

Jump to:

[Pathology Information System](#) • [Critical Value Reporting Policy](#)  
[Microbiology Result Reporting Procedures](#)  
[Antimicrobial Susceptibility Test Result Reporting](#) • [Surgical Pathology Result Reporting](#)  
[Cytopathology Result Reporting](#) • [Molecular Pathology Reporting](#)

## Laboratory Test Result Reporting and Inquiry Procedures

### **PATHOLOGY INFORMATION SYSTEM**

VCUHS Department of Pathology is supported by the Cerner Clinical Information System (CIS). The Pathology Information System (PIS) Group is responsible for the proper operation and maintenance of the Laboratory Information System (LIS) which functions to facilitate and support specimen accessioning, analysis, and result reporting.

Most laboratory reports for inpatients and most VCUHS Clinics are reported and retrieved from the CIS System. The exceptions are some non-Pathology Ancillary Testing, and some referral laboratory studies. These printed final reports are sent to Medical Records and to the ordering physicians.

### **Computer-Generated and Charted Reports (Electronic Result Reporting — Fax and Remote Printers)**

#### **Outreach clients**

Reports for outreach clients are provided by a fax printer at their site that prints either a daily report or broadcasts of the results as completed.

#### **VCUHS patients**

Inpatient results are not printed but are available in CIS as soon as they are completed. Ambulatory Care stat results print on CIS printers on test completion; routine results print once daily in the morning to CIS printers in the clinic areas. For some referral test results that are not available in CIS, printed reports are sent to Ambulatory Clinic areas or to Medical Records for inclusion in the paper chart. For users without access to CIS, requests for results should be made as follows:

- **Client Services** at (804) 828-7284

Hospital policy restricts the use of telephone inquiries for patient results to authorized individuals. Laboratory personnel are restricted in releasing patient information.

## **On-Line Computer Result Retrieval**

Within the hospital environment, view or print laboratory reports from the CIS System.

## **Telephone Inquiries**

To obtain verbal laboratory results, call the laboratory Help-Line at (804) 828-7284 or (804) 828-PATH for assistance.

## **Outcomes and Research Reporting**

PIS may be authorized to provide laboratory data and specialized reports to support research projects and outcomes studies. Requests for such reports should be made in writing to Dr Richard McPherson, Chairman, Clinical Pathology, at VCUHS, Box 980258, Richmond, VA 23298-0258; email [rmcpherson@mcvh-vcu.edu](mailto:rmcpherson@mcvh-vcu.edu).

## **CRITICAL VALUE REPORTING POLICY** [\[Go to Top\]](#)

The following protocol is used by the Pathology Laboratories for the rapid reporting of results of analytical tests which may have critical impact on patient care.

A technologist will communicate the results of Critical Tests and Panic Values to a licensed healthcare provider caring for the patient as soon as results are available and, as appropriate, after confirming the value. Panic values and critical results should always be called within 60 minutes of obtaining the result. Providers should be prepared to document and read back all patient information communicated to them by technologists.

**Critical tests** are tests that require rapid communication of results, whether normal or abnormal. Results of critical tests are communicated to a licensed provider who is caring for the patient within sixty minutes of obtaining the result.

Critical tests defined by the VCUHS Department of Pathology:

- Frozen Sections
- Parathyroid Hormone (PTH) – during parathyroid surgery
- HIV-1 antibody, no prenatal care L&D
- HIV-1 antibody, employee occupational exposure

**Panic Values/Critical Results** are test results that are abnormal to a degree that it may indicate a life threatening situation. These panic values or critical results are established by the Department of Pathology in consultation with VCUHS providers and outreach customers. Panic values are communicated to a licensed healthcare provider within 60 minutes of obtaining the result.

All critical values (where appropriate) should be flagged ("C") in the laboratory report. Reporting Flags are noted in the table below:

- H** – value is higher than reference range.
- L** – value is lower than reference range.
- C** – value is a critical or “panic” result.

Critical values obtained on patient samples from outside the VCUHS will be called to the physician at the telephone number indicated on the request form. Calls will be made as soon as results are completed.

For any questions, contact the laboratory director or pathology resident.

<b>Summary Table of Panic Values/Critical Values</b>			
<b>Test</b>	<b>Reference Ranges</b>	<b>Test Values &lt; = (unless noted)</b>	<b>Test Values &gt; = (unless noted)</b>
<b>CHEMISTRY</b>			
<b>Calcium</b>			
• <7 d	6-12 mg/dL	<6 mg/dL	>12 mg/dL
• 8 d - 10 y	9.4-10.9 mg/dL	<6.6 mg/dL	>12 mg/dL
• 11 y to adult male	9.2-10.7 mg/dL	<6.6 mg/dL	>12 mg/dL
• 11 y to adult female	8.9-10.5 mg/dL	<6.6 mg/dL	>12 mg/dL
<b>Glucose, fasting</b>			
• Adult	65-100 mg/dL	<50 mg/dL	>500 mg/dL
• 1 mo-3 y	60-100 mg/dL	<50 mg/dL	>500 mg/dL

<b>Summary Table of Panic Values/Critical Values</b>			
<b>Test</b>	<b>Reference Ranges</b>	<b>Test Values &lt; = (unless noted)</b>	<b>Test Values &gt; = (unless noted)</b>
• <30 d	40-90 mg/dL	<40 mg/dL	>500 mg/dL
Lithium	0.5-1.5 mmol/L	NA	>2 mmol/L
Magnesium	1.8-2.4 mg/dL	<1 mg/dL	>4.9 mg/dL
Phosphorus	2.5-4.6 mg/dL	<1.3 mg/dL	NA
Potassium	3.6-5.1 mmol/L	<2.8 mmol/L	>6.1 mmol/L
• <3 d	5.0-7.5 mmol/L	<2.8 mmol/L	>7.5 mmol/L
• 3 d - 3 mo	4.0-6.2 mmol/L	<2.8 mmol/L	>6.2 mmol/L
Sodium	135-145 mmol/L	<125 mmol/L	>155 mmol/L
<b>IMMUNOLOGY</b>			
Cryptococcal antigen (first time positive to ID)	Negative	Positive	
HIV Ab/Western blot	Negative	Positive	
RSV antigen	Negative	Positive	
Viral isolation	No virus isolated	Positive	
<b>MICROBIOLOGY</b>			
AFB cultures	No growth	Positive	
AFB smears	No AFB seen	Positive	
Blood culture	No growth	Positive	
<i>Bordetella pertussis</i> FA	Negative	Positive	
CSF cultures	No growth	Positive	
CSF Gram stain	No organism seen	Positive	
Cultures positive for the growth of: <i>Brucella</i> species, <i>Bordetella pertussis</i> , <i>Clostridium botulinum</i> , <i>Corynebacterium diphtheriae</i> , <i>Francisella tularensis</i> , <i>Listeria</i> species, <i>Streptococcus</i> Group A – from sterile sites or wounds only, <i>Yersinia pestis</i>	No growth	Positive	

<b>Summary Table of Panic Values/Critical Values</b>			
<b>Test</b>	<b>Reference Ranges</b>	<b>Test Values &lt; = (unless noted)</b>	<b>Test Values &gt; = (unless noted)</b>
<i>Legionella</i> culture or antigen	No growth/Negative	Positive	
Malaria Smears	Negative	Positive	
Mycology cultures (from sterile sites only)	No growth	Positive	
Shiga Toxin antigen	Negative	Positive	
<b>HEMATOLOGY</b>			
Hemoglobin (Hgb)	For age specific reference ranges refer to Pathology Catalog of Laboratory Services appendices	≤7 g/dL	≥20.0 g/dL* (except newborn infants)
Hematocrit (Hct) (only if Hgb is not reported)	For age specific reference ranges refer to Pathology Catalog of Laboratory Services appendices	≤20%	
Platelet (PLT)	For age specific reference ranges refer to Pathology Catalog of Laboratory Services appendices	≤40 (x 10 <sup>9</sup> /L)	≥1000 (x 10 <sup>9</sup> /L)
WBC	For age specific reference ranges refer to Pathology Catalog of Laboratory Services appendices	≤2 (x 10 <sup>9</sup> )	≥50 (x 10 <sup>9</sup> /L)
Peripheral Smear Findings		Presence of blasts, intra- or extra-	

<b>Summary Table of Panic Values/Critical Values</b>			
<b>Test</b>	<b>Reference Ranges</b>	<b>Test Values &lt; = (unless noted)</b>	<b>Test Values &gt; = (unless noted)</b>
		cellular organisms determined as clinically relevant by Pathologist	
<b>Critical values are called each occurrence except on inpatients with known hematologic disturbance</b>			
<b>URINALYSIS</b>			
Ketones	Negative		≥80 mg/dL (4+)
<b>BODY FLUIDS</b>			
		Presence of bacteria or yeast after smear confirmation	
		Presence of blasts or neoplastic cells after smear confirmation	
CSF (WBC)	(0-5 cells)		WBC ≥200 mm <sup>3</sup>
<b>COAGULATION</b>			
Activated partial thromboplastin time (APTT)	25-38 sec		>150 sec
D-Dimer	<0.50 µg/mL FEU		>5 µg/mL FEU
Fibrinogen	180-450 mg/dL	<60 mg/dL	
Heparin induced platelet antibody	Negative		Positive
Protime (PT)	Call Laboratory for Reference Range		≥56 sec, INR > =5
<b>MOLECULAR DIAGNOSTICS</b>			
Herpes Simplex Virus by PCR	Negative	Positive	
<b>TOXICOLOGY</b>			
Acetaminophen	10-20 mg/mL		100 mg/mL
<b>Alcohols</b>			

<b>Summary Table of Panic Values/Critical Values</b>			
<b>Test</b>	<b>Reference Ranges</b>	<b>Test Values &lt; = (unless noted)</b>	<b>Test Values &gt; = (unless noted)</b>
• Acetone	Negative		1000 mg/L
• Ethanol	Negative		4000 mg/L
• Isopropanol	Negative		200 mg/L
• Methanol	Negative		200 mg/L
Aluminum	Dialysis patient <40 µg/L  Environmental exposure: 0-9 µg/L		>60 µg/L
Amikacin			
• Trough	1-8 mg/L		10 mg/L
• Peak	25-35 mg/L		40 mg/L
<b>Anticonvulsants</b>			
Carbamazepine	7-12 mg/L		15 mg/L
Phenobarbital	15-40 mg/L		50 mg/L
Phenytoin	10-20 mg/L		40 mg/L
Primidone	5-12 mg/L		15 mg/L
<b>Barbiturate scan</b>			
Amobarbital	1-5 mg/L		10 mg/L
Butabarbital	1-5 mg/L		10 mg/L
Butalbital	1-5 mg/L		10 mg/L
Pentobarbital	1-5 mg/L		10 mg/L
Secobarbital	1-2 mg/L		5 mg/L
Caffeine			
• Children	8-20 mg/L		50 mg/L

<b>Summary Table of Panic Values/Critical Values</b>			
<b>Test</b>	<b>Reference Ranges</b>	<b>Test Values &lt; = (unless noted)</b>	<b>Test Values &gt; = (unless noted)</b>
• Adults	3-15 mg/L		50 mg/L
Chloramphenicol			
• Trough	5-10 mg/L		25 mg/L
• Peak	10-20 mg/L		25 mg/L
Chlordiazepoxide	0.5-3.0 mg/L		5 mg/L
Clonazepam	0.015-0.060 mg/L		0.08 mg/L
Desipramine	40-160 ng/mL		400 ng/mL
Digoxin	0.5-2.0 ng/mL		2.4 ng/mL
Doxepin	50-100 ng/mL		400 ng/mL
Ethosuximide	40-100 mg/L		150 mg/L
Ethylene glycol	Negative		>0
Gabapentin	2-15 mg/L		20 mg/L
Gentamicin			
• Trough	0.5-2.0 mg/L		2 mg/L
• Peak	5.0-10.0 mg/L		12 mg/L
Haloperidol	2-20 ng/mL		50 ng/mL
Heavy metals	None detected		Any positive
Ibuprofen	10-50 mg/L		200 mg/L
Lidocaine	1-5 mg/L		6 mg/L
Lithium			
• Saliva	1-3 ng/dL		3.5 ng/dL
• Red blood cell	0.2-0.8 ng/dL		0.9 ng/dL
Methotrexate	Subject to MD's interpretation		
N-acetyl procainamide	Not defined		40 mg/L

<b>Summary Table of Panic Values/Critical Values</b>			
<b>Test</b>	<b>Reference Ranges</b>	<b>Test Values &lt; = (unless noted)</b>	<b>Test Values &gt; = (unless noted)</b>
(NAPA)			
Norchlordiazepoxide	0.2-0.7 mg/L		
Nortriptyline	50-150 ng/mL		400 ng/mL
Phenytoin free	1-2 mg/L		4 mg/L
Procainamide	4-10 mg/L		16 mg/L
Quinidine	2-5 mg/L		10 mg/L
Salicylate	150-250 mg/L		500 mg/L
Theophylline			
• Newborn	8-12 mg/L		25 mg/L
• Children/adults	10-20 mg/L		40 mg/L
Tobramycin			
• Trough	0.5-1.5 mg/L		12 mg/L
• Peak	5-10 mg/L		12 mg/L
Tricyclics, total	50-100 ng/mL		500 ng/mL
Valproic acid	50-100 mg/L		200 mg/L
Vancomycin			
• Trough	5-10 mg/L		90 mg/L
• Peak	30-40 mg/L		90 mg/L

## MICROBIOLOGY RESULT REPORTING PROCEDURES [\[Go to Top\]](#)

### Test Result Report (Routine Bacteriology)

1. One area of the report will give the Gram stain results on direct smears of clinical specimens when applicable.
2. Organisms will be listed followed by either quantitative (of colonies/mL) in the case of urine cultures or semiquantitative (rare, few, moderate, many) for other cultures, indicating the number of colonies that grew on primary culture media.

**Rare:** The organism grew only in the broth culture but not on the agar plate media.

**Few:** Growth only in the primary inoculum area of the agar plate (1+).

**Moderate:** Growth occurred in primary inoculum and in second quadrant of the agar plate (2+).

**Many:** Growth occurred in primary inoculum and in second, third, and fourth quadrants of agar plate (3+, 4+).

3. Preliminary reports on a patient's specimen are reported whenever new information of possible clinical significance becomes available. When work on a specimen is completed, a final report will be issued.

## ANTIMICROBIAL SUSCEPTIBILITY TEST RESULT REPORTING

### Routine Bacterial Susceptibility Testing

Routine susceptibility testing is performed by a combination of several methodologies which include the Vitek automated system and Disk Diffusion. Results are reported within an interpretive category:

**S – susceptible**  
**I – intermediate**  
**R – resistant**

If further technical information is needed, please call the Microbiology Laboratory at 828-9077.

## **SURGICAL PATHOLOGY RESULT REPORTING** [\[Go to Top\]](#)

Results of Surgical Pathology examinations of small biopsies and minor cases not requiring extra fixation time, additional sections, or special stains or studies are available by phone at 828-9739 or by inquiry from the Pathology Information System (PIS) usually by the end of 3 working days from time of receipt in the Surgical Pathology Laboratory. Large and complex specimens and those requiring additional stains or special procedures will add several extra working days to this turnaround time before the final report is signed out and printed for distribution. Small biopsies for expedited processing and review (transplant biopsies and cases approved by senior attending pathologists) that arrive in the laboratory before 11 AM will be processed and reviewed the same day, with a verbal report available by 4 PM. Final printed reports can be faxed upon request to the attending physician.

## **CYTOPATHOLOGY RESULT REPORTING** [\[Go to Top\]](#)

Gynecologic specimens are resulted using 2001 The Bethesda System (TBS) for reporting cervicovaginal cytologic diagnoses. This format includes a descriptive diagnosis and an evaluation of specimen adequacy. The Bethesda nomenclature is designed to standardize results based on the most abnormal cells present. The major categories of TBS are as follows:

- negative for intraepithelial lesion or malignancy
- benign cellular changes (includes reactive cell changes repair, and infections)
- epithelial cell abnormalities (includes ASCUS, AGUS, LGSIL, HGSIL)
- other malignant neoplasms

Nongynecologic specimens are reported by a statement of cell types present and descriptive diagnoses; a statement regarding specimen inadequacy is included when necessary.

## **MOLECULAR PATHOLOGY REPORTING** [\[Go to Top\]](#)

All Molecular Diagnostics testing results are reported in Cerner except for HIV genotyping, Prader-Willi/Angelman syndrome, hereditary pancreatitis, fragile X mutation by Southern blot and PCR, and T and B cell gene rearrangement. The previously listed exceptions are reported via fax directly from the Molecular Diagnostics Laboratory. all viral load testing is reported within two weeks of receipt of sample. Hematopathology tests are resulted within two to three weeks of receipt of sample.