

Spectrum Health Laboratory Critical Values List

Given values are not inclusive for being critical.

Note: Some analytes in the list are required by contractual obligations.

Test	Critical Low Value (Less Than)	Critical High Value (Greater than)
Chemistry – Infants and Children		
Bilirubin (age 0 to 30 days)	N/A	See Bilirubin - Infant by Age (in hours)
Glucose (age 0 to 90 days)	42 mg/dL	200 mg/dL
Glucose (age 90 days to 18 years)	50 mg/dL	300 mg/dL
pH Cord Arterial	7	N/A
pH Cord Venous	7	N/A
Potassium including whole blood (age 0 to 90 days)	2.5 mmol/L	6.5 mmol/L
Sodium (age under 18 years)	129 mmol/L	160 mmol/L
Chemistry & Toxicology – Children and Adults		
Ammonia	N/A	150 µmol/L
Amylase	N/A	500 IU/L
Bilirubin (age 31 days and older)	N/A	15 mg/dL
Bicarbonate	10 mmol/L	40 mmol/L
BUN	N/A	100 mg/dL
Calcium	6.5 mg/dL	12.0 mg/dL
Carbamazapine	N/A	15 µg/mL
Creatinine	N/A	10 mg/dL
OB Protein/Creatinine Random Urine	N/A	0.30 ratio
Digoxin	N/A	2.5 ng/mL
Ethanol	N/A	400 mg/dL
Gentamicin Peak	N/A	≥40 µg/mL
Gentamicin Trough	N/A	≥ 2 µg/mL
Glucose (age 18 years and older)	50 mg/dL	400 mg/dL
HIV (Quick test)	N/A	Positive
Ionized Calcium	0.85 mmol/L	1.60 mmol/L
Lactic Acid	N/A	3.0 mmol/L
Sepsis Protocol Lactic Acid	N/A	2.1 mmol/L if normal baseline

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Test	Critical Low Value (Less Than)	Critical High Value (Greater than)
Lidocaine	N/A	6.0 mcg/mL
Lithium	N/A	1.5 mEq/L
Magnesium (Critical high maternity)	1.2 mg/dL	3.5 mg/dL 8.0 mg/dL
pH (Venous whole blood)	7.2	7.5
Phenobarbital	N/A	60 µg/mL
Phenytoin	N/A	30 µg/mL
Phenytoin (free)	N/A	3 µg/mL
Phosphorus	1.0 mg/dL	N/A
Potassium including whole blood (age 91 days and older)	3.0 mmol/L	6.0 mmol/L
Salicylates	N/A	30 mg/dL
Sodium (age 18 years and older)	120 mmol/L	160 mmol/L
Theophylline	N/A	25 µg/mL
Tobramycin Peak	N/A	≥40 µg/mL
Tobramycin Trough	N/A	≥ 2 µg/mL
Troponin T	N/A	99 ng/mL
Uric Acid	N/A	15 mg/dL
Valproic Acid	N/A	150 µg/mL
Valproic Acid (free)	N/A	20 µg/mL
Vancomycin Trough	8 µg/mL	24 µg/mL
Bilirubin - Infant by Age (in hours)		
Bilirubin (age 0 to 12 hours)	N/A	4.0 mg/dL
Bilirubin (age 12 to 18 hours)	N/A	6.5 mg/dL
Bilirubin (age 18 to 24 hours)	N/A	7.5 mg/dL
Bilirubin (age 24 to 26 hours)	N/A	8.1 mg/dL
Bilirubin (age 26 to 28 hours)	N/A	8.6 mg/dL
Bilirubin (age 28 to 30 hours)	N/A	9.2 mg/dL
Bilirubin (age 30 to 32 hours)	N/A	9.7 mg/dL
Bilirubin (age 32 to 34 hours)	N/A	10.3 mg/dL
Bilirubin (age 34 to 36 hours)	N/A	10.8 mg/dL
Bilirubin (age 36 to 38 hours)	N/A	11.4 mg/dL

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Test	Critical Low Value (Less Than)	Critical High Value (Greater than)
Bilirubin (age 38 to 40 hours)	N/A	11.9 mg/dL
Bilirubin (age 40 to 42 hours)	N/A	12.3 mg/dL
Bilirubin (age 42 to 45 hours)	N/A	12.5 mg/dL
Bilirubin (age 45 to 48 hours)	N/A	13.0 mg/dL
Bilirubin (age 48 to 51 hours)	N/A	13.5 mg/dL
Bilirubin (age 51 to 54 hours)	N/A	14.0 mg/dL
Bilirubin (age 54 to 57 hours)	N/A	14.5 mg/dL
Bilirubin (age 57 to 60 hours)	N/A	15.0 mg/dL
Bilirubin (age 60 to 66 hours)	N/A	15.5 mg/dL
Bilirubin (age 66 to 72 hours)	N/A	15.9 mg/dL
Bilirubin (age 72 to 78 hours)	N/A	16.3 mg/dL
Bilirubin (age 78 to 84 hours)	N/A	16.7 mg/dL
Bilirubin (age 84 to 90 hours)	N/A	17.1 mg/dL
Bilirubin (age 90 hours to 30 days)	N/A	17.5 mg/dL
Coagulation		
Fibrinogen	100 mg/dL	N/A
INR	N/A	5
Activated APTT	N/A	100 seconds
Factor Assay	15%	N/A
Low Molecular Weight Heparin	N/A	1.2 U/mL
Unfractionated Heparin Level	N/A	>1.0 U/mL
Hematology – Infants / Children		
WBC (age 0 to 30 days)	4x10 ³ /μL	25x10 ³ /μL
WBC (age under 13 years)	2x10 ³ /mL	25x10 ³ /mL
Hemoglobin (age 0 to 30 days)	10 g/dL	22.5 g/dL
Hemoglobin (age 31 to 90 days)	8 g/dL	22.5 g/dL
Blood Smear Evaluation	Presence of Blasts	
Hematology – Children / Adults		
WBC (age 13 years and older)	2x10 ³ /mL	35x10 ³ /mL
Hemoglobin (age 91 days and older)	7 g/dL	20 g/dL
Platelets	50,000/mL	900,000/mL
Blood Smear Examination	Presence of Blasts	

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Test	Critical Low Value (Less Than)	Critical High Value (Greater than)
	Presence of intracellular organisms (including malaria)	
CSF Smear Examination	Presence of intracellular bacteria	
Xanthochromia CSF	Present	
Blood Gas		
Arterial Blood Gases:		
pH	7.2	7.6
pCO ₂ (age 0 to 90 days)	35 mmHg	70 mmHg
pCO ₂ (age 91 days and older)	25 mmHg	70 mmHg
pO ₂ (age 0 to 90 days)	40 mmHg	150 mmHg
pO ₂ (age 91 days and older)	60 mm Hg	N/A
Capillary/Venous Gases:		
pH	7.2	7.5
pCO ₂	35 mmHg	75 mmHg
pO ₂	20 mmHg	80 mmHg
CO ₂ , total	15	40
Carboxyhemoglobin	N/A	6%
Hemoglobin O ₂ Saturation	50%	N/A
Methemoglobin	N/A	2.50%
Microbiology		
Positive Gram stains and cultures on: <ul style="list-style-type: none"> • Cerebrospinal fluid (CSF) • Blood • Stem cells • Bone and bone aspirates (pre- or post-infusion) • Sterile sites (e.g., pericardial, synovial fluids) • Brain tissue or abscess • Intraocular fluid Positive blood smears for parasites Positive cryptococcal antigen test		
See policy Critical and Alert Values-Microbiology and Virology below for a more extensive list of critical and		

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Test	Critical Low Value (Less Than)	Critical High Value (Greater than)
Perinatal Pathology		
<ul style="list-style-type: none"> • Specific infections diagnosable by microscopic exam and special stains (HSV, CMV, and Candida) • Acute villitis, suggestive of listeria or other maternal infection • Evidence of a maternal or fetal malignancy or metastatic disease • Evidence of a metabolic disease, e.g. storage disease • Evidence of dyserythropoiesis • Absence of villi and trophoblasts in a products of conception specimen where there has not been confirmation of an intrauterine pregnancy 		
Urinalysis		
Ketones and Glucose (age under 10 years)	Positive ketones with urine glucose greater than or equal to 500 mg/dL	

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Critical and Alert Values-Microbiology and Virology

Critical Results – called within 30 minutes of verification	
Bacteria	Specimen Source(s)
<ul style="list-style-type: none"> Positive Gram stain: notify provider for each new positive regardless of multiple orders/previous positives. Also call organisms cultured from these sources if not already represented by the Gram stain result. 	<ul style="list-style-type: none"> Blood Tissue (sterile sites) Sterile body fluids*
<ul style="list-style-type: none"> <i>Neisseria meningitidis</i> confirmed culture 	<ul style="list-style-type: none"> Blood Tissue Sterile body fluids*
<ul style="list-style-type: none"> Bacterial culture with suspect <i>Francisella</i>, <i>Brucella</i>, <i>Bacillus anthracis</i>, <i>Yersinia pestis</i>, <i>Burkholderia mallei/pseudomallei</i>, or <i>Clostridium botulinum</i> 	<ul style="list-style-type: none"> All sources
<ul style="list-style-type: none"> Neonate (< 1 month old) cultures or PCR positive for <i>Neisseria gonorrhoeae</i>, <i>Chlamydia</i>, or <i>Listeria</i> 	<ul style="list-style-type: none"> All sources
<ul style="list-style-type: none"> <i>Bordetella pertussis</i> by PCR on neonates (<1 month) 	<ul style="list-style-type: none"> Nasopharyngeal
<ul style="list-style-type: none"> Positive acid-fast or modified acid-fast stains, or positive culture growing an Actinomycete or mycobacteria (exception: do not call if identified as <i>M. gordonae</i>), first time positives **. 	<ul style="list-style-type: none"> Blood Tissue Sterile body fluids* Respiratory sources
<ul style="list-style-type: none"> <i>Mycobacterium tuberculosis</i> by culture (or DNA probe), first time positives **. 	<ul style="list-style-type: none"> All sources
Virus	Specimen Source(s)
<ul style="list-style-type: none"> HSV, CMV, or VZV detected by culture, PCR, or DFA (direct fluorescent antibody) 	<ul style="list-style-type: none"> CSF, brain, ocular, and amniotic fluid.
<ul style="list-style-type: none"> HSV positive culture or PCR on neonates (< 1 month) 	<ul style="list-style-type: none"> All sources
Fungi	Specimen Source(s)
<ul style="list-style-type: none"> Positive <i>Pneumocystis</i> smears 	<ul style="list-style-type: none"> All sources
<ul style="list-style-type: none"> Positive <i>Cryptococcus</i> antigen (first positive only) 	<ul style="list-style-type: none"> All sources
<ul style="list-style-type: none"> Smears or cultures with a dimorphic pathogen, first time positives **. (<i>Histoplasma</i>, <i>Coccidioides</i>, <i>Blastomyces</i>, <i>Paracoccidioides</i>, <i>Penicillium marneffeii</i>, or <i>Sporothrix</i>) 	<ul style="list-style-type: none"> All sources
<ul style="list-style-type: none"> Positive fungal smears and cultures (any fungal organism), first time positives **. <ul style="list-style-type: none"> Also call organisms cultured from these sources if not already represented by the stain result. Specify if smear/culture resembles Zygomycete (<i>Rhizopus</i>, <i>Mucor</i>, <i>Rhizomucor</i>, <i>Lichthemia</i>, <i>Apophysomyces</i>, etc) 	<ul style="list-style-type: none"> Blood Tissue Sterile body fluids*
Parasite	Specimen Source(s)
<ul style="list-style-type: none"> Positive blood smears with parasites (<i>Plasmodium</i>, <i>Babesia</i>, <i>Toxoplasma</i>, <i>Ehrlichia</i>, <i>Anaplasma</i>, microfilaria, <i>Trypanosoma</i>) 	<ul style="list-style-type: none"> Blood

***Sterile body fluids include (but not limited to):** amniotic, cerebrospinal (CSF), ocular, pericardial, pleural, synovial, and ventricular fluids. **Exception:** Abdominal, ascites, abscess, peritoneal, and sinus fluids are not considered sterile for critical calls.

****First time positives:** Only calling first time positives is necessary, which is defined as notification of stain or organism result for a particular patient within the last 14 days. If another specimen is positive beyond 14 days, call again.

H. Alert Value List

Inpatient Alert Values (called)	
•	<i>Candida auris</i> (call Infection Prevention at 616-479-4099)
•	<i>Legionella</i> by culture or DFA
•	VISA/VRSA: Vancomycin intermediate or resistant <i>Staphylococcus aureus</i>

Epic Best Practice Advisories (BPAs). Upon laboratory resulting of the bacterial and viral targets below, Epic automatically adds an infection flag to a patient's record. Upon opening of a patient's chart by nursing, an infection BPA notification is displayed for inpatients system wide whenever there is a mismatch in required isolation precautions to prompt resolution. If a patient is already under the correct isolation precautions for a particular lab result, a BPA will not display. Results communicated via BPA are **not** also communicated by phone call from the lab.

Bacteria		Viruses	
<i>Bordetella</i>	<i>M. pneumoniae</i>	Adenovirus	Parainfluenza
<i>Campylobacter</i>	<i>Salmonella</i>	Coronavirus	Parvovirus B19
<i>Chlamydomphila pneumoniae</i>	<i>Serratia</i> (neonatal)	Enterovirus	Rhinovirus
<i>C. difficile</i>	<i>Shigella</i>	Influenza	Rotavirus
CRE	<i>Vibrio</i>	Measles	RSV
ESBL	VRE	Metapneumovirus	
KPC	<i>Yersinia</i>	Mumps	
MRSA		Norovirus	