The purpose of this manual is to provide information about daily operations of Palmetto Health Laboratory Services. This manual is also located on myPal https://www.palmettohealth.org/document-library/laboratory/hospital_info. Test Information can be accessed by choosing the beginning letter of the test name on the Laboratory Directory keypad on the top left of the Palmetto Health Laboratories Home Page.

**GENERAL PHONE NUMBERS**

PH Central Laboratory ................................................. 434-7770
Laboratory Managers:
   Christy Knight, Core Laboratory/LIS ............................. 434-2322
   Dee Dailey, Outreach/Courier Services ............................ 434-2315
   Fay Parker Brown, Microbiology/Molecular Pathology/Safety 434-3754
   Nicole Huffman, Billing/Client Services/Compliance ............ 434-6707

PH Rapid Care Laboratories
   Baptist Rapid Care Laboratory ................................... 296-5750
      LaVerne Jackson, Laboratory Manager .......................... 296-5298
   Baptist Parkridge Rapid Care Laboratory ......................... 907-1403
      Eileen Postles, Laboratory Manager ............................. 907-1407
   Richland Rapid Care Laboratory ................................ 434-7471
      Deanne Piester, Laboratory Director ............................ 434-2296

Paul L. Guerry, M.D.
Professional/Medical Director of Pathology Services and PH Laboratories .......... 434-6405

Rebecca Walters, MA, MT (ASCP) DLM
Administrative Director, PH Rapid Care Laboratories .................. 434-6405

Ann Vandersteenhoven, M.D., MBA
Administrative Director, PH Central Laboratory and Outreach Services .............. 434-7619
# TABLE OF CONTENTS

GENERAL PHONE NUMBERS ........................................................................................................... 1
PATHOLOGY DEPARTMENT ORGANIZATION .................................................................................... 5
LABORATORIES HOURS OF OPERATION ............................................................................................ 6
ANATOMIC PATHOLOGY .................................................................................................................... 8
  FROZEN SECTIONS ........................................................................................................................... 8
  PATHOLOGICAL EXAMINATION ..................................................................................................... 8
  PREPARATION OF SPECIMENS .................................................................................................... 9
SPECIMEN PICKUP REQUEST BY PATIENT ..................................................................................... 11
ANATOMIC PATHOLOGY REQUEST FORMS .................................................................................... 11
AUTOPSY ........................................................................................................................................... 13
  TRANSFER OF BODY TO MORGUE ............................................................................................... 13
  NOTIFICATION TO PATHOLOGY DEPARTMENT OF AUTOPSY .................................................. 13
  NOTIFICATION OF SECURITY ....................................................................................................... 14
  GROSS DISSECTION FOR AUTOPSY ............................................................................................. 14
  TISSUE REMOVED AND SAMPLED AT AUTOPSY ..................................................................... 15
  WRITTEN AUTOPSY PROTOCOL .................................................................................................. 15
CYTOLOGY ......................................................................................................................................... 16
NON-GYN CYTOLOGY ....................................................................................................................... 16
CLINICAL LABORATORY SECTION GUIDELINES ......................................................................... 17
  SPECIMEN TRANSPORT ............................................................................................................... 17
  ORDERING PRIORITIES AND ORDER STATUSES IN CERNE POWERCHART/ORDER ............... 17
  ORDER STATUSES AS VIEWED IN CERNE POWERCHART/ORDERS ......................................... 18
  DUPLICATE ORDERS .................................................................................................................... 19
  DOWNTIME ORDER SLIPS .......................................................................................................... 19
  COLLECTION OF URINE ................................................................................................................ 19
    URINE SPECIMEN COLLECTION PROCESS .............................................................................. 20
    TIMED URINE INSTRUCTION ...................................................................................................... 23
    TIMED URINE COLLECTIONS FORMS ... ENGLISH AND SPANISH ......................................... 23
  SPECIMEN LABELING AND HANDLING ..................................................................................... 26
  LABORATORY GUIDELINE RELABELING OF CRUCIAL SPECIMENS PGR .................................... 26
  STAT TEST LIST ........................................................................................................................... 28
PATHOLOGY DEPARTMENT ORGANIZATION

The Department of Anatomical and Clinical Pathology of Palmetto Health Richland provides pathological investigations and clinical laboratory tests for hospital patients, private outpatients, and Ambulatory Care Center patients.

The Anatomical Pathology Department is composed of Histology (Surgical Pathology), and the Autopsy Service. For general information, call campus specific departments

The Clinical Pathology Departments are composed of Specimen Processing, Blood Bank, Core Lab: (Hematology, Coagulation, Chemistry, Urinalysis, Immunology), Point of Care Testing, Client Services, Microbiology/Parasitological, Molecular Pathology, Reference Lab (Send Outs), and Rapid Care Laboratories. For general information, call extension 434-7770.

PROFESSIONAL DIRECTOR OF PATHOLOGY SERVICES
Paul L. Guerry, MD, Medical Director
Jacqueline A. Emery, MD
Darren J. Monroe, MD
Geoffrey Turner, MD
Atwell Coleman, MD
Lawrence D. Grant, MD
Bradley J. Marcus, MD
Robert F. Bradley, MD
Sarah G. Williams, MD
Michael J Hayes, MD
Amy M. Durso, MD
Allan T Bennett, MD
Harry C Kellermier, MD
Kent J Newsom, MD
Lawrence E Klein, MD

ADMINISTRATIVE DIRECTORS

Dr Anne Vandersteenhoven, MD, MHA Palmetto Health Central Lab and Outreach
Rebecca Y. Walters, MA, MT (ASCP) DLM, Palmetto Health Rapid Care Labs
# LABORATORIES HOURS OF OPERATION

<table>
<thead>
<tr>
<th>Departments</th>
<th>Hours</th>
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<tbody>
<tr>
<td><strong>Anatomic Pathology:</strong></td>
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</tr>
<tr>
<td>Baptist &amp; Richland Rapid Care</td>
<td>7:00 a.m.–6:00 p.m. (Mon.–Fri.) (on call evenings/weekends/hospital holidays)</td>
</tr>
<tr>
<td>Baptist Parkridge Rapid Care</td>
<td>7:30 a.m.–4:00 p.m. (on call evenings/weekends/hospital holidays)</td>
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<tr>
<td><strong>Autopsy (Richland Campus Only)</strong></td>
<td>8:30 a.m.–4:00 p.m. (on call evenings/weekends/hospital holidays)</td>
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<tr>
<td><strong>Histology/Cytology:</strong></td>
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<tr>
<td>Baptist Rapid Care</td>
<td>7:00 a.m.–6:00 p.m.; Frozens 7:30 a.m.–5:00 p.m. (on call evenings/weekends/hospital holidays)</td>
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<tr>
<td>Baptist Parkridge Rapid Care</td>
<td>7:30 a.m.–4:00 p.m. (on call evenings/weekends/hospital holidays)</td>
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<tr>
<td>Richland Rapid Care (Histology Only)</td>
<td>7:00 a.m.–6:00 p.m.; Frozens 7:30 a.m.–5:00 p.m. (on call evenings/weekends/hospital holidays)</td>
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<tr>
<td><strong>PH Central Laboratory:</strong></td>
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<tr>
<td>Central Laboratory Chemistry, Hematology, Urinalysis Immunology</td>
<td>24 Hr. Coverage 7:00 a.m.–15:30 p.m. (Mon.–Fri.) 7:00 a.m.–2:00 p.m. (Sat. &amp; Sun.)</td>
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<tr>
<td>Microbiology/Mycobacteriology Parasitology/Mycology</td>
<td>24 Hr. Coverage</td>
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<tr>
<td>Molecular Pathology</td>
<td>8:00 a.m.–4:30 p.m. (Mon.–Sat.) (closed Sunday)</td>
</tr>
<tr>
<td>Reference Laboratory Sendouts</td>
<td>8:00 a.m.–4:30 p.m. (Mon.–Fri.) 9:00 a.m.–1:00 p.m. (Saturday) (closed Sunday)</td>
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<tr>
<td><strong>PH Rapid Care Laboratories (includes Blood Bank):</strong></td>
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<td>Baptist</td>
<td>24 Hr. Coverage</td>
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<td>Baptist Parkridge</td>
<td>24 Hr. Coverage</td>
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<tr>
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<td>Hours</td>
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<td><strong>PH Laboratories Outpatient</strong></td>
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<td>Draw Stations:</td>
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<tr>
<td>Baptist Rapid Care</td>
<td>7:00 a.m.–5:00 p.m. (Mon.–Fri.)</td>
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<td>(closed on Saturday, Sunday, Hospital Holidays)</td>
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<tr>
<td>Baptist Parkridge Rapid Care</td>
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<tr>
<td>Richland Rapid Care</td>
<td>7:00 a.m.–5:00 p.m. (Mon.–Fri.)</td>
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<td></td>
<td>7:00 a.m.–3:30 p.m. (Sat. &amp; Sun.)</td>
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<tr>
<td>Baptist Professional Office Building (POB)</td>
<td>8:00 a.m.–5:00 p.m. (Mon.–Fri.)</td>
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<tr>
<td>Baptist Parkridge Medical Office Building (MOB)</td>
<td>8:00 a.m.–5:00 p.m. (Mon.– Fri.)</td>
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<td>Closed for lunch 12 – 1 pm</td>
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<tr>
<td>Richland 2 Medical Park</td>
<td>8:00 a.m.–5:00 p.m. (Mon.–Fri.)</td>
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<tr>
<td>Richland 7 Medical Park</td>
<td>7:00 a.m.–5:30 p.m. (Mon.–Fri.) (closed 12–1 p.m.)</td>
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<tr>
<td>Richland 14 Medical Park</td>
<td>8:00 a.m.–5:00 p.m. (Mon.–Fri.)</td>
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ANATOMIC PATHOLOGY

In general, specimens received by 4:30 p.m., Monday through Thursday will be examined grossly on the day received, processed overnight, and have sections available for interpretation on the following day.
Specimens received on Friday by 4:30 p.m. will be processed over the weekend and sections will be available for interpretation the following Monday.

Certain specimens received on Friday deemed essential for earlier processing by special request (RUSH) or at the option of the pathologists may be processed Friday night and have section available for interpretation on Saturday.

Specimens received in the laboratory on weekends will be processed on Monday and sections will be available for interpretations on Tuesday.
Specimens received on holidays will be processed the day following the holiday unless the holiday precedes a weekend. Generally, there will be a one-day delay due to any holiday falling on the usual work days (Monday through Thursday).

Frozen Sections
Pathology should be notified when a frozen section is obtained between the hours of 7:30 a.m. and 5:00 p.m. (4:00 p.m. for Baptist Parkridge), Monday through Friday. Call the respective campus at:

Richland: 434-6710
Baptist: Surgery Intercom 49 or 296-5763 if no one answers; state the patient’s name, doctor’s name, room number and tissue to be collected. Histology personnel will respond to the call and pick up the specimen from the Dumbwaiter.
Baptist Parkridge: 907-1413

If there is a need for a frozen section after hours, on weekends or holidays, please call the pathologist ahead of time and arrange for him to be available at the time needed or notify the laboratory charge tech at:

Richland 434-2228
Baptist 296-5541
Baptist Parkridge: 907-1403

The charge tech will notify the pathologist-on-call. After hours, a pathologist may not be physically present in the department. Therefore, some delay must be expected for his/her arrival.

Pathological Examination

Requests for pathological examinations should contain:
1. Patient’s full name
2. Age/date of birth (DOB)
3. Race
4. Sex
5. Social security number is helpful
6. Medical record number
7. Billing number
8. Insurance information
9. Patient’s address if outpatient
10. Ordering physician’s name
11. Source of specimen
12. Post-op diagnosis
13. Clinical information….Abortions and products of conception should also have the last menstrual period, if known, included in the clinical data section of the requisition.

**Preparation of Specimens**

1. Specimen containers and pathology requisitions should be labeled with
   a. Patient’s name
   b. Medical record number
   c. Billing number
   d. Physician name
   e. Date and identification of contents

2. The pathologist on call should be consulted when any fresh **UNFIXED** specimen comes to the lab.

3. Specimens for **FROZEN SECTION** should be submitted **WITHOUT** fixative and brought immediately to Histology.

4. Specimens (**not for frozen sections**) should be completely covered with 10% formalin fixative as soon as possible. At least nine (9) volumes of formalin per one unit of specimen should be used.

   **NOTE:** Histology supplies formalin and specimen containers. Four sizes of prefilled 10% formalin containers: 20 mL, 40 mL, 60 mL and 120 mL are available. Please call at Richland 434-6710 or Morgue 434-2285, at Baptist 296-5763 or at Baptist Parkridge 907-1413.

5. Air drying of specimens prevents proper processing and accurate diagnosis. This is especially true of placenta. **DO NOT ALLOW PLACENTA TO REMAIN UNFIXED.** Autolysis occurs at a very rapid rate.

6. **MUSCLE BIOPSIES** should be obtained in a muscle clamp available in the O.R. or submitted held by muscle biopsy forceps. The specimen should be sent immediately to the laboratory **WITHOUT FIXATIVE.**

7. Shared Specimens that require **BACTERIAL CULTURES** must be collected in a sterile container. Care should be taken not to place a tissue in 10% formalin if the physician is also requesting Microbiology studies on the same tissue specimen. These specimens **should not be covered with any fixative** until smears and/or cultures are taken.
Formalin destroys the organisms, so it is better to send the specimen immediately to the Rapid Care Lab in a sterile container with attached completed Histology form.

8. Fresh tissue, **DIAGNOSTIC LYMPH NODES, SPLEEN, and other RES TISSUES** should be sent immediately to Histology **WITHOUT FIXATIVE**. Indicate on the requisition if the specimen is for frozen section, fresh or a sentinel node, etc. Notify the pathologist if the lymph node is being sent to rule out Lymphoma by Flow Cytometry.

9. **All BREAST BIOPSIES** are to be sent fresh, **WITHOUT FIXATIVE** to Histology immediately upon removal for gross dissection and examination by the pathologist.
   a. Breast tissue resections may be sent fresh if immediate examination by a pathologist is desired.
   b. Please notify lab for any fresh specimen needs after usual working hours or weekends.
   c. Core biopsies are submitted in formalin.

   **NOTE**: If a gross tumor is detected, frozen section can be performed.

Specimens which have had localization procedures (methylene blue injections, etc. prior to the biopsy may, at the discretion of the surgeon:
   d. Be first sent to the Department of Radiology for a specimen radiograph (in surgery)
   e. Suspicious areas on the specimen radiograph will be marked by the radiologist.
   f. The specimen will then be sent immediately to Histology via the dumbwaiter for gross examination by the pathologist.
   g. After sectioning, the specimen may, at the discretion of the Pathologist, be returned to the Department of Radiology for an additional radiograph to further delineate areas of concern. (call Surgery)
   h. Any suspicious areas noted on either the specimen radiograph or on gross examination will be submitted by the pathologist for microscopic examination, along with all other portions of the specimen that the Pathologist considers appropriate.
   i. Radiographs are returned to the Department of Radiology at the completion of grossing.

10. **MYOCARDIAL BIOPSIES** are generally submitted in 10% formulin. Containers with 10% formalin may be obtained from Histology.

11. **TESTICULAR BIOPSIES** are generally submitted in 10% formalin. Containers with 10% formalin may be obtained from Histology.

12. **All BREAST IMPLANTS** are to be sent to Histology with a completed Tissue Exam form. Requests for saving breast implants should be documented on the form. A patient desiring her implants should schedule a time with Histology to pick up the specimen. The patient will need to provide identification before specimen can be released. A copy of the
release form will be given to the patient that includes formaldehyde hazards. If a patient chooses not to have her specimen saved, the implant will be discarded within 4-6 weeks.

13. **RENAL BIOPSIES** should be scheduled with Histology. As soon as possible, the histologist will be available to assist/instruct for special handling.

14. After hours, all specimens for Histology must be delivered to the Rapid Care Laboratory. Information concerning the specimen must be entered in the appropriate log book by the person delivering or receiving the specimen. The specimen and logged information will be checked & verified by a laboratory technologist while nursing personnel is still in the department.

15. Be certain that all specimens are placed immediately in the proper fixative unless special handling is requested by the attending physician. If there are any questions concerning any of these procedures, please ask the attending physician or call Histology for advice.

**Specimen Pickup Request By Patient**

(Examples: Teeth, Gallstones, Hardware, Breast Implants)

Notify Histology:

- Weekdays, call early in the morning - - Pick up the afternoon of that same day.
- Saturday and Sunday - - cannot be picked up until Monday morning.

Proper identification must be supplied for release of breast implants. The patient must sign a special authorization for release of the specimen when picking up the specimen.

**Anatomic Pathology Request Forms**

**Histology**

**#3500 Professional Pathology Services (PPS) customizable Surgical Request Form**

All specimens must be accompanied by the **properly completed** PPS Surgical Request Form, and brought to the Histology Department.

In completing the form with a pen, **USE PRESSURE** since there are several copies that must be legible after separation of the form. If any of the basic information is not present on the Surgical Request Form or if it is illegible, the form will be returned for clarification of the missing or illegible items.

All “RUSH” requests are to be brought to the attention of one of the department histologists.

**For Inpatients, Complete the Form as Follows:**

1. Enter patient’s social security number, name, address, sex, date of birth, chart/medical record number, encounter number. A hospital sticker with all of the patient information is acceptable.
1. Under **Requesting Physician**, enter name of surgeon, nurse, radiologist and referring physician, as applicable. If on the form, and applicable, indicate whether specimen is “Fresh”, “Frozen” or if “Consult with Call Back” is required.

2. Enter the specimen collection date and time.

3. If results are to be called, check “Call Results to” and enter phone number.

4. If this is a Stat request, check “STAT”.

5. Under **Tissue Source**, enter specimen source (e.g. node, appendix, spleen, etc.).

6. Under **Clinical History**, enter pertinent postoperative diagnosis/clinical data.

**For Outpatients, Complete the Form as Follows:**

1. Enter patient’s social security number, name, address, sex, date of birth, chart/medical record number for all hospital outpatients. A patient sticker from the office is acceptable if it has all of the patient information that we need. PH purchased practice offices will also need to supply a MRN and Encounter number. This information should be on the patient sticker.

2. Enter place (e.g., FP, Clinic, Physician’s Office from which the specimen originated. The client name and location as well as the physician name be placed under Requesting Physician section of the requisition slip. Some offices may have an electronic requisition that can be used as long as all of the pertinent information is provided.

3. Under **Requesting Physician**, enter name of physician performing surgical procedure. **The Attending Physician’s Name Must Be Provided with a Resident’s Name**. If on the form, and applicable, indicate whether specimen is “Fresh”, “Frozen” or if “Consult with Call Back” is required. This pertains to inpatients and outpatients if a frozen section or fresh specimen is needed.

4. Enter the specimen collection date and time.

5. If results are to be called, check “Call Results to” and enter phone number.

6. If this is a Stat request, check “STAT”.

7. Under **Tissue Source**, enter specimen source (e.g. node, appendix, spleen, etc.).

8. Under **Clinical History**, enter pertinent postoperative diagnosis/clinical data.

9. Enter Complete billing information indicating **Insurance, Medicare, Medicaid** or **Patient Self Pay. Please Include a Copy of Insurance Card(s). (Front & Back)**

10. **For Outpatients, Complete the Form as Follows:**

11. Enter patient’s social security number, name, address, sex, date of birth, chart/medical record number for all hospital outpatients. A patient sticker from the office is acceptable if it has all of the patient information that we need. PH purchased practice offices will also need to supply a MRN and Encounter number. This information should be on the patient sticker.

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13. Under **Requesting Physician**, enter name of physician performing surgical procedure. **The Attending Physician’s Name Must Be Provided with a Resident’s Name**. If on the form, and applicable, indicate whether specimen is “Fresh”, “Frozen” or if “Consult with Call Back” is required. This pertains to inpatients and outpatients if a frozen section or fresh specimen is needed.

14. Enter the specimen collection date and time.

15. If results are to be called, check “Call Results to” and enter phone number.

16. If this is a Stat request, check “STAT”.

17. Under **Tissue Source**, enter specimen source (e.g. node, appendix, spleen, etc.).

18. Under **Clinical History**, enter pertinent postoperative diagnosis/clinical data.

19. Enter Complete billing information indicating **Insurance, Medicare, Medicaid** or **Patient Self Pay. Please Include a Copy of Insurance Card(s). (Front & Back)**
10. The Diagnosis (DX) and appropriate ICD Code must be submitted on the PPS Surgical Request Form to avoid delay in specimen processing.

AUTOPSY

#651001S10mr  Adult – Pediatric Family Requested Autopsy Form
#651005S10mr  Fetal/Neonatal Family Requested Autopsy/Funeral Home
#651002S10mr  Adult/Pediatric Release of Body Form
#651004S10mr  Fetal/Neonatal Release of Body Form
#65036S10mr   Consent For Postmortem Examination & Retention or Disposal of Tissue, Organs, etc. Form
#651006S10mr  Release of Human Remains to the Family Form
#651007S10mr  Release of Human Remains to Family Guidelines Form
#10027C70mr   Certificate of Request for Organ and/or Tissue/Eye Donation Form (LifePoint Notification)

NOTE: All PH autopsies are performed in the PHR Med Park 5 Campus morgue.

Transfer of Body to Morgue

1. The AOD on each hospital campus is responsible for this process.

2. When a Consent for Postmortem Examination & Retention or Disposal of Tissue, Organ, etc. Form has been secured with signed legal permission, the body should be labeled “FOR AUTOPSY” and transferred to the PHR Med Park 5 Campus morgue in the usual manner as soon as possible.

3. When an autopsy is pending, the body should be labeled “POSSIBLE AUTOPSY” and transferred to the morgue in the usual manner as soon as possible.

4. If deceased is known to have serious infection, such as hepatitis, tuberculosis, AIDS, etc. label as “CONTAMINATED”.

Notification to Pathology Department of Autopsy

1. The Consent for Postmortem Examination & Retention or Disposal of Tissue, Organ, etc. Form must be properly completed. In order for the Consent for Postmortem Examination & Retention or Disposal of Tissue, Organ, etc. Form to be legal, it must be signed by the next of kin* and two witnesses. It is also essential to indicate whether or not there are any RESTRICTIONS by checking either “none”, one of the designated organs, or “other” and listing the other restrictions.

NOTE: *Signing as Next of Kin Must Be:
a) BOTH parents if examination for stillborn or infant (Both grandparents if mother is unmarried minor); b) BOTH parents if examination of minor; c) Spouse if married (or legal guardian, or person(s) responsible for hospital/funeral arrangements).

2. During routine hours, notify Pathology that a Postmortem Examination & Retention or Disposal of Tissue, Organ, etc. Form has been obtained.

3. Immediately bring the Postmortem Examination & Retention or Disposal of Tissue, Organ, etc. Form and the patient’s chart to the Pathology Office.

4. After hours of operation and on weekends and holidays, call the Laboratory (434-2228) and notify the charge tech that the Postmortem Examination & Retention or Disposal of Tissue, Organ, etc. Form has been obtained. Immediately bring the completed form and the patient’s chart to the Laboratory and hand deliver to the charge tech. the charge tech will notify the pathologist-on-call.

5. When an autopsy is to be performed on a fetus for which one or both parents want the hospital to take responsibility of disposal, the appropriate sections of the Fetal/Neonatal Family Requested Autopsy/Funeral Home Release/Hospital Care Release Form must be completed and must accompany the Postmortem Examination & Retention or Disposal of Tissue, Organ, etc. Form and the mother’s chart to the Pathology Department.

6. **NO AUTOPSY REPORT IS ISSUED TO THE FAMILY BY THE PATHOLOGY DEPARTMENT.** A copy of an autopsy report may be secured from Medical Records or the Attending Physician.

7. Autopsies are performed every day of the week including holidays during daytime hours.

**Notification of Security**

1. When autopsies are completed, designated Pathology personnel completes appropriate release form and notify PHR Hospital Security. Security is responsible for releasing body to the appropriate party.

2. For disposal of fetus from autopsy, Security calls Pathology to inquire if autopsy is completed.

**Gross Dissection for Autopsy**

Actual performance of the autopsy and the responsibility for recording of tentative and final interpretation rests with the pathologist who functions as the prosector. Portions of the gross dissection and certain ancillary procedures may be delegated to and carried out by the pathology assistant under the guidance and supervision of the pathologist.

The extent of the anatomical dissection may vary from case to case depending upon the
limitations of the autopsy permit, if any, nature of the clinical situation, and suspected or actual gross findings. Decisions relative to the extent of dissection are left to the judgment of the pathologist performing the autopsy.

In most cases, when no limitations of consent exist, a complete autopsy is performed which includes examination of the organs of the neck, thorax, abdomen, and pelvis and removal of the brain.

**Tissue Removed and Sampled at Autopsy**

All gross unfixed tissues remaining after appropriate sampling for histological examination, etc. are placed in a red plastic bag, sealed, and returned with the body. These organs and tissues are taken with the body to the funeral home. Otherwise, unfixed tissues are incinerated by the hospital Environmental Services.

At the time of gross dissection, appropriate gross material may be removed and kept for further dissection and examination; this material will be placed in a formalin container and labeled appropriately. The actual amount of tissue saved or retained in this manner will depend on the suspected or actual findings at the time of the autopsy. Organs may be saved for diagnostic or teaching purposes indefinitely.

From the material retained, tissue sections for histology are prepared and processed. The number of sections required or submitted in each case will vary depending on the findings or suspected findings and the custom in performance of the pathologist. However, in practically every case, sections from all major viscera are placed in a formalin container and submitted even if they are grossly normal. In general, all significant gross observations are documented or represented by a histological section. Fixed gross material is retained for one year, unless portions or all are felt to be useful for diagnostic or teaching purposes.

**Written Autopsy Protocol**

Within one working day following completion of the gross dissection, the Provisional Anatomical Diagnosis, based on gross observations, is rendered and sent to the Attending Physician and to the Medical Records Department for inclusion in the permanent record of the deceased.

The basic final autopsy report will contain the following elements:

1. Name of the deceased, medical record #, date and time of death, date and time of autopsy, autopsy number, prosector’s name, attending physician’s name.
2. Gross description (external, internal [upon opening], description of organ systems or individual organs).
3. Description of microscopic slides.
4. Final Anatomical Diagnoses.
5. Final note or summary of pertinent findings (optional).

The style and format may vary somewhat in individual cases, and may vary relative to the custom and preference of the prosector.
CYTOLOGY

Specimens for cytology are sent to a reference lab by the specimen processing area. All specimens should be brought directly to the specimen processing area; unless it is a fluid or bronchial washing (then it should go to Rapid Care Chemistry first and be signed in the book.

Information/instructions on how to complete the Cytology form can be obtained from the Send out dept. at x7609 or the Specimen Processing Department at x4650.

The following is a list of cytology tests that can be performed... See Alphabetical Listing of Tests for information concerning these tests.

TESTS

- Abdominal Washings
- Fine Needle Aspirations must list source
- Breast Smears
- Bronchial Washings
- Brushings must list source
- Buccal Smears for Barr Bodies Esophageal Brush
- Fluid Cysts must list source
- Gastric Brush
- Misc. fluids (must list source)

Pleural Fluid
Spinal Fluid
Sputum
Thyroids
Urines
Peritoneal Fluid
Esophageal Washing
Gastric Washing

Needle Biopsies biopsies are usually surgical specimens and are not listed on requisition

NON-GYN CYTOLOGY

PLEASE ORDER # 15900 IN HBO. Completed form MUST accompany the specimen before it can be sent to reference lab.

PLEASE REFERENCE PAP SMEARS FOR ORDERING INFORMATION ON GYN CYTOLOGY.

For Inpatients Fill in the Forms as Follows:

1. Enter the patient’s name, address, unit record number, billing number, age, and room number in spaces labeled NAME AND ADDRESS using the patient’s addressograph plate.

2. Enter the name of the physician ordering the test in the space labeled REQUESTING PHYSICIAN.

3. Enter date specimen was collected in space labeled Collection Date

4. Enter any pertinent information in space labeled CLINICAL INFORMATION (PLEASE INCLUDE) DIAGNOSIS.
5. For pap smears fill in appropriate spaces concerning patient’s history in spaces labeled: DATE OF BIRTH, LMP, PREGNANT, POSTPARTUM-WKS, POSTMENOPAUSAL-YRS., HORMONES (TYPE), IUD, PREVIOUS PAP (results and cytology number), PREVIOUS BIOPSY (results and pathology number), and RADIATION (when completed). Indicate area from which specimen were taken by placing an “X” in the appropriate space beside SOURCE.

6. For Non-Genital Cytology check the correct box to indicate SOURCE OF SPECIMEN.

7. Use a black ball point pen to complete the form. If writing, USE PRESSURE and write legibly since there are several copies which must be legible after separation of the form.

For Outpatients Fill in the Form as Follows

1. Enter patient’s name in space labeled NAME.

2. Enter patient’s address in space labeled ADDRESS.

3. Enter COMPLETE billing information.

4. Fill out remainder of information as described for inpatients listed above.

**CLINICAL LABORATORY SECTION GUIDELINES**

**Specimen transport**

Blood and replaceable fluids may be transported to the lab via pneumatic carriers lined with foam inserts. All specimen lids and tops need to be completely closed and tightened prior to placing in an appropriately marked biohazard bag and sealing securely. Do not over fill the carrier.

Blood culture bottles are to be sent one patient at a time in individual red carriers to prevent breakage.

Fluids that are considered non-replaceable (example: spinal fluid, pleural fluids, etc.) cannot be sent through the pneumatic tube system. They must be brought to the Rapid Care lab after orders are placed.

In the event the main tube system is non-operational, each floor (if decentralized) and each phlebotomist is responsible for transporting their specimens to the laboratory.

**Ordering Priorities and Order Statuses in Cerner PowerChart/Order**

Palmetto Health Laboratories will process all samples as soon as possible, with the first scheduled analytical run, or without undue delay in analysis to assure the optimal specimen accuracy. The following order priorities are being used by Palmetto Health Laboratories in the Laboratory
Information System (LIS).

Note: Due to the nature of testing, not all assays qualify for STAT, ASAP and timed turnaround times. Refer to Laboratory Test Directory.

Note: Laboratory personnel collecting on units use the Zebra handheld devices. Labels do not print until patient’s armband barcode is scanned at bedside.

**General definitions of Priorities available:**

**ROUTINE**  Test usually resulted within 4-6 hrs from receipt in the lab unless batched

**TIMED**  Prefer two (2) hour lead time for orders, collected by time specified. Note: The scheduled frequencies (AM Lab) is what drives the collection time per unit.

**STAT**  Resulted within one (1) hour after receipt in lab. STAT orders print as soon as ordered for immediate collection and processing of specimen.

**ASAP**  Resulted within two (2) hours of receipt in lab.

**CRISIS**  Tests necessary when the patient is in an immediate “life or death” situation. These requests receive priority over all (including STAT) work in the laboratory. CRISIS labs must be collected on the nursing unit and walked to the Rapid Care Labs and signed in a Crisis Log. These labs are processed immediately. Results will be called, please give appropriate contact.

**ADD ON**  To be used only “to add on” to orders that have already been COLLECTED AND RECEIVED in the lab. Barcode labels will print in the main laboratory and laboratory personnel will check to see if the specimens are adequate for testing. Lab will call the unit if not adequate.

**ADD ON STAT**  To be used only “to add on” for STAT orders that have already been COLLECTED AND RECEIVED in the lab. Barcode labels will print in the main laboratory and laboratory personnel will check to see if the specimens are adequate for testing. Lab will call the unit if not adequate.

Nurse collected non blood orders will not generate specimen labels in the Laboratory. Patient ID link labels should be placed on the specimen at the bedside. Collector should use a Patient ID link label and include: the collector's Novell login, date and time of collection, and specimen source.

**Order Statuses as Viewed in Cerner Powerchart/Orders**
<table>
<thead>
<tr>
<th>EVENT OR ACTION</th>
<th>POWERCHART STATUS</th>
<th>PATHNET LAB STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order Entered In Powerchart for future collection</td>
<td>Ordered (Scheduled)</td>
<td>Order assigned to a collection list</td>
</tr>
<tr>
<td>(Order ready to be collected</td>
<td>Ordered – (Dispatched)</td>
<td>Order has crossed the Network to Pathnet. Order ready to be collected</td>
</tr>
<tr>
<td>Orders – already collected</td>
<td>Ordered- (Collected)</td>
<td>Collected</td>
</tr>
<tr>
<td>Specimen has been collected and accessioned in Laboratory</td>
<td>Ordered – (In Lab)</td>
<td>In-Lab (GenLab) or Pending (Micro)</td>
</tr>
<tr>
<td>Technologist enters part of the results for a test</td>
<td>In process – In Process</td>
<td>In Process for GenLab. For Micro – reflective of last task performed. I.e. Stain, Preliminary, Susceptibility, etc. (These are pending review.)</td>
</tr>
<tr>
<td>All of the results for a test are entered by a technologist. These test results are now available for viewing.</td>
<td>Completed</td>
<td>Completed (All results entered)</td>
</tr>
<tr>
<td>Orders originating from Atlas</td>
<td>Ordered</td>
<td>LAB status can be any of the above. Ordering personnel will be Contributor_System, Atlas</td>
</tr>
<tr>
<td>Orders originating from Powerchart as reflex</td>
<td>Ordered</td>
<td>LAB status can be any of the above. Ordering personnel will be System, System.</td>
</tr>
</tbody>
</table>

**Duplicate Orders**

An order inquiry should be checked before orders for laboratory procedures are entered into the computer. This will ensure that duplicate entries, resulting in duplicate charges to the patient, are not made. If duplicate orders are entered, floor must cancel. Lab personnel are allowed to cancel exact duplicates.

**Downtime Order Slips**

[http://mypal/PalmettoIntranet/Palmetto-Intranet-Media- Library/myPal%20Documents/Care/Laboratory%20Services/_downtime-organization.pdf](http://mypal/PalmettoIntranet/Palmetto-Intranet-Media-Library/myPal%20Documents/Care/Laboratory%20Services/_downtime-organization.pdf)

**Collection of Urine**

All urine specimens are to be received in the lab in a sealed biohazard bag. Urine specimens are to be **completely** labeled with patient’s full name, MR number, **TESTS DESIRED WRITTEN ON THE LABEL**. The addressograph label is acceptable.
Urine Specimen Collection Process
*Effective March 20, 2017*
Methods of obtaining freshly voided urine samples:

**URINE SPECIMEN COLLECTION PROCESS**

*Effective March 20, 2017*

**SCRUB THE TOP OF THE GRAY AND TIGER TOP TUBES FOR 15 SECONDS & allow to air dry. For voiding patients, use the syringe & transfer device to transfer the sample from the cup to the appropriate tube. For catheterized patients, use a vacutainer.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Tube Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>10cc syringe</td>
<td>TIGER TOP</td>
</tr>
<tr>
<td>Female Luer Lock</td>
<td>GREY TOP</td>
</tr>
<tr>
<td>Male Luer Lock</td>
<td>GREY TOP</td>
</tr>
<tr>
<td>Specimen cup</td>
<td>TIGER TOP</td>
</tr>
<tr>
<td>UA tiger top tube</td>
<td>CLEAR TOP</td>
</tr>
<tr>
<td>C&amp;S gray top tube</td>
<td>CLEAR TOP</td>
</tr>
<tr>
<td>Clear top tube</td>
<td>CLEAR TOP</td>
</tr>
</tbody>
</table>

- **Do not** send urine to the lab in a specimen cup. It must be in the appropriate tube.
- **Lab will not** be able to “add-on” to an order once the specimen has been placed into a tiger tube.
- If a patient has a Foley that has been in place >3 days and a culture is ordered, replace the Foley (per MD order) before obtaining the sample.

**Order of Urine Tube Draw**

<table>
<thead>
<tr>
<th>ORDER</th>
<th>TUBE</th>
<th>PRESERVATIVE</th>
<th>MIX BY INVERTING</th>
<th>BENEFIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>GREY TOP</td>
<td>Culture &amp; Sensitivity</td>
<td>10x</td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td>TIGER TOP</td>
<td>Uramysis with Preservative</td>
<td>10x</td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>CLEAR TOP</td>
<td>Other or low volume</td>
<td>0x</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Preservative</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>80% Ethyl Alcohol</td>
<td>80% Alcohol in 100% glycerine is an effective preservative for urine</td>
</tr>
<tr>
<td>Sodium Hypochlorite</td>
<td>Sodium Hypochlorite is a strong disinfectant that is effective for</td>
</tr>
<tr>
<td>Sodium Thiosulfate</td>
<td>Maintains the pH of the fluid.</td>
</tr>
</tbody>
</table>

- Stable up to 48hrs without refrigeration to prevent overgrowth of bacteria
- Vacuum draw to avoid spills
- Sterile tube interior
- 3 ml minimum draw volume
- Stable for up to 72hrs without refrigeration to prevent overgrowth of bacteria
- Vacuum draw to avoid spills
- Sterile tube interior
- 7ml minimum draw volume
- 5ml volume
- Available for all other specimen types
- Available for low specimen volume C&S or UAs

**Methods of obtaining freshly voided urine samples:**
A freshly voided urine specimen is adequate for most urinalysis testing except the bacterial examination (urine culture and sensitivity).

The patient should be instructed to void directly into a clean, dry container or into a clean dry bedpan and then transfer the specimen directly into an appropriate container. Specimens from infants and young children can be collected in a disposable pediatric collection device, consisting of a plastic bag with an adhesive backing around the penis to adhere to the child so that he voids directly into the bag.

All specimens should be properly labeled with the patient’s name, hospital number, date and time of collection, placed in the appropriate tubes.

Mislabeled specimens cannot be processed.

Methods of obtaining a clean voided (“clean catch”) specimen:

Use this technique for a specimen likely to be contaminated with vaginal discharge or menstrual blood, or when collecting a specimen for bacteriological examination.

The most commonly used procedure for obtaining a suitable specimen for bacteriological examination is the collection of a clean voided midstream specimen. Bladder catheterization and percutaneous suprapubic aspiration of the bladder may be used, but only in unusual circumstances, i.e., infants). Collection of clean voided specimens is the method of choice unless specific contradictions exist.

To avoid contamination of the voided urine organisms in the area adjacent to the meatus, this area must be cleaned thoroughly before patient voids. To avoid contamination of the specimen with organisms often harbored normally in the distally urethra, the first urine is discarded and subsequent midstream urine is collected.

A satisfactory technique for female patients consists of:

1. Spreading the labia and cleansing the area with a towelette. The washing is accomplished by making a single front to back motion with three separate areas of the towelette. One motion is used to cleanse the area on one side of the meatus, one area for the other side and the last area for the center of the meatus.

2. While the labia are held apart, a small amount of urine is passed into the toilet or bedpan (to be discarded). A midstream specimen is collected.

A comparable technique is used for males:

1. Retracting the foreskin of the penis, cleansing the glands and particularly the area surrounding the meatus, with three different areas of the towelette. With the foreskin still retracted, a small amount of urine is passed into the toilet or bedpan (to be discarded).

2. From the subsequent midstream urine a specimen is collected.

For infants and children who have not yet been toilet trained sterilized disposable collection devices can be used to obtain specimens after the perianal area has been suitably cleaned.
**Timed Urine Instruction**

Containers for 24 hour urine collections must be obtained from the Specimen Processing Section in the laboratory. Laboratory Staff will check for inpatient orders for the 24 hour collection and will label the container with patient’s name and MR# with a permanent marker. Instructions are printed on forms attached to the container at the time of pick-up from the laboratory. Floors must enter the patient’s height and weight in **metric units** as an order for Creatinine Clearance is placed in Cerner. In addition, **Specimens cannot be processed until lab has information on data tag** (See Appendix / Gray side bar for forms).

**Timed Urine Collections forms…English and Spanish**
ENGLISH FORM

HOW TO COLLECT SPECIMEN
1. Empty bladder at the start of collection and discard the urine. Write the start time and date on this form.
2. From the start time on, collect all urine and pour into the provided container. If more than one container is needed, obtain from the laboratory and continue collection in the new container. Do not interrupt urine collection. Refrigerate the container(s) until it is transported to the laboratory.
3. Continue to collect urine until the designated end date and time. Empty your bladder and include this specimen in the collection container. Write this time and date on this form.
4. Bring the specimen to the laboratory as soon as possible after termination of collection.

ALL INFORMATION BELOW MUST BE COMPLETED TO ENSURE PROPER PROCESSING

TO BE COMPLETED BY PATIENT OR NURING STAFF

DATE STARTED______TIME STARTED________DATE ENDED______ TIME ENDED________

PATIENT HEIGHT:_____(centimeters)  PATIENT WEIGHT _________(kilograms)  # Containers____

(Inches times 2.54 = cm) (Pounds divided by 2.2 = kg)

PERSON COMPLETING FORM ____________________________

TO BE COMPLETED BY LABORATORY STAFF

PATIENT NAME ____________________________  MR#________________________  ROOM #________

TESTS ORDERED (ensure they are entered into the computer)______________________Dr.______________

Laboratory Staff completing form:______________________ Date container given_______________
SPANISH FORM

RECOLECCIONES DE ORINA CRONOMETRADAS...CÓMO RECOGER LA MUESTRA:

1. Desocupe la vejiga antes de recoger la muestra y deseche la orina.

2. De este momento en adelante recoja toda la orina y viértala en este recipiente. (Si necesita otro recipiente, obténgalo del laboratorio y continúe. No interrumpa la recolección de orina y comience de nuevo. Es muy importante recoger toda la orina dentro del tiempo especificado.) Mantenga el recipiente refrigerado hasta que sea llevado al laboratorio.

3. Siga recogiendo la orina hasta el punto final designado. En ese momento desocupe su vejiga e incluya esta muestra en el recipiente recolector. Anote la hora y fecha en esta solicitud.

4. Lleve la muestra al laboratorio tan pronto haya terminado de recogerla completamente.

TODA LA SIGUIENTE INFORMACIÓN DEBE SER DILIGENCIADA ANTES DE PROCESAR UNA MUESTRA.

A SER DILIGENCIADO POR EL PACIENTE O EL PERSONAL DE ENFERMERÍA.
(POR FAVOR LLENE TODOS LOS ESPACIOS EN BLANCO):

FECHA DE INICIO_________________ HORA DE INICIO_________________FECHA DE TERMINACIÓN_________________ HORA DE TERMINACIÓN_________________

ESTATURA DEL PACIENTE_____________cm PESO DEL PACIENTE_____________Kg
NÚMERO DE RECIPIENTES_____________

NOMBRE DE LA PERSONA QUE DILIGENCIABA EL FORMATO:

A SER DILIGENCIADO POR EL PERSONAL DEL LABORATORIO: Personal del Laboratorio Nombre:________________________________________

Nombre del Paciente:________________________________________ #ID_______________________ Habitación_____________________

Exámenes Ordenados:__________________________________________ Dr._______________________
Fecha del recipiente__________________________________________


Specimen Labeling and Handling

FOR SPECIMENS COLLECTED ON NURSING UNITS:

Specimens which are collected on the nursing unit should have the following information included on the specimen label and, during downtime situations, on the computer request form in the appropriate spaces:

1. Time and date specimen collected.
2. Cerner Log In of person collecting specimen
3. Notation of all laboratory tests to be performed on the specimen and on the back up request form if in downtime.
4. Complete patient name, account number, and unit record number.
5. Source of specimen on specimen and back up request form during downtime.
6. Identification must be verified at time of drawing by matching patient’s name, unit record number and the account number on the armband with request or lab label or other source of patient identification. Out Patient identification may be verified with patient’s name and birth date if arm-banding is not available. Positive patient ID and labeling at the bedside is critical to the collection process.
7. Specimens that are delivered to the lab mislabeled will be automatically discarded once floor has been notified by lab personnel.
8. All body fluid specimens except urine must be hand delivered to the Rapid Care Lab and orders logged into the body fluid log.

In accordance with the Universal/Standard Precautions Policy in effect at PHR:

1. Specimens should be received in sealed plastic transparent bags, including all urine, stool, fluids, cultures or blood.
2. Specimens that are leaking, spilled, broken, or otherwise damaged, or that have containers that have been contaminated will not be accepted.
3. Urine specimens from the hospital floors that are received spilled or leaking will be discarded and the floor notified to recollect specimen.
4. Specimens in syringes with needle attached will not be accepted.
5. Mislabeled specimens will be discarded unless attending physician requests relabeling and proper form is signed in the laboratory.

Laboratory Guideline Relabeling of Crucial Specimens PGR
Effective Date: 3.15.2017

PRINCIPLE:

1.0 The standard of Palmetto Health Laboratories is to obtain new specimens when an improperly labeled specimen is received.
1.1 Relabeling is permitted only as outlined in this PGR
1.2 Refer to department PGR’s for relabeling protocols for Blood Bank, Histology, or Cytology Specimens.

DEFINITIONS:
1. Mislabeled Specimens:
   1.3 Specimens on which the identification label on the container does not match the true identity of the patient from which the specimen was obtained.
   1.3.1 Specimens sent to the lab labeled with identifiers from multiple patients.
   1.3.2 Unlabeled Specimens: Specimens that are sent to the lab without any patient identification.

PROCEDURE STEPS, GUIDELINES or RECOMMENDATIONS:

1. Guidelines
   1.4 The Laboratory will not return any specimens to units or clients without the approval of the manager or supervisor.
   1.5 Irreplaceable Specimens
   1.5.1 Examples of irreplaceable specimens may include, but are not limited to:
      1.5.1.1 Body fluids
      1.5.1.2 Infant collections
      1.5.1.3 Cerebrospinal fluid
   1.5.2 The attending physician may authorize specimen relabeling if he/she determines that the specimen cannot be recollected.
      1.5.2.1 The attending physician must sign the Laboratory Form Report Error
   1.5.3 A record of all relabeling is maintained on the result.
      1.5.3.1 Refer to Laboratory Guideline Report Errors PGR
   1.5.4 Refer to Palmetto Health Corporate Policy B.11 Occurrence Reporting and Follow-Up
## STAT Test List

The following tests are those which will be performed on a STAT basis. The time listed for the performance of each test is the MINIMUM time required for completion of the test after the specimen is received in the laboratory and when the laboratory is fully-staffed with all equipment in working order. When multiple requests are received at the same time, some tests may take longer to complete.

<table>
<thead>
<tr>
<th>TEST</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABO/Rh Type</td>
<td>15 Minutes</td>
</tr>
<tr>
<td>Acetaminophen</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Betahydroxybutyrate</td>
<td>20 Minutes</td>
</tr>
<tr>
<td>Adenovirus, Rapid</td>
<td>30 minutes</td>
</tr>
<tr>
<td>Albumin</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Alcohol (Diagnostic Only)</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Alkaline Phosphatase</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Ammonia, Plasma</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Amylase</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Basic Metabolic Screen</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Bilirubin, Direct</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Bilirubin</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Bilirubin, Total</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Blood Culture, Broth (See Culture Blood Broth)</td>
<td>Collected Stat</td>
</tr>
<tr>
<td>Blood Urea Nitrogen (BUN)</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>BNP</td>
<td>90 Minutes</td>
</tr>
<tr>
<td>Calcium</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>C Difficile Rapid PCR</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Cell Count and Diff, CSF</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Cell Count and Diff, Extravascular Fluids</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Chemical Screen, Urine</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Chloride</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>CKMB</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>CO2 (Carbon Dioxide)</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Complete Blood Count Without Differential</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Complete Blood Count/Auto Differential</td>
<td>40 Minutes</td>
</tr>
<tr>
<td>Complete Blood Count/Manual Differential</td>
<td>90 Minutes</td>
</tr>
<tr>
<td>Coombs, Direct</td>
<td>20 Minutes</td>
</tr>
<tr>
<td>CPK, Total</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Creatinine, Phosphokinase (CPK)</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Creatinine</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>D-Dimer</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Differential</td>
<td>90 Minutes</td>
</tr>
<tr>
<td>Digoxin</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Dilantin</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Electrolytes</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Electrolytes, Urine (excluding chloride)</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Fibrinogen</td>
<td>30 Minutes</td>
</tr>
</tbody>
</table>
• Fresh Frozen Plasma 45 Minutes
• GGT 45 Minutes
• Glucose, Extravascular Fluids 30 Minutes
• Glucose 30 Minutes
• Gram Stain (Smears) 30 Minutes ER/OR 60 Min other areas
• Hematocrit 30 Minutes
• Hemoglobin 30 Minutes
• Hemoglobin/Hematocrit 30 Minutes
• HIV-1 Screen (Rapid test) 45 minutes
• India Ink Prep 30 Minutes
• Iron 45 Minutes
• Ketones, Urine 20 Minutes
• Lactic Acid, Plasma 30 Minutes
• Lactic Dehydrogenase (LDH) 45 Minutes
• Lipase, Serum 45 Minutes
• Magnesium 45 Minutes
• Osmolality 30 Minutes
• Osmolality, Urine 30 Minutes
• Phenobarbital 45 Minutes
• Phosphorus 45 Minutes
• Platelet Count 30 Minutes
• Potassium 30 Minutes
• Pregnancy Test, Urine 20 Minutes
• Protein, Extravascular Fluids 45 Minutes
• Protein, Total 45 Minutes
• Prothrombin Time 30 Minutes
• Prothrombin Time and PTT 30 Minutes
• PTT (Partial Thromboplastin Time) 30 Minutes
• Rapid Adenovirus Test 30 Minutes
• Rapid Influenza A & B Test 30 Minutes
• Rapid RSV Test 30 Minutes
• Rapid Strep Test 30 minutes
• Reticulocyte Count 45 Minutes
• Salicylate 45 Minutes
• Serum Iron 45 Minutes
• SGOT/AST 45 Minutes
• SGPT/ALT 45 Minutes
• Sickle Cell Test 60 Minutes
• Sodium 30 Minutes
• Sodium, Urine 30 Minutes
• TEG 30 Minutes
• Tegretol/Carbamezepine 45 Minutes
• Theophylline 45 Minutes
• Thrombin Time 60 Minutes
• Troponin I 45 Minutes
• Type/Crossmatch Packed Cells/Whole Blood 45-60 Minutes
(if blood available at PRMH)

- Type/Screen 40 Minutes
- Uric Acid 45 Minutes
- Valproic Acid-Stat 1 Hour
- White Blood Cell Count 30 Minutes

### Blood Collection Tube Types

Vacutainer® tubes are used for the drawing of blood, with a few exceptions. They are coded as to content by different colored tops (rubber stoppers or hemoguard tops). Some contain anticoagulants required by specific tests and others contain no anticoagulant. When stocked on floors or in units expiration dates on tubes must be monitored.

The Laboratory Test Directory provides information on the type of tube required and the amount of blood needed for tests performed in this laboratory and for tests which are sent to reference laboratories.

Listed below are the types of blood collection tubes available in the laboratory.

**BLUE TOP:**
This tube type contains 3.2% of Buffered Sodium Citrate as the anticoagulant. The tubes are available in different sizes. The 2 mL tube contains 0.2 mL of anticoagulant and will be filled with 1.8 mL of blood. This is considered a neonate draw tube. The 3.0 mL tube contains 0.3 mL of anticoagulant and takes 2.7 mL of blood. It is used for prothrombin time and other coagulation studies. Because of the ratio of blood to anticoagulant required for accuracy, tubes must be 90% full. Short draws will only be used with physician permission. Moderate and marked hemolysis will warrant recollection.

**GREEN HEMOGUARD TOP:**
The inside wall of this tube is coated with lithium heparin as the anticoagulant. These are required for the collection of certain tests and may be used for a large number of tests where whole blood or plasma is required. Green top cannot be used for amylase, lipase, troponin, AST, LIVP, CMP, and HCG.

**GOLD HEMOGUARD TOP SST**
This tube is available in 3.5 and 6 mL size. It contains a clot enhancer and a silicone barrier which forms a seal between the cells and serum when it is centrifuged. **DO NOT USE THIS TUBE TO COLLECT SAMPLES FOR BLOOD BANK, THERAPEUTIC DRUG LEVELS OR SERUM DRUG TESTING.**

**GRAY TOP:**
This tube type contains Sodium Fluoride Potassium Oxalate. It is available in a 2 mL and 4 mL draw tube. It is used for lactic acid and glucose testing.

**LAVENDER TOP:**
This tube contains EDTA (ethylenediaminetetra-acetate) as the anticoagulant and is used for most hematological procedures. This tube available in 2 mL size.

**PINK:**
This tube type contains EDTA(ethylenediaminetetra-acetate) K2 and is used for all Blood Bank
testing. This tube is available in 6 ml and 2 ml size. NOTE: 2ml FOR NEONATES ONLY

**RED TOP:**
Red top tubes contain no anticoagulant and are used for tests which require serum for analysis. They are available in 5ml size and do not have a silicone barrier. These tubes are exceptable for some Blood Bank procedures and all therapeutic drug levels.

**WHITE TOP:**
This tube type contains EDTA (ethylenediaminetetra-acetate) K2 and is used for collection of HIV Viral Load specimens. It may also be used for collection of specimens for Hepatitis C PCR testing (both Qualitative and Quantitative) and HIV-1 Genotyping. This tube is available in a 5 mL size.

**PEDIATRIC MICROTAINER® TUBES:**
MICROTAINER® BLOOD COLLECTION DEVICES are the tubes of choice when collecting small amounts of specimens. The Microtainer® tubes come in red tops, lithium heparin green tops and lavender tops.

NOTE: Before substituting a different type tube than the one listed, contact Phlebotomy (ext. 7216). Some substitutions may be made.

---

**Palmetto Health Richland Children’s Hospital Weight-based Guide Lines for Blood Culture Volumes**

<table>
<thead>
<tr>
<th>Patient’s Wt</th>
<th>Volume of Blood</th>
<th>Vial Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 2 Kg</td>
<td>1 mL</td>
<td>3 mL</td>
</tr>
<tr>
<td>2.1 - 10 Kg</td>
<td>1.5 mL</td>
<td>3 mL</td>
</tr>
<tr>
<td>10.1 - 20 Kg</td>
<td>3 mL</td>
<td>3 mL</td>
</tr>
<tr>
<td>20.1 - 39.9 Kg</td>
<td>5 mL</td>
<td>10 mL</td>
</tr>
<tr>
<td>&gt;= 40 Kg</td>
<td>10 mL</td>
<td>10 mL</td>
</tr>
</tbody>
</table>
Laboratory Guideline Legal Blood Alcohol PGR

PRINCIPLE:

1.0 Palmetto Health Laboratory employees may be requested to perform phlebotomy in order to collect specimens for blood alcohol levels for law enforcement.
2.0 Blood alcohol testing performed at Palmetto Health (PH) Laboratories is for Medical Purposes only.
3.0 Testing for blood alcohol for legal purposes is not preformed at Palmetto Health Laboratories.

PROCEDURE:

1. Emergency Room (ER) staff normally perform the phlebotomy.
2. Testing is performed at the State Law Enforcement Division (SLED).
3. When ER staff is unable to perform the phlebotomy, the law enforcement officer should bring the chain of custody paperwork and client permission to the lab.
   3.1 The permit must be obtained prior to the specimen being collected.
   3.2 These forms are provided by the law enforcement officer.
   3.3 Permission for the test must be obtained from the client or guardian without any coercion or misrepresentation.
4. The client should be aware of the purpose and possible consequences of the test.
   4.1 The person performing the phlebotomy should ask the client if they understand what is being done.
5. The specimen is collected in two 10 cc Red top tubes.
   5.1 DO NOT USE alcohol to cleanse the site.
   5.2 Betadine, Zepharin, or other non alcohol cleaner should be used.
6. The person drawing the sample must sign the permit after the blood is collected.
7. After proper labeling, the tube tops are sealed with liquid paraffin.
   7.1 Paraffin is found in the Emergency Department.
8. One of the labeled sealed tubes is given to the patient and the other tube is given to the law enforcement officer.
9. A copy of the permit is kept as a lab record and for billing purposes.
   9.1 This form is to be left with the Staff Assistant for the Administrative Lab Director.
10. The original permit form is given back to the officer.
11. If a client inquires about having their own testing, you may tell them that private laboratories (i.e. Quest, Lab Corp) may perform legal testing.
**Fluid Processing**

**PURPOSE:** To facilitate fluid processing by providing guidelines that will allow the accurate and timely processing of fluid specimens.

**PROCEDURE:**
1. Enter all orders into the computer. Order spinal fluids (CSF) as such; order all other fluids as extra-vascular fluids. If no code is specified for the test needed order the blood code and enter the specimen type in the comment section.

2. Label specimen with patient name, unit record number, fluid type, tests ordered on each tube, and date collected. Deliver specimen to Rapid Care Lab where you will give the fluid to a tech in the laboratory and check off testing to be performed (exception for CPOE orders). Fluid specimens which are not easily replaced cannot be transported to the laboratory through the tube system.

1. If additional orders are requested after the fluid has been delivered to the Rapid Care lab (not tubed), a call must be placed to the laboratory in order for the add-on orders to be processed.

**Laboratory Guideline Critical Tests/Critical or Significant Results PGR**

**PRINCIPLE:**

1.0 Critical values are results that warrant immediate attention due to potential life threatening consequences, independent of order priority.

2.0 Alert values are those results that may require rapid clinical attention to avert significant patient morbidity or mortality.

3.0 Critical tests are deemed critical (life or death) in nature by the provider or caregiver based on the patient clinical condition.

3.1 Can be ordered as CRISIS priority and delivered to the lab.

**GUIDELINES:**

1. Critical values are determined by the Technical Supervisor (Medical Director), Pathologists, and physicians in consultation with the clinicians served.

2. All critical results are reviewed by the resulting tech before being accepted in the Laboratory Information System (LIS).

3. LIS tests built as GenLab tests will flag critical values in red and a comment box will require addition of comment and documentation. Letters of “c” or “p” may also appear indicating critical results depending on application.

4. LIS tests built as Blood Bank and Microbiology that are considered critical or significant in nature are defined in the department procedures, and will follow this Guideline for notification.

5. Critical values notifications may be reflected by the reference lab when test is not performed on site as stated in agreements with the reference lab.
5.1 These results will be called and documented by the Send Out (SO) department upon releasing the results daily.

5.2 If the Send Out department is closed, the Central Lab Core Lab Charge Tech will receive the critical results and follow this guideline for notification and documentation.
5.3 Specimen characteristics are noted on the report where appropriate.
5.4 Critical value notification follows all Palmetto Health (PH) and Laboratory PH Compliance PGRs

PROCEDURE:

1. **Critical Values:**
   1.1 Inpatient critical values are called to the physician or clinical provider, charge nurse, or nurse assigned to the patient.
   1.2 Outpatient / OutReach critical values are called to the physician, clinical provider, or nurse at the physicians’ office.
   1.3 Outreach critical values are called to the client as soon as possible
   1.4 Critical values are called as they are encountered, with exceptions as outlined above for Outreach
   1.5 Critical values are not given to the answering service or left on answering machines.
   1.6 The person receiving the critical values must read back the critical value to verify accuracy and understanding to include:
      1.6.1 Full name and Medical Record Number and/or date of birth of the patient
      1.6.2 Test name
      1.6.3 Critical result with units of measure
      1.6.4 Patient Room number or location is not to be used in the notification process
      1.6.5 Note the last name of the person receiving results and the time the results were called as a comment in the LIS.
   1.6.6 At the discretion of the Lead Tech, the pathologist may be notified when:
      1.6.6.1 Results indicate an unusual condition
      1.6.6.2 Results are questionable
      1.6.6.3 Tech is unable to contact responsible party
      1.6.6.3.1 Delays in notification and all attempts to notify the appropriate person must be documented per department procedure.
      1.6.6.3.2 Action should be taken to prevent recurrence of the communication problem.

2. **Critical Needs Tests:**
   2.1 If patients are in life or death situations, laboratory tests may be ordered using the CRISIS collection priority in the Hospital Information System (HIS), Powerchart.
   2.2 Samples will be hand delivered to the laboratory and given to the charge tech that will be responsible for the sample until completion of testing.
   2.2.1 If the sample cannot be delivered to the lab, a call can be made to the supervisor, charge/lead tech to alert that the sample(s) will be sent to the lab via the pneumatic tube system.
   2.2.1.1 The Supervisor or charge tech will go to the tube system immediately to retrieve the sample(s).
   2.2.2 Samples will be logged into the CRISIS lab log book by the person who first receives the specimen.
   2.2.3 Tests will be run and resulted as soon as possible before any other testing, with a goal of less than 15 minutes TAT for tests on the laboratory Stat Test Menu.
   2.2.3.1 Refer to Laboratory Test Manual on MyPal for order priorities
2.2.4 Crisis test results will be called immediately upon completion, contact information requested

3. Reportable Diseases:
   3.1 PH will comply with current state and national reportable disease notification requirements.
      3.1.1 Results that require immediate notification to the Department of Health and Environmental Control (DHEC) will be called immediately.
      3.1.2 Results that require Urgent notification to DHEC will be reported within 24 hours.
      3.1.3 All other Reportable Conditions Results will be reported to DHEC within 3 days.

4. Significant or Unexpected Surgical Pathology Findings:
   4.1 When the Pathologist discovers significant or unexpected surgical pathology findings they will immediately notify the submitting physician as indicated, either by telephone or pager.
      4.1.1 This notification is documented as a comment in the surgical pathology report.
   4.2 Findings may include, but are not limited to:
      4.2.1 Unexpected malignancy
      4.2.2 Discrepancies between frozen sections diagnosis and permanent section findings
      4.2.3 Significant findings on special stains
### Critical Values

#### Hospital Addresses

<table>
<thead>
<tr>
<th>Palmetto Health Richland</th>
<th>Palmetto Health Baptist</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Richland Medical Park Drive</td>
<td>Taylor at Marion Street</td>
</tr>
<tr>
<td>Columbia, SC 29203</td>
<td>Columbia, SC 29220</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Palmetto Health Baptist Parkridge</th>
<th>Palmetto Health Toumey</th>
</tr>
</thead>
<tbody>
<tr>
<td>400 Palmetto Health Parkway</td>
<td>129 North Washington Stress</td>
</tr>
<tr>
<td>Columbia, SC 29212</td>
<td>Sumter, SC 29150</td>
</tr>
</tbody>
</table>

#### Chemistry and Immunoassay

<table>
<thead>
<tr>
<th>Chemistry and Immunoassay</th>
<th>Less Than/Equal To</th>
<th>Greater Than/Equal To</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ammonia:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-17 Yrs.</td>
<td>NA</td>
<td>109 umol/L</td>
</tr>
<tr>
<td>&gt;= 18 Yrs.</td>
<td>NA</td>
<td>200 umol/L</td>
</tr>
<tr>
<td><strong>Bilirubin, Total:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-1 Day</td>
<td>NA</td>
<td>6.0 mg/dL</td>
</tr>
<tr>
<td>1-3 Days</td>
<td>NA</td>
<td>15.0 mg/dL</td>
</tr>
<tr>
<td>3-30 Days</td>
<td>NA</td>
<td>18.0 mg/dL</td>
</tr>
<tr>
<td>&gt;= 1 Mos.</td>
<td>NA</td>
<td>15.1 mg/dL</td>
</tr>
<tr>
<td><strong>Calcium, Total:</strong></td>
<td>6.0 mg/dL</td>
<td>13.0 mg/dL</td>
</tr>
<tr>
<td><strong>Calcium, Ionized:</strong></td>
<td>0.78 mmol/L</td>
<td>1.58 mmol/L</td>
</tr>
<tr>
<td>CO2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;= 1 mos.</td>
<td>10 mmol/L</td>
<td>40 mmol/L</td>
</tr>
<tr>
<td>&lt;1 month</td>
<td>10 mmol/L</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Creatinine:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;= 19 Yr.</td>
<td>NA</td>
<td>15.0 mg/dL</td>
</tr>
<tr>
<td><strong>0-18 Yr.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bilirubin, Direct</strong></td>
<td>NA</td>
<td>9.0 mg/dL</td>
</tr>
<tr>
<td><strong>Glucose:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-60 days</td>
<td>40 mg/dL</td>
<td>201 mg/dL</td>
</tr>
<tr>
<td>61 days- 17 Yr.</td>
<td>40 mg/dL</td>
<td>400 mg/dL</td>
</tr>
<tr>
<td>&gt;= 18 Yr.</td>
<td>40 mg/dL</td>
<td>501 mg/dL</td>
</tr>
<tr>
<td><strong>Glucose, Post Prandial</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-60 days</td>
<td>40 mg/dL</td>
<td>201 mg/dL</td>
</tr>
<tr>
<td>61 days- 17 Yr.</td>
<td>40 mg/dL</td>
<td>400 mg/dL</td>
</tr>
<tr>
<td>&gt;= 18 Yr.</td>
<td>40 mg/dL</td>
<td>501 mg/dL</td>
</tr>
<tr>
<td><strong>Lactic Acid</strong></td>
<td>NA</td>
<td>5.0 mmol/L</td>
</tr>
<tr>
<td><strong>Magnesium</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male &gt;= 18 Yr.</td>
<td>1.0 mg/dL</td>
<td>6.0 mg/dL</td>
</tr>
<tr>
<td></td>
<td>Male 0-17 Yr.</td>
<td>Female 0-17 Yr.</td>
</tr>
<tr>
<td>-----------------------</td>
<td>--------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Osmolality (Serum)</td>
<td>1.0 mg/dL</td>
<td>1.0 mg/dL</td>
</tr>
<tr>
<td></td>
<td>5.0 mg/dL</td>
<td>5.0 mg/dL</td>
</tr>
<tr>
<td>Phosphorus:</td>
<td>1.2 mg/dL</td>
<td>1.0 mg/dL</td>
</tr>
<tr>
<td></td>
<td>8.9 mg/dL</td>
<td>5.0 mg/dL</td>
</tr>
<tr>
<td>Potassium:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-5 mos.</td>
<td>2.5 mmol/L</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.0 mmol/L</td>
<td></td>
</tr>
<tr>
<td>&gt;/= 6 mos.</td>
<td>2.5 mmol/L</td>
<td>6.5 mmol/L</td>
</tr>
<tr>
<td>Procalcitonin</td>
<td>0 ng/mL</td>
<td>2 ng/mL</td>
</tr>
<tr>
<td>Sodium:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-30 Days</td>
<td>125 mmol/L</td>
<td>125 mmol/L</td>
</tr>
<tr>
<td></td>
<td>150 mmol/L</td>
<td>160 mmol/L</td>
</tr>
<tr>
<td>31 Days - 12 years</td>
<td>125 mmol/L</td>
<td></td>
</tr>
<tr>
<td></td>
<td>160 mmol/L</td>
<td></td>
</tr>
<tr>
<td>&gt;/=13 years</td>
<td>120 mmol/L</td>
<td></td>
</tr>
<tr>
<td></td>
<td>160 mmol/L</td>
<td></td>
</tr>
<tr>
<td>Troponin</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.30 ng/mL</td>
<td></td>
</tr>
<tr>
<td>Uric Acid</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11.9 mg/dL</td>
<td></td>
</tr>
</tbody>
</table>

**Chemistry Therapeutic Drugs**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetaminophen</td>
<td>151 ug/mL</td>
</tr>
<tr>
<td>Alcohol</td>
<td>300 mg/dL</td>
</tr>
<tr>
<td>Amikacin Peak</td>
<td>40.1 ug/mL</td>
</tr>
<tr>
<td>Amikacin Trough</td>
<td></td>
</tr>
<tr>
<td>&gt;/=3 months</td>
<td>10.1 ug/mL</td>
</tr>
<tr>
<td>0-2 months</td>
<td>7.00 ug/mL</td>
</tr>
<tr>
<td>Carbamazepine(Tegretol)</td>
<td>15.1 ug/mL</td>
</tr>
<tr>
<td>Cyclosporine</td>
<td>500 ng/mL</td>
</tr>
<tr>
<td>Dilantin, Total</td>
<td>30.1 ug/mL</td>
</tr>
<tr>
<td>Dilantin, Free</td>
<td>4.1 ug/mL</td>
</tr>
<tr>
<td>Digoxin</td>
<td>2.1 ng/mL</td>
</tr>
<tr>
<td>Gentamicin Peak</td>
<td>12.1 ug/mL</td>
</tr>
<tr>
<td>Gentamicin Trough</td>
<td></td>
</tr>
<tr>
<td>&gt;/=18 years</td>
<td>2.1 ug/mL</td>
</tr>
<tr>
<td>3m-18yrs</td>
<td>2.5 ug/mL</td>
</tr>
<tr>
<td>0-2 months</td>
<td>1.2 ug/mL</td>
</tr>
<tr>
<td>Lithium</td>
<td>1.6 mmol/L</td>
</tr>
<tr>
<td>Phenobarbital</td>
<td>41 ug/mL</td>
</tr>
<tr>
<td>Salicylate</td>
<td>41 mg/mL</td>
</tr>
<tr>
<td>Tacrolimus</td>
<td>25.0 mg/mL</td>
</tr>
<tr>
<td>Theophylline</td>
<td>25.1 ug/mL</td>
</tr>
<tr>
<td>Tobramycin Peak</td>
<td>15.1 ug/mL</td>
</tr>
<tr>
<td>Tobramycin Trough</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Less Than/Equal To</td>
</tr>
<tr>
<td>----------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td><strong>Valproic Acid</strong></td>
<td>201 ug/mL</td>
</tr>
<tr>
<td><strong>Vancomycin Trough</strong></td>
<td></td>
</tr>
<tr>
<td>0-18 years</td>
<td>25.0 ug/mL</td>
</tr>
<tr>
<td>&gt;18 years</td>
<td>40.1 ug/mL</td>
</tr>
<tr>
<td><strong>Vancomycin Peak</strong></td>
<td>70.1 ug/mL</td>
</tr>
<tr>
<td><strong>Coagulation</strong></td>
<td></td>
</tr>
<tr>
<td>Antithrombin III</td>
<td>50%</td>
</tr>
<tr>
<td>Fibrinogen</td>
<td>100 mg/dL</td>
</tr>
<tr>
<td>INR</td>
<td>NA</td>
</tr>
<tr>
<td>PT</td>
<td>NA</td>
</tr>
<tr>
<td>PTT</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Flow Cytometry</strong></td>
<td></td>
</tr>
<tr>
<td>Fetal Hgb Flow Marker</td>
<td>≥0.30%</td>
</tr>
<tr>
<td><strong>Hematology</strong></td>
<td></td>
</tr>
<tr>
<td>Hemoglobin</td>
<td></td>
</tr>
<tr>
<td>(0-1 mos)</td>
<td>9.6 g/dL</td>
</tr>
<tr>
<td>(&gt;1 mos)</td>
<td>5.5 g/dL</td>
</tr>
<tr>
<td>Hematocrit</td>
<td></td>
</tr>
<tr>
<td>(0-3 mos)</td>
<td>25%</td>
</tr>
<tr>
<td>(&gt; 3 mos)</td>
<td>18%</td>
</tr>
<tr>
<td>WBC</td>
<td></td>
</tr>
<tr>
<td>(0-3 mos)</td>
<td>2.0 K/uL</td>
</tr>
<tr>
<td>(&gt; 3 mos)</td>
<td>1.0 K/uL</td>
</tr>
<tr>
<td>Platelet Count</td>
<td></td>
</tr>
<tr>
<td>(0-2 mos)</td>
<td>50 K/uL</td>
</tr>
<tr>
<td>(&gt; 2 mos)</td>
<td>20 K/uL</td>
</tr>
</tbody>
</table>
**Immunology**

<table>
<thead>
<tr>
<th>Bacterial Antigen Detection, Rapid Test for:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Legionella urinary antigen</td>
<td>Positive</td>
</tr>
<tr>
<td>Streptococcus pneumonia antigen</td>
<td>Positive</td>
</tr>
<tr>
<td>Cryptococcal Antigen (CSF or Serum)</td>
<td>Positive</td>
</tr>
<tr>
<td>Heparin Induced Platelet Antibody</td>
<td>Positive</td>
</tr>
<tr>
<td>HIV, Rapid test</td>
<td>Positive</td>
</tr>
</tbody>
</table>

**Microbiology**

| Carbapenemase Isolates                      | Positive |
| C difficile toxin A/B                      | Positive |
| Cultures from:                             | Positive |
| Tissue Samples from OR to include bone and cornea samples | Positive |
| Blood Cultures                             | Positive |
| Stool for Parasites                        | Positive |
| Cultures for:                              |  |
| Acid Fast Bacteria (AFB)                   | Positive |
| Bordetella                                 | Positive |
| Haemophilus influenzae (Invasive)           | Positive |
| Listeria                                   | Positive |
| Neisseria gonorrhoeae                      | Positive |
| Neisseria meningitidis                     | Positive |
| Streptococcus pneumoniae (Invasive)         | Positive |
| Salmonella                                 | Positive |
| Shigella                                   | Positive |
| Campylobacter                              | Positive |
| E coli 0157:H7                             | Positive |
| India Ink Prep                             | Positive |
| Smears for:                                |  |
| Acid Fast Bacteria (AFB)                   | Positive |
| Smears from:                               |  |
| CSF                                        | Positive |
| Blood                                      | Positive |
| Body Cavity                                | Positive |
### Tissue Samples from OR (to include bone and cornea samples)

<table>
<thead>
<tr>
<th><strong>Molecular Pathology</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bordetella pertussis DNA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Parasitology</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria Smears</td>
</tr>
<tr>
<td>Pathologic parasites from O&amp;P exam</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Reference Lab</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Blot</td>
</tr>
</tbody>
</table>

Other Reference Lab Critical value results as determined by the reference lab will be called by the reference lab to the Palmetto Richland Lab. Palmetto Richland Lab will then call the panic value result per lab policy.

### PH1.005.13 Collection Process

#### 1.0 General Information

1. Scan the patient’s armband and have them verify their name and Date of Birth if using a handheld device.
   1.1 If the patient does not have an armband, **DO NOT** collect any blood work until an armband is placed on the patients arm by the nursing staff.
   1.2 If discrepancies are found during the identification process such as account number or MR# that does not match, do not draw the patient’s blood until a new armband can be placed on the patient by the nursing staff.

2. Verify proper collection tubes and quantity for unfamiliar tests with coordinator or computer system (i.e. Cerner) before start of collection.

3. Verify all necessary supplies and equipment is on your tray or beside you at the drawing site before starting the Phlebotomy process.

4. Use AIDET to establish trust.

5. Never force a patient to have his/her blood drawn. Attempt to reason with a reluctant patient, if refuse, inform a nurse and record your attempt on your collection sheet with the name of the notified nurse.
   1.6.1 If the patient’s doctor requests that the sample be drawn by force, the nurse present to assume responsibility.

6. Always wash your hands before and after each patient. Always apply new gloves between each patient.

7. If the patient is having, or begins having a seizure, stop the collection process and notify the patients nurse immediately. Nursing will give clearance before
collection is continued.

1.9 Never draw blood from arteries. Should an artery be accidentally punctured, hold pressure on the site for at least ten minutes and apply a pressure bandage before leaving. Notify the patient’s nurse or nursing supervisor.

1.10 Never argue with doctors, nurses, unit clerks, patients or patients’ families. If there is a conflict or a complaint, have them contact your Supervisor, Charge Tech, Clinical Manager, or the Administrative Director.

1.11 Always call for help if a patient faint during venipuncture. Never leave the patient unattended. On the floor, nurses should be called to handle the situation; in the lab, a pathologist should be notified.

1.12 If a patient should fall or injure themselves while under our care, never allow them to leave the unit until the Supervisor, Charge Tech, Administrative Director or Clinical Manager is notified and the patient is examined by a pathologist. An incident report needs to be filled out for future reference.

1.13 Label all tubes completely (patient name, hospital number, date, time of collection, Cerner login) after the blood is drawn. Never pre-label tubes. Computer barcode labels must have date, time and Cerner login.

1.14 Specimens collected on ice or in special tubes must be brought to the laboratory within 15 minutes —no greater than 30.

1.15 Certain tests, (i.e. glucose tolerance tests) are drawn at specific intervals. Refer to glucose tolerance procedure for information on this test. For sendout tests, refer to appropriate reference lab catalog.

2.0 Inpatients

2.1 Check tray and requisitions before leaving lab to insure all necessary equipment is available for proper blood collection.

2.2 Check on sample requirements before you leave the lab if you have any doubts about what to draw.

2.3 Knock on patient’s door and announce your arrival by introducing yourself and continue with AIDET (A – Acknowledge, I – Introduce, D – Duration, E – Explanation, and T – Thank You) scripting for Excellent Service.

2.3.1 Acknowledge: the patient by name.

2.3.1.1 Hello Mr(s) _______ (while making eye contact with the patient).

2.3.2 Introduce: yourself, your reason for entering room, and your experience.

2.3.2.1 (My name is _______and I am here from the lab to draw blood your physician has ordered for your care. I have been drawing blood for _______years and will make this as pleasant as possible.

2.3.3 Duration: Give an estimate of time it will take you to complete the blood draw while you are identifying the patient and gathering your supplies.

2.3.3.1 Mr(s)_______, I do apologize for the interruption and will be finished in about five minutes.

2.3.4 Explanation: Explain what you are doing as you go through the steps.

2.3.4.1 I must verify you are the patient I am to draw (for your safety).

2.3.4.2 I will place a tourniquet on your arm to find the best vein to insure to collect the best specimen possible.

2.3.4.3 I do need to collect______tubes so you will see me changing tubes, but, will not feel the change.

2.3.4.4 Once the draw is complete, I will hold pressure to the site until the bleeding has stopped. I will then tape gauze to the site to apply continued pressure to insure no bleeding occurs.

2.3.4.5 If you have any questions or concerns, you can reach me at x7216.

2.3.5 Thank You: Thank the patient (and family members if in the room).

2.3.5.1 Thank you Mr(s)_______for allowing me to help you feel better.
2.3.5.2 For Family Members: Thank you for supporting Mr(s) _______ and your cooperation during collection.

2.4 If the patient insists on knowing what you are drawing always get the patient’s nurse to answer the question(s) before proceeding with the blood collection.

2.5 Ask the patient to repeat his/her name and date of birth. Compare the name and date of birth with the information found on the Pathnet barcode label.

2.6 Do not rely on labels at the foot of the patient’s bed or on the bed’s arm rail.

2.7 Perform venipuncture or capillary stick according to instructions in this manual.

2.8 Label all specimens before leaving the room with the patient’s name, hospital number, Cerner login and the time and date of collection. Document the collect time and workload on your collection sheet. Refer to B8.018.02 Labeling Specimens for Crossmatch/Type and Screen for these tests.

2.9 Apply bandage to the puncture site before leaving room; if patient is alert and requests that you not bandage the site, make sure he/she understands that pressure must be applied for several minutes to prevent bruising.

2.10 If you were unable to collect the specimen, notify the nurse in charge of the patient and also indicate “can’t stick” or “C/S”, your tech number, time and date on your collection sheet.

2.10.1 You must notify the Coordinator of the C/S and it will be assigned to another phlebotomist.

2.10.2 The unsuccessful phlebotomist is expected to accompany the reassigned phlebotomist to observe their attempt to collect the specimen.

2.10.3 If reassigned phlebotomist is unsuccessful, notify the patient’s nurse and she will notify the patient’s physician.

2.10.4 The general rule is 2 phlebotomists to attempt and each attempt 2 times each.

2.11 Specimens are promptly sent to the accessioning area to be received in the computer with proper collect time.

2.11.1 If specimen is your last collection, hand deliver the specimen to the laboratory for receiving.

2.11.2 If other collections are needed, tube the specimen to the laboratory for receiving.

2.11.3 It is your responsibility to ensure your specimens are received by clearing pendings.

3.0 Outpatients

3.1 Outpatients should be accommodated immediately.

3.1.1 Although there is usually a person assigned specifically to outpatient coverage, it is the responsibility of any phlebotomist who is available at the time to assist with outpatient collections.

3.2 Check the labels you have versus the prescription carefully and draw all blood needed. Failure to do this may result in the patient’s having to return to the hospital due to lab error.

3.2.1 If patient has to return to the hospital for recollection, it is the responsibility of the phlebotomy department to notify the patient.

3.2.2 The recollection must be documented in the outpatient Call Back log immediately along with who called the patient and when the patient will return.

3.3 Always ask the patient to state his/her full name and their date of birth/age. This is the only assurance you have that ensure you have the proper labels to collect the proper patient.

3.3.1 If patients are not able to give you the information, check to see if someone accompanying the patient can give the information.

3.3.2 Never give the information and then ask if that is correct.

3.3.3 If the patient is reluctant to give you the information, explain that it is for
their protection and identification safety.

3.4 Place an aliquot label on the outpatient log sheet after the venipuncture or fingerstick is performed and document the date and time the specimen was drawn, tubes collected and your tech code. Label all tubes completely (patient name, hospital number, date, time of collection, Cerner login) after the blood is drawn. *Never pre-label tubes.*

Computer barcode labels must have date, time and Cerner login.

3.5 Make sure bleeding has stopped before allowing the patient to leave the lab. This is especially important with patients on anticoagulant therapy or those with special bleeding disorders. Always place a bandage on the puncture site before the patient leaves.

3.6 All STAT priority patients must have a STAT label placed on each tube.

3.7 All collected outpatient samples are to be delivered to accessioning and handed directly to the STAT Processor.

3.7.1 Stat priority collections are to be announced to the STAT processor upon delivery.

3.7 Be sure patient collects urine specimen when indicated.

4.0 Emergency Room Patients

4.1 The Emergency Room staff collects its own specimens. In cases where a patient is very difficult to draw and in certain other special situations, the lab may be called to assist with specimen collection.

4.2 All blood work from the Emergency Room should be collected immediately.

4.3 Often the ER physicians add last-minute orders for blood collection. Be sure that all orders have been prepared before beginning blood collection.

5.0 Decentralized Areas

5.1 Most of the areas of the hospital are decentralized so they collect their own blood work. In cases of a very difficult draw the lab may be called to assist with the specimen collection.

5.2 Ask what tests need to be collected. If they can be done by fingerstick, suggest this to them. If not, explain to the caller that we will be there as soon as we possibly can.

5.3 Phlebotomists are not authorized to:

5.3.1 Perform arterial sticks

5.3.2 Perform venipuncture on lower extremities — must have physician’s order to do so

5.3.3 Draw from a central line

5.3.4 Draw above an IV site, insert IV catheters or manipulate IV infusions

5.3.5 Instill heparin

5.3.6 Draw from patient with no ID bracelet

5.3.7 Collect blood from arm with an active fistula, shunt, etc.

5.3.8 Stick more than twice

5.4 Areas the phlebotomist should avoid:

5.4.1 Above an IV site

5.4.2 Patient’s receiving transfusions unless directed to do so by the caregiver

5.4.3 Do not draw from heparin locks, central lines, IVs or fistulas

5.4.4 Side of a mastectomy

5.4.5 No feet extremities

5.4.6 Swollen or badly bruised extremities

5.4.7 Scarred areas (excessively) — can be difficult to puncture

5.4.8 Bruising indicates a previous hematoma and is usually painful (erroneous results may be obtained due to excess tissue fluid
5.4.9 Use care with edematous patients — excess fluid can alter test results by diluting constituents.
5.4.10 Never stick more than 2 times
5.4.11 DO NOT PROBE WITH NEEDLE!

6.0 Other Considerations

6.1 Patients on IV:
6.1.1 Ask nurse to turn off IV for at least 2 minutes if drawing from same arm. Perform venipuncture below IV.
6.1.2 Apply tourniquet, select vein other than one with IV
6.1.3 Perform the stick
6.1.4 Draw a red top tube or waste tube (approximately 5ml of blood)
6.1.5 Collect the blood
6.1.6 Document the collect time and workload on your collection sheet

6.2 Incomplete/No collection:
6.2.1 Move needle slightly forward
6.2.2 Move needle slightly backward
6.2.3 Adjust angle
6.2.4 Release tourniquet— if it is too tight can restrict blood flow into arm
6.2.5 Try another tube
6.2.6 Re-anchor the vein in case it has rolled

6.3 Blood Stops:
6.3.1 Vein collapse — try smaller tube
6.3.2 Needle pulled out — start over
6.3.3 Try new tube

6.4 Difficult Patients/Patient Refusal:
6.4.1 Try to persuade the patient to permit the blood collection. Emphasize that the physician wants this done.
6.4.2 Do not discuss or explain ordered test. This is the physician’s responsibility.
6.4.3 If gentle persuasion does not work, report problem to the nurse. The nurse may be able to persuade the patient.
6.4.4 If patient still refuses, obtain the nurse’s name, document on the lab log and return to the lab. Share this information on to the coordinator.

6.5 Other Problems:
6.5.1 Hematoma formation — abort immediately
6.5.2 Arterial stick hold extended pressure and document
6.5.3 Patient refusal — try to convince, notify nurse and document
6.5.4 Fainting— stop, inform nurse (if outpatient, notify pathologist on clinicals)
6.5.5 Convulsions stop, call for help (same as above)
6.5.6 Communication problems — ask for assistance
6.5.7 Tremors — ask for assistance
6.5.8 Do not stick where there are casts, dressings, fraction
6.5.9 Do not stick when there are no signs of life
6.5.10 ALWAYS observe special precautions

PH1.016.07 Correct Order for Drawing Tubes

1.0 Purpose: An order of draw is used during the collection process to reduce the effects of cross-contamination. Cross-contamination occurs during the tube exchange when a drop
of blood mixed with tube additives enters the following tube. Cross-contamination can result in the patient being redrawn due to the contamination

2.0 Examples of additive tubes:
2.1 Green top – Lithium Heparin, Sodium Heparin
2.2 Gray top – Fluoride, Oxalate
2.3 Purple/Pink top – EDTA
2.4 Blue top – Citrate
2.5 Gold/Red – SST and Clot Activator

3.0 RECOMMENDED order of draw
3.1 Blood cultures
3.2 Blue
3.3 Gold
3.4 Green
3.5 Lavendar/Pink
3.6 Other additive tubes (gray, etc.)

4.0 Reasoning behind this order of draw:
4.1 The blood culture tubes are drawn first to avoid contamination.
4.2 The coagulation tubes (blue) may be drawn first for PT/INR or aPTT testing with syringe or vacutainer collections.
   4.2.1 A blue top partially filled discard tube must be drawn for all coagulation tests collected with a winged collection set to prime the tubing of the collection set.
4.3 Additive tubes are drawn last to prevent contamination of the non-additive tubes.

PH1.010.07 Blood Collection: Venipuncture

1.0 Principle: A patient’s veins are the main source of blood for laboratory testing as well as a point of entry for IVs and blood transfusions. Since only a few veins are easily accessible to both laboratory and other medical personnel, it is important that everything be done to preserve their good condition and availability.

2.0 Equipment
2.1 Tourniquet
2.2 70 % alcohol prep pads
2.3 Dry gauze pads
2.4 Appropriate evacuated tubes for test ordered
2.5 Evacuated blood collection system holder or syringe
2.6 Plastic adhesive pressure strip
2.7 PPE – gloves (goggles, face shield, and gown as needed)
2.8 Honeywell Handheld Device

3.0 Procedure
3.1 Be sure to knock on the patient’s door before you enter the room.
3.2 Properly identify the patient by scanning the patients armband and have them verify their name and date of birth.. This is the most important step in the performance of a venipuncture. Do not draw a patient if he/she is not wearing an armband.
3.3 Use AIDET (Acknowledge, Introduce, Duration, Explanation, and Thank You)
3.4 If the patient wants to know more information, refer his/her questions to the nurse.
3.5 Check for diet restrictions
3.6 Check above the patient’s bed for any restrictions concerning the collection of blood.
3.7 Properly position the patient.
3.8 Always wash hands before and after each patient. Always wear new gloves with each new patient.
3.9 Prepare your equipment before you apply the tourniquet.
   3.9.1 Select the proper size needle. Needle choice depends on the size of the vein.
   3.9.2 The most frequently used needle is the 21 gauge. The higher the gauge number, the smaller the diameter or bore.
   3.9.3 For extremely small veins, use a 22 or 23 gauge needle.
   3.9.4 The length of the needle (1 to 1.5 inches) is an individual choice
3.10 Select the tubes needed for patients orders displayed on Handheld scanner.
3.11 Select site for venipuncture. DO NOT DRAW BLOOD ABOVE AN INTRAVENOUS INFUSION.
3.12 Application of Tourniquet: Wrap the tourniquet around the arm approximately 3 to 4 inches above the area where you are going to “feel” for a vein. Hold one end taut and tuck a portion of the end under the taut end to form a loop.
3.13 Clean venipuncture site with 70% alcohol after locating the vein of choice to stick. Dry with a dry gauze pad.
3.14 Grasp the patient’s arm approximately 1 to 2 inches below the venipuncture site. Pull the skin tight with your thumb to keep the vein from rolling.
3.15 Perform the venipuncture.
   3.15.1 The needle should be held at approximately a 15 degree angle to the patient’s arm and in a direct line with the vein.
   3.15.2 The syringe or tube should be below the venipuncture site to prevent backflow, and the arm (or other venipuncture site) be placed in a downward position.
   3.15.3 Turn the needle so that the bevel is in an upward position.
   3.15.4 Puncture the vein. The puncture of the skin and vein should be done, if possible, in one motion.
   3.15.5 If a syringe is used, care must be taken not to pull on the plunger too rapidly or forcefully.

4.0 Quality Assurance
4.1 Do not attempt to stick a patient more than two (2) times. If after the second attempt you are unsuccessful, obtain help from another phlebotomist.
4.2 DO NOT STICK ABOVE AN IV. If an IV is running in both arms, and no other vein is available except in the arm of the IV administration, specimens may be drawn below the IV as follows:
   4.2.1 Speak with the patient’s nurse to see if he/she will turn off the IV for no less than 2 minutes before venipuncture.
   4.2.2 Apply the tourniquet below the IV site. A vein other than the one with the IV should be used.
   4.2.3 After performing the venipuncture, draw 5mL of blood. Discard this blood then draw the blood sample to be used for testing.
4.3 Make sure that all blue top tubes have a “full draw.” Improperly filled tubes will not be accepted for testing.
4.4 A discard tube must be drawn before the blue top tube if the phlebotomist is collecting the sample with a winged collection set. The discard tube must be a plain red or blue top tube.
4.5 Label all tubes AFTER you have stuck the patient, NEVER BEFORE.
4.6 If swelling occurs around the venipuncture site during collection, immediately release the tourniquet, remove the needle, and apply pressure with the gauze pad.
4.7  USE NEEDLES AND LANCETS ONLY ONCE AND DISCARD IN A SHARPS CONTAINER
4.8  NEVER DISPOSE OF USED NEEDLES IN THE WASTE BASKET
4.9  NEVER RECAP A USED NEEDLE.
4.10 NEVER CUT A USED NEEDLE.
4.11 Do not keep the tourniquet on a patient’s arm for more than 1 to 2 minutes.
4.12 The order of tube draw is important for obtaining accurate values and preventing the risk of contaminating a subsequent tube with the additive from a tube just collected.
   4.12.1 If a tube containing the potassium salt of EDTA is collected prior to a tube for electrolyte evaluation, it is possible the potassium value could be falsely increased.
   4.12.2 The order in which blood is added to tubes when a syringe is used is important, because of the possibility of micro clots, which can cause erroneous coagulation and hematologic results.

Collection and Handling of Coagulation Specimens PH1.017.10

1.0  Purpose: Specimens collected for coagulation studies must be drawn properly to ensure a good sample is obtained. Special attention must be given to patients who are on IV heparin to avoid specimen contamination.

2.0  Drawing Procedure
   2.1  All coagulation tests must be drawn as the second tube if the collection is with a winged collection set and mixed immediately.
   2.1.1 The discard tube must be used to prime the tubing of the collection set.
   2.2  PT/INR and aPTT coagulation tests can be drawn as the first tube with collections by syringe or Vacutainer® tube and mixed immediately.
   2.3  If the patient is receiving IV heparin:
      2.3.1 The best collection is a peripheral stick in the opposite arm. The nurse should turn off the IV for 10 minutes prior to this collection.
      2.3.2 If a line draw is performed, the nurse should turn off the IV for 10 minutes prior to the collection.
      2.3.2.1 Then perform a 10cc flush before collecting the sample in a separate syringe.
      2.3.2.2 Then transfer the appropriate amount of blood from the syringe to the 3.2% Sodium Citrate tube.
   2.4  Mix collected tube immediately and send to Specimen Processing.

3.0  Collection Tubes
   3.1  BD 3.2% Sodium Citrate
   3.2  For normal hematocrits, collect the following amounts:
      3.2.1 Tube volume 3.0 ml = 0.3 ml Citrate and 2.7ml Blood
      3.2.2 Tube volume 2.0 ml = 0.2 ml Citrate and 1.8ml Blood

4.0  Unacceptable Specimens
   4.1  Coagulation tubes less than 90% full.
   4.2  Clotted specimens.
   4.3  Coagulation specimens that are moderately or grossly hemolyzed are unacceptable for testing.
   4.4  Prothrombin Time (PT) over 24 hours old if unopened. Over 8 hours old if
Blood Collection from Infants

PRINCIPLE:
To obtain adequate and accurate blood specimens from infants with the least amount of trauma while maintaining good isolation techniques. Routine venipunctures are not performed on patients under 12 months of age unless an experienced phlebotomist is comfortable with performing venipuncture.

EQUIPMENT:
Gloves, gauze pads, alcohol swabs, sterile lancet, microcollection tubes, 4x4 gauze pads to wrap the foot.

PROCEDURE:
1. Observe the safety regulations required for entrance into the infant care facility.
2. Review the request for type of test(s) ordered and prepare the required equipment, including labeling materials.
3. Use only blood collection tray designed for the nursery units.
4. Remove all jewelry.
5. Wash hands with supplied soap using aseptic technique. (See section on proper hand washing for nursery units).
6. Put appropriate personnel protective safety gown.
7. Sleeves must be pushed above the elbows at all times while in the nursery units.
8. Approach the patient.
9. Observe feet for any unusual marks, bruising, skin tears or abrasions and notify nursing personnel immediately. Document name of the staff nurse notified.
10. Identify the patient by matching the request label (full name and MR #) with the patient’s ankle bracelet. Account numbers are essential for glucose screen testing.
11. Apply a heel warmer to the site for 3 minutes.
12. Cleanse the site with alcohol and allow to air dry. The presence of alcohol will quickly hemolyze the blood.
13. Mix all additive tubes properly. Failure to mix immediately after collection will cause clots to form.
14. Properly label all samples collected for transport to the laboratory to the laboratory specimen processing center.

15. Properly dispose of all contaminated collection materials.

16. Wash hands using aseptic technique.

QUALITY ASSURANCE NOTES:
1. Make sure the area for the skin puncture is completely dry before carrying out the procedure.

2. Remember not to squeeze heel too tightly to avoid diluting the blood with tissue juices.

3. On all laboratory labels, note whether the specimen is from a skin puncture.

4. Because platelets have a tendency to clump, it is a good idea, particularly if a number of different tests are ordered, to collect the anti-coagulated blood first.

5. Do not stick a baby more than twice to obtain a specimen at any given time.

6. Do not puncture a foot if there are bruises, abrasions, or sloughing skin present. Call this to the attention of the nurse.

7. To help obtain a free-flowing puncture wound from a baby who does not bleed freely, wrap the baby’s heel in a heel warming device for 5 minutes.

8. Use only gentle massage when obtaining blood. Excessive massaging dilutes the blood with tissue fluids and may cause hemolysis.

9. NEVER re-puncture old puncture wounds.

10. NEVER remove a baby from its bassinet or change its position in any way without the approval of a nurse.

11. Age limit for pediatric heel sticks: Pediatrics that are of the age of pulling themselves up on their feet (usually around 6 to 7 months of age) are too old to have heelsticks performed. Fingersticks should be performed at this age and older.

12. Properly secure the puncture site.

PROCEDURE FOR HOLDING THE INFANT FOOT:
When doing a heelstick on an infant, hold the heel gently but firmly. This may be done in one of two ways: (1) place the forefinger around the ankle, and thumb over the arch of the foot or (2) place the forefinger over the arch of the foot and the thumb below the puncture site at the ankle.

13. Use only lancets with a maximum tip length of 2.50 mm. Make the puncture in one continuous, deliberate motion perpendicular to the puncture site. Punctures should be made on the most medial or most lateral portion of the plantar surface (shaded areas in the diagram of an infant’s foot below). It is also recommended that you do not perform
skin punctures on the posterior curvature of the heel.

NOTE: The depth of the skin puncture in the heel is important in infants, particularly neonates. It must not exceed 2.5 mm. Penetration of the calcaneus bone, osteomyelitis, and sepsis have all been reported as potential complications.

14. Perform the skin puncture smoothly and quickly. Hold the lancet across the skin grain as this will allow the blood to form in a well rounded drop. If the puncture is made with the grain of the skin then the blood will run along the grains and not form a rounded drop.

15. Maintain the pressure on the site, as needed. Do not hold continuous pressure as this will not allow a free flow of blood to accumulate at puncture site. Apply gently pressure again to form another rounded drop of blood.

16. Wipe the first drop off since excess tissue fluid will dilute and/or cause clumping of the specimen.

17. Collect an adequate sample for each request and follow the correct order for draw.

18. Apply the direct pressure to the site until the bleeding stops. A pressure pad should be applied along with a bootie wrap to aid in the puncture site to clot.

19. If more than one microcollection tube is needed, always collect additive tubes first. Good blood flow is more critical for anti-coagulated specimens than serum specimens. Also, never “scoop” the blood from the surface of the skin. This can cause platelet clumping, which can make a hematology or blood bank specimen unsuitable for analysis. Instead, drops of blood should be allowed to flow freely into the collection top and down the walls of the tube. Clumps or hemolysis in a specimen will cause rejection of the specimen by the laboratory and necessitate a re-draw.

20. Skin puncture blood is neither venous or arterial blood. It is a mixture of blood from arterioles, venules, and capillaries and also contains a small amount of tissue fluid. No clinically important differences are found between skin puncture serum and skin puncture plasma. However, there are important clinical differences between skin puncture blood and venous serum in four constituents - glucose, potassium, total protein, and calcium. Except for glucose, concentrations in venous serum are higher. These differences do not diminish the value of the specimen but indicate that the origin of the specimen must be taken into account when interpreting test results.

21. Osteochondritis, or bone cartilage infections, of the heel of newborns can be complication of skin puncture. To avoid this, follow these guidelines:

   a. Punctures should be made on the most medial or lateral portions of the plantar or flat surface of the heel.
   b. Puncture should NOT be made on the posterior curvature of the heel where the bone is closet to the skin.
   c. Punctures should NOT be made deeper than 2.5 mm.
   d. Punctures should NOT be made through previous puncture sites because hidden infection may be present.
A proper area for heelstick can be determined by imaging a line drawn posteriorly from the middle of the big toe to the heel and another drawn posteriorly from the 4th and 5th toes to the heel. The puncture should be medial to the 1st line or lateral to the 2nd line. The arch is unacceptable due to the potential for tendon, cartilage and/or nerve injury.

**babyLance Heelstick Lancet PH 1.025.04**

1.0 Principle:
All babyLance lancets are automated, producing a standardized surgical quality incision for sampling blood from preemies and newborns. The skin of humans, especially babies, has unique stress-strain characteristics that result in remarkable skin compression and indentation from even minor pressure. Any pressure from a device on the infant’s heel will indent the skin, causing the skin cells to elongate and compress in a distinct, stratified manner. The degree of skin indentation increases the depth of any wound. If the skin indent is 2.0 mm when using a lancet device that punctures to 2.4 mm, the puncture depth will surpass a hazardous 4.0 mm.

The babyLance principle is to assure an incision of uniform depth and length with a large, flat blade-slot surface which the blade protracts, enabling it to be flush against the child’s heel without undue pressure or skin indentation. The penetration depth is 1.0 mm with Newborn babyLance and 0.85 penetration depth for Preemie babyLance.

2.0 Equipment
2.1 Personal Protection Equipment
2.2 Gauze
2.3 70% Alcohol Pads
2.4 Microtainer® tube collection tubes
2.5 Heelwarmers
2.6 babyLance Heelstick Lancet

3.0 Procedure
3.1 Follow the proper patient identification protocol before collection.
3.2 Review the test(s) ordered and prepare the required collection supplies.
3.3 Apply all required Personal Protection Equipment before contact with infant.
3.4 The heelstick should be obtained from the proper collection area.
   3.4.1 One area is determined by a line extending posteriorly from a point between the 4th and 5th toes and running parallel to the lateral aspect of the heel.
   3.4.2 Next area is determined by a line extending posteriorly from the middle of the great toe running parallel to the medial aspect of the heel.

3.5 Proper collection position for infant.
3.5.1 The baby should be placed in a supine (lying on back) position with the knee at open end of the support surface.
   3.5.1.1 This allows the foot to hang lower than the torso, improving blood flow

3.6 Place infant heel warmer over heel for 5 minutes.

3.7 Clean the incision area of the heel with a 70% alcohol swab.
   3.7.1 Allow to air dry or wipe with a clean dry gauze pad.
   3.7.2 Do not touch the incision site or allow the heel to come into contact with any non-sterile item or surface.

3.8 Remove the babyLance device from its blister pack taking care not to rest the blade slot end on any non-sterile surface.

3.9 Remove the safety clip and Do Not push the trigger or touch the blade slot.

3.10 Raise the foot above the infant’s heart level and select a safe incision site.
    3.10.1 Avoid any edematous area or site within 2.0 mm of a prior wound.

3.11 Place the blade-slot surface of the device flush against the heel so that its center point is vertically aligned with the desired incision site.

3.12 Ensure both ends of the instrument have made light contact with the skin, and depress the trigger.

3.13 Immediately remove the instrument from the infant’s heel and lower the heel to a position level with or below the baby.

3.14 Using only a dry sterile gauze pad, gently wipe away the first droplet of blood that appears at the wound site.

3.15 Collect blood in the proper collection Microtainer® tube and fill to the appropriate specimen volume without making direct contact to wound site.

3.16 Gently press a dry sterile gauze pad to the incision site until bleeding has ceased.
    3.16.1 Pressure held on incision site will help prevent a hematoma from forming.

3.17 Place a pressure pad over the incision site and wrap the foot in a bootie wrap made of 4x4 gauze.

4.0 Conditions affecting the procedure

4.1 Heel edema

4.2 Re-incision of prior wound site

4.3 Inflamed heel

4.4 Excessive pressure and skin indentation from placing the instrument on the heel, resulting in deep and hazardous wound depths.

5.0 Limitations of the procedure

5.1 Care and proper procedure must always be followed to avoid injury.

5.2 Poor vascularization may cause inadequate blood flow.
   5.2.1 Warming heel to 42 degrees to 44 degrees will improve blood flow.
   5.2.2 Temperatures above 44 degrees will burn the heel.
Line Collection Procedure
For centralized phlebotomy units where patients need blood collections should be obtained through line access, please refer to campus specific procedures in coordination with the laboratory Phlebotomy Departments.

Needleless Transfer System PH1.014.05

1.0 Principle: This system has been devised to assure a safe transfer of blood using a syringe collection method to a Vacutainer® tube. It is to protect the health care worker from needlesticks and exposure to HIV and HBV. It is an approved OSHA methodology and has been instituted through Palmetto Health Richland under the guidance of the Nursing Safety Coordinators.

2.0 Equipment:
2.1 Syringe
2.2 Syringe needle protection device
2.3 BD Blood Transfer Device
2.4 Vacutainer® Tubes

3.0 Procedure: ***Wear Gloves At All Times***
3.1 Prepare the Needleless Transfer System before beginning the venipuncture procedure to ensure specimen integrity.
3.2 After venipuncture is performed and the venipuncture site has been dressed, the safe transfer of blood from the syringe to Vacutainer® tube is needed. The collection person/phlebotomist must work quickly to prevent micro-clots from forming.
3.3 Safety lock the syringe needle with the protection device and remove from syringe.
3.4 Dispose of the needle in the biohazard sharps container.
3.5 Attach the syringe to the BD blood transfer device.
3.6 Follow the Order of Draw before transferring blood.
3.7 Place Vacutainer® tubes in the holder and push to penetrate the needle through the rubber stopper.
   3.7.1 Aliquot blood as appropriate to the tests needed.
   3.7.2 Change Vacutainer® tubes as needed (tubes will fill automatically).
3.8 Label tubes appropriately.
3.9 Dispose of Needleless Transfer device in biohazard sharps container.

PH1.008.08 Acceptable Specimens

1.0 Blood Samples Labeling
1.1 Tubes are to be labeled with a barcode label generated by the laboratory computer system or a Patient ID Link label from the floors.
1.2 Labels are to be affixed after the drawing of the tubes by the person collecting the
blood.

1.3 If using barcode labels, tear off the large aliquot and place the label along the length of the tube.

1.4 Do not wrap the label around the tube (only exception is microtainers).

1.5 Document the time of collection and the tech number of collecting phlebotomist on the label for identification of the correct collecting time and phlebotomist.

1.6 DO NOT PRELABEL TUBES!

1.7 All blood specimens are to be received in the lab properly labeled with complete patient information to include:
   1.7.1 Patient Name
   1.7.2 Medical Record Number
   1.7.3 Time of Collection
   1.7.4 Date of Collection
   1.7.5 Tech number of person collecting specimen.
      1.7.5.1 Initials of person collected if collection took place on the floor.

2.0 Unacceptable Blood Samples Include:

2.1 Improperly labeled:
   2.1.1 Name only
   2.1.2 Incorrect Medical Record Number
   2.1.3 Wrong name and medical record number
   2.1.4 No labeling information at all
   2.1.5 No date and time of collection on specimen
      2.1.5.1 Floor staff will be called if no date or time to come and mark time date of specimen collection.

2.2 Blood tubes that have cracks or have been broken in transit
   2.2.1 Recollection will be required if broken.

2.3 Blood tubes that have expired.
   2.3.1 Recollection will be required if tube has expired.

2.4 Blood specimens have not met special draw requirements causing inaccurate results to include:
   2.4.1 Collection in incorrect tube type
   2.4.2 Specimen not placed on ice, if required
   2.4.3 Specimen not delivered to the lab in a designated time frame

3.0 Urine Specimen Labeling

3.1 Urine samples should be labeled with the following:
   3.1.1 Patient name
   3.1.2 Medical Record Number
   3.2.3 Physician
   3.2.4 Tests written on label
   3.2.5 Date and time of collection

3.2 Specimens will be accepted in a tightly sealed urine cup or syringe that has been capped off.

3.3 All 24 hour urine specimens MUST have complete patient information written on the container to match the request form.

4.0 Unacceptable Urine Samples

4.1 Any urine container that is sent to the lab leaking in the bag will be rejected and recollection requested.
   4.1.1 If recollection is not possible, the unit will be notified and a unit employee will be responsible for cleaning the specimen container
making it suitable for handling.

4.2 Any urine syringes received with needles attached will be rejected.
4.2.1 Either a recollection must be performed or a unit employee will have to come to the lab making the specimen suitable for handling.

4.3 Any urine sample sent to the label with no patient information will be discarded.
4.3.1 Documentation MUST be kept in the event a call comes to the department inquiring about results.

4.4 A 24 hour urine collection that fails to have a labeled container and the lab request form is not attached will be held in the event an inquiry for results occur.
4.4.1 At this time the unit will be informed of the no re-labeling situation and the clinical managers will be informed of the error.

5.0 Miscellaneous
5.1 For the unacceptable specimen, the specimen must be rejected and a request for a recollect will be initiated.
5.2 In the event that the specimen can not be recollected due to the time frame or difficulty of obtaining a new specimen, the Nurse Manager of the unit, MUST be notified of the error and the patient’s physician MUST be notified by the nurse in charge.
5.3 The individual who performed the original collection will have to come to the laboratory and correctly label specimen and documentation MUST be performed with the person’s signature making the correction.
5.4 Documents will be made in the laboratory computer making the correction.
5.5 Documentation will be made in the Laboratory computer system stating the specimen was relabeled.
5.6 SPECIMENS WILL NOT BE SENT BACK TO THE UNIT FOR ANY REASON.

PH1.027.10 BacT/Alert®Blood Culture Collection

1.0 Policy Statement
Blood Cultures are collected whenever the physician has reason to suspect clinically significant bacteremia. Blood Cultures are one of the most important cultures performed in the Microbiology Department. Blood Cultures help to indicate the severity and extent of spread of an infection. They provide for the identification and antimicrobial susceptibility of the etiological agent causing a severe or life-threatening disease. Therefore, the technique and procedure used in the collection and processing of these specimens are important for proper patient care.

2.0 Skin Antisepsis
2.1 The most important procedure during the collection process is proper skin antisepsis. Although variable from person to person, many bacteria, both gram positive and gram negative, are present on the skin.
2.1.1 Gram-negative organisms and yeast are less common inhabitants on normal, healthy skin but are not uncommon on the skin of hospitalized patients or hospital personnel.
2.1.1.1 There is a high risk of blood culture contamination from the skin of the patients and from the skin of the collecting phlebotomist.
2.1.1.2 The significance of these organisms, although usually nonpathogenic in nature, may be difficult to establish when they are isolated from a blood culture because of their role in causing endocarditis from implanted prosthetic material infections.

2.2 The laboratory must report all microorganisms isolated from the blood cultures.

2.3 The physician must interpret the report and decide whether the isolate is clinically significant or whether the isolate is a contaminant.

2.3.1 If the isolate is interpreted as clinically significant, a designated treatment protocol is indicated.

2.3.2 The patient could be committed to additional hospitalization for treatment at considerable expense and some risk because of possible adverse toxic effect due to antibiotics.

2.4 The role the phlebotomist, by his/her expertise or lack of it, either contributes to the patient's welfare or possibly causes misleading information to be reported.

3.0 Equipment

3.1 BacT/Alert® Blood Culture Bottles

3.2 Butterfly Collection Set (with luer adapter and holder) or Syringe System (BD)

3.3 ChloraPrep® One-Step 1.5 ml Frepp®Applicators (Medi Flex)

3.4 70% Alcohol Pads

3.5 PPE: All proper PPE to include gloves, gowns and masks (if applicable),

4.0 Reagents

4.1 ChloraPrep® One-Step 1.5 ml Frepp®Applicators

4.1 Chlorhexidine gluconate 2% (w/v) and Isopropyl alcohol 70% (v/v)

4.2 Warnings

4.2.1 For external use only.

4.2.2.1 Flammable: Keep away from fire or flame.

4.2.2.2 Use with care in premature infants or infants under 2 months of age.

These products may cause irritation or chemical burns.

4.2.2.3 Do not use on patients with known allergies to chlorhexidine gluconate or isopropyl alcohol.

4.2 BacT/Alert® PF (Pediatric: Yellow) Ingredients and Volume:

4.2.1 Complex Media 16 ml

4.2.2 8.5% Charcoal Suspension 4 ml

4.2.3 Soybean-Casein Digest 2.00% w/v

4.2.4 Brain Heart Infusion Solids 0.1% w/v

4.2.5 Sodium Polyanetholesulfonate 0.025% w/v

4.2.6 Pyridoxine HCl 0.001% w/v

4.2.7 Menadione 0.0000625% w/v

4.2.8 Hemin 0.0000625% w/v

4.2.9 L-Cysteine 0.025% w/v

4.3 BacT/Alert® FA (Aerobic: Pale Green) Ingredients and Volume:

4.3.1 Complex Media 22 ml

4.3.2 6.5% Charcoal Suspension 8 ml

4.3.3 Soybean-Casein Digest Broth 2.0% w/v

4.3.4 Brain Heart Infusion Solids 0.1% w/v

4.3.5 Sodium Polyanetholesulfonate 0.05% w/v
4.3.6 Pyridoxine HCl 0.001% w/v
4.3.7 Menadione 0.0000725% w/v
4.3.8 Hemin 0.0000725% w/v
4.3.9 L-Cysteine 0.03% w/v

4.4 BacT/Alert® FN (Anaerobic: Orange) Ingredients and Volume:
4.4.1 Complex Media 32 ml
4.4.2 8.5% Charcoal Suspension 8 ml
4.4.3 Soybean-Casein Digest Broth 2.0% w/v
4.4.4 Brain Heart Infusion Solids 0.1% w/v
4.4.5 Sodium Polyanetholesulfonate 0.044% w/v
4.4.6 Pyridoxine HCl 0.001% w/v
4.4.7 Menadione 0.0000625% w/v
4.4.8 Hemin 0.0000625% w/v
4.4.9 L-Cysteine 0.025% w/v

5.0 BacT/Alert Blood Culture Bottle Warnings
5.1 Prior to use, each vial should be examined. *Do not use Bottles if you observe any of the following:*
   5.1.1 Damage or deterioration (discoloration)
   5.1.2 Contamination such as cloudiness
      5.1.2.1 A contaminated vial could contain positive pressure.
      5.1.2.2 If contaminated vial is used for direct draw, gas or contaminated culture media could be refluxed into the patient’s vein.
   5.1.3 Excessive gas pressure (bulging septum)
   5.1.4 Leakage
      5.1.4.1 If spillage or leakage occurs after the vial has been inoculated, treat the leak or spill with caution as pathogenic organisms/agents maybe present.
   5.1.5 Always check expiration date before collection. *Never use expired bottles for patient collection.*
   5.1.6 Observe the bottom of each bottle before use.
      5.1.6.1 Do not use bottle if the bottom disk displays a yellow fluorescence. The yellow fluorescence indicates bottle contamination.

6.0 Procedure
6.1 Preparation of Site. The site or source of blood collection influences the contamination rate of blood cultures. Cultures of blood from the umbilical or femoral vein are more likely to be contaminated than are those of blood from the antecubital vein. Indwelling intravascular catheters become colonized with bacteria when left in place for longer than 48 hours. Cultures of blood taken from such catheters are more likely to become contaminated than are those of blood collected by percutaneous venipuncture.
   6.1.1 An antiseptic agent (Chloraprep) requires at least 1 to 2 minutes before they exert any significant activity against most skin bacteria.
   6.1.2 The Chloraprep must be allowed to completely air dry.
   6.1.3 Once the venipuncture site has been prepared aseptically, it should never be touched unless the fingers used for palpitation have also been disinfected (in the same manner as the venipuncture site).
6.2 Preparation of BacT/Alert Bottles
6.2.1 Remove the plastic flip top from culture bottle and disinfect with an alcohol pad. Do not use betadine.

6.3 Method of Specimen Collection
6.3.1 Blood can be drawn with a butterfly transfer set consisting of sterile tubing with a needle at either end. This is the recommended Collection Process.
6.3.1 Blood can be drawn with a sterile needle and syringe.

6.4 Specimen Collection – Butterfly
6.4.1 Wash hands thoroughly and don gloves.
6.4.2 Identify the patient with the full name and medical record number.
   6.4.2.1 Step 4 may be done before Step 2. While you prepare your equipment the Chloraprep may be given the appropriate amount of time to air dry.
6.4.3 Assemble and prepare the equipment.
6.4.4 Perform AIDET (Acknowledge, Introduce, Duration, Explanation and Thank you)
6.4.5 Pinch the wings on the Chloraprep scrub applicator to break the ampule and release the antiseptic.
   6.4.4.1 Do not touch the sponge.
   6.4.4.2 Wet the sponge by pressing and releasing the sponge against the venipuncture site until liquid is visible on the skin.
6.4.6 Apply Chloraprep with back and forth strokes of the applicator for 2 minutes to thoroughly disinfect the selected site.
6.4.7 Allow the area to air dry for approximately 60 seconds. Do not blot or wipe away.
6.4.8 Reapply tourniquet without touching the venipuncture site. Place the patient’s arm in a flat position on a solid surface.
6.4.9 Without touching the site, pull tight on the skin and insert the needle from the butterfly with luer adapter and tube holder (bevel up) into the vein.
6.4.10 Once blood begins to flow through the rubber tubing, attach bottles (pale green aerobic bottle first) to the holder to collect the blood.
   6.4.10.1 Blood culture bottle must remain in an upright position to prevent reflux of reagent into patient.
   6.4.10.2 Maintain control of the luer connector by securing it between the thumb and forefinger.
6.4.11 Blood culture bottles are filled directly using the needleless adapter, not allowing any broth from the bottle to contaminate the butterfly line.
6.4.12 Remove needle from the vein smoothly and apply pressure.
6.4.13 Label each bottle with a barcode label, collection time, and collector identification.
   6.4.12.1 Do not place labels over barcode on bottles!
6.4.12.2 Use the clear area length wise to place patient label on.
   6.4.12.3 Include the site of collection on the label.
6.4.14 Check site to ensure bleeding has stopped and apply pressure bandage.
6.4.15 Discard collection device in sharps container and all other
supplies in trash.

6.4.16 Wash hands thoroughly.
6.4.17 Blood Culture specimens are sent to Specimen Processing to be received and delivered to Microbiology.

6.5 Specimen Collection Syringe (with butterfly or syringe needle)
6.5.1 Follow steps 6.4.1 through 6.4.8
6.5.2 Without touching the site, pull tight on the skin.
6.5.3 Insert the needle (bevel up) into the vein and fill syringe
6.5.4 Remove needle smoothly from arm and activate safety device
6.5.5 Apply pressure
6.5.6 Attach needleless transfer device to syringe
6.5.7 Fill Blood Culture bottle (Orange Anaerobic bottle first to prevent oxygen entering the bottle – only if maximum quantity is collected)
6.5.8 Add tube holder adapter to fill other blood tubes using correct blood draw order as outlined in Order of Draw.
6.5.9 Follow steps 6.4.13 through 6.4.17
6.5.10 Fungal and AFB Blood Cultures can not be collected by this method. Continue to use the Isolator Tubes for Fungal and AFB. See Isolator Fungal/AFB Procedure.

7.0 Collection Requirements
7.1 Adult Requirement
7.1.1 Collect one Pale Green (Aerobic) and one Orange (Anaerobic) bottle for each culture ordered.
7.1.1.1 Insert 5 – 10 mls of blood to each bottle, optimal is 8-10 ml per vial. Do not deviate from these volumes. Volumes less than the recommended amount may compromise organism recovery.
7.1.1.2 If your patient is a difficult draw and can only obtain a small amount of blood, please place the collection in the pale green Aerobic bottle only. Must be at least 5 mls.
7.1.1.2 Children 30-80 lbs; 5-10 mls per culture. Children >80 lbs and adults 10-20 mls divided between anaerobic and aerobic vials.

7.2 Pediatric Requirements
7.2.1 Collect one Yellow pediatric bottle for each culture ordered.
7.2.1.1 Insert 4 mls of blood into the pediatric bottle.
7.2.1.2 If your patient is a difficult draw and can only obtain a small amount of blood, please place a minimum of 2 mls in the yellow pediatric bottle.
7.2.1.3 Neonates to 1 yr.(<4kg):0.5-1.5ml/vial (1ml is preferred)*Note:2 separate cultures are generally not possible.
7.2.1.4 Children 1 to 6: 1ml per year of age, divided between 2 cultures(i.e.,0.5ml to 3ml per culture)Physician should always be consulted concerning the amount especially if the child is below normal weight or has had previous venipunctures.

8.0 Labeling
8.1 Label each bottle with a barcode label, collection time and collector identification. Do not place labels over barcode on bottles! Use the clear area length wise to place patient labels.
BLOOD BANK PROCEDURES

B8.018.03 Labeling and Collection of Specimens for Blood Bank

1.0 Principle
Proper identification of patient, patient’s sample and blood products is crucial to safe transfusion. A correctly labeled specimen is the first step in transfusion safety. Verification of all patient information prior to transfusion is the final crucial step in transfusion safety. For other Blood Bank tests, proper identification of patients and correct labeling of specimens is also imperative in obtaining accurate test results.

2.0 Safety Precautions
2.1 Refer to PH 1.005 Collection Process for requirements applicable to collection of samples for testing.

3.0 Equipment
3.1 Computer order labels or patient ID labels (chart labels)
3.2 Blood Bank armbands, if applicable

Collection and Labeling of Samples For Crossmatch/Type and Screen

4.0 Sample Requirements
4.1 Pink-stoppered tubes (K₂ EDTA) are preferred.
4.1.1 Plain red-stoppered tube (no additive) are acceptable
4.1.2 Lavender-stoppered EDTA tubes are acceptable.
4.2 Samples used for compatibility testing must be collected within 3 days of transfusion. The day of collection is Day 0.
4.3 For information on specimens for other Blood Bank tests, refer to 6.0.
4.4 The patient’s hospital bracelet and the computer order label must match exactly for patient name, medical record number and date of birth. 

**Palmetto Health Richland Only 4.4.1 – 4.4.3**

4.4.1 Specimens drawn by an outside source may use a unique identification system other than a Palmetto Health Richland medical record number.

4.4.2 Specific requirements for outside samples are described in SOPs specific for those facilities.

4.4.3 For outside samples, Palmetto Health Richland Laboratory staff will enter patient information into the computer system and document the assigned medical record number.

4.5 Allowable minor corrections to items listed in 4.4 are;

- Date of collection
- Time of collection

4.5.1 Corrections are **NOT** allowed for any discrepancy in patient name, medical record number or date of birth.

4.5.2 Discrepancies in name, medical record number or date of birth require recollection of sample.

### 5.0 Specimen Collection

5.1 Ask patient to verify name and date of birth, if able

5.2 Compare order label to hospital armband on the patient.

5.2.1 Verify patient name, medical record number and date of birth.

5.2.2 Patient must have an identification bracelet on before drawing blood.

5.2.3 Any discrepancy (ies), must be resolved before obtaining the sample.

5.3 Blood Bank identification bracelets are available for certain patient care situations.

5.3.1 For emergencies, unknown name or if a discrepancy cannot be resolved in a reasonable amount of time, a Blood Bank armband may be placed on the patient and must be used to establish a positive identification link between patients and red blood cell products for transfusion.

5.3.2 All emergency patients with no known identification will be registered as “Trauma Male (Female)”, “STEMI”, “John (Jane) Doe” or “Neuro Male (Female)”. The Blood Bank arm band will remain on the patient until actual patient identification has been determined.

5.3.3 Should patient identification be unavailable, the original Blood Bank armband will remain on the patient for the duration of the current hospital stay. New blood bands are not required for testing of subsequent samples if transfusion is needed. After patient identification has been determined and new identification bracelet placed on patient, the Blood Bank armband should be removed after 72 hours (3 days) following the collection of the sample.

5.3.4 Blood Bank armbands will be used in the following situations.

5.3.4.1 **Palmetto Health Richland, Baptist, and Parkridge**

- Emergency Dept. (Trauma, Stemi, Neuro, John or Jane Doe)

5.3.4.2 Outpatient and Offsite Transfusions: **Palmetto Health Richland Only**

- Sickle Cell/Infusion
- Pediatric Oncology
• Health South
• Dept. of Corrections (KCI)
• Columbia Care Center (CCC)

5.3.4.3 **Palmetto Health Baptist and Parkridge**
• Outpatients (with no hospital bracelet) and offsite – Baptist and Parkridge
• Intermedical (7th floor) – Baptist only
• Rehabilitation – Baptist only

5.3.5 Collect specimen according to PH 1.005 Collection Process.

5.3.6 Label all tubes at the patient’s bedside. If all information on patient’s order label matches exactly with the patient’s armband, place on tube and label with date, time, and collector’s (laboratory and non-laboratory) FIRST and LAST name. Printed name must be legible.

5.3.7 Before leaving the patient, the information on the labeled samples must be verified. Refer to Palmetto Health “Final Check” procedure.

5.4 To eliminate the need for a second sample draw for non-group O patients who do not have a historical blood type on file in the Blood Bank, samples collected by OR staff, OR holding, and Labor & Delivery must be labeled using the following process.

5.4.1 When a Type and Screen/Type and Crossmatch is ordered for a patient in the OR and Labor & Delivery, the entire process must be witnessed by two **licensed staff** (RNs, Preop RNs Holding Room, OR RNs, CRNAs Anesthesiologist), one of which is obtaining the blood sample. Obtain blood sample with the witness present in the patient’s room for the **entire** process.

5.4.1.1 **Same Day Surgery patients in OPS** – It is permissible for an approved phlebotomist to draw a crossmatch in OPS and have a nurse witness and sign the specimen without needing a second sample for ABO/Rh verification.

5.4.2 A chart label/patient ID label will be placed on the tube after verification of patient information on the patient’s armband.

5.4.3 The label will include the date and time drawn and the first and last name (**no initials**) of TWO patient care staff members; the person who draws the sample and a witness to the draw. The names must be legible. Example: Amanda Moore, CRNA and Shari Altman, RN.

5.4.4 Both patient care staff members must verify patient name, medical record number, and date of birth. Have patient verbalize patient name and date of birth (when possible) as the staff are verifying information with the patient ID bracelet and chart label/patient ID label. Any discrepancies must be resolved before moving forward. **There will be ZERO TOLERANCE on any discrepancy in patient name, medical record number, date of birth, and legibility of collectors’ information.** All tubes must be labeled at the patient’s bedside.

5.4.4.1 Place the labeled sample tube in a small transport bag and transport to the Blood Bank.

5.4.4.2 If the specimen does not have two legible patient care staff member’s signature on the label, the tubes will not be accepted. **NO EXCEPTIONS!** The sample must be recollected.
5.5 A second sample may need to be drawn for ABO verification if there is no previous history on the patient and the patient is non-group O. Refer to section 5.4 for exceptions.

5.5.1 Blood Bank staff will notify floor when second sample is needed.
5.5.2 Blood Bank will order ABO verification (ABO/Rh type).
5.5.3 Blood Bank will send computer order label and tube to the floor in a small biohazard bag.
5.5.4 Sample shall be drawn and labeled as outlined in sections 5.1-5.3.6.
   5.5.4.1 Place the labeled sample tube in the small biohazard bag and send directly to the Blood Bank.

5.6 Blood Bank staff will verify that patient information matches and that all other information (date, time, collector, etc.) is on the sample prior to performing compatibility testing.

5.7 When applicable, Blood Bank staff will:
   5.7.1 Enter the Blood Bank ID Number (on barcode blood band) as the result for LIS (Laboratory Information System) test code in the applicable field when testing is performed.

Collection and Labeling For Non-Crossmatch/Type and Screen Blood Bank Tests (i.e. Cord Blood, Rhogam, ABO/Rh, etc.)

6.0 Sample and Labeling Requirements

6.1 Tube type
   6.1.1 Pink-stoppered tubes (K₂ EDTA) are preferred.
   6.1.2 Plain red-stoppered tube (no additive) are acceptable
   6.1.3 Lavender-stoppered EDTA tubes are acceptable.

6.3 Information on patient’s armband and specimen labels must match exactly the corresponding information in the LIS.

6.4 For collection and labeling requirements of tests, other than crossmatch/type and screen and cord bloods, refer to 5.3.5 to 5.3.7.

6.5 Labeling of Cord blood specimens
   6.5.1 Cord blood specimens must be labeled with 2 distinct labels.
      6.5.1.1 One label will contain the mother’s name and medical record number.
      6.5.1.2 One label will contain the baby’s name and medical record number.
      6.5.1.3 Either label must include date and time of collection, identification of the person collecting the sample and a notation that the sample is cord blood.

6.6 Samples received in Blood Bank -- for allowable minor corrections on the label, refer to 4.5 to 4.5.2.
   6.6.1 The sample tube does not leave the Blood Bank. The person making the correction must come to the Blood Bank to do so.
   6.6.2 If corrections are not allowed, or cannot be made, the sample must be recollected.
Protocol for Use/Transfusion of Blood Products

COMPONENT REQUESTS

The component must first be ordered by the provider or nursing staff using the appropriate Blood Product Transfusion PowerPlans.

When special blood products (i.e. autologous or directed-donor units) are needed, please contact the Blood Bank to confirm availability of autologous and/or directed-donor units.

NOTE: This would be a good time to ask the patient if they have autologous or directed-donor blood they are expecting to be used for them.

Patient diagnosis is often vitally important to the Blood Bank staff in securing the proper product for the patient. The prime example is when blood is ordered for people with sickle cell disease. These units must be screened for sickle cell trait. Blood Bank must be notified since this screening is not routine and since Sickle Cell is not usually listed as the primary diagnosis in Powerchart.

NOTE: All units to be used for babies are routinely screened for sickle cell.

BLOOD COMPONENTS

PACKED RED BLOOD CELLS
1. A routine crossmatch must be performed, blood will be held for 3 days.
2. Each unit of packed red cells contains approximately 250-300 ml.
3. This product is prepared as leukoreduced from the Blood Supplier – The American Red Cross.

WHOLE BLOOD
1. Whole blood is only available as an autologous unit.
2. Autologous Whole blood must be crossmatched.

WASHED RED CELLS
1. Washed red blood cells must be ordered 24-48 hours in advance.
2. Washed cells must be crossmatched.
3. Once washed the red cells have a 24 hour expiration period.
4. Each unit contains approximately 200-250ml.

AUTOLOGOUS/DIRECTED DONATED BLOOD
1. Autologous blood is the patient’s own blood withdrawn before surgery in order to provide blood during the procedure.
2. Arrangements must be made in advance with the Columbia American Red Cross to schedule blood collections. Special Donation Department - Tel. #251-6078. NOTE: The American Red Cross will notify the PHR Blood Bank of scheduled donations, listing the amount and type units ordered.
3. Neither Directed Donations or Autologous Blood is available in emergency situations. Processing takes 3-5 days from collection for directed-donor and autologous units to be available to PHR. All blood must be fully tested and this process takes
approximately three working days from collection.
4. Directed donation units must be crossmatched, and will be held for 3 days. Autologous units must be crossmatched, and will be held until the patient is discharged.

PLASMA
1. Plasma is not crossmatched but an ABO/Rh, historical blood type must be on file for the patient to give type specific or ABO compatible plasma.
2. Fresh Frozen Plasma (FFP; frozen within 8 hours of collection) and Plasma, Frozen Within 24 Hours of Collection (FP24) are used interchangeably for most patients.
3. Neonates (babies up to 4 months old) are transfused with fresh FFP only (thawed ≤ 24 hours).
4. Fresh plasma (thawed ≤ 24 hours) is available for patients with known isolated coagulation factor deficiencies. Include the comment “Fresh plasma only” with requests for these patients.
5. Plasma is stored frozen and must be thawed. PHR Blood Bank maintains a small supply of thawed plasma for emergency requests. Notify the Blood Bank one hour prior to transfusion to allow time to thaw plasma products if needed.
6. Each product contains 200-300 mls of plasma. Apheresis derived units contain as much as 400-600 mL.

CRYOPRECIPITATE
1. Cryoprecipitate is not crossmatched, but a current ABO/Rh, historical blood type must be on file for the patient. ABO compatible is given when possible.
2. Each unit contains approximately 15 ml.
3. Allow at least 20 minutes notice to thaw cryoprecipitate. Notify Blood Bank when to thaw the cryoprecipitate.
4. Once thawed, it must be transfused within 4-6 hours.

PLATELETS PHERESIS
1. Platelet pheresis are not crossmatched, but a current ABO/Rh, historical blood type must be on file for the patient.
2. Platelet pheresis is a platelet product equivalent to 6-10 single platelet units drawn from one donor through the pheresis process.
3. Pheresis units are used to provide platelet support to patients while limiting the donors they are exposed to.
4. Pheresis units are not usually crossmatched unless they contain a large amount of contaminating red cells. They are given ABO compatible, when possible.
5. The Blood Bank keeps an inventory of Platelet Pheresis products in-house.
6. This product is prepared as leukoreduced from the Blood Suppliers – The American Red Cross and The Blood Connection

LEUKOCYTE PHERESIS (Granulocyte Pheresis)
1. Leukocyte pheresis with or without platelets are a special product obtained by the pheresis process from a single donor to provide white blood cells for patients.
2. Leukocyte pheresis units must be crossmatched because they contain a large amount of red blood cells.
3. These products are a special order from the American Red Cross, and are usually released before complete donor testing.
4. Leukocyte pheresis units must be infused within 24 hours of collection, preferable ASAP
within 8 hours.

5. **VOLUME REDUCING PLATELETS**
   1. Floor needs to call Blood Bank when patient needs a platelet product volume reduced.
   2. Product will be ready in 2-3 hours
   3. Product will expire in 4 hours or the original expiration date, whichever is first.

**CRYOPRECIPITATE (single unit)**

1. SIM #: 15442. Only one order needed.
2. Please call Blood Bank when ordering cryoprecipitate.
3. Cryoprecipitate orders for 5 or more units will be prepared as pre-pooled cryoprecipitate (equivalent to 5 units).
4. Expires 6 hours after thawing.

**IRRADIATED BLOOD PRODUCTS**

A. These must be requested when blood or blood component is ordered.

B. Indication for use:
   i. Irradiation of blood components (except fresh frozen plasma and cryoprecipitate) prior to transfusion is an attempt to prevent Graft vs. Host Disease in immunosuppressed patients and first degree donors.

C. Where products are irradiated:
   i. This procedure is done in the Blood Bank Dept.

D. Procedure:
   i. When irradiation of a product is requested, Blood Bank will irradiate with 25 GY (2500cGY).

E. Labeling:
   i. All irradiated products will be labeled “Irradiated” and the date, time and tech initials.

**Laboratory RRC- BB Emergency Release of Blood Products PGR**

**PURPOSE:**

In emergency situations, delay of transfusion in order to provide completely tested products may be detrimental to a patient’s survival. Expedited issue of products is necessary when transfusion is required prior to receipt of patient specimen, completion of compatibility testing or completion of donor testing. Applicable testing is initiated immediately upon receipt of a suitable specimen in the Blood Bank. Products for emergency release to treat trauma cases are maintained in designated blood storage refrigerators located in the Emergency Department (ED) and the Operating Room (OR). Products for patients other than trauma cases should be obtained from the Blood Bank.

**SAFETY PRECAUTIONS:**

Standard safety precautions should be adhered to when handling blood and blood products.
RESPONSIBLE POSITIONS (TITLE):
Blood Bank Technicians/Technologists

EQUIPMENT NEEDED:
Blood Storage Refrigerators
Emergency Blood Release Forms
Transfusion Product Tag
Plastic ziplock bags
“Safe-T-Vue 10” temperature detector
Labels: UNXCROSSMATCH BLOOD, “blue” dots, and “pink” dots
DO NOT REFRIGERATE (For Platelet Products)
ADULT TRAUMA ONLY (For Group A Plasma)
Validated Coolers

SPECIMEN REQUIREMENTS:
See “Labeling and Collection of Specimens for Blood Bank”

PROCEDURE STEPS:
1 For trauma patients arriving as a Trauma Stat in the ED Trauma Bay or the OR room, uncrossmatched O Negative blood (4 units) 1st Choice Trauma Female, O Positive blood (4 units) 1st Choice Trauma Male and 2 group AB plasma for male or female patients are stored in the ED. Group A or AB plasma or liquid plasma will be stocked in the OR Emergency Release Refrigerators for male or female patients.

2 Blood Bank staff prepares the following number of pRBCs and thawed plasma (group AB or A) or liquid plasma units for emergency issue from the Trauma blood storage refrigerators.

2.1 Select the 8 freshest O Negative and O Positive pRBCs from the red cell inventory.
   • Eight O, Rh Negative pRBCs (Trauma Female)
   • Eight O, Rh Positive pRBCs (Trauma Male)
   • Four units thawed plasma (group AB or A) or *liquid plasma, (Trauma Male or Trauma Female patients).
   * If there is a shortage of group A or AB plasma, Blood Bank will substitute liquid plasma, depending on availability.

2.1.1 Remove 2 segments from each pRBC product and label with the donor identification number and place them in the appropriate bag labeled “Trauma Segments” and store in appropriate blood bank refrigerator.

2.1.2 Apply labels on the front of each pRBC product and the Transfusion Report form. See examples of labels at the end of PGR.
   • UNXCROSSMATCHED BLOOD
   • Blue dot to O Positive pRBCs only
- Pink dot to O Negative pRBCs only

2.1.3 Apply labels on the front of each group “A” thawed plasma or liquid plasma product and the Transfusion Report form, if applicable

- ADULT TRAUMA USE ONLY

2.1.4 Apply a “Safe-T-Vue 10” temperature detector to the back of each product. See “Safe-T-Vue” PGR.

2.1.5 Attach each Transfusion Report form to its corresponding blood product and place the product sticker to the back of its corresponding unit.

2.1.6 Place the appropriate number of products for each set in a plastic ziplock bag.

2.1.6.1 Trauma products; Trauma Bay 1 Refrigerator
- Two (2) sets of two (2) O positive RBC units
- Two (2) sets of two (2) O negative RBC units
- Two units of plasma (group AB)

2.1.6.2 Trauma products; Trauma OR Refrigerator
- Two (2) sets of two (2) O positive RBC units
- Two (2) sets of two (2) O negative RBC units
- Two units of plasma (group AB or A) or liquid plasma, depending on availability.

2.2 Emergency Release of Blood Product forms

2.2.1 All information pertaining to the blood products in the trauma packs are to be completed when the trauma packs are prepared.

2.2.2 Complete a separate form for each set of products.

2.2.2.1 For each product, record the following information in the indicated section of a Transfusion Report form and on the Transfusion Report label:
- Donor Unit numbers
- Component name
- Donor ABO/Rh
- Expiration Date/Time

2.2.3 All products must be transferred to the appropriate storage location in the LIS.

2.2.3.1 A second Blood Bank tech verifies that the unit numbers match the unit numbers
- in the “Trauma Segment” bag
- listed on “Emergency Release” form(s).
- listed on “Inventory Transfer” form(s).

2.2.3.2 Verifying tech writes their tech id number on the “Inventory Transfer” form.

2.2.3.3 Place the completed form(s) in the appropriate designated binder.

2.2.3.4 Place products in the appropriate blood storage refrigerators.
- ED Trauma Bay
- OR Trauma refrigerator located outside of OR 12
3  Patient Sample during Emergency Release
3.1  If a sample is not already available in the Blood Bank, it is crucial that a properly labeled sample be collected on the patient as soon as possible and immediately delivered to the Blood Bank.

3.1.1  Group-specific blood may be issued during an emergency release only after the patient’s ABO/Rh has been determined on a current blood sample. Previous records must not be used to determine which blood group to issue.

3.1.1.1  Uncrossmatched red cell units should be ready for pick-up in 8 minutes.

3.1.2  Continue to send Emergency Release Group O if there is no previous history on the patient and the patient is non-group O until an ABO verification is completed.

4  Emergency Blood Request for Uncrossmatched Blood Trauma Cases

4.1  Emergency Release of Blood Product forms are kept in the Blood Bank.

4.2  A responsible party from the transfusing Trauma Unit: ED Trauma Bay/ OR Trauma room initiates the request for Emergency Release when ordered by the physician by notifying the Blood Bank at (47611).

4.3  Blood Bank staff releases the remote lock on the appropriate trauma refrigerator.

4.4  ED/OR staff selects the appropriate set of products for the intended patient:
   - O positive RBCs for male patients
   - O negative RBCs for female patients
   - AB or A plasma products as needed for male or female patients.

4.5  ED/OR staff supplies required information for Emergency Blood Release forms
   - Name of person placing the request
   - Patient’s Name and Medical Record Number
   - Patient location
   - Requesting physician’s first and last name
   - Nature of Emergency
   - Blood Product identification number(s)
   - ABO/Rh of blood product(s)
   - Product Type

4.6  Blood Bank staff will ask “Do you want to initiate massive transfusion protocol?” If the answer is “yes”, proceed to “Adult Massive Transfusion Protocol” or “Massive Transfusion Protocol for Obstetric”.

4.7  Blood Bank staff will complete the Emergency Release form(s).

4.8  ED/OR staff documents required information on the Transfusion Report form(s).
4.9 If it is determined that additional emergency release blood is needed, the ED/OR staff are responsible for dispatching a designated runner to the Blood Bank. Blood Bank will NOT deliver emergency release blood or blood products.

4.9.1 Uncrossmatched O pRBCs should be available within **8 minutes** of notification.

4.10 ED/OR staff will maintain control of blood products under appropriate temperature storage conditions.

4.10.1 When blood products are removed from the ED refrigerator, and the patient is subsequently taken to surgery, it is acceptable for the ED nursing staff to transport the products on ice in the designated Blood Bank cooler to surgery to avoid waste.

4.10.2 When blood products are removed from the OR trauma refrigerator, it is acceptable for OR nursing staff to place products on ice in the designated Blood Bank cooler to avoid waste.

4.11 If it has been determined that blood products removed from either the ED/OR trauma refrigerators are not needed, products should be promptly returned to the Blood Bank.

4.11.1 Blood Bank staff will remove the blood products from the returned trauma blood transport coolers, verify that the “Safe-T-Vue 10” temperature detector is still white, and if applicable, restock or dispose of blood products per protocol. See “Blood Products Return to Inventory”.

5 Emergency Blood Request Uncrossmatched Blood for Non-Trauma Cases

5.1 Once a physician order is given, responsible patient care staff calls the Blood Bank at (47611) to request emergency release blood products, provides the following information, and sends a runner to the Blood Bank.

- Patient’s Name and Medical Record Number
- Date of Birth
- Gender
- Requesting physician’s first and last name
- Patient location
- Nature of Emergency

5.1.1 The emergency release form must be signed by the requesting physician. The physician will sign the form when time permits.

5.1.2 If the patient’s ABO group is unknown or ABO/Rh has not been determined on a **current** sample, Group “O” red cells should be released.

5.1.3 Select products according to gender.
- One (1) set of four (4) O positive pRBC units, for male patients or females > 55 years old.
- One (1) set of four (4) O negative pRBC units, for female patients of childbearing age (≤ 55 years old).
- Immediately begin thawing 4 AB plasmas if current sample is not available.

***DO NOT*** select Rh positive RBCs for patients with a history of Anti-D and/or when Anti-D has been identified in the current sample***

5.1.4 When issuing more than 1 unit of rbc's at the same time (Ex: multiple units issued in a short amount of time, or plasma and/or platelets are requested at same time blood is being issued always assess the patient’s situation with the physician/nursing staff.

5.1.4.1 If patient appears to be critical ask “Do you want to initiate massive transfusion protocol?” If the answer is “yes”, begin preparing batches as outline in section 5.1.6.
- 5.1.4.1.1 For Obstetric patients, proceed to “Massive Transfusion Protocol for Obstetrics”.
- 5.1.4.1.2 For Pediatric patients, proceed to “Massive Transfusion Protocol, Junior (MTP JR)”.

5.1.4.2 If the answer is “no” or “not at this time” begin preparing blood/blood products as requested by physician.

5.1.5 In the event, the patient is placed on massive transfusion, Blood Bank will be responsible for entering orders in LIS. Cryoprecipitate will be prepared upon request.

5.1.6 Batches should be prepared within **20 minutes**.
- 6 units of pRBCs
- 6 units of plasma
- 1 plateletpheresis pack

*If cryoprecipitate has not been requested, Blood Bank should ask if needed to ensure cryoprecipitate is dispensed with subsequent batches.

5.1.7 In emergent situations, Emergency release products should not be issued via the pneumatic tube system.
- 5.1.7.1 Only clinical employees may pick up blood products

5.1.8 If it has been determined that blood products will not be needed, blood products should be promptly returned to the Blood Bank.
- 5.1.8.1 The Blood Bank will check product temperatures and, if applicable restock or dispose of blood products per protocol.

6 Upon issue of Emergency Release blood products, Blood Bank staff will:

6.1 comply with all blood supplier requirements for any products that must be transfused prior to completion of donor testing.

6.2 dispense all products in the LIS.
6.3 type, screen, and crossmatch the patient with the unit segments when a sample becomes available. Crossmatched red cell units should be ready for issue within **45 minutes** when there is a valid sample in the Blood Bank.

6.3.1 Begin using group-specific plasma when the patient’s ABO/Rh has been determined.

6.3.2 If an antibody (ies) is/are detected, red cells units must be tested for corresponding antigen and crossmatch testing performed through the antiglobulin phase to ensure confirmation of compatibility.

6.3.2.1 Enter the patient test results in the LIS.

6.3.3 Notify attending physician and BB Medical Director or Pathologist on call of any incompatibility discovered on completion of an incomplete crossmatch.

6.3.3.1 Documentation of notification is done by entering the call/date time, tech id of person placing the call, and name of attending physician or nursing staff under the appropriate accession number, called/date/time field in the LIS.

6.3.4 In massive transfusion situations where a large volume of O pRBCs has been transfused prior to collection of a patient sample, the decision to change back to the patient’s original ABO group will be based on the presence or absence of Anti-A and/or Anti-B in a current sample.

6.3.4.1 If there is any question about the patient’s true ABO group continue with group O red blood cells and group A plasma.

6.3.5 If a patient receives blood of a Rh type that is different from that of his or her own blood (i.e. massive transfusion), it may become difficult to determine the patient’s true Rh type once a sample is collected.

6.3.5.1 If there is any question about the patient’s true Rh type and the patient is a potential female of childbearing age, it may be prudent to administer Rh-negative blood.

7 Non-Emergency Medical Release of Blood Products

7.1 Occasionally, transfusion of RBCs may be necessary when no serologically compatible units are available for a patient. This most often occurs in patients with:

7.1.1 Serological problems with Autoantibodies that typically are reactive with cells from all donors (i.e. cold and warm-reactive autoantibodies).

7.1.2 HTLA (high titer low avidity) antibodies

7.2 Notify attending physician and Blood Bank Medical Director or designee of incompatibility discovered on completion of crossmatch.

7.3 When releasing positive donor units, the requesting physician must sign the “Emergency Release of Blood for Patients with Unidentified Antibody (ies)” form.
7.4 Contact Medical Director or Pathologist on call immediately after release of blood products.

7.5 Once a physician approval is given, Blood bank staff documents required information on the Blood Release form.
   - Patient name and medical record number
   - Requesting physician
   - Requested number of units
   - Nature of antibody problem and/or reason for transfusion of incompatible donor unit(s)
   - Blood product identification number(s)
   - ABO/Rh of patient
   - ABO/Rh of blood product(s)
   - Date/time blood product(s) issued/tubed
   - Signature of BB Technologist

7.6 Once Emergency Release form has been signed by physician, product(s) can be issue as needed via pneumatic tube station or picked up by clinical staff.

8 Review of Emergency Blood Release Forms

8.1 For blood products issued during emergent/crisis situations, Blood Bank staff is responsible for:
   - reviewing Emergency Release form(s) for completeness of documentation of all required information.
   - attaching the completed crossmatch reports to the Emergency Release of Blood Products form(s).
   - filing the paperwork in the Emergency Release folder.

8.2 Blood Bank Manager or designee should review emergency release forms for completeness of documentation and submit completed form to HIM for physician’s electronic signature within 5 days of physician’s verbal request, if indicated.
   8.2.1 Date of review/date submitted to HIM will be documented on the Emergency Release of Blood Products Review Log.

8.3 Blood Bank Manager or designee will review release forms for completeness of physician’s electronic-signature within 30 days of verbal request.

8.4 A copy of completed Emergency Release form(s) will be maintained in the Blood Bank.

9 Procedure Notes

9.1 This protocol is primarily for emergent provision of blood; occasionally, physicians must transfuse a patient for whom no serologically compatible donor units are available. Emergency Release-Unidentified Agglutinin(s) form should be used for these emergent situations.
9.2 Blood Bank Medical Director or Pathologist on call and the attending physician (or physician designee) must be notified of any incompatibility discovered upon completion of an incomplete crossmatch and/or the need to transfuse serologically incompatible donor units.

**LIS ENTRY OF RESULTS:**

10 Blood Bank Tech should place ALL Blood Bank orders during a CRISIS, Emergent or Massive Transfusion event.

10.1 The Blood Bank staff will enter orders for products in the LIS and select physician signature required.

10.2 Blood Bank staff should order a “massive transfusion” (Blood Bank orderable) and appropriately result, selecting physician signature required, if indicated.

10.3 The Blood Bank staff will place all subsequent product orders in LIS for the duration of the crisis or massive transfusion event.

10.4 Be sure to dispense uncrossmatched units in the Blood Bank computer system before entering results of compatibility testing.

**Laboratory RRC- BB Adult Massive Transfusion Protocol (MTP) PGR**

**DEFINITIONS:**

Exsanguinating hemorrhage is a major cause of death in trauma patients, it has been estimated that exsanguination accounts for >80% of deaths in the operating room and 50% of deaths in the first 24 hours after trauma.

**PURPOSE:**

A consistent method of expediting the preparation and issue of blood products for use in trauma patients experiencing massive hemorrhage whether in the Emergency department, Operating room, or Post-Trauma care unit (i.e. STICU).

The Blood Bank staff is responsible for

- Maintaining the levels of products outlined in this policy.
- Placing appropriate orders in the LIS so that the providing of products is not delayed.
- Preparing products for transfusion.
- Notifying patient care staff that products are ready for issue.
- Asking if subsequent batches are needed.
- Notifying pathologist on call as soon as time allows.

**SAFETY PRECAUTIONS:**
Standard safety precautions should be adhered to when handling blood and blood products.

**RESPONSIBLE POSITIONS (TITLE):**
Blood Bank Technicians/Technologists

**EQUIPMENT NEEDED:**
- Blood Storage Refrigerator
- Lexmark Printer
- Validated Coolers

**SPECIMEN REQUIREMENTS:**
See “Labeling and Collection of Specimens for Blood Bank”

**PROCEDURE STEPS:**

1. Two trauma bins (one Trauma Male, one Trauma Female) will be maintained in the Blood Bank at all times. Replace the blood units every Tuesday to maintain inventory control.

   1.1 Select the 6 freshest O Negative and O Positive pRBCs from the red cell inventory.
   - Six O, Rh Pos pRBCS (Trauma Male)
   - Six O, Rh Neg pRBCs (Trauma Female)
   - Six units A, Rh positive or Rh negative thawed plasma or *liquid plasma for Trauma Male and Trauma Female

   *If there is a shortage of group A or AB plasma, Blood Bank will substitute liquid plasma. Use of group A plasma or liquid plasma approved by the Blood Bank Medical Director and Trauma medical staff ONLY for use in adult trauma patients.

   1.2 Remove 2 segments from each pRBC product and label with the donor identification number and place them in the appropriate bag labeled “Trauma Segments”

      1.2.1 Apply labels on the front of each pRBC product and the Transfusion Report form. See Emergency Release of Blood Products PGR
      - UNCROSSEDMATCHED BLOOD
      - Blue dot to O Positive pRBCs only
      - Pink dot to O Negative pRBCs only

      1.2.2 Apply labels on the front of each plasma product and the Transfusion Report form. See Emergency Release of Blood Products PGR
      - ADULT TRAUMA USE ONLY
1.2.3 Apply a “Safe-T-Vue 10” temperature detector to the back of each product. See “Safe-T-Vue” PGR.

1.2.4 Attach each Transfusion Report form to its corresponding blood product and place the product sticker to the back of its corresponding unit.

1.2.5 Place the appropriate number of products for each set in a plastic ziplock bag.

1.2.6 Emergency Release of Blood Product forms
1.2.6.1 All information pertaining to the blood products in the trauma bins are to be completed when the trauma packs are prepared.
1.2.6.2 Complete a separate form for each set of products.
1.2.6.3 For each product, record the following information in the indicated section of a Transfusion Report form and on the Transfusion Report label:
   - Donor Unit numbers
   - Component name
   - Donor ABO/Rh
   - Expiration Date/Time
1.2.6.4 Preparing tech writes date/ their tech id number on the “Trauma” log.
1.2.6.5 A second Blood Bank tech verifies that the unit numbers match the unit numbers
   - in the “Trauma Segment” bag
   - listed on “Emergency Release” form(s).
   - listed on the Transfusion Report form(s).
1.2.6.6 Verifying tech writes date/ their tech id number on the “Trauma” log.
1.2.6.7 Place the completed form(s) in the appropriate designated binder.
1.2.6.8 Place products in the appropriate blood storage refrigerator.

2 Two apheresis platelet packs will be maintained in the Blood Bank at all times for trauma patients.

3 Trauma Alert is received by the Trauma Pager

4 A responsible party will be designated for initiating MTP when ordered by the physician. To activate the MTP in an adult trauma patient, the responsible party must call the Blood Bank and state “initiate massive transfusion protocol.” When the Blood Bank is called and the request is made to “initiate massive transfusion protocol,” the Blood Bank should perform a verbal order read back confirming “initiate massive transfusion protocol.”

Additional information to be relayed to the Blood Bank at the time of the request is:

4.1 Patient Name
4.2 Medical Record Number (MRN)
4.3 Current and future location of the patient
MTP must be activated separately from a request for Emergency Release blood and/or blood products.

The patient must be wearing a blood bank armband if applicable and there must be a current valid specimen for the crossmatch in the Blood Bank.

6.1 If a sample is not already available in the Blood bank, it is crucial that a properly labeled sample be collected on the patient and immediately delivered to the Blood Bank.

6.2 Type, screen, and crossmatch the patient with the unit segments from the appropriate trauma segment bag when a sample becomes available.

6.2.1 Begin using group-specific plasma when the patient’s ABO/Rh has been determined.

6.3 If any of the following conditions apply, RBC products will be issued according to Emergency Release of Blood Products PGR.

6.3.1 Pretransfusion testing has not been completed on a current valid patient sample.
   6.3.1.1 Continue to send Emergency Release Group O or Type Specific RBCs until type and crossmatched blood is available.
   6.3.1.2 **Do not release type specific blood until an ABO verification has been completed.**
   6.3.1.3 Perform ABO verification on an appropriate sample if needed.
   6.3.1.4 The decision to change back to the patient’s original ABO group will be based on the presence or absence of Anti-A and/or Anti-B in a current sample. See “Emergency Release of Blood Products”.

6.3.2 Pretransfusion testing has been completed on a current valid patient sample and the patient has a positive antibody screen.

6.3.3 The patient has a history of one or more clinically significant blood group antibodies.

6.4 Blood Bank staff will notify the physician and the Blood Bank Medical Director or Pathologist on call if 6.3 is applicable.

6.5 Blood Bank staff will initiate immediately, procurement and appropriate testing of products if the patient has a positive antibody screen or a history of a clinically significant antibody.

6.5.1 Issue of products for emergency transfusion will not be delayed in order to obtain antigen-tested products unless approved by the attending physician.
The Blood Bank staff will enter orders for products in the LIS and select physician signature required.

7.1 Blood Bank staff should order a “massive transfusion” (Blood Bank orderable) and appropriately result.

7.2 The Blood Bank staff will place all subsequent product orders in LIS for the duration of the MTP.

8 Once the MTP is activated, the Blood Bank personnel immediately will:

- Print appropriate patient ID chart label for trauma male or trauma female. See Job Aide for printing patient ID link label.
- Place appropriate patient ID chart label on Transfusion Report form and the product sticker on the back of its corresponding unit.
- Prepare trauma blood transport cooler
- Issue the 1st batch within 10 minutes of request; this includes all products within the batch.

8.1 Trauma Male
- 6 units of O Positive pRBCs
- 6 units of group A plasma
- plateletpheresis

8.2 Trauma Female
- 6 units of O Negative pRBCs
- 6 units of group A plasma
- 1 plateletpheresis

8.3 Blood Bank staff will maintain Blood Product Release slip(s) and Emergency Release of Blood Product form(s) to document actual times of dispense and transfusions.

8.3.1 Dispense 1st batch of blood products to the patient in the LIS immediately following release of blood products from the Blood Bank.

8.4 Blood Bank staff will access current inventory of red blood cells, platelets and cryoprecipitate.

8.4.1 If necessary, order additional red blood cells, platelets and cryoprecipitate to support ratio-based massive transfusion.

9 If there is a shortage of O red blood cells, Blood Bank will decrease 1st batch to:

- 2 group O red blood cells (O Pos for Trauma Male/O Neg for Trauma Female).
- 6 units of group A plasma
- 1 plateletpheresis

9.1 ED/OR staff will call the Blood Bank and request additional Emergency Release Blood products from the ED and/or OR Trauma refrigerators.

10 Subsequent batches (batch #2, 3,4,5,6 etc.) should be prepared and sequentially issued within 15 minutes:
10.1 6 units pRBCs
10.2 6 units of plasma (group-specific)
10.3 1 plateletpheresis
10.4 Cryoprecipitate will be sent with all **EVEN** numbered batches (batch 2, 4, 6, etc).
   10.4.1 Batch 2 will contain 10 units of cryoprecipitate, (equivalent to 2 pre-pooled packs).
   10.4.2 Subsequent **EVEN** numbered batches (starting with #4) will contain 5 units of cryoprecipitate, (equivalent to 1 pre-pooled pack).

11 Blood Bank staff will notify the physician if the blood products differ from the requested MTP batch.

12 As each batch is issued, ask the physician/designee if another batch needs to be prepared.

13 After 10 units of red blood cells are transfused, the crossmatch may be omitted. See Compatibility Testing Following Massive Transfusion.

14 If the physician deems necessary, the ratio-driven massive transfusion may be upgraded or downgraded based on the laboratory findings if the acute exsanguination is still active or under control.

   14.1 When applicable, the physician or their designee will notify the Blood Bank.

15 Blood products are transported and stored in designated Blood Bank transport coolers until administered or returned to the Blood Bank. MTP coolers will be validated and stored in the Blood Bank.

   15.1 RBCs and plasma will be transported inside the cooler on ice. Platelets and cryoprecipitate will be stored and transported in a pouch attached to the outside of the cooler. Platelets and cryoprecipitate are **NOT** to be placed inside the cooler at any time.

   15.2 All unused products and coolers should be returned to the Blood Bank promptly to avoid waste.

   15.3 The Blood Bank will check product temperature and, if applicable, restock or dispose of blood products per protocol.

16 The Blood Bank staff will continue to prepare and issue subsequent batches until the Attending Physician or their designee notifies the Blood Bank to stop preparing units.

17 The Attending Physician or their designee will call the Blood Bank and state, “discontinue massive transfusion protocol.” Additional information to be relayed to the Blood Bank at the time of discontinuation is:

   17.1 Patient name
17.2 Medical Record Number (MRN)
17.3 Current location of the patient

18 The MTP is valid for the 3 days that the original crossmatch specimen is valid. After the original specimen expires, a new specimen must be collected and fully tested.

18.1 The Blood bank staff will notify patient care personnel when a new sample must be collected.

19 All products must be dispensed to the patient in the LIS.

19.1 Attach the completed crossmatch reports to the Emergency Release of Blood Products form and file the paperwork in the Emergency Release folder.

20 Procedure Notes

20.1 Massive Transfusion is defined as infusion of a volume of blood approaching or exceeding replacement of the recipient's total blood volume. In an adult, it would be 8 to 10 or more units in less than 24 hours or as the acute administration of 4 to 5 units in 1 hour. Exchange transfusion of an infant is also considered a massive transfusion. This may occur unexpectedly in surgical and medical emergencies.

20.2 This protocol applies only to those trauma patients who are under the direct care of a trauma physician / surgeon. This protocol is NOT for emergency release blood in non-massive transfusion situations or to be used as a general surgery procedure.

20.3 The routine use of group A plasma or liquid plasma approved by the Blood Bank Medical Director and Trauma medical staff ONLY for use in adult trauma patients.

20.4 For massive transfusion other than trauma patients, Refer to Emergency Release Blood Products PGR, section 4.

LIS ENTRY OF RESULTS:

21 Blood Bank Tech should place ALL Blood Bank orders during a CRISIS, Emergent or Massive Transfusion event.

21.1 The Blood Bank staff will enter orders for products in the LIS and select physician signature required.

21.2 Blood Bank staff should order a “massive transfusion” (Blood Bank orderable) and appropriately result, selecting physician signature required.

21.3 The Blood Bank staff will place all subsequent product orders in LIS for the duration of the crisis or massive transfusion event.
21.4 Be sure to dispense uncrossmatched units in the Blood Bank computer system before entering results of compatibility testing.

**Picking Up Blood Components From Blood Bank**

1). **IN PERSON**

Blood will be released to representatives of the nursing units who present a “Form for Picking Up Products from the Blood Bank”. This form is stamped with the patient’s addressograph and the product needed.

ONE CARRIER WILL BE ALLOWED TO PICKUP BLOOD PRODUCTS FOR ONE PATIENT AT A TIME. Refer to Appendix for form example.

2). **VIA PNEUMATIC TUBE SYSTEM:**

To provide blood products in a timely efficient manner without requiring nursing to leave unit.

Blood will be released to the units upon receiving a properly filled out “Form for Picking Up Products in the Blood Bank: through the tube system. Refer to Appendix for form example.

Release Form will have:

a. Name of patient
b. Medical Record Number
c. Requesting unit location and phone number
d. Product requested, number required, special instructions (irradiate, etc.)
e. Name of person that will accept product from tube system
f. Signature of nurse administering the product

Blood Bank will:

a. Get form from tube system
b. Select appropriate units
c. Compare information on units and form with another person using standard issue protocol with verbal callback
d. Place product in sealed biohazard plastic bag (must not be sealed without removing most of air first)
e. Call person designated on form to accept product and notify them to wait at tube station for product.

Blood Bank will then go to tube station and complete section for released date, time and initials of issuing tech on the Release Form. Form will be tucked in outer flap of plastic bag. Product will be tubed immediately.

Person in nursing unit accepting product from tube system will:

a. Check name and product/products
b. Note on form number of products received. Multiple products will be sent one after the other.
c. Note time last product received
d. Note their name on Release Form
e. Immediately send completed form back in tube system

Blood Bank tech will expect return of form within 15 minutes.

**Failure to do this in a prompt manner may result in loss of tube privileges for that floor.**

Blood Bank tech will note time form returned via tube system on log. Completed Release Form will be stored in Blood Bank.

**NOTE:** If a product is lost in tube system, contact Engineering Services immediately!! Notify Blood Bank of product status.

**Return of Blood Products to Blood Bank from Nursing Units**

If a blood product cannot be infused, for any reason, it must be returned to the Blood Bank ASAP, (within 15-30 minutes) of the time it was issued. DO NOT store blood products in refrigerators on the nursing units. Blood products must be kept within strict temperature ranges in a monitored refrigerator for patient safety. Blood that has been warmed **cannot** be returned for re-issue.

**Identification of the Patient before Starting Transfusion**

Accurate identification of the donor’s blood and the intended recipient may be the single most important step in insuring transfusion safety. Most fatal hemolytic transfusion reactions occur because ABO-incompatible blood was inadvertently administered. **Strict adherence to the following steps is required:**

It is necessary for two people to verify the patient identification information at the patient’s bedside.

The following information should be checked:
1. the patient’s full name
2. the patient’s medical record number
3. the Fenwal Typenex Armband number, if applicable
4. the donor unit number
5. the ABO/RH type listed
6. the expiration date of the product
7. color and appearance of blood bag

All these items must agree on the Blood Transfusion Record, the Compatibility Sticker, and the patient’s armband.
If there is a discrepancy, **DO NOT** transfuse the blood product. Return it immediately to the Blood Bank.

The transfusion of one red cell unit should be accomplished within 2-4 hours. If the units are not completely transfused within 4 hours, discontinue the transfusion. The blood units provide an excellent growth medium for bacteria and extending the transfusion time greater than 4 hours is
not safe. If a longer transfusion time is necessary due to the patient’s condition, the blood unit may be divided by the Blood Bank personnel and the two halves transfused for up to four hours each.

**Infusion of Blood and Blood Components**

Each transfusion area should have its own protocol for patient preparation, etc. for infusion in addition to these notes.

All blood and blood components must be given through an administration set with a filter. The choice of sets and filters is the responsibility of nursing service.

Nursing should also check:

a. vital signs  
b. check the chart or with the Blood Bank for the need of warming coils  
c. recheck orders to make sure the proper products are being given (i.e. Autologous, Directed-Donors. Autologous units are specially marked with green stickers, Directed –Donor units are specially marked with yellow tag).  
d. Verify physician order to transfuse  
e. **CAREFULLY FOLLOW PATIENT IDENTIFICATION PROCEDURES ABOVE BEFORE STARTING TRANSFUSION**

**After the Transfusion**

The Transfusion Record should be completed and placed on the patient’s chart.

Empty blood product bags are to be disposed of on the nursing units according to established policy.

**Transfusion Reaction Investigation**

It is the responsibility of the transfusionist to observe the patient for signs or symptoms of transfusion reactions. There are many different types of transfusion reactions possible:

1. Immediate reactions  
   a. Hemolytic symptoms include pain in the lumbar region of the back or along the arm where blood is being administered, rapid elevation of temperature and pulse, chills, flushing of skin, nausea, vomiting and occasional blood pressure drop. Blood in the urine and oozing from wounds may also be observed.  
   b. Febrile symptoms include rise in temperature (greater than 3 degrees F) chills.  
   c. Allergic reaction symptoms include rash, itching and flushing of the skin. These are the only symptoms that transfusion may be continued (after the administration of antihistamines) with the physicians orders.

2. Delayed reactions: incompatible transfusions may manifest themselves after several days by the appearance of jaundice and increasing anemia with or without other clinical symptoms. If this is suspected contact the blood bank immediately.

If a transfusion reaction is suspected follow the directions on the back of the Transfusion Record attached to the product. Refer to Nursing “Administration of Blood/Blood Products” PGR for
more details.

**Holding Blood for Patients**

A Physician’s order to “keep units ahead/on hold” must be entered into the computer system including the number of blood products to be kept on hold. Blood Bank personnel will be in close communication with the nurse taking care of the patient to ensure the appropriate number of blood products are maintained in the Blood Bank.

**Determining if Blood Products are in Blood Bank**

Crossmatched units will remain allocated to the patient for 3 days. After 3 days, the products are released for use as needed by other patients. A new sample is needed for compatibility testing. The day of sample draw is day 0.

**Circular of Information (American Red Cross)**

The current circular of information from the ARC on the use of human blood and blood components is posted on the MYPAL (MyPal/myCampus/Richland/Laboratory Services/Laboratory Manual). This circular is to be available for the physicians and transfusionist. The circular is prepared by the American Red Cross and the American Association of Blood Banks. It has the approval of the Center of Biologics Evaluation and Research, Food and Drug Administration, and is consistent with the use of uniform labeling.

A list of Blood Components and the indications for transfusion are also in the packet. This list describes the component, the composition of each component, the approximate volume, and the indication for transfusion in an abbreviated form. Please see appendix for the list.

**GLUCOSE TOLERANCE TESTING**

**CCH2.402.08 Oral Glucose Tolerance Test**

1.0 **Principle**

1.1 The oral glucose tolerance test (OGTT) is a serial measurement of glucose before and after a specific amount of glucose is given orally.

1.2 The OGTT should be scheduled to begin in the morning as glucose tolerance exhibits a diurnal rhythm with a significant decrease in the afternoon.

1.3 The 2 hour Glucose Tolerance Test (Non-Pregnant Patients)

1.3.1 Identifies non-pregnant patients with either Impaired Fasting Glucose (IFG) or Impaired Glucose Tolerance (IGT) and includes:

1.3.1.1 Fasting Glucose

1.3.1.2 2 Hour Glucose
1.3.2 In the absence of unequivocal hyperglycemia, a positive 2 hour OGTT should be confirmed on a subsequent day with

1.3.2.1 A Fasting Plasma Glucose (FPG)
1.3.2.2 A Casual Plasma Glucose or
1.3.2.3 2 hour OGTT

1.3.3 The standard dose for children is 1.75 grams of glucose per kilogram of body weight, to a maximum dose of 75 grams.

1.3.4 In some instances physicians will request a 3, 4 and 5 hour Glucose Tolerance in non-pregnant patients.

1.3.4.1 The ADA (American Diabetes Association) provides no recommended reference ranges for the 3rd, 4th and 5th hours.

1.4 The 3 hour Glucose Tolerance Test (Pregnant patients)

1.4.1 The One-Step strategy for diagnosis of Gestational Diabetes Mellitus (GDM).

1.4.1.1 Refer to Gestational Diabetes Mellitus Screen Procedure for Two-Step strategy.

1.4.2 Includes:
1.4.2.1 Fasting Glucose
1.4.2.2 1 Hour Glucose
1.4.2.3 2 Hour Glucose
1.4.2.4 3 Hour Glucose

2.0 Definitions

2.1 Fasting: No caloric intake >/= 8 hours

2.2 Gestational Diabetes Mellitus: glucose intolerance with onset or first recognition during pregnancy.

2.2.1 Diabetic women who become pregnant are not included in this category.

2.3 Diabetes Mellitus: a group of metabolic disorders of carbohydrate metabolism in which glucose is underutilized, producing hyperglycemia.

2.4 Type 1 diabetes: due to β-cell destruction, usually leading to absolute insulin deficiency.

2.5 Type 2 diabetes: due to a progressive insulin secretory defect on the background of insulin resistance.

3.0 Instructions for Patient

3.1 Medications known to affect glucose tolerance should be stopped by patient's physician at least 3 days prior to test.

3.2 Testing should be performed between the hours of 0700 and 0900.

3.3 Perform after 3 days of unrestricted diet (containing at least 150 g of carbohydrate/day) and activity.

3.4 Perform the test after an 8-14 hour fast in ambulatory subjects.

3.5 Testing should not be performed on hospitalized, acutely ill, or inactive individuals.

3.6 During test the Patient should:

3.6.1 Remain seated
3.6.2 Not smoke cigarettes
3.6.1 Not eat (water is allowed).
3.6.2 Avoid physical exertion, emotional stress, and stimulants such as tobacco, alcohol, coffee and tea

4.0 Specimen
4.1 Specimen should be centrifuged to separate immediately as glucose level decreases rapidly in whole blood.
4.2 Lithium heparin plasma from a venous collection should be used.
4.3 Capillary specimens are not recommended.
4.4 The specimen type and collection container should remain constant throughout the test.

5.0 Required Supplies
5.1 Two Hour Glucose Tolerance (Non-Pregnant Patient)
   5.1.1 Glucola 75g bottle
      5.1.1.1 See 6.3.3 for pediatric patient
   5.1.2 Venipuncture supplies
5.2 3 Hour Glucose Tolerance (Pregnant Patient)
   5.2.1 Glucola 100g bottle
   5.2.2 Venipuncture equipment

6.0 Procedure
6.1 Identify patients following lab procedure PH1.006
6.2 2 Hour Glucose Tolerance orders:
   6.2.1 Verify that the patient is NOT pregnant.
6.3 3 Hour Glucose Tolerance orders:
   6.3.1 Verify that the patient IS pregnant.
6.4 Determine the age of the patient.
6.5 Perform venipuncture to obtain fasting glucose specimen in a Lithium Heparin green top tube.
6.6 Give patient proper amount of chilled Glucola.
6.6.1 Non-Pregnant Adults: 75g (whole bottle of 75g)
6.6.2 Pregnant Adult Female: 100g (whole bottle of 100g)
6.6.3 Pediatric patients and patients less than 83 lbs:
   6.6.3.1 The correct dosage of Glucola is 1.75 grams of glucose per kg of body weight and is calculated as follows:
      6.6.3.1.1 Find the weight of the child in pounds (lbs).
      6.6.3.1.2 Convert lbs to kgs by dividing lbs by 2.2 (2.2 lbs = 1 kg)
      6.6.3.1.3 Calculate dosage by multiplying body weight in kg X 1.75
      6.6.3.1.4 Convert grams of glucose to Ounces by dividing by 10
      Example: 35 lb child
            35 lb divided by 2.2 = 15.9 kg
            15.9 kg body weight x 1.75 grams glucose = 28 grams glucose
            28 grams divided by 10 = 2.8 ounces Glucola
   6.6.3.2 DO NOT EXCEED ONE 75g BOTTLE
6.7 Document the time the patient takes the first swallow
6.7.1 The patient should drink the full amount within 5 minutes of starting to drink.
6.7.2 Write proper collections times down on labels
   6.7.2.1 1 hour: 1 hour from 1\textsuperscript{st} swallow of glucola
   6.7.2.2 2 hour: 2\textsuperscript{nd} hour from 1\textsuperscript{st} swallow of glucola
   6.7.2.3 3 hour: 3\textsuperscript{rd}, 4\textsuperscript{th}, or 5\textsuperscript{th} hour from 1\textsuperscript{st} swallow of glucola
6.8 Collect the next glucose specimens at the appropriate time and label per policy L03.005.
6.9 Centrifuge specimen promptly.

7.0 Safety Precautions
7.1 If during testing patient suffers nausea, fainting, sweating or other symptoms, the pathologist on Clinical is to be notified immediately.
7.2 Test will be discontinued after physician is consulted if needed.
7.3 In the case that the tolerance is canceled, patient may need to be given something to eat or drink before leaving the lab.

8.0 PathNet Entry of Results
8.1 Refer to CG.404 \textit{PathNet Entry of Result}

9.0 Reference Ranges

9.1 2 Hour Glucose Tolerance

Fasting
   70-99 mg/dL Normal
   100-125 mg/dL Increased Risk for Diabetes
   \(\geq\) 126 mg/dL Provisional Diagnosis of Diabetes

2 Hour Glucose
   70-139 mg/dL Normal
   140-199 mg/dL Increased Risk for Diabetes
   \(\geq\) 200 mg/dL Provisional Diagnosis of Diabetes

9.2 4 Hour Tolerance

Fasting
   70-99 mg/dL Normal
   100-125 mg/dL Increased Risk for Diabetes
   \(\geq\) 126 mg/dL Provisional Diagnosis of Diabetes

2 Hour Glucose
   70-139 mg/dL Normal
   140-199 mg/dL Increased Risk for Diabetes
   \(\geq\) 200 mg/dL Provisional Diagnosis of Diabetes

3 Hour Glucose Tolerance \(\text{(mg/dL)}\) \textit{No Reference Ranges per ADA guidelines}

4 Hour Glucose Tolerance \(\text{(mg/dL)}\) \textit{No Reference Ranges per ADA guidelines}

9.3 5 Hour Tolerance

Fasting
   70-99 mg/dL Normal
100-125 mg/dL Increased Risk for Diabetes
\( \geq 126 \) mg/dL Provisional Diagnosis of Diabetes

2 Hour Glucose
70-139 mg/dL Normal
140-199 mg/dL Increased Risk for Diabetes
\( \geq 200 \) mg/dL Provisional Diagnosis of Diabetes

3 Hour Glucose Tolerance (mg/dL) No Reference Ranges per ADA guidelines

4 Hour Glucose Tolerance (mg/dL) No Reference Ranges per ADA guidelines

5 Hour Glucose Tolerance (mg/dL) No Reference Ranges per ADA guidelines

9.2 3 Hour Glucose Tolerance (Gestational Diabetes)
The diagnosis of GDM is made if at least two of the following four plasma glucose levels are met or exceeded:

Fasting 95 mg/dL
1 Hour Glucose 180 mg/dL
2 Hour Glucose 155 mg/dL
3 Hour Glucose 140 mg/dL

10.0 Critical Values

10.1 All Ages: Less Than or Equal to 40 mg/dL
10.2 Age 0-60 days: >200 mg/dL
10.3 Age 61 days to 18 years: >399 mg/dL
10.4 Age >18 years: >500 mg/dL

11.0 Related Documents

11.1 L03.003 Collection Process
11.3 CCH2.401 Gestational Diabetes Screen

CCH2.401.05 Gestational Diabetes Screen (GDS)

1.0 Purpose

1.1 The Two-Step strategy for screening for Gestational Diabetes Mellitus is performed by glucose measurement in plasma 1 hour after a 50 gram oral glucose load administered without regard to the time of day or last meal (nonfasting).
1.2 Screening should be performed between 24 and 28 weeks of gestation on all pregnant women not known to have prior diabetes.
1.3 A positive result should be confirmed with a 3 hour glucose tolerance test performed on a subsequent day (Step two of the Two-Step strategy).
1.4 Gestational diabetes is associated with an increased incidence of congenital malformations and complications of pregnancy.
2.0 Definitions

2.1 Gestational Diabetes Mellitus: glucose intolerance with onset or first recognition during pregnancy.

2.1.1 Diabetic women who become pregnant are not included in this category.

3.0 Specimen

3.1 Lithium heparin plasma from a venous collection should be used.

4.0 Patient Instructions

4.1 Patient is not to eat before and during testing.

4.2 Patient should avoid:

4.2.1 Physical exertion

4.2.2 Emotional stress

4.2.3 Stimulants such as tobacco, alcohol, coffee, tea during testing.

5.0 Required Equipment

5.1 Glucola, 50g bottle

5.2 Venipuncture equipment

6.0 Procedure

6.1 Identify patient following procedure LO3.003

6.2 Give patient 50 grams of Glucola to drink.

6.3 Timing starts with the first swallow and the patient should drink the full amount within 5 minutes of starting to drink.

6.4 Write proper collection time for 1 hour specimen on label.

6.5 Draw the 1 hr glucose 1 hour after the first swallow of glucola.

6.6 Label specimen following policy LO3.003

6.7 Glucose levels decrease rapidly in whole blood.

6.7.1 Samples should be centrifuged promptly to avoid decreasing glucose levels.

6.8 Sample once received is given to Chemistry Department.

7.0 Safety

7.1 If during testing patient suffers nausea, fainting, sweating or other symptoms, the pathologist on “Clinicals” should be notified immediately.

7.2 Test will be discontinued after the ordering physician is consulted.

7.3 The patient should be given something to eat or drink before leaving the lab.

8.0 Reference Range

8.1 Glucose Gestational Screen:
8.1.1 1 Hour: For values \( \geq 140 \text{ mg/dL} \) the American Diabetes Association (ADA) recommends a 100g Oral Glucose Tolerance Test.

9.0 Critical Value

9.1 \( \leq 40 \text{ mg/dL} \)
9.2 \( \geq 501 \text{ mg/dL} \)

**CCH2.403.07 Two Hour Post Prandial Glucose**

1.0 Principle

1.1 The two hour postprandial blood sugar is a test which measures the body's ability to metabolize carbohydrates and produce insulin.
1.2 This test is administered two hours following a meal to
   1.2.1 Screen for diabetes
   1.2.2 To diagnosis diabetes
   1.2.3 To aim to reduce A1C levels.
   1.2.4 To evaluate the effectiveness of medication or dietary therapy in those already diagnosed with diabetes
1.3 Other conditions which may result in an elevated result include
   1.3.1 Pancreatitis
   1.3.2 Cushing's syndrome
   1.3.3 Liver or kidney disease
   1.3.4 Eclampsia
   1.3.5 Other chronic and acute illnesses.
1.4 A lab result below the normal range can indicate problems such as
   1.4.1 Reactive hypoglycemia
   1.4.2 Renal or hepatic insufficiency
   1.4.3 Hypopituitarism
   1.4.4 Malabsorption syndrome

2.0 Definitions:

2.1 Postprandial: 1–2 h after the beginning of the meal, generally peak levels in patients with diabetes.

3.0 Special Patient Instructions

3.1 Patient should eat a normal meal.

4.0 Specimen

4.1 Lithium heparin plasma from a venous collection should be used.
4.2 Centrifuge to separate immediately as glucose level decreases rapidly in whole blood.
4.3 Capillary specimens are not recommended.
4.4 The specimen type and collection container should remain constant throughout the test.
5.0 Procedure

5.1 Identify patient per procedure L03.003
5.2 Label properly per procedure L03.003
5.3 Samples should be centrifuged promptly to avoid decreasing glucose levels.

6.0 Performance Specifications

6.1 The American Diabetes Association recommended glycemic goals for postprandial glucose are as follows:
   6.1.1 Less than or equal to 180 mg/dL for Non-Pregnant Adults with Diabetes
   6.1.2 More or less stringent glycemic goals may be appropriate for individual patients.

6.2 Critical Values
   6.2.1 Less than or equal to 40 mg/dL
   6.2.2 Age 0-60 days greater than 200 mg/dL
   6.2.3 Age 61 days to 18 years old greater than 399
   6.2.4 Age 18 years and older greater than 500 mg/dL

MICROBIOLOGY SPECIMENS

Culture Handling M1.027.07

1.0 PURPOSE AND/OR PRINCIPLE
   Many species of bacteria are vulnerable to delays in processing, temperature changes and decreased moisture. If transport is delayed, rapidly growing bacteria may overgrow more fastidious pathogens. If a delay is anticipated, or if cultures are sent from outpatient sources transport media should be used. Dry swabs are unacceptable. It is important that culture specimens be processed as soon as possible after collection, preferably within 2 hours.

1.1 ALL SPECIMENS SHOULD BE DELIVERED PROMPTLY TO THE LAB TO ENSURE MINIMUM DELAY AND PROMPT PROCESSING.

1.2 FOLLOW STANDARD PRECAUTIONS. TREAT ALL SPECIMENS AS IF THEY ARE POTENTIALLY HAZARDOUS.

2. TRANSPORTATION of Microbiology specimens

2.1 All specimens must be promptly delivered to the lab, within 2 hours of collection. If specimen processing is delayed please follow the guidelines in this procedure for storage. These conditions should be followed for transport by courier.

2.2 Do not store specimens for bacterial culture for more than 24 hours.

2.3 Viruses usually remain stable for 2 to 3 days at 4°C. It is optimal to transport in viral transport media.
2.4 Optimal transport of clinical specimens, including anaerobic cultures, depends primarily on the volume of material collected.

2.4.1 Small amounts of specimens should be submitted to the lab within 15 to 30 minutes.
2.4.2 Tissue from biopsies may be held for up to 24 hours, if stored at 25°C in an anaerobic transport system.

2.5 Environmentally sensitive organisms include:
2.5.1 Shigella spp. which should be processed immediately.
2.5.2 N. gonorrhoeae, Neisseria meningitidis and Haemophilus influenzae which are sensitive to cold temperatures.
2.5.3 Never refrigerate spinal fluid, genital, eye or internal ear specimens or specimens suspected of containing these agents.

2.6 The integrity of the specimens must be maintained during transportation. If for some reason there is a delay in transport, (2 hours or greater) specimens should be handled in the following manner:

<table>
<thead>
<tr>
<th>Refrigerate</th>
<th>Leave at room temp</th>
<th>Frozen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urines</td>
<td>Spinal fluids</td>
<td>Serum for serologic studies (-20)</td>
</tr>
<tr>
<td>Respiratory exudates</td>
<td>Body fluids</td>
<td>Tissue for long term storage(-20)</td>
</tr>
<tr>
<td>Wounds</td>
<td>Blood specimens</td>
<td></td>
</tr>
<tr>
<td>Stools</td>
<td>Genital/cervical for gonococcus</td>
<td></td>
</tr>
<tr>
<td>Bronchial wash</td>
<td>All other sources</td>
<td></td>
</tr>
<tr>
<td>Lung biopsy material</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Viral cultures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.7 Cultures for gonorrhoeae should be placed directly on transport media and held at room temp. Microbiology supplies transport media to the floors for samples to be inoculated immediately.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.8 Transport media should be used for the collection of exudates.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.9 Liquid stools should be placed in a preservative if not brought down in one hour.</td>
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</tr>
</tbody>
</table>

**Specimen Collection for Microbiology M1.026.07**

1.0 PURPOSE AND/OR PRINCIPLE

Generally, a report from the microbiology laboratory can indicate only what has been found by microscopic and cultural examination. An etiologic diagnosis is thus confirmed or denied. Failure to isolate the causative organism may be due to faulty collecting or transport technique. Also contaminants or normal microbiota maybe recovered, which may lead to improper treatment of the patient. There are general considerations regarding collection.

1.1 When possible, specimens should be obtained before antimicrobial agents have been administered.
1.2 Select the correct anatomic site from which to obtain the specimen. The specimen should be collected where the suspected organism is most likely to
be found, with as little external contamination as possible. All mucosal surfaces and skin have indigenous flora. Patients may acquire a transient flora or become colonized for extended periods with potential pathogens from the hospital environment. The skin surface should be cleansed with a germicide using enough friction for mechanical cleansing.

1.3 Culture only for a specific pathogen.
1.4 The stage of the disease is an important contributing factor.
1.5 Patients need to be given full instructions when participating actively in collection. Collect the specimens using the proper technique and supplies.
1.6 Specimens should be of a sufficient quantity. Inadequate amounts of specimen may yield false-negative results.
1.7 Prompt delivery is a must.
1.8 Collect specimens in sturdy, sterile, screw-cap, leak-proof containers with lids that do not create an aerosol when opened.
1.9 Clearly label the specimen container with the patient’s name and identification number and with the date and time of collection and source.
1.10 Transport all specimens to the laboratory promptly to ensure the survival and isolation of fastidious organisms and to prevent overgrowth by more hardy bacteria. Rapid transport is necessary to shorten the duration of specimen contact with some local anesthetics used in collection procedures that may have antibacterial activity.

4.0 Specific Instruction per Specimen Type:

2.1 **BLOOD**: The method of collection and the amount of blood drawn directly influence the success of recovery of isolates and the interpretation of results. There is no difference in yield whether blood samples obtained during a 24hr period were drawn simultaneously or at spaced intervals (usually 15 minutes apart). Most cases of bacteremia are detected by using 3 sets of separately collected blood cultures. More than three sets of blood cultures yield little additional information. Conversely, a single blood culture may miss intermittently occurring bacteremia and make it difficult to interpret the clinical significance of certain isolated organisms.

2.1.1 Acute sepsis, meningitis, osteomyelitis, arthritis, pneumonia
Collect two or three cultures from separately prepared sites prior to starting therapy.

2.1.2 Endocarditis

2.1.2.1 Acute: Obtain three sets of blood cultures with three separated Venipunctures over 1 to 2 hr, and begin therapy.

2.1.2.2 Subacute: Obtain 3 blood cultures in 24 hours. Collect two at start of fever spikes. Collect three more if the first three are negative after 24 hours.

2.1.2.3 Antimicrobial therapy 1 to 2 weeks before admission obtain 2 separate blood cultures on each of 3 successive days.

2.1.3 Fever of unknown origin: Obtain 2 separate blood cultures at least 1 hr apart. If these are negative, then 24 to 36 hr later, obtain two more Blood cultures 1 hr apart. The yield of information beyond 4 cultures is usually minimal.

2.1.4 Younger children: 1 to 2mL samples. Two cultures are usually
2.1.5 Low-grade intravascular infection: Three cultures in 24 hours. Space collections at least 1 hour apart. Collect two at first sign of febrile episode.

2.1.6 Collection of blood through a peripheral or indwelling central venous catheter is often fraught with error because of contamination by commensal flora. Culture results for blood from catheter collection need accompanying results for a venous-collected specimen to aid in interpretation.

2.1.7 See the blood culture processing procedure for collection instructions.

2.1.8 No more than 3 sets of cultures are accepted in a 24 hour period.

2.2 Cerebrospinal Fluid: Obtain specimen under conditions of strict asepsis. The skin should be disinfected with iodine. Specimens of at least 2mL should be placed in sterile containers. Bring to lab immediately. Store at 35°C if not set up immediately. DO NOT REFRIGERATE

2.2.1 1 - 5 mL recommended volume for culture.

2.2.2 CSF- Lumbar puncture or reservoir fluid

2.2.3 Draw CSF at L3 to L4 or lower to avoid spinal cord damage.

2.2.4 Draw up at L4 to L5 in children because the conus medullaris extends lower in children than in adults.

2.2.5 Bacteria - require 1 mL send cloudiest specimen to Micro Immediately. Tube 2 is preferred.

2.2.6 Fungi- recommend 2 mL

2.2.7 Mycobacteria - recommend 2 mL

2.2.8 Aspirates of brain abcess or a biopsy may be necessary to detect anaerobic bacteria or parasites.

2.3 Pleural-Thoracentesis Fluid: Fluid accumulation may cause pain, dyspnea, and other symptoms of pressure. With (congestive heart failure) transudative effusions may issue from the heart or kidneys or may be the result of vascular disease; exudative effusions are associated with inflammatory conditions such as parapneumonia and tuberculous emphysema. Fluid can also be associated with lung infections.

2.3.1 Obtain specimens under conditions of strict asepsis.

2.3.2 The skin should be disinfected with iodine.

2.3.3 An aspirate of 10mL of chest fluid is optimum.

2.3.4 Specimens of at least 2mL should be placed in sterile containers.

2.3.5 Bring to lab immediately. Do not refrigerate.

2.4 Cellulitis:

2.4.1 Cleanse area, aspirate area of maximum inflammation with fine Needle and syringe.

2.4.2 Draw small amount of sterile saline into the syringe and aspirate into a sterile screw-cap tube.

2.4.3 Send to the lab immediately.

2.5 Decubitus Ulcer:

2.5.1 Cleanse the surface with sterile saline.
2.5.2 If a biopsy sample is not available aspirate inflammatory material from the base of the ulcer.
2.5.4 Decubitus swab provides little clinical information. The collection of this sample should be discouraged.
2.5.5 Tissue biopsy sample or needle aspirate is the specimen of choice.
2.5.6 A swab specimen is not the specimen of choice.

2.6 **Dental Culture:** Gingival, periodontal, periapical, Vincent’s stomatitis
2.6.1 Carefully cleanse gingival margin and supragingival tooth surface to remove saliva, debris and plaque.
2.6.2 Using periodontal scaler, carefully remove subgingival lesion material and transfer it to anaerobic transport system.

2.7 **Ear:** Inner- Tympanocentesis is reserved for complicated, recurrent, or chronic persistent otitis media.
2.7.1 For intact ear drums, clean ear canal with soap solution, and collect fluid via syringe aspiration technique.
2.7.2 For ruptured ear drums, collect fluid on flexible shaft swab via auditory speculum. (aerobic culture only)
2.7.3 Deliver to the lab immediately or store at room temperature.
2.7.4 Outer ear: Use moistened swab to remove any debris or crust from the ear canal. Obtain sample by firmly rotating swab in outer canal. Bring to the lab immediately if necessary store at 4°C.
2.7.5 For otitis externa, vigorous swabbing is required because surface swabbing may miss streptococcal cellulitis.
2.7.6 Smears are not performed on these samples.

2.8 **Respiratory tract**
2.8.1 Lower (BAL, BBW, and tracheal aspirate). Lower respiratory specimens include bronchoalveolar lavage, bronchial brushings, tracheal aspirate and transbronchial biopsy specimens.
2.8.2 Place specimens in sterile tightly capped containers.
2.8.3 Place brush in sterile container with saline.
2.8.4 Collect >1mL of sample.
2.8.5 BAL 40 to 80 mL of fluid is needed for quantitative analysis.
2.8.6 Usually collected by respiratory therapy.

2.9 **Sputum**
2.9.1 Collect specimen resulting from a deep cough.
2.9.2 The mouth should be rinsed with water or gargle immediately before the sample is collected (this is to reduce number of contaminating bacteria).
2.9.3 Induced specimens or transtracheal aspirates are recommended for adult patients who cannot produce sputum and pediatric patients.
2.9.4 Do not collect saliva.
2.9.5 Do not collect 24 hour specimens.
2.9.6 Place in sterile container. Close tightly and bring to laboratory as soon as possible.
2.9.7 Unacceptable sputum specimens will be rejected and the floors are asked to recollect within a time frame.
2.9.8  Best specimen should have <= 10 squamous cells/LPF fields.

2.10  **Upper Respiratory tract**

2.10.1  Oral- Remove oral secretions or debris from surface of lesion with swab, and discard.

2.10.1.1  Using a second swab vigorously sample lesion, avoiding any areas of normal tissue.

2.10.2  Nasal- Use swab premoistened with sterile saline. Insert ~ 2cm into nares.

2.10.2.1  Rotate swab against nasal mucosa.

2.10.2.2  Anterior nose cultures are reserved for detecting staphylococcal and streptococcal carriers or for nasal lesions.

2.10.3  Nasopharyngeal specimens should be obtained with a Dacron, cotton, or calcium alginate swab on a flexible wire which is gently passed through the nose into the nasopharynx, rotated, removed, and inoculate directly to media or place into a suitable transport medium for isolation.

2.10.3.1  Do not use calcium alginate swabs for RSV testing.

2.10.4  **Throat:**  Tongue should be depressed with a tongue blade or spoon to minimize contamination of swab with oral secretions which may dilute, overgrow, or inhibit the growth of pharyngeal flora.

2.10.4.1  Obtain cultures under direct visualization with swab by vigorously swabbing tonsillar areas, the posterior pharynx, and any areas of inflammation, ulceration, exudation, or capsule formation.

2.10.4.2  Use transport system and bring to laboratory.

2.10.4.3  **DONT OBTAIN THROAT SAMPLES IF EPIGLOTTIS IS INFLAMED, AS SAMPLING MAY CAUSE SERIOUS RESPIRATORY OBSTRUCTION.**

2.11  **Tissue, Deep Wounds and Aspirates**

2.11.1  Tissues- always submit as much tissue as possible.

2.11.1.1  Never submit a swab that has simply been rubbed over the surface.

2.11.1.2  Quantitative tissue 1 gram of tissue is needed.

2.11.2  Bite wounds:  Aspirate pus from the wound or obtain it at the time of incision, drainage, or debridement of infected wound.

2.11.3  Bone:  Obtain during surgery.

2.11.3.1  Submit in sterile container.

2.11.3.2  Sterile saline may be used to keep it moist.

2.11.4  Deep wounds or abscesses

2.11.4.1  Disinfect surface, aspirate the deepest portion of the lesion, avoiding contamination by the wound surface.

2.11.5  Punch skin biopsies

2.11.5.1  Disinfect and aspirate the deepest portion of the lesion or sinus tract.

2.11.5.2  Specimen should be obtained aseptically and placed...
in a sterile screw-topped jar.

2.11.5.3 Add several drops of sterile saline to keep moist. Do not allow tissue to dry out.

2.11.5.4 Bring to lab immediately.

2.12 **URINE:** Verbal or written clean catch instructions should be given to patient to ensure collection of good specimen.

2.12.1 Use special sterile container from clean catch or catheter tray set.

2.12.2 Cap tightly and send to laboratory immediately or refrigerate until it can be sent.

2.12.3 Female midstream-Thoroughly clean urethral area with soap and water. Rinse area with wet gauze pads. While holding labia apart, begin voiding. After several mL have passed, collect midstream portion without stopping the flow of urine. Collect in a sterile wide mouth container \( \geq 1\text{mL} \) or in a **urine transport kit** (preferred).

2.12.4 Male midstream-Clean the glans with soap and water. Rinse area with wet gauze pads. While holding the foreskin retracted, begin voiding. After several mL have passed collect midstream portion without stopping the flow of urine. Collect in sterile wide mouth container or **urine transport kit**. (preferred)

2.12.5 Straight Catheter-Thoroughly clean urethral area with soap and water. Rinse area with wet gauze pads. Aseptically insert catheter into bladder. Allow \( \sim 15\text{mL} \) to pass, then collect urine to be submitted in a sterile container. This is not recommended for routine urine culture because of potential contamination problems. The procedure may introduce urethral flora into the bladder.

2.12.6 Indwelling Catheter- Disinfect catheter collection port with 70% alcohol. Use needle and syringe to aseptically collect 5-10mL of urine. Transfer sample to sterile tube or container.

2.13 **WOUND, ABSCESS:** Surface lesions should be opened and the advancing edge firmly sampled. Use transport system as directed on package. Unopened wounds should be aspirated with needle and syringe.

2.13.1 Superficial wound

2.13.1.1 Syringe aspiration is preferable to swab collection.

2.13.1.2 Disinfect and aspirate from the deepest portion of the lesion.

2.13.1.3 If vesicle is present, collect both fluid and cells from the base of the lesion.

2.13.1.4 If the initial aspiration fails to obtain material, inject sterile, nonbacteriostatic saline subcutaneously and repeat aspiration.

2.13.2 Superficial lesions, fungal

2.13.2.1 Cleanse the surface with sterile water, and use a
sterile scalpel blade, scrap the periphery of the lesion border.

2.13.2.2 Samples from scalp areas should include hair. If there is nail involvement, obtain scrapings of debris or material beneath the nail plate.

2.13.2.3 Transport in sterile container or sterile petri dish.

2.13.3 Ulcers and nodules: Cleanse the area; remove overlying debris, curette the base of the ulcer or nodule.

2.13.4 Nails
2.13.4.1 Wipe with 70% alcohol using gauze, not cotton.
2.13.4.2 Clip away generous portion of affected area, and collect material or debris from under the nail.
2.13.4.3 Place material in clean container - enough scraping to cover head of a thumb tack.

2.14 Gastrointestinal Tract: The gastrointestinal tract includes the esophagus, stomach, duodenum, small intestine, and colon.

2.14.1 Fecal specimens: Send freshly passed or collected specimen in screw capped container.
2.14.1.1 For stool culturing transport to Micro lab within 1 hour of collection, or transfer to enteric transport system.
2.14.1.2 Swabs cannot be used for Parasitology testing.
2.14.1.3 Keep stool specimens cool, do not incubate.
2.14.1.4 Do not collect more than two specimens per patient, because of the limited yield provided by additional specimens. Do not perform stool cultures for patients whose length of stay was > 3 days and admitting diagnosis with gastroenteritis without consultation.

2.14.2 Rectal swabs: Reserved for *N. gonorrhoeae*, enteric pathogens, herpes simplex virus and anal carriage of Group B Streptococcus and for patients unable to pass a specimen. (usually children)
2.14.2.1 Feces should be visible on swab for detection of pathogens.
2.14.2.2 Pass the tip of a sterile swab approximately 1 inch beyond the anal sphincter.
2.14.2.3 Carefully rotate the swab to sample the anal cyst, and withdraw the swab.
2.14.2.4 Send the swab in transport media.
2.14.2.5 Rectal swabs for detection of *N. gonorrhoeae*. They should be placed on GC transport bottles/plates ASAP.

2.14.3 Gastric aspirates (Specimen must be processed promptly. Micro should be notified prior to specimen collection.)
2.14.3.1 Gastric lavages are submitted primarily for the detection of *Mycobacterium tuberculosis* in patients (most frequently children) unable to produce quality sputum.
2.14.3.2 This should be performed after the patient wakes in the morning so that sputum swallowed during sleep is still in the stomach.

2.14.4 Duodenal aspiration
2.14.4.1 Pass a tube orally though the duodenum, to aspirate for giardiasis, the tube should be in the third portion of the duodenum.
2.14.4.2 Submitted primarily for the detection of Giardia species and the larvae of Strongyloides stercoralis and Ascaris lumbricoides.

2.14.5 Ecoli 0157:H7
2.14.5.1 Pass liquid and/or bloody stool into a clean dry container.
2.14.5.2 Bloody or liquid stools should be collected within 6 days of onset among patients with abdominal cramps have the highest yield.

2.15 Ocular Specimens:
2.15.1 Swabs for culture should be taken prior to anesthetic, whereas corneal scrapings can be obtained afterward.
2.15.2 Do not refrigerate.
2.15.3 Conjunctiva- sample both eyes with separate swabs (pre-moistened with sterile saline) by rolling a swab over each conjunctiva.
2.15.4 Inoculate directly to medium. Sample both conjunctiva to determine indigenous microflora.
2.15.5 The uninfected eye will serve as the control.
2.15.6 Obtain samples on swabs.
2.15.7 Inoculate directly to media. (Blood and Chocolate agar plates)
2.15.8 Some samples include conjunctival scrapings, corneal scrapings, and intraocular fluid.
2.15.8.1 Corneal scrapings: Scrape multiple areas of ulceration and suppuration with a sterilized spatula. Inoculate directly to media. Prepare smears immediately also.
2.15.8.2 Vitreous fluid aspirates(are to be ordered and setup like body fluids). Use a needle aspiration technique to collect. Inoculate media immediately or transport immediately.
2.15.8.3 Contact the Microbiology Lab at 434-7623 for Acanthamoeba culturing.

2.16 GENITAL
2.16.1 DO NOT REFRIGERATE ANY OF THE FOLLOWING SAMPLES
2.16.2 FEMALE:
2.16.2.1 Amniotic- Aspirate via amniocentesis, cesarean section or intrauterine catheter. Transfer fluid to anaerobic transport, collect >1mL within 15 minutes.
Swabbing or aspiration of vaginal membrane is not acceptable because of vaginal contamination.

2.16.2.2 **Bartholin**- disinfect skin with iodine preparation. Aspirate >1ml of fluid from ducts. Transport in anaerobic system.

2.16.2.3 **Cervix**- visualize cervix with speculum without lubricant. Remove mucus and/or secretions from cervix with swab, and discard swab. Firmly yet gently, sample endocervical canal with sterile swab.

2.16.2.4 **Cul-de-sac**- submit aspirate or fluid >1mL in anaerobic transport system.

2.16.2.5 **Endometrium**- collect transcervical aspirate via telescoping catheter. Transfer entire amount to anaerobic transport system. Collect >1mL.

2.16.2.6 **Products of Conception**- submit portion of tissue in sterile container. If obtained by cesarean section, immediately transfer to anaerobic transport.

2.16.2.7 **Urethra**- Collect 1 hour after patient has urinated. Do not refrigerate. Remove exudates from urethral orifice. Collect discharge material on swab by massaging urethra against pubic symphysis through the vagina. If no discharge can be obtained, wash external urethra with betadine soap, and rinse with water. Then insert urethrogenital swab 2-4 cm into urethra, and rotate the swab for 2 seconds. The specimen should be directly inoculate to Thayer-Martin medium or to a GC transport system if gonorrhoeae is suspected.

2.16.2.8 **Vagina**- wipe away excessive amount of secretion or discharge. Obtain secretions from mucosal membrane of vaginal vault with a sterile swab. Inoculate directly to MTM agar or GC transport system if gonorrhoeae is suspected. For intrauterine devices, place entire device into sterile container, and submit at room temperature.

2.16.3 **MALE**

2.16.3.1 **Prostate**- clean glans with soap and water. Massage prostate through rectum. Collect fluid on sterile swab or in sterile tube.

2.16.3.2 **Urethra**- insert urethrogenital swab 2-4 cm into urethral lumen, rotate swab and leave in place for at least 2 seconds.
2.16.4 **GENITAL: MALE AND FEMALE:** Lesion- Clean lesion with sterile saline, and remove lesion’s surface with sterile scalpel blade. Allow transudate to accumulate. While pressing base of lesion, firmly sample exudates with sterile swab.

2.16.5 **CHLAMYDIA CULTURE**
Specimens should be collected as early in the infection as possible. It is essential that epithelial cells be collected in conjunctival and genital specimens. Vigorously swab or scrap the area after removal of the exudate. The transitional zone of the cervix should be sampled. Sputa or throat washings are suitable for respiratory infection. Collect in VTM media and transport on ice. Send out test.

2.16.6 **HERPES CULTURE**
Specimens should be collected from the site of infection as soon as possible after onset of disease. The specimen of choice is vesicular fluid aspirated from the fresh (not crusted) lesions with a 26 or 27 gauge needle in a tuberculin syringe. Collect in VTM media and transport on ice. Send out test.

2.17 **INTRAVASCULAR CATHETERS**
2.17.1 They are important potential source of bacteremia and fungemia as well as local infectious complications at sites of catheter insertion.

2.17.2 Quantitative culturing of catheter tips is useful in assessing the relationship between catheters and sepsis.

2.17.2.1 Aseptically remove and clip 5-cm distal tip of catheter directly into sterile tube.

2.17.3 Semi quantitative culture: central, CVP, Hickman, broviac, peripheral, arterial, umbilical, hyperalimentation, Swan-Ganz.

2.17.3.1 A 2-inch distal segment of catheter should be submitted to the laboratory by aseptically clipping off the end of the catheter directly into a screw-cap, large-mouth sterile container at the time the catheter is removed. Send to the lab as soon as possible.

2.17.4 Add a few drops of non-bacteriostatic sterile saline.

2.17.4 **FOLEY - DO NOT CULTURE, SINCE GROWTH REPRESENTS DISTAL URETHRAL FLORA.**

2.18 **GONORRHOEAE:** Inoculate directly to MTM agar when possible. Use swab transport system as directed. (NEVER REFRIGERATE).

2.19 **EPIDEMIOLOGICAL CULTURES:** Do only with approval of Infection Control.

2.20 **SPECIAL MICROBIAL ISOLATES:** Because of special media and differences in processing necessary to achieve maximum recovery, the
Microbiology lab must be notified in advance if any of the following are requested:

2.20.1 Brucellosis (*Always notify lab of suspicion*)
2.20.2 Leptospirosis
2.20.3 Mycoplasmosis
2.20.4 Pertussis
2.20.5 Pneumocytosis
2.20.6 Tularemia
2.20.7 Diphtheria
2.20.8 Acanthamoeba infection
2.20.9 Cell wall defective organisms
2.20.10 See chart

### 3.0 RAPID PCR TESTING

#### 3.1 MRSA Screen

3.1.1 Ask the patient to tilt his/her head back. Insert dry swab approximately 1–2 cm into each nostril.

3.1.2 Rotate the swab against the inside of the nostril for 3 seconds. Apply slight pressure with a finger on the outside of the nose to help assure good contact between the swab and the inside of the nose.

3.1.3 Using the same swab, repeat for the second nostril, trying not to touch anything but the inside of the nose.

3.1.4 Remove the plastic transport tube. Twist off the tube cap and discard it.

3.1.5 Using the second swab collect a throat sample as in 2.11.4 of this procedure.

3.1.7 Place the swabs into the plastic transport tube. The swabs should go all the way into the tube until they rest on top of the sponge at the bottom of the tube. Make sure the red cap is on tightly.

**Note:** The swabs should stay attached to the red cap at all times.

3.1.8 Label the plastic transport tube with patient ID and send to the laboratory.

3.1.9 Store swab specimen at **room temperature (15–30 °C)** if it will be processed within 24 hours, otherwise store swab at 2–8 °C.

3.1.10 The swab specimen is stable up to 5 days when stored at 2–8 °C.

#### 3.2 GROUP B

3.2.1 Using the Cepheid Collection Device, collect specimens according to CDC recommendations. The following procedure should be used:

- Wipe away excessive amounts of secretion or discharge.
- Remove both marked swabs from the transport container.
- Carefully insert both marked swabs into the patient's vagina. Sample secretions from the mucosa of the lower one-third part of the vagina. Rotate the swabs three times to ensure uniform sample on both swabs.
- Using the same marked swabs, carefully insert both swabs approximately 2.5 cm beyond the anal sphincter, and gently rotate to sample anal crypts.
- Place both marked swabs in the transport container.

3.2.2 If the specimens will be processed within 24 hours, store at room
temperature. If the specimens will be tested after 24 hours, refrigerate until testing is performed.

3.2.3 Specimens stored at 2–8°C are stable for up to six days.

3.3 **CLOSTRIDIUM DIFFICILE**

3.3.1 Collect the unformed stool specimen in a clean container. Follow the institution’s guidelines for collecting samples for *C. difficile* testing.

3.3.2 Label with Sample ID and send to the laboratory.

3.3.3 Store specimen at 2–8 °C. The specimen is stable for up to 5 days when stored at 2–8 °C. Alternatively, specimens can be kept at room temperature (20–30 °C) for up to 24 hours.

### 4.0 SPECIAL TESTING

<table>
<thead>
<tr>
<th>ORGANISM</th>
<th>SPECIMEN OF CHOICE</th>
<th>TRANSPORT</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brucella</td>
<td>Blood (Bone marrow)</td>
<td>Transport at room temperature Collect isolator tube</td>
<td>Hold blood culture up to 30 days</td>
</tr>
<tr>
<td>Francisella spp. (tularemia)</td>
<td>Lymph node aspirate Scrapings Lesion biopsy Blood (use isolator) Sputum</td>
<td>Rapid transport to the lab or freeze</td>
<td>Send to reference lab or Do in house on Chocolate agar Hold for 30 days</td>
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<tr>
<td>Cat Scratch Fever Bartonella</td>
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<tr>
<td>Mycoplasma or Ureaplasma</td>
<td>Respiratory (throat or early morning sputum), vaginal swab, cervical, urine, endometrial washing, placenta</td>
<td>Store at 2°C for up to 6 hours and freeze after. Transport mycoplasma growth media, viral transport</td>
<td>Send to reference lab</td>
</tr>
<tr>
<td>Viral specimens</td>
<td>Various areas</td>
<td>Collect in viral transport and send immediately with cold pack or on ice. Tissue and fluid should be in sterile containers.</td>
<td>Send to reference lab</td>
</tr>
<tr>
<td>Legionella Culture / DFA</td>
<td>Sputum, bronch washing, pleural fld, lung tissue, other body fluids, abscesses, bacterial isolates</td>
<td>Volume 1-2mL, sterile leak proof containers, keep on cold pack or ice, freeze if not sending day of receipt. <strong>DFA</strong>- send 2 slides</td>
<td>Send to reference lab</td>
</tr>
<tr>
<td>Acanthamoeba/Naegleria culture</td>
<td>CSF or tissue submitted in Page’s amoeba saline</td>
<td>1mL CSF or small piece of tissue sterile screw capped tube, store at room temperature</td>
<td>Contact lab in advance for media</td>
</tr>
<tr>
<td>Bordetella pertussis CULT/DFA/PCR</td>
<td>NP swab Collect with calcium alginate</td>
<td>Culture: Inoculate media Immediately after collection</td>
<td>Contact lab in advance for media. PCR performed in MP. DFA</td>
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<tr>
<td>suitable specimens</td>
<td>unsuitable specimens</td>
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<tr>
<td>properly collected abscess material</td>
<td>throat, nasopharyngeal, material endotracheal secretions</td>
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<tr>
<td>blood (venipuncture)</td>
<td>sputum (expectorated or induced), tracheotomy aspirate bronchoscopic washings, bronchoalveolar lavage washings (BAL)</td>
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<td>bone marrow</td>
<td>voided or bladder catheterization urine</td>
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<td>lung aspirate and transtracheal asp</td>
<td>vaginal, vulvar, cervical, or lochia secretions (swabs)</td>
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<tr>
<td>suprapubic urine</td>
<td>material from superficial abscesses or lesions improperly collected</td>
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<tr>
<td>endometrial or endocervical material collected by direct visualization through a speculum</td>
<td>specimens contaminated, with feces (draining fistulae, colostomy, bowel contents, rectal abscesses, perinea swabs)</td>
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<tr>
<td>aseptically collected tissue</td>
<td>* feces or rectal swabs</td>
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<tr>
<td>“sulfur granules” from sputum or other materials when actinomycosis is suspected.</td>
<td>prostatic or seminal fluid, urethral, lochia, or cervical secretions.</td>
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<tr>
<td>body fluids (ascitic, cerebrospinal pericardial, pleural, synovial)</td>
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<td>bile</td>
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<tr>
<td>nasal sinus aspirate</td>
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<tr>
<td>fallopian tube fdl. or tissue</td>
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<tr>
<td>stool for C. difficile</td>
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<tr>
<td>IUD for Actinomycyes spp.</td>
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<tr>
<td>placenta tissue (via cesarean)</td>
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</table>

*There are a few exceptions; for example when botulism, C. perfringens foodborne disease, or antibiotic associated pseudomembranous colitis is suspected, it is appropriate to test stool specimens.*
5.4 Miscellaneous test - Please contact the Microbiology Laboratory for others not listed.

5.5 Some samples are routinely sent to reference labs. Please refer to their individual manuals for test not listed.

Specimen Collection Mycology M5.001.07

1.0 PRINCIPLE

Following the proper procedure for collecting, transporting and storing specimens are extremely important for providing rapid and accurate results for the diagnosis and management of Mycoses. The best specimen for determining the etiologic agent is at active infection site. Specimens must be collected under aseptic conditions or after appropriate hygienic preparation to optimize the significance of the mycology results. All specimens for mycology studies should be handled as potentially hazardous. Transportation to the laboratory should be rapid and kept at room temperature. Only if processing is delayed, may specimens be stored at 4 °C; however, there are rare exceptions. Culturette swabs should not be stored before culturing, since Histoplasma capsulatum, Blastomyces dermatitidis, and Cryptococcus neoformans may be inhibited.

2.0 SPECIMENS

Most specimens for fungal culture are collected as you would bacterial cultures. Swabs are not recommended for collecting fungal specimens except when used to swab the vagina for yeast or to swab sporotrichotic chancre. Pediatric specimens should be collected in the same manner. The presence of more material for primary inoculum and concentration of large volumes of fluid greatly increases the likelihood of recovery of fungal species.

2.1 HAIR, SKIN AND NAILS

Usually submitted for dermatophyte culture

2.1.1 Abnormal hairs should be removed with forceps and scalp scales collected by scraping.

2.1.2 If nail polish is present remove before sampling. Wipe with 70% alcohol on gauze. Do not use cotton. Nail specimens should be obtained by clipping a portion of the affected area and scraping off the excess keratin produced beneath the nail.

2.1.3 Skin specimens should be obtained by scraping off the active borders of the lesions with a scalpel after cleaning the affected area with an alcohol swab.

2.1.4 All skin, hair, and nail specimens may be placed in an envelope or sterile culture dish for transport. Cultures may be stored at room temperature.

2.2 URINE

Urine specimens should be collected in sterile containers and sent to the laboratory immediately, if not, specimens may be stored at 4 °C for up to 12
hours. Twenty-four hour and catheter bags are not acceptable for mycology studies. Centrifuge and plate sediment.

2.3 **STERILE BODY FLUIDS** (CSF, Pericardial, Peritoneal, Synovial, and Vitreous Humor)

Body fluids should be obtained under aseptic conditions with the use of a sterile syringe. The fluid can be transferred to a sterile tube for safe transport to the laboratory. Specimens should be stored at 4 °C.

2.4 **EYE SPECIMENS**

An Ophthalmologist should obtain specimens. After the surface of the cornea is scraped several times, the kimara scalpel should be streaked on X’s of C’s designated on the bottom of appropriate fungal media in petri dishes. Another portion of the scraping should be fixed on glass microscope slides for examination. Inoculated plates should be kept at room temperature if transit time to the laboratory may be delayed.

2.5 **VAGINAL SPECIMENS**

Vaginal specimens are collected on two swabs in order to culture and make a smear, or a slide may be sent along with one swab for culture. Specimens should be transported in a closed container and may be stored at 4 °C if needed.

2.6 **RESPIRATORY SECRETIONS**

Most respiratory specimens are collected through the upper respiratory tract. The first morning specimens are preferred after proper oral hygiene of brushing teeth and rinsing the mouth. All specimens should be collected in wide mouth containers with leak proof lids; 5 to 10 ml is more than adequate. Specimens may be stored at 4 °C if necessary.

2.7 **TISSUE SPECIMENS**

Tissue specimens should be collected by an experienced person. Specimens should be placed in a small sterile container and sent to the laboratory immediately.

2.8 **STOOL SPECIMENS**

Stool cultures should be submitted in a sterile container or on two rectal swabs. Specimens may be stored at 4 °C.

2.9 **BLOOD CULTURES**

Blood specimens should be collected in Isolator tubes. See the specimen collection and blood culture processing procedures for the details of this procedure.

3.0 **SPECIMEN TRANSPORT**

Appropriate transport and storage of specimens are necessary for fungal elements to remain viable. Fungal viability may be affected by excessive heat and cold.
3.1 Room temperature transport and storage, ideally within 2 hours of collection is recommended.
3.2 Exceptions 30°C for central nervous system specimens and 4°C for extended storage of specimens likely to be contaminated with bacteria.

4.0 PRECAUTIONS
4.1 For systemic infections consider the need for acute and convalescent-phase sera.
4.2 Always sample the periphery of a skin lesion.
4.3 Keep biopsy material moist by placing it between pieces of sterile, moistened gauze in a small dish.

Mycobacteriology Specimen Collection M4.002.08

1.0 PURPOSE AND/OR PRINCIPLE
The efficiency of any laboratory procedure used to culture Mycobacteria from clinical specimens depends on the manner in which the specimen is obtained and handled. Specimens should be collected with the utmost care and promptly transported to the laboratory. The proper procedure for collecting, transporting and storing specimens are extremely important for providing rapid and accurate results for the diagnosis and management of Mycobacteria. The successful isolation of the organism depends on the quality of the specimen obtained and appropriate processing and culture techniques used by the mycobacteria laboratory.

2.0 SPECIMEN COLLECTION AND HANDLING
For optimal results, obtain specimens under the following conditions:
2.1 Collect specimen before chemotherapy is started because just a few days of therapy may kill or inhibit sufficient numbers of acid-fast bacilli to leave confirmation of disease in doubt.
2.2 Collect specimens in clean, leak proof, sterile, one-use, plastic disposable containers with a screw cap. Make sure it is sealed to avoid leakage or breakage in transit.
2.3 Waxed containers must not be used because they may yield false-positive AFB smear results.
2.4 Specimens should be collected aseptically, or the collection method should bypass areas of contamination as much as possible in order to minimize contamination with indigenous flora.
2.5 Avoid contamination with tap water or other fluids that may contain either viable or nonviable environmental mycobacteria, since saprophytic mycobacteria may produce false-positive culture and or smear results.
2.6 On successive days, collect a series of three early morning specimens.
2.7 Swabs are not optimal for recovery of AFB since they provide limited material and the hydrophobicity of the mycobacterial cell envelope often compromises a transfer from swabs onto solid or into broth media.

3.0 SPECIMEN TRANSPORT
3.1 Transport media, fixatives or preservatives are not necessary because of the robust nature of mycobacteria.
3.1.1 Transport to the lab immediately to avoid overgrowth by
contaminating bacteria and fungi.

3.2 Transport specimens to the lab as soon as possible (within 30 minutes).
3.2.1 Refrigerate specimens if delivery is delayed to discourage the multiplication of rapidly growing non-acid fast organisms that reproduce at room temperature and sometimes make decontamination of the specimen impossible in the laboratory.
3.3 Seal specimen containers carefully to avoid leakage or breakage in transit.
3.4 Once in the lab keep refrigerated until processed.

4.0 SPECIMEN LABELING
4.1 The specimens must be labeled with the following:
   4.1.1 Patient's name
   4.1.2 Patient's room number, unit record number, date of birth
   4.1.3 Specimen source
   4.1.4 Date and time of collection
   4.1.5 Test to be performed on specimen

5.0 SPECIMENS
5.1 NOTE: Samples are incubated at 35-37°C, unless otherwise specified by type.
5.2 Many different types of clinical specimens may be collected for mycobacteriologic analyses.
5.3 The majority of the specimens originate from the respiratory tract (sputum, or induced sputum, tracheal aspiration, bronchial aspirates; bronchoalveolar lavage fluid specimens).
5.2 Other common specimens include:
   5.2.1 Urine
   5.2.2 Gastric aspirates
   5.2.3 Tissues
   5.2.4 Biopsy specimens
   5.2.5 Sterile body fluids
   5.2.6 Blood and fecal specimens are usually submitted from immunocompromised patients only.

5.3 Sputum and aerosol induced sputum:
   5.3.1 Sputum, expectorated or induced, is the principal specimen obtained for the diagnosis of pulmonary tuberculosis.
   5.3.2 To obtain a desirable specimen, the patient should be instructed to rinse the mouth with water before sputum is collected to minimize residual food particles, mouth wash, and oral drugs that might contaminate the specimen or inhibit growth of any acid fast bacilli present.
   5.3.3 Have the patient take a deep breath, hold it momentarily and then cough deeply and vigorously. Collect only the exudative material brought up from the lungs after a deep, productive cough. The patient should cover their mouths carefully while coughing and to discard tissues in an appropriate receptacle.
   5.3.3.1 Specimens should be collected in laboratory approved containers, clearly labeled with patient name and identification number.
   5.3.4 These specimens should be a series of 3 single early morning
samples.
5.3.4.1 A first morning specimen is **superior** to a pooled specimen primarily because of the higher contamination rate of the pooled specimen.

5.3.4.2 Pooled (24 hour) specimens are not acceptable for AFB processing.

5.3.5 A volume of 5 to 10 ml is adequate for each sample.
5.3.6 If there is a delay in the delivery of the specimens to the lab, they should be refrigerated.
5.3.7 For patients who have neither a cough nor spontaneous expectoration, suitable specimens may be obtained by the induction of a cough by the inhalation of warm, aerosolized, sterile sodium chloride (5% to 10%).
6.4.7.1 Because these specimens resemble saliva, it is important they be labeled "induced" specimens.
5.3.8 Saliva and nasal secretions are not to be collected.

5.4 **Gastric lavage**
5.4.1 Aspiration of swallowed sputum from the stomach by gastric lavage maybe necessary for infants, young children, senile and nonambulatory patients.
5.4.2 Samples of 5 to 10ml adjusted to neutral pH, should be collected on 3 consecutive days.
5.4.3 The collection should be made early in the morning before the patient arises, has eaten or taken oral drugs. It is preferable to use commercially prepared sterile distilled water for parenteral injection to avoid introducing saprophytic acid-fast organisms which may be present in tap water.
5.4.4 Gastric contents are toxic to tubercule bacilli so they must be processed immediately after collection.
5.4.5 Notification of the Microbiology department prior to collection is necessary to ensure adequate and prompt processing.

5.5 **Urine**
5.5.1 First morning urine midstream specimens are **superior** to 24 hour collections because organisms accumulate in the bladder overnight. They should be collected for at least 3 consecutive days.
5.5.2 Twenty-four hour collections are unacceptable because they have a higher contamination rate and yield a smaller number of positive cultures because of dilution and contamination.
5.5.3 Keep the specimen refrigerated before processing.
5.5.4 Also before specimens are collected external genitalia should be washed.
5.5.5 Do not use bottles containing preservatives, as they can kill Mycobacteria.
5.5.6 At least 40 ml of urine is required for culture.
5.5.7 Catheterization should be used only if a midstream sample cannot be obtained.

5.6 **Tissue** (Note: Tissue samples initial smears positive will be ordered)
and tested by TBPCR on the Cepheid GeneXpert by the Molecular Pathology department.

5.6.1 Aseptically collected tissue specimens, suspected to contain Mycobacteria, are placed in sterile containers without fixatives or preservatives.
5.6.2 Do not immerse in saline or other body fluids.
5.6.3 Do not place or wrap in gauze.
5.6.4 Minute quantities of biopsy material may be immersed in a small amount of physiological saline.
5.6.5 For cutaneous ulcers collect biopsy material from the periphery of the lesion.
5.6.6 When delay is necessary, freeze the tissue, and transport to the laboratory in frozen state.
5.6.7 Specimens received in formalin are unacceptable.

5.7 Blood
5.7.1 Collect as would blood culture in a 10 ml Isolator tube or (If Pediatric patient 1.5 ml isolator tube). See Blood Culture Specimen Procedure for Blood culture collection.
6.7.2 Store at room temperature and send to the lab promptly.

5.8 Skin Lesions
5.8.1 Cleanse the skin with alcohol before aspirating the sample.
5.8.2 In cutaneous lesions, material is aspirated from beneath the margin of the lesion.
5.8.4 Swabs that are collected should be a last resort for they are not good sources for optimum growth.
5.8.5 Negative results from swab specimens are not reliable.
5.8.6 Dry swabs are not acceptable.

5.9 Body fluids
5.9.1 Cerebrospinal fluid, pleural, peritoneal, pericardial, joint fluids, ascetic fluid, bone marrow should only be collected after proper cleansing.
5.9.2 Collect in a sterile container or syringe.
6.10.2.1 Remove the needle before bringing to the lab.
5.9.3 Larger volumes increase culture yields because organisms are in low numbers from body fluids. At least 10ml of CSF should be submitted and 10 to 15 ml of other body fluids.

6.0 Stool specimens
6.0.1 Stool specimens should be greater than 1 gram. Collect in sterile, leak proof, wax free container without preservative or diluent.
6.10.1.1 Initially only a smear is performed on stool samples. If the AFB smear is positive, then the specimen is cultured for AFB. An order will have to be entered by the physician or nurse to get results back to the patient’s chart.
6.0.2 They are recommended for the detection of MAC involvement in gastrointestinal tracts of immunocompromised patients.
Collection and Preservation of Fecal Specimens M6.001.04

1.0 PRINCIPLE
One of the most important steps in the diagnosis of intestinal parasites is the proper collection of specimens. Improperly collected specimens can result in inaccurate results. Fresh specimens are mandatory for the recovery of motile trophozoites. Trophozoites will not survive if the stool specimen begins to dry-out. Cysts will not form once the specimen has been passed. Strict collection and delivery times must be adhered to or the specimen may have little value for diagnostic testing.

2.0 SPECIMEN
2.1 Collect in a clean, wide-mouthed container with a tight fitting lid.
2.2 Avoid contamination with urine or water from the toilet. If specimens are to be collected in a bedpan, the patient should urinate into a separate container before the specimen is collected.
2.3 Preserved or unpreserved specimens are acceptable. Several commercial kits are available.
2.4 Specimens should be transported to the lab as soon as possible or kept refrigerated until transport is possible. Refrigeration will delay deterioration of the parasitic organism. Freezing of the fecal specimen is not recommended, as characteristic morphology of the parasitic organism may be altered. Never incubate fecal specimens.
2.5 There is no maximum amount to collect. As a minimum amount, collect several grams.
2.6 Reject any specimen that appears to be dry on the surface or edges.
2.7 Do not receive more than 3 specimens without consultation.
2.8 Do not accept specimens from inpatients after the fourth hospital day.
2.9 A patient who has received treatment for a protozoan infection should be checked 3 to 4 weeks after therapy.
2.10 Patients treated for helminth infections may be checked 1 to 2 weeks after therapy and those treated for Taenia infections 5 to 6 weeks after therapy.
2.11 Fresh passed specimens are mandatory for the detection of trophic amebae or flagellates.
2.12 Reject samples contaminated with barium.
2.13 If 3 specimens are collected, it is recommended they be 1 to 2 days apart; otherwise the series of 3 specimens should be submitted within no more than 10 days.

3.0 PRESERVATION
3.1 Specimens that cannot be processed and examined in the recommended time should be placed in an appropriate preservative.
3.2 Preservatives will prevent the deterioration of any parasites that are present.
3.3 A number of fixatives for preserving protozoa and helminths are available. Each preservative has specific limitations, and no single solution enables all techniques to be performed with optimal results.
3.4 Liquid specimens should be received and examined or preserved by the lab within 30 minutes of passage.
3.5 Soft or semi-formed specimens should be received and examined or preserved by the lab within 1 hour of passage.
3.6 Formed specimens should be received and examined or preserved by the lab on the same day of passage.

4.0 PRECAUTIONS
4.1 Collect all fecal specimens prior to the administration of antibiotics or anti-diarrheal agents.
4.2 Avoid the use of mineral oil, bismuth, and barium prior to fecal collection since these substances interfere with the detection or identification of intestinal parasites.
   4.2.1 Barium causes feces to be light tan to white.
   4.2.2 Barium causes an excess of crystalline material in the stool specimen making it impossible to detect intestinal protozoa for at least a week after use.
4.3 Anti-malarials may also prevent the detection of intestinal protozoa.

5.0 HAZARDS
5.1 Specimens collected should be transported to the laboratory in such a way that no one handling the container comes in direct contact with the specimens.
5.2 The unpreserved specimens should be considered as potentially infectious and gloves should be worn.
5.3 Protozoan cyst, Cryptosporidium oocysts, eggs of *Taenia solium, Enterobius vermicularis, Hymenolepsis nana*, and larvae of *Strongyloides stercoralis* may be infective.
5.4 The fresh specimen may also contain *Salmonella sp.*, *Shigella sp.*, or other bacterial pathogens.
5.5 Bloody stools may pose a special hazard as potential carriers of Hepatitis A and B virus, HIV, and enteric non A, non B viruses.

6.0 PROCEDURE NOTES
6.1 The number of specimens required to demonstrate intestinal parasites will vary depending on the quality of the specimen submitted, the accuracy of the examination performed, and the severity of the infection.
6.2 For routine examination for parasites before treatment, a minimum of three fecal specimens is recommended. If 3 specimens are collected, it is recommended they be 1 to 2 days apart; otherwise the series of 3 specimens should be submitted within no more than 10 days.
6.3 Protozoan trophozoites will not survive if the stool specimen begins to dry out and cysts will not form once the specimen has been passed
6.4 A patient who has received treatment for a protozoan infection should be checked 3 to 4 weeks after therapy.
6.5 Patient treated for helminth infections may be checked 1 to 2 weeks after therapy and those treated for Taenia infections 5 to 6 weeks after therapy.
6.6 Ingested iron and some anti-diarrheal compounds may cause the specimen to be dark and black.
6.7 Yellowish specimens may be noted in cases of fat malabsorption, which commonly seen in infections with *Giardia lamblia*.
6.8 Fresh passed specimens are mandatory for the detection of trophic amebae or flagellates.
6.9 **All stools for Ova and Parasite examination are concentrated and stained with a permanent stain.** (trichrome)
6.10 Ova and parasite testing is only done on patients with travel history and previous positive results. Antigen testing is performed on other samples first.

Rejection of Microbiology Specimens M1.025.06

1.0 Purpose and/or Principle
Although the primary responsibility of the bacteriology lab is to accept specimens for routine culture and carry out the requested test on them, there are times when it is necessary to reject a specimen. At times specimens arriving in the lab may have been improperly selected, collected, or transported. An immediate request should be made for a recollection, especially in instances where antimicrobial therapy has been indicated. Processing and reporting of results for these specimens to physicians may provide misleading information that can lead to misdiagnosis and inappropriate therapy. Samples with gross external contamination, inadequate specimens, samples on dry swabs and incorrect use of transport media should be rejected.

2.0 Some possible reasons and details for rejection are as follows:
2.1 The specimen is not labeled with the patient's name, hospital number and type of specimen.
2.2 The specimen is in a non-sterile container.
2.3 Prolonged transport.
2.4 Specimen not adequate for the test requested.
2.5 Specimen collected incorrectly or stored incorrectly upon arrival in the lab.
2.6 Specimen collected in such a way as to make handling hazardous for laboratory personnel.
2.7 Duplicate specimens on same day for the same request should not be processed.
Second specimens obtained from the same site within 24 hours should not be processed unless there are specific orders from the physician or special circumstances. (Except blood and tissues) Sputum - only one sputum for AFB will be processed daily and should be an early morning specimen. Stool - duplicate stool specimens will be set up daily only from pediatrics. Only one specimen will be cultured daily for adults.

2.8 Stool guidelines for routine bacterial culturing. Do not accept more than 2 specimens per patient without prior consultation with an individual who can explain the limited yield provided by additional specimens. Do not accept specimens from inpatients after the third hospital day, without consultation. Do not accept repeat stools for C. difficile by PCR, until the 7th day. Do not accept formed stools for C. difficile, unless ileus due to C. difficile is suspected.

2.9 Specimens with needles.

2.10 Specimens with questionable microbial information – foley catheters, vomitus, gastric aspirate of newborn, bowel content, colostomy discharge or lochia.

3.0 Specimens should be discouraged and other requested:
5.1 Superficial oral and periodontal lesion, swab request tissue or aspirate
5.2 Decubitus, swab request tissue or aspirate
5.3 Varicose ulcer, swab request tissue or aspirate
5.4 Burn wound, swab request tissue or aspirate
5.5 Superficial gangrenous lesion, swab request tissue or aspirate
5.6 Perirectal abscess, swab request tissue or aspirate