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<p>DXH - CBC REVIEW CRITERIA</p>		

POLICY

FHS Laboratory has defined parameters for result review from the DxH analyzers.

BACKGROUND

The tables below list current reportable limits, action limits, critical values, and common flags. Due to the number of error codes and flags generated by the DxH analyzer, only the most common flags are listed. If a flag is not listed, the information is available on the analyzer Help screen.

For interferences, review the CBC-Table of Interferences. The procedures are located on the Intranet and should be consulted for managing the interference or flag. The actions that are listed below for analyzer flags are intended as guidelines. Always refer to the related procedure for the specific interferences.

REPORTABLE RANGE

PARAMETER	BECKMAN DXH800
WBC	0.4-383.0
RBC	0.80-8.00
HGB	2.3-24.5
MCV	50.150
PLT	6-4400
RET	0.2-30.0

FHS CRITICAL VALUES FOR ADULTS

PARAMETER	CRITICAL LOW	CRITICAL HIGH
WBC	< 2.0	>50.0
HCT	<22.0	>60
PLT	< 30	>1000
BLASTS (1 st event)		Any

FHS CRITICAL VALUES FOR CHILDREN <12 YEARS AND NEONATES

PARAMETER	AGE	CRITICAL LOW	CRITICAL HIGH
WBC	<12 YEARS	< 2.0	>50.0
HCT	<1 mo.	<24	>75
HCT	2mo. – 12 YRS.	<24	>70
PLT		< 30	>1000

NEONATES

Neonate: <1mo.	DL MAN order		MAN DIFF required.
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WBC COUNT	FIRST ACTION	SECOND ACTION	FINAL ACTION
WBC: <2.5 or >30.0	Scan slide at 1 st presentation	AND, every 3 days, if WBC remains consistent.	If WBC results show change, repeat slide review.
WBC: <1.0	Slide review. Follow procedure: Low WBC Count.	Scan for immature or ABN cells. If sufficient cells, Auto or MAN diff reported. If too few cells, cancel diff.	Submit for path Review if indicated.
WBC with R- flag	Check for clots. Vortex, repeat.	Slide review for interferences. Follow procedure: WBC Interference.	WBC estimate. PLT estimate. Review Diff %'s for accuracy.
WBC : (+++++), or Elevated/ R-flagged WBC INTER: MCV WBC INTER: HGB MCV INTER: WBC	Dilute X2 or X3 and repeat. Correct for dilution.	If flag unresolved, follow procedure: Elevated WBC's, or DxH- WBC Interferences.	Slide review. WBC/PLT estimate. Man Diff, if indicated
WBC Carryover	Prior sample had high WBC.	Carryover may have occurred to this sample	Repeat the sample.
RBC, HGB, HCT	FIRST ACTION	SECOND ACTION	FINAL ACTION
RBC: > 8.00	Dilute X2	Correct for dilution.	Report Indices from dilution.
HGB: <2.6	Below reportable limit.	Do not report Hgb.	Result MCH and MCHC as "N/A".
HGB: > 24.0	Dilute X2	Correct for dilution.	Report Indices from dilution.
HGB with R-flag HGB BLANK SHIFT	Repeat, or check for hemolysis or lipemia. Recollect, if needed	If sample related issue, follow procedure: CBC – Interference from Hemolysis.	If not sample related, rule out instrument error. Troubleshoot. Remove from service, if indicated.
H/H FAILURE	Repeat, review HGBx3 calculation. Correlation: +/- 4%.	Rule out sample interferences. If not sample related, repeat on alternate analyzer to rule out analyzer error.	If DxH error, remove from service until troubleshooting is complete.
HCT with Failed Delta	Confirm sample ID and labeling.	Confirm sample stability and integrity.	Review patient history or TX history

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INDICES	FIRST ACTION	SECOND ACTION	FINAL ACTION
MCV: <65	1 st presentation, Slide review, AND every 30 days, unless interference present	Check for microcytes, RBC fragments, or giant platelets.	If interference from PLTs, perform Plt estimate.
MCV: >115	1 st presentation, AND, every 30 days, unless interference present. Scan slide for Macrocytes.	Check for interference from: Cold Aggl, Plt clumps, elevated WBC, very abnormal sodium, glucose, or BUN.	If interference: Follow the procedure for the interference. See Related Procedures listed below.
MCV with Failed Delta	Check sample ID, labeling. Confirm stability, integrity.	Review slide for cellular interferences if indicated. Check TX history.	See procedure: DxH Cell Interferences. Re-collect, if indicated.
MCV: R-flag MCV Inter: PLT	Review slide.	Check for microcytes, or interferences from: RBC fragments, or Giant Plts.	If interference from PLTs, perform Plt estimate.
MCV Inter: WBC	MCV has interference from high WBC count.	Make slide and review.	Follow procedure : DxH WBC Interference
MCHC: >37.0 MCHC: +++++	Review slide. Rule out Cold Agg lipemia, hemolysis or spherocytes.	Follow Procedure for RBC Agglutinins, or Plasma Replacement	Prewarm, saline replace, or dilute specimen, as indicated.
MCHC: <30.0 and Low MCV	Scan slide for microcytes, RBC morphology.	Check patient history for anemia.	Consider path review if MCV less than 65 and 1 st presentation.
MCHC: <30.0 with Normal to High MCV or H/H Failure	Repeat on alternate analyzer to rule out aspiration error.	Consider sample related causes: contamination, anemia, pseudo-macrocytosis, high BUN Sodium or glucose.	Dilute X2, let sit for 5 minutes and repeat. See procedure: CBC-Interference from Ab-normal Chemistries.
RBC Fragments / Microcytes.	Review slide.	Check for microcytes, RBC fragments, spherocytes or Giant Plts.	If interference from PLTs, perform Plt estimate.

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PLT COUNT / RDW	FIRST ACTION	SECOND ACTION	FINAL ACTION
PLT: <80	1 st presentation. Review slide and perform estimate.	Review slide and perform estimate. If flagged, check sample.	If consistent with previous, result may be reported.
PLT: <10	Check for clots, or sample integrity	Review patient platelet history. Slide review.	Perform estimate before reporting.
PLT: (+++++) or High With R-Flag	Dilute and repeat. Slide review 1 st presentation.	Confirm count with PLT estimate.	Review and report PLT morphology.
PLT: and Failed Delta	Check for clots, or sample integrity	Perform slide review for platelet clumps, fibrin.	Perform PLT estimate.
Platelet Clumps	Check sample. Vortex, repeat.	Slide review. Perform platelet estimate Recollect, if indicated	Follow procedure: Plt Clumping EDTA Correction
RBC-PLT Overlap	Review slide. Small RBC's may cause interference to PLT count	Check slide morphology for microcytosis or fragmented RBCs	Perform PLT estimate.
PLT Inter: Debris	Vortex, repeat. Slide review. Slide estimate.	Check for very small platelets.	Scan for other interferences.
PLT Carryover	Prior sample had very high PLT's.	Carryover may have occurred to this sample.	Repeat the sample.
RDW: >24.0	1 st presentation Review RBC morphology.	Rule out RBC interferences.	Report degree of anisocytosis.
RDW with R-Flag	Repeat testing. If unresolved, review slide.	Check for interferences: Plt clumps, Giant Plt, microcytes, RBC fragments, cold aggl., or elevated WBC count.	If unable to resolve, do not report result.
RETIC COUNT	FIRST ACTION	SECOND ACTION	FINAL ACTION
RET% >30% RET% with R-Flag Sickled Cells Retic Inter: Debris Retic Inter: PLT RET-RBC Overlap ABN Hemoglobin ABN Retic Pattern	Prepare manual retic slides.	Count retics in 500 cells. Multiply X2.	If count is inconsistent with auto-retic, perform full manual retic count.

<p>CATHOLIC HEALTH INITIATIVES</p> <p>Franciscan Health System</p> <p>St. Anthony Hospital Gig Harbor, WA St. Clare Hospital Lakewood, WA St. Elizabeth Hospital Enumclaw, WA St. Francis Hospital Federal Way, WA St. Joseph Medical Center Tacoma, WA</p>	<p>POLICY</p>	<p>DOCUMENT NUMBER J-PO-HEM1577-00</p>
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DIFFERENTIAL	FIRST ACTION	SECOND ACTION	FINAL ACTION
A. Neut : <1.0 or >20.0	Scan slide-1 st presentation	AND, every 3 days.	Follow Slide Review Procedure
A. Lymph: >5.0 adult >7.0 (<12 y.o.)	Scan slide-1 st presentation	AND, every 3 days	Follow Slide Review Procedure
A. Mono: >1.5 adult >3.0 (<12 y.o.)	Scan slide-1 st presentation	AND, every 3 days.	Follow Slide Review Procedure
A. Eos: >2.0	Scan slide-1 st presentation	AND, every 3 days.	Follow Slide Review Procedure
A. Bas: >0.5 or Percent>3.0%	Scan slide for Baso's, Agranular Neut's, WBC cell inclusions.	Manual Diff, if indicated.	If unresolved, suspect instrument issue, repeat on alternate analyzer.
FLAGS / CODES	FIRST ACTION	SECOND ACTION	FINAL ACTION
Vote-Outs (.....) or Flow Cell Clog(:::) Data Disc: D	Check for clots.	Vortex and repeat, if indicated.	If unresolved: MAN DIFF
R- Flags	Check sample, vortex, repeat.	If persists, scan slide.	WBC/PLT estimate may be indicated.
CELLULAR INTER WBC INTER: MCV WBC INTER: HGB MCV INTER: WBC	Check for clots, vortex, repeat. Review slide for interferences.	Perform WBC and PLT estimates. If NRBCs present, WBC count may need correction if estimate does not match. See procedure for DXH WBC Interference.	Perform Man Diff. See procedure for Hematology Slide Review. Recollect sample, if indicated.
IMM GRAN	Slide Review for 1 st presentation	AND, every 3 days if WBC consistent with previous.	Repeat slide review if WBC or differential results have significant changes.
Blast: MO, NE, LY	Slide review.	Man Diff, if blasts present.	CBC PR if indicated.
Variant LY	1 st presentation.	AND, every 3 days.	Slide Review.
Dimorphic Reds	1 st presentation	And, NO Transfusion history	Slide review.
Red Cell Agglut	Slide review.	Check for RBC agglutination	See procedure: Managing RBC Agglutinin

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Abn Diff Pattern	Repeat.	If unresolved, slide review.	Man Diff, if indicated.
Excessive Debris: D	Check for clots	Repeat.	Slide review.
Bubbles Partial Aspiration	Aspiration error. Check volume.	Check for clots. Repeat.	Recollect if indicated
MO-NE Overlap	Repeat, diff is skewed.	Correlate % Monos and % Neuts with slide.	Do manual diff, if indicated.
NE-EO Overlap	Repeat, diff is skewed.	Correlate %Neut and % Eosinophils with slide.	Do manual diff, if indicated.
NRBC-LY Overlap	Correlate % Lymphs and % NRBC with slide.	Rule out large NRBC being counted as lymphs. Rule out small Lymphs being counted as NRBC.	Manual Diff, and /or Corrected WBC may be indicated.
Sickled Cells	Review slide for Sickled cells.	Flag may occur with elliptocytes, ovalocytes.	If Retic ordered, do manual retic.
NRBC >1 Any NRBC flag NRBC Interference	Review slide for Increased NRBCs	If NRBC's on slide do not correlate with analyzer count, perform WBC estimate.	If WBC estimate does not correlate, Corrected WBC may be indicated. Do manual diff.

RELATED PROCEDURES

PROCEDURE NAME	DOCUMENT NUMBER
Low WBC Count	R-W-HEM1325
Elevated WBC Count	M-W-HEM1318
DxH - WBC Interference	J-W-HEM1581
CBC – Interference from Hemolysis	R-W-HEM1575
CBC-Interference from Abnormal Chemistries	R-W-HEM1576
Platelet Clumping EDTA Induced Correction	R-W-HEM1317
RBC Agglutination Management	R-W-HEM1413
Hematology Slide Review	R-W-HEM1326
WBC Estimate	R-W-HEM1420
Platelet Count Estimate	R-W-HEM1421
Lipemic Sample Plasma Replacement	R-W-HEM1319
CBC – Table of Interferences	R-W-HEM1578

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REFERENCES

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PN 4206695A, 4/1999.

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