

**CRITICAL VALUE POLICY****SCOPE**

This policy is applicable to all laboratories within Marshfield Labs Laboratory Service Line.

**PURPOSE**

Critical values may imply a life-threatening situation for the patient and must be brought to the immediate attention of the physician and/or the patient care staff responsible for the patient. Prompt notification of potentially life-threatening test results is important to ensure appropriate care is administered. Critical (panic) values are established for a normal population, though in some instances may not be considered “critical” when related to particular disease states. Interpretation of test results and determining if a result is critical to a particular disease state is the responsibility of the requesting physician. The purpose of this policy is to provide staff with the list of test values identified as potentially life-threatening.

**POLICY STATEMENT**

- All critical values are promptly reported to the ordering provider or designee following the applicable notification procedure(s).
  - For lab setting refer to the [Critical Value Notification Procedure](#) for notification procedure.
  - For point of care setting (POC) refer to [Communication of Critical Results and Critical Tests Policy-Acute Care](#) or [Communication of Critical Results Policy-Ambulatory Care](#)
- Approved designees include:
  - Nurse responsible for the patient
  - Provider’s Medical Assistant (M.A.) or Health Service Coordinator
  - Nurse in the same department or unit
  - Health Unit Coordinator (HUC) on same unit, only if RN is not available.
  - Technologist in the laboratory from which the specimen was referred (Outreach only)
- Notification must include the following:
  - Patient’s full name
  - Medical record number (or accession number)
  - Date and time of specimen collection
  - Test name
  - Patient test result and reference range.
  - Any additional pertinent information (i.e. hemolysis, lipemia, etc.)
- Notification and verification of read back must be electronically documented in the lab or Transfusion Service information system(s). Read back documentation must include the identity (first and last name) of the person called.
  - Point of Care Setting: *The identity of the testing individual and person notified need not be recorded when the individual performing the test is the same person who treats the patient. In this circumstance, the medical record must include the critical result, date, and time.*
- If a critical result is discovered on an assay that was not ordered, notify the provider. Explain that the critical value was discovered on a test that was not ordered. Inform the provider an add-on order will

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need to be placed if the provider would like the results in the medical record (the provider is not required to order the test). Document the results and the call, including who was notified and when as a result note comment on the ordered test.

Refer to [Attachment I: Critical Value List](#) subsections for critical values and conditions for notification.

- *Conditions are not applicable for Point of Care test results.*

<a href="#">Chemistry, Blood Gas, Therapeutic Drugs</a>	<a href="#">Microbiology</a>
<a href="#">Coagulation and Hematology</a>	<a href="#">Pathology</a>
<a href="#">Cytology</a>	<a href="#">Transfusion Service</a>
<a href="#">Molecular Pathology</a>	

## RELATED DOCUMENTS

<b>Title:</b>
<a href="#">Critical Value Notification Procedure</a>
<a href="#">Communication of Critical Results and Critical Tests Policy-Acute Care</a>
<a href="#">Communication of Critical Results Policy-Ambulatory Care</a>

## ATTACHMENTS

<b>Title:</b>	<b>Attachment</b>
<a href="#">Critical Value List</a>	<a href="#">Attachment I</a>

POLICY

### ATTACHMENT I: Critical Value List

Chemistry, Blood Gas, Therapeutic Drugs				
Test	Units	Critical Low	Critical High	Condition
Acetaminophen	ug/mL	NA	>=50	
Alcohol	mg/dL	NA	>300	
Ammonia	umol/L	NA	>110 (<1 year old) >150 (>= 1 year old)	
Bili Total	mg/dL	NA	>15.0	
BUN	mg/dL	NA	>100	
Carbamazepine	ug/dL	NA	>15.0	
CO2 Lvl (Bicarbonate)	mmol/L	<10	>40	
Calcium	mg/dL	<6.5	>13.0	
Carboxyhemo (CO)	%	NA	>20.0	
Creatinine	mg/dL	NA	>10.0	
CK Total	U/L	NA	>=10,000	
Digoxin	ng/mL	NA	>=3.0	
Gentamicin	ug/mL	NA	>10.0	
Glucose	mg/dL	<30 <50 <50	>325 <30 days old >325 >=30 days to 1yr old >450 >1 year old	
HIV1,2 Exposure (EXPOSE)	NA	Reactive		Employee exposures only <ul style="list-style-type: none"> <li>M-F 8a – 4p Employee Health RN 7-7081, opt 1</li> <li>Off hours Hospital Supervisor</li> </ul>
Hep B Surf Ag (HBSAGDV)	NA	Reactive		
Ionized Ca	mg/dL	<3.0	>6.3	
Lithium	mmol/L	NA	>2.00	
Magnesium	mg/dL	<1.0	>5.0	
pH Art/Ven		<7.20	>7.60	MMC-Marshfield OR/Surg only; No call
pH Art, Umb		<7.00	NA	
pH, ECMO Art/Ven (ABGELS/VBGELS)		<7.2	>7.60	
pCO2 Art/Ven	mmHg	<20	>70	MMC-Marshfield OR/Surg only; No call
pCO2, ECMO Art/Ven (ABGELS/VBGELS)	mmHg	<20	>70	
pO2, Art	mmHg	<35 (<=1 day old) <40 (>1 day old)	NA	MMC-Marshfield OR/Surg only; No call
pO2, ECMO Art (ABGELS)	mmHg	<80	NA	
PO2 Cap	mmHg	<35 (<=1 day old) <40 (>1 day old)	NA	
Phenobarbital	ug/mL	NA	>55	
Phenytoin	ug/mL	NA	>30.0	
Phosphorus	mg/dL	<1.0	NA	
Potassium	mmol/L	<2.5	>6.9 (< 1 month old) >6.0 (>= 1 month old)	
Salicylate	ug/mL	NA	>50.0	
Sodium	mmol/L	<120	>160	
Valproic Acid	ug/mL	NA	>150	
Vancomycin	ug/mL	NA	>30.0	
Volatile (methanol & isopropanol)		Positive		

<b>Coagulation and Hematology</b>				
<b>Test</b>	<b>Units</b>	<b>Critical Low</b>	<b>Critical High</b>	<b>Condition</b>
APTT	seconds	NA	>100.0	
Blood Parasites (Anaplasma Smear and Babesia Smear)		Positive		
*HCT	%	<20	>78 (<= 1 mo old) >60 (>1 mo old)	Inpatient: Call Outpatient: Call, except: MCHS Heme/Onc Adult providers M-F prior to 17:00 no call. After 1700 call NurseLine
*HGB	g/dL	<7.0	>27.0 (<= 1 mo old) >20.0 (>1 mo old)	Inpatient: Call Outpatient: Call, except: MCHS Heme/Onc Adult providers M-F prior to 17:00 no call. After 1700 call NurseLine
Fibrinogen	mg/dL	<50	NA	
INR		NA	>6.0	
*PLT	x10 <sup>3</sup> /uL	<30	>1000	Inpatient: Call Outpatient: Call, except: MCHS Heme/Onc Adult providers M-F prior to 17:00 no call. After 1700 call NurseLine
Unf Heparin	IU/mL	NA	>1.50	
*WBC	x10 <sup>3</sup> /uL	<1.0	>35.0	Inpatient: Call Outpatient: Call, except: MCHS Heme/Onc Adult providers M-F prior to 17:00 no call. After 1700 call NurseLine

\*Follow UW-Health policy for UW-Health providers [Critical-Call-List.pdf \(uwhealth.org\)](https://www.uwhealth.org/critical-call-list.pdf)

<b>Transfusion</b>		
<b>Test</b>	<b>Result</b>	<b>Condition</b>
DAT	Positive	Cord blood or neonatal sample
TxRx (Transfusion reaction workup)	Evidence of immune mediated hemolysis	

<b>Microbiology</b>		
<b>Category</b>	<b>Critical value</b>	<b>Condition</b>
Aerobic & anaerobic blood culture	<ul style="list-style-type: none"> <li>Positive culture Gram stains.</li> <li>Additional morphology/organism isolated in culture.</li> </ul>	One positive called to provider per 72h if successive results match the first
Aerobic & anaerobic culture from the following sterile body fluids: <ul style="list-style-type: none"> <li>CSF</li> <li>Eye (internal aqueous &amp; vitreous)</li> <li>Synovial</li> <li>Pericardial</li> </ul>	<ul style="list-style-type: none"> <li>Positive Gram stain of the specimen.</li> <li>Positive culture if direct Gram stain is negative.</li> <li>Additional morphology/organism isolated in culture.</li> <li>Positive culture isolate identifications.</li> </ul>	One positive called to provider per 72h if successive results match the first

Mycobacterial culture	<ul style="list-style-type: none"> <li>Positive acid fast stain of the specimen.</li> <li>Positive culture if direct acid fast stain is negative.</li> <li>Positive nucleic acid test results of the specimen.</li> <li>Positive culture isolate identifications of the <i>M. tuberculosis</i> complex.</li> </ul>	One positive called to provider per 72h if successive results match the first
Mycological culture	<ul style="list-style-type: none"> <li>Specimen stains positive for fungi morphologically consistent with <i>Blastomyces</i>, <i>Histoplasma</i>, <i>Coccidioides</i>, <i>Paracoccidioides</i> or <i>Pneumocystis</i>.</li> <li>Positive culture identifications of <i>Blastomyces</i>, <i>Histoplasma</i>, <i>Coccidioides</i>, or <i>Paracoccidioides</i>.</li> </ul>	One positive called to provider per 72h if successive results match the first
Film Array Respiratory Panel	<ul style="list-style-type: none"> <li><i>Bordetella pertussis</i></li> </ul>	
HHS/USDA Select Agents	Confirmed identifications.	

Molecular Pathology	Results	Condition
Herpes Simplex Virus and Varicella Zoster Virus by PCR on CSF (spinal fluid)	Positive	
Anaplasma/Ehrlichia/Babesia by PCR	Positive	Inpatient and ER: Call Outpatient: No call
<i>Entamoeba histolytica</i>	Positive	
<i>Bordetella pertussis</i>	Positive	

Pathology
Significant or unexpected surgical pathology.

Cytology
<p>All abnormal GYN Cytology results that are reported as:</p> <ul style="list-style-type: none"> <li>Malignant cases,</li> <li>Results deemed significant or unexpected</li> </ul> <p>All abnormal Non-GYN Cytology results that are reported as:</p> <ul style="list-style-type: none"> <li>Blastomyces, Coccidioides Immitis, Coccidioidomycosis, Cryptococcus, or Histoplasmosis (Reported to provider or designee and Lab Communicable Disease),</li> <li>Pneumocystis Jiroveci (Carinii) (Reported to provider or designee only),</li> <li>Results deemed significant or unexpected</li> </ul>

## HISTORY RECORD

### CRITICAL VALUE POLICY

Version	Revision Description
0001	Effective: 11-25-2008 Updated list of critical values as directed by section heads/PhDs. Updated the Notification Procedure and the Computer Documentation sections to MILS from DG. Policy updated to include Oxcarbazepine Metabolite and Zonisamide critical values and reflects approval by new medical directors. Policy updated to include Blood Parasite, VSVPCR, HSVPCR critical values and redefined the Notification Procedure. Policy updated to include changes to Blood Gas pH, Bicarbonate, Bilirubin, Hgb, Hct, Plt. Also updated medical director and contact information.
0002	Effective: 2-20-2009 Removed Amitriptyline and Nortriptyline from list since they are now sendouts.
0003	Effective: 11-10-2009 Removed caffeine from list since this is now a sendout. Added information on non-ordered critical values and Blood Gas pH.
0004	Effective: 12-07-2009 No version history recorded. Previously numbered as: 0202-0019-3004 Transferred to new Document Control System, December 2012.

Version No.	Editor	Revision Description
1.0		Changed document type from procedure to policy. Notification procedure information reformatted as policy statements. Re-formatted critical value information into a table format separated by discipline. Added requirement to record first and last name of person who was notified. Critical value changes: <ul style="list-style-type: none"> <li>• Added Positive Ethylene Glycol</li> <li>• Added Positive Volatile (methanol and isopropanol)</li> <li>• Moved HIV rapid serology from Microbiology list to newly created Immunodiagnostic list.</li> <li>• Added section for Hematology Oncology patients with the following Critical Low values:               <ul style="list-style-type: none"> <li>○ Hgb &lt; 7</li> <li>○ Plt &lt; 20</li> <li>○ WBC &lt; 0.5</li> </ul> </li> <li>• Added <i>Pneumocystis jiroveci</i></li> <li>• Added <i>Blastomyces, Histoplasma, Coccidioides, or Pneumocystis</i> found on microscopy (e.g. Silver, Gram, or Fungal)</li> <li>• Added Anaplasma/Ehrlichia/Babesia by PCR</li> <li>• Deleted instruction to contact provider on urinalysis specific gravity &lt;1.002 – not considered a “critical value” and addressed in section procedure per B.Robeson.</li> <li>• Removed Measles IgM, now a send-out test.</li> <li>• Updated Cytology list:               <ul style="list-style-type: none"> <li>○ Added “Atypical” to ASC-H</li> <li>○ Added “Results deemed significant and unexpected”.</li> </ul> </li> <li>• Added Cytology critical value policy to Related Documents.</li> <li>• Added Positive RSV results on a patient ≤1 yr old.</li> </ul> The following completed co-author tasks on the original workflow which was terminated at the publishing phase: Dr. Tom Novicki, Dr. Tim Uphoff, Dr. Annu Khajuria, Dr. Joyce Flanagan, Bryan Robeson, Doris Scherr, Sarah Komis, and Janice Weyhmilller. The 24 HS chemistry changes had to be reversed. New workflow started with author and approvers only.
2.0		Removed Anaplasma and RSV <1 yr old from Molecular Pathology. Removed Desipramine and Imipramine (+ Desipramine) from Therapeutic Drugs.

Version No.	Editor	Revision Description
3.0		Removed reference to DFA staining in the Legionella critical value. Chemistry Critical Value changes <ul style="list-style-type: none"> <li>• Added Ammonia (&gt;1 year): critical high &gt;110</li> <li>• Changed Blood Gas               <ul style="list-style-type: none"> <li>○ C-PO2                   <ul style="list-style-type: none"> <li>▪ ≤1 day: critical low &lt;35.0</li> <li>▪ &gt;1 day: critical low &lt;40</li> </ul> </li> <li>○ PO2 (≤1 day): critical low &lt;35.0</li> </ul> </li> <li>• Added BUN (all ages): critical high &gt;100</li> <li>• Added Creatinine (all ages): critical high &gt;10.0</li> <li>• Changed Glucose (≥1 year): critical high &gt;450</li> <li>• Change Magnesium (all ages): critical high &gt;5.0</li> <li>• Changed Potassium (≥ 1 month): critical high &gt;6.0</li> </ul> Therapeutic Drug Critical Value changes <ul style="list-style-type: none"> <li>• Changed Theophylline ages to &lt;6 months, and ≥6 months</li> <li>• Changed Vancomycin critical high to &gt;30.0 ug/mL</li> <li>• Removed Free Valproic Acid – no longer performed</li> </ul>
4.0		Added Troponin-I and Note regarding critical value reporting of elevated Troponin results. Added neonate samples to DAT Added Tacrolimus to Therapeutic drugs, critical high >25ng/mL Updated Cyclosporine critical from >600 to >700. Removed “Bleeding Time” and criteria – no longer performed at Marshfield Labs. Removed Amidarone and Carbamazepine 10,11 Epoxide and criteria – no longer performed at Marshfield Labs. Added Lamotrigine, ≥20. Added Microbiology section: <ul style="list-style-type: none"> <li>Positive <i>Paracoccidioides</i> isolated in culture</li> <li>Positive <i>Paracoccidioides</i> found on microscopy (e.g. Silver, Gram, or Fungal)</li> </ul> Added “only if RN not available” to HUC delegation Added to Cytology GYN: <ul style="list-style-type: none"> <li>• Atypical endocervical cells favor neoplasia,</li> <li>• Atypical endometrial cells favor neoplasia</li> </ul> Added Cytology NonGYN critical values. Removed “Stat and Rush cases” from Cytology (verified by Cytology management).
5.0		Per Dr. Novicki, Ehrlichia/Babesia by PCR will be considered critical for hospital patients, per e-mail from Shari Conrad, also include ED patients and Anaplasma. Listed full name for HSV and VZV under Mole Path Updated Blood Bank: <ul style="list-style-type: none"> <li>• Changed from Blood Bank to Transfusion Services</li> <li>• Added evidence of incompatibility on an emergency release RBC unit issued prior to testing being complete.</li> <li>• Added Transfusion Service information system as a place to electronically document critical value call back.</li> </ul> Removed “Immunodiagnosics” (department no longer exists), HIV critical value added under Chemistry.
6.0		Added “Health Services Coordinator” as an alternative to M.A. in the Clinic setting. Added “equal to” to Zonisamide and Oxcarbazepine Metabolite Per Dr. Uphoff, added the following to Mole Path: Lyme and Eneovirus on CSF Per Dr. Novicki, updated “Potential agents of bioterrorism” to “HHS/USDA Select Agents” and list of agents.
7.0		Added when Microbiology Critical Value Notification is not required, previous positive within 72h Removed CSF viral culture and Legionella culture from Microbiology Critical Values list. Updated purpose statement to specify ordering provider’s responsibility to determine if a result is critical based on the disease state. Updated scope from DLM to Mfld Labs Service Line

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8.0		Added Internal Eye Fluid Gram stain and Bacterial culture to Microbiology Critical Value List (L.Gray). Update Acetaminophen from >120 to ≥50 per Dr.F and Dr.B
9.0		Added COVID19 to Molecular Pathology (M.Stemper)
10.0		<ul style="list-style-type: none"> <li>• Updated Glucose critical value from:               <ul style="list-style-type: none"> <li>&lt; 1 yr: &lt;30 and &gt;325</li> <li>≥ 1 yr: &lt;40 and &gt; 450</li> </ul> </li> <li>TO               <ul style="list-style-type: none"> <li>&lt;30 days: &lt;30 and &gt;325</li> <li>≥ 30 days and &lt;1 yr: &lt;50 and &gt;325</li> <li>≥ 1 yr: &lt;50 and &gt;450</li> </ul> </li> <li>• Added reference to the Critical Value notification procedure for notification exceptions, including Hematology/Oncology and OR ABGs.</li> </ul>
11.0		<ul style="list-style-type: none"> <li>• Removed COVID-19 from Critical value list.</li> </ul>
12.0		<ul style="list-style-type: none"> <li>• Updated Cytology (per email from S.Komis):               <ul style="list-style-type: none"> <li>• GYN:                   <ul style="list-style-type: none"> <li>• High grade squamous intraepithelial lesions (HSIL)</li> <li>• Atypical endocervical cells favor neoplasia</li> <li>• Atypical endometrial cells favor neoplasia</li> <li>• Atypical glandular cells favor neoplasia</li> <li>• Atypical squamous cells cannot exclude high grade squamous intraepithelial lesion (ASC-H)</li> </ul> </li> <li>• Non-GYN:                   <ul style="list-style-type: none"> <li>○ Malignant cases</li> </ul> </li> </ul> </li> <li>• Updated TDM (per B.Robeson):               <ul style="list-style-type: none"> <li>○ Remove Tobramycin (send-out)</li> <li>○ Phenobarb change from &gt;55.0 to &gt;55</li> <li>○ Lithium change from &gt;2.0 to &gt;2.00</li> <li>○ Remove Lidocaine (send-out)</li> </ul> </li> <li>• Removed Ethylene glycol (send-out per Dr. Flanagan)</li> <li>• Coagulation:               <ul style="list-style-type: none"> <li>○ Low Molecular – removed with implementation of new Anti-Xa testing (Dr. Puca and A.Hook).</li> <li>○ Heparin, Unfractionated – only keep the upper critical value (per A.Hook).</li> <li>○ Remove Plt function test (Dr. Puca)</li> </ul> </li> <li>• Removed Oxcarbazepine Metabolite (per J.Winterhack)</li> </ul>
13.0		<ul style="list-style-type: none"> <li>• Updated Microbiology Table:               <ul style="list-style-type: none"> <li>- Added positive sterile fluid aerobic and anaerobic cultures as critical values</li> <li>- Added details on the criteria for positive blood cultures. TN, JB</li> </ul> </li> </ul>
14.0		<ul style="list-style-type: none"> <li>• No change to content, updated for Dr. Vander Heide approval.</li> </ul>
15.0		<ul style="list-style-type: none"> <li>• Added HepBS Ag for DaVita patients, approved by Dr. Bissonnette</li> <li>• Removed Oxcarbazepine per Jenn W.</li> <li>• Added E.histolytica to Mole Path section per Dr. Novicki</li> <li>• Removed reference to ‘designee in Emergency Contact tab’ from notification list – emergency contact tab was cattails, not applicable to PathNet Cerner.</li> </ul> <p>Added to Microbiology (per B.Bulgrin):</p> <ul style="list-style-type: none"> <li>• <b>Category = Film Array Respiratory Panel</b></li> <li>• <b>Critical Value = Bordetella pertussis detected</b></li> </ul> <p>Removed: TNI Note – TNI was not considered by lab to be a critical value and this policy included a statement from Dr. Sitwala explaining rationale. To ensure no confusion, note has been removed and added to the lab Test Reference Manual, TNI entry.</p>
16.0		<ul style="list-style-type: none"> <li>• Removed “Neonatal Total” from Bilirubin, critical values apply to all ages, per Dr. Bissonnette.</li> </ul>

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Version No.	Editor	Revision Description
		<ul style="list-style-type: none"> <li>Removed reference/links to Cytology documents, Cytology documents no longer include critical values</li> </ul>
17.0		<ul style="list-style-type: none"> <li>Added statement regarding notification of POC results</li> <li>Added critical high Ammonia for <math>\geq 1</math>yr, per Dr. Bissonnette</li> </ul>
18.0	S.Mowbray	<ul style="list-style-type: none"> <li>Added critical high <math>&gt;10,000</math> for Creatine Kinase, Total per Dr. Bissonnette</li> <li>Added (1) footnote reference to the Mycobacterial culture and Mycological culture. Footnote added previously, failed to note which microbiology results the footnote applies.</li> </ul>
19.0	S.Mowbray	<ul style="list-style-type: none"> <li>Remove Lamotrigine, Zonisamide, Tacrolimus and Cyclosporine per Dr. Bissonnette.</li> </ul>
20.0	S.Mowbray	<ul style="list-style-type: none"> <li>Removed reference to specific exceptions (blood gases, hematology) in the first Policy statement. Additional exceptions are being added to the notification procedure.</li> <li>Updated Blood Gas pH:               <ul style="list-style-type: none"> <li>Removed units of measure</li> <li>Added pH Art, Umbilical <math>&lt;7.0</math></li> </ul> </li> <li>Updated Creatinine Kinase from <math>&gt;10,000</math> to <math>\geq 10,000</math></li> <li>Updated HIV expose, removed 'rapid'.</li> </ul>
21.0	A. Ebben	No changes to content. Approval workflow initiated for Dr. Medina-Flores
22.0	A Hook	<ul style="list-style-type: none"> <li>Added Condition column</li> <li>Updated assays to display Cerner DTA names</li> <li>Added ECMO blood gas criteria</li> <li>Removed Phenytoin, Free and Theophylline</li> <li>Added link to UW Health policy for UW Health providers</li> <li>Under Transfusion Service removed 'Bacterial detection in a previously transfused blood product' and 'Emergency-released RBC unit that was issued and transfused prior to completion of testing' – both are pathology notifications found in <a href="#">Transfusion Service Pathology Notification (mflclin.org)</a></li> <li>Removed Cytogenetics table – sendout</li> <li>Under Molecular Pathology removed 'Lyme' and 'Enterovirus'</li> <li>Added references to <a href="#">Communication of Critical Results and Critical Tests Policy-Acute Care</a> and <a href="#">Communication of Critical Results Policy-Ambulatory Care</a> for point of care testing in the first policy bullet point. And added these documents to RELATED DOCUMENTS section.</li> <li>Added instructions to refer to the Refer to <a href="#">Attachment I: Critical Value List</a> and subsections for critical values and conditions for notification with the statement "<i>Conditions are not applicable for Point of Care test results.</i>"</li> <li>Added ATTACHMENTS section with bookmarks to <a href="#">Attachment I: Critical Value List</a></li> </ul>