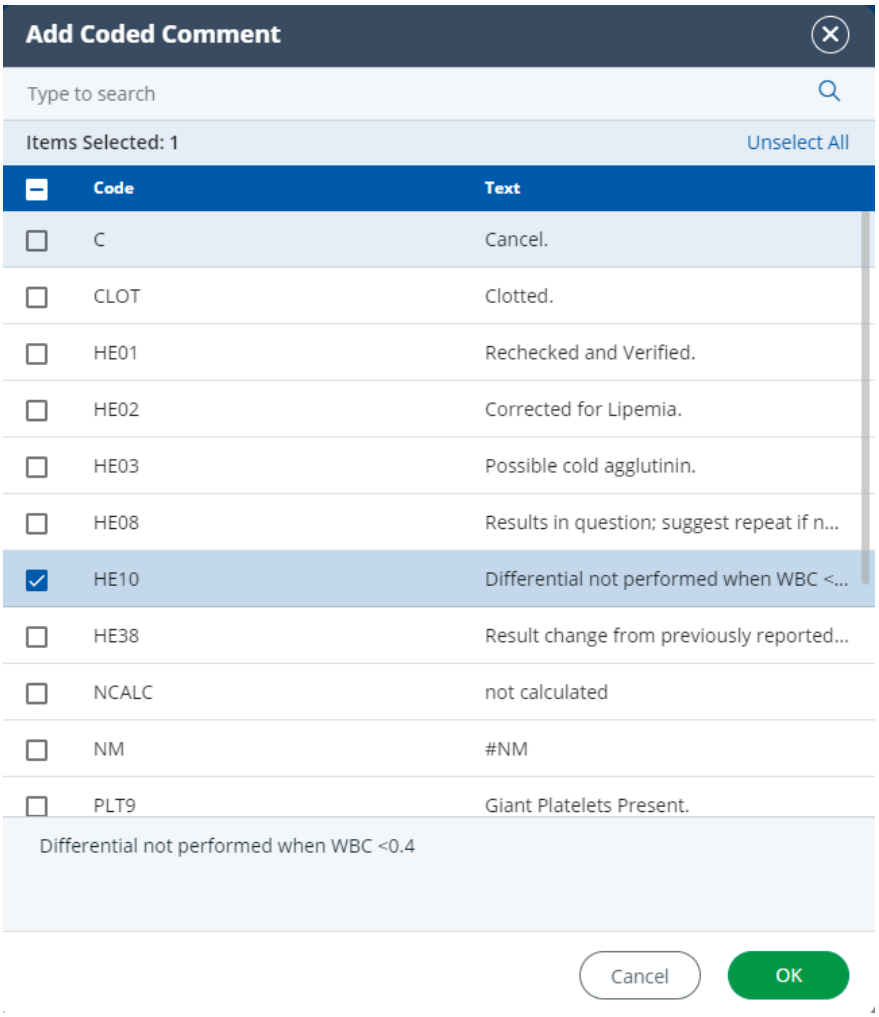
13. Click Validate All.

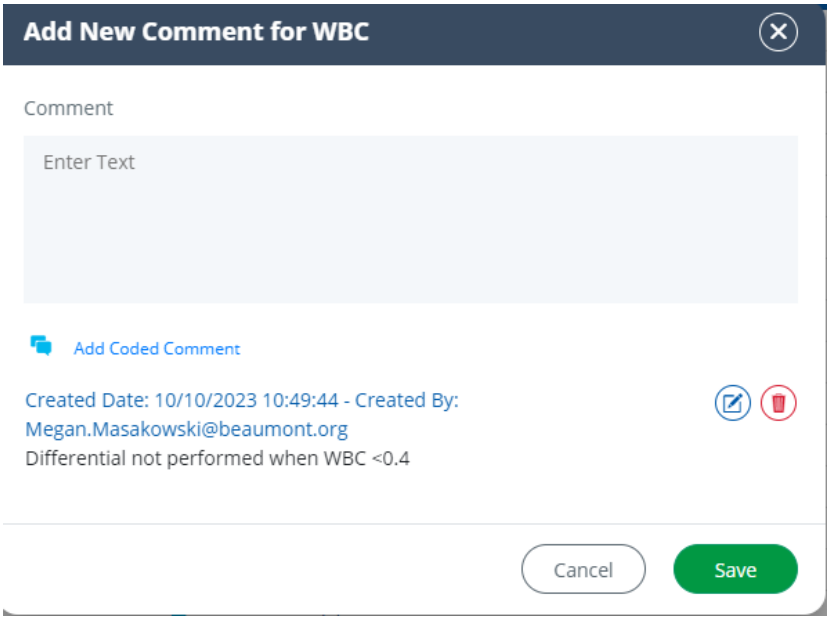
F. WBC <0.4

1. All CBCWD orders with a WBC < 0.4 bill/L will not have a differential resulted.
2. The LIS order will need to be changed to a CBCND.
   a. NOTE: If pathologist review is needed based on the smear review checklist, keep the CBCWD order and send for pathologist review.
3. Add the HE10 comment to the WBC parameter for the CBCND order in the middleware.
4. Click on the comment icon in the result line of the test code.

5. A window will open. Select Add Coded Comment to select the HE10 comment. Click OK. Click Save.




Add Coded Comment
Type to search
Items Selected: 1
Unselect All
Code
Text
C
Cancel.
CLOT
Clotted.
HE01
Rechecked and Verified.
HE02
Corrected for Lipemia.
HE03
Possible cold agglutinin.
HE08
Results in question; suggest repeat if n...
HE10
Differential not performed when WBC <...
HE38
Result change from previously reported...
NCALC
not calculated
NM
#NM
PLT9
Giant Platelets Present.
Differential not performed when WBC <0.4
Cancel
OK


Add New Comment for WBC
Comment
Enter Text
Add Coded Comment
Created Date: 10/10/2023 10:49:44 - Created By:
Megan.Masakowski@beaumont.org
Differential not performed when WBC <0.4
Cancel
Save

6. Continue to result the CBCND in the middleware per procedure.

G. FIRST TIME BLASTS SEEN

1. Validate CBC or Validate Selection after addressing the flags, Op alerts, etc.

2. Review the slide under the microscope. Perform a manual differential to include the blast count. Add morphologies to the morphology tab if applicable.

3. Add a comment next to the blast percentage by clicking the blue comment icon.

4. Enter free text “First time critical blast.” Click Save.

5. Add a path review in Caresphere (see step K below).

6. Validate All when complete.

7. Document all critical calls in the LIS.

8. Follow site specific workflow for sending slides and paperwork to the pathologists.

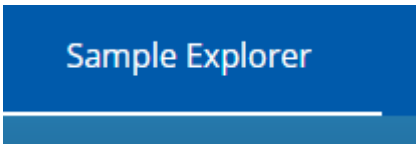
H. SECOND LEVEL REVIEW FOR BLAST FLAG

1. Validate CBC only after addressing flags, Op alerts, etc.

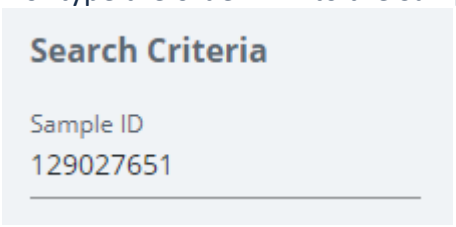
2. If only a scan is required:
   a. First level tech: Perform scan and result required morphology fields (WBC estimate, Instrument flag check, RBC morphology and PLT estimate). If differential can be released without further review by pathologist and only secondary blast review is needed, Validate All.

This will send out the differential and leave only the Second Level Review field pending.

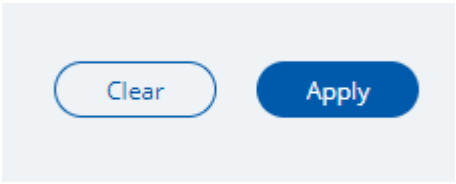
b. Secondary Review Tech: Click the Sample Explorer tab on the top of the screen.



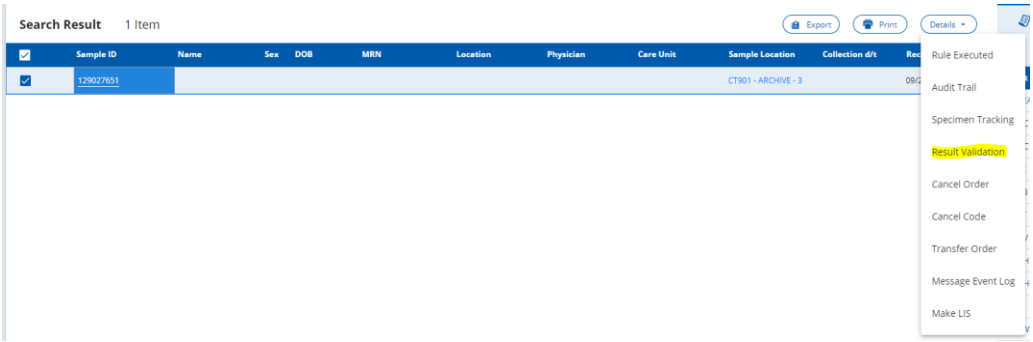
c. Scan or type the order ID into the Sample ID field.



d. Click Apply.



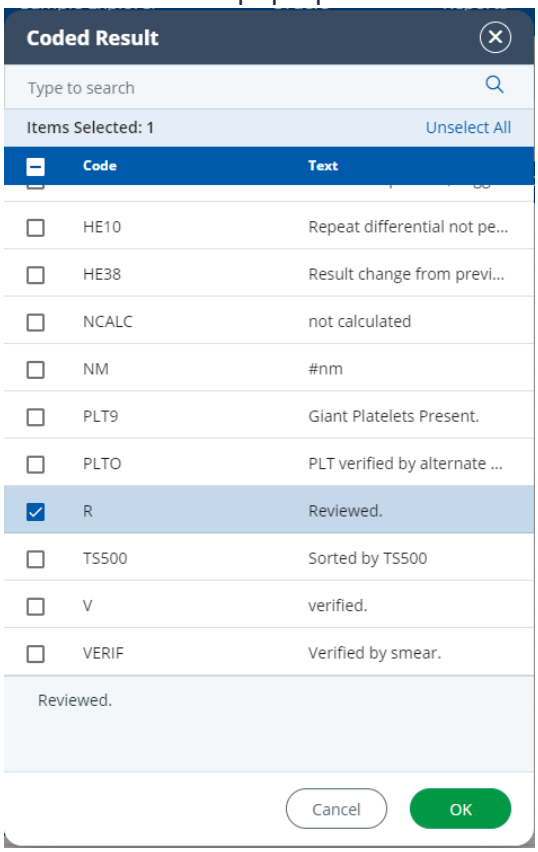
e. The sample will appear in the search result list. Check the box next to the sample ID, click Details and Result Validation to branch to the result validation screen or click on the sample ID hyperlink (will open a new tab).



f. The result validation screen will open.

g. After reviewing the smear, result the Second Level Review field by clicking on the three dots next to the field.

h. Click on Reviewed in the pop-up window. Click OK.



i. Click Save.

j. Click Validate All.

3. If a differential is required:

a. First level tech will perform manual differential under the Diff tab.

b. Click Diff under the Manual panel in the Result Validation screen.

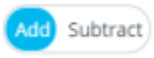
c. MDIFF is the default counter. Perform manual differential by selecting the appropriate key for each respective cell type. (User can select which key translates to which cell type).

1. When count limit is reached, the counting stops. No additional cells are added.

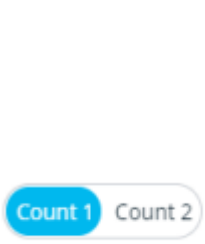
2. The count limit default is 100 cells. If you need to count more than 100 cells edit this number before beginning to count.

3. If the counting is stopped before the count limit is reached, you will be alerted that less than the number of cells has been reached. If accepted, the results will be averaged and rounded correctly for the total number of cells counted.

4. In the event of a cell being misclassified, select Subtract. Remove the cell by selecting the respective key. When finished removing cell, select Add and continue enumerating cell types.



5. Additional counts can be completed by switching to Count 2. After completion, determine which results will be reported (Count 1 or Count 2).

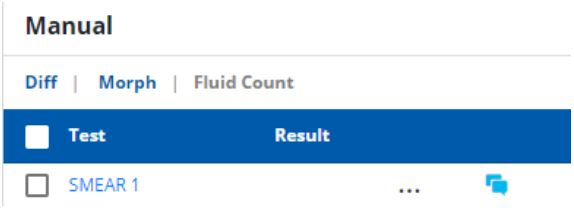


d. Click Save.

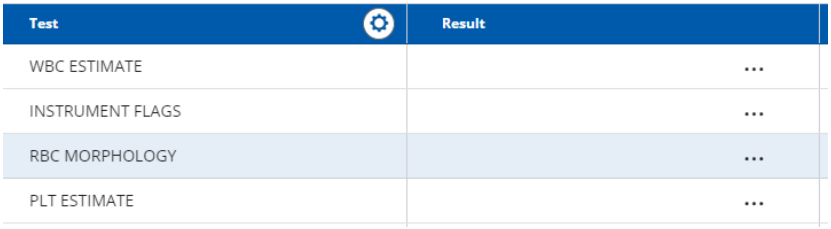
e. After completion, review the Result Validation screen for any Operator Alerts related to manual differential and absolute counts.

f. After performing the manual differential, complete the Morphology Checks.

g. Click the Morph tab.

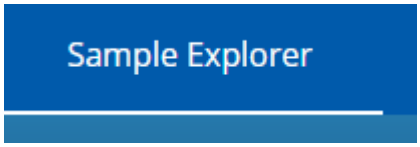


h. Perform “Morphology Checks” by clicking on the three dots in the result fields and selecting appropriate responses for WBC estimate, instrument flags, RBC morphology and platelet estimate.

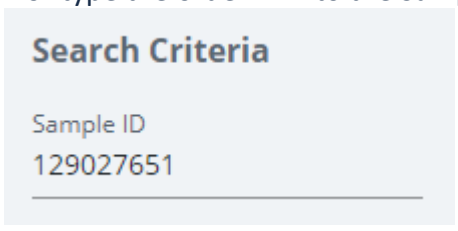


i. Once all results are finalized, the first level tech will Validate All. This will send out the differential and leave only the Second Level Review field pending.

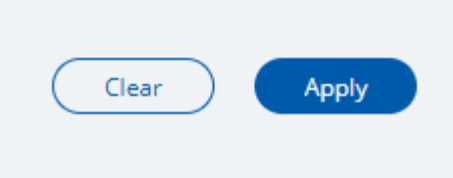
j. Secondary Review Tech: Click the Sample Explorer tab on the top of the screen.



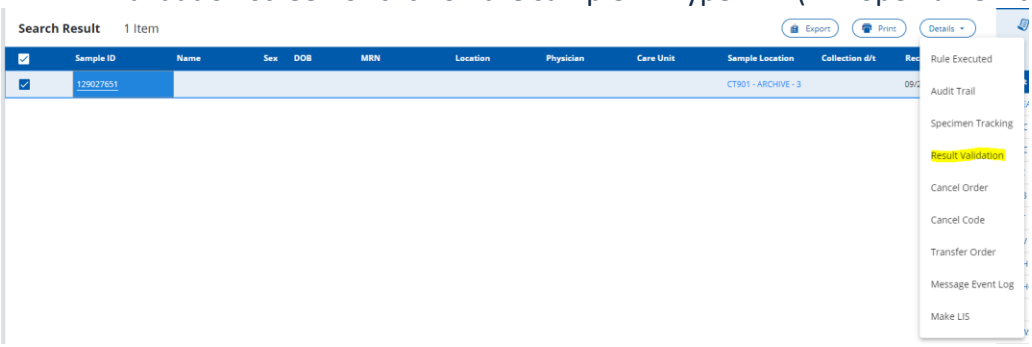
k. Scan or type the order ID into the Sample ID field.



l. Click Apply.



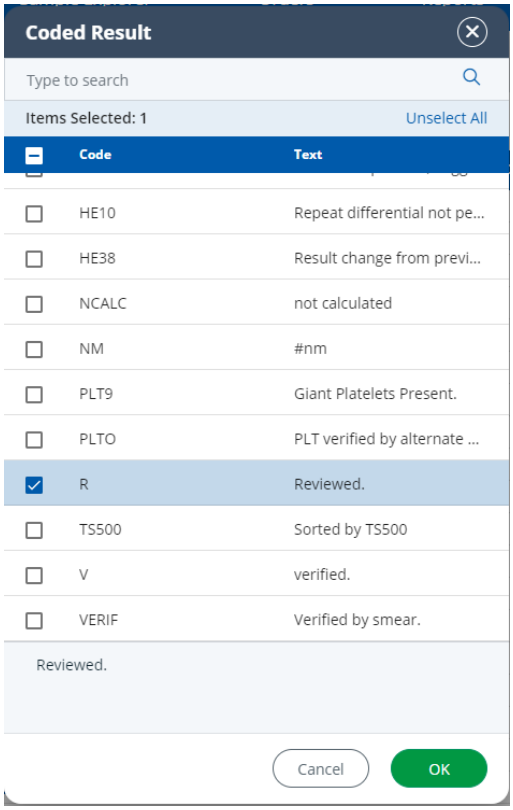
m. The sample will appear in the search result list. Check the box next to the sample ID, click Details and Result Validation to branch to the result validation screen or click on the sample ID hyperlink (will open a new tab).



n. The result validation screen will open.

o. After reviewing the smear, result the Second Level Review field by clicking on the three dots next to the field.

p. Click on Reviewed in the pop-up window. Click OK.



q. Click Save.

r. Click Validate All.

s. Since the second level review is internal, it will not appear in the LIS.

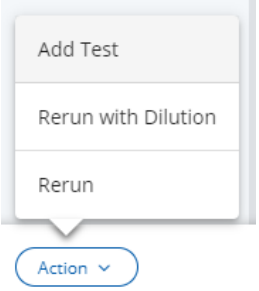
t. Note that if the Second Level Review is not answered, it will remain pending in Caresphere.

I. RETICULOCYTE (RET) ABN SCATTERGRAM

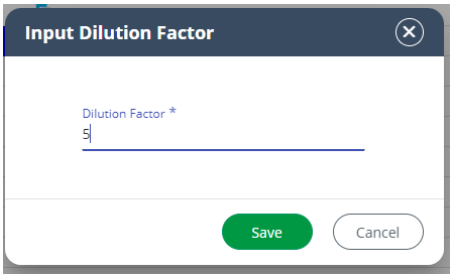
1. If the Retic Abn Scattergram is flagged and there are asterisks next to the RET%, RET#, IRF, and RET-He, a dilution is necessary. (If no asterisks are present, the retic parameters may be reported without further review). Refer to the workflow for proper handling of sample with this error.

2. In Caresphere under the Result Validation tab, check mark the box next to each retic parameter.

3. Click on the ACTION button and select rerun with dilution.



4. Enter dilution factor and click Save.



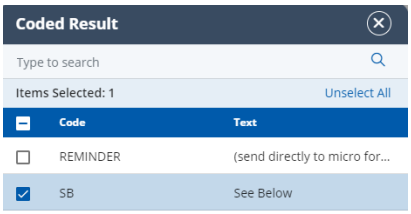
5. After you have prepared your dilution, run the diluted sample in the manual mode under the original barcode label. This run will cross over into Caresphere and can be seen in the Rerun tab.

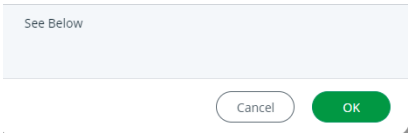
6. The diluted results should automatically be calculated by Caresphere. Refer to the workflow for any additional steps to be taken before validating the results.

J. MICROORGANISMS FOUND ON PERIPHERAL SMEAR

1. In Morph tab, after reviewing the slide and resulting all of the required morphology fields (WBCEST, INSTFL check, RBCM and PLTE) click on the three dots in the Intracellular Bacteria result field.

2. Select See Below and Save.



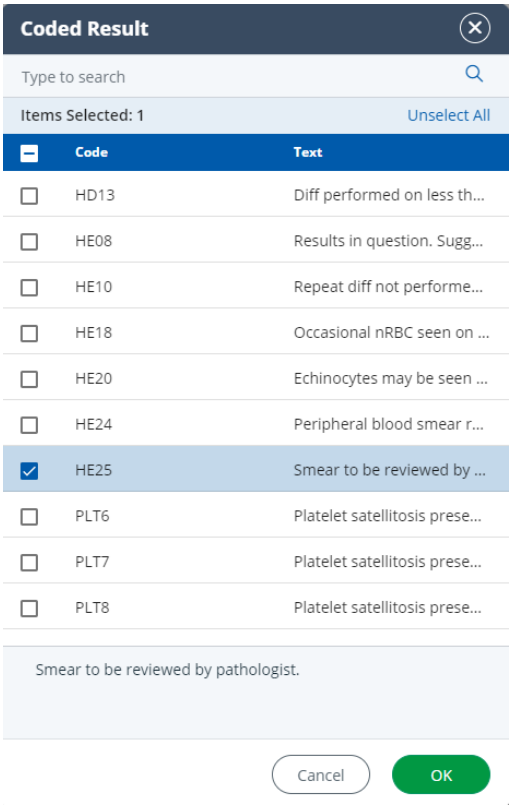


3. Validate All.

4. Send sample to microbiology following your sites specific workflow.

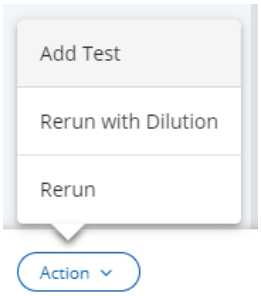
K. ADDING A PATHOLOGY (PATH) REVIEW IN CARESPHERE

1. Determine if the case needs to be sent for a Path Review.
2. If a path review is needed: Add a diff comment in the morph tab “Smear to be reviewed by pathologist”.

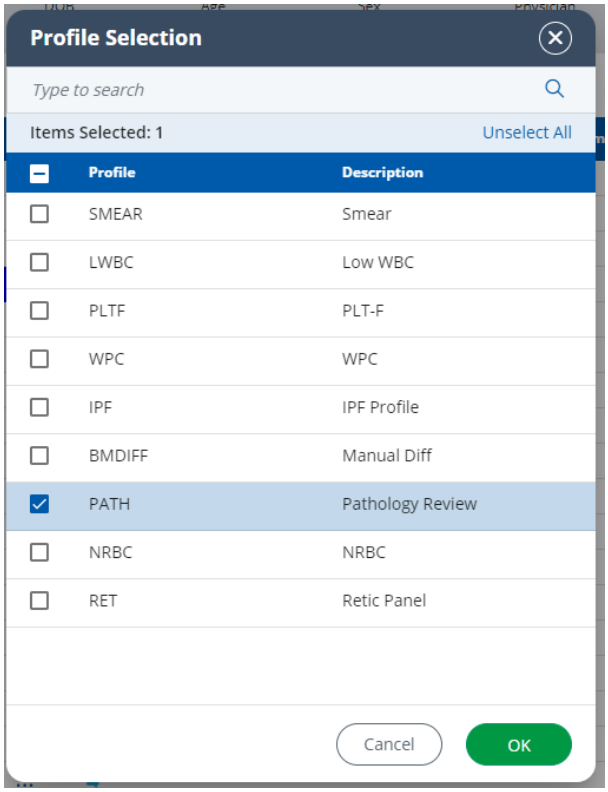


Click Ok and Save.

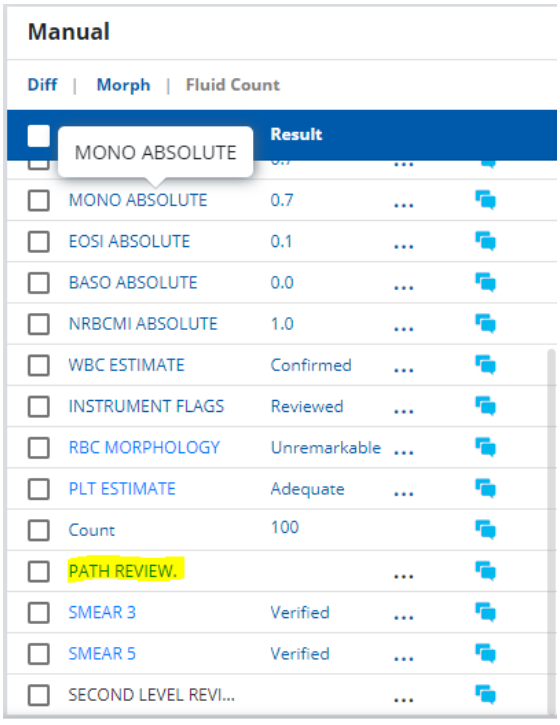
3. Click the Action button and select Add Test.



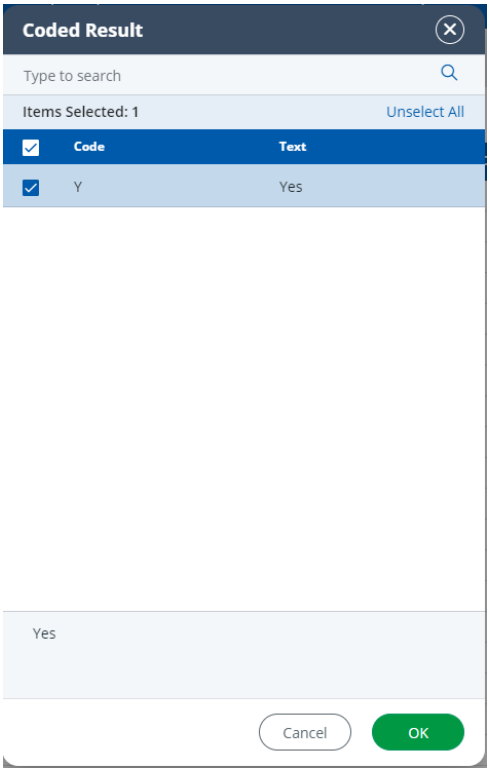
4. Select Pathology Review. Click OK.



5. Path Review will display under the manual tab to the right.



6. Enter Yes in the path review field by clicking on the three dots. Click Yes and OK.



7. Validate All when all results are final.

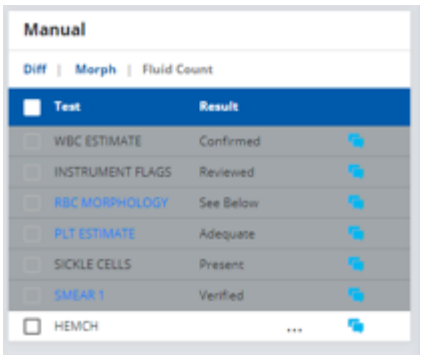
8. Follow site specific workflow for sending slides and paperwork to the pathologists.

9. Checking for a Previous Path Review in Caresphere: If you would like to know if a patient was previously sent for a Path Review:
   a. Click the Prev Res hyperlink to open the Previous Results popup.

   b. The list is sorted in reverse chronological order. The most recent previous result is considered as Prev Res 1.

L. HOW TO REMOVE HEMCH WHEN SICKLE CELLS ARE RESULTED (IF APPLICABLE)

1. When sickle cells are called and validated in Caresphere, the order may show back up on the Caresphere list with the HEMCH field pending.



2. To cancel the HEMCH field, click on the three dots in the field and select cancel. Click Save.

3. The order will autovalidate and be removed from the list.

4. NOTE: If you cannot search for the sample ID afterward in Caresphere, you may need to select site R or site ALL to view the results.

M. MANUAL NRBC DISAGREEMENT FROM ANALYZER (XN SITES)

1. Review Op alerts. Select the parameters that can be validated before slide review.

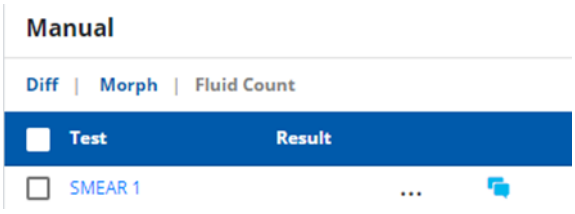
2. Validate Selection.

3. This will release the CBC parameters that were checked, holding back the diff and WBC result fields.
4. Review the slide and determine if a manual differential should be performed. If the number of NRBC's is in disagreement with the automated NRBC count (>10), perform a manual differential under the Diff tab.

5. Complete your differential using the keypad.

6. Click Save.

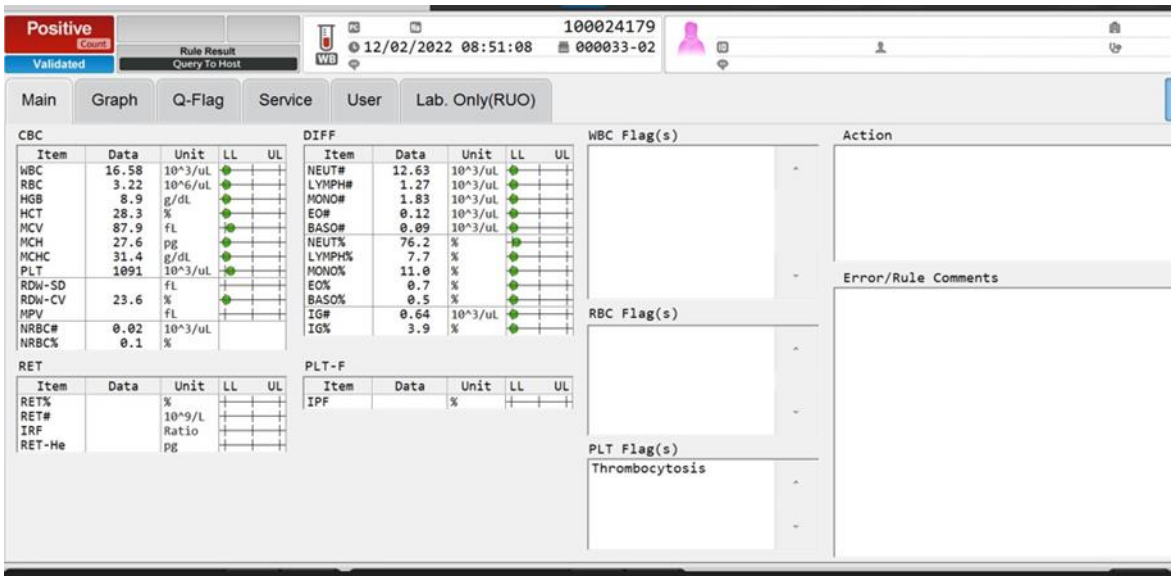
7. Perform all "Morphology Checks" under the Morph tab (WBC estimate, Instrument flag check, RBC morphology and PLT estimate).



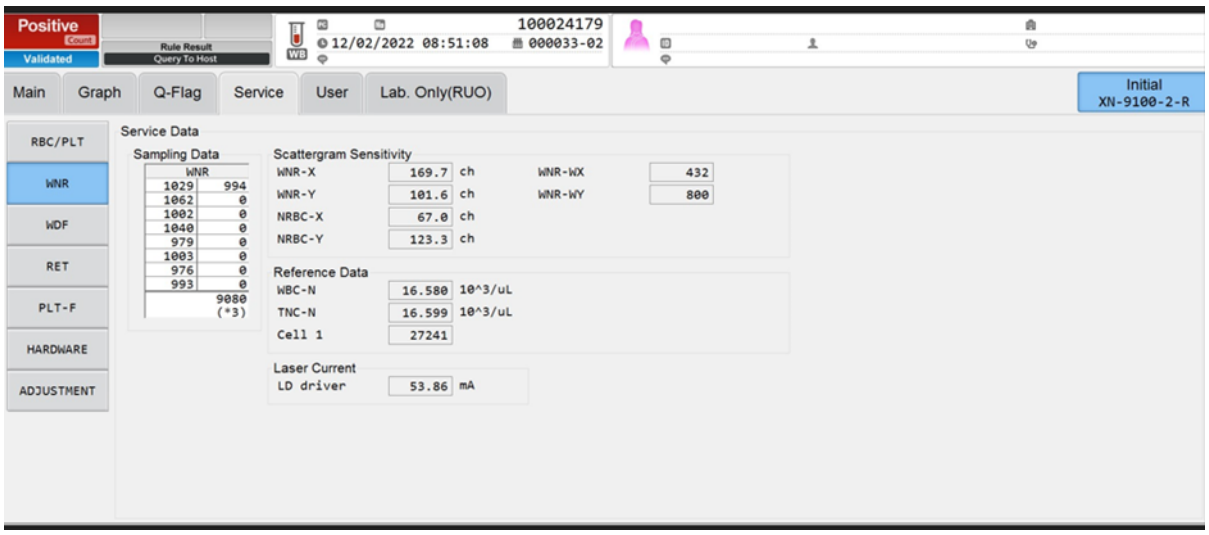
8. Return to the Result Validation tab. The WBC will need to be recalculated to correct for the manual NRBC's counted.

9. Obtain the original WBC count from the analyzer.

a. Select the order number from the analyzer IPU. Open the order.



b. Select the service tab on the top and the WNR tab on the left side. The uncorrected WBC count will be listed in the TNC-N field.



10. Manually calculate the corrected WBC value using the below equation.

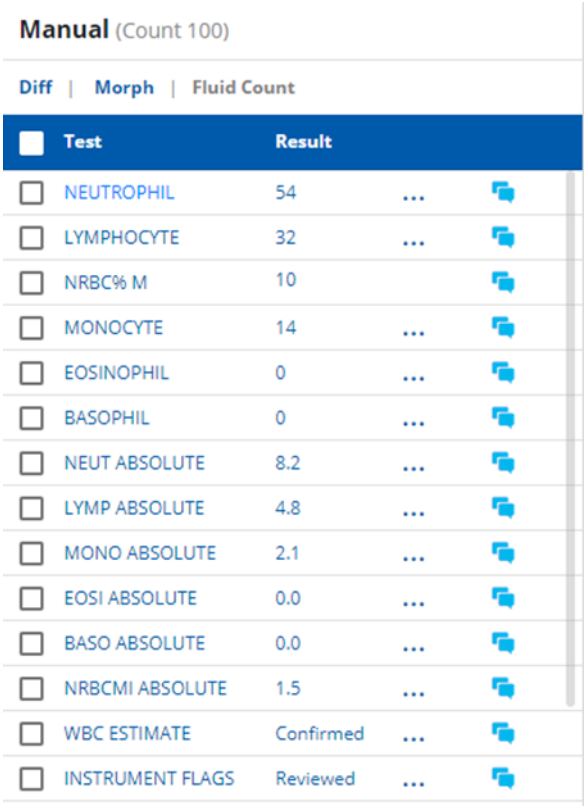
[Uncorrected WBC/(100 + manual NRBC count)] X 100

Example:
Uncorrected WBC: 16.599

Manual NRBC count: 10
[16.599/(100+10)] X 100
[16.599/110] X 100
0.1509 X 100
15.09
Corrected WBC: 15.1

11. Enter the corrected WBC into the WBC field in Caresphere. Click Save.

12. The manual diff absolutes will calculate to the right side of the screen.



13. When all results are complete, Validate All.

a. NOTE: If the WBC result field was released in Caresphere, the tech reviewing the slide will have to recalculate the WBC manually and make the correction in the LIS. The absolute differential results will need to be corrected as well.

N. MANUAL NRBC DISAGREEMENT FROM ANALYZER (XNL SITES)

1. Review Op alerts. Select the parameters that can be validated before slide review.

Test	Result	Comment
WBC	4.9 ...	
RBC	5.15 ...	
HGB	15.6 ...	
HCT	45.3 ...	
MCV	88 ...	
MCH	30 ...	
MCHC	34 ...	
PLT	250 ...	1
RDWCV	13 ...	
NEUTRE	56.0 ...	
LYMPRE	33.1 ...	
MONORE	6.7 ...	
EOSIRE	2.4 ...	
BASORE	1.4 ...	
IGRE	0.4 ...	
NRBCRE	0.0 ...	
NEUTAB	2.7 ...	
LYMPAB	1.6 ...	
MONOAB	0.3 ...	
EOSIAB	0.1 ...	
BASOAB	0.1 ...	

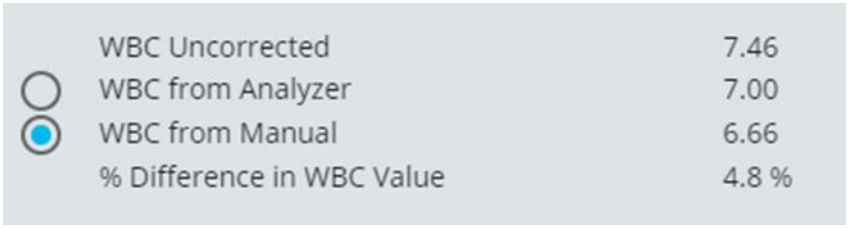
2. Validate Selection.

3. This will release the CBC parameters that were checked, holding back the diff and WBC result fields.

4. Review the slide and determine if a manual differential should be performed. If the number of NRBC's is in disagreement with the automated NRBC count, perform a manual differential under the Diff tab.

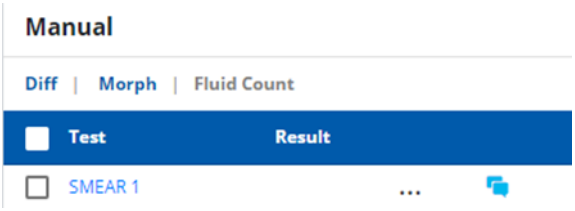
5. Complete your differential using the keypad.

6. On the left side of the screen, select which WBC to release.



7. Click Save.

8. Perform all “Morphology Checks” under the Morph tab (WBC estimate, Instrument flag check, RBC morphology and PLT estimate).



9. Return to the Result Validation tab. Notice that the WBC selected from the diff tab populates in the WBC field. Validate All.

a. NOTE: If the WBC result field was released in Caresphere, the tech reviewing the slide will have to recalculate the WBC manually and make the correction in the LIS.

O. OTHERS RESULTED

If others are counted in the manual differential, a comment must be added to explain what the other cells are referring to.

1. Validate CBC or Validate Selection after addressing the flags, Op alerts, etc.

2. Review the slide under the microscope. Perform a manual differential to include the others count. Add morphologies to the morphology tab if applicable.

3. Add a comment next to the others absolute result by clicking the blue comment icon.

4. Enter free text “Others are _____.” Click Save.

5. Add a path review in Caresphere, if needed. (see step K above).

6. Validate All when complete.

7. Follow site specific workflow for sending slides and paperwork to the pathologists, if applicable.