

# ThedaCare

## Policy & Procedure

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<b>Policy Title:</b>	Laboratory Values, Critical	<b>Policy Number:</b>	694
<b>Location(s):</b>	All ThedaCare	<b>Department(s):</b>	Laboratory; General Lab
<b>Date Last Reviewed:</b>	8/31/2018	<b>Reviewing Body(s):</b>	Quality; Laboratory Leadership
<b>Date Last Revised:</b>	8/31/2018	<b>Approving Body(s):</b>	Laboratory Medical Directors; Medical Executive Committees

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This policy applies to the following laboratory entity(s):

- ThedaCare Regional Medical Center-Neenah
- ThedaCare Regional Medical Center-Appleton
- ThedaCare Medical Center-Shawano
- ThedaCare Medical Center-New London
- ThedaCare Medical Center-Berlin
- ThedaCare Medical Center-Wild Rose
- ThedaCare Medical Center-Waupaca
- ThedaCare Physicians Clinics
- Encircle Health

**Purpose** This policy shall establish criteria for the immediate notification of physicians or other practitioners responsible for the care of patients when critical lab values are exceeded.

Critical Lab Value – One that represents a pathophysiological state at such variance with normal as to be life threatening unless something is done promptly and for which some corrective action could be taken.

**Policy** The Medical Director of the Laboratory shall establish a list of critical laboratory values for each section of the laboratory. Published sources and the Medical Staff will be consulted in establishing the list and the list shall be updated periodically, as needed.

After verification of a critical laboratory value, laboratory testing personnel shall be responsible for notifying the health care practitioners. All critical values will be called on outpatient and clinic patients. Laboratory personnel will notify the responsible health care practitioner of any non-ordered critical values encountered while performing ordered testing. Laboratory personnel will also notify the responsible health care practitioner of any critical values that originate from a referral laboratory for send-out testing.

All critical values must be called by lab to the patient care provider within 15 minutes of verifying the critical result. The only exception to this is on eight different tests that have special rules applied to calling frequency or patient location. Clostridium difficile Antigen and Toxins A & B, total CK, Troponin I, low platelet count, low white count, and critical WBC counts in spinal fluids will only be called with the first critical value. Subsequent critical values will not be called unless the value is again critical after a seven day window.

Notification of physicians or health care practitioners shall be documented by laboratory personnel.

Any critical laboratory value that is verbally communicated by Laboratory personnel to a physician or clinical staff requires a verbal read-back of the results, by the receiver, to assure accuracy. Read-back must be documented. Read-back includes the patient's full name, test and result.

Clinical staff receiving a critical result from the laboratory must contact the physician within 30 minutes of receiving the result. This action must be documented in the patient's chart.

**Exceptions:**

1. Hematologic critical values for patients in the dedicated inpatient oncology unit do not need to be called if they are expected to be low due to course of treatment or disease process.
2. Serial critical values that are drawn to monitor patient response to treatment or if sliding scale has previously been ordered for management, will not need to be called if the value is trending in a positive direction (i.e. Sodium level improving, electrolyte is within acceptable range).
3. If pharmacy is dosing antibiotics, critical levels will be followed by pharmacy and no call to provider is required.
4. Critical values resulted while patient is in emergent treatment would not need to be called within 30 minutes (i.e. CK, Initial Troponin I resulted while patient in CVL procedure).

**References** College of American Pathologists. *Laboratory Accreditation Checklist* Northfield, IL; College of American Pathologist. Available at: [www.cap.org](http://www.cap.org)

The Joint Commission: National Patient Safety Goals. Available at: [www.jointcommission.org](http://www.jointcommission.org). Accessed September 2015.

Howantiz PJ, Steidel SJ, Heard NV. Laboratory Critical Values Policies and Procedures: a College of American Pathologists Q-Probes study in 623 institutions. *Arch Pathol Lab Med.* 2002;126:663-669

Dighe AS, Rao A, Coakley AB, Lewandrowski KB. Analysis of laboratory critical value reporting at a large academic medical center. *Am J Clin Pathol.* 2006;125:758-764

### ThedaCare Critical Values

<b>CHEMISTRY CRITICAL VALUES</b>			
Test Name	Low	High	Other Information
Calcium	< 6.1 mg/dL	>13.9 mg/dL	Adult ≥ 18 years
CK		>5000 U/L	Repeat criticals called every 7 days on inpatients
CKMB (Ortho chemistry)		> 5.0 ng/mL	Called only on outpatients/referrals; not called on ER or inpatients
CKMB (Beckman Coulter chemistry)		> 6.3 ng/mL	Called only on outpatients/referrals; not called on ED or inpatients
D-Dimer		>500 ng/mL FEU	
Glucose	<55 mg/dL	>500 mg/dL	Adult ≥18 years
Lead		≥ 30 µg/dL	Adult >15 years
Magnesium		> 8 mg/dL	
pH	< 7.21	>7.65	Adult ≥ 18 years
Phosphorus	<1.1 mg/dL		
Potassium	<2.9 mmol/L	> 6.4 mmol/L	Adult ≥ 18 years
Sodium	< 126 mmol/L	> 154 mmol/L	Adult ≥ 18 years
Troponin		≥ 0.120 ng/mL	Repeat criticals called every 7 days
<b>HEMATOLOGY CRITICAL VALUES</b>			
Test Name	Low	High	Other Information
Hemoglobin	< 6.0 gm/dL	> 19.0 gm/dL	Adult, Children >1 month
WBC	< 1.0 K/µl	>100.0 K/µL	Repeat criticals called every 7 days on inpatients, Adult ≥ 18 years
Platelet count	< 30 K/µl	> 1000 K/µL	Repeat criticals called every 7 days on inpatients, Adult ≥ 18 years
Differential, peripheral blood		Blasts present	Blasts not previously seen for that patient
Blood Parasites, malaria species		Malaria species parasite present	Call immediately upon Pathology confirmation
Blood Parasites		All other parasites present	Called only during dayshift hours
Kleihauer–Betke		2 or more vials of Rhogam indicated	One 1-mL dose (300 µg) protects against 15 mL of D-positive red cells or 30 mL of fetal blood.
<b>COAGULATION CRITICAL VALUES</b>			
Test Name	Low	High	Other Information
INR		> 4.9	Adult ≥ 18 years
aPTT		> 100 seconds	Adult ≥ 18 years
Fibrinogen	< 50 mg/dL		Adult ≥ 18 years
Any factor assay	< 10 %		
<b>BODY FLUID CRITICAL VALUES</b>			
Test Name	Low	High	Other Information
CSF WBC		> 5 WBC/µL	Adult, Children >5 years

<b>ANATOMIC PATHOLOGY CRITICAL VALUES</b>			
<b>Test Name</b>	<b>Critical Result</b>	<b>Other Information</b>	
Surgical pathology	Unexpected findings	Any unexpected findings, including, but not limited to: unexpected infection, presence of unsuspected pathogenic organisms of immediate clinical significance, unexpected malignancy in a biopsy, absence of chorionic villi in a D & C, non-uterine/non-cervical tissue in an endometrial specimen.	
<b>THERAPEUTIC DRUG CRITICAL VALUES</b>			
<b>Test Name</b>	<b>Low</b>	<b>High</b>	<b>Other Information</b>
Acetaminophen		> 150 µg/mL	4 hours after ingestion
		> 50 µg/mL	12 hours after ingestion
Caffeine		> 20 µg/mL	Adult, Children >1 year
Carbamazepine		> 15 µg/mL	
Digoxin		> 2.5 ng/mL	
Free Phenytoin		> 3.0 µg/mL	
Gentamicin		> 2 µg/mL	Trough
		> 10 µg/mL	Peak and Random
Lidocaine		> 6 µg/mL	
Lithium		> 2 mmol/L	
Phenobarbital		> 55 µg/mL	Adult ≥ 18 years
Phenytoin		> 30 µg/mL	Adult ≥ 18 years
Salicylate		> 30 mg/dL	
Theophylline		> 25 µg/mL	
Tobramycin		> 2 µg/mL	Trough
		> 10 µg/mL	Peak and Random
Valproic Acid		>125 µg/mL	Adult ≥ 18 years
Vancomycin		>20 µg/mL	Trough
		> 80 µg/mL	Peak and Random
<b>MICROBIOLOGY CRITICAL VALUES</b>			
<b>Test Name</b>	<b>Critical Result</b>		
Blood Culture	Positive, with gram stain and PCR results		
Clostridium difficile Antigen and Toxins A & B	Clostridium difficile positive result, first positive result only		
GI Panel	Shiga-like producing E.coli (STEC) stx1/stx2, Vibrio Cholerae		
Cryptococcal Antigen	All positive CSF results		
CSF Culture	All positive gram stains, PCR Panels, Cryptococcal antigens, or cultures		
Fungal stain	All positive smears that exhibit structure suggestive of potential fungal pathogen.		
Herpes Simplex Virus, CSF by PCR	Positive, HSV type 1 or type 2		
Respiratory syncytial virus	All positive antigen results		
Tuberculosis	All positive AFB smears and positive cultures		

<b>PEDIATRIC CRITICAL VALUES</b>			
<b>CHEMISTRY, TDM, and POCT CRITICAL VALUES</b>			
<b>Test Name</b>	<b>Low</b>	<b>High</b>	<b>Other Information</b>
Ammonia		>100 µmol/L	Children < 18 years
Bilirubin, Direct		≥10 mg/dL	Children < 18 years
Bilirubin, Total		≥15 mg/dL	Children < 18 years
Bilirubin, Neonatal		≥15 mg/dL	
Blood Urea Nitrogen (BUN)		>40 mg/dL	Children < 18 years
Calcium	<6.0 mg/dL	>12.0 mg/dL	Children < 18 years
Tacrolimus	<3.0 ng/mL	>20 ng/mL	Children < 18 years
Glucose	<40 mg/dL	>250 mg/dL	Children < 48 hours
	<61 mg/dL	>350 mg/dL	Children >48 hours, <18 years
Bicarbonate (HCO <sub>3</sub> )	<10 mmol/L	>40 mmol/L	Children < 18 years
pCO <sub>2</sub>	<20 mm Hg	>60 mm Hg	Children < 18 years
Total CO <sub>2</sub>	<5 mmol/L	>40 mmol/L	Children < 18 years
pH	<7.20	>7.60	Children < 18 years
Potassium	<2.5 mmol/L	>6.5 mmol/L	Children < 18 years
Sodium	<125 mmol/L	>160 mmol/L	Children < 18 years
Cyclosporine	<60 ng/mL	>400 ng/mL	Children < 18 years
Phenobarbital		>40 µg/mL	Children < 18 years
Digoxin		> 2.5 ng/mL	Children < 18 years
Phenytoin		> 20 µg/mL	Children < 18 years
Valproic Acid		>150 µg/mL	Children < 18 years
Carbamazepine		>15 µg/mL	Children < 18 years
Rapid Urine Drug Screen		Positive	Children < 18 years
Blood Drug Screen		Positive	Children < 18 years
Iron		>350 µg/dL	Children < 18 years
HIV		Reactive	Children < 18 years
Lead		≥20 µg/dL	Children ≤ 15 years
Caffeine		> 30 µg/mL	Children < 1 year
<b>HEMATOLOGY CRITICAL VALUES</b>			
<b>Test Name</b>	<b>Low</b>	<b>High</b>	<b>Other Information</b>
WBC	< 1.0 K/µL	> 50 K/µL	Children < 18 years
Hemoglobin	< 9.0 gm/dL	> 24.0 gm/dL	Newborn, ≤1 month
Hematocrit	<15 %	>75 %	Children < 18 years
Platelet count	<20 K/µl	>1,000 K/µl	Children < 18 years
Blood Parasites, malaria species		Malaria species parasite present	Children < 18 years, Call immediately upon Pathology confirmation
<b>COAGULATION CRITICAL VALUES</b>			
<b>Test Name</b>	<b>Low</b>	<b>High</b>	<b>Other Information</b>
Platelet Function Test		Epinephrine >185 sec and/or ADP >125 sec	Children < 18 years

Fibrinogen	<75 mg/dL	>800 mg/dL	Children < 18 years
Heparin Assay		>1.00 anti-Xa IU/mL	Children < 18 years
Low Molecular Weight Heparin		>2.00 anti-Xa IU/mL	Children < 18 years
<b>PEDIATRIC CRITICAL VALUES (cont.)</b>			
<b>COAGULATION CRITICAL VALUES (cont.)</b>			
Prothrombin Time (PT)		>30 seconds	Children < 18 years
INR		>4.0	Children < 18 years
aPTT		>100 seconds	Children < 18 years
<b>BODY FLUID CRITICAL VALUES</b>			
<b>Test Name</b>	<b>Low</b>	<b>High</b>	<b>Other Information</b>
CSF WBC		>30 WBC/ $\mu$ L	Newborn, < 1 month
		> 20 WBC/ $\mu$ L	Children 1 month to 5 years
		> 5 WBC/ $\mu$ L	Children > 5 years
<b>URINE CRITICAL VALUES</b>			
<b>Test Name</b>	<b>Low</b>	<b>High</b>	<b>Other Information</b>
Urine ketones		>trace	Children < 1 year
Urine glucose		>500 mg/dL	Children < 1 year
<b>MICROBIOLOGY CRITICAL VALUES</b>			
<b>Test Name</b>	<b>Critical Result</b>		<b>Other Information</b>
Blood Culture	Positive, with gram stain and PCR results		Children <18 years
CSF Culture	All positive gram stains, PCR Panels, Cryptococcal antigens, or cultures		Children <18 years
GI Panel	Shiga-like producing E.coli (STEC) stx1/stx2, Vibrio Cholerae		Children <18 years
Herpes Simplex Virus, CSF by PCR	Positive, HSV type 1 or type 2		Children <18 years
Enterovirus, CSF by PCR	Positive		Children <18 years
Cytomegalovirus (CMV), CSF by PCR	Positive		Children <18 years
Adenovirus, CSF by PCR	Positive		Children <18 years
Varicella-Zoster Virus, CSF by PCR	Positive		Children <18 years
Chlamydia trachomatis	Positive		Children < 18 years
Neisseria gonorrhoeae	Positive		Children < 18 years
Rapid Plasma Reagin (RPR) Syphilis Serology	Reactive		Children < 18 years
Trichomonas - DNA Probe	Positive		Children < 18 years
Wet Prep-Trichomonas	Few/Moderate/Many Seen		Children < 18 years
<b>BLOOD BANK CRITICAL VALUES</b>			
<b>Test Name</b>	<b>Critical Result</b>		<b>Other Information</b>
Transfusion Reaction Workup	Hemolytic Transfusion Reaction		Children <18 years