Clinical Laboratories
West Virginia University Hospitals

Resident Orientation

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Residents are IMPORTANT in Laboratory Testing Process

<table>
<thead>
<tr>
<th>Provider</th>
<th>Phlebotomy/Nursing</th>
<th>Laboratory</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PreAnalytic</strong></td>
<td>Welcome to the Laboratory Testing Process</td>
<td>Test Specimen</td>
</tr>
<tr>
<td>Order</td>
<td>Collect Sample</td>
<td>Verify &amp; Report Results</td>
</tr>
<tr>
<td>Right Test at Right Time on Right Patient</td>
<td>From Right Patient at Right Time in Right Tube</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transport Sample to Lab</td>
<td></td>
</tr>
<tr>
<td><strong>Analytic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PostAnalytic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>View Result</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpret</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Act</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**What were you taught about Lab Medicine in medical school?**
Clinical Labs @ WVUH

24/7
Level 3 Ruby
Staffed by supervisors, technologists, etc.

- Chemistry: Dr. Tacker
- Hematology & Coagulation: Dr. Esan
- Flow cytometry: Dr. Rosado
- Microbiology: Dr. LaSala
- Molecular Diagnostics: Dr. Smolkin
- Cytogenetics: Dr. Sasi
- Blood Bank: Dr. Perrotta

Problems are brought to supervisors & pathologists!
Regulatory Concerns

• Lab practice **strictly regulated by federal (CMS, FDA) and other organizations (JC, CAP, AABB)**
  
  – CLIA Medical Director = Dr. Perrotta

• **MUST** be a **computer-entered (written) order for each test, and the test must be medically necessary**

• Some tests require **informed consent**
  
  – Genetic tests
  – Blood transfusion
  – HIV no longer requires written consent

*Technologists CANNOT deviate from policies/procedures without pathologist approval*
Test Availability

• Tests needed for urgent care (& many others) are available 24/7

• Tests we don’t do are sent to a reference lab far away

• Limited point-of-care testing
Testing Capabilities

- Chemistry & Hematology Automated Core
- Flow cytometry, FISH, cytogenetics
- Molecular (PCR): Many varieties
- Mass spectrometry
- MALDI-TOF Microbiology
Turnaround Times (TAT)

- **Routine**: < 4 hours (usually < 2 hours)

- **“STAT”**: < 1 hour
  - 25-50% tests ordered “STAT”
  - Collected by unit/nurse
  - ED Tnl 30 minutes

- **Timed**
  - Collected 1 hour before or after time by phlebotomy

*Routine priority for orders usually sufficient*
Electronic Test Formulary

- Comprehensive
  - Tests performed at WVUH
  - Reference lab tests

- Current/Accurate/Easily updated

- Includes educational material
  - Practice guidelines, algorithms, publications

http://wvuh.testcatalog.org/
Mayo Medical Labs is our Primary Reference Lab

Hyperlinks to Mayo website in Epic
Test Order Entry

Priorities & Frequencies

HEPATITIS C ANTIBODY SCREEN WITH REFLEX TO HCV PCR
STAT, starting Today at 1342 Until Specified, Unit Collect

- **Priority:** STAT, Routine, STAT

- **Frequency:** ONE TIME
  - For: Occurrences, Hours, Days, Weeks
  - Starting: 4/26/2015, Today, Tomorrow
  - First Occurrence: Today, 1342, Until Specified

- **Class:** Unit Collect, Phlebotomy Rounds, Unit Collect, System Default
  - Comments (F6): Click to add text

- There are no scheduled times based on the current order parameters.

- Hyperlinks

- Don’t use “Comments”
Lab Collect Times

• **AM Draw (0530)**
  – Results available early to mid-morning

• **AFTERNOON Draw (1600)**
  – Results available later afternoon

• **NIGHT Draw (2200)**
  – Results available around midnight
Best Practice Alerts & Pop-ups

We are sensitive to pop-up fatigue and limit whenever possible.

- **Important (1 Advisory)**
  - This test has been performed and resulted as negative within the past 7 days. Alternative etiologies of diarrhea should be considered. Test methods in use at WVUH have high negative predictive value; and, review of internal data has confirmed the low yield of repeat testing for C. difficile within a 7 day period. Last CDIFFTOX=negative on 9/12/2013.

- **Important (2 Advisories)**
  - This test has been performed and reported as positive within the past 14 days. Please do NOT continue placing order for C DIFFICILE DETECTION. Current guidelines recommend against testing for cure; and, recurrent disease cannot be confirmed or excluded based upon repeat testing during this time interval. Last CDIFFTOX=POSITIVE on 9/13/2013.

- **Testing for Clostridium difficile is not recommended in this patient due to recent laxative use. Most patients infected with this organism experience diarrhea and do not require laxatives.**
Duplicate Testing (includes duplicate alerts)

• Providers pressured to improve diabetes care lead to increased duplicate HbA1c testing (up to 10% for inpatients)

• Limit every 3 months (per physiology & Medicare)

• Coordinated effort to decrease to <1% duplicates:
  – Alerts: Appeared more effective when embed previous results
  – Phlebotomy: Combining orders
  – Diabetes care managers
Test Formulary Can Help Select the Correct Test

- Right test 1st
- Real-time Information
- Reduce user burden
Ordersets & Preference Lists

- We have too many
- Poorly controlled
- Some labs “autochecked”
### Test Result Review

#### Results Review (Last refresh: 5/31/2011 11:30:01 AM)

- **CHEM 1**
  - SODIUM: 140
  - POTASSIUM: 2.3
  - CHLORIDE: 115
  - CARBON DIOXIDE: 16
  - BUN: 55
  - CREATININE: 8.10
  - GLUCOSE, NONFAST: 107

- **CARDIAC MARKERS**
  - TROPONIN-I: 0.313 *

#### Flags
- Critical
- Low Critical
- High Critical
- In Process
- Abnormal
- High
- Low
- Low Off-Scale
- High Off-Scale
- Other
- Preliminary
- Changed
House staff are *critical* in the Post-analytical testing phase

- Results must be retrieved and acted upon

- **Critical results** ("panic values") are phoned to you & require *immediate action* (if you are not sure what to do, ask!)
  - "Readback" required by JC

- Unexpected/unexplained results may need confirmation

*Let the lab know if you think there is a problem with a result!*
Laboratory Resource Utilization
“Testing Wisely”

• Lab testing ~5% cost of healthcare

• Routine labs relatively inexpensive per test but costs add up
  – Does every patient need large # daily labs?
  – Option to order daily labs (e.g. “daily x 7 days”) has been removed
    • PT/INRs can be ordered daily x7 days
    • Troponin Q4h x2 or x3

• No more CK-MB testing for myocardial injury

• Some tests only needed once (genetic, $$$)

• Some tests are limited to outpatients & specialists
Blood Utilization

- Use of RBCs, platelets, FFP, factors is monitored by the Blood Utilization Committee

- Blood components are a finite resource (and very expensive)

- Recognize transfusion reactions
  - Transfusion Manual online

- Hemolytic transfusion reactions are caused by giving the wrong blood to the wrong patient
Transfusion Medicine

• We use **apheresis platelets**: An adult dose of platelets is “1 dose” (not 2, 3, 6, 10, etc)

• Order **irradiated blood** products appropriately
  – NOT every patient with cancer

• We **won’t** accept mislabeled specimens

• We have policies for **emergency blood release**

• We have a **massive transfusion protocol**
Laboratory Services provides comprehensive laboratory testing for WVU Healthcare patients. The department also serves regional healthcare providers through University Medical Laboratories. A wide variety of routine and specialized tests are performed in the labs – tests that are used to help diagnose disease and guide treatment.

The labs are staffed by professionals trained in laboratory sciences and by pathologists from the WVU Department of Pathology.
Laboratory Concerns

- Direct to supervisors and/or Medical Directors
  - We take MD complaints/concerns VERY SERIOUSLY

- Pathology residents and attendings on call 24/7 for both Anatomic & Clinical Pathology

- We are always happy to help with test selection, test interpretation, etc.
Autopsy Tid Bits

Why do we perform autopsies?
Who gets an autopsy?
When should an autopsy be performed?
What needs to be completed prior to autopsy?
How to fill out a death certificate?
Importance of Autopsies

• Provides information to families, clinicians, public, etc.
  – Inheritable, preventable, infectious disease
• Establish a cause of death or document clinical suspicions/findings
• Pathology residents require 50 autopsies to sit for boards
• Medical student, resident, PA student, and other field education
• Research
• No charge to WVUH hospital patients (yes, FREE)
  – If they have ever been seen here
Patient Dies

Natural disease process - not suspicious

Death Certificate and Report of Death completed by hospital physician

(Unexpected Death) Death Result of:
Unexpected death, accident, homicide, suicide, physical abuse, neglect, overdose/intoxication, contagious disease (threat to public safety), associated with therapeutic procedure, police intervention/involvement, incarceration, or any unnatural manner.

Immediately call County Medical Examiner:
304-599-6382

Decline

Assumes Jurisdiction

Inform Families About Autopsy and Obtain Consent

Complete pronouncement section of the death certificate (Line 24-26) & Report of Death
AUTOPSY CONSENT
NI 014
CW 111

DATE: __/__/____

Autopsy Consent for (Name of deceased): ____________________________

Date of Birth: __/__/____ Date of Death: __/__/____

I certify that I have the legal right to authorize an autopsy and/or dispose of the body of the decedent as the acts of a personal representative of the deceased in accordance with West Virginia law. This complete autopsy report is part of the permanent medical record and is subject to the WVU Medical Records Department. My relationship to the deceased is (PLEASE INITIAL ONLY ONE):

_____ 1) medical power of attorney representative

_____ 2) surviving spouse of the deceased

IF THERE IS NO MEDICAL POWER OF ATTORNEY REPRESENTATIVE OR SURVIVING SPOUSE, THE MEDICAL RECORDS (WILL) OR OTHER PROPERLY AUTHORIZED WRITING BY THE DECEASED PERSON IS KNOWN TO ME.

_____ 3) child of the deceased over the age of 18

IF THERE IS NO MEDICAL POWER OF ATTORNEY REPRESENTATIVE OR SURVIVING SPOUSE, HOWEVER, THE CHILD'S ATTORNEY IN FACT OR THE PERSON RESPECTIVE OF THE DECEASED AND OVER THE AGE OF 18 WHOSE INTERESTS WILL BE IMPACTED BY THE AUTOPSY MUST BE NOTIFIED.

_____ 4) parent of the deceased

IF THERE IS NO MEDICAL POWER OF ATTORNEY NOR SURVIVING SPOUSE NOR ADULT CHILD OF THE DECEASED.

_____ 5) health care surrogate

IF THERE IS NO MEDICAL POWER OF ATTORNEY NOR SURVIVING SPOUSE NOR ADULT CHILD OF THE DECEASED AND ONE IS APPOINTED.

_____ 6) the duly appointed and acting fiduciary of the estate

IF THERE IS NO MEDICAL POWER OF ATTORNEY NOR SURVIVING SPOUSE NOR ADULT CHILD OF THE DECEASED NOR PATIENT OF THE DECEASED NOR HEALTH CARE SURROGATE.

_____ 7) the person, firm, corporation or agency legally responsible for the financial obligation incurred in disposing the body of the deceased.

IF THERE IS NO MEDICAL POWER OF ATTORNEY NOR SURVIVING SPOUSE NOR ADULT CHILD OF THE DECEASED NOR PATIENT OF THE DECEASED NOR HEALTH CARE SURROGATE NOR DULY APPOINTED AND ACTING FIDUCIARY OF THE ESTATE.

IN THE EVENT THAT THE MEDICAL POWER OF ATTORNEY REPRESENTATIVE, THE SPOUSE, CHILD, PARENT OR HEALTH CARE SURROGATE OF THE DECEASED IS MENTALLY INCAPACITATED, THE PERSON AUTHORIZED TO CONSENT TO SUCH AUTOPSY SHALL BE THE NEXT IN THE ORDER OF PRIORITY AS ABOVE DEFINED, BROTHERS AND SISTERS OF THE DECEASED ARE NOT RECOGNIZED SPECIFICALLY IN THE WEST VIRGINIA STATUTE FOR LEGAL AUTHORIZATION OF AN AUTOPSY.

CONTINUE ON NEXT PAGE
Autopsy Consent for (Name of deceased): __________________________

In order to verify the cause of death and to aid in the diagnosis and treatment of other persons, I, the undersigned, request and permit the physician(s) authorized by the hospital to perform a (PLEASE INITIAL ONLY ONE):

1) Complete autopsy

2) Examination limited to (Please specify) __________________________

3) Restrictions (Please specify) __________________________

I authorize the presence of such other persons as the physician(s) and their discretion, permission to use the autopsy as an educational resource. As to any tissue, body part, fluids or organs (“specimen”) removed during or incidental to the autopsy, I authorize the physician(s) and/or WVUH to retain, preserve, and/or dispose of such tissues according to hospital policy for diagnosis, teaching, and/or research with the following exceptions: __________________________, as they deem proper.

Name

Address

Telephone

Signature: __________________________ Date/Time: __________________________

(Signature of person authorizing the autopsy)

WITNESSES

This was signed in my presence (or I have received faxed, telegraphic or verified telephonic or other verbal authorization) after complete disclosure and explanation of this document.

Verified telephone consent to AUTOPSY (check one) ___ YES ___ NO

Signature of person and/or physician obtaining consent

Payer #: __________________________

Signature of Witness

Printed name of person obtaining consent

(Please) Date: ____________ Time: ____________

Restrictions: To be valid this document (1) must be dated, (2) must be signed by the person authorizing autopsy, (3) must be signed by the person and/or physician obtaining permission, AND (4) signed by witnesses.
Questions???

- **ANY** questions, concerns, issues, regarding autopsy consent forms, family inquiries, death certificates, what should get called into the medical examiner, etc.

- **FEEL FREE TO CONTACT THE AUTOPSY SERVICE**
  - Morgue: 285-7095 (M-F 7:30a-4:30p)
  - Pathology resident on call (24/7)
  - My office: 293-9789
  - jadeltondo@hsc.wvu.edu
Please feel free to contact myself or any of the other pathologists

We look forward to working with you at WVUH

Thank you and Good Luck!