Bon Secours Richmond HealthPartners Laboratories
Critical Value List – version 2023

The following tables delineate the critical (panic/medical alert) values in use at all sites within Bon Secours Richmond HealthPartners Laboratories (HPL). The criteria are used by laboratory staff to determine if immediate notification of the Nurse[1] and/or Physician caring for a patient is indicated. The definition of a critical value [2] is "a pathophysiologic state at such variance with normal as to be life-threatening unless something is done promptly and at which some corrective action could be taken." [3]

Unless otherwise specifically noted in this document, all results that meet criteria for a critical value will be called, as identified, to the designated party, for all inpatient, outpatient and outreach (i.e., Physician office, clinic) patients. Since point of care test critical values are obtained in the clinical setting, they are handled per policy.

If you have questions related to this document and or would like to recommend additions/deletions/changes to the list, please contact C. Lee Bridges, M.D. at:

(804) 281-8224 or Clifton_Bridges@bshsi.org.

The following box contains information relative to changes made to this document:

Critical value change: Vancomycin, peak and random testing, results greater than 50 μg/mL.

Copies of the critical value list can be obtained from BSMH Central or from HPL client services [(804) 281-8100]. To access the posted document:

- Go to BSMH Central
- Select Policies
- From Virginia select the Richmond Market
- Select Bon Secours Richmond Policy Manager
- Select Laboratory- HealthPartners Laboratories
- Critical Values – Richmond Laboratories

[1] Currently, critical values are only reported to a Nurse, Nurse Practitioner, Physician's Assistant, Physician and/or another Clinical Laboratory Scientist.

[2] "Critical Value" is the generally accepted term used to describe this type of lab result and therefore "panic value", "medical alert value", etc. are no longer used.

[3] Emancipator, K, Critical values ASCP practice parameter, Am J Clin Path 108: 247, 1997.

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Chemistry

Analyte	Less than	Greater than
Acetaminophen		150 µg/mL
Alcohol (ethanol)		500 mg/dL
Alcohol (ethanol) **SMC,SECC,SVMC only**		300 mg/dL
Bilirubin, Total (<14 days)		18 mg/dL
Bilirubin, Total (≥14 days)		30 mg/dL
Calcium (Total) (<14 years)	7 mg/dL	13 mg/dL
Calcium (Total) (≥14 years)	6.5 mg/dL	13 mg/dL
CO2	16 mmol/L	40 mmol/L
Creatine Kinase-total		10,000 U/L
Digoxin		2.5 ng/mL
Digoxin **CEC only**		2.0 ng/mL
Gentamicin-peak/random		10 µg/mL
Gentamicin-trough		2 µg/mL
Glucose, neonatal (0 to 7 days)	47 mg/dL	240 mg/dL
Glucose, pediatric (8 days to 17 years)	50 mg/dL	240 mg/dL
Glucose (>17 years)	54 mg/dL	600 mg/dL
Glucose (>17 years) **RGH only**	60 mg/dL	600 mg/dL
Glucose (>17 years) **RCH only**	60 mg/dL	500 mg/dL
Glucose (point of care) (0 to 7 days)	50 mg/dL	240 mg/dL
Glucose (point of care) (8 days to 17 years)	54 mg/dL	240 mg/dL
Glucose (point of care) (> 17 years)	54 mg/dL	600 mg/dL
Glucose (point of care) (> 17 years) **RGH only**	60 mg/dL	600 mg/dL
Glucose (point of care) (> 17years) **RCH only**	60 mg/dL	500 mg/dL
Lactic acid		2.0 mmol/L
Lithium (<65 yr.)		2.00 mmol/L
Lithium (≥65 yr.)		1.50 mmol/L
Magnesium	1.0 mg/dL	
Magnesium, therapeutic – patient in labor		8.4 mg/dL
Phenytoin		25 µg/mL
Phosphate (Phosphorus)	1.0 mg/dL	
Potassium	2.8 mmol/L	6.5 mmol/L
Potassium **(RGH only)**	2.8 mmol/L	6.0 mmol/L
Salicylate		30 mg/dL
Sodium	120 mmol/L	160 mmol/L
Theophylline		20 µg/mL
Tobramycin-trough		2 µg/mL
Troponin High Sensitivity (HS)		≥ 120 ng/L
Vancomycin-peak/random		50 µg/mL
Vancomycin-trough		20 µg/mL
Valproic Acid		150 µg/mL

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COVID 19 – SARS-CoV-2

Analyte		Inpatient notification if:
SARS-CoV-2 Nucleic Acid Test		Detected / Positive
SARS-CoV-2 Antibody		Reactive / Positive

Hematology

Analyte	Less than	Greater than
Hematocrit (neonates < 30 days)		65%
Hematocrit (<1 year)	20%	
Hematocrit (≥1 year)	18%	
Hematocrit (≥1 year) **RCH only**	20%	60%
Hemoglobin (neonates <14 days)	7 g/dL	23.4 g/dL
Hemoglobin (≥14 days)	6 g/dL	20 g/dL
Hemoglobin (≥14 days) **RGH only**	7 g/dL	20 g/dL
WBC	1,000 /µL	50,000 /µL
WBC **RCH only**	2,000 /µL	20,000 /µL
Fibrinogen	60 mg/dl	
aPTT		85.9 seconds
aPTT **SMC only**		109.0 seconds
Heparin Anti Xa		0.99 IU/mL
INR		4.4
Platelet count	50,000 /µL	1,000,000 /µL
Platelet count **RCH only**	50,000 /µL	650,000 /µL
Bacteria identified on peripheral or other sterile body fluid smear	Any	Any
Presumptive malarial parasites on peripheral smear	Any	Any
CSF white blood cell count		250/cu mm

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Microbiology

Analyte		Call results to clinician if:
Blood cultures		Positive
CSF cultures/CSF smears		Positive
Joint fluid cultures		Positive
Sterile body fluid cultures [4]		Positive
Bacteria in sterile body fluid gram stain		Present
Cultures		Growing MRSA (inpatient only), VRE, VISA, VRSA, VIBRIO, ESBL, B. anthracis, N. meningitidis, invasive H. influenzae [5]
Throat culture		Growing Group A β Hemolytic Streptococci
Identification of Carbapenemase Resistant Enterobacteriaceae		Called to the unit and infection prevention practitioner
NICU and PICU urine culture		Any result other than "no growth"
Stat gram stains		All Positive
Cultures for Filamentous Fungus		Positive
Toxigenic Clostridium difficile		Positive
Cryptococcal antigen		Positive
Salmonella or Shigella culture		Positive
Bordetella pertussis		Detected in Respiratory Viral Panel
Chlamydophila pneumoniae		Detected in Respiratory Viral Panel
Mycoplasma pneumoniae		Detected in Respiratory Viral Panel
Respiratory Syncytial Virus		Detected in Respiratory Viral Panel
Meningitis / Encephalitis panel		Any Pathogen Detected

Serology

Analyte		Call results if:
RSV antigen		Positive
Fetal fibronectin		All results

Reference

Analyte/Source	Call results if:
AFB cultures/AFB smears	First / Initial Positive result for each specimen source.
Thiocyanate, serum	Greater than 50 mcg/mL
Ethylene glycol	Present
LabCorp	Notification of a critical value by a reference laboratory automatically results in HPL treating the result as if it were a pre-defined critical value by HPL.
Other reference laboratory (e.g., ARUP, UVA, VCU-MCV)	Notification of a critical value by a reference laboratory automatically results in HPL treating the result as if it were a pre-defined critical value by HPL.

[4] For example, pleural, peritoneal, pericardial fluids.

[5] MRSA = methicillin resistant Staphylococcus aureus; VRE = vancomycin resistant enterococci; VISA = vancomycin intermediate resistance Staphylococcus aureus, VRSA = vancomycin resistant Staphylococcus aureus; ESBL = bacteria (typically E coli and Klebsiella species) that produce extended spectrum beta lac- tamases; Bacillus anthracis, Neisseria meningitides, invasive Haemophilus influenza.

Transfusion Services

Test/Procedure		Call results:
Evidence of a hemolytic transfusion reaction		Notify covering Pathologist Call ordering Physician
Blood is not available or cannot be available with short notice due to multiple antibodies, warm autoantibodies, rare blood type, etc.)		Notify covering Pathologist Call ordering Physician
Rh negative patient to be switched to Rh positive blood product		Notify covering Pathologist Call ordering Physician
Compatible blood not available		Notify covering Pathologist Call ordering Physician
Evidence of a transfusion error		Notify covering Pathologist
New hemolytic antibody identified during pregnancy (if prior antibody status known to laboratory)		Notify covering Pathologist Call ordering Physician
Positive blood/blood product unit culture related to transfusion reaction		Notify covering Pathologist Call ordering Physician

Anatomic Pathology

Test/Procedure	
Frozen section results	Routinely called to Surgeon; if unavailable, message to be given to nurse by the Pathologist.
Unexpected result (Call-back of unexpected findings)	If a clinically significant unexpected pathologic finding is encountered during review of surgical slides (e.g., carcinoma in a gallbladder removed for stones, endometrial carcinoma in a uterus removed for fibroids, etc.), this finding must be verbally conveyed to the clinician or office personnel who is authorized to take diagnoses over the phone. The Pathologist is to document this communication in the surgical pathology report, specifically indicating the name of the individual who received the verbal diagnosis and the date/time of the call.

Respiratory/Arterial Blood Gas Laboratory and POC [6] ABG Critical Values

Critical values for arterial blood for patients on pediatric services and in the PICU less than 2 months old are defined as any one or more of the following:	pH < 7.200 (no high value) PCO_2 > 80.0 (no low value) PaO2 < 60.0 (no high value)
Critical values for any blood gas for any patient less than 2 months old in the NICU are defined as any one or more of the following:	pH < 7.200 (no high value) PCO_2 > 80.0 (no low value)
Critical values for arterial blood for patients on pediatric services and in the PICU from 2 months to 17 years old are defined as any one or more of the following:	pH < 7.32, > 7.52 pCO2 > 55 pO2 < 56
Critical values for arterial blood for any patient 18 years old or older are defined as any one or more of the following:	pH < 7.250 pH > 7.550 p02 < 50
Critical values for venous blood for any patient less than 18 years old are defined as any one or more of the following:	pH < 7.200 pH > 7.550 PCO_2 > 60.0 PCO_2 < 25.0
Critical values for venous or mixed venous blood for any patient 18 years old or older are defined as any one or more of the following:	pH < 7.200 pH > 7.500
Critical values for co-oximetry for all age groups and specimen types are defined as any one or more of the following:	THb < 8 THb > 18.9 O_2Hb < 82 (arterial only) COHb > 10 METHb > 6
Critical values for ionized calcium for all age groups and specimen types are defined as any one or more of the following:	IONC > 1.6 IONC < 0.8

[6] POC = Point of care testing

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Critical value list is to be reviewed annually by the laboratory, nursing administration, quality / risk representatives, and medical staff. **Note: following approval of the revised critical value list, implementation of some changes may require several weeks to achieve, while others may be implemented more rapidly.**	Approved at:	Date Approved
Input was requested from all four Bon Secours Richmond Health System hospital medical staff quality committees, nursing services, laboratory staff, VPMAs, interested clinicians and risk management (January/February 2008). Input was reviewed, collated, and this list modified as appropriate by the medical director of Bon Secours Richmond HealthPartners Laboratory prior to submission to the respective Medical Executive Committees at each site for their review/approval.	MRMC RCH [7] SFMC SMH	March 3, 2008 June 4, 2008 March 6, 2008 March 4, 2008
Input was requested from all four Bon Secours Richmond Health System hospital medical staff quality committees, nursing services, laboratory staff, VPMAs, interested clinicians and risk management (January/February 2009). Input was reviewed, collated, and this list modified as appropriate by the regional medical director of Bon Secours Richmond HealthPartners Laboratory prior to submission to the respective Medical Executive Committees at each site for their review/approval.	MRMC RCH SFMC SMH	March 9, 2009 March 4, 2009 March 5, 2009 March 3, 2009
2009 interim changes approved by the respective Medical Executive Committees	MRMC RCH SFMC SMH	August 3, 2009 June 3, 2009 June 4, 2009 June 2, 2009
Input was requested from all four Bon Secours Richmond Health System hospital medical staff quality committees, nursing services, laboratory staff, VPMAs, interested clinicians and risk management (January -March 2010). Input was reviewed, collated, and this list modified as appropriate by the regional medical director of Bon Secours Rich- mond HealthPartners Laboratory prior to submission to the respective Medical Executive Committees at each site for their review/approval.	MRMC RCH SFMC SMH	April 5, 2010 April 7, 2010 April 1, 2010 April 6, 2010
Input was requested from all four Bon Secours Richmond Health System hospital medical staff quality committees, nursing services, laboratory staff, VPMAs, interested clinicians and risk management (June – -July 2011). Input was reviewed, collated, and this list modified as appropriate by the regional medical director of Bon Secours Richmond HealthPartners Laboratory prior to submission to the respective Medical Executive Committees at each site for their review/approval.	MRMC RCH SFMC SMH	August 1, 2011 August 3, 2011 August 4, 2011 August 2, 2011
Input was requested from all four Bon Secours Richmond Health System hospital medical staff quality committees, nursing services, laboratory staff, VPMAs, interested clinicians and risk management (March 2012). Input was reviewed, collated, and this list modified as appropriate by the regional medical director of Bon Secours Richmond HealthPartners Laboratory prior to submission to the respective Medical Executive Committees at each site for their review/approval.	MRMC RCH SFMC SMH	April 2, 2012 April 4, 2012 April 5, 2012 April 3, 2012
Input was requested from all four Bon Secours Richmond Health System hospital medical staff quality committees, nursing services, laboratory staff, VPMAs, interested clinicians and risk management (February/March 2013). Input was reviewed, collated, and this list modified as appropriate by the regional medical director of Bon Secours Richmond HealthPartners Laboratory prior to submission to the respective Medical Executive Committees at each site for their review/approval.	MRMC RCH SFMC SMH	June 3, 2013 June 5, 2013 June 6, 2013 June 4, 2013

[7] With modifications to be used only at Richmond Community Hospital (RCH) {2008}

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Input was requested from all four Bon Secours Richmond Health System hospital medical staff quality committees, nursing services, laboratory staff, CMOs, interested clinicians and risk management, laboratory directors and staff (February-June 2014). Input was reviewed, collated, and this list modified as appropriate by the regional medical director of Bon Secours Richmond HealthPartners Laboratory prior to submission to the respective Medical Executive Committees at each site for their review/approval.	MRMC RCH SFMC SMH	August 4, 2014 June 4, 2014 July 10, 2014 August, 2014 (e-mail vote)
Input was requested from all four Bon Secours Richmond Health System hospital medical staff quality committees, nursing services, laboratory staff, CMOs, interested clinicians and risk management, laboratory directors and staff. (March 26th to April 10th, 2015; Lactic acid update January 2016). Input was reviewed, collated and this list modified as appropriate by the regional medical director of Bon Secours Richmond HealthPartners Laboratories.	MRMC RCH SFMC SMH	Approved by all Laboratory Directors on February 24, 2016 (e-mail vote)
Update to pediatric and adult blood gas laboratory critical values. Email notification and signed approval by all Laboratory Directors of Bon Secours Richmond Blood Gas Laboratories and Bon Secours Hampton Roads Blood Gas Laboratories.		Adult Ranges / Pediatric Ranges
	MRMC	3/16/16 / 3/16/16
	RCH	3/9/16 / 3/11/16
	SFMC	3/10/16 / 3/16/16
	SMH	3/10/16 / 3/16/16
	Watkins	3/11/16 / 3/22/16
	DMC	3/10/16 / 3/17/16
	MIH	3/10/16 / 3/14/16
	Maryview	3/16/16 / 3/16/16
	Harborview	3/16/16 / 3/16/16
Input was requested from all four Bon Secours Richmond Health System Hospital medical staff quality committees, nursing services, laboratory staff, CMOs, interested clinicians and risk management, laboratory directors and staff (Nov.2016 - Jan. 2017). Input was reviewed, collated, and this list modified as appropriate by the Regional Medical Laboratory Director of Bon Secours Richmond HealthPartners Laboratories prior to submission to the respective Medical Executive Committees at each site for their review/approval.	MRMC RCH SFMC SMH SFWEC RGH	12-6-16 2-22-17 1-30-17 11-17-16 3-20-17 12-2-16 (e-mail vote)
Update to Respiratory Blood Gas Laboratory and POC critical values for ionized calcium. Signed approval by all Laboratory Directors of Bon Secours Richmond Blood Gas Laboratories and Bon Secours Hampton Roads Blood Gas Laboratories.	MRMC RCH SFMC SMH SFWEC DMC MIH MMC Harborview	9-28-17 9-28-17 9-28-17 9-29-17 (JL), 10-2-17 (CLB) 10-2-17 11-7-17 11-7-17 11-7-17 11-7-17
Memorial Regional Medical Center medical staff and nursing services, request for updated Troponin notification protocol to mirror SMH. Input was reviewed, by the MRMC Laboratory Director and the Regional Medical Laboratory Director of Bon Secours Richmond HealthPartners Laboratories prior to submission to the MRMC Medical Executive Committees	MRMC SMH MEC	1-29-18 1-29-18 2-5-18

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Update to aPTT critical value from > 93.0 seconds to ≥ 86.0 seconds due to new aPTT reagent lot. Regional Medical Laboratory Director and Site Laboratory Director approval	MRMC SMH RCH SFWEC SFMC	2-12-18 2-9-18 2-11-18 2-12-18 2-13-18
Update to the RGH aPTT critical value from >93.0 seconds to ≥ 86.0 seconds; and to the INR critical value from >4.0 to >4.4 due to the implementation of new Coagulation instrumentation methods.	RGH	5-23-18
Update to RGH Troponin notification criteria with the implementation of new Instrumentation. Change from ≥0.08 ng/mL and 1st value >0.59 ng/mL within the last 6 days; to >0.09 ng/mL and doubling of previous result and ≥ 2.0ng/mL.	RGH	6-12-18
Update to include the new Short Pump Emergency Center in Troponin notification Criteria > 0.09 ng/mL.	SPEC	9-5-18
Richmond Community Hospital: Low Critical Glucose, for pediatric ages 8 days to 17 years, is changed from less than 60 mg/dL to less than 50 mg/dL.	RCH	12-26-18
Addition to Microbiology: A. The detection of Respiratory Syncytial Virus, Bordetella pertussis, Chlamydophila pneumoniae and Mycoplasma pneumoniae on the Biofire Respiratory Viral Molecular Panel; B. Any pathogen detected on the Biofire Meningitis/Encephalitis Molecular Panel.	SMH	2-26-19
Microbiology: a. Positive cultures for VIBRIO. b. Positive MRSA cultures changed to immediate notification for inpatients only. Glucose: a. Low Critical Glucose, patients > 17 years, is changed from 50 to 54 mg/dL, for all locations except RCH. b. Low Critical Glucose Point of Care Testing is changed from 50 to 54 mg/dL, for all ages except newborns. COVID 19 Antigen, Antibody: Positive / Detected / Reactive Results	SMH MRMC SPEC RGH RCH SRMC SVRMC SECC	8-25-20 8-5-20 8-25-20 8-25-20 8-5-20 8-19-20 8-19-20 8-19-20
Troponin Immediate Notification Criteria at SFMC only: Inpatient and outpatient criteria will change from 1st value > 0.59 ng/mL within the last 6 days, to doubling of the previous result and ≥ 2.0 ng/mL	SFMC	10-1-20
RGH only: Low Critical Glucose, patients >17 years and for point of care, is changed from < 54 to < 60 mg/dL, High Critical Potassium is changed from >6.5 to > 6.0 mmol/L, and Low Critical Hemoglobin, ≥ 14 days, is changed from < 6.0 to < 7.0 g/dL.	RGH	7-19-21
High Sensitivity Troponin new test Critical Value: Female: ≥ 52 ng/L Male: ≥ 77 ng/L Immediate notification: Delta change ≥ 20% on any troponin value greater than 5 ng/L. Immediate subsequent testing within 3 days.	SMH MRMC SPEC RGH RCH SFMC SRMC SVRMC SECC WEC	9-23-21 9-23-21 9-28-21 9-23-21 9-22-21 9-23-21 9-29-21 9-29-21 9-29-21 9-29-21

High Sensitivity Troponin new Critical Value Results greater than or equal to 120 ng/L.	SMH MRMC SPEC RGH RCH SFMC SRMC SVRMC SECC WEC	5-11-22 5-11-22 5-11-22 5-11-22 5-11-22 5-11-22 5-11-22 5-11-22 5-11-22 5-11-22
Digoxin – Chester Emergency Center only. New methodology. Change from HPL 2.5 ng/mL to 2.0 ng/mL	CEC	5-18-22
Heparin Anti Xa new critical value set by pharmacy	All Locations	12-20-22
Vancomycin, peak and random testing, results greater than 50 μg/mL	SMH MRMC SPEC RGH RCH SFMC SMC SVMC SECC WEC CEC	7-10-23 8-7-23 7-10-23 7-10-23 7-10-23 8-9-23 7-10-23 7-10-23 7-10-23 8-9-23 8-9-23