



INSTRUCTOR'S GUIDE FOR TRAINING PHLEBOTOMISTS

**A Document That Expands Upon the
Technical Committee Report for the
Phlebotomist and Provides Teaching
Resources for Instructors**

**STATE DIVISION OF PROFESSIONAL-TECHNICAL EDUCATION
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INTRODUCTION

The curriculum development process undertaken by the Idaho Division of Vocational Education involved the active use of industry personnel. Industry personnel comprise the membership on technical committees which are responsible for the development of task lists for each program. A technical committee report was prepared on completion of the committee's assignment. This instructor's guide is an expansion of the Technical Committee Report for the Phlebotomist Training Program.

The task list reviewed in the Technical Committee Report reflects the current trends and skills necessary for an employee to: 1) obtain a job in Idaho's industry, 2) retain a job once hired, and 3) advance in the occupational field. Task lists are grouped according to duty areas generally used in industry settings. The technical committee segment is the single most significant step in the curriculum development process. All future curriculum activities are predicated on the premise that an accurate picture of industry needs is reflected in the task list.

Industry personnel reviewed and revised the performance statements for each task and then wrote objectives for each task. The tasks are in a competency-based format to provide an effective and efficient methodology for determining student progress. All programs must use the tasks in the report and Instructor's Guide in order to be approved for operation. Any deviation from these documents requires written approval from the respective program manager at the Division of Vocational Education. The division does not require that all programs be designed exactly the same, but assurance is needed that the program meets the minimum standards for operation, based on the community needs, equipment, and facilities available to the local school or institution.

This Instructor's Guide does not dictate the level of instruction. Schools and institutions determine what skills can be taught and what depth of instruction can be provided. They must choose the tasks to be taught but are free to determine how many or which ones can be incorporated into their program. Advisory committees are used to help determine local training and employability trends and needs.

The Technical Committee Report and Instructor's Guide are also used for generating student profiles. The profile is used as a cumulative record of each student's progress. They are printed in a folder format and have performance scales for each task so that student competence can be recorded for individual skills or tasks. This document will become the main component for articulation activities in the event that the student desires to go on for additional training or education.

ACKNOWLEDGMENTS

Selected members of the original Technical Committee for the Phlebotomist Training Program who compiled the Task List diligently worked to provide the content of this Instructor's Guide.

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IMPORTANT INFORMATION

Delivery of Instruction: Phlebotomy training in Idaho is now possible through the Vocational Education delivery system. Each of the vocational-technical schools in Idaho may choose to offer this curriculum, thereby standardizing the instruction and providing a retrieval system that documents for the student that he or she received instruction. A certificate of completion will be provided to the student upon passing the didactic and clinical portions of the course.

Instructor Qualifications: The qualified instructor is one who meets the vocational education requirements for education and/or experience in the medical laboratory. The instructor may have his/her years of experience as a phlebotomist or as a healthcare worker specifically trained in the techniques of phlebotomy.

Length of the Program: This is a competency-based program of at least 160 hours which is necessary to be eligible for testing with ASCP for national phlebotomy certification. Because students vary in learning time, the instructor should expect some learners may take less or more time than others.

National Certification Examination: Learners may become eligible to take the national certification examinations. Opportunities to learn the techniques and knowledge required should be provided.

- I. MAJOR CONCEPTS/CONTENT:** The purpose of this program is to prepare students for employment as phlebotomists or to provide supplemental training for persons previously or currently employed in this occupation. The content includes, but is not limited to, communication, leadership, human relations, and employability skills; performance of safe and efficient work practices in obtaining adequate and correct blood specimens by capillary or venipuncture on adults, children and neonates; maintaining the integrity of the specimen in relation to the test to be performed; preparing blood smears; labeling specimens accurately and completely; collecting timed specimens; promoting the comfort and well-being of the patient while performing blood collecting duties; observing safety policies and procedures; medical terminology; emergency procedures including CPR; delivering a variety of clinical specimens to the clinical laboratory; sorting and recording specimens received in the laboratory; centrifuging specimens and preparing aliquots of samples according to the designated protocol; distributing samples to appropriate laboratory sections; and preparing collection trays for specimen procurement. Reinforcement of basic skills in English, mathematics, and science appropriate for the job occurs through vocational classroom instruction and applied laboratory procedures or practice.
- II. CERTIFICATE AWARDED:** Upon completion of the Phlebotomist Training Program, the student will receive a certificate of completion.
- III. LABORATORY/CLINICAL ACTIVITIES:** Simulation and clinical laboratory experiences are integrated with the didactic portion of this program. Clinical experience is defined as patient contact in which the student performs phlebotomy skills under the supervision of a qualified health worker.
- IV. SPECIAL NOTES:** The student taking this specialized program may want to take the national certification examinations. Training and opportunities for students to take these examinations should be provided.
- V. CAREER PATHWAYS:** Phlebotomist Training is a program of instruction that is taught at the postsecondary level and is one of many programs of study for persons interested in health careers. Health careers are in the Health Services Career Pathway. For more information on Career Pathways as described in Idaho, see the publication Career Pathways published by the Idaho Division of Vocational Education or call (208) 334-3216.
- VI. INTENDED OUTCOMES:** After successfully completing this program and under the supervision of a qualified instructor, the student will be able to:
1. Use verbal and written communication.
 2. Demonstrate knowledge of age-related communication and care.
 3. Demonstrate accepted professional, communication, and interpersonal skills.
 4. Demonstrate employability skills.
 5. Apply computer, and basic math and science skills.
 6. Discuss phlebotomy in relation to the health care setting.
 7. Identify the anatomic structure and function of body systems in relation to services performed by phlebotomists.
 8. Recognize/identify collection reagents, supplies, equipment and interfering chemical substances.
 9. Demonstrate skills and knowledge necessary to perform phlebotomy.
 10. Practice accepted procedures of transporting, accessioning and processing specimens.
 11. Practice quality assurance and safety.
 12. Practice infection control following standard precautions
 13. Practice quality assurance and safety.
 14. Demonstrate knowledge of communicable diseases, including AIDS.
 15. Demonstrate knowledge of legal issues, and patient rights.

PHLEBOTOMY PRIMARY REFERENCES

Students will be required to purchase at least the first two (2) of the following textbooks. Each student should have her/his own copy of all texts. The last two (2) texts could be purchased and kept at the teaching center of the facility where training will take place or may be purchased by the student.

Di Lorenzo, M.S., Strasinger, S.K. (2003). *The Phlebotomy Workbook*. Second Edition. F.A. Davis Company, Philadelphia, Pa. ISBN: 0-8036-1049-1

To order: F.A. Davis Company
1915 Arch Street
Philadelphia, Pa 19103
www.fadavis.com

Becan-Mcbride, K., Garza, D. (2005). *Phlebotomy Handbook: Blood Collection Essentials*. Seventh Edition. Pearson Education, Inc., Upper Saddle River, New Jersey. ISBN: 0-13-113334-9

To order: Prentice Hall Health
Upper Saddle River, NJ 07458
www.prenhall.com/healthprofessions

College of American Pathologists, (2005). *So You're Going to Collect a Blood Specimen: An Introduction to Phlebotomy* Eleventh Edition. ISBN: 0-930304-84-5

To order: College of American Pathologists
325 Waukegan Road
Northfield, Illinois 60093
800-323-4040

McCall, R., Tankersley, C., (2004). *Phlebotomy Exam Review*. Second Edition. Lippincott Williams & Wilkins, Baltimore, MD. ISBN: 0-7817-3354-5

To order: Lippincott Williams & Wilkins
351 West Camden Street
Baltimore, MD. 21201
www.LWW.com

Other References

Instructors should have access to the following resources.

Ernst, D. (2005). *Applied Phlebotomy*. Lippincott Williams & Wilkins, Baltimore, MD.

ISBN: 0-7817-5055-5

To order: Lippincott Williams & Wilkins
351 West Camden Street
Baltimore, MD. 21201
www.LWW.com

From the Clinical and Laboratory Standards Institute (CLSI, formerly NCCLS).

Procedures for the collection of diagnostic blood specimens by venipunctures; approved standards fifth edition- Clinical and Laboratory Standards: H3-A5 Vol. 23 No. 32

Procedures and devices for the collection of diagnostic capillary blood specimens by skin puncture; approved standard fourth edition- Clinical and Laboratory Standards: H4-A5, Vol. 24 No. 21

Collection, Transport and Processing of Blood Specimens for testing plasma-based coagulation studies; approved guideline- fourth edition- Clinical Laboratory Standards: H21-A4 Vol. 23 No. 35

Pagana, K., Pagana, T. (2003), *Mosby's Diagnostic and Laboratory Test Reference*, Sixth Edition.

Mosby, Inc. An affiliate of Elsevier Science ISBN: 0-323-02049-6

To order: Mosby
Elsevier Science
11830 Westline Industrial Drive
St. Louis, Missouri 63146

Ernst, D. (2005) To the Point articles in Phlebotomy, Center for Phlebotomy Education, Inc.

Preanalytical Errors that Occur Before Specimen Collection

Preanalytical Errors that Occur During Specimen Collection

Preanalytical Errors that Occur After Specimen Collection

OSHA Update

To order: www.phlebotomy.com

Garza, D., Becan-McBride, K., (2006). *Success! In Phlebotomy: A Q&A Review*, Sixth Edition. Prentice-Hall, Inc. ISBN: 0-13-118326-5

To order: Prentice-Hall, Inc.
Upper River, New Jersey 07458

Video Resources

Applied Phlebotomy Training Videos (2004). Center for Phlebotomy, Inc.

Basic Venipuncture

Preventing Preanalytical Errors

Avoiding Phlebotomy-Related Lawsuits

To order: www.phlebotomy.com

Blood Collection Education Program (2000). Becton Dickinson

Blood Collection: Modern Blood Collection

Blood Collection: Microcollection

Blood Collection: The Difficult Draw

Blood Collection: Troubleshooting and Helpful Hints

Blood Collection: Transportation and Handling

To order: BD

1 Becton Drive

Franklin Lakes, New Jersey 07414

Bloodborne Pathogens and Phlebotomy: How to Protect Yourself. (Booklet also available) Target Training Technologies. 352 Hungerford Drive, Rockford, MD. 301/762-5566

Microtainer Tube with EDTA and Microgard Closure. Becton Dickinson. Manufacturer's Video for Glucose Instrumentation. Tenderfoot International Technidyne Corporation. 23 Nevsky Street, Edison, NJ 08820 800/621-5945 or 908/548-5700

The Miracle of Blood and the Techniques of Collecting Specimens. Becton Dickinson.

Slide/Tape Resources

Blood Specimen Collection by Skin Puncture in Infants Becton Dickinson

Other Resources/References

ASCP Teleconferences:

Pediatric Phlebotomy. September 1990

Pediatric Blood Collection. March 1994

Complications and Special Considerations in Blood Collection. June 1995

Preanalytical Errors in Specimen Collection and Processing. October 1994

Quality Assurance and Quality Control Procedures for Phlebotomy Techniques. September 1993

The Role of Today's Phlebotomist. December 1992

Effect of Sample Collection on Laboratory Test Results. March 1992.

Legislation and medicolegal Issues Affecting Phlebotomy Practice. October 1995.

Available from the Bureau of Laboratories, 2220 Old Penitentiary Road, Boise, ID 83712-8249

National Organizations for Certification of Phlebotomists

American Association of Allied Health Professionals (AAAHP)
PO Box 463
Myrtle Beach, SC 29578
(843)445-9818
www.aaahp.com

American Certification Agency for Healthcare Professionals (ACA)
PO Box 58
Osceola, IN 46561
(219) 277-4538
www.acacert.com

American Medical Technologists (AMT)
710 Higgins Rd.
Park Ridge, IL 60068-5765
(847) 823-5169
www.amt1.com

American Society of Clinical Pathologists (ASCP)
2100 West Harrison St.
Chicago, IL 60612
(312) 738-1336
info@ascp.org
www.ascp.org

American Society of Phlebotomy Technicians (ASPT)
PO Box 1831
Hickory, NC 28603
(828) 299-0078
www.aspt.org

National Credentialing Agency (NCA)
PO Box 15945-289
Lenexa, KS 66285
(913) 438-5110
www.nca-info.org

National Phlebotomy Association (NPA)
1901 Brightseat Rd.
Landover, MD 20785
(301)386-4200
www.scpt.com/npa.htm

National Healthcareer Association
134 Evergreen Place, 9th Floor
East Orange, NJ 07018
(800)499-9092
www.nhanow.com

TASKS

INSTRUCTOR'S GUIDE FOR TRAINING PHLEBOTOMISTS

01.0 USE VERBAL AND WRITTEN COMMUNICATIONS

01.01 TASK: IDENTIFY AND USE VARIOUS FORMS OF COMMUNICATION

ENABLING OBJECTIVES

1. Identify characteristics of effective communication.
2. Differentiate between verbal and non-verbal communication.
3. Describe the components of interpersonal relationships.
4. Demonstrate effective communication techniques.
5. Distinguish between patterns of communication when communicating with patients of all ages, supervisors, and peers/co-workers.

Suggested Activities

Reading Assignments

Key words: Communication Skills

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Find out how healthcare institutions communicate internally and externally (urban and rural locations) with all customers.

Provide resources for students that will assist them in completing enabling objectives.

(See Teaching Tools Section A)

Student Activities

Determine how to avoid breakdowns in communication and the importance of good communication skills, verbal and non-verbal.

Role play communication techniques.

Using the resources, complete the enabling objectives.

Complete study questions in the *Phlebotomy Workbook*

01.02 TASK: IDENTIFY BARRIERS TO COMMUNICATION

ENABLING OBJECTIVES

1. Identify barriers to communication.
2. Describe the barriers to developing the components of interpersonal relationships.
3. Identify methods to overcome barriers to communication.

Suggested Activities

Reading Assignments

Key Words: Communication, barriers

Phlebotomy Handbook

Phlebotomy Workbook

Teacher Activities

Find out how healthcare institutions communicate internally and externally (urban and rural locations) with all customers.

Provide resources for students that will assist them in completing enabling objectives.

(See Teaching Tools Section A)

Student Activities

Determine how to avoid breakdowns in communication and the importance of good communication skills, verbal and non-verbal.

Using the resources, complete the enabling objectives.

01.03 TASK: USE RESOURCES TO INTERPRET FOREIGN LANGUAGE USED BY PATIENT

ENABLING OBJECTIVES

1. Discuss the programs available in facilities to assist with non-English speaking patients.
2. Examine references for use when communicating with non-English speaking patients.
3. Discuss the procedures to follow when the phlebotomist does not speak the language of the patient and/or specific cultural considerations are involved in providing patient care.

Suggested Activities

Reading Assignments

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Provide resources for students to achieve objectives.

Hospital/facility policy for communicating with deaf/mute or non-English speaking patients.

Student Activities

Using the resources complete the enabling objectives.

01.04 TASK: USE BASIC MEDICAL TERMINOLOGY AND APPROVED ABBREVIATIONS

ENABLING OBJECTIVES

1. Describe the concept of "approved" abbreviations.
2. State the meaning of the commonly used prefixes and suffixes.
3. Correctly form medical terms using prefixes, suffixes, vowels, roots, and combining forms.
4. Interpret common abbreviations used in medical facilities.
5. Demonstrate the use of medical terms and abbreviations in reading, speaking, interpreting and writing simulated medical records.

Suggested Activities

Reading Assignments

Key Words: Prefix, Suffix, Word Roots, and Combining Forms

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Using medical terminology resources help students to distinguish parts of a medical term. Begin with common words, such as "appendectomy" and "tonsillectomy." Use games, such as Bingo, Wheel of Fortune, and Jeopardy, to help students learn the most common terms and abbreviations.

Using case studies have students interpret terms and abbreviations. Create team competitions, such as medical term bee, and reward winners. Let students help to plan rewards and games.

Use simulated medical records for students to interpret terms and abbreviations.

(See Teaching Tools Section A)

Student Activities

Using medical terminology resources, study parts of terms and recognize the prefixes, roots, and suffixes. Participate in games to learn the terms and abbreviations.

Apply knowledge of terms to case studies and simulated patient records. Plan a game to learn terminology and abbreviations and awards for winners.

Complete study questions in the *Phlebotomy Workbook*

01.05 TASK: DEMONSTRATE PROPER TELEPHONE USAGE

ENABLING OBJECTIVES

1. List at least three (3) items of information that customers need to know when they have called you.
2. Identify at least five (5) ways to have positive telephone contacts with others.
3. Demonstrate the ability to recognize and use positive, interactive telephone skills.
4. Describe the principle of patient confidentiality as it applies to telephone usage.
5. Identify the department at your facility where calls requesting employee information should be directed.

Suggested Activities

Reading Assignments

Key Words: telephone usage, telephone skills, confidentiality

Phlebotomy Handbook

Phlebotomy Workbook

Teacher Activities

Provide resources for students that will assist them in completing enabling objectives.

Have student's role play with different telephone scenarios.

Assess the competency of students using the Checklist of Abilities for Telephone Answering.

Student Activities

Using the resources, complete the enabling objectives.

Simulate various routine and critical situations.

Practice appropriate business telephone usage skills.

01.06 TASK: DEMONSTRATE BASIC COMPUTER SKILLS

ENABLING OBJECTIVES

1. Define basic terms associated with computers.
2. State three (3) routine phlebotomy duties that can involve a phlebotomist in the use of a lab information management system (LIMS or LIS).
3. Discuss Electronic Medical Records (EMR) and its impact in the Lab.

Suggested Activities

Reading Assignments

Key Words: computer, computerized reporting/communications, electronic medical records (EMR).

Phlebotomy Handbook

Phlebotomy Workbook

Teacher Activities

Introduce computer and electronic medical records (EMR) as forms of communication in health care settings.

Invite health care professionals to class to discuss how communication is established between workers, patients, and departments.

Student Activities

Investigate the use of computers in healthcare facilities and how they are used for communication within a department and between departments.

Investigate the new ways of telecommunications that benefit patients in small rural communities.

01.07 TASK: PROPERLY IDENTIFY PATIENTS

ENABLING OBJECTIVES

1. Describe the legal and ethical importance of proper patient identification.
2. Define complete patient identification procedures.
3. Identify potential patient identification errors that can occur.
4. Demonstrate correct patient identification.
5. Identify how this process changes if the patient is a child or neonate, In-patient or out-patient.

Suggested Activities

Reading Assignments

Key Words: patient identification, legal issues, patient interview, pediatric interview, pediatric phlebotomy, collection procedures, patient(s)

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Provide resources for students that will assist them in completion of enabling objectives.

Overhead of patient identification procedures. Assess competency in patient identification skills.

(See Teaching Tools Section A)

Student Activities

Role playing - identify patients in an out- patient, in-patient, and emergency situation.

01.08 TASK: ASSIST WITH EXPLAINING ACTIVITIES TO PATIENT

ENABLING OBJECTIVES

1. Explain the major points in interviewing a patient or a patient's representative in preparation for obtaining specimens.
2. Describe the concept of variation in instructions to be given in preparation for routine blood collection.
3. Identify how interaction changes if specimens are being obtained from a pediatric patient or neonate.
4. Identify sources available for explaining activities to the patient.
5. Describe and discuss techniques for dealing with family and visitors during the blood specimen collection.

Suggested Activities

Reading Assignments

Key Words: collection procedures, patient education, age related

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Provide numerous role playing scenarios to allow students to practice.

(See Teaching Tools Section A)

Student Activities

Role play using varying techniques of patient instruction.

01.09 TASK: DEMONSTRATE EFFECTIVE TEAMWORK AS A MEMBER OF THE HEALTHCARE TEAM

ENABLING OBJECTIVES

1. Explain the importance of effective teamwork and how it relates to the well being of everyone in any given situation.
2. Describe the concept of being a team player.
3. Describe what it means to be a part of the healthcare team.

Suggested Activities

Reading Assignments

Key Words: dependability, compassion, honesty, integrity, and flexibility

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Using the example of healthcare teams that form in hospital/patient care settings, have students identify the team members, roles and functions of each member. Discuss the importance of having healthcare teams to care for patients. Integrate the importance of a philosophy of healthcare. Using an evaluation tool, have students self-evaluate their own characteristics by comparing those of healthcare workers. Direct students to identify areas they need to improve and to establish ways to improve.

Student Activities

Use the evaluation tool with desirable characteristics of healthcare workers to compare yourself and your own characteristics to verify strengths and weaknesses and areas to improve.

Demonstrate effective teamwork skills in daily activities.

Complete study questions in the *Phlebotomy Workbook*

<h2>02.0 DEMONSTRATE ACCEPTED PROFESSIONAL COMMUNICATIONS AND INTERPERSONAL SKILLS</h2>
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02.01 TASK: RECOGNIZE APPROPRIATE, EFFECTIVE, AND PROFESSIONAL BEHAVIOR

ENABLING OBJECTIVES

1. Define ethics as applied to the laboratory profession.
2. Define medical law and state how it differs from ethics.

Suggested Activities

Reading Assignments

Key Words: professional behavior, ethics, professionalism

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Provide resources for students to achieve objectives.

Distinguish, through examples, legal and ethical differences.

Use role play and/or case studies to help students identify differences.

(See Teaching Tools Section A)

Student Activities

Use resources to determine differences between legal and ethical situations.

Participate in role plays and examine case studies to identify legal and ethical components.

02.02 TASK: COMMUNICATE APPROPRIATELY WITH THE PATIENTS AND MEMBERS OF THE HEALTHCARE TEAM

ENABLING OBJECTIVES

1. Describe the proper manner for greeting and interacting with patients.
2. Discuss the protocol for teaching and preparing a patient for laboratory testing.
3. Identify barriers to patient instruction.
4. Discuss the skills needed to circumvent these barriers.
5. Diagram at least three (3) models of communication between the patient, physician, and laboratory.
6. Distinguish between patterns of communication when communicating with patients, supervisor, and peers/co-workers.
7. Describe the special needs of and methods to identify patients who are: hearing impaired, blind, arthritic, or who have experienced a miscarriage, mastectomy, etc.

Suggested Activities

Reading Assignments

Key Words: intra-laboratory communication network

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Provide opportunities for role playing, discussing both positive and negative patient responses. Assess students' competency using the Checklist of Abilities for Active Communication

Student Activities

Using the resources, complete the enabling objectives.

Role play the proper manner of greeting the patient.

02.03 TASK: EXPLAIN, TO THE PATIENT, THE PROCEDURE TO BE USED IN SPECIMEN COLLECTION

ENABLING OBJECTIVES

1. Explain the major points in interviewing a patient or a patient's representative in preparation for obtaining specimens.
2. Describe the concept of variation in instructions to be given in preparation for routine blood collection. With 100% accuracy, explain the steps to be performed during each test: routine blood collection, glucose tolerance tests, bleeding times, and other procedures.
3. Identify how interaction changes specimens if obtained from a pediatric or neonate patient.
4. Identify sources available for explaining activities to the patient.
5. Describe and discuss techniques for dealing with family and visitors during the blood specimen collection.

Suggested Activities

Reading Assignments

Key Words: patient interview, specimen collection, pediatric phlebotomy,

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Provide role playing scenarios of all types to allow students to practice.

Provide students with acceptable scripts for use in explaining the phlebotomy procedure with patients

Student Activities

Role play to gain experience in patient interactions.

02.04 TASK: MAINTAIN ACCEPTABLE APPEARANCE, GROOMING, AND PERSONAL HYGIENE (PROFESSIONALISM)

ENABLING OBJECTIVES

1. Describe the importance of a professional public image for the phlebotomist.
2. Relate the appearance of the phlebotomist to the patient's perception of:
 - The quality of care at the facility.
 - The quality of laboratory work at that facility.
3. Describe at least five (5) personal characteristics that are important in a phlebotomist.
4. List at least six (6) appearance characteristics consistent with the concept of "professionalism" as it applies to phlebotomists.
5. List the causes of stress in the work environment, and discuss the coping skills used to deal with stress in the work environment.

Suggested Activities

Reading Assignments

Key Words: professionalism, appearance, stress, professional behavior

Phlebotomy Handbook

Phlebotomy Workbook

Teacher Activities

Discuss the stress coping mechanisms we use and how lack of coping may lead to diseases. (Selye's work on stress is a classic reference.) Have students identify stressors in everyday life and how people react differently. Role play different situations that may provoke different reactions (health and unhealthy reactions).

(See Teaching Tools Section B)

Student Activities

Participate in role playing exercises.

Complete study questions in the *Phlebotomy Workbook*.

03.0 DEMONSTRATE EMPLOYABILITY SKILLS

03.01 TASK: CONDUCT A SEARCH FOR EMPLOYMENT

ENABLING OBJECTIVES

1. Complete a self-assessment of interests, abilities, and skills
2. Investigate a minimum of three (3) places/sources of employment.
3. Compare and contrast job requirements, benefits and opportunities of each place of employment.
4. Compare self-assessment to jobs available.

Suggested Activities

Reading Assignments

Health Careers Today by Gerdin 2nd Edition, Published by Mosby Lifeline, Chapter on Interpersonal Dynamics Communication.

Teacher Activities

Provide direction for students to complete a self assessment.

Direct students to check 3 sources of possible employment.

Direct students to compare self assessment to the job opportunities.

Encourage job seeking and development of job seeking skills.

(See Teaching Tools Section B)

Student Activities

Follow direction for self assessment.

Locate 3 job opportunities.

Compare your self assessment with job requirements.

Prepare yourself for a job.

03.02 TASK: ASSEMBLE DOCUMENTS THAT MAY BE REQUIRED WHEN APPLYING FOR A JOB.

ENABLING OBJECTIVES

1. Assemble and prepare a resume.
2. Assemble and review a variety of job applications.
3. Gather educational transcripts, certificates of training and related documents.
4. Gather letters of recommendations and a list of references.
5. Prepare portfolio of job application materials.

Suggested Activities

Reading Assignments

Health Careers Today, by Judith A. Gerdin

Other career preparation books

Teacher Activities

Gather a variety of job application forms for student practice.

Provide direction on resume and portfolio preparation.

Direct students in gathering transcripts and reference letters.

Have samples of well written resumes, applications and portfolios for students to follow.

(See Teaching Tools Section B)

Student Activities

Practice how to write a resume and to fill out job applications. Pay close attention to neatness and correct spelling.

Gather your transcripts and letters of recommendation.

Prepare a portfolio of selected best work related to the job.

03.03 TASK: COMPLETE AN EMPLOYMENT APPLICATION CORRECTLY

ENABLING OBJECTIVES

1. Select and complete one job application.
2. Review and revise job application until all items are correct.

Suggested Activities

Reading Assignments

Read career preparation materials in library and those provided.

Teacher Activities

Direct students to complete applications without errors.

Advise students about portfolio building.

Provide students with sample healthcare applications.

Student Activities

Practice completion of job application until there are no errors.

Add best one to portfolio; continue to build portfolio.

03.04 TASK: IDENTIFY ACCEPTABLE INTERVIEW TECHNIQUES

ENABLING OBJECTIVES

1. Review effective interview techniques from a variety of sources.
2. Role play interview with a simulated employer.

Suggested Activities

Reading Assignments

Career preparation materials.

Teacher Activities

See Gerdin's list of interview questions and use as handouts for students (Health Careers Today) or use other sources.

Have student's role play interviews.

Videotape for critiques.

Set up simulation job interviews with employers.

Discuss, review and perfect interview situations.

Student Activities

Study list of questions normally asked in research. Be prepared.

Participate in simulated role play interviews.

Videotape and critique for improvement.

Participate in simulated employer interviews.

Practice and critique your own interviews to build confidence.

03.05 TASK: IDENTIFY OR DEMONSTRATE APPROPRIATE RESPONSES TO CRITICISM FROM EMPLOYER, SUPERVISOR, OR OTHERS

ENABLING OBJECTIVES

1. Discuss various ways to accept criticism.
2. Role play appropriate responses to criticism.
3. Identify responses to criticism appropriate to employer, supervisor and others.

Suggested Activities

Teacher Activities

Provide role play situations in which students can feel the affect of criticisms and discuss ways to respond.

Help students to turn negative situations to positive ones by finding positive responses.

Invite guest speaker to class who is qualified in personnel matters and assertiveness to share responses with students.

Student Activities

Participate in role play situations to improve ways of responding to criticism.

Modify personal behavior by accepting and seeking ways to improve.

Attend a session by a guest speaker who knows assertiveness.

03.06 TASK: IDENTIFY AND PRACTICE ACCEPTABLE WORK HABITS AND RESPONSIBILITIES

ENABLING OBJECTIVES

1. Apply appropriate communication and interpersonal skills on the job.
2. Perform as a team member.
3. Perform legal and ethical responsibilities.
4. Follow employee policies and procedures.
5. Apply computer skills on the job.
6. Use resources effectively when solving problems/making decisions.
7. Recognize and participate in continuing education sessions.

Suggested Activities

Reading Assignments

Read materials on job preparation and employability skills that help in job seeking and keeping.

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Review earlier sections on communication and ethics.

Discuss team work and skills to retain jobs.

Invite employer to class to talk about effective employees.

(See Teaching Tools Section A)

Student Activities

Participate in discussion of effective employee skills.

Set personal goals to achieve employability skills.

Attend session given by employer on how to be an effective employee.

03.07 TASK: DEMONSTRATE AWARENESS OF PERSONAL WELLNESS

ENABLING OBJECTIVES

1. Practice sound healthful habits.
2. Maintain positive image.
3. Develop and implement a plan for stress reduction.

Suggested Activities

Reading Assignments

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Discuss sound health habits and the need to adopt activities that result in good health.

Discuss a positive image and its affect on family, friends and co-workers.

Provide essentials of a good stress reduction plan and lead students to develop one.

(See Teaching Tools Section B)

Student Activities

Study healthful habits and adopt them.

Discuss how you can improve your own image into a very positive one.

Develop a good stress reduction plan for yourself and follow it.

List the stressors in your life and the way that you cope with them.

4.0 DEMONSTRATE AND UNDERSTAND ALL LEGAL ISSUES IN THE HEALTHCARE SETTING
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CONFIDENTIALITY/PATIENT'S RIGHTS

04.01 TASK: EXPLAIN THE POLICIES OF PATIENT RIGHTS AND RESPONSIBILITIES

ENABLING OBJECTIVES

1. Define confidentiality.
2. Relate the concept of confidentiality to the Patient's Bill of Rights.
3. Describe and discuss the major points of the Patient's Bill of Rights as it applies to clinical laboratory personnel.

4. Explain and identify times when patient confidentiality with a healthcare worker should not be honored.
5. Discuss the role of Medicare and the need for an ABN (Advanced Beneficiary Form) that may need to be signed by a patient with Medicare insurance.

Suggested Activities

Reading Assignments

Key Words: HIIPA, confidentiality, Patient's Bill of Rights, ABN

Phlebotomy Handbook

Phlebotomy Workbook

Teacher Activities

Provide students with the Patient's Bill of Rights and a copy of Advance Directives based on the Patient Self-Determination Act (obtains materials from one of the healthcare facilities and ask about how they use these materials to inform patients of their rights).

Provide ethical and legal situations/case studies for students to examine for breach of confidentiality and other legal/ethical components.

Provide resources and/or guidelines students can use to judge these components.

Provide a procedure/guideline for decision-making or have students put together a set of guidelines for consideration.

(See Teaching Tools Section C)

Student Activities

Identify patient's rights. Study the Patient's Bill of Rights and Advance Directives and identify how they help patients in healthcare facilities.

Recognize the consequences for unethical and unlawful behavior.

Discuss confidentiality and identify when it should not be honored and to whom you would report the confidential matter.

Use a set of guideline for ethical decision-making.

Complete study questions in the *Phlebotomy Workbook*.

04.02 TASK: DESCRIBE APPROPRIATE AND LEGAL USE OF THE PATIENTS MEDICAL RECORDS

ENABLING OBJECTIVES

1. Identify the four (4) basic purposes of medical records.
2. Describe how medical records are used for non-medical reasons.
3. Explain the correct recording method to correct a clerical error.
4. Understand the need for patients to sign Release of Information forms in order to have a copy of their lab reports for personal use.

Suggested Activities

Reading Assignments

Key Words: medical records, reporting mechanisms, HIIPA.

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Impress upon students that healthcare records are legal documents and can be used in a court of law.

Discuss the legal and ethical concepts that apply to recording and reporting.

Provide simulated patient records with poor recordings and have students practice how to enter statements, how to do error corrections, and "late entries."

Provide students with a sample Release of Information form.

(See Teaching Tool Section C)

Student Activities

Using the resources, complete the enabling records objectives.

Recognize that healthcare records are legal documents and are used in legal cases such as malpractice.

Determine the legal and ethical aspects of recording.

Practice recording and reporting using the guidelines given.

04.03 TASK: DEMONSTRATE UNDERSTANDING OF ETHICAL BEHAVIOR, PROFESSIONAL LIABILITY, LEGAL ASPECTS, AND THE IMPORTANCE OF FOLLOWING PROTOCOL AND CHAIN OF COMMAND

ENABLING OBJECTIVES

1. List the basic legal terminology involved in healthcare and used in the medical legal aspect for phlebotomy.
2. Identify four (4) factors considered in cases of negligence.
3. Define "informed consent."
4. Discuss policies and protocols designed to avoid medicolegal problems and the consequences of not following these policies/ protocols.
5. Relate legal responsibilities of the laboratory and phlebotomist to the need for physicians' requests for all specimen collection and testing.
6. Explain the chain of command and pathways of communication in healthcare facilities.
7. Define "scope" of practice.
8. Explain the consequences of practicing outside the scope.

Suggested Activities

Reading Assignments

Key Words: legal issues, consent, negligence, patient's rights, specimen collection

Phlebotomy Handbook

Phlebotomy Workbook

Teacher Activities

Emphasize the terminology key to this unit.

Direct students to determine scopes of practice by using resources such as rules and regulations from Idaho's Boards.

Student Activities

Define terms and how they are used.

Using the resources, complete the enabling objectives.

Examine rules and regulations to determine scopes of practices and what happens when a person practices beyond the scope.

View ASCP Teleconference 9063, "Legislation and Medicolegal Issues Affecting Phlebotomy Practice."

View video "Avoiding Phlebotomy Related Lawsuits".

Complete study questions in the *Phlebotomy workbook*.

05.0 DISCUSS PHLEBOTOMY IN RELATION TO THE HEALTH CARE SETTING

05.01 TASK: LIST, CLASSIFY, AND DISCUSS VARIOUS DEPARTMENTS AND SERVICES WITHIN THE HEALTHCARE SETTING IN WHICH THE PHLEBOTOMIST MUST INTERACT TO OBTAIN LABORATORY SPECIMENS FROM PATIENTS

ENABLING OBJECTIVES

1. Define the terms used in the healthcare setting; be familiar with assigned prefixes, suffixes, word roots, abbreviations, and symbols.
2. List the various hospital departments/services.
3. Describe the major functions of these hospital departments:

<u>Floor/patient categories</u>	<u>Specialized areas/patients</u>
Medical/surgical	ER (or ED)
Neurology	OR
Pediatric	PICU
Psychiatric	ICU
Obstetrics	MSS
Oncology	MSTI
Nursery	NICU
Cardiac	CCU
Orthopedics	MICU (Medical ICU)
Geriatric	SICU (Surgical ICU)
Dialysis	CVOR
Medical Imaging (X-ray)	Physical Therapy
Occupational Therapy	Pharmacy
Respiratory Care	Molecular Biology

4. Define the following in terms of the healthcare team:

MD (physician)	CNA (certified nursing assistant)
RN (registered nurse)	RT (respiratory technician)
LPN (licensed practical nurse)	PT (physical therapist)
Pharmacist	MT (medical technologist)

Suggested Activities

Reading Assignments

Key Words: healthcare facilities, healthcare delivery system, patient care

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Provide students with examples of cases where a phlebotomist may need to go to a department to perform phlebotomy duties. Use departments where one may not think a phlebotomy procedure would need to be done there.

(See Teaching Tools Section D)

Student Activities

Using the resources, complete the enabling objectives.

Complete the study questions in the *Phlebotomy Workbook*.

05.02 TASK: IDENTIFY THE MAJOR DEPARTMENTS/SECTIONS WITHIN THE CLINICAL LABORATORY, THE MAJOR TYPES OF PROCEDURES RUN IN EACH DEPARTMENT/SECTION AND THEIR SPECIMEN REQUIREMENTS

ENABLING OBJECTIVES

1. Describe the organizational structure of the clinical laboratory department. (Diagram an organizational chart.)
2. Identify the individual departments/sections within the clinical laboratory.

3. Describe how laboratory testing is used to assess body functions and disease.
4. List the types of lab procedures performed in the various sections.
5. Identify the sources available to determine specimen requirements.
6. List the specimen requirements for the most commonly ordered lab tests and identify the laboratory section which performs each test.
7. Be familiar with the clinical relevance of the most commonly ordered lab tests.

Suggested Activities

Reading Assignments

Key Words: Clinical Laboratory sections, laboratory tests, specimen handling, collection procedures, clinical laboratory departments.

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Provide a copy of the Departmental Service manual for individual facility

Use video tapes of laboratory careers, professionals, and technicians who work in the healthcare industry.

Discuss the procedures performed in each section of the laboratory and the laboratory requisition slips that are utilized.

Student Activities

Using the resources, complete the enabling objectives.

View video tapes of laboratory health careers, professionals, and technical healthcare workers.

Complete the study questions in the *Phlebotomy Workbook*.

05.03 TASK: DESCRIBE ROLES OF THE MAJOR CLASSIFICATIONS OF CLINICAL LABORATORY PERSONNEL

ENABLING OBJECTIVES

1. Define the following in terms of laboratory personnel:

MT	Pathologist
MLT	CT
HT	CLS
Phlebotomist	Lab Manager/Director
Section Supervisor	Data Entry

2. Describe the qualifications of clinical laboratory personnel as listed above.

3. Discuss the accreditation/regulation agencies of laboratories:

CAP	CLSI	NCR
JCAHO	AABB	
CLIA '88	FDA	

4. Describe the role of the laboratory professional in providing training, monitoring, and competency assessment of phlebotomists and CAP/multi-disciplinary personnel.

Suggested Activities

Reading Assignments

Key Words: CLIA, regulatory issues, healthcare team, regulation

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Provide additional resources to support enabling objectives. National Medical Laboratory Week (NMLW) pamphlets contain such information.

(See Teaching Tools Section D)

Student Activities

Using the resources, complete Enabling Objectives
Complete the study questions in the *Phlebotomy Workbook*.

05.04 TASK: DESCRIBE THE PHLEBOTOMIST'S ROLE AND RESPONSIBILITIES IN PROBLEM-SOLVING SITUATIONS (FOR EXAMPLE: PROBLEM DRAWS, WHEN TO CALL THE LAB)

ENABLING OBJECTIVES

1. State the duties of a phlebotomist.
2. Describe a job description and the information it contains.
3. Describe the problem solving situations that the phlebotomist might encounter:

Patient refuses to be drawn	Patient not in room
Can't find a vein	IVs in both hands
Edema	Repeated attempts fail
4. List the steps the phlebotomist would follow when unable to obtain a blood sample after repeated venipuncture attempts.
5. Identify situations where the laboratory would need to be contacted.
6. Discuss the procedures to follow when patients are asleep, in the shower, not in their rooms, or being visited by a physician, a member of the clergy, family, or friend.

Suggested Activities

Reading Assignments

Key Words: complications, troubleshooting, problem-solving, blood collection

Phlebotomy Workbook

Phlebotomy Handbook

Video

Blood Collection: The Difficult Draw

Teacher Activities

Phlebotomy Procedure Manual-specific to each facility

Give examples of real situations that have occurred in a facility where you have worked.

Student Activities

Role playing, view ASCP Teleconference 9452, "The Role of Today's Phlebotomist".

View video *Blood Collection: The Difficult Draw*.

Complete the study questions in the *Phlebotomy Workbook*

05.05 TASK: IDENTIFY PHLEBOTOMY PROCEDURES THAT MAY CHANGE FROM FACILITY TO FACILITY

ENABLING OBJECTIVES

1. List specific phlebotomy duties/procedures/protocols most likely to show variation from facility to facility.
2. Identify the additional, different types of laboratory tasks that a phlebotomist may be asked to perform.

Suggested Activities

Reading Assignments

Key Words: additional phlebotomy duties, special procedures, ancillary testing, point-of-care quality control/assurance.

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Provide the policies/procedures of your department or of facilities in your area.
Obtain the policies/procedures of another facility in your area to enhance the point that there may be significant difference from facility to facility.

Student Activities

Using the resources complete the enabling objectives.
Complete the study questions in the *Phlebotomy Workbook*.

06.0 BASIC MATH SKILLS

06.01 TASK: MAKE AND USE MEASUREMENTS IN BOTH TRADITIONAL AND METRIC UNITS

ENABLING OBJECTIVES

1. Discuss the uses of traditional measurement and metric unit measurement in healthcare and every day living.
2. Practice conversion from one system to the other.
3. Discuss how the phlebotomist uses the metric and traditional measurements.

Suggested Activities

Reading Assignments

Phlebotomy Workbook
Phlebotomy Handbook

Teacher Activities

Provide an overview and discussion of how these two systems are used.
Provide students with learning materials in Teaching Tools Section to help them develop conversions.
Relate uses of the systems to the job.
Assist students with calculations for glucose tolerance test when dosage varies from standard.
(See Teaching Tools Section E)

Student Activities

Study the conversion techniques and tables provided.
Discuss how these conversions and measurements are used on the job.
Practice conversions and solving problems provided.
Be able to use the systems on the job.
Calculate correct dosage for a glucose tolerance test when dosage varies from standard.
Complete student activities found in the Teaching Tools Section D.

06.02 TASK: CONVERT FROM REGULAR TIME TO 24-HOUR TIME (MILITARY TIME)

ENABLING OBJECTIVES

1. Discuss the differences between regular time and 24 hour time (often called military time).
2. Practice conversion from regular time to 24 hour time.
3. Discuss when 24 hour time is used in healthcare facilities.
4. Relate the time conversion process to the job.

Suggested Activities

Reading Assignments

Materials in the Teaching Tools Section

Teacher Activities

Review a chart of time conversion.
Discuss when 24 hour time is used on the job.
(See Teaching Tools Section E)

Student Activities

Study the chart on 24 hour time.
Practice conversions using given materials.
Be able to convert time on the job.

07.0 BASIC SCIENCE SKILLS

07.01 TASK: DEMONSTRATE KNOWLEDGE OF THE ORGANIZATIONAL LEVELS OF THE HUMAN BODY

ENABLING OBJECTIVES

1. Describe the organization of the body beginning with the smallest, the cell.
2. Describe how all of these levels are connected to one another.
3. Define Homeostasis.

Suggested Activities

Reading Assignments

Key words: cell, tissue, organ, and homeostasis
Phlebotomy Workbook
Phlebotomy Handbook

Teacher Activities

Provide overhead pictures of different types of cells, tissues, and organs in the human body.
Explain the ways in which the body achieves homeostasis.

Student Activities

Complete enabling objectives
Complete questions in the *Phlebotomy Workbook* and the *Phlebotomy Handbook*

08.0 IDENTIFY THE ANATOMIC STRUCTURE AND FUNCTION OF BODY SYSTEMS IN RELATION TO SERVICES PERFORMED BY THE PHLEBOTOMIST

08.01 TASK: DEMONSTRATE KNOWLEDGE OF ANATOMY AND PHYSIOLOGY OF THE BODY SYSTEMS (waiting until task 08.02 for the circulatory system).

ENABLING OBJECTIVES

1. Describe the basic functions of each of the main body systems (physiology): skeletal, muscular, nervous, respiratory, digestive, endocrine, reproductive, lymphatic, and urinary.
2. Define the following: sagittal plane, transverse plane, and frontal plane.
3. Identify parts of a body according to their proximity to one of the body planes (anatomy).

Suggested Activities

Reading Assignments: Key words: prone, supine, lymph, hematopoiesis, CSF, ABG
Phlebotomy Handbook
Phlebotomy Workbook

Teacher Activities

Using torso model, identify body cavities and put organs into proper cavities. Stand up and identify body surfaces (anterior, posterior, dorsal, ventral, etc).

Provide diagrams for each system and have students label parts.

Describe the major function of each body system.

Identify the major diseases/disorders of each system.

Announce available in-services with speakers, professionals, and patients to discuss real diseases/disorders.

As you go through the different systems, list major laboratory tests that are associated with each and what type of sample is required.

Student Activities

Label systems as you study them.

Study major diseases/disorders of each system.

Attend presentations on major diseases and disorders given by guests.

Develop a list of healthful practices to protect the body systems.

Complete questions in the *Phlebotomy Workbook* and the *Phlebotomy Handbook*.

08.02 TASK: DESCRIBE AND DEFINE THE CIRCULATORY SYSTEM

ENABLING OBJECTIVE

1. Describe the pathway of blood through the heart.
2. Describe the process of Hemostasis
3. Understand the function of the circulatory system
4. Know the components of the circulatory system

Suggested Activities

Reading Assignments

Key Words: circulatory system, veins, capillary function, blood components, hemostasis

Phlebotomy Handbook

Phlebotomy Workbook

Teacher Activities

Use video tapes, slides, models, and other visual aids to enhance learning about the circulatory system. Discuss risk factors and contributing lifestyles that lead to disease/ disorders.

Student Activities

View visual aids provided to increase learning about the circulatory system and how to prevent illness. Associate risk factors and lifestyles that are conducive to disease/disorders.

Complete the study questions in the *Phlebotomy Workbook*.

08.03 TASK: IDENTIFY, WITH 100% ACCURACY, THE MAIN SUPERFICIAL VEINS USED IN PERFORMING VENIPUNCTURES

ENABLING OBJECTIVES

1. Describe the arteries, veins, and capillaries by structure and function.
2. Be able to identify the following structures on an illustration and a patient:

Cephalic vein	Femoral artery
Accessory cephalic vein	Radial artery
Basilic vein	Ulnar artery
Median antecubital vein	brachial artery
Median antebrachial vein	Digital veins
3. Describe, with 90% accuracy the following:

Intravenous lines	indwelling lines
Heparin locks	Cannulas
Fistulas	Hickman catheters
Central venous access device	

Suggested Activities

Reading Assignments

Key Words: venipuncture, vein, artery, capillary

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Provide diagram of veins in the human body.

Provide diagram of arteries in the human body.

Student Activities

Using the resources complete the enabling objectives.

Complete the study questions in the *Phlebotomy Workbook*.

08.04 TASK: IDENTIFY, WITH 100% ACCURACY, THE MOST APPROPRIATE SITES FOR VENIPUNCTURE

ENABLING OBJECTIVES

1. List, in priority, the arm veins to be used for venipuncture.
2. Describe the selection process for the use of hand veins for phlebotomy.
3. Identify alternate venipuncture collection sites and describe the limitations and precautions of each.
4. Name three (3) conditions in which drawing from legs and feet is contraindicated.

Suggested Activities

Reading Assignments

Key Words: venipuncture site, blood collection

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Use visual aids, and student examples to enhance learning about appropriate venipuncture sites.

Student Activities

Palpitate antecubital and wrist/hand veins on each other and self.

Using the resources, complete the enabling objectives.

Study anatomy of heart and diagram of general circulation showing gaseous exchange.

Study anatomic charts of major veins and arteries.

Study anatomic charts of arms, hands, and foot veins. Identify frequently used sites for venipuncture.

Find these sites on other students.

08.05 TASK: DESCRIBE, WITH 90% ACCURACY, THE CHARACTERISTICS OF WHOLE BLOOD, SERUM, PLASMA, AND THE FOLLOWING BLOOD COMPONENTS: ERYTHROCYTES, THROMBOCYTES (PLATELETS), AND LEUKOCYTES

ENABLING OBJECTIVES

1. List the components of blood, including each type of cellular component, and where each is produced.
2. Describe the function of and alternate names for RBC, WBC, and platelets.
3. Explain the differences between whole blood, serum and plasma.
4. Identify the properties of venous blood versus arterial blood.

Suggested Activities

Reading Assignments

Key Words: blood components, body fluids, serum, plasma, whole blood

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Identify major constituents of blood, showing examples of serum, plasma, and blood cells.

Show examples of blood cells using strained smears and microscope, or slides and a slide projector.

Student Activities

Using the resources, complete the enabling objectives.

Complete the study questions in the *Phlebotomy Workbook*.

08.06 TASK: COAGULATION: INTRINSIC AND EXTRINSIC PATHWAYS, HEMOSTASIS, AND FIBRINOLYSIS

ENABLING OBJECTIVES

1. Define hemostasis.
2. Identify three (3) components of coagulation.
3. Explain the basic process of coagulation and fibrinolysis.

Suggested Activities

Reading Assignments

Key Words: coagulation, anticoagulants, hemostasis

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Review the coagulation pathways and show a diagram of each.

Review the process of coagulation when an injury occurs.

Student Activities

Complete the study questions in the *Phlebotomy Workbook*.

09.0 RECOGNIZE AND IDENTIFY COLLECTION REAGENTS, SUPPLIES, EQUIPMENT

09.01 TASK: GATHER, WITH 100% ACCURACY, PROPER EQUIPMENT NEEDED TO COLLECT VARIOUS CLINICAL LABORATORY BLOOD SPECIMENS BY VENIPUNCTURE

ENABLING OBJECTIVES

1. List the supplies that should be carried on a phlebotomist's tray.
2. List equipment used for venipuncture using evacuated tube system, syringe system, and winged infusion set system (butterfly) with and without multiple sample adapter.
3. Explain the reason and need for safety devices on needles.
4. Explain how a phlebotomist would determine that special or unique pieces of equipment are required for specimen collection and/or transport.
5. List all needle sizes and match them with the coordinating color.
6. Describe/discuss, with 100% accuracy, the proper supplies to use in aliquoting short draws into micro specimen containers.
7. Describe location(s) of all above supplies at your facility.

Suggested Activities

Reading Assignments

Key Words: supplies, equipment, tray, safety devices, evacuated tube system, syringe system, winged infusion set (butterfly) system, and micro specimen collection.

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Provide supplies needed to set up collection trays.

Provide examples of venipuncture equipment of all types and supplies for aliquoting.

Student Activities

Set up your own collection tray.

Using the resources, complete the enabling objectives.

Complete the study questions in the *Phlebotomy Workbook*.

09.02 TASK: EXPLAIN THE SPECIAL PRECAUTIONS AND TYPES OF EQUIPMENT NEEDED TO COLLECT BLOOD FROM A NEONATE

ENABLING OBJECTIVES

1. Discuss the types of skin puncture devices available.
2. Describe four (4) types of microspecimen containers, as well as reasons for their use, advantages and disadvantages.
3. List the common complications associated with skin puncture.

Suggested Activities

Reading Assignments

Key Words: neonatal collection, skin puncture equipment, heel warmer

Phlebotomy Workbook

Phlebotomy Handbook

Video

Blood Collection: Microcollection

Teacher Activities

Provide and demonstrate examples of the skin puncture devices.

Student Activities

Watch slide-tape series "Blood Specimen Collection by Skin Puncture in Infants."

View ASCP Teleconference 9459, "Pediatric Blood Collection."

View the video *Blood Collection: Microcollection* (also for task 09.03).

Complete the study questions in the *Phlebotomy Workbook*.

09.03 TASK: IDENTIFY AND DISCUSS PROPER USE OF SUPPLIES USED IN COLLECTING MICRO SPECIMENS

ENABLING OBJECTIVES

1. Describe method of collection using the different types of microspecimen containers.
2. Describe the correct labeling of microspecimens.
3. Describe the methods for puncture site warming.

Suggested Activities

Reading Assignments

Key Words: micro specimen collection, micro specimen equipment

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Provide examples of different types of micro containers; demonstrate methods of collection and labeling. Demonstrate equipment.

Student Activities

Watch video *Blood Collection: Microcollection*

09.04 TASK: DISCUSS, WITH 95% ACCURACY, THE PROPER USE OF THE VARIOUS TYPES OF ANTICOAGULANTS, PRESERVATIVES, AND GELS USED IN BLOOD COLLECTION AND THE VACUUM TUBE COLOR-CODES FOR THESE ADDITIVES

ENABLING OBJECTIVES

1. Identify the various types of additives used in blood collection, and explain the reasons for their use.
2. Identify the evacuated tube color codes associated with the additives.
3. Match, with 100% accuracy, the color-coded tubes to the test being ordered.
4. Identify, with 95-100% accuracy, anticoagulant used in each tube and mode of action for each anticoagulant.
5. State, with 100% accuracy, the volume required for each tube. (Include minimum amounts.)
6. Discuss limitations of aliquoting short samples at the bedside/pouring from one tube to another.
7. Match, with 100% accuracy, the computer container code(s) on the printed label with the correct collection tube.

Suggested Activities

Reading Assignments

Key Words: anticoagulants/additives, mode of action, EDTA, heparin, evacuated tubes/stoppers, evacuated tubes/tests minimum volumes, aliquot

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Use the chart included in the *Phlebotomy Workbook*.

Engage students with placing lab tests with the correct tube, and the department in the lab that will be doing the test.

Student Activities

Discuss common tests. Refer to Appendix 1 in *The Phlebotomy Workbook*, and laboratory tests associated with the different body systems.

Stress the importance of consistency among staff when referring to tubes: “gold” not “yellow”, “lt. blue” vs. “dark blue”, “corvac”, vs. “tiger top”, vs. “serum separator”, “lithium heparin”, vs. “sodium heparin”.

Discuss the special and infrequently used tubes for special collections.

Complete the study questions in the *Phlebotomy Workbook*.

09.05 TASK: DESCRIBE, WITH 90% ACCURACY, THE TYPES OF PATIENTS' SPECIMENS THAT ARE ANALYZED IN THE CLINICAL LABORATORY AND THE PHLEBOTOMIST'S ROLE IN COLLECTING AND/OR TRANSPORTING THESE SPECIMENS TO THE LABORATORY

Suggested Activities

Reading Assignments

Key Words: specimen collection and transportation, laboratory departments/testing done

Phlebotomy Workbook

Phlebotomy Handbook

Video

Blood Collection: Transportation and Handling.

Teacher Activities

Focus on key terms, common abbreviations.

(See Teaching Tools Section K)

Student Activities

View video *Blood Collection: Transportation and Handling.*

Do study questions in *Phlebotomy Workbook*.

09.06 TASK: DEFINE AND UTILIZE CORRECT MEDICAL TERMINOLOGY AND METRIC EQUIPMENT NEEDED FOR SPECIMEN COLLECTION

Suggested Activities

Reading Assignments

Key Words: medical terminology, equivalents, metric-English, metric system

Phlebotomy Handbook

Phlebotomy Workbook

Teacher Activities

Discuss the most common abbreviations for phlebotomy equipment, especially tubes.

Student Activities

Make a chart to help memorize the types of equipment, abbreviations, and uses.

Complete study questions in the *Phlebotomy Workbook*.

09.07 TASK: DESCRIBE AND PERFORM (AS PERMITTED) USES OF THE CENTRIFUGE

Suggested Activities

Reading Assignments

Key Words: centrifuge operation, processing, centrifugation

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Demonstrate correct use of various types of centrifuges.

Student Activities

Use a basic centrifuge to spin down routine specimens.

10.0 IDENTIFIES AND UNDERSTANDS ERRORS BEFORE, DURING AND AFTER SPECIMEN COLLECTION THAT CAN CAUSE SPECIMENS TO BE REJECTED, TO GIVE ERRONEOUS RESULTS, SEVERE PATIENT COMPLICATIONS

10.01 TASK: DESCRIBE, WITH 90% ACCURACY, PRE-ANALYTICAL ERRORS WHICH CAN OCCUR BEFORE SPECIMEN COLLECTION.

ENABLING OBJECTIVES

1. List eight (8) types of errors that can affect patient samples before collection begins.
2. Describe the impact of these errors on specific analyses.
3. Explain ways in which the phlebotomist can avoid making these errors.
4. List the circumstances that would lead to recollection or rejection of a sample.

Suggested Activities

Reading Assignment

Key words: Pt identification, time of collection, fasting, blood cultures, tourniquet time, site preparation, exercise, posture, chronobiology, and medication

Phlebotomy Handbook

Phlebotomy Workbook

Video

Preventing Pre-analytical Errors. This video is appropriate for Tasks 10.02 and 10.03.

Teacher Activities

Explain the importance of patient ID, Give examples of proper patient ID, both in-patient and out-patient obtain facility procedures for collection of blood cultures.

(See Teaching Tools Section A, H, and F)

Student Activities

Role play proper patient ID.

Role play communication for fasting samples.

10.02 TASK: DESCRIBE, WITH 90% ACCURACY, PRE-ANALYTICAL ERRORS WHICH CAN OCCUR DURING SPECIMEN COLLECTION.

ENABLING OBJECTIVES

1. List four (4) types of errors that can affect patient samples during blood collection..
2. Describe the impact of these errors on specific analyses.
3. Explain ways in which the phlebotomist can avoid errors during collection of blood samples.
4. List the circumstances that would lead to recollection or rejection of a patient sample.
5. Describe with 100% accuracy the Order of Draw for syringe and vacutainer venipunctures.
6. Describe with 100% accuracy the Order of Draw for capillary draws.

Suggested Activities

Reading Assignment

Key Terms: Hemolysis, Order of Draw, inversion, blood/anticoagulant ratio, hemoconcentration, incorrect tube.

Phlebotomy Handbook

Phlebotomy Workbook

Teacher activities

Obtain several samples with different stages of hemolysis. List analytes affected by hemolysis.

Obtain or assemble a poster indicating the correct Order of Draw.

Demonstrate ways to pre-warm sites for capillary sticks.

Student Activities

Take laboratory tests and place them with the proper tube and correct Order of Draw.

Demonstrate the correct way to pull the plunger of a syringe back.

10.03 TASK: DESCRIBE, WITH 90% ACCURACY, PRE-ANALYTICAL ERRORS WHICH CAN OCCUR AFTER SPECIMEN COLLECTION.

ENABLING OBJECTIVES

1. List four (4) factors that interfere with specimen integrity after collection.
2. Describe the impact of possible erroneous results.
3. Explain ways in which the phlebotomist can avoid pre-analytical errors that can occur after specimen collection.
4. List the circumstances that would lead to recollection or rejection of a patient sample.

Suggested Activities

Reading Assignment:

Key Terms: Stability, Centrifugation, transportation and delivery, light sensitivity.

Phlebotomy Handbook

Phlebotomy Workbook

Teacher Activities

Review video *Preventing Pre-analytical errors*.

(See Teaching Tools Section K)

Student Activities

Complete study questions in the *Phlebotomy Workbook*.

<p>11.0 DEMONSTRATE SKILLS AND KNOWLEDGE NECESSARY TO PERFORM PHLEBOTOMY</p>

11.01 TASK: DEMONSTRATE APPLICATION OF ESTABLISHED PROTOCOLS WHEN IDENTIFYING PATIENTS

ENABLING OBJECTIVES

Requisitions

1. Explain the correct procedure for identifying an appropriate physician's request for collection of routine and special specimens.
2. List the essential information that should be on the requisition or computer order entry.
3. List the precautions applicable to verbal test ordering and reporting.
4. Recognize, with 100% accuracy, a properly completed requisition form.
5. With 100% accuracy, complete microbiology/transfusion service test request forms (to include antibiotics/transfusion history, diagnosis, etc.).
6. With 100% accuracy, ask patient necessary questions in order to complete test request forms.
7. Relate legal responsibilities of the lab and phlebotomist to the need for physicians' requests for all specimen collection and testing.

Patient Identification

8. Describe the legal and ethical importance of proper patient and specimen identification.
9. Define complete patient/specimen identification procedures.
10. Identify potential patient/specimen identification errors that can occur.
11. Demonstrate application of established protocols when identifying patients and specimens.
12. Describe the consequences of failure to comply with established policy.

Specimen Labeling

13. With 100% accuracy, explain the importance of labeling specimens immediately after collection.

14. Discuss policy for labeling specimens, manual versus computer generated, and situations where computer labels are not available at the time of draw.
15. Explain the proper placement of computer labels on tubes.
16. Describe the consequences of failure to comply with established policy.

Suggested Activities

Reading Assignments

Key Words: patient identification, requisitions, orders, legal considerations, labeling, specimen identification.

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Obtain sample requisition forms.

Discuss sample requisitions, including specific forms for microbiology/transfusion service, as appropriate.

Refer to CLIA '88, other accreditation and regulatory requirements.

Overhead of flowchart of patient identification policy. Overhead of criteria for patient identification and specimen labeling.

Use group discussion, covering the issues presented in each situation.

Situations in *Phlebotomy Workbook* and *Phlebotomy Handbook* could be used.

Discuss sample policies for patient identification. If possible, have students bring sample policies from their places of employment.

Review articles; discuss necessity for strict compliance and implications/ consequences for failure to follow policy.

Discuss types of patient identification systems available (hand written, bar codes, Addressograph, etc.)

Include advantages and disadvantages of each.

(See Teaching Tools Section A, F, G, and K)

Student Activities

Fill out and evaluate sample requisitions to be sure all information is included. Note other information present on sample forms.

Using the resources, complete Enabling Objectives Numbers 1, 2, and 3.

Role play, asking patients necessary questions to complete forms.

Role play, using various scenarios (potential problems/pitfalls with the patient identification systems/barriers encountered/ practice how to handle all situations).

Using the resources, complete Enabling Objectives 8 - 12.

Correctly label tubes using both manual and computer labels.

Using blank requisition and specimen tubes, practice labeling both with appropriate information.

For hospital settings, describe necessity of having a protocol for identification of patients whose identity is not known. Brainstorm ways to do this.

Discuss sample requisitions for completeness. If possible, have students bring requisitions and labels from their places of employment.

Discuss necessity for compliance with established policies.

Complete study questions in the *Phlebotomy Workbook* and *Phlebotomy Handbook*.

11.02 TASK: DISCUSS AND PERFORM, WITH 100% ACCURACY, METHODS FOR FACILITATING VENIPUNCTURE COLLECTION AND CAPILLARY COLLECTION

ENABLING OBJECTIVES

1. Perform, with 100% accuracy, appropriate placement and application of a tourniquet.
2. Discuss and describe patient complications and specimen suitability that can result from

- inappropriate tourniquet application.
3. Describe vein palpation.
 4. List four (4) methods used to locate veins that are not prominent.
 5. Explain reasons for not drawing from an area of hematoma, from a burned or scarred area, or an arm adjacent to a mastectomy.
 6. State three (3) methods for obtaining blood from a patient with an IV. Know specific facility practice/policy.
 7. Describe patient preparation and positioning.
 8. Recognize, with 100% accuracy, proper needle insertion and withdrawal techniques, including direction, angle, depth, and aspiration.
 9. Discuss the purpose/methodology of puncture site warming.

Suggested Activities

Reading Assignments

Key Words: venipuncture technique, veins, tourniquet, site selection, difficult draws

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Discuss sample policies, consequences (for patient and phlebotomist) of noncompliance with methods.
(See Teaching Tools Section G)

Student Activities

View the video *Basic Venipuncture*.

Using the resources, complete the enabling objectives.

Complete the study questions in the *Phlebotomy Workbook* and the *Phlebotomy Handbook*.

11.03 TASK: LIST, WITH 100% ACCURACY, APPROPRIATE ANTISEPTIC AGENTS USEFUL IN PREPARING SITES FOR VENIPUNCTURE/CAPILLARY PUNCTURE

ENABLING OBJECTIVES

1. List the steps in cleansing the venipuncture site.
2. Differentiate between sterile and antiseptic techniques.
3. List the antiseptic agents used in the venipuncture procedure.
4. State the complications produced by the presence of alcohol at the puncture site.

Suggested Activities

Reading Assignments

Key Words: cleansing site, venipuncture, sterile, aseptic technique

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Discuss key terms, definitions in the *Phlebotomy Workbook*

Apply the principles of medical/surgical asepsis.

Discuss advantages/disadvantages of antiseptic agents used.

(See Teaching Tools Section G)

Student Activities

View the video "The Miracle of Blood and the Technique of Collecting Specimens."

Using the resources, complete the enabling objectives.

11.04 TASK: PERFORM, WITH 100% ACCURACY, APPROPRIATE METHODS FOR PREPARING A SITE FOR VENIPUNCTURE AND CAPILLARY COLLECTION, INCLUDING CHOOSING THE BEST SITE

ENABLING OBJECTIVES

1. Determine an appropriate site for venipunctures and capillary puncture.
2. Use the appropriate type of site preparation for different sites and tests.

Suggested Activities

Reading Assignments

Key Words: site selection/preparation for venipuncture, site selection/preparation for skin puncture, capillary puncture, dermal puncture

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Assess competency of skin puncture.

Assess competency of venipuncture site selection.

Student Activities

Practice methods for preparing a site for venipunctures and capillary blood collection

Take time to investigate different possibilities for venipunctures collection.

Complete study questions in the *Phlebotomy Workbook and Phlebotomy Handbook*

PERFORMING VENIPUNCTURE

11.05 TASK: PERFORM VENIPUNCTURE BY EVACUATED TUBE SYSTEM, SYRINGE, AND WINGED INFUSION SET (BUTTERFLY). DEMONSTRATING APPROPRIATE USE OF SUPPLIES, PROPER HANDLING OF EQUIPMENT AND SPECIMENS, AND PATIENT CARE

ENABLING OBJECTIVES

1. Describe/demonstrate the venipuncture procedure using a syringe, including equipment examination, use of blood transfer devices to evacuated tubes, needle safety devices and disposal of equipments.
2. Describe/demonstrate the venipuncture procedure using a butterfly (winged infusion set), the technique involved and disposal of equipment.
3. Describe/demonstrate the venipuncture procedure using the evacuated tube system, the technique involved, and disposal of equipment.
4. Demonstrate proper site care post-venipuncture.
5. Prepare at bedside, with 90% accuracy, aliquot(s) of specimen or component(s) for analysis according to specimen type and analysis to be performed.

Suggested Activities

Reading Assignments

Key Words: venipuncture technique, routine procedure, equipment disposal, safety.

Phlebotomy Workbook

Phlebotomy Handbook

Video

Basic Venipuncture, and/or Blood Collection: Modern Blood Collection

Teacher Activities

Using the rubber arm, have students perform venipuncture using all three (3) systems. Use role playing

to include all aspects of the venipuncture procedure.
If venipuncture is unsuccessful, describe course of action.
Assess competency of students using the Checklist of Abilities for Venipuncture-Evacuated Tube system, Venipuncture-Syringe, and Venipuncture-Winged Infusion set.
(See Teaching Tools Section G)

Student Activities

Practice the venipuncture procedure on the model arms, both adult and pediatric sizes, until the procedure is mastered. It should include the syringe method and the evacuated tube method. Transferring specimens and using the correct order of draw should also be part of this exercise.
Special attention should be given when using the safety devices on all needles.
After successful completion of procedures using the rubber arm, students should perform venipunctures on each other.
Perform patient venipuncture.
Complete study questions in the *Phlebotomy Workbook*.

11.06 TASK: DESCRIBE, WITH 100% ACCURACY, THE CORRECT ORDER OF DRAW DURING VENIPUNCTURE AND CAPILLARY COLLECTION

ENABLING OBJECTIVES

1. Discuss considerations for coagulation testing.
2. List the steps necessary to perform a venipuncture in correct order of draw.
3. State the order of draw for a skin (capillary) puncture.
4. Describe the reason for the difference

Suggested Activities

Reading Assignments

Key Words: tubes/order of draw, order of fill
Phlebotomy Workbook
Phlebotomy Handbook

Teacher Activities

Include discussion about controversial issues, variations among facilities.
Compare references to order of draw in all texts and articles provided.
Discuss facility policy.
CLSI approved standard H3-A4 Vol. 23 No. 32.

Student Activities

Practice the correct order of draws, using the appropriate tube for the test(s) requested.
Determine special conditions for transport or processing for these specimens.
Using the resources, complete the enabling objectives.
Complete study questions in the *Phlebotomy Workbook*.

SPECIAL PROCEDURES/COMPLICATIONS

11.07 TASK: PERFORM CAPILLARY PUNCTURE USING APPROPRIATE SUPPLIES AND TECHNIQUES FOR ADULTS, CHILDREN, AND NEONATES

ENABLING OBJECTIVES

1. Define the terms and abbreviations with capillary puncture and special capillary punctures.
2. Describe the composition of capillary blood and name five (5) test results that may be different from venous blood.
3. List six (6) reasons for performing capillary punctures on adults.
4. Describe the complications associated with capillary punctures in infants.

5. Discuss the conditions when finger and heel punctures are performed and list four (4) unacceptable areas for heel puncture.
6. Describe/demonstrate, with 100% accuracy, the acceptable sites for performing finger and heel punctures.
7. Describe/demonstrate, with 100% accuracy, the correct positioning of the lancet device for capillary puncture.
8. Name the major cause of micro specimen contamination.
9. Perform, with 100% accuracy, capillary punctures on the finger and/or heel, as permitted.
10. Correctly perform a bleeding time following the instructions provided.
11. Describe the collection of capillary blood gases, including sources of technical error.
12. Describe the unopette system and its uses.

Suggested Activities

Reading Assignments

Key Words: skin puncture (capillary) technique.

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Demonstrate the appropriate procedure for a capillary puncture.

Have students practice appropriate procedure for a capillary puncture.

After practice, assess students for competency.

Student Activities

Practice the skin puncture procedure on a student partner. Blood smears can be made and capillary tubes should be filled with only one puncture.

Using the anticoagulated blood specimen, practice filling capillary tubes, micro dilution vials, and other micropipettes until they can be filled with ease.

Perform skin puncture procedures on finger and/or heel.

(As permitted) Perform modified ivy bleeding time procedure and capillary blood gases.

Complete the study questions in the *Phlebotomy Workbook*.

11.08 TASK: EXPLAIN, WITH 90% ACCURACY, THE MOST COMMON COMPLICATIONS/PHYSICAL PROBLEMS ASSOCIATED WITH VENIPUNCTURE, THEIR CAUSES, PREVENTION AND TREATMENT

ENABLING OBJECTIVES

1. Define the terms associated with venipuncture complications.
2. Name and explain frequent causes of phlebotomy complications.
3. Describe the signs and symptoms of physical problems that may occur during blood collection.
4. Discuss the procedure to follow when a patient develops syncope during the venipuncture procedure.
5. List five (5) causes of hematomas.
6. List seven (7) venipuncture errors that may produce hemolysis.

Suggested Activities

Reading Assignments

Key Words: venipuncture complication, hemolysis, syncope, hematoma

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Focus on decision-making and judgment required.
Relate examples of real situations that you have encountered.

Student Activities

Using the resources, complete the enabling objectives.
Complete the study questions in the *Phlebotomy Workbook*.

AFTER VENIPUNCTURE

11.09 TASK: PERFORM, WITH 100% ACCURACY, PROCEDURES FOR DISPOSING OF USED OR CONTAMINATED SUPPLIES

ENABLING OBJECTIVES

1. Describe disposal for evacuated tube system, syringe system, and butterfly.
2. Describe three (3) different needle disposal devices and appropriate use for each.
3. Describe the consequences of not using the proper safety and disposal of contaminated equipment.

Suggested Activities

Reading Assignment

Key Words: needle disposal, disposal devices, venipuncture, site care
Phlebotomy Workbook
Phlebotomy Handbook

Teacher Activities

Provide examples of sharps containers – wall mount, tray mount, and floor. Different needle disposal devices. Demonstrate the appropriate use of needle disposal devices.

Student Activities

Using the resources, complete the enabling objectives.
Watch Baxter A.N.D. "Needle Removal Device" video.
Watch video and refer to "Blood Borne Pathogens and Phlebotomy: How to Protect Yourself" pamphlet.

11.10 TASK: PERFORM, WITH 90% ACCURACY, APPROPRIATE TECHNIQUES FOR MAKING A PERIPHERAL BLOOD SMEAR FOR HEMATOLOGIC EVALUATION

ENABLING OBJECTIVES

1. List the characteristics of a good peripheral blood smear for a manual differential.
2. Demonstrate the technique for a peripheral blood smear.
3. Discuss the advantages/disadvantages of preparing the slide with blood directly from the needle versus from an anticoagulated tube.
4. List six (6) possible errors in technique that cause unacceptable blood smears.

Suggested Activities

Reading Assignments

Key Words: slides, blood smears, manual differential
Phlebotomy Workbook
Phlebotomy Handbook

Teacher Activities

Provide samples of blood smears.
Demonstrate how to make a good peripheral blood smear

Student Activities

Practice making peripheral blood smears with anticoagulated blood while using proper standard safety precautions.

11.11 TASK: DESCRIBE, WITH 90% ACCURACY, BLOOD WITHDRAWAL FROM PATIENTS WHO DIFFER FROM GENERAL POPULATION: PATIENT WITH MASTECTOMY, DIALYSIS, HEPARIN LOCKS, HICKMAN CATHETER, PORT-A-QATH, CODE ENABLING OBJECTIVES

1. Describe complications/special considerations involved in each of the above situations.
2. Discuss specifics of facility policies.

Suggested Activities

Reading Assignments

Key Words: vascular access device, heparin lock, special collection procedures

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Obtain and discuss specifics of facility policies.

Relate real life situations that you have encountered.

Student Activities

Using the resources, complete the enabling objectives.

Complete the study questions in the *Phlebotomy Workbook*.

11.12 TASK: DESCRIBE, WITH 90% ACCURACY, SPECIAL COLLECTION TECHNIQUES FOR:

BLEEDING TIME	PKUS
B12	CRYOGLOBULINS
MALARIAL SMEARS	COLD AGGLUTININS
GTT	2 HOUR POST PRANDIAL
1hr GTT FOR GESTATION DIABETES	
PEAK/TROUGH DRUG MONITORING	
ANCILLARY BLOOD GLUCOSE	

ENABLING OBJECTIVES

1. List five (5) tests that are affected by exposure to light.
2. Prepare an acceptable malarial blood smear using the instructions provided.
3. State two (2) reasons why fasting specimens are requested and name three (3) tests affected by not fasting.
4. List four (4) reasons for requesting timed specimens.
5. Explain the procedure for a 2-hour postprandial glucose test.
6. Correctly schedule specimen collections for a GTT.
7. Using an example, discuss diurnal variation of blood constituents.
8. State two (2) reasons for therapeutic drug monitoring.
9. Differentiate between a trough and a peak drug level.
10. Describe the procedure for collecting specimens for cold agglutinins.
11. List seven (7) tests that must be chilled immediately after collection.
12. State the purpose of the bleeding time and three (3) reasons why it may be prolonged.
13. Discuss the standardization of the bleeding time since its introduction by Duke and errors in technique that affect test results.

14. Briefly discuss why and how neonatal filter paper screening tests are collected.
15. Discuss the performance of ancillary blood glucose testing including puncture technique and other procedures that must be performed.
16. Discuss/describe legal ramifications in informing patients of glucose results at bedside.
17. Describe the variations and documentation that needs to be considered when doing finger stick and "drop from the end of needle" ancillary glucoses.
18. Perform an ancillary blood glucose test following the manufacturer's instructions for the instrument provided and documentation results.
19. Discuss blood glucose quality control and the recommended frequency of performance.
20. Perform and document QC for ancillary blood glucose testing.

Suggested Activities

Reading Assignments

Key Words: special collection techniques, peak/trough drug monitoring, glucose tolerance testing, special dermal puncture.

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Emphasize terminology for key terms.

(See Teaching Tools Section H).

Student Activities.

Using the resources, complete the enabling objectives.

Have students pair up for role play activity to set up a 3hr GTT.

11.13 TASK: PERFORM, WITH 100% ACCURACY, SPECIAL COLLECTION TECHNIQUES FOR:

OCCUPATIONAL DRUG SCREENING

BLOOD ALCOHOL

TYPE AND CROSSMATCH

FDPs

Blood Culture

ENABLING OBJECTIVES

1. Describe the paperwork/documentation involved in the collection of transfusion services specimens such as a type and cross match.
2. Discuss three (3) timing sequences for the collection of blood cultures, reasons for selecting a particular timing sequence, and the number of specimens collected.
3. Describe the aseptic techniques required when collecting blood cultures.
4. Understand the basic principles for a Chain of Custody (COC) used for collection for Occupational Drug Screening.

Suggested Activities

Reading Assignments

Key Words: blood alcohol, cross match/blood bank/transfusion service, DOT

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Assemble necessary equipment.

Provide various forms of COC i.e.: Department of Transportation (DOT) and Non-Dot

Provide a variety of facility policies for collection of blood cultures.

(See Teaching Tools Section H)

Student Activities

Perform special collection techniques.

Role play Occupational Drug Screening collection

Complete study questions in the *Phlebotomy Workbook*.

11.14 TASK: LIST THE PROCEDURAL STEPS FOR BLOOD ALCOHOL SPECIMEN COLLECTION

ENABLING OBJECTIVES

1. Explain the differences between legal and medical blood draws.
2. Discuss the variations in policy from facility to facility regarding legal blood alcohols.
3. Describe the conditions that must be met in blood specimens and laboratory tests that are to be used as legal evidence.
4. Describe "chain of custody" as it relates to specimen collection.
5. Perform, with 100% accuracy, blood alcohol collection.

Suggested Activities

Reading Assignments

Key Words: blood alcohol, chain of custody, alcohol, legal/medical

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Include discussion of legal versus medical alcohol, chain of custody, appropriate cleaning of the site, and any chain of custody requirements at specific facilities.

Student Activities

Role play in collection procedures of legal and non blood alcohol.

11.15 TASK: PERFORM (AS PERMITTED) ARTERIAL PUNCTURES

ENABLING OBJECTS

1. Define the terms and abbreviations associated with arterial blood gases ("ABG").
2. Describe the diagnostic function of arterial blood gases.
3. List clinical information that must be collected when performing ABGs.
4. Name the preferred site for arterial puncture and state four (4) factors that should be considered when selecting a site.
5. State the purpose of the Modified Allen Test.
6. Discuss six (6) technical errors associated with arterial puncture and the effect on the specimen.
7. Describe six (6) complications of arterial puncture and precautions to avoid them.
8. State four (4) contraindications to performing an arterial puncture.
9. Describe three (3) ways in which an arterial sample can be differentiated from a venous sample.
10. Discuss age specific differences between pediatric and adult arterial punctures.
11. With 100% accuracy, describe/perform arterial punctures.
12. Describe policies for certification/recertification for arterial punctures.

Suggested Activities

Reading Assignments

Key Words: arterial puncture, radial artery, brachial artery, femoral artery, Allen test.

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Arrange for students to observe/shadow individuals performing arterial punctures.
Assess arterial puncture using the checklist in the *Phlebotomy Workbook*.

Student Activities

Do arterial puncture exercise.
Perform the Allen Test on other students.
Watch the prepared ABG video(s) *Workbook*. Perform arterial puncture procedures.

12.0 PRACTICE INFECTION CONTROL FOLLOWING UNIVERSAL PRECAUTIONS

12.01 TASK: DEFINE THE TERMS "NOSOCOMIAL INFECTION" AND "STANDARD PRECAUTIONS"

ENABLING OBJECTIVES

1. Describe in detail the chain of infection (mode of transmission)
2. Understands Occupational and Health Administration (OSHA) Standards.

Suggested Activities

Reading Assignments

Key words: Nosocomial, standard precautions, pathogen, PPE
Phlebotomy Workbook
Phlebotomy Handbook

Teacher Activities

Provide up to date guidelines from OSHA
Stress the importance of Standard Precautions, giving real life examples in the healthcare industry where failure to comply with these standards has ended in major medical issues, either for a patient or a healthcare worker.
(See Teaching Tools Section I)

Student Activities

Using 3 students to a group role play scenarios where a phlebotomist may carry an infectious agent from one patient to another.
Complete the study questions in the *Phlebotomy Workbook and Phlebotomy Handbook*.

12.02 TASK: DESCRIBE/PRACTICE PROCEDURES FOR INFECTION PREVENTION ENABLING OBJECTIVES

1. Discuss in detail and perform proper infection control techniques, such as hand washing, gowning, gloving, masking, and double-bagging.
2. Discuss in detail the standard precautions outlined by the Center for Disease Control.
3. Describe safety measures that should be followed at all times by a phlebotomist when collecting patient's specimens.

Suggested Activities

Reading Assignments

Key Words: infection control, safety, universal precautions, isolation procedures.
Phlebotomy Workbook
Phlebotomy Handbook

Teacher Activities

Using the skill checklists and necessary supplies, direct students to practice standard precautions.

Provide demonstrations to students.
Relate uses of precautionary settings.
Discuss approved instant hand wash stations in relation to infection control.
Practice standard precautions using the measures of real life situations and health care checklists.
Using the Checklists of Abilities for Handwashing, donning and removing gloves, masks, and isolation gloves assess the students for their ability.

Student Activities

Complete checklist for Hand washing and Gowning, Gloving, and Masking.
Using the resources, complete Enabling Objective Number 3.
Study how and when these standard precautions practices are used in a variety of circumstances.
Complete the study questions in the *Phlebotomy Workbook* and *Phlebotomy Handbook*.

12.03 TASK: DEMONSTRATE, WITH 100% ACCURACY, PERFORMING A VENIPUNCTURE IN AN ISOLATION SETTING

ENABLING OBJECTIVES

1. Identify reasons for placing patients in isolation.
2. Perform, with 100% accuracy, venipuncture in an isolation setting.
3. Identify the precautions the phlebotomist must take before entering surgery and/or negative pressure (flow) rooms.

Suggested Activities

Reading Assignments

Key Words: isolation precautions, personal protective equipment (PPE).
Phlebotomy Workbook
Phlebotomy Handbook

Teacher Activities

Review sample policies of infection control procedures.
Review sample policy of Bloodborne Pathogen Exposure Control Plan.
(See Teaching Tools Section I)

Student Activities

Perform venipuncture in an isolation setting.
Using the resources, complete Enabling Objective Numbers 1 and 3.
Complete study questions in the *Phlebotomy Workbook*.

12.04 TASK: IDENTIFY POTENTIAL ROUTES OF INFECTION

ENABLING OBJECTIVES

1. List the components of the chain of infection and the safety precautions that break the chain.
2. List six (6) types of isolation; discuss the modes of transmission of infection.
3. State the conditions under which the above types of isolation occur.

Suggested Activities

Reading Assignments

Key Words: Chain of infection, infection control, blood borne pathogens
Phlebotomy Workbook
Phlebotomy Handbook

Teacher Activities

Provide resources for students that will assist them in completing the enabling objectives.
Show students how the chain of infection (cycle of) occurs using portals of entry, susceptible hosts and modes of transmission.

Relate transmission to daily life practices.
Direct students to investigate home practices and areas that need correction to reduce transmission.
Relate transmission to common health care practices.
Provide student activity found in Teaching Tools Section I.

Student Activities

Use available resources, and those you think of, to complete the objectives.
Define terms.
Study the chain or cycle of infection.
Relate to a known disease and discover how to prevent transmission.
Check out home practices and ways to avoid or reduce possible transmission of disease-causing organisms.
Complete study questions in the *Phlebotomy Workbook*

12.05 TASK: RECOGNIZE AND PROPERLY HANDLE, WITH 100% ACCURACY, BIOHAZARDOUS MATERIALS

ENABLING OBJECTIVES

1. Define "biohazardous specimen."
2. List at least three (3) types of biohazardous materials a phlebotomist may routinely encounter.
3. Describe proper disposal procedures for each material listed.

Suggested Activities

Reading Assignments

Key Words: biohazard, safety, waste, MSDS

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Provide copies of MSDS

Assign the name of a potential hazardous chemical to each student and provide them with the necessary MSDS that is needed to complete their safety needs with the given chemical.

(See Teaching Tools Section J)

Student Activities

Using the resources, complete the enabling objectives

Complete study questions in the *Phlebotomy Workbook*.

13.0 DEMONSTRATES AND FOLLOWS SAFETY GUIDELINES FOR PATIENTS AND STAFF

13.01 TASK: DEMONSTRATE KNOWLEDGE OF AND PRACTICE APPROPRIATE PATIENT SAFETY

ENABLING OBJECTIVES

1. Describe, with 100% accuracy, safety measures that should be followed at all times by a phlebotomist when collecting patient's specimen.
2. Demonstrate usage of needle safety devices.
3. Demonstrate safe disposal of sharps.
4. Demonstrate and practice on a mannequin designed for the instruction of cardiopulmonary resuscitation (CPR).

Suggested Activities

Reading Assignments

Key Words: safety, CPR, needle disposal, patient safety, OSHA.

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Provide examples of sharps containers.

Provide case studies involving patient safety issues during specimen collection.

Provide samples of needle safety devices.

Provide time and/or instruction for CPR certification.

(See Teaching Tools Section J)

Student Activities

Demonstrate proper and safe disposal of sharps.

Role play, become certified for CPR at the level required by your facility.

Complete study questions in the *Phlebotomy Workbook*

13.02 TASK: PRACTICE LABORATORY SAFETY IN ACCORDANCE WITH ESTABLISHED PROCEDURES

ENABLING OBJECTIVES

1. List three (3) agencies responsible for establishing rules of safety in the clinical laboratory.
2. List at least three (3) characteristics of laboratories that define them as potentially hazardous environments.
3. Define the terms and abbreviations associated with healthcare safety.
4. Identify the engineering control and work practice controls utilized in the clinical setting.
5. Identify the following symbols:

Radiation	Biohazard	Toxic or poison
Carcinogen	Corrosive	Flammable
6. Demonstrate the cleaning protocols used for equipment/work space in a health care setting.
7. Discuss the purpose of the Disaster Plan.

Chemical

8. Describe the safety precautions utilized when handling chemicals.
9. Identify the steps taken when a chemical spill occurs.
10. Discuss the purpose of the Material Safety Data Sheets (MSDS).
11. Discuss the purpose of the Chemical Hygiene Plan.
12. Describe the hazard identification system developed by the NFPA including labeling diamonds and level of hazard.

Biohazard

13. Discuss the OSHA blood borne pathogen policy (Exposure Control Plan).
14. Describe/demonstrate appropriate methods for disposal of needles.

Radiation

15. List the three (3) elements of radiation safety.

Electrical

16. List at least three (3) rules of electrical safety.
17. Discuss the procedure to follow in cases of electrical shock.
18. List the steps to follow when a fire is discovered.
19. Demonstrate operation of a fire extinguisher.
20. List at least four (4) classifications of fire and the types of extinguishers appropriate to use one each type of fire.

Suggested Activities

Reading Assignments

Key Words: safety, OSHA

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Provide resources, including guest speakers, to allow the students to complete the enabling objectives.

Invite a speaker or acquire video tapes of OSHA requirements for health care workers and agencies.

Provide descriptions of unsafe situations and acquire reporting procedures.

Have students practice how they would report the situations presented. State and federal guidelines should be part of the discussion.

Discuss safety factors in simulated emergency situations.

Direct students to recognize abbreviations and symbols that indicate hazardous materials and environmental conditions.

Discuss interventions for examples of unsafe conditions. Invite a guest speaker to talk about hazardous materials and common accidents that occur and how to prevent them.

Have a student laboratory session for the demonstration of fire extinguishers and the fire blanket.

Discuss safety in handling and demonstrate use of the precaution labels for identification of hepatitis, AIDS, and other patients in isolation in the health care institution.

Demonstrate use of the chemical spill kit in a student laboratory on chemical safety.

Discuss electrical and radiation safety precautions.

Discuss and demonstrate first aid techniques.

Discuss the documentation procedure that must be followed in the health care institution when an accident occurs during specimen procurement and handling.

Student Activities

Using the resources, complete the enabling objectives.

Identify reporting procedures.

Attend sessions given by guest speakers to learn actual incidences and reporting procedures.

Recognize the procedures enforced by state and federal agencies.

Study simulated unsafe environmental situations and the abbreviations and symbols used to designate known hazardous situations.

Decide on interventions for each situation discussed in class.

Demonstrate operation of a fire extinguisher, chemical spill pillow, recapping techniques/devices, and fire blanket.

Complete study questions in the *Phlebotomy Workbook*.

13.03 TASK: FOLLOW DOCUMENTATION PROCEDURES FOR WORK-RELATED ACCIDENTS

ENABLING OBJECTIVES

1. Describe, with 100% accuracy, what to do in the event of an accidental needle stick.
2. Describe, with 95% accuracy, what to do in the event of an exposure to patients with respiratory infections, such as TB, pertussis or RSV.
3. Describe, with 95% accuracy, the phlebotomist's role when exposures to infectious agents, such as N. meningitis and M. Tuberculosis, have been verified.
4. Identify the phlebotomist's responsibility when pregnancy of the phlebotomist has been determined.
5. Explain the procedure(s) the phlebotomist should take when he/she suspects he/she has an infection, such as strep throat or pink eye.

Suggested Activities

Reading Assignments

Phlebotomy Workbook

Phlebotomy Handbook

Policies and procedures from facility, including OSHA Exposure Control Plan.

Teacher Activities

Provide examples of facility policy/ procedures pertaining to above work-related accidents.

Discuss use and availability of Hepatitis B vaccine.

(See Teaching Tools Sections I and J)

Student Activities

Using the resources, complete the enabling objectives.

Complete study questions in the *Phlebotomy Workbook*.

14.0 DEMONSTRATE KNOWLEDGE OF COMMUNICABLE DISEASES

14.01 TASK: DISTINGUISH BETWEEN FACT AND FALLACY ABOUT THE TRANSMISSION AND TREATMENT OF COMMUNICABLE DISEASES, INCLUDING HIV INFECTION

ENABLING OBJECTIVES

1. Diagram the cycle of transmission of communicable diseases.
2. Identify facts about transmission of a variety of communicable diseases, including hepatitis.
3. Identify facts on how HIV is transmitted.
4. Select a communicable disease and research ways it is transmitted; compare to HIV transmission.

Suggested Activities

Reading Assignments

Key Terms: HIV, Hepatitis

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

If not already taught in earlier units, review Teaching Tools Section I on infection transmission and HIV/AIDS.

Have students research several diseases and ways to prevent transmission.

Student Activities

Review all materials on infection transmission and HIV/AIDS. Know Standard Precautions.

Research infections, diseases and ways to prevent transmission.

Complete study questions in *Phlebotomy Workbook*.

14.02 TASK: IDENTIFY COMMUNITY RESOURCES AND SERVICES AVAILABLE TO INDIVIDUALS WITH COMMUNICABLE DISEASES

ENABLING OBJECTIVES

1. Contact (or attend a presentation) by a representative from the local health department on communicable diseases.
2. Investigate resources in your community that provide services to people with communicable diseases.

Suggested Activities

Reading Assignments

Materials provided on local community resources.

Teacher Activities

Arrange for guest speaker from local health department to talk about resources on communicable diseases.

Student Activities

Study materials to achieve objectives.

Attend session by representative of local health department.

14.03 TASK: APPLY STANDARD PRECAUTIONS AND INFECTION CONTROL AS RECOMMENDED BY CENTERS FOR DISEASE CONTROL

ENABLING OBJECTIVES

1. Define/describe standard precautions.
2. Explain the role of the Centers for Disease Control.
3. Practice and perform proper hand washing.
4. Practice and perform proper gloving (donning and removal).
5. Practice and perform masking and gowning (donning and removal).
6. Practice and perform care of sharps.
7. Practice and perform cleaning up blood spills and spills of other body fluids.
8. Practice and perform care of hazardous materials.
9. Apply standard precautions in all aspects of job performance.

Suggested Activities

Reading Assignments

Key Terms: Standard Precautions, CDC

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Provide skill checklists, if not already completed, for all procedures and have students practice. Check students off on procedures when they are ready.

Student Activities

Review and study all standard precaution procedures and practice them.

Be checked off when ready on all procedures.

Complete study questions in the *Phlebotomy Workbook*.

14.05 TASK: DEMONSTRATE KNOWLEDGE OF LEGAL ASPECTS OF AIDS

ENABLING OBJECTIVES

1. Discuss confidentiality of a patient's diagnosis of AIDS.
2. Discuss AIDS patients' right to healthcare services.
3. Discuss the impact and effect of the American Disability Act on a person with AIDS.
4. Review and relate legal implications for healthcare workers who might become infected on the job.
5. Follow policies and procedures of employer regarding AIDS when on the job.

Suggested Activities

Reading Assignments

Policies and procedures of healthcare facilities on HIV/AIDS.

Teacher Activities

Discuss confidentiality as a right of the AIDS patient and how employees handle/protect this right.
Discuss the impact of the American Disability Act on AIDS patients.
Review healthcare facility policies and procedures to prevent employee injuries/infections and what to do if accidents/exposure occurs.
(See Teaching Tools Section A)

Student Activities

Study how confidentiality is a right to AIDS patients and how to protect this right.
Know how the American Disability Act affects AIDS patients.
Follow the AIDS policies and procedures for job exposure/accidents.

15.0 PRACTICE ACCEPTED PROCEDURES OF TRANSPORTING, ACCESSIONING, AND PROCESSING SPECIMENS

15.01 TASK: DEMONSTRATE, WITH 100% ACCURACY, PROPER TRANSPORT OF BLOOD SPECIMENS TO LAB OR OTHER STATIONS

ENABLING OBJECTIVES

1. List four (4) types of transport services routinely used for laboratory services.
2. Explain methods for transporting and processing blood specimens for routine and special testing within the hospital.
3. Describe the types of patient specimens that are analyzed in the clinical laboratory and phlebotomist's role in transporting these specimens to the laboratory.
4. Describe at least three (3) transport methods of specimens for special testing (not related to time constraints).

Suggested Activities

Reading Assignments

Key Words: transport, specimens, labeling, safety, biohazard, pneumatic tube system.
Phlebotomy Workbook
Phlebotomy Handbook

Teacher Activities

Discuss specimen rejection due to inappropriate handling of specimens.
Provide sample policies for use of a Pneumatic Tube System.
Discuss the importance of the Pneumatic Tube systems in specimen processing.
(See Teaching Tools Section K)

Student Activities

Using the resources, complete the enabling objectives.
Do exercises for collecting chilled and light-sensitive specimens. .
Describe types of transport systems, including advantages and disadvantages of each.
Identify and properly label biohazardous specimens and prepare for transport using various methods.
Complete study questions in the *Phlebotomy Workbook*.

15.02 TASK: DESCRIBE, WITH 90% ACCURACY, THE SIGNIFICANCE OF TIME CONSTRAINTS FOR SPECIMEN COLLECTION AND DELIVERY

ENABLING OBJECTIVES

1. Explain, with 95% accuracy, the importance of timed specimens, fasting specimens, and STAT specimens.
2. Describe at least three (3) examples of the above specimens.
3. In regard to processing and transporting of blood, describe, with 90% accuracy, the general effects of time on test quality and patient care.

Suggested Activities

Reading Assignments

Key Words: specimen transport, delivery, Time Draws. STAT, ASAP, and Routine draws

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Have students brainstorm a list of things which could interfere with their ability to collect and/or deliver specimens in a timely manner.

Have guest speaker to emphasize the importance of “Time Draws” being done as close to the appointed time as possible. A hospital pharmacist would be ideal.

(See Teaching Tools Section H)

Student Activities

Role play by placing different phlebotomy draw situations in the correct order in which they should be handled. Complete study questions in *Phlebotomy Workbook*.

15.03 TASK: DEMONSTRATE KNOWLEDGE OF ACCESSIONING PROCEDURES

ENABLING OBJECTIVES

1. Understand the reasoning for accessioning of laboratory specimens
2. Understands that accessioning procedures may change during computer downtime.

Suggested Activities

Reading Assignments

Key Words: specimen accessioning

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Provide examples of specimen accessioning.

Provide opportunities and observe competency in accessioning procedures.

Provide policies for “downtime procedures” and assigning accession numbers to specimens.

Student Activities

Role play sample accessioning of specimens.

15.04 TASK: PREPARE ALIQUOT(S) OF SPECIMEN OR COMPONENT(S) FOR ANALYSIS ACCORDING TO SPECIMEN TYPE AND ANALYSIS TO BE PERFORMED

ENABLING OBJECTIVES

1. List the general criteria for suitability of a specimen for analysis.
2. Explain methods for processing and transporting blood specimens for testing at reference laboratories.
3. Describe the potential clerical and technical errors that may occur during specimen process.
4. Understand the importance of Standard Precautions during specimen aliquoting.

Suggested Activities

Reading Assignments

Key Words: aliquot, specimen rejection criteria, safety shield, goggles

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Provide examples of reference books and specimen transport requirements and aliquots.
Assign students 3-5 lab tests for them to use reference manuals to look up specimen requirements.

Student Activities

Complete the above activity assigned by the instructor and present their findings to the class making sure to include any and all pertinent information needed to deliver a quality sample.

15.05 TASK: WITH 100% ACCURACY, FOLLOW PROTOCOL FOR ACCEPTING VERBAL TEST ORDERS

Suggested Activities

Reading Assignments

Key Words: ordering tests, verbal orders, telephone orders
Phlebotomy Workbook
Phlebotomy Handbook

Teacher Activities

Provide opportunities/situations to role play acceptance and documentation of verbal test orders.
Organize opportunities to have students shadow data entry or other lab staff who receive verbal orders.
Provide sample verbal and telephone order forms.

Student Activities

Role play various scenarios of protocols for verbal orders and telephone orders.

16.0 PRACTICE QUALITY ASSURANCE/QUALITY CONTROL AND SAFETY

16.01 TASK: WITH 100% ACCURACY, DEFINE TERMS ASSOCIATED WITH LABORATORY QA/QC (TAT- TURNAROUND TIME, ETC.)

ENABLING OBJECTIVES

1. Explain, with 90% accuracy, the legal and ethical ramifications of inadequate QA/QC.
2. Describe the effect of CLIA (Clinical Laboratory Improvement Amendment) 1988 on specimen collection and testing.
3. Define QA, QC, TAT, CQI, TQM, delta check, etc.
4. List the accrediting agencies that routinely inspect for QC/QA documentation.

Suggested Activities

Reading Assignments

Key Words: Quality Control, Quality Assurance, legal issues, ethics
Phlebotomy Workbook
Phlebotomy Handbook

Teacher Activities

Describe the effect of CLIA '88 on specimen collection and testing - or invite a guest speaker to do so.

Student Activities

Using the resources, complete Enabling Objectives.
View ASCP Teleconference 9455, "QA and QC Procedures for Phlebotomy Techniques."
Complete study questions in the *Phlebotomy Workbook*.

16.02 TASK: DISCUSS QC MEASURES FOR PHLEBOTOMY PROCEDURES PERFORMED BY PHLEBOTOMISTS

ENABLING OBJECTIVES

1. With 100% accuracy, insure the use of reagents and equipment that are not out of date.
2. With 95% accuracy, maintain current documentation.
3. Discuss competency assessment for phlebotomy and ancillary skills such as blood glucose testing.

Suggested Activities

Reading Assignments

Key Words: quality control, documentation Phlebotomy Techniques.

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Provide examples of documentation of reagent QC, equipment maintenance/QC charts, etc. (See Teaching Tools Section L)

Student Activities

Verify that the supplies on your phlebotomy tray are "in date."

16.03 TASK: DISTINGUISH, WITH 95% ACCURACY, PROCEDURES WHICH ENSURE RELIABILITY OF TEST RESULTS WHEN COLLECTING BLOOD SPECIMENS

ENABLING OBJECTIVES

1. Describe the system for monitoring quality assurance in the collection of blood specimens.
2. Identify policies and procedures used in the clinical laboratory to assure quality in the obtaining of blood specimens.
3. With 100% accuracy, recognize abnormalities in reagents, equipment, or test results.
4. With 90% accuracy, investigate causes of abnormal reagents, equipment and test results.
5. With 100% accuracy, notify the appropriate party (usually the PCP or lab) of abnormal reagents, equipment or test results.
6. List, with 90% accuracy, the criteria that may cause rejection of a patient specimen.

Suggested Activities

Reading Assignments

Key Words: quality assurance.

Phlebotomy Workbook

Phlebotomy Handbook

Teacher Activities

Provide resources for students to use to complete objectives, including policies specific to facilities.

(See Teaching Tools Section L)

Student Activities

Using the resources, complete Enabling Objectives.

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SECTION A

COMMUNICATION

COMMUNICATION FOR THE HEALTHCARE WORKER

The ability to communicate with other members of the health care team cannot be overemphasized. Communication is the basis for all human interaction whether it be spoken (sometimes called oral or verbal), non-verbal (gestures, signals, facial and body expressions), or written, such as in the care plan. Communication is usually defined as a means of sending and receiving messages. The communication process, although described in many different ways by various authors, actually involves 5 parts as shown in the diagram below.



1. The sender: Person initiating message.
2. Message: Words spoken, written, gestures, or other symbols conveying thoughts, ideas by sender. NOTE: Sender may speak but will always include non-verbal message.
3. The receiver: Person to who the message is intended.
4. The transmitting device: method used to convey the message.
5. The feedback: Evidence that the receiver understands or does not understand the message. Unfortunately, feedback is not requested enough by persons.

Unfortunately, feedback is not requested enough by persons sending messages and becomes a major reason why the communication process breaks down.

Body Language Chart

Example illustrated: Listening to Employee Suggestions

Conversation with David Samuels—new supervisor in our research department

Situation:	Professional
Location:	My office
Purpose of conversation:	To listen to David's ideas regarding the expansion of the research department
My motivation	To influence David's ideas; to ensure financial responsibility and success of research department
His motivations	To excel in his new position; to gain approval from me—his boss; to have the opportunity to express his ideas
My body language	Steeping
Interpretation	To establish my position and power, and yet make clear to David my ability to listen and think about new ideas
His body language	Erect posture; attempts at direct eye contact; occasional finger taps on armchair
Interpretation	To show confidence and intelligence; nervousness or slight anxiety about new situation pokes through the confident exterior

The Seven Signs to Watch for When Listening

1. Eyes

Widening eyebrows indicate pleasure; contracting pupils indicate displeasure or dislike; narrowing eyes indicate distrust or disbelief.

2. Eyebrows

Lifting one eyebrow indicates disbelief or skepticism; lifting two eyebrows indicates surprise.

3. Nose and Ears

Rubbing the nose or tugging an ear while verbally acknowledging understanding indicates puzzlement or bewilderment.

4. Forehead

Downward wrinkle (similar to a frown) indicates puzzlement or disagreement; upward wrinkle indicates surprise.

5. Shoulders

Shrugging shoulders indicates indifference and possible hostility.

6. Fingers

Drumming or tapping fingertips on desktop or arm of chair indicates nervousness, anxiety, or impatience.

7. Arms

Clasping arms around the chest indicates isolation or fear.

VERBAL AND NONVERBAL TECHNIQUES OF COMMUNICATION

Effective spoken communication is clearly understood between the sender and the receiver. It requires active listening on the part of the receiver. Active listening means that the listener is receiving the entire message--the words and the feelings that are being expressed. An example of active listening: After asking Mrs. Smith how she feels today, she replies in a very sad voice, "I'm fine." She obviously isn't fine because you detected sadness in her voice. Noting the sadness means that you were actively listening to the tone of her voice, which conveyed a different message than the words spoken. Active listening also includes observation of the nonverbal behavior during the communication.

Techniques of verbal communication, besides active listening, which the health care worker should apply, are the following:

1. Speech is clear.
2. Vocabulary is understood by clients.
3. A nonverbal response, such as a nod of head, is provided to indicate understanding.
4. The message is clarified by giving back main points said by client.
5. The message is rephrased back to the client as another way to make sure that you understand.
6. The client is allowed to express anger and hostile behavior. (Do not try to cut off behavior that you do not like.)
7. A calm touch on the client's hand or shoulder is used when appropriate. (Note: Touch the person's hand first; some people do not like to be touched.)
8. Eye contact is maintained with the client.
9. The speaker is given time to finish--do not hurry or appear distracted.
10. The client is spoken to with respect and as an equal.

BARRIERS TO COMMUNICATION

Barriers to communication are those actions that prevent effective communication. Some of the barriers that healthcare workers should avoid are:

1. Labeling or stereotyping people because of preset ideas and prejudices.
2. Allowing yourself to become angry about the client's words or behavior
3. Speaking to the adult person in a demeaning or childish manner.
4. Interrupting the speaker--interjecting your own ideas.
5. Making value statements about the client's beliefs, telling him/her what they believe is wrong.
6. Talking too fast or too low so that the client cannot hear you.
7. Making jokes out of clients' expressions of feeling unhappy or upset.
8. Using medical terms that the client cannot understand.
9. Ignoring the need for an interpreter when a client cannot understand the spoken language of the country.
10. Giving false reassurances-- telling clients they will be fine when they are actually terminally ill.

People who have studied the process of communication believe that nonverbal expressions are far more important than the spoken word. When you take time to think about how much we use gestures and facial expressions to say what we mean and feel, it is easy to understand the meaning and importance of nonverbal behavior. An effective health care worker must learn to use nonverbal behavior appropriately. This means learning acceptance of: disfigurement, hostile behaviors, odors from foul-smelling wounds or diseased parts of the body, and similar conditions which may cause facial and body expressions that offend clients. On the other hand, it is through facial expression that we can show empathy, concern, interest, and happiness when caring for clients.

BASIC FOUNDATIONS OF RELATIONSHIPS

The ability to communicate and to build satisfactory relationships cannot be overemphasized. Communication is the basis for all human understanding, interactions, and relationships. Communication can be spoken or verbal, or nonverbal (gestures, signals, facial and body expressions), or written. Communication is defined as a means of sending and receiving messages. The communication process, although described many ways by different people, involves five parts.

1. **Sender:** person initiating the message.
2. **Transmitting medium:** method used to convey the message.
3. **Message:** words spoken written, gestures, or other symbols; the thoughts and ideas conveyed by the sender.
4. **Receiver:** person to whom the message is intended.
5. **Feedback:** evidence that the receiver understands the message.

Unfortunately, feedback is not requested enough by persons sending messages and becomes a major reason why the communication process breaks down. For example, you are giving directions to someone about how to find the nursing home:

1. **Sender:** "Go down Main Street until you reach the greenhouse and turn right. There is only one greenhouse, so you can't miss the turn."
2. **Receiver:** understands he is looking for a green house (colored green); never sees one, so misses the turn.
3. **Undelivered Message:** the greenhouse: a building made of glass that houses flowers.
Feedback: not clarified, not requested.

Feedback is very important when working with a variety of staff and patients. Workers who do not take the time to assess a person's ability to understand the message will have a breakdown in communication. Effective relationships evolve from two basic foundations: trust and rapport. Trust requires confidence in another person, a feeling that another person will act in your best interest, and these actions are favorable and predictable. Rapport develops from trust. Rapport means to be in agreement or in harmony with another person. You know that you have an effective interpersonal relationship when you trust the other person and have established rapport; a feeling of comfort exists when sharing your thoughts and concerns without fear of being criticized, embarrassed, or the subject of gossip. Confidentiality is an essential part of an effective relationship.

Confidentiality is also a right of each client/patient and must be respected at all times. Confidentiality means that all matters pertaining to information about clients is secret and is not discussed with anyone who is not privileged to know it. Discussion of clients is necessary with other team members and care givers involved in the plan of care. However, to discuss information about clients with your own family or friends is violating the client's right to confidentiality.

AN ETHICAL DECISION MAKING PROCESS

The Ten Steps:

1. Review the situation to determine the health problems, persons involved, conflicts and decisions to be made
2. Gather additional information to clarify the information
3. Identify the ethical issues
4. Define personal and professional moral positions
5. Identify moral positions of individuals involved
6. Identify value conflicts
7. Determine who should make the decision
8. Identify range of actions and possible outcomes
9. Decide on course of action and carry it out
10. Evaluate/review results of decision/actions throughout the time actions are taken

ETHICS OF CONFIDENTIALITY

DO NOT DISCUSS PATIENT INFORMATION WITH:

- ◆ ONE PATIENT ABOUT ANOTHER PATIENT
- ◆ RELATIVES AND FRIENDS OF THE PATIENT
- ◆ VISITORS TO THE HOSPITAL
- ◆ REPRESENTATIVES OF THE NEWS MEDIA
- ◆ FELLOW WORKERS, EXCEPT WHEN IN CONFERENCE
- ◆ YOUR OWN RELATIVES AND FRIENDS

SOURCES OF INFORMATION FOR QUALITY ASSESSMENT

Patient questionnaires

Customer focus groups

Quality circles

Medical records

Incident reports

Accident reports

Written complaints

Staff meetings

Marketing agents

Pathologists

Attending physicians

Direct observation

Laboratory employees

Committee reports

Identification Band Policy

Medical Center policy dictates that "everyone admitted to the hospital must wear a wristband with full name, age, religion, admission date and name of doctor. ...The patient must wear the identification band until he leaves the hospital."

1. The wristband must be on the patient, not attached to the bed or in some other area of the room. If the wristband is not attached to the patient and the patient cannot state his/her name, obtain verification of proper identification from a person familiar with the patient. Have that person verify patient's identity at the bedside.
2. Patients admitted to rehabilitation units (3 West, 4 West, 3 Central) will likely be discharged from their previous hospital ward, readmitted to new unit, and assigned a new patient identification (hospital/account number). Medical record number will remain the same.

The old wristband should be removed and the new one put on the patient. If patients have two wristbands, this should be resolved. Any red fluorescent Transfusion Service numbers should be verified as valid by Blood Bank personnel before being removed from the patient.

3. Non-trauma Emergency Department patients must be identified with ED band containing patient's first and last name.

Trauma patients admitted to Emergency Department are identified as KNOWN or UNKNOWN; depending on whether their true identity is known at the time of arrival. Phlebotomists will not draw blood until KNOWN/UNKNOWN status is established and an ID band is placed on the patient by the identifying nurse.

If the status is KNOWN, the regular ED band is used. Laboratory phlebotomist will add Fenwal Ident-a-band with Transfusion Service number.

If the status is UNKNOWN, Fenwal Ident-a-band from trauma packet must be placed on patient by identifying nurse **BEFORE** blood is drawn. See trauma protocol for further details.

Saint Alphonsus Regional Medical Center

Laboratory Policy for Patient Identification

Patient identification is a critical aspect of total quality of care. It is mandatory that the phlebotomist who collects the blood specimen from the patient correctly identify the patient, regardless of the clinical setting. Patients must be **POSITIVELY** identified at the time the sample is drawn. Sample must be labeled at the bedside or other collection site in the presence of the patient.

I. Patient who is conscious...

1. Ask the patient "What is your name?" Check the patient's wristband for verification. If the patient is able to give full name and the wristband agrees with the patient's statement, check the requisition and/or preprinted label to be sure all information agrees. This includes i.e. hospital number, medical record number, room number, correct spelling of first and last name, sex, middle initial, and date of birth.

If all information agrees, perform the venipuncture and label tubes according to established criteria.

Patients to be drawn for cross match must verify date of birth. That reformation should not be taken from the computer alone.

II. Report any discrepancy no matter how minor.

1. If there is a discrepancy between information on the requisition, preprinted label, and wristband, **DO NOT** perform the venipuncture until the situation has been resolved. Have a nurse familiar with the patient provide positive identification and/or check to be sure patient has correct wristband. If changes are necessary (i.e. in IHS computer, Sunquest computer, or addressograph plates), the phlebotomist should notify appropriate personnel to make these changes.

Be sure ALL information is the same. The requisition (preprinted or handwritten), wristband, and verbal information from the patient or person identifying the patient must agree.

II. Patient who is unconscious, too young, mentally incompetent, or does not speak the language of the phlebotomist...

1. If the patient is unable to state his or her name, the wristband must be relied upon totally for information and/or a nurse familiar with the patient must be consulted to verify identification of the patient. Have the identifying person initial the tube(s). If this is not possible, phlebotomist should get name of person and document that as part of computer workload entry. A friend or relative may identify a patient. Verify full name and birth date. Be sure all information agrees with information on request form or preprinted computer label.
2. If the patient can be positively identified (verbal statement, wristband, or nurse ID), perform the venipuncture and label the tube(s) according to established criteria. Specimens must be labeled at the time of collection in the presence of the patient. Tubes should be initialed by the phlebotomist to provide a mechanism for identifying the person who drew the blood.

III. Patient who has no wristband...

1. If patient can state full name or can be identified by a nurse, friend or relative, but has no wristband, notify the nursing station or patient nurse and request that the wristband be put on the patient. Once the band is in place, perform the venipuncture and label the tubes according to established criteria. If problems or delays occur in getting the wristband on the patient, draw the blood (Do not compromise patient care) and then follow up with nurse manager and assistant laboratory director as necessary to resolve the problem. Patients for cross match **CANNOT** be drawn without ID band.

IV. Patient who is ambulatory...

1. Outpatients, TBA or PAT surgical patients and employee hospital physical patients should be called into the drawing room using first and last names. No exceptions to this no matter how well you know the patient. Using first names only for some and not others gives the appearance that some patients get special treatment.
2. Verify patient identification again before drawing blood. Patients may respond to the wrong name or to a similar name.
3. Verify identity of repeat patients (i.e. glucose tolerance) each time they are drawn. During a 3, 4, or 5 hour stay, it is possible a different phlebotomist could obtain the blood sample each time.
4. Check the IHS computer routing slip and the Sunquest computer label to be sure all information agrees. If information on the preprinted computer label is incorrect the phlebotomist is responsible for changing that information or notifying lab registrars to do so. This should be done at the time of draw. For significant errors (i.e. first and last names reversed), labels should be reprinted and the new set of labels with corrected information used.

V. Patients drawn outside the medical center b^y laboratory personnel...

1. House call patients (from nursing homes, private homes, businesses, health fairs, clinics, other hospitals, etc.) must be identified according to established policy. If other facilities have a policy that their patients are not banded, a staff member should accompany the phlebotomist to make positive identification if the patient cannot or will not do so.
2. Specimens must be labeled at the site of collection before delivery to the laboratory for processing. Labeling must meet established criteria or specimens will be rejected.

VI. If blood is obtained from the wrong person...

1. If at any time a mix-up occurs and blood is drawn from the wrong patient, it is the responsibility of the phlebotomist to generate an occurrence report (if this has not already been done) and to provide an explanation of circumstances involved.
2. All incidents must be reported to assistant laboratory operations director and/or operations director.
3. Appropriate disciplinary action will occur upon repeated violations of policy.

SAMPLE IN-PATIENT IDENTIFICATION SCRIPT

Knock on door, enter and greet the patient.

Greeting: “Good morning, how are you this morning?”

“My name is Sara and I’m from the lab. Dr. Jones has ordered some lab work for you today so I will need to take a sample of blood from you. Do you have any questions or concerns?”

Patient answers

“Before we get started, I need to have you tell me your full name and your date of birth.

Could you spell your last name for me please?”

Patient gives name and date of birth while phlebotomist verifies name and date of birth with the requisition labels and then matches that information with the hospital id wristband.

Patient spell last name

Thank you. Now we can get started.”

**SAMPLE
OUT- PATIENT IDENTIFICATION
SCRIPT**

Phlebotomist goes to the waiting room and calls patient by first name. (Do not give last name, HIIPA).

Calling patient and greeting: “Jane. Good morning, my name is Sara. Would you follow me please? You may have a seat here.

“Jane, Dr. Jones has ordered a lipid profile and cbc for you today. The lipid profile requires you to be fasting for 10-12 hours. Have you had anything to eat or drink during this period?”

Patient answers

Patient identification: “Jane I will need to have you tell me your last name, spell it, and give me your date of birth.”

Patient responds

“Jane, do you have any questions before we get started?”

Patient responds

“Let’s begin.”

ACCEPTED ABBREVIATIONS AND DEFINITIONS

ABBREVIATION	DEFINITION
AB	antibody
ABG	arterial blood gases
Abn	abnormal
ABN	Advanced Beneficiary Notice
ABO	blood type
AC	antecubital
AFB	acid fast bacilli
Afib	atrial fibrillation
Ag	antigen
AIDS	Acquired Immune Deficiency Syndrome
Alb	Albumin
ARDS	adult respiratory distress syndrome
ASAP	as soon as possible
Auto	autologous donation
Bact	bacteria
Baso	basophil
BC	blood culture
Bili	bilirubin
BMP	basic metabolic panel
BMT	bone marrow transplant
BT	bleeding time
BUN	blood urea nitrogen
CAP	College of American Pathologists

C&S	culture and sensitivity
Ca	calcium
cath	catheterize
CBC	complete blood count (includes RBC and WBC)
CBCD	complete blood count with differential
Cc	cubic centimeters
C. diff	clostridium difficile
CEA	carcinoembryonic antigen
CHF	congestive heart failure
Chol	cholesterol
CLS	Clinical Laboratory Scientist
CLT	Clinical Laboratory Technician
CMP	comprehensive metabolic panel
COPD	chronic obstructive pulmonary disease
CP	chest pain
CPK	creative phosphokinase
Creat	creatinine
crit or Hct	hematocrit
CRF	chronic renal failure
CRP	c-reactive protein
CSF	cerebrospinal fluid
CV	clean void
CVA	cerebrovascular accident
DD	directed donor
DIC	disseminated intravascular coagulation
diff	manual differential

DM	diabetes mellitus
DOB	date of birth
DVT	deep vein thrombosis
Dx	diagnosis
EBV	Epstein - Barr virus
E coli	Escherichia Coli
EDTA	ethylenediaminetetraacetic acid
Eos	eosinophils
ER	emergency room
ERP	emergency room panel
ESR (SR)	erythrocyte sedimentation rate (sed rate)
FBS	fasting blood sugar
Fe	iron
FFP	fresh frozen plasma
GERD	gastroesophageal reflux disease
GGT	gamma glutamyl transpeptidase
Glu	glucose
GTT	glucose tolerance test
H&H	hemoglobin and hematocrit
HCG	Human Chorionic gonadotrophin
Hct	hematocrit
Hgb	hemoglobin
Hgb A1c	Hemoglobin A1C
HIV	Human Immunodeficiency virus
HTN	hypertension
ID	identification

ICU	intensive care unit
IV	intravenous
K	potassium
Kcl	potassium chloride
L	liter
L&D	labor and delivery
LDH	Lactic acid dehydrogenase
LDPC	leuko depleted packed cells
LFT	liver function test
Li	lithium
Lymphs	lymphocytes
Lytes	electrolytes
MCH	mean corpuscular hemoglobin
MD	medical doctor
Mg	milligrams
MI	myocardial infarction
ML	milliliter
MLT	Medical Laboratory Technician
Mono(s)	monocytes
MRSA	methicillin resistant staphylococcus aureus
MSDA	material safety data sheet
MT	Medical Technologist
N&V	nausea and vomiting
Na	sodium
NP	nasopharyngeal

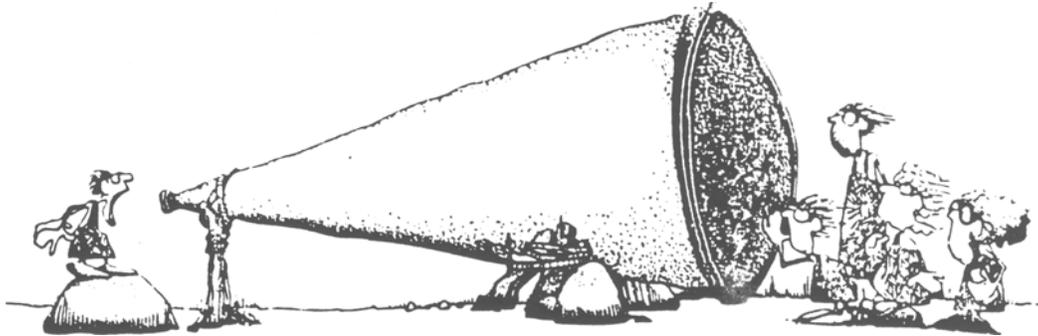
NSAID	nonsteroidal anti-inflammatory drugs
O&P	ova and parasites
O2	oxygen
OB	obstetrics
OP	out patient
OSHA	Occupational safety and health administration
Osmo	osmolality
PAD	pre-admission
Path	pathology
PC	packed cells
Ped	pediatric
pH	acidity
PKU	phenylketonuria
Plt	platelet
PMR	polymyalgia rheumatica
Pneumo	Step pneumonia
POCT	point of care testing
POL	physician office lab
PPE	personal protective equipment
PPO	Preferred provider organization
Protime (PT)	prothrombin time
PSA	prostate specific antigen
APTT (PTT)	Activated partial thromboplastin time
QA	quality assurance
QC	quality control
QNS	quantity no sufficient

RBC	red blood cells
Retic	reticulocyte count
RhiG	RhoGam, Anti-D Immunoglobulin - large dose
RSV	Respiratory Syncytial Virus
SGOT	serum glutamic-oxaloacetic transaminase
SGPT	serum glutamic pyruvic transaminase
SMAC	chemistry screen
SIDS	sudden infant death syndrome
SOB	shortness of breath
Spec	specimen
SST	serum separator tube
STAPH	Staphylococcus
Stat	at once
STREP	Streptococcus
T&C or T&X	Type and cross match
T&S	Type and screen
TAT	turnaround time
Tia	transient ischemic attack
TIBC	total iron binding capacity
TP	total protein
TSH	thyroid stimulating hormone
UA	urinalysis
UTI	urinary tract infection
WBC	white blood cells

SECTION B

EMPLOYABILITY

The fast track – Writers INC: School to Work.



Writers INC: School to Work bridges the gap between school and work, effectively blending academic writing with all types of workplace communication. Along with common forms of school writing, such as the research paper, this relevant and accessible handbook provides strategies and samples of work-related communications such as:

- résumés and cover letters
- memos and meeting minutes
- instructions and proposals
- media releases and speeches
- tips for communicating with groups

School to Work is the smart source—for school and work and the road in between.

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Almanac

Tables and Lists

World Maps

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WRITE SOURCE

D.C. HEATH AND COMPANY

1-800-235-3563

I: Introduction to the Portfolio

What is a portfolio?

A portfolio is a collection of documents that represent you. The portfolio presents a unique opportunity to show the abilities, knowledge, and skills you have achieved. You are responsible for putting together this collection--you determine how it looks and what it says about you!

You may be familiar with an artist's portfolio, which is a large folder containing a variety of drawings, sketches, and sometimes photographs or slides of larger paintings or sculpture. The artist uses the portfolio to show his or her best work to galleries or collectors. Portfolios are used in many other occupations as well: industrial designers, models, public relations representatives, writers, and actors. Even nurses and scientists use portfolios.

What is the purpose of your portfolio?

The main purpose of your portfolio is to demonstrate your mastery of the required knowledge, skills, and abilities in your vocational area. Your school wants to guarantee that you are ready to move on to the next level of training or employment. Your portfolio is important for displaying your skills for an employer, a college, or some other training program. Putting together a portfolio also helps you to see your own growth and accomplishments over time. Once your portfolio is completed, you should feel a sense of satisfaction in the work you have accomplished.

What is included in this portfolio?

The portfolio contains five main sections:

- Letter of Introduction: a letter that introduces you and your portfolio to the person or persons reviewing your completed portfolio.
- Career Development Package: a resume, an employment and college application, and two letters of recommendation to help you prepare for a job search, advanced training, or college.
- Supervised Practical Experience Evaluation: documentation of your practical or work experience related to your vocational area.
- Written Report: a three to ten-page report on a topic in your field
- Work Samples: samples and descriptions of work you do for class.

What does this portfolio look like?

You will need a three-ring binder WITH POCKETS to hold the contents of your portfolio and supplemental materials. When your materials are completed, they will be compiled, neatly into a new folder with pockets. As this portfolio is meant to be used when you interview for college or employment, you will want a professional-looking portfolio with everything typed carefully and no decoration. You may want to include graphic designs or a nice cover that relates to the contents of your portfolio or to your career goals.

II: Letter of introduction

Sample letter of introduction-

To Whom It May Concern:

I am a graduating high school senior, completing my vocational courses in computer technology. I see my training in computers as one step toward my future goal of being a computer technician. I plan to get a job working with computers while I complete my education. I believe that two of my qualities will help guide me in my future work and training: ambition and ability to solve problems. I have the ambition to continuously learn and to work, gaining more experience, while completing my education. I enjoy solving problems and trying new things, which is important in the field of technology. This letter of introduction describes each section of my portfolio and how it relates to my growth, training and future goals.

Career Development Package: This section of the portfolio contains my resume, a job application and a college application (completed to use for reference), and two letters of recommendation.

Supervised Practical Experience: As one of my class projects, I volunteered to help set up computers for the teachers in our building. I was supervised by our computer teacher and the school district's computer technician. This experience has helped me learn more about working with and teaching others. It also taught me more about what kind of careers might be available. This experience has given me more confidence in my abilities, and I am excited about getting more training in computers.

Written Report: I have combined my experience with research to write my report on careers in technology. This report reflects my career interest and my skills in writing. It also gave me a chance to be creative with the computer, making writing fun!

Work Samples: I have included samples of programs I have created for the teachers in our building. Also included are samples of business forms I created and produced for our school. Producing these forms has saved the school district money.

I learned a lot from working on this portfolio. I feel it prepared me for real life experiences and gave me more confidence to keep trying. I also learned that there is a difference between just doing something and doing something well. I learned new skills as well as identified skills I didn't realize I had. The experiences I have had, while working on the projects for the portfolio, have made me even more excited about getting more training in computers.

Thank you for taking the time to review my portfolio.

Sincerely,

Suzanne Smith

Developed by the Division of Vocational Education, 1996. Taken from the teacher's guide and course titled Introduction To Career Pathways. Reproduced from original by Robert Beauregard

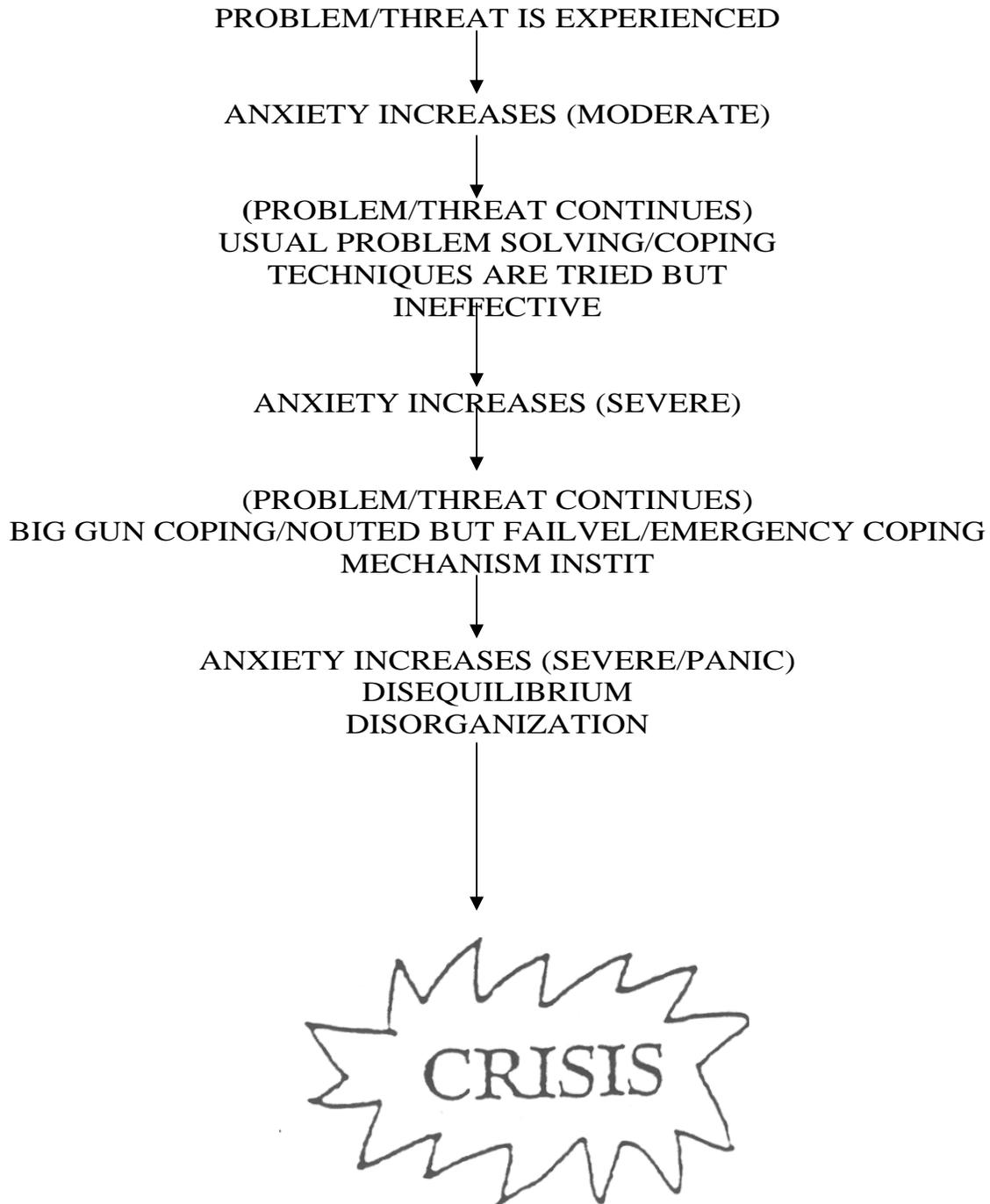
STRESS:

1. A PROCESS IN WHICH ENVIRONMENTAL EVENTS (CALLED STRESSORS) THREATEN AN ORGANISM'S EXISTENCE AND WELL BEING.
2. A CONDITION IN WHICH THERE IS A MARKED DISCREPANCY BETWEEN THE DEMANDS MADE ON AN ORGANISM AND THE ORGANISM'S CAPABILITY TO RESPOND.
3. A STIMULUS
4. A RESPONSE
5. A TRANSACTION

STRESSORS:

1. THE CAUSATIVE AGENTS OF STRESS
2. CHALLENGING OR DEMANDING STIMULI TYPES OF STRESSORS
3. PHYSIOLOGIC STRESSORS
 - a. PHYSICAL LIGHT, HEAT, DARK, COLD, TEXTURE
 - b. CHEMICAL FOOD, DRUGS, GASES, TOXINS
4. PSYCHOLOGICAL
 - a. LOSS
 - b. CONFLICT
5. SOCIOCULTURAL
 - a. POVERTY
 - b. OVERCROWDING
 - c. MEANINGLESS WORK
 - d. LAWLESSNESS
 - e. ETHNICITY

PHASES OF A TYPICAL CRISIS



GOOD HEALTH

vs.

POOR HEALTH

Good health shows up in the way people look, act and behave:

Poor health shows up in the way people look, act and behave:

Attitude

Optimistic, alert, happy

No energy, often sick with colds and other infections

Energy Level

Energetic, coping with stress

Little energy

Sleep Habits

Sleeping well

Trouble sleeping

Eyes

Clear, bright eyes and vision

Sore, red, itching eyes

Teeth

Healthy gums and teeth

Tooth cavities, bleeding gums

Hair

Clean, shiny

Dull, brittle hair that breaks easily

Skin

Clean, smooth, natural

Skin that breaks out and wounds that do not heal easily

Muscles

Firm, solid

Flabby, poorly developed muscles

Posture

Erect

Slumping, drooping posture

Height/Weight Ratio

Normal weight for height, sex, and bone structure

Overweight or underweight

Personal Health Plan

Name _____

Date _____

Years in school _____

Write a statement of personal responsibility you will take for your health.

I will _____

Healthy Life Practice: Write practices that will keep you healthy. Consider the following categories and promise yourself you will carry out these practices.

As a wise health care consumer, I will:

When I choose nutritional foods, I will choose:

When I choose physical fitness, I will choose to:

When I choose social behaviors, I will choose to:

When I choose coping mechanisms for emotional/mental stresses, I will choose to:

When I choose environmental practices, I will choose to:

When I choose chemical substances, I will choose to:

When I choose other healthful practices, I will choose to:

When I am a health care worker, I will choose to keep myself healthy by:



National Institute of Mental Health Office of Scientific Information

Plain Talk About...

Handling Stress

Plain Talk Series

You need stress in your life! Does that surprise you? Perhaps so, but it is quite true. Without stress, life would be dull and unexciting. Stress adds flavor, challenge, and opportunity to life. Too much stress, however, can seriously affect your physical and mental well-being. A major challenge in this stress-filled world of today is to make the stress in your life work *for* you instead of against you.

Stress is with us all the time. It comes from mental or emotional activity and physical activity. It is unique and personal to each of us. So personal, in fact, that what may be relaxing to one person may be stressful to another. For example, if you are an executive who likes to keep busy all the time, "taking it easy" at the beach on a beautiful day may feel extremely frustrating, nonproductive, and upsetting. You may be emotionally distressed from "doing nothing." Too much emotional stress can cause physical illness such as high blood pressure, ulcers, or even heart disease; physical stress from work or exercise *is* not likely to cause such ailments. The truth is that physical exercise can help you to relax and to handle your mental or emotional stress.

Hans Selye, M.D., a recognized expert in the field, has defined stress as a "non-specific response of the body to a demand." The important issue is learning how our bodies respond to these demands. When stress becomes prolonged or particularly frustrating, it can become harmful—causing distress or "bad stress." Recognizing the early signs of distress and then doing something about them can make an important difference in the quality of your life, and may actually influence your survival.

Reacting to Stress

Let's take the example of a typical commuter in rush-hour traffic. If a car suddenly pulls out in front of him, his initial alarm reaction may include fear of an accident, anger at the driver who committed the action, and general frustration. His body may respond in the alarm stage by releasing hormones into the bloodstream which cause his face to flush, perspiration to form, his stomach to have a sinking feeling, and his arms and legs to tighten. The next stage is resistance, in which the body repairs damage caused by the stress. If the stress of driving continues with repeated close calls or traffic jams, however, his body will not have time to make repairs. He may become so conditioned to expect potential problems when he drives that he tightens up at the beginning of each commuting day. Eventually, he may even develop a physical problem that is related to stress, such as migraine headaches, high blood pressure, backaches, or insomnia. While it is impossible to live completely free of stress and distress, it is possible to prevent some distress as well as to minimize its impact when it can't be avoided.

Helping Yourself

When stress does occur, it is important to recognize and deal with it. Here are some suggestions for ways to handle stress. As you begin to understand more about how stress affects you as an individual, you will come up with your own ideas of helping to ease the tensions.

- Try physical activity. When you are nervous, angry, or upset, release the pressure through exercise or physical activity. Running, walking, playing tennis, or working in your garden are just some of the activities you might try. Physical exercise will relieve that "up tight" feelings, relax you, and turn the frowns into smiles. Remember, your body and your mind work together.
- Share your stress. It helps to talk to someone about your concerns and worries. Perhaps a friend, family member, teacher, or counselor can help you see your problem in a different light. If you feel your problem is serious, you might seek professional help from a psychologist, psychiatrist, help social worker, or mental health counselor. Knowing when to ask for help may avoid more serious problems later.
- Know your limits. If a problem is beyond your control and cannot be changed at the moment, don't fight the situation. Learn to accept what is—for now—until such time when you can change it.
- Take care of yourself. You are special. Get enough rest and eat well. If you are irritable and tense from lack of sleep or if you are not eating correctly, you will have less ability to deal with stressful situations. If stress repeatedly keeps you from sleeping, you should ask your doctor for help.
- Make time for fun. Schedule time for both work and recreation. Play can be just as important to your wellbeing *as* work; you need a break from your daily routine to just relax and have fun
- Be a participant. One way to keep from getting bored, sad, and lonely is to go where it's all happening. Sitting alone can make you feel frustrated. Instead of feeling sorry for yourself, get involved and become a participant. Offer your services in neighborhood or volunteer organizations. Help yourself by helping other people. Get involved in the world and the people around you, and you'll find they will be attracted to you. You will be on your way to making new friends and enjoying new activities.
- Check off your tasks. Trying to take care of everything at once can seem overwhelming, and, as a result, you may not accomplish anything. Instead, make a list of what tasks you have to do, then do one at a time, checking them off as they're completed. Give priority to the most important ones and do those first.
- Must you always be right? Do other people upset you—particularly when they don't do things your way? Try cooperation instead of confrontation; it's better than fighting and always being "right." A little give and take on both sides will reduce the strain and make you both feel more comfortable
- It's OK to cry. A good cry can be a healthy way to bring relief to your anxiety, and it might even prevent a headache or other physical consequence. Take some deep breaths; they also release tension.
- Create a quiet scene. You can't always run away, but you can "dream the impossible dream." A quiet country scene painted mentally, or on canvas, can take you out of the turmoil of a stressful situation. Change the scene by reading a good book or playing beautiful music to create a sense of peace and tranquility.
- Avoid self-medication. Although you can use prescription or over-the-counter medications to relieve stress temporarily, they do not remove the conditions that caused the stress in the first place. Medications, in fact, may be habit-forming and also may reduce your efficiency, thus creating more stress than they take away. They should be taken only on the advice of your doctor.

The Art of Relaxation

The best strategy for avoiding stress is to learn how to relax. Unfortunately, many people try to relax at the same pace that they lead the rest of their lives. For a while, tune out your worries about time, productivity, and "doing right." You will find satisfaction in just being, without striving. Find activities that give you pleasure and that are good for your mental and physical well-being. Forget about always winning. Focus on relaxation, enjoyment, and health. If the stress in your life seems insurmountable, you may find it beneficial to see a mental health counselor. Be good to yourself.



Written by Lous E. Kopolow, M.D. Reproduced from the original by Robert Beauregard
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SECTION C
LEGAL ISSUES

A Comparison:

**Americans With
Disabilities Act**

**Individuals With
Disabilities Education and
Rehabilitation Act
Of 1992**

ELIGIBILITY

ADA

Qualified Individual with a Disability

To be considered "disabled" under the ADA, a person must have a condition that impairs a major life activity or history of such a condition or be regarded as having such a condition.

A disabled person must also be qualified for the job, program or activity to which he or she seeks access. To be qualified under the ADA, a disabled person must be able to perform the essential functions of a job or meet the essential eligibility requirements of the program or benefit, with or without an accommodation to his or her condition.

Specifically excludes persons engaging in illegal use of drugs. However, the Act does cover persons no longer engaging in illegal drug use who have completed successful supervised drug rehab program.

Alcoholism is covered by the Act unless it interferes with job performance. Specifically excludes persons engaging in illegal use of drugs. However, the Act does cover persons no longer engaging in illegal drug use who have completed successful supervised drug rehab program. Alcoholism is covered by the Act unless it interferes with job performance.

Sexual orientation is not considered an impairment: homosexuality or bisexuality. Other non-covered include: transvestitism, transsexualism, pedophilia, or other sexual disorders, compulsive gambling, kleptomania, or pyromania.

IDEA

Children with Disabilities

Children with disabilities means those children evaluated as having mental retardation, hearing impairments including blindness, serious emotional disturbance, orthopedic impairments, autism, traumatic brain injury, other health impairments, specific learning disabilities, deaf-blindness, or multiple disabilities, and who because of those impairments need special education and related services.

REHABILITATION ACT

Individual with A Disability

A person with a physical or mental "impairment" which substantially limits one or more major life activities, has a record of impairment, or is regarded as having an impairment which constitutes or results in a substantial impediment to employment and can benefit in terms of an employment outcome from vocational rehabilitation services, and the individual requires vocational rehabilitation services to prepare for, enter, engage in, or retain gainful employment. There is a presumption for all applicants that they can benefit from services unless the State agency can rebut this presumption. Further the state agency must first conduct an extended assessment prior to challenging this presumption.

An individual who has a disability or blind as determined under Social Security is considered disabled. Determinations by other agencies, particularly education, satisfy one or more factors related to the determination that an individual is disabled.

Specifically excludes persons engaging in illegal use of drugs. However, the Act does cover persons no longer engaging in illegal drug use who have completed successful supervised drug rehab program. Alcoholism is covered by the Act unless it interferes with job performance.

Sexual orientation is not considered an impairment: homosexuality or bisexuality. Other non-covered include: transvestitism, transsexualism, pedophilia, or other sexual disorders, compulsive gambling, kleptomania, or pyromania.

Note:

A person with AIDS is eligible under the ADA and qualifies for vocational rehabilitation services if it is determined that a disability is present and this disability limits that person from performing a job but with rehabilitation services, can do the job. A person with AIDS is considered for rehabilitation services as any other person with a debilitating injury and/or illness. The limitations must be proven through extensive assessment. In addition, the ADA allows for the impact on the individual caused by the "stigma" of a disease that sometimes prevents employment for the affected person. AIDS is a disease that causes "stigma."

Source: Interview with consultant at the Idaho Vocational Rehabilitation Agency, February, 1996.

Individual with Severe Disability:

1. Severe physical or mental "impairment" which seriously limits one or more functional capacities (e.g. mobility, communication) in terms of employment outcome.
2. Vocational rehabilitation can be expected to require multiple and extended services.
3. Have one or more physical or mental disabilities (from an identified listing) or an assessment for determining eligibility and vocational rehabilitation needs.

**MAGIC VALLEY
REGIONAL MEDICAL CENTER**

P.O. BOX 409, TWIN FALLS, IDAHO 83303-0409 PHONE: (208) 737-2000

Patient's Name: _____ Medicare # (HICN): _____

ADVANCE BENEFICIARY NOTICE (ABN)

NOTE: You need to make a choice about receiving these laboratory tests.

We expect that Medicare will not pay for the laboratory test(s) that are described below. Medicare does not pay for all of your health care costs. Medicare only pays for covered items and services when Medicare rules are met. The fact that Medicare may not pay for a particular item or service does not mean that you should not receive it. There may be a good reason your doctor recommended it. Right now, in your case, Medicare probably will not pay for laboratory test(s) indicated below for the following reasons:

Medicare does not pay for these tests for your condition	Medicare does not pay for these tests as often as this (denied as too frequent)	Medicare does not pay for experimental or research tests
<input type="checkbox"/> CBC, Blood Cell count, <input type="checkbox"/> Platelet count, Hemogram <input type="checkbox"/> Digoxin Assay <input type="checkbox"/> Fecal Occult Blood tests <input type="checkbox"/> GGT <input type="checkbox"/> Serum Iron studies, Ferritin <input type="checkbox"/> Lipid Profile/Cholesterol <input type="checkbox"/> Magnesium <input type="checkbox"/> Prothrombin time (PT) <input type="checkbox"/> PTT	<input type="checkbox"/> Reticulocyte count <input type="checkbox"/> PSA <input type="checkbox"/> Rheumatoid Factor <input type="checkbox"/> Thyroid testing (TSH, T4, FT4, T3) <input type="checkbox"/> Tumor antigens (CA 125, CA27.29, CA15-3, AFP, HCG, CEA) <input type="checkbox"/> Urine Culture or <input type="checkbox"/> Urinalysis Culture Indicated	<input type="checkbox"/> PSA (1 per 12 months covered) <input type="checkbox"/> PAP smear (1 per 24 months covered) <input type="checkbox"/> Fecal Occult Blood tests (1 per 12 mo. covered)
		<input type="checkbox"/> ImmunoAssay for tumor antigens (CA 19-9)

The purpose of this form is to help you make an informed choice about whether or not you want to receive these laboratory tests, knowing that you might have to pay for them yourself. Before you make a decision about your options, you should read this entire notice carefully.

-Ask us to explain, if you don't understand why Medicare probably won't pay.

-Ask us how much these laboratory tests will cost you (Estimated Cost: \$ _____) in case you have to pay for them yourself or through other insurance.

PLEASE CHOOSE ONE OPTION. CHECK ONE BOX. SIGN & DATE YOUR CHOICE.

Option 1. YES. I want to receive these laboratory tests. I understand that Medicare will not decide whether to pay unless I receive these laboratory tests. Please submit my claim to Medicare. I understand that you may bill me for laboratory tests and that I may have to pay the bill while Medicare is making its decision. If Medicare does pay, you will refund to me any payments I made to you that are due to me. If Medicare denies payment, I agree to be personally and fully responsible for payment. That is, I will pay personally, either out of pocket or through any other insurance that I have. I understand I can appeal Medicare's decision.

Option 2. NO. I have decided not to receive these laboratory tests. I will not receive these laboratory tests. I understand that you will not be able to submit a claim to Medicare and that I will not be able to appeal your opinion that Medicare won't pay. I will notify my doctor who ordered these laboratory tests that I did not receive them.

Date: _____ Signature of patient or person acting on patient's behalf _____

NOTE: Your health information will be kept confidential. Any information that we collect about you on this form will be kept confidential in our offices. If a claim is submitted to Medicare, your health information on this form may be shared with Medicare. Your health information which Medicare sees will be kept confidential by Medicare.

SECTION D

PHLEBOTOMY IN HEALTH CARE

T	E	L	C	E	T	T	G	C	0	L	E	D	E	I	T	H	R	D	I
I	L	A	R	E	Y	H	N	H	S	F	I	B	R	I	N	0	G	E	N
P	E	A	0	H	P	M	E	E	I	E	I	I	T	0	U	B	E	E	S
0	S	M	S	N	E	L	A	M	A	I	T	N	N	0	I	M	R	U	S
T	S	I	S	F	S	R	0	I	A	E	0	0	E	L	E	U	N	D	A
N	P	C	M	A	H	B	I	S	E	T	0	E	I	L	B	E	C	R	F
N	E	R	A	S	A	0	E	T	C	P	0	R	R	E	0	0	H	A	E
E	E	0	T	T	R	A	I	R	E	I	U	L	L	B	A	S	0	Z	T
E	H	S	C	I	P	S	C	Y	U	B	A	L	0	A	F	I	L	A	Y
D	E	C	H	N	S	G	M	T	I	T	A	A	S	G	E	N	E	H	C
L	P	0	L	G	E	N	L	N	A	R	C	0	0	0	Y	0	S	0	T
E	A	P	P	I	P	A	T	I	E	N	T	N	T	S	T	P	T	I	N
P	T	E	P	L	A	T	E	L	E	T	U	G	U	S	L	H	E	B	E
S	I	T	I	R	0	U	G	L	U	C	0	S	E	P	E	I	R	0	0
A	T	H	E	0	S	E	A	N	E	M	I	A	H	0	I	L	0	U	N
R	I	Y	D	T	S	C	0	A	G	U	L	A	T	I	0	N	L	B	A
C	S	R	R	N	E	0	S	E	D	S	L	I	D	E	A	H	E	I	T
S	H	0	U	S	E	R	0	L	0	G	Y	S	E	R	U	M	I	V	A
D	I	I	G	S	T	A	P	H	Y	L	0	C	0	C	C	U	S	T	L
G	R	D	L	Y	R	N	U	R	I	N	A	L	Y	S	I	S	H	P	L

FIND THESE WORDS ASSOCIATED WITH THE LABORATORY

ANEMIA
 BILIRUBIN
 BIOHAZARD
 CHEMISTRY
 CHOLESTEROL
 COAGULATION
 CROSSMATCH
 DRUG
 EOSINOPHIL
 FASTING

FIBRINOGEN
 GLUCOSE
 HEMATOLOGY
 HEPATITIS
 MICROSCOPE
 NEEDLE
 NEONATAL
 PATIENT
 PLATELET
 RUBELLA

SAFETY
 SEROLOGY
 SERUM
 SHARPS
 SLIDE
 STAPHYLOCOCCUS
 THYROID
 TYPE
 URINALYSIS
 VENIPUNCTURE

CLINICAL PATHOLOGY PERSONNEL

THE PATHOLOGISTS

Pathologists are a special type of doctor that participate in your day-to-day hospital care by providing and interpreting laboratory information. This information is used to help solve diagnostic problems and monitor the effects of therapy.

A pathologist is a physician who took four or more years of additional training after completing medical school in order to become an expert in the use of laboratory tests to diagnose and treat disease. Because of the pathologist's role in interpreting test results and in research, he or she is sometimes called "the doctor's doctor."

The Pathologist is a physician and reads and interprets the results of laboratory test or examines tissues under a microscope to diagnose and monitor disease. They are licensed medical doctors (MD) who are experts in diagnosing such diseases as cancer, diabetes, AIDS, hepatitis and thyroid conditions. The American Board of Pathology requires five years of training following graduation from medical school to be eligible to take examinations leading to Board certification as a Clinical/Anatomic Pathologist.

THE TECHNOLOGISTS

Technologists are highly skilled professionals possessing the knowledge and training to assist the pathologist discover what is wrong (or right) with a patient. Technologists perform a full range of laboratory tests - from simple, pre-marital blood tests to complex tests that detect cancer. Technologists are also responsible for confirming the accuracy of test results and reporting the findings to the pathologist and other doctors.

A Medical Technologist (MT) - Holds a minimum of a baccalaureate degree and is responsible for performing a full range of laboratory tests, confirming the accuracy of test results, and reporting laboratory findings to the pathologist and other physicians. Medical technologists work in five major areas of the laboratory: blood banking, chemistry, hematology, immunology and microbiology.

A Cytotechnologist (CT) - Examines cells under the microscope to detect signs of cancer in the earliest stages when a cure is most likely, Cytotechnologist must hold baccalaureate degrees and have special training to search out the smallest abnormalities in color, shape or sizes of cells.

A Histotechnologist (HTL) - Prepares body tissue samples for microscopic examination by the pathologist using sophisticated techniques such as electron microscopy and immunohistochemistry. Histotechnologists must hold baccalaureate degrees and have special training to freeze, cut, mount and stain the tissues, often while the patient is still in surgery, thus playing a major role in the diagnosis of malignancy.

THE TECHNICIANS

Medical Laboratory Technicians are an important part of the health care team. Special types of technicians include the histologic technician (prepares tiny sections of body tissues for microscopic examinations by a pathologist) and the phlebotomy technician (collects blood samples for laboratory analysis).

A Phlebotomy Technician (PBT) - Collects blood samples to be used in many laboratory tests to detect disease and monitor treatment. Phlebotomists have special training in addition to a high school diploma and may go on to take a national certification exam in the area of phlebotomy.

THE MEDICAL LABORATORY DEPARTMENTS

Chemistry is filled with fascinating, state-of-the-art technology which helps laboratory professionals to quickly analyze the chemical composition of blood and body fluids. Some of the tests performed in the chemistry section include glucose testing (aids in the diagnosis of diabetes), cholesterol, and drug testing.

Cytology is the study of human cells. This is where cell samples are examined to detect early signs of cancer and other diseases. One of the principle functions is the detection of cancer of the cervix (the familiar "PAP" smear).

Hematology counts, describes and identifies cells in blood and other body fluids. The slightest change in shape or size or number of cells will tell these skilled laboratory professionals if you are anemic or have leukemia.

Histology evaluates cells in tissues and organs. The histotechnologist also helps the pathologist with such complex tasks as fine needle biopsies (a special procedure that collects tissue from lesions) and autopsies (to determine the cause of death).

Immunology is the study of the body's response to viruses or allergy-causing agents. This area is responsible for many tests of the efficiency of the human immune system.

Data Entry coordinates all the activities that keep the laboratory operation running smoothly and efficiently. Dedicated personnel look up test results for physicians and nurses, send reports to nursing station, order outpatient's lab work and perform all the clerical duties.

Microbiology tracks down and identifies disease-causing bacteria, parasites or viruses. These laboratory professionals will use growth characteristics in artificial media, chemical testing and slide identification to determine which medications will work against the infections.

Phlebotomy is the collection and processing of blood and other specimens. After processing, the samples are distributed to different areas of the laboratory for analysis.

Transfusion Medicine or **Blood Bank** supplies all the blood products that are necessary for the treatment of many types of blood disorders including anemia and blood clotting disorders. Each blood unit is individually typed for blood group, screened for antibodies and tested for contagious diseases.

Word/Term	Meaning
Accessioning	the first step in processing a specimen, when you give it a specific number or code
Accuracy	as near to the real answer as possible
Acrocyanosis	a blueness of the hands or feet caused by disturbances to the superficial veins
Aerobic	lives in the presence of oxygen
Anaerobic	able to live without oxygen
Anemia	deficiency of red blood cells, hemoglobin, or both
Aneurysm	a bulge in an artery caused by a weakening of its wall
Anorexia	loss of appetite
Antibiotic	a substance used in the treatment of infectious diseases, usually caused by bacteria
Antibody	a protective body protein produced as a result of exposure to an antigen
Anticoagulant	a substance that delays or prevents the blood from clotting
Antigen	a substance that stimulates a specific resistance response and thus causes the body to produce antibodies
Antimicrobial	a substance that either kills or inhibits microscopic organisms
Asepsis	free from germs or infection
Bacteria	one-cell microscopic organism that either cause disease or do not cause disease; many different kinds of bacteria normally live on the skin and in the intestine, and are referred to as “normal flora”
Bacteriology	the study of bacteria
Bacteriostatic	inhibits, but does not kill bacteria
Carcinogenic	anything that is capable of or conducive to the production of cancer
Carcinoma	a malignant tumor (cancer)
Cardiology	the study of the physiology and pathology of the heart
Cardiovascular	pertaining to the heart and blood vessels
Centrifuge	a piece of laboratory equipment that spins test tubes at a high speed and separates the cellular and liquid portions of the blood
Clot	coagulated blood
Communicable	refers to a disease that may be spread from one person to another either directly or indirectly
Coumadin	an anticoagulant or blood thinning agent also known as warfarin; prothrombin time determination are essential for its proper control
Cyanosis	a condition in which the skin turns a bluish color caused by lack of oxygen to the blood
Cystic fibrosis	an inherited disorder of the exocrine glands that causes them to produce thick secretions of mucus, obstruction of the small bowel and persistent upper respiratory infections
Differential	a percentage of each type of white blood cell in a total of 100 white cells observed
Digoxin	a drug used to strengthen heart contraction, also known as Lanoxin
Disinfect	to kill disease-causing germs
Edema	a condition in which the body tissues contain an excessive amount of fluid, resulting in swelling
Embolus	a blood clot or some other mass (which may be solid, liquid, or gaseous) that stops up a blood vessel, brought to the plugged vessel from another area

Emphysema	a chronic disease of the lungs in which there is an improper exchange of oxygen and carbon dioxide
Endocrine	pertains to a group of ductless glands that secrete a substance or hormone that affects other organs directly into the bloodstream
Endocrinology	that branch of medicine that deals with diseases of the ductless glands
Enzyme	a complex compound that is able to initiate chemical changes in the body
Epithelium	a layer of cells that covers the internal and external surfaces of the body
Febrile	with fever
Fibrillation	quivering of the heart muscle rather than normal contraction
Gastralgia	stomach ache
Gastritis	inflammation of the lining of the stomach
Gastroenterology	that branch of medicine concerned with the physiology and pathology of the stomach, intestines, and related areas
Gauge	as used in the laboratory, a unit of measurement determining the dimension of a needle
Geriatric	that branch of medicine that deals with the health and diseases of the elderly
Germicide	a substance that kills germs
Gram stain	a special stain used to help classify bacteria into two groups: gram-positive and gram-negative
Hematocrit	a laboratory test in which the red blood cells are centrifuged at a high speed so they will be separated from the blood serum and their volume can be expressed as a percentage of the total volume
Hematology	the study of blood and its diseases
Hemoconcentration	a rapid increase in the relative red blood cell content in the blood
Hemolysis	destruction of the red blood cells
Hemophilia	a hereditary disease characterized by a prolonged clotting time of the blood
Hemorrhage	abnormal internal or external bleeding
Hemostasis	bleeding cessation
Hepatic	having to do with the liver
Hepatitis	inflammation of the liver usually resulting from an infection by a transmissible virus
Homeostasis	the body's ability to attain a steady state
Hormone	a substance that is produced by a ductless gland and is carried to other parts of the body by the blood; it exerts control over many of the body's processes
Host	a plant or animal in which a parasite lives
Hyperglycemia	excessive amount of sugar in the blood
Hyperkalemia	an excess in the amount of potassium in the blood
Hyperlipidemia	a term meaning an excess of any or all kinds of lipids in the plasma
Hypernatremia	excess of sodium in the blood
Hypoglycemia	decreased sugar level in the blood
Hypokalemia	decreased potassium in the blood
Hyponatremia	decreased sodium in the blood
Immune	a condition in which the body is able to resist certain illnesses or toxins
Incubation	maintenance at a specified temperature and for a specified time until growth or a reaction occurs
Infection	invasion of the body by bacteria, molds, viruses, or parasites
Ischemia	a temporary deficiency of blood to a localized area, caused by an obstruction

Isolation	the limitation of movement and social contact of a patient
Ketosis	an accumulation in the body of substances known as ketones, which may be detected by testing urine; it is commonly observed in starvation, pregnancy and diabetes
Leukemia	a blood disease in which there is an overproduction of white blood cells
Leukocytes	a broad term covering all types of white blood cells
Leukocytosis	an increase in the number of white blood cells
Leukopenia	a decrease in the number of white blood cells
Lipemic	the presence of an abnormal amount of fatty substances
Liter	a metric fluid measure of 1000 milliliters; approximately 2 pints
Lithium	a psychoactive agent used in the treatment of manic-depressive disorders
Lysis	the dissolution of a red blood cell
Melanoma	a malignant tumor that is often black
Microbiology	the study of microscopic organism
Milliliter	1/1000 of a liter
Morphology	the study of a structure
Multiple myeloma	a disease characterized by the formation of multiple tumor masses in the bone and bone marrow
Neonatal	the first 6 week after birth
Neoplasm	new growth, such a tumor
Nephritis	inflammation of the kidney
Neurology	branch of medicine that deals with the nervous system and its diseases
Nosocomia	pertaining to a hospital; a nosocomial infection would be one obtained while in a hospital
Obstetrics	branch of medicine concerned with women during pregnancy and childbirth
Oncology	branch of medicine that deals with tumors
Orthopedic	branch of medicine that deals with problems of the skeleton, joints, muscles, and other supporting structures
Palpate	to examine by touching with the fingers
Palpitation	a rapid, intense beating of the heart
Pancreatitis	inflammation of the pancreas
Pathogenic	anything that can produce a disease
Pathology	the study of structural or functional changes in body tissues and organs caused by disease
Pediatrics	branch of medicine related to the care and treatment of diseases of children
Pharyngitis	inflammation of the pharynx
Phlebitis	inflammation of a vein, often accompanied by clot formation
Prandial	pertains to a meal and is used in relation to timing, as in “2 hour postprandial” or 2 hours after a meal
Pulmonary	refers to the lungs and lung tissue
Renal	relating to the kidney
Respiratory	having to do with respiration or, more specifically, the taking in of oxygen and the release of carbon dioxide by the lungs
Rod	a nonspecific name for a group of bacteria that generally have the shape of a slender, straight bar
Sepsis	an infection of the blood with a pathogenic organism or a product (toxin) produced by the organism
Serology	the testing of blood serum for antigen-antibody reaction
Sterile	the absence of living microorganisms

Susceptible	a condition in which a person is more than normally vulnerable to a disease
Syncope	a fainting spell
Thrombophlebitis	inflammation of the wall of a vein with an accompanying clot at the site
Thrombosis	the formation of a blood clot called a thrombus, which remains at the site of its formation in the circulatory system; when it becomes detached, it is known as an embolus
Transmission	the spreading of a disease from one person to another
Urinary	having to do with the urinary tract or urine
Urology	branch of medicine concerned with the urinary tract of both sexes and the genital tract of males
Vaginitis	inflammation of the vagina
Vascular	refers to the blood system also describes tissue heavily supplied with blood vessels
Vasoconstrictor	an agent that causes a decrease in the diameter of a blood vessel, may be caused by either the introduction of a drug or a disease condition
Vasodilator	refers to an agent that causes an increase in the diameter of a blood vessel, thus producing greater blood flow
Vasovagal	the action of stimuli from the vagus nerve on the blood vessels
Virology	the study of viruses, infectious agents that are too small to be seen through the usual light microscope

SECTION E

**METRIC SYSTEM AND
ACTIVITIES**

MILITARY TIME

Metric Measurements

Approximate Equivalencies

◆	One Ounce	=	approximately 28 grams
◆	Three and one-half ounces	=	100 grams
◆	Eight ounces	=	227 grams
◆	One pound	=	454 grams

Metric Conversions

◆	1 kilogram	=	2.2 pounds
◆	454 grams	=	1 pound
◆	1,000 milliliters	=	1 ounce
◆	1,000 liters	=	1 kiloliter

Translation

◆	1 gallon	=	3.79 liters
◆	1 quart	=	0.95 liters (or 950 milliliters or approximately 1 liter)
◆	1 pint	=	0.48 liters (or 480 milliliters or approximately 500 ml)
◆	1 cup (8 fluid ounces)	=	0.24 liters (or 240 milliliters or approximately 250 ml)
◆	1 tablespoon	=	15 milliliters
◆	1 teaspoon	=	5 milliliters

TABLES OF CONVERSION FACTORS

To convert from meters to Inches, for example, find the row labeled "1 meter" and the column labeled "inch" The conversion factor is 39.37. Thus, 1 meter = 39.37 inches.

LENGTH

	centimeter	meter	kilometer	Inch	feet	yard	mile
1 centimeter	1	0.01	10^{-5}	0.3937	3.281×10^{-2}	1.094×10^{-2}	6.214×10^{-6}
1 meter	100	1	10^{-3}	39.37	3.281	1.094	6.214×10^{-4}
1 kilometer	105	1000	1	3.937×10^4	3281	1094	0.6214
1 inch	2.54	0.0254	2.54×10^{-5}	1	0.0833	0.0278	10578×10^{-5}
1 foot	30.48	0.3048	3.048×10^4	12	1	0.3333	1.894×10^{-4}
1 yard	91.44	0.9144	9.144×10^4	36	3	1	5.682×10^{-4}
1 mile	1.6093×10^5	1609.3	1.6093	6.336×10^4	5280	1760	1

AREA

	Centimeter ²	Meter ²	Inch ²	Foot ²	Acre	Mile
1 square centimeter	1	104	0.1550	1.076×10^8	2.471×10^8	3.861×10^{11}
1 square meter	104	1	1550	10.76	2.471×10^{-4}	3.861×10^{-7}
1 square inch	6.452	6.452×10^{-4}	1	6.944×10^{-3}	1.594×10^1	2.491×10^{-10}
1 square foot	929.0	0.09290	144	1	2.296×10^{-5}	3.587×10^8
1 acre	4.047×10^7	4407	6.273×10^6	43,560	1	1.563×10^3
1 square mile	2.590×10^{10}	2.590×10^5	4.007×10^9	2.788×10^7	640	1

VOLUME (CAPACITY)

	Centimeter ³	Meter ³	Inch ³	Foot ³	E	ounce	gallon
1 cubic centimeter	1	10 ⁻⁶	0.06102	3.531 X 10 ⁻³	1.000 X 10 ⁻³	0.03381	2.642 X 10 ⁻⁴
1 cubic meter	106	1	6.102 X 10 ⁴	35.31	1000	3.381 X 10 ⁴	2642
1 cubic inch	16.39	1.639 X 10 ⁻⁵	1	5.787 X 10 ⁻⁴	0.01639	0.5541	4.329 X 10 ⁻³
1 cubic foot	2.832 X 10 ⁴	0.02832	1728	1	28.32	957.5	7.480
1 liter	1000	1.000 X 10 ⁻³	61.03	0.03532	1	33.81	0.2642
1 ounce	29.57	2.957 X 10 ⁻⁵	1.805	1.044 X 10 ⁻³	0.02957	1	7.813 X 10 ⁻³
1 gallon	3785	3.785 X 10 ⁻³	231	0.1337	3.785	128	1

1 gallon = 4 quarts (qt) = 8 pints (pt) = 16 cups (c)

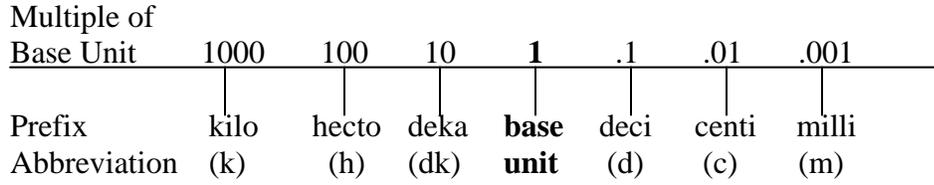
1 cup (c) = 8 ounces (oz) = 16 tablespoons (tbsp) = 48 teaspoons (tsp)

MASS/WEIGHT

	gram	kilogram	ounces	pound	ton
1 gram	1	10 ⁻³	0.03527	2.205 X 10 ⁻³	1.102 X 10 ⁻⁶
1 kilogram	10 ³	1	35.27	2.205	1.102 X 10 ⁻³
1 ounce	28.35	0.02835	1	0.0625	3.125 X 10 ⁻⁵
1 pound	453.6	0.4536	16	1	0.0005
1 ton	9.072 X 10 ⁵	907.2	3.2 X 10 ⁴	2000	1

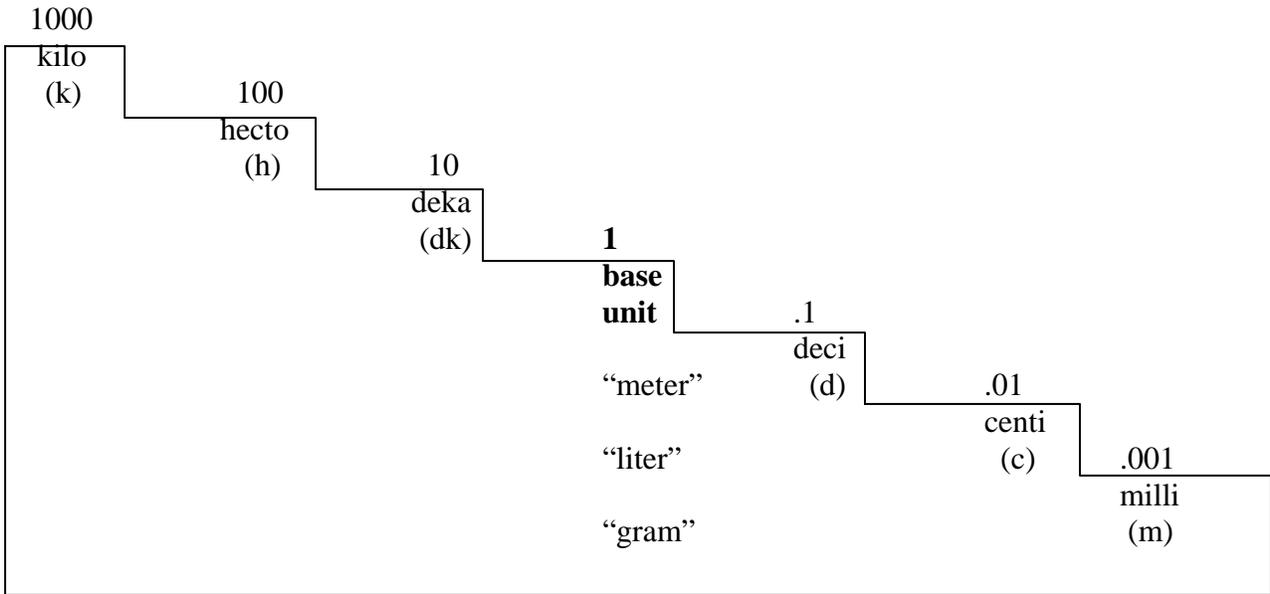
Visualization 1:

Number Line



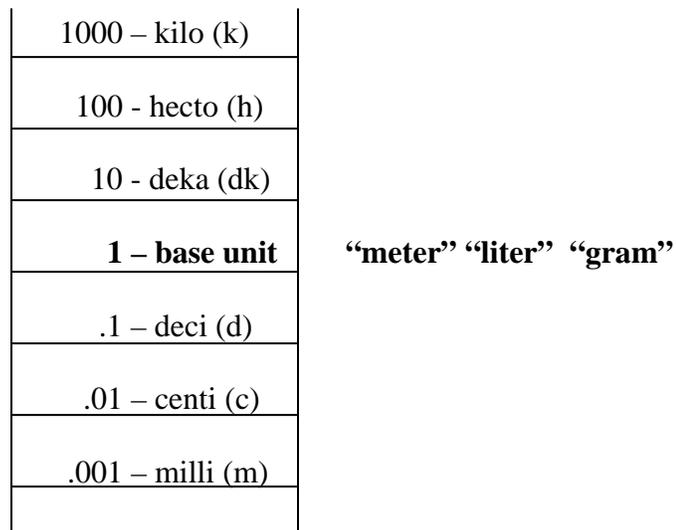
Visualization 2:

Stair Step



Visualization 3:

The Ladder



NAME _____ DATE _____ CLASS _____

Student Activity: Metric System Conversions

DIRECTIONS:

Write the correct response to the following statements in the spaces provided. Select your responses from the words listed below. NOTE: Some words can be used more than once for your responses.

larger	1000	smaller	100	unit
number	10	ten	ten	1000
metric	decimal	prefix	1000	

Measurements in science include a (1) _____ and the (2) _____ being measured. We usually use a unit that will require a small number for that measurement. The (3) _____ system is based on units which are multiples of (4) _____. When converting from one unit to another, the same numbers are used, but the (5) _____ point is moved. A base unit is changed by adding a (6) _____ to the beginning of the word. Every time the base unit becomes (7) _____ times larger or smaller, a different prefix is used.

The most common prefixes are:

milli which is (8) _____ times (9) _____ than the base unit

centi which is (10) _____ times (11) _____ than the base unit

deci which is (12) _____ times (13) _____ than the base unit

kilo which is (14) _____ times (15) _____ than the base unit

Number lines, stair steps, and ladders are useful in visualizing and remembering prefixes in the metric system, numbers of places, and the direction a decimal point is moved. On a number line, when the decimal is moved to the right, the number becomes larger, so we use a prefix for a (16) _____ unit. When the decimal point is moved to the left, the number becomes (17) _____. So we use a prefix for a (18) _____ unit.

FOR TEACHER USE
Metric Systems Conversions Answer Key

Answers

- | | | | |
|----|---------|-----|---------|
| 1. | number | 10. | 100 |
| 2. | unit | 11. | smaller |
| 3. | metric | 12. | 10 |
| 4. | ten | 13. | smaller |
| 5. | decimal | 14. | 1000 |
| 6. | prefix | 15. | larger |
| 7. | ten | 16. | smaller |
| 8. | 1000 | 17. | smaller |
| 9. | smaller | 18. | larger |

Student Activity: Standards of Measurement

INTRODUCTION:

When expressing a quantity in science, it is necessary to use the correct standard of measurement. For example, we measure distance in meters, not liters. A unit is the correct standard combined with the appropriate prefix.

DIRECTIONS:

Complete the following statements on the right with the correct metric units on the left. Some terms may be used more than once.

- | | |
|--------------------|---|
| A. centimeter (cm) | ___ 1. The distance from your desk to the safety shower is measured in. |
| B. meter (m) | ___ 2. The soda in a can is measured in. |
| C. millimeter (mm) | ___ 3. Your height is measured in. |
| D. milligram (mg) | ___ 4. The volume of blood in your body is measured in. |
| E. liter (L) | ___ 5. The length of your hair is measured in. |
| F. kilometer (km) | ___ 6. The mass of Vitamin C in a vitamin pill is measured in. |
| G. milliliter (ml) | ___ 7. The distance from here to Boston is measured in. |
| H. kiloliter (kL) | ___ 8. The mass of your body is measured in. |
| I. kilogram (kg) | ___ 9. The thickness of your toenail is measured in. |
| | ___ 10. The volume of ink in a ball point pen is measured in. |
| | ___ 11. The length of a pencil is measured in. |
| | ___ 12. The volume of water in a lake is measured in. |

FOR TEACHER USE
Standards of Measurements Answer Key

Teacher Note: Consult science texts to find additional metric information.

1. B meter (m)
2. G milliliter (ml)
3. B meter (m)
4. E liter (l)
5. A centimeter (cm)
6. D milligram (mg)
7. F kilometer (km)
8. I kilogram (kg)
9. C millimeter (mm)
10. G milliliter (ml)
11. A centimeter (cm)
12. H kiloliter (kL)

MILITARY TIME CONVERSIONS

Regular time	Military time		Regular time	Military time
12:01 am	0001		Noon	1200
1:00 am	0100		1:00 pm	1300
2:00 am	0200		2:00 pm	1400
3:00 am	0300		3:00 pm	1500
4:00 am	0400		4:00 pm	1600
5:00 am	0500		5:00 pm	1700
6:00 am	0600		6:00 pm	1800
7:00 am	0700		7:00 pm	1900
8:00 am	0800		8:00 pm	2000
9:00 am	0900		9:00 pm	2100
10:00 am	1000		10:00 pm	2200
11:00 am	1100		11:00 pm	2300

SECTION F

ERRORS IN COLLECTION

CORRECTION OF CLERICAL ERRORS

As required by the FDA

Any corrections should be made on the test requisition/addressograph impression/specimen labels/etc. by:

- 1) drawing a single line through the incorrect information
- 2) replacing with correct information and
- 3) dating and initialing all changes.

SEVEN CRITERIA PATIENT FOR IDENTIFICATION

1. Correct Patient Name

This requires verbal confirmation of the patient's first and last name
Ask the patient to SPELL his/her first and last names

2. Correct Date of Birth

Ask the patient to tell you her/his DOB
(for out patient)

and/ or

Medical Records Number

for documentation on the specimen
(for in patient)

3. Correct Date of Collection

for documentation on the specimen

4. Correct Time of Collection

for documentation on the specimen

5. Initials of CAP/ PCP

to be documented on the specimen

6. Location of Patient

to be documented on the specimen

7. Source of Specimen

indicated for Microbiology specimens
these criteria allow for correct patient identification and appropriate
follow-up with the CAP/ PCP if questions about the specimen or
collection procedure should arise.

MAGIC VALLEY REGIONAL MEDICAL CENTER

Location: MVRMC PHLEBOTOMY	
Procedure: ACCEPTING UNLABELED OR MISLABELED SPECIMENS	Test #: 702-01-0134
Prepared by: LOANN CLOUD, MS MT (ASCP)	Original Date Written: 7/97
Revised by: ANGIE KNIGHT DTC-PHLEB TEAM LEADER	Date: 7/04
Approved by: _____	Date Executed: 1/05

Reviewed _____ Date _____
Reviewed _____ Date _____
Reviewed _____ Date _____

I. Policy:

- A. If an unlabeled or mislabeled specimen is received into the lab on a hospital inpatient, the specimen will be placed into our chemistry day rack and a new specimen will be collected using proper identification and specimen labeling.
- B. If an unlabeled or mislabeled specimen is received from one of our clients, the client will be notified and, encouraged to collect a new specimen. If they give us the probable patient name and request that we analyze the unlabeled specimen under that name, then we will perform the analysis and document the problem on the laboratory report using a standardized footnote.
- C. EXCEPTION: Unlabeled or mislabeled specimens will not be accepted for processing for distribution of blood products under any circumstances.
- D. Any other exceptional situation will be reviewed with a pathologist if deviation from this policy is requested.

II. Purpose:

- A. To try to reach 100% accuracy in our analysis of patient specimens, proper patient identification and specimen labeling is essential.
- B. To show good customer service, we will not argue with our clients. To produce high quality diagnostic services, all necessary information regarding specimen processing which could contribute inaccurate results will be documented on the laboratory report.

III. POLICY IMPLEMENTATION:

- A. Unlabeled specimens on Inpatients:
 - 1. Collector (i.e. phlebotomist, medical technologist, nurse) will be notified of the problem.
 - 2. The unlabeled or mislabeled specimen will be placed in the “day rack” in chemistry.
 - 3. A new specimen will be collected using appropriate identification and labeling procedure according to:
 - 706-1-001 in the Phlebotomy Procedure Manual
 - 702-2-010 in the Phlebotomy Procedure Manual
 - 702-2-050 in the Phlebotomy Procedure Manual
 - a. Positively identify the patient
 - b. Collect the specimen
 - c. Immediately after collection, label the specimen at the patients’ bedside from the wristband, not the request form

- d. Transport specimen to the lab using proper procedure (702-2-010)
- B. Unlabeled or Mislabeled specimens from clients outside the hospital:
 - 1. Notify the client of the specimen labeling error and indicate that our policy is not to accept unlabeled or mislabeled specimens; as to do so is an accreditation violation.
 - 2. Make every effort to honor the client's request while maintaining diagnostic accuracy in the patient's laboratory report.
 - a. If a client wishes to collect a new specimen, cancel the test and wait for a new specimen.
 - b. If a client wishes to identify and label the specimen, honor their request and perform the test (s). Add the "unlabeled specimen" footnote as a phrase in the patients laboratory report: "Warning: Specimen was not labeled appropriately. Tests have been performed as per the request of _____."
 - c. If the client requests that we label the specimen and perform he test, do so and add the "unlabeled specimen" footnote as a phrase in the patients laboratory report "Warning: Specimen was not labeled appropriately. Tests have been performed as per the request of _____."

IV. REFERENCES:

- A. Index Number 706-1-001 (Phlebotomy) Identification and Labeling of Blood Specimens
- B. Index Number 703-2-013 (Chemistry) Specimen Processing
- C. Personal consult with ARUP, Spectra Labs, Mayo Clinic, and Specialty Labs

V. SUBMITTED BY:

Merlen Fullmer, MT- (ASCP) Administrative Director

VI. APPROVAL:

John Gray, M.D. Laboratory Medical Director

SECTION G

PERFORMING PHLEBOTOMY

MAGIC VALLEY REGIONAL MEDICAL CENTER

Location: MVRMC PHLEBOTOMY	
Procedure: SPECIMEN COLLECTION: BLOOD	Test #: 706-01-002
Prepared by: NANCY HUDDLESTON, MT (ASCP)	Original Date Written: 6/93
Revised by: ANGIE KNIGHT DTC-PHLEB TEAM LEADER	Date: 8/04
Approved by: _____	Date Executed: 1/05

Reviewed _____ Date _____
Reviewed _____ Date _____
Reviewed _____ Date _____

I. PRINCIPLE:

A Chemical, cellular, microbiological, and many other diagnostic evaluations are obtained from a patient's blood sample. Proper collection for the test requested is important. In order to prevent unacceptable specimens, **LOOK UP THE COLLECTION REQUIREMENTS BEFORE DOING THE VENIPUNCTURE.** This information can be found in the specimen collection book or the manuals from the various reference labs that we use.

II. SPECIMEN:

A. Blood is obtained from a properly done venipuncture for the majority of the tests requested of the laboratory. Arterial blood for blood gases is obtained by qualified personnel only.

111. PROCEDURE:

A. GENERAL

1. Written requests are delivered to the laboratory, or the department that is asked to get the specimen.
2. The patient must be accurately identified. Check the wristband on hospitalized patients, and ask the outpatient his/her name and date of birth.

B. VENOUS BLOOD

1. The proper evacuated tubes are selected for the blood collection. If there is any question which anticoagulant to use, look it up.
2. Evacuated tube collection: (Vacutainer)
 - a. Materials needed:
 - Evacuated tubes
 - Needle and Holder
 - Alcohol swab
 - Gauze
 - Tourniquet
 - Coban or paper tape
 - Gloves
 - b. Put on comfortably fitting gloves
 - c. Select a needle but do not remove shield. Thread needle onto holder
 - d. Select tubes and place within easy reach. Tubes that contain additives should be gently tapped to dislodge any additive that may be trapped around the stopper.
 - e. Insert tube into holder. Tubes will retract slightly. Leave in this position. It is important to center 13 mm tubes to preclude sidewall penetration.

- f. Apply the tourniquet 3-4 inches above the puncture site, just tightly enough to be uncomfortable to the patient. Do not leave on for more than one minute. Ask the patient to make a tight fist; the patient should NOT pump their fist. Select a suitable vein for puncture. The median cubital vein is the preferred vein. The cephalic veins have a tendency to roll and the basilic vein is close to the brachial nerve and artery, therefore this site should be avoided if possible. The vein should feel similar to a rubber tube when the arm is palpated. The middle, inner edge and outer edge of the arm is where the main veins are located. Sometimes both of the patient's arms should be checked, and sometimes the hand is the only source of a usable vein. See illustration.
 - g. Prepare venipuncture site with an appropriate antiseptic of 70% isopropyl alcohol. Do not touch this area again. Allow it to air dry.
 - h. Place the patient's arm in a downward position and grasp the arm just below the puncture site, pulling the skin tight with your thumb. Hold the needle, holder and evacuated tube in the same direction as the vein with the needle at a 15-degree angle to the vein. The vein should be entered slightly below the area where it can be seen if possible.
 - i. As soon as the needle is in the vein, push the tube firmly but carefully in as far as it will go, ensuring that the needle is kept steady.
 - j. The tourniquet may be loosened as soon as blood enters the tube. Do not allow the contents of the tube to contact the stopper or the end of the needle during the procedure. If no blood flows into the tube or if flow ceases before an adequate sample is collected, the following steps are suggested to complete the collection:
 1. Confirm correct position of needle in vein.
 2. Remove the tube and try a new one.
 - k. When the first tube is full, remove it from the holder and place the succeeding tube in the holder. Tubes without additives should be drawn before tubes with additives. While each tube is filling, invert the previous tubes carefully to mix the additives.
 - l. When the last tube is full, remove the needle from the vein, **FLIP THE SAFETY SHIELD OVER THE NEEDLE**, and apply pressure to the puncture site with a dry sterile gauze swab until bleeding has stopped.
 - m. Apply coban or paper tape, over the gauze over the puncture site.
 - n. Discard the needle using an appropriate disposal device. Never resheath the needle.
 - o. **LABEL ALL TUBES WITH THE PATIENT'S NAME, TIME OF DRAW, AND YOUR INITIALS.** Affix the bar-coded sticker to the tube, allowing the handwritten name to show. Enter the time drawn and your lab identification number to the appropriate spaces on the label. **The tubes must be labeled prior to the patient leaving the drawing area.**
3. Syringe Collection
- a. Materials needed: same as for evacuated tube collection except that a syringe is substituted for the needle holder and you will need a Blood Transfer Device.
 - b. Put on comfortably fitting gloves.
 - c. Follow the steps "F" through "1-1" under Evacuated tube collection.
 - d. Pull the plunger back slowly and carefully until the amount of blood needed has been collected. Remove the needle from the vein and cover with the safety shield. Apply pressure to the puncture site. The patient may hold the gauze while you continue to
 - e. Remove the needle by twisting it off. Apply the blood transfer device to the full syringe and fill the tubes in the correct order of draw. **DO NOT FORCE THE BLOOD IN TO THE EVACUATED TUBES SO THAT HEMOLYSIS DOES NOT OCCUR.**
 - f. Apply coban or paper tape over the gauze.

- g. Dispose of the syringe and blood transfer device in the appropriate disposal container. **DO NOT SEPARATE THEM ONCE THEY HAVE BEEN ATTACHED TO ONE ANOTHER.**
 - h. Label all tubes properly.
4. Butterfly Collection (Safety-Lok blood collection set)
- a. Materials needed are the same as above except that the butterfly and Vacutainer holder is substituted for the needle and holder.
 - b. The needle is the butterfly and should be inserted into the vein by holding the wings together at the top of the needle.
 - c. To activate the safety shield, grasp either wing with one hand and grip the area of the yellow safety shield base with the other hand. Slide the wings back into the rear slot of the safety shield until a click is heard to ensure that the needle is completely retracted and locked in place. Discard in an appropriate disposal device.
 - d. Label all tubes properly
5. Special Considerations
- a. In the event of inability to puncture the vein immediately, use your free index finger to locate the vein. It may be that the needle has not gone in deeply enough or is slightly to the side of the vein. Do not attempt to puncture the vein from where the needle is now located. Withdraw the needle until the point is almost to the surface of the skin, and then redirect the needle. This procedure is acceptable if the needle is very close to the vein but care should be taken that the patient is not being caused too much pain.
 - b. If a patient has intravenous solution going into both arms, it is acceptable to puncture the vein 3-4 inches below the site of the *W*.
 - c. An unsuccessful venipuncture should never be attempted more than twice by the same person.
 - d. Veins that tend to collapse should have blood collected with the syringe method. There is more control over the amount of negative pressure on the inside of the vein with this technique.
 - e. In case of a needle stick to the phlebotomist, notify the laboratory manager immediately.
 - f. In the following cases **DO NOT** use the collection site in question:
 - Mastectomy- **DO NOT** use any site on this arm or hand.
 - **DO NOT** use the site (arm or hand) where there will be a surgical procedure done.
 - A nurse must draw Hickman or Groshong catheter or any indwelling line-.
 - **DO NOT** use any site where there is a shunt
 - If for any reason a **DOCTOR** has instructed the patient not to use a certain site **DO NOT** question that directive!

C. ARTERIAL BLOOD

1. Any request for blood gases, which requires arterial blood, should be drawn by Respiratory Therapy or by a physician.

D. CAPILLARY BLOOD

1. Material needed:
 - Alcohol swab
 - Dry gauze pad
 - Sterile lancet
 - Micro-collecting tubes, capillary tubes, or diluting fluids as needed.
2. Using the 3rd or 4th finger on adults and children, or toes or heel on infants, rub the puncture site vigorously with the alcohol swab to cleanse the area and increase

circulation. See illustration for correct areas of puncture.

3. Allow to air dry.
4. Pinch the site chosen slightly to make it less painful, and using the sterile blood lancet, make a deep puncture.
5. Discard the lancet in a sharp's container.
6. Using dry gauze, wipe away the first drop of blood to eliminate tissue fluid contamination.
7. Apply moderate pressure, approximately-1 cm behind the puncture site, to obtain a drop of blood. Squeezing tightly will cause tissue fluid to mix with the blood and contaminate it.
8. Apply moderate pressure, approximately 1 cm behind the puncture site, to obtain a drop of blood. Squeezing tightly will cause tissue fluid to mix with the blood and contaminate it.
9. Release pressure immediately to allow re-circulation to the puncture site and squeeze gently again. Repeating until enough blood has been collected.
10. Apply a piece of gauze to the puncture site and press until bleeding has stopped.
11. Special considerations:
 - a. Collect platelet count and blood smears first due to platelet aggregation at the puncture site.
 - b. Capillary blood gives slightly different values in many areas; venipunctures should be done whenever possible.
 - c. If bleeding has stopped before required amount of blood is needed you can wipe puncture site with alcohol to remove clotted blood around puncture site. Make sure to wipe away first drop of blood again.

IV. LIMITS:

See sections on special considerations for blood collection.

V. REFERENCES:

Vacutainer Brand Evacuated Blood Collection Tube package insert.

Vacutainer Brand Safety-Lok Blood Collection Set package insert.

Todd, Sanford, Davidsohn, Clinical Diagnosis and Management by Laboratory Methods, 16th edition, W.B. Saunders, 1979.

VI. SUBMITTED BY:

Merlen Fullmer, MT-(ASCP) Administrative Director

VII. APPROVED BY:

John Gray, M.D. Laboratory Medical Director

MAGIC VALLEY REGIONAL MEDICAL CENTER

Location: MVRMC PHLEBOTOMY
Procedure: VENIPUNCTURE PROCEDURE Test #: 706-01-005
Prepared by: SUSAN MORRIS, MPH Original Date Written: 5/99
Revised by: ANGIE KNIGHT DTC-PHLEB TEAM LEADER Date: 7/04
Approved by: _____ Date Executed: 1/05

Reviewed _____ Date _____
Reviewed _____ Date _____
Reviewed _____ Date _____

I. PROCEDURE OUTLINE:

- A. Reassure the patient and identify yourself as from the lab and you are to draw a blood sample for tests ordered by their physician.
B. Identify the patient.
C. Check whether the patient is fasting, if appropriate.
D. Perform hand hygiene.
E. Apply gloves.
F. Position the patient.
G. Assemble supplies.
H. Verify tube selection.
I. Apply tourniquet.
J. Close the patient's hand, do not have patient pump their fist.
K. Select the vein site.
L. Cleanse the venipuncture site.
M. Inspect the needle and collection tube or syringe.
N. Grasp the patient's arm.
O. Perform venipuncture.
P. Release the tourniquet.
Q. Open the patient's hand.
R. Position the gauze pad.
S. Remove the needle and apply pressure.
T. Activate the safety device over the needle.
U. Bandage the arm.
V. If the syringe is used, fill the tubes using the blood transfer device.
W. Dispose of the syringe if used or the vacutainer holder and needle.
X. Chill the specimen if necessary.
Y. Properly label all tubes with patients' name, initials, and time of draw.

II. DETAILED PROCEDURE NOTES:

- A. Step 1. Reassuring The Patient:
1. Introduce yourself, explaining that you will be collecting a blood sample. It is helpful to gain the patient's confidence and assure him/her that, though the venipuncture will be a little painful, it will be of short duration. Patients should never be told, "This won't hurt." Always make sure the patient understands what you are going to do.
B. Step 2. Patient Identification:

1. Before a blood sample is drawn, certain steps must be taken to make proper identification of a patient. The following procedure should be followed:
 - a. Ask the patient to tell you his/her name. Ask him/her to spell their last name for you. If the patient cannot communicate, have a nurse or family member make the identification. Check the name against the name on the requisition. Out patients should be asked their date of birth as a second means of verifying identification.
 - b. Check the identification bracelet to see that the information on the identification bracelet corresponds with that on the requisition or labels. Do not rely on nametags on beds (except for isolettes) or other items. Patients are often moved and these tags can be left behind.
 - c. The unidentified emergency patient should be given temporary, but clear, designation until positive identification can be made.
 1. If patient's armband has medical record number, label tube with that number.
 2. If patient's armband only has emergency room number, label tubes with that number. Upon return to the lab, edit search demographics to verify E.R. number and find medical record number. Label tubes with medical record number.
 3. It is extremely important that an emergency patient be banded and this should be done if at all possible.
 4. Exceptions to the above rules may need to be made on emergency patients. A modification of the rule may be to label as completely as possible. The physician's name is helpful if a hospital or room number is not available. If the name is not known, use the emergency room's ID, i.e. John Doe, or an assigned number. The patient should be banded with the blood band R-band, and the R-number applied to the tubes and requisitions.

C. Step 3. Ascertain Whether Patient Is Fasting:

1. Fasting specimens are required for:
 - a. Comprehensive or Basic Metabolic Panel
 - b. Lipid profiles
 - c. Glucose tolerance tests
 - d. Glucose, if specified
 - e. HDL
 - f. Iron
 - g. Iron binding capacity
 - h. Phosphorous
 - i. Triglycerides
2. For other tests consult the Test Directory or call Client Services for specific patient preparation.

D. Step 4. Wear Gloves:

1. Latex-free disposable gloves are required for all phlebotomies and any finger sticks or heel sticks. Hands must be washed before putting on gloves. Gloves must be changed between each patient. Wash hands after removing last pair of gloves.

E. Step 5. Position Patient:

1. Procedure for Seating Patient: Ask the patient to be seated comfortably in a chair. Have the patient position his or her arm on the slanting armrest, extending the arm so as to form a straight line from the shoulder to the wrist. The arm should be supported firmly by the armrest and should not be bent at the elbow.
2. Procedure for Having Patient Lie Down: Ask the patient to lie on his/her back in a comfortable position. Place a pillow (if additional support is needed) under the arm from which the specimen is being drawn. Have the patient extend his/her arm so as to form a straight line from the shoulder to the wrist.

3. Do not draw blood from patients who are standing, or who are in the bathtub or shower.
- F. Step 6. Assemble Supplies:
1. Assemble the following supplies:
 - a. Alcohol, 70% or alcohol swab
 - b. Dry gauze pads or cotton balls
 - c. Tourniquet (A separate tourniquet should be left in each patient's room and used exclusively for that patient.)
 - d. Appropriate test tubes for the tests ordered
 - e. Vacutainer holder or syringe along with a Blood Transfer Device.
 - f. Needle
 - g. Tape or some type of bandage
 2. Select the appropriate type needle based on patient's physical characteristics and amount of blood to be drawn.
 3. Select the appropriate system for drawing the blood specimen:
 - a. Plastic Syringe: In general, use a syringe when drawing a specimen from individuals with fragile, thready, or "roily" vein walls.
 - b. Evacuated Systems: The evacuated system is the most commonly used means of collecting specimens today. It is generally preferable to the needle and syringe, since it allows the blood to pass directly from the vein into the evacuated tube. The system is composed of three basic elements: a sterile blood collection needle, a holder that is used to needle and the evacuated tube, and an evacuated tube containing a pre-measured additive.
 - c. Select the Appropriate Needle: The choice of needle will depend on the type of vein the patient has. The most commonly used needle is 20-gauge. (This refers to the diameter of the needle. The higher the gauge number, the smaller will be the diameter, or bore, of the needle.) For small veins a 21- or 22-gauge needle is recommended. The length of needle chosen is up to the individual phlebotomist. The two most widely used needle lengths are 1-inch and 1 1/2-inches. Blood may be obtained from most deep veins with a 1-inch needle.
- G. Step 7. Verify Tube Selection:
1. Check the tubes to see that the appropriate kinds and sizes have been selected:
 - a. Color Coding: The stoppers of tubes are color coded as follows:
 - Gray and red top
(serum separator) - Plain
 - Red top - Plain
 - Blue - Sodium Citrate
 - Green - Lithium heparin
 - Lavender - EDTA
 - Navy - Trace elements (no additive) or EDTA
 - Yellow - Sterile
 - Gray - Potassium oxalate/sodium fluoride for lactates
 - b. NOTE: If a tube contains an anticoagulant, it must be 3/4 full! The blue tube must be filled with the exact amount of blood that is required (4.5 ml in the big tube and 1.8 ml in the small one).
- H. Step 8. Apply Tourniquet:
1. Use a tourniquet to increase venous filling, which makes the veins more prominent and easier to enter.
 2. Precautions When Using a Tourniquet: Never leave the tourniquet on for longer than one minute. To do so may result in hemoconcentration or a variation in blood test values. If a tourniquet must be applied for the preliminary vein selection, it should be released and

- reapplied after a wait of 2 minutes. If the patient has a skin problem, put the tourniquet over the patient's gown or use a piece of gauze or paper tissue so as not to pinch the skin.
3. Suggested Procedure for Applying Tourniquet: Wrap the tourniquet around the arm 3 to 4 inches (7.5 to 10.0 cm) above the venipuncture site.
- I. Step 9. Ask the Patient to Close His or Her Hand:
1. The veins become more prominent and easier to enter when the patient forms a fist. Vigorous hand exercise "pumping" should be avoided.
- J. Step 10. Selection of a Vein Site:
1. Importance: A patient's life may depend on vein patency (transfusion, infusion, therapeutic agents).
 2. Preferred Veins: Although the larger and fuller median cubital and cephalic veins are used most frequently, wrist, hand, and ankle veins are also acceptable for venipuncture. Do not use a foot or ankle vein without first getting permission from the patient's attending physician.
 3. Factors to consider in Site Selection:
 - a. Extensive Scarring: Healed burn areas should be avoided.
 - b. Mastectomy: Because of lymphostasis, specimens taken from the side on which a mastectomy was performed may not be truly representative specimens. These patients are also more susceptible to infection. Do not draw from the arm on the same side as the surgery.
 - c. Hematoma: Specimens collected from a hematoma area may cause erroneous test results. If another vein site is not available, the specimen should be collected distal to the hematoma. Note in the computer that blood was collected from an area with hematoma.
 - d. IV Therapy: Blood should not be drawn from the same arm that has an IV running unless absolutely necessary. If the opposite arm is not available, ask the nurse to shut off the IV. After 5 minutes, draw the required sample from a site above the IV. Be sure you tell the nurse when you finish so the IV can be restarted. Enter "IV shut off" into computer. Blood should never be drawn from total parental nutrition line.
 - e. Blood Transfusion: It is best not to obtain the blood specimen until the patient has received the transfusion. However, if the attending physician specifically requests a blood sample be collected, the blood specimen should be collected from the arm not receiving the transfusion.
 4. Procedure for Vein Selection: Palpate and trace the path of veins several times with the index finger. Unlike veins, arteries pulsate, are more elastic, and have a thick wall. Thrombosed veins lack resilience, feel cord-like, and roll easily.
 5. If superficial veins are not readily apparent, blood can be forced into the vein by massaging the arm from wrist to elbow. Tapping sharply at the vein site with the index finger a few times will cause the vein to dilate. Application of heat to the site may have the same result. Lowering the extremity over the bedside will allow the veins to fill to capacity.
- K. Step 11. Cleanse the Venipuncture Site:
1. The vein site should be cleansed to prevent any chemical or microbiological contamination of either the patient or the specimen.
 - a. Cleansing Method for Routine Venipuncture: Soak a gauze pad with 70% isopropyl alcohol solution, or remove alcohol prep from its sterile package.
 - b. When blood alcohol samples are drawn, the skin should be cleansed with an iodine solution instead of alcohol.
 - c. Cleanse the vein site with a circular motion from the center to the periphery.
 - d. Allow the area to dry to prevent hemolysis of the specimen and burning sensation to the patient when the venipuncture is performed.

- e. Touching the Vein Site After Cleansing: If the venipuncture proves difficult and the site must be touched, then the site must be cleansed again before the needle is inserted.
 - f. Blood culture collections refer to Special Collection Blood Culture procedure.
- L. Step 12. Inspection of Needle and Syringes:
- 1. Needles: Inspect the tip of the needle visually to determine if it is free of hooks at the end of the point, and if its opening is clear of any small particles that would obstruct the flow of blood.
 - 2. Syringes: Move the plunger within the barrel of the syringe to demonstrate syringe and needle patency and freedom of plunger movement.
- M. Step 13. Grasp the Patient's Arm:
- 1. Hold the patient's arm firmly, using your thumb to draw the skin taut. This anchors the vein. The thumb should be 1 or 2 inches (2.5 cm or 5.0 cm) below the venipuncture site.
- N. Step 14. Perform Venipuncture:
- 1. Venipuncture Procedure Using Needle and Syringe: Insert the appropriate needle onto the syringe.
 - a. Place the patient's arm in a downward position if possible.
 - b. Line up the needle and syringe with the vein from which the blood will be drawn.
 - c. Turn the needle so that the beveled side is in an upward position.
 - d. Push the needle into the vein. A sensation of resistance will be felt, followed by ease of penetration as the vein is entered.
 - e. Withdraw the desired amount of blood. Release the tourniquet
 - f. When finished, cover the needle with the safety guard and unscrew it from the syringe. Attach the Blood Transfer Device and begin to fill the tubes in the correct order of draw.
 - g. If more than one 10 ml of blood is needed, use a butterfly and ask another phlebotomist to assist in this draw. Determine what gauge needle is the appropriate size for the vein. Attach the syringe to the hub of the butterfly. Fill the first syringe. After the syringe is full, kink the tubing of the butterfly and unscrew syringe and attach a new syringe. Ask the other phlebotomist to attach the Blood Transfer Device to the full syringe and begin to fill the tubes. NEVER force blood from a syringe into a tube by pushing the plunger. Let the evacuated tube fill on its' own.
 - 2. Venipuncture Procedure When Evacuated Tubes Are Used: Thread the appropriate needle into the holder until it is secured, using the needle sheath as a wrench.
 - a. Insert the blood collection tube into the holder and onto the needle up to the recessed guideline on the needle holder. Do not push the tube beyond the guideline as a premature loss of vacuum may result. The tube will retract slightly. Leave it in this position. Insert the correct order of draw.
 - b. Make sure the patient's arm or other venipuncture site is in a downward position while maintaining the tube below the site throughout the procedure. This will help insure that no backflow from the tube will go into the patient's vein.
 - c. Grasp the flange of the needle holder and push the tube forward until the butt end of the needle punctures the stopper, exposing the full lumen of the needle.
- O. Step 15. Release the Tourniquet:
- 1. The tourniquet should be removed when blood begins to flow. This allows the blood circulation to return to normal. Removing the tourniquet also reduces bleeding at the venipuncture site after the specimen is obtained.

- P. Step 16. Ask the Patient to Open His/Her Hand After Enough Blood Has Been Collected:
1. This reduces the amount of venous pressure. Don't allow the patient to pump his hand.
- Q. Step 17. Lightly Place the Gauze Pad or Cotton Ball Above the Venipuncture Site.
- R. Step 18. Remove the Needle:
1. Apply slight pressure to the pad. Remove the needle slowly while keeping the bevel in an upward position. Exercise care not to scratch the patient's arm. Retract the needle to the covered position inside the vacutainer holder.
- S. Step 19. Bandage the Arm:
1. Under Normal Condition: Slip the gauze pad down over the site, continuing mild pressure.
 2. Apply an adhesive or gauze bandage over the venipuncture site.
 3. When the Patient Continues to Bleed: Apply pressure to the site with a gauze pad until the bleeding stops.
 4. Wrap a gauze bandage tightly around the arm over the pad and secure with tape.
 5. Tell the patient to leave the bandage on for 15 minutes.
 6. The phlebotomist should be alert to excess bleeding. If bleeding persists longer than 5 minutes, a nurse or physician should be alerted so that the attending physician can be notified of the problem. Continue pressure on the site as long as necessary to stop the bleeding.
- T. Step 20. Fill Appropriate Tubes for Syringe Drawn Specimens:
1. Do not hold tubes in your hand. Place them in a rack.
 2. Fill the appropriate tubes in the correct order using the blood transfer device. Never force blood into a tube.
- U. Step 21. Dispose of the Needle:
1. Needles should be disposed of promptly to prevent their reuse or accidental injury. Insert the needle into an appropriately labeled box designated for this purpose.
- V. Step 22. Chill the specimen: (This is done only for certain specimens.)
1. Some tests require that the blood specimens be cooled immediately following the venipuncture in order to slow down metabolic processes, which may cause alteration of some chemical values
 2. Examples of Common Tests Requiring Chilling the Specimen:
 - a. Venous pH
 - b. Ammonia
 - c. Renin
 - d. Gastrin
 - e. VIP (Vaso-intestinal polypeptide)
- W. Step 23. Properly Label All Tubes:
1. Label all tubes immediately after collection with patient's name, medical record, location, date, time, and your initials. Samples for crossmatch or type & screen also need the Blood Bank band number. Never leave the bedside with unlabeled tubes.
 2. Never prelabel tubes. Do the labeling in the patient's room after taking the specimen. If labels are not available, legibly write the information on the tube in ink.
 3. Unlabeled or Improperly Labeled Tubes or Specimens Cannot be Accepted By the Laboratory
 - a. In the case of improperly labeled blood samples; the patient must be redrawn, with strict attention to proper identification and labeling procedures.
- X. Step 24. Transport to lab:
1. All specimens must be sealed inside a plastic biohazard bag before being transported to the Laboratory.

III. SUBMITTED BY:

Merlen Fullmer, MT-(ASCP) Administrative Director

IV. APPROVED BY:

John Gray, M.D. Laboratory Medical Director

EXAMPLES OF THE CORRECT AREAS OF DRAW FOR VENIPUNCTURE AND FOR CAPILLARY DRAWS

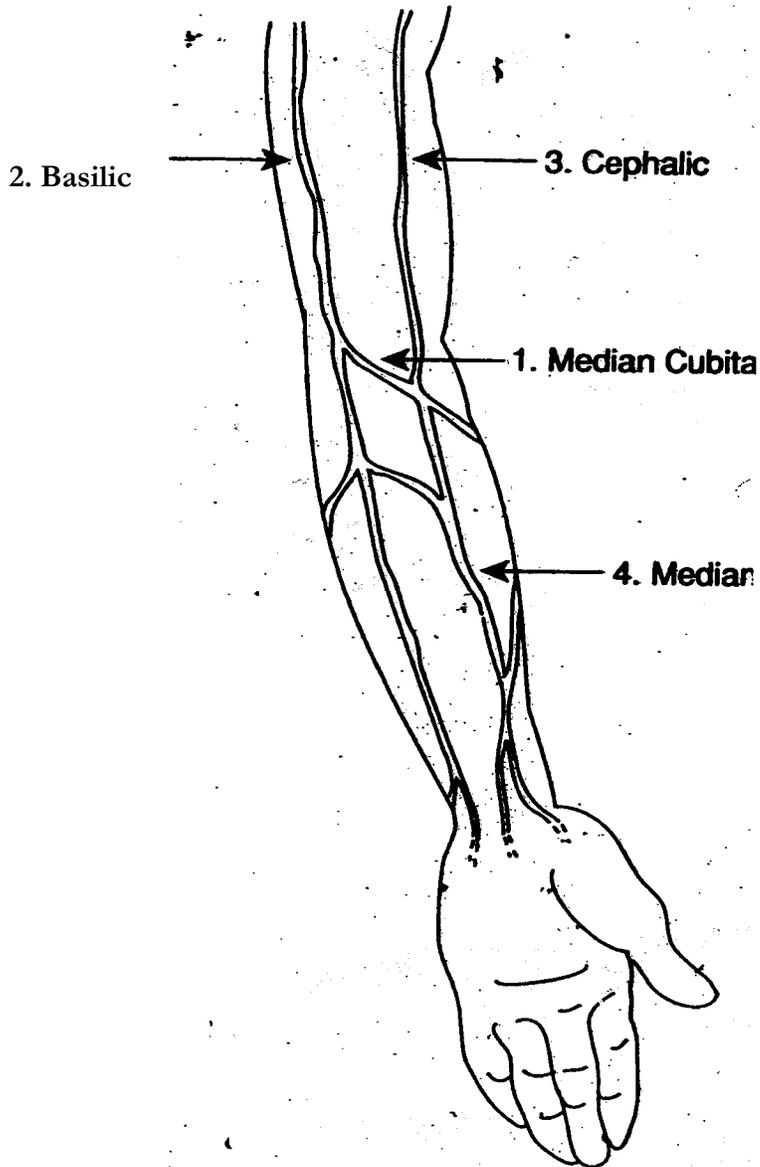
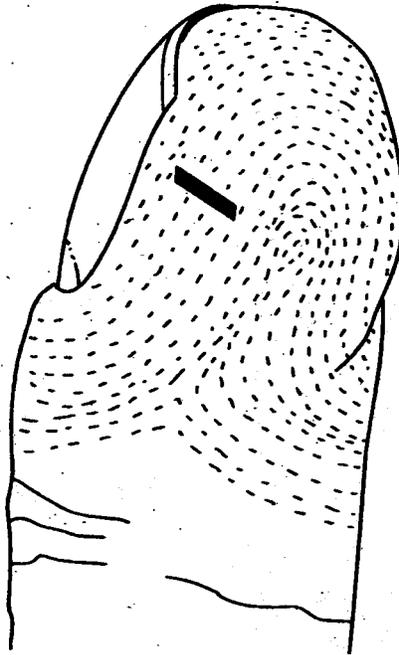
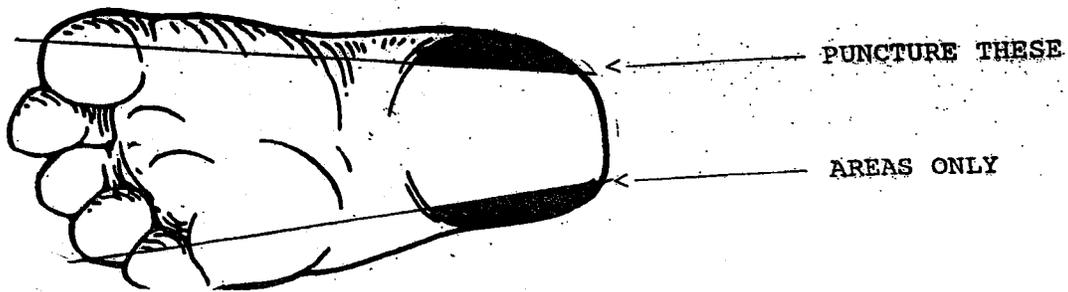


Figure 4.3 Veins in the arm.

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Puncture site on finger.



Infant heel: The darkened areas illustrate the acceptable areas for puncture. The little toe side is the primary area of choice.

Saint Alphonsus Regional Medical Center Laboratory

Policy for Patient Identification

Patient identification is a critical aspect of total quality of care. It is mandatory that the phlebotomist who collects the blood specimen from the patient correctly identify the patient, regardless of the clinical setting. Patients must be POSITIVELY identified at the time the sample is drawn. Sample must be labeled at the bedside or other collection site in the presence of the patient.

I. Patient who is conscious...

1. Ask the patient "What is your name?" Check the patient's wristband for verification. If the patient is able to give full name and the wristband agrees with the patient's statement, check the requisition and/or preprinted label to be sure all information agrees. This includes i.e. hospital number, medical record number, room number, correct spelling of first and last name, sex, middle initial, and date of birth.

If all information agrees, perform the venipuncture and label tubes according to established criteria.

Patients to be drawn for cross match must verify date of birth. That reformation should not be taken from the computer alone.

2. **Report any discrepancy, no matter how minor...** If there is a discrepancy between information on the requisition, preprinted label, and wristband, DO NOT perform the venipuncture until the situation has been resolved. Have a nurse familiar with the patient provide positive identification and/or check to be sure patient has correct wristband. If changes are necessary (i.e. in IHS computer, Sunquest computer, or addressograph plates), the phlebotomist should notify appropriate personnel to make these changes.

Be sure ALL information is the same. The requisition (preprinted or handwritten), wristband, and verbal information from the patient or person identifying the patient must agree.

II. Patient who is unconscious, too young, mentally incompetent, or does not speak the language of the phlebotomist...

1. If the patient is unable to state his or her name, the wristband must be relied upon totally for information and/or a nurse familiar with the patient must be consulted to verify identification of the patient. Have the identifying person initial the tube(s). If this is not possible, phlebotomist should get name of person and document that is part of computer workload entry. A friend or relative may identify a patient. Verify full name and birth date. Be sure all information agrees with information on request form or preprinted computer label.
2. If the patient can be positively identified (verbal statement, wristband, or nurse ID), perform the venipuncture and label the tube(s) according to established criteria.

Specimens must be labeled at the time of collection in the presence of the patient. Tubes should be initialed by the phlebotomist to provide a mechanism for identifying the person who drew the blood.

III. Patient who has no wristband...

1. If patient can state full name or can be identified by a nurse, friend or relative, but has no

wristband, notify the nursing station or patient nurse and request that the wristband be put on the patient. Once the band is in place, perform the venipuncture and label the tubes according to established criteria.

If problems or delays occur in getting the wristband on the patient, draw the blood (Do not compromise patient care.) and then follow up with nurse manager and assistant laboratory director as necessary to resolve the problem.

Patients for cross match CANNOT be drawn without ID band.

IV. Patient who is ambulatory...

1. Outpatients, TBA or PAT surgical patients and employee hospital physical patients should be called into the drawing room using first and last names. No exceptions to this no matter how well you know the patient. Using first names only for some and not others gives the appearance that some patients get special treatment.
2. Verify patient identification again before drawing blood. Patients may respond to the wrong name or to a similar name.
3. Verify identity of repeat patients (i.e. glucose tolerance) each time they are drawn. During a 3, 4, or 5 hour stay, it is possible a different phlebotomist could obtain the blood sample each time.
4. Check the IHS computer routing slip and the Sunquest computer label to be sure all information agrees. If information on the preprinted computer label is incorrect, the phlebotomist is responsible for changing that information or notifying lab registrars to do so. This should be done at the time of draw. For significant errors (i.e. first and last names reversed), labels should be reprinted and the new set of labels with corrected information used.

V. Patients drawn outside the medical center by laboratory personnel...

1. House call patients (from nursing homes, private homes, businesses, health fairs, clinics, other hospitals, etc.) must be identified according to established policy. If other facilities have a policy that their patients are not banded, a staff member should accompany the phlebotomist to make positive identification if the patient cannot or will not do so.
2. Specimens must be labeled at the site of collection before delivery to the laboratory for processing. Labeling must meet established criteria or specimens will be rejected.

If blood is obtained from the wrong person...

1. If at any time a mix-up occurs and blood is drawn from the wrong patient, it is the responsibility of the phlebotomist to generate an occurrence report (if this has not already been done) and to provide an explanation of circumstances involved.
2. All incidents must be reported to assistant laboratory operations director and/or operations director.
3. Appropriate disciplinary action will occur upon repeated violations of policy.

NO SHORTCUTS!!

MAGIC VALLEY REGIONAL MEDICAL CENTER

Location: MVRMC PHLEBOTOMY	
Procedure: IDENTIFICATION AND LABELING OF SPECIMENS	Test #: 706-1-001
Prepared by: SUSAN MORRIS	Original Date Written: 10/98
Revised by: ANGIE KNIGHT DTC-PHLEB TEAM LEADER	Date: 1/06
Approved by: _____	Date Executed: 1/06

Reviewed _____ Date _____
Reviewed _____ Date _____
Reviewed _____ Date _____

I. POLICY/PURPOSE:

A. All patients will be positively identified prior to specimen collection. A request for a repeat specimen will be made if the lab receives a mislabeled or unlabeled specimen.

II. POLICY IMPLEMENTATION:

A. If there is any difficulty and you are requested to do something contrary to this procedure, consult a medical technologist. The medical technologist may consult a pathologist, if needed.

1. Positively Identifying INPATIENTS

- a. The patient **MUST** be positively identified at the time of collection of the blood specimen.
- b. The name and medical record number must be attached to the patient's body either by ident-a-band or adhesive tape. **Except for isolettes, bed labels may not be used for identification.**
- c. The information on the wristband must be checked with the request form by comparing name, medical record number, and date of birth.

EXCEPTIONS:

***If identification cannot be attached because of the patient's condition (e.g., burns), the nurse in charge of the patient must identify the patient at the bedside, giving the name and medical record number and/or birth date.

2. Positively Identifying OUTPATIENTS

- a. Outpatients are to be identified by calling them by name from the waiting area and then asking them to spell their last name, and then asking them for the date of birth and comparing both to the requisition (or Meditech labels).
-- he/she **must not** be asked, "Are you Mr. (Ms.) Jones?"
- b. The patient's birth date should also be matched and written on the requisition and the tube to differentiate duplicate names in the computer.

3. Labeling the Tubes or Specimen Containers

- a. Immediately after the blood specimen is drawn, the tube must be completely labeled at the bedside with the patient's full name, medical record number, time, date, and **the first name and last initial** of the phlebotomist who drew the specimen.

IMPORTANT:

- 1. Legibly label the tube in ink.
- 2. Copy the identification information from the wristband, not the request form.
- b. Pre-printed labels (e.g. Meditech labels) may be used as long as the patient's name,

medical record number, and/or birth date are checked and matched.

NOTE: Leave a margin of bare tube so the serum/cell level can be observed.

Legibly write the time, date, and **first name and last initial** on the label.

4. Blood Bank Specimens (orders for Crossmatch or Type and Screen)

****Patients with orders for crossmatch or type and screen must be banded with the pink Blood Bank band. ****

- a. Prepare a Blood Bank R-card, including at least the patients' full name, medical record number and their birth date in the upper right hand corner.
- b. An R-number sticker from the card will be placed on the EDTA tube.
- c. An R-number sticker will also be placed on the requisition form.
- d. A pink wristband will be used with the R-number unless the patient is an autologous donor in which case they are to have a green band.
- e. The R-number strip at the bottom of the card is filled out (or addressographed) with the patient's name and inserted into the wristband.
- f. The band will then be sent to the blood bank with the specimen.
- g. The blood bank will then route that band to pre-admission who will identify the patient and place the band on the patient when the patient is admitted.

III. DO NOT ATTACH THE BAND TO THE PATIENT ANY MORE...UNLESS THEY ARE A SAME-DAY SURGERY HAVING THEIR SURGERY HERE AT THE DOWNTOWN CAMPUS THAT SAME DAY AS THE DRAW OR THE NEXT DAY.

NOTES:

- a. The patient should have only 1 pink band on at a time. That is, only **one** R-number per visit!
- b. The band is for identification purposes when blood may be or is given, and can be of value only if used properly.
- c. Autologous donors will be banded with green Blood Bank bands with the above labeling criteria adhered to.
- d. The patient need not be banded with a pink blood bank band if only fresh frozen plasma, platelets, cryo, RH IG, or albumin are given.

1. Emergency Room Patients

- a. It is extremely important that an emergency patient be banded and this should be done if at all possible.
- b. With banded patients, the INPATIENT Identification procedure must be followed.
- c. **Exceptions** for unbanded emergency patients.
 1. Label specimens as completely as possible.
 2. If the name is not known, use both:
 - a. the emergency room's Patient ID, (i.e., John/Jane Doe)
 - b. an assigned number.
 3. The patient should be banded with the blood bank R-band
 4. Apply the blood bank R-number to all tubes and requisitions.

IV. REFERENCES:

Lab Ward Manual Index number 706-1-001

V. SUBMITTED BY:

Merlin Fullmer, MT-(ASCP)

VI. APPROVAL:

John Gray, M.D., Laboratory Medical Director

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MAGIC VALLEY REGIONAL MEDICAL CENTER

Location: MVRMC PHLEBOTOMY

Procedure: VENIPUNCTURE COMPLICATIONS AND TREATMENT Test #: 706-1-007

Prepared by: FRANCES MALONE

Original Date Written: 9/94

Revised by: ANGIE KNIGHT DTC-PHLEB TEAM LEADER

Date: 7/04

Approved by: _____

Date Executed: 1/05

Reviewed _____ Date _____

Reviewed _____ Date _____

Reviewed _____ Date _____

I. POLICY/PROCEDURE:

A. Procedure for Obtaining Assistance in a Medical Emergency:

1. Cardiac Arrest:

- a. Call 2555 and say "Code Blue", indicating your location;
- b. Call a nurse.

B. Patient Problems:

1. Syncope (fainting):

- a. If the patient is in a sitting position, lower his/her head and arms. Get into the recliner in a laying position with feet elevated.
- b. Loosen tight clothing. Call for help if needed.
- c. Administer ammonia inhalant. The patient will respond by coughing.
- d. Apply cold compresses to the forehead and back of neck if necessary.
- e. Have another phlebotomist call for the nurse. The RN will then take the blood pressure and pulse of the patient. Only the RN, not the phlebotomist, can release the patient after the blood pressure and pulse have returned to normal and the patient feels, good enough to leave.
- f. If the patient does not respond, notify a physician.

2. Nausea:

- a. Make the patient as comfortable as possible.
- b. Instruct the patient to breathe deeply and slowly.
- c. Apply cold compresses to the patient's forehead.

3. Vomiting:

- a. Give the patient an emesis basin or carton, and have tissues ready.

4. Convulsions:

- a. Prevent the patient from injuring himself/herself. Do not restrain the movements of the patient's extremities completely, but try to prevent him/her from being injured.
- b. Call someone to help.
- c. Place tongue blades wrapped in gauze between the teeth to prevent the patient from chewing his/her tongue.
- d. Keep the blades in place until the patient revives.
- e. Be sure the patient has an airway.
- f. Call a physician.

5. Patient Refusal:

- a. A patient has the right to refuse blood to be drawn if they are above the age of 12. If they are under 12 years of age then the decision is for the legal guardian to make. Document refusal when canceling tests.
- b. Contact appropriate nurse or doctor that the venipuncture was refused.

II. REFERENCE:

Phlebotomy Handbook, Garza and Becan-McBride, 2nd ed. 1989.

III. SUBMITTED BY:

Merlen Fullmer, MT (ASCP) Administrative Director

IV. APPROVALS:

John Gray, M.D. Laboratory Medical Director

USING A SYRINGE FOR VENIPUNCTURE

Syringes should be used for venipuncture when veins are small or fragile, as they will possibly collapse when using the evacuated tube system. However, it is safer to use the evacuated tube system whenever possible.

Advantages of using a syringe include:

1. When the vein has been accessed blood will appear in the hub of the needle.
2. When veins are small, use of the syringe allows the phlebotomist to control the pressure of blood flow into the syringe.

Disadvantages of using a syringe include:

1. Syringes are not as safe as the evacuated tube method. I.e.: The time in between the safety needle removal and the adaptor placed on the syringe, the blood may accidentally be splashed out if the syringe is dropped or mishandled in some way.
2. The syringe may not hold enough blood that is required for multiple testing.
3. Phlebotomists may become dependant on the fact that they are able to see blood in the hub of the needle. The syringe then can become a safety blanket for the phlebotomist. Give yourself credit for being the skilled professional you are.

Using the syringe for venipuncture:

1. Properly identify the patient.
2. First locate the vein while applying the tourniquet.
3. Once the vein is located, remove the tourniquet and cleanse the site with alcohol and allow the alcohol to dry.
4. Before inserting the needle, the plunger should be moved back and forth to allow the plunger to move easily and also to expel any air.
5. Place the tourniquet on the patient again.
6. Place your thumb on the top of the barrel of the syringe and two fingers under the barrel.
7. With your free hand anchor the vein with your thumb below the intended venipuncture site.
8. With the bevel up insert the needle with a smooth motion.
9. Keeping your fingers firmly against the patients skin, gently pull back the plunger of the syringe allowing the blood to flow without effort. As soon as blood flow is established remove the tourniquet.
10. **Do not pull hard on the plunger** it may cause the vein to collapse and can cause hemolysis, which may give erroneous test results.
11. If blood seems to quit flowing, discontinue pulling on the plunger briefly. This may allow blood to return to the area where the venipuncture is being performed. You may then continue gently filling the syringe.
12. After the required amount of blood has been obtained remove the needle, activate the safety device and apply pressure to the puncture site.
13. Dispose of the safety needle and apply the safety adaptor to the syringe and fill tubes using the correct order of draw.
14. As is the case with any venipuncture, if the patient experiences **pain**, other than the initial venipuncture stick, discontinue the venipuncture immediately and apply pressure.
15. If a **hematoma** begins to occur, discontinue the venipuncture immediately and apply pressure.

If either #14 or #15 occurs you will need to go to the other arm and begin the procedure again or get assistance from another phlebotomist.

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SECTION H
SPECIAL COLLECTIONS

MAGIC VALLEY REGIONAL MEDICAL CENTER

Location: MVRMC PHLEBOTOMY	
Procedure: BLOOD CULTURE AND BacT Alert 3D	Test #: 706-01-069
Prepared by: SANDRA JUSSEL MT (ASCP)	Original Date Written: 4/04
Revised by: SANDRA JUSSEL MT (ASCP)	Date: 1/05
Approved by: MICHELE HARRIS, LABORATORY MANAGER	Date Executed: 1/05

Reviewed _____ Date _____
Reviewed _____ Date _____
Reviewed _____ Date _____

I. LEARNING OBJECTIVES:

- A. Upon completion of this paper the reader will be able to:
 - 1. Understand the importance of proper skin preparation and blood culture draws to decrease contaminated blood cultures.
 - 2. Factors affecting blood-culture collection.
 - 3. Proper inoculation of blood culture bottles.
 - 4. Proper loading of blood culture bottles into the BacT/Alert 3D Instrument
 - 5. The proper drawing of blood cultures is extremely important to the diagnosis of a true bacteremia, the presence of bacteria in the blood stream. Contaminated blood cultures can be very frustrating to the Microbiologists and Physicians. Reporting positive blood cultures that are not consistent with the patient's condition, diagnosis or clinical symptoms puts the Physicians in a quandary. Most choose to administer antibiotic therapy, extend the patient's stay and monitor the patient with more tests. Proper skin preparation and adequate blood draws eliminate the majority of these contaminants.
- B. Certain factors have a critical bearing on drawing a blood-culture specimen. These factors are:
 - 1. Training of blood-culture personnel
 - 2. Location of collection site
 - 3. Preparation of puncture site
 - 4. Blood collection equipment
 - 5. Collection volume
- C. Personnel
 - 1. When personnel other than trained phlebotomists collected blood cultures the contamination rate was significantly higher (as much as 77% contamination).
- D. Site Selection
 - 1. The location of the collection site has a significant impact on the potential for a culture to be contaminated. Draws from arterial lines, central venous catheters, and heparin locks, have been shown to result in: high contamination rates. Because these ports pass through the skin and remain there for long periods of time, they are susceptible to bacterial growth. Occasionally blood will have to be drawn from a line. For example, from chemo patients, picc lines or Groshong ports. Remember the source of these draws is "Blood L" with the port/site information documented in the micro comments. A request to obtain blood cultures from an "IV start" (particularly from ER) is not a legitimate line study. DO NOT allow nurses to draw blood cultures when starting an IV. Many times such

cultures become positive from contamination in the site prep protocol. Do not be pressured into poor specimen handling. This is not an acceptable blood culture specimen and as stated above can cause problems for the Physician, extended hospital stay and extended antibiotic use.

E. Site Preparation

1. Aseptic site preparation is without question the single most important factor in collecting uncontaminated blood cultures. Chlorhexidine gluconate 2% and 70% isopropyl alcohol is a one step antiseptic solution used for skin preparation. Since organisms are normal on the skin surface, we must get rid of them before the draw. Remember the organisms die because they dry out, not because you drown them with alcohol. Let the antiseptic you use to cleanse the area dry.
 - a. Always begin with proper patient identification
 - b. After palpitation prepare the skin by gently rubbing the venipuncture site with 70% alcohol and let dry for a minimum of 30 seconds.
 - c. Apply ChlorPrep (chlorhexidine gluconate 2% and 70% isopropyl alcohol) using a thirty (30) second scrub in a back and forth motion. Completely wet the treatment area and allow to dry. If the site of venipuncture is wet, scrub for two, (2) minutes.
 - d. Once the area is cleansed, do not touch the puncture site again. If one is unsure of the vein's location, you can re-palpate above or below the intended puncture site. Cleansing the tip of the gloved index finger for palpation is not advised.
 - e. Decontaminate the tops of the blood culture bottles with 70% alcohol and allow drying for one minute. DO NOT use iodine.

D. Equipment

1. The equipment provided for blood culture draws are the vacuum tube adapter, butterfly/adapter set and the syringe. Use only needles designed with safety features. DO NOT try to forcefully push the sample into the blood culture bottles as this can cause an increase risk to blood borne pathogens if the force results in splattering. Make sure that a 'sharps container is within reach at the point of use. Using the NCCLS order of draw, blood culture bottles are drawn first if multiple tubes are drawn.
 - a. If using a butterfly adapter set the aerobic bottle should be inoculated first because the butterfly tubing can give up to 1 cc of dead space volume. If this volume of air is pulled into the anaerobic bottle, the results may be inaccurate.
 - b. If using a syringe the anaerobic bottle should be inoculated first because the longer the blood sits in the syringe the longer it is exposed to air. With the safety shield; recap and remove the needle from the syringe and inoculate the blood culture bottle using the transfer device.
 - c. The butterfly adapter set and transfer device are required safety equipment used to prevent needle sticks. If you are unfamiliar with the use of these devices see Nancy (Downtown Lab) or Sandra (Microbiology).

E. Collection Volume

1. The optimal volume for blood-culture collection from adults is considered to be 20 ml per set (10 ml into the aerobic and anaerobic bottles). If you have a short draw, the aerobic bottle is the most important. For example:
 - a. If you draw 10 ml of blood, inoculate the aerobic bottle only and note in micro comments "FAN bottle only".
 - b. If you draw 5 ml blood, inoculate the aerobic bottle only.
 - c. If you draw 15 ml blood, inoculate 5 ml blood in the anaerobic bottle and 10 ml in the aerobic bottle.
 - d. If you only can draw 3 ml blood, get someone else to come and draw. **NEVER PUT AN ADULT DRAW INTO A PEDIATRIC BOTTLE.** The pediatric bottles are formulated specifically for children. Do not overfill bottles. Never put more than 12

ml of blood in the aerobic or anaerobic bottles. This can cause false positives due to the excess number of white blood, cells.

- e. Properly label the blood culture bottles with Name, Date, Time of Draw, Phlebotomist and location of draw (ex: Right arm). Remove the tags from the bottles and place them on the slip next to the appropriate accession number.
- f. The reason we draw the patient twice for every set requested is because the organisms can be transient. This means that the organisms come and go in the system so we have a better chance of detecting it with two separate draws from two different sites. The optimal time is 15 minutes or less for the second draw. If only one site is available, then use it.

F. Pediatric Draws

1. Pediatric bottles are for patients that weigh less than 60 pounds only. If you don't know the child's weight, then ask the caregiver. To repeat: **NEVER PUT AND-ADULT DRAW INTO A PEDIATRIC BOTTLE.** The pediatric bottles are formulated specifically for children. The blood requirement for pediatric bottles is 1-4 ml of blood.
2. Blood cultures for Acid Fast Bacteria (C AFB) and Fungus (C FUN) need to be collected in the isolator tubes (found in the main lab store room) for optimal organism recovery.
3. **PROCEDURE FOR LOADING BLOOD CULTURE BOTTLES IN THE BacT/ALERT 3D INSTRUMENT** (performed at the Main Campus Laboratory)
 - a. **Logging in specimens (Accessioning)**
 1. Check all information on the bottle and requisition for completeness as follows:
 - a. Patient's name
 - b. Hospital ID
 - c. Date and time of collection
 - d. Collected by
 - e. Comments
 2. Remove the pull-off bottle barcode and place it on the requisition slip. There should be two bottles for adults and one for pediatrics. Other exceptions should be noted under comment, e.g. "No Anaerobic bottle drawn".
 - b. **Loading Bottles (BacT/ALERT 3D)**
 1. Press the **Load Bottles** icon on the 3D Controller Screen.
 2. Scan the bottle's bar code. The bottle ID will appear on the 3D screen.
 3. Scan the bottle's accession the # barcode. The accession # will appear on the 3D screen.
 4. A green light will designate those drawers that are available for loading new bottles.
 5. Open the drawer and load the bottle into any cell that has its green light illuminated.
 6. Repeat scanning and loading for all bottles.
 7. Press the <check> button to return to the **Controller Screen.**
 - c. **Quick Data Entry (BacT/VIEW)**
 1. Touch the <Quick Data Entry> icon.
 2. Enter or scan the accession number.
 3. Enter your name (not the person who collected the specimen).
 4. Enter or scan the Patient's Identification Number.
 5. Enter the Patient's name.
 6. Touch <Save> icon.

II. SUBMITTED BY: Sandra Jussel MT (ASCP) Outreach Team Leader

III. APPROVED BY: Jane Bennett-Munro M.D. Laboratory Medical Director

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BacT/Alert® Blood Collection Adapter



For in vitro diagnostic use.

Intended use

The **BacT/Alert® Blood Collection Adapter** is used as an aid to facilitate filling of blood into the BacT/Alert Blood Culture Bottle, when using a blood collection set. **Caution: This blood collection adapter SHOULD NOT be used as a direct draw device. Draw blood only with a blood collection set.**

Summary and explanation

The **BacT/Alert Blood Collection Adapter** consists of two components: an **Adapter Cap** and an **Adapter Insert**. The **Adapter Cap** is used to facilitate the filling of blood into a BacT/Alert Blood Culture Bottle. The **Adapter Insert** can be locked into place inside the **Adapter Cap** to allow blood to be filled into vacuum collection tubes.

The BacT/Alert Blood Collection Adapter Cap and Insert are reusable.

Reagents

For in vitro diagnostic use.

Materials provided

Each component sold separately.

- | | |
|-----------|--|
| 120 units | BacT/Alert® Blood Collection Adapter Cap (Adapter Cap) - Nonsterile polypropylene device used for collection into BacT/Alert culture bottles. |
| 60 units | BacT/Alert® Blood Collection Adapter Insert (Adapter Insert) - Nonsterile polypropylene device used (in conjunction with the BacT/Alert Blood Collection Adapter Cap) for collection into blood collection tubes. |

Materials required but not provided

Blood Collection Set

BacT/Alert Blood Culture Bottle(s)

Storage Instructions

The BacT/Alert Blood Collection Adapter should not be exposed to direct source of heat.

Procedural note and precaution

1. Follow these instructions exactly when collection specimens to eliminate back flow.
2. If the BacT/Alert Blood Collection Adapter becomes contaminated or damaged, handle as if capable of transmitting infectious agents. Discard according to local and federal guidelines for disposal of biohazardous waste.

Test procedure

1. Clean the selected venipuncture site as recommended by your facility's approved procedure.
2. Remove flip caps from the required number of BacT/Alert culture bottles and disinfect the exposed septa with an alcohol swab. Set the bottle(s) upright at bedside.
3. Tightly connect the Adapter Cap to the luer connector of the collection set.
4. Perform venipuncture. When the needle is in the vein, secure it with tape or hold it in place.
5. Place the **Adapter Cap** on the aerobic BacT/Alert culture bottle septum and press down to penetrate and obtain blood flow. Verify that blood flow into the bottle. Hold the **Adapter Cap** down on the bottle during collection. Line demarcations on the bottle label indicate sufficient blood volume fill.
6. After obtaining the specified amount of blood, move the **Adapter Cap** from the aerobic bottle to the anaerobic bottle (if required) and continue the collection. Do not remove the needle from the patient's vein during this process.

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MAGIC VALLEY REGIONAL MEDICAL CENTER

Location: MVRMC PHLEBOTOMY	
Procedure: SPECIMEN-BLOOD BANK	Test #: 710-01-045
Prepared by: A. HANSON, MT (ASCP)	Original Date Written: 1/04
Revised by: ANGIE KNIGHT DTC-PHLEB TEAM LEADER	Date: 8/04
Approved by: _____	Date Executed: 1/05

Reviewed _____	Date _____
Reviewed _____	Date _____
Reviewed _____	Date _____

I. POLICY:

A. All patients will be positively identified prior to specimen collection to ensure the validity of test results.

II. PURPOSE:

A. To outline the steps in patient identification and specimen labeling.

III. IDENTIFICATION:

A. The patient **MUST** be positively identified at the time of collection of the blood specimen. The name and medical record number must be attached to the patient's body either by Ident-A-Band or adhesive tape. If identification cannot be attached because of the patient's condition, e.g., burns, the nurse in charge of his/her case must identify the patient at the bedside. Except for isolettes, bed labels may not be used for identification.

1. The emergency patient **MUST** be given a medical record number and, if name is unknown, the emergency department will assign an alias. A Blood Bank Ident-A-Band patient identification band must be attached to his/her body if a type and crossmatch or a type and screen are ordered.
2. Pre-admit patients' wristbands should be left in pre-admit with the patient chart until admission. Upon admission, the patient must be asked his/her full name and the wristband be identified by the patient saying that is his/her name. NOTE: If a patient comes for pre-admission lab work and the pre-admission center is closed (i.e. weekends of evenings), the lab charts will be taken to the area where the patient will be admitted (usually 3 North or OB). If a blood bank "R" band is associated with the lab work it should be attached to the blood bank lab results.

When a pre-admit patient is being drawn for blood bank lab work and answers "yes" to the question of having been pregnant or received RBC's in the past 3 months, the patient will not be drawn unless the surgery date is less than 72 hours away. AABB Standards states "If the patient has been transfused in the preceding 3 months with blood or a blood component containing red blood cells or has been pregnant within the preceding 3 months or the history is uncertain or unavailable, the sample must be obtained from the patient within 3 days of the scheduled transfusion." Because a recently transfused or pregnant woman may have been sensitized but has not yet developed detectable antibodies, the sample used must be as fresh as possible (no older than 3 days).

3. For Cancer Center patients, OB patients, ER patients, pre-admits, and Same Day Surgery

patients, and any patient 12 years or older who may be a potential transfusion candidate a clot tube for Blood Bank will be drawn along with the CBC tube and chemistry tube. These tubes will be properly labeled with medical record number, full name, date, time drawn, and phlebotomists' initials. These tubes will be placed in the racks on the fifth shelf in the Puffer-Hubbard refrigerator and kept for 3 days. If blood bank orders are received, the patient will be properly identified by using the medical record number and the patient verbally identifying him/herself to the person banding him/her. The phlebotomist will then band him/her with the blood bank "R" band. The phlebotomist will retrieve the tube from the clot rack and order the procedure on the accession number that is on the tube.

4. For outpatients drawn in the Laboratory, have the patient spell his/her name to ensure correct spelling for the records.
- B. The information on the wristband must be checked with the request form comparing **name, medical record number, and date of birth.**
- C. The patient must be asked to state his/her given name and spell his/her last name. He/She must not be asked, "Are you Mr. /Ms. Jones?" His/Her name must be checked with the name on the request form and wristband.

IV. LABELING:

- A. The patient will be banded with the pink Blood Bank Ident-A-Band when he/she is drawn if a type and crossmatch or a type and screen are ordered. A green IdentA-Band will be used for autologous donors. A patient will have only one Blood Bank Ident-A-Band on at one time. A patient need not be banded if only platelets, fresh frozen plasma, cryoprecipitate, Rh immune globulin, or albumin are given.
- B. Draw the same tube of blood for all Blood Bank tests:
One 6 ml lavender tube. A 4 ml lavender tube is acceptable if the Blood Bank technologist okays it.
- C. Label at the bedside, matching label with wristband and patient's verbal confirmation of name. The label can either be an addressograph stamped label or handwritten, but must be legible and have the patient's full name, medical record number, date and time drawn, initials of phlebotomist, and "R" number. After the tubes are labeled, again ask the patient his/her name. Check name given against the labels. The Blood Bank requisition form must also carry the date, time drawn, and phlebotomist's initials at the bottom of the form. This is especially important on emergency cases as there is more of a chance that times and dates will become important with time. The blood bank technologist will confirm all identifying information on the request form agrees with that on the specimen tube label before using the specimen for blood grouping, typing, or compatibility testing.
- D. It is extremely important that an emergency room patient be banded. Exceptions may need to be made on emergency patients. A modification may be to label as completely as possible. If the name is not known, use the emergency room's ID, i.e., John Doe, or an assigned number.
- E. All patients who will be receiving blood must be redrawn every 72 hours (3 days).
- F. Patients in which a transfusion reaction is reported must be drawn immediately. Draw 1 10 ml plain red stoppered tube and 1 5 ml green stoppered tube.
- G. Patients who have antibody or crossmatching problems will need to have 2 10 ml plan red stoppered tubes drawn.
- H. All patient specimen tubes are to be retained 7 days from transfusion date. Tubes will be rotated as indicated in specimen holding boxes in refrigerator.

V. REJECTION:

- A. Any deviation from the above rules is cause for rejection of the specimen. The Blood Bank technologist will decide if the deviation is legitimate, i.e.:

1. Emergency room patients.
2. Patients in hospital room, but admission not completed.
 3. If tube is corvac tube, what the circumstances of the draw were.
 4. If the patient was not banded with the "R" band at the time of the draw and the technologist has a problem with the tube.
- B. Rejection of specimen by the Blood Bank initiates the following procedure:
 1. Blood Bank technologist calls for phlebotomist whose initials appear on tube label, if the phlebotomist is still on duty.
 2. Technologist explains difficulty to phlebotomist.
 3. Phlebotomist returns to patient and draws a new specimen.

VI. SUBMITTED BY:

Merlen Fullmer, MT-(ASCP) Administrative Director

VII. APPROVED BY:

John Gray, M.D. Laboratory Medical Director

MAGIC VALLEY REGIONAL MEDICAL CENTER

Location: MVRMC PHLEBOTOMY	
Procedure: STANDARD ORAL GLUCOSE TOLERANCE TEST	Test #: 706-01-025
Prepared by: SANDRA JUSSEL MT (ASCP)	Original Date Written: 10/89
Revised by: ANGIE KNIGHT DTC-PHLEB TEAM LEADER	Date: 1/05
Approved by: _____	Date Executed: _____

Reviewed _____ Date _____

Reviewed _____ Date _____

Reviewed _____ Date _____

I. PRINCIPLE:

A. A standard glucose load is administered to a patient who is in the fasting state. Blood samples are obtained at timed intervals and tested for glucose. These values are useful in the diagnosis of diabetes mellitus and a number of other disorders.

II. MATERIALS:

A. Standard glucose load is 75 gms for non-pregnant adults/or children, 1.75 gms/kg of ideal body weight, up to a 75 gms maximum is administered. To calculate body weight:

$$100 \text{ gm}/296 \text{ ml} = .34 \text{ gm/ml} \times 221 \text{ ml} = 75 \text{ gm.} \quad (2.24 \text{ lbs})$$

If a patient is a child use the calculation below to determine the amount of glucola to be given.

Example: Glucose load for a 50 lb. child = $\frac{39 \text{ gm}}{115 \text{ ml}}$

$$50 \text{ lb.} \times \frac{1 \text{ Kg}}{2.24 \text{ lb.}} \times \frac{1.75 \text{ gms}}{\text{Kg}} = 39 \text{ gms} \quad .34 \text{ gm/ml}$$

III. PROCEDURE:

- A. Ideally the patient should have been on a high carbohydrate diet (i.e. 100+ grams of glucose) per day for at least 3 days prior to this test.
- B. The patient should be fasting from the previous evening meal. Water may be taken as they usually drink. During the test the patient should not smoke or drink caffeine-containing drinks. The patient should rest quietly but may walk around some.
- C. Using a Lifescan SureStep Meter perform a fasting blood. If glucose > 126 mg/dl, consult the ordering physician for a decision as to whether or not to proceed with test. If the physician's instructions are to proceed, then footnote the date, time, physician's name, and your name when entering your fasting result in the computer (GLUWB). If you are at a station without computer access, document the result and footnote on the requisition.
- D. If the fasting blood is <126 mg/dl, patient is given the glucose load. Blood samples are obtained at 1 hour and 2 hours. The preceding sampling routine is performed if the order is glucose tolerance test.
- E. **NOTE:** Any specific sampling times or duration of the test can be ordered by the patient's physician and should be performed as ordered.
- F. Perform blood glucose on each sample and record.

IV. INTERPRETATION:

A. Criteria for Interpretation of the 2-Hour Oral Glucose Tolerance Test

A two hour value of 200 mg/dl or more is indicative of diabetes mellitus.

B. Normal Results

Impaired Tolerance Diabetes

Mellitus

Fasting	<115 mg/dl	110-125 mg/dl	>126 mg/dl
---------	------------	---------------	------------

1 hour	<200 mg/dl		
--------	------------	--	--

2 hour	<140 mg/dl	140-200 mg/dl	>200 mg/dl
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V. NOTES:

A. Sometimes the concentrated glucose solution makes the patient ill. If nausea, vomiting, profuse sweating, or other signs that the patient is "ill" develop, then call a pathologist to evaluate. This can significantly alter the glucose values and will render the results useless.

VI. SUBMITTED BY:

Sandra Jussel MT (ASCP) Outreach Team Leader

VII. APPROVED BY:

Kirk Peterson, M.D. Laboratory Pathologist

MAGIC VALLEY REGIONAL MEDICAL CENTER

Location: MVRMC PHLEBOTOMY	
Procedure: POST-PRANDIAL GLUCOSE	Test #: 703-01-240
Prepared by: FRANCES MALONE 3/99	Original Date Written:
Revised by: ANGIE KNIGHT DTC-PHLEB TEAM LEADER	Date: 7/04
Approved by: _____	Date Executed:

Reviewed _____ Date _____
Reviewed _____ Date _____
Reviewed _____ Date _____

I. PRINCIPLE:

A. The 2 hour sample following a standard meal or glucose load of one of three major criteria used to diagnose diabetes. This has its main role in non-pregnant patients with fasting glucose less than 126 mg/dl and essentially replaces the need for complete glucose tolerance test.

II. MATERIALS:

A. At the physician's request, the patient, following obtaining of a fasting blood glucose, ingests either a meal containing 100 mg of carbohydrates or a standard glucose load of 75 gms (Glucola).

III. PROCEDURE:

- A. Measure fasting blood glucose using a glucometer. If the value is above 126 mg/dl, notify the physician and determine if he wishes to proceed with the test. If the physician approves, the patient may be given the glucose load or eat the meal. Enter the glucometer reading in the computer. Document in the computer as a footnote with the Lifescan SureStep meter value the date, time, physicians name, and your name.
- B. If the FBS is less than 126 mg/dl the patient may be given the glucose load (or eat the meal).
- C. A blood sample is obtained at 2 hours.
- D. Document the value from the glucose meter on the fasting glucose label.

IV. INTERPRETATION:

A. A 2-hour post-prandial glucose of 200 mg/dl or more is indicative of diabetes.

V. SUBMITTED BY:

Sandra Jussel MT (ASCP) Outreach Team Leader

VI. APPROVED BY:

Kirk Peterson, M.D. Laboratory Pathologist

MAGIC VALLEY REGIONAL MEDICAL CENTER

Location: MVRMC PHLEBOTOMY	Test #: 706-01-035
Procedure: MODIFIED O'SULLIVAN TEST (1 HOUR GLUCOSE TOLERANCE TEST)	
Prepared by: SANDRA JUSSEL MT (ASCP)	Original Date Written: 3/99
Revised by: MICHELE HARRIS, Laboratory Manager	Date: 1/05
Approved by: _____	Date Executed: _____

Reviewed _____ Date _____
Reviewed _____ Date _____
Reviewed _____ Date _____

I. PRINCIPLE:

A. Some women who have normal plasma or serum glucose levels when non-pregnant will become glucose intolerant during the stress of pregnancy. The O'Sullivan Test is a screen to identify women who require further evaluation for gestational diabetes.

II. MATERIALS:

- A. 50 gram glucose load (7.5 oz. of the Baxter orange drink)
- B. Standard phlebotomy equipment
- C. Red or speckled top tubes (7.5 cc)
- D. Lifescan SureStep Meter

III. PREPARATION:

A. No patient preparation required. Patient does not need to be fasting.

IV. PROCEDURE:

- A. Using a Lifescan SureStep Meter perform a blood glucose. If glucose > 150 mg/dl, consult the ordering physician for a decision as to whether or not to proceed with test. If the physician's instructions are to proceed, then footnote the date, time, physician's name, and your name when entering your fasting result in the computer (GLUWB). If you are at a station without computer access, document the result and footnote on the requisition.
- B. If the blood glucose less than 150 mg/dl, administer 50 gram glucose load. Patient must drink all within about 5 minutes.
- C. Exactly 1 hour after glucose load consumed, obtain blood for glucose.

V. INTERPRETATION:

A. Patients who have serum glucose levels of \geq 150 mg/dl at 1 hour require further evaluation for gestational diabetes. A 3-hour glucose tolerance test may be required.

VI. REFERENCES:

- A. "Screening Criteria for High Risk Gestational Diabetic Patients," O'Sullivan, et al., AJOG 116:7 pp. 895-900, August 1, 1973.
- B. "Criteria for Screening Tests for Gestational Diabetes," Carpenter & Coustan, AJOG 114:7 pp.768-773, December 1, 1982.

VII. SUBMITTED BY:

Sandra Jussel, MT (ASCP) Outreach Team Leader

VIII. APPROVAL:

Kirk Peterson, M.D. Laboratory Pathologist

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MAGIC VALLEY REGIONAL MEDICAL CENTER

Location: MVRMC PHLEBOTOMY
Procedure: GLUCOSE TOLERANCE TEST FOR EVALUATION OF GESTATIONAL DIABETES – 3 HOUR
Prepared by: FRANCES MALONE
Revised by: ANGIE KNIGHT DTC-PHLEB TEAM LEADER
Approved by: _____
Test #: 706-1-030
Original Date Written: 3/99
Date: 1/05
Date Executed: _____

Reviewed _____ Date _____
Reviewed _____ Date _____
Reviewed _____ Date _____

I. PRINCIPLE:

A. During the stress of pregnancy, some women develop gestational diabetes, which presents some risk to the fetus. This test is to identify those patients. The interpretative data are different than the standard 2 hour GTT. In most instances, women who get this test should have previously failed an O'Sullivan Screening Test, but there are exceptions.

II. MATERIALS:

- A. 100 gram glucose load (12.5 Oz. of the Baxter orange drink)
B. Standard phlebotomy equipment
C. Red, red tiger, or green tube (7.5 cc)
D. Lifescan SureStep Meter

III. PREPARATION:

- A. Same as standard GTT.
1. The patient must be fasting since previous evening meal.
2. Water only during test. No coffee. No smoking. No mints. No Gum.
3. No strenuous exercise. Ambulation is permitted.

IV. PROCEDURE:

- A. Using a Lifescan SureStep Meter perform a fasting blood glucose. If glucose > 140, consult ordering physician for decision as to whether or not to proceed with test. If the physician's instructions are to proceed, then footnote the date, time, physician's name and your name when entering your fasting result in the computer (GLUWB). If you are at a station without computer access, document the result and footnote on the requisition.
B. Administer 100-gram glucose load. Patient must drink all within about 5 minutes. Caution: This glucose load may nauseate the patient. If the patient becomes sick or can't finish the test, contact the physician immediately and stop the test.
C. Collect blood at 1 hour, 2 hours, and 3 hours after glucose load.

V. INTERPRETATION:

- A. Two or more of the following glucose abnormalities suggest gestational diabetes:
1. Fasting ≥ 105 mg/dl
2. 1 hour ≥ 190 mg/dl
3. 2 hours ≥ 165 mg/dl
4. 3 hours ≥ 145 mg/dl

VI. SUBMITTED BY:

Sandra Jussel MT (ASCP) Outreach Team Leader

VII. APPROVAL:

Kirk Peterson, M.D. Laboratory Pathologist

Cross Reference 703-01-270

Saint Alphonus Regional Medical Center Laboratory

Glucose Tolerance

Oral glucose tolerance testing involves obtaining a fasting blood sugar, administering a glucose load to the patient, and measuring blood sugar levels at scheduled intervals.

Food and Other Restrictions

Patient should be fasting since midnight, but no more than sixteen (16) hours before test is performed. Nothing of food value, either liquid or solid should be consumed during this time. Water is permitted according to thirst. Patient should be on a diet of at least 150 grams of glucose per day for three days prior to the test and should have been on a normal diet prior to this time. Drugs affecting glucose tolerance should be avoided [especially insulin, orinase, sulfonylureas or monoamine oxidase (MAO) inhibitors]. Testing should be postponed following an acute illness or trauma.

Time of Testing

The test should be performed between 7:00 A.M. and Noon, which means the fasting sample, should be drawn between 7:00 A.M. and 9:00 A.M.

Glucose Load

A standard glucose dose is administered according to recommendations of the National Diabetes Data Group at the National Institute of Health.

- .. **75 gram dose for non-pregnant adults**
- ... **100 gram dose for pregnant adults**
- ... **1.75 grams/kg for children, but not to exceed 75 grams**

Commercial products, hydrolysable polysaccharides of corn syrup and carbonated water with flavoring, are normally used. Koladex 1002-75 gram (Custom Laboratories) is used for standard adult dosage. Dextol Lemon-Lime (Baxter Scientific) is currently used for the 100 gram dosage. Both contain 10 fluid ounces or 300 ml. Koladex products currently in use contain 296 ml. These should be stored in outpatient phlebotomy room refrigerator and should be chilled when given to the patient to drink.

Restocking is important. At least five bottles of the 75 gram product and three bottles of the 100 gram product should be in the refrigerator at all times. Read the label carefully to be sure proper dosage is being administered. Additional stock is kept in the lab storeroom.

CALCULATE DOSAGE FOR CHILDREN

Weight should be less than 95 pounds. If greater than 95 pounds, give the standard 75 gram dosage.

Multiply weight in Kg by 1.75 to get grams of glucose. Use the 100 gram bottle which contains 300 ml (volume).

Example: Patient weighs 43 pounds.

$$\begin{array}{rcl} 43 & & \\ 2.2 & = & 19.5 \text{ Kg} \\ \\ 19.5 \times 1.75 & = & 34 \text{ grams} \\ \underline{34 \text{ grams}} & & \\ 100 \text{ grams} \times & 300 \text{ ml} & = 103 \text{ ml} \end{array}$$

THIS IS THE DOSAGE TO BE GIVEN. POUR OFF 197 ml (300 minus 103) and give the patient the 103 ml remaining in the bottle to drink.

TO CALCULATE ADULT DOSAGES OTHER THAN THE STANDARD 75 OR 100 GRAM AMOUNTS Example: 50 gram dosage

Use the 100 gram bottle which contains 300 ml.

$$\frac{50 \text{ grams}}{100 \text{ grams}} \quad \times \quad \frac{\text{amount to be given}}{300 \text{ ml}} \quad = 150 \text{ ml}$$

THIS IS THE DOSAGE TO BE GIVEN. Measure 150 ml into graduated cylinder and discard. Pour the remaining 150 ml into a clean plastic cup for the patient to drink.

Example: 40 gram dosage

Use the 100 gram bottle which contains 300 ml.

$$\frac{40 \text{ grams}}{100 \text{ grams}} \quad \times \quad \frac{\text{amount to be given}}{300 \text{ ml}} \quad = 120 \text{ ml}$$

Pour off 180 ml (300 ml minus 120 ml) into a graduated cylinder and discard. Pour remaining 120 ml into a clean plastic cup for the patient to drink.

Sampling

A fasting venous blood sample is drawn and analyzed before glucose load is administered. No urine samples are required. If the fasting level is acceptable (less than 175 mg/dL), begin the test by administering glucose according to the dosage protocol.

Patients should drink the glucose solution in a five-minute period. Time "0" is recorded when patient finishes drinking glucose solution. Additional blood samples are drawn at hourly intervals (i.e. 1, 2,3,4,5, or 6 hours after time "0"). All patients should be given an instruction sheet (see example on following page). If the front office receptionist did not provide the patient with this information, the phlebotomist should do so. Briefly explain procedure to patient and answer any questions patient might have.

Specimen Requirements

- a. Green top separator or gold separator tube is acceptable for testing. Both allow blood to be spun down and serum separated from red cells until it can be analyzed.
- b. Capillary samples are acceptable, but should be noted accordingly as part of test results since capillary values may be 20-30 mg/dl higher than venous after carbohydrate loading. Glucose concentrations in arterial and capillary blood are similar.

Analysis

Kodak analyzers in Chemistry utilize 200 uL sample size.

Interpretation of Results

The fasting, one, two and three-hour (four, five or six if ordered) blood values should be reported. Criteria proposed by National Diabetes Data Group for patients receiving 75 gram dose recommend that diabetes be diagnosed only when:

- a. fasting plasma glucose is greater than 140•Mg/dL
- b. the two-hour value is 200 mg/dL or greater, and
- c. a level between 0 and two hours is greater than 200, mg/dL

Patients with values between the reference and diabetic groups are placed in a category called "impaired glucose tolerance". Patients who are diabetics or have impaired glucose tolerance may experience reactive hypoglycemia (low blood sugar occurring after ingestion of a meal). Chemical hypoglycemia usually occurs when glucose levels drop to 40 mg/dL or below.

Special Instructions

- a. Juice is available in outpatient phlebotomy room refrigerator and should be offered to any patient who is feeling lightheaded or nauseated at the conclusion of the test.
- b. Patients who exhibit symptoms such as nausea, fainting, sweating, shakiness, and/or who need to rest on the bed for completion of the test should be given juice before being allowed to leave the laboratory area. At the direction of a pathologist, Emergency Department may be consulted to provide care for patients. Family members should be notified to provide transportation for patients who are not feeling well enough to drive. All unusual circumstances must be documented using the occurrence report form.
- c. Stay with the patient while he/she is ingesting the glucose. Be sure you observe patient drink all of the solution. Do not allow patients to pour the drink into the cup. They may be nervous or shaky and could spill some of the solution.
- d. When pouring off any amount from the bottle to adjust for correct dosage, be sure you are in front of the patient. This can be done in the dish room where you obtain the graduated cylinder or in the main lab. Measure out the amount to be discarded, not the amount to be given to the patient.
- e. Do not save partial bottles of glucose solution. Bottles should be opened, any necessary amount poured off, and the rest of the solution given to the patient.

References

Henry, J.B., *Clinical Diagnosis and Management by Laboratory Methods*. W. B. Saunders.

National Diabetes Data Group. National Institute of Health.

**Saint Alphonsus Regional Medical Center
Laboratory**

Protocol for Glucose Tolerance Testing (OGTT)

Procedure for Routine OGTT (3, 4, 5 or 6 Hour)

1. All fasting blood sugars will be taken to Chemistry to be run before any glucose load is administered to the patient. No urine samples need to be collected from the patient or tested at any time.
2. A fasting blood sugar (FBS) of 175 mg/dL or greater indicates impaired glucose tolerance. These results should be reported to a pathologist or patient's physician. The pathologist will contact the physician ordering the test to obtain more specific information about the patient's symptoms, disease state, etc. The pathologist will notify Chemistry technologist/phlebotomist whether the glucose should be administered.
3. If the fasting blood sugar is less than 175 mg/dL, the patient may be given the glucose load and the test will be completed as described in the glucose tolerance procedure.

Procedure for Abbreviated Glucose Tolerance Testing (1 and 2 Hour)

Abbreviated glucose tolerance can be performed as a screening test for diabetes, with measurements of blood levels at one or two hours following administration of glucose load.

1. **ONE HOUR PROTOCOL**
 - a. A one-hour glucose can be done, with a 50-gram dosage of glucose administered. This is generally used as a screening test for diabetes in pregnant women. Fasting blood sugar may or may not be ordered in conjunction with the one-hour sugar. This may vary with individual physicians.
 - b. In rare situations, at the specific request of the physician, the patient may be non-fasting when glucose solution is administered. This should be noted. Appropriate comments should be entered in the laboratory computer to reflect patient status.
2. **TWO HOUR PROTOCOL**

Two hour post-prandial glucose can be measured following administration of a standard 75-gram dose of glucose solution. Fasting blood sugar and two hour PP are generally ordered together, with glucose load being administered upon completion of fasting blood sugar.

Panic Values

1. If, at any time following administration of glucose, the blood sugar level drops to 50 mg/dL or below, a pathologist is to be notified immediately to determine a course of action based on patient's symptoms and condition.
2. Panic values are less than 50 and greater than 500 mg/dL. These results should be brought to the attention of the pathologist and/or patient's physician immediately. Appropriate comments should be entered in laboratory computer.
3. If, at any time during the procedure, the patient becomes ill, phlebotomy supervisor and/or pathologist should be notified and policy for outpatients who faint or become ill should be followed.

Computer Information

	<u>IHS</u>	<u>SUNOUEST</u>
1 Hour	L757	GTL1
2 Hour	L382	GTL2
3 Hour	L115	GTL3
4 Hour	L436	GTL4
5 Hour	L116	GTL5
6 Hour	L116	GTL6
2 Hour Post	L113	GL2HP

Saint Alphonsus Regional Medical Center Laboratory

Patient Instructions for Glucose Tolerance Test

1. This test will take from two to six hours, depending on which test your physician ordered. You must not have had any food or drink (except water) since midnight. If you have had any liquid or solid food during this time, please notify the receptionist or blood drawer because your test will need to be rescheduled. If you are taking any prescription or nonprescription medications, please tell the receptionist or blood drawer before the first blood sample is taken.
 - a. A blood sample will be taken initially and will be analyzed before you are given a glucose solution to drink.
 - b. You will be given 10 ounces of a carbonated beverage that contains 75 grams of glucose. If you are pregnant, you should alert the receptionist or blood drawer (you will be given a carbonated beverage containing 100 grams of glucose if you are pregnant).
 - c. Each hour, for the next two to six hours, another blood sample will be drawn. You will be given a written schedule telling you when to return for additional blood samples.
2. You may drink as much water as you want during this test, but no other beverage or food is permitted. This includes chewing gum, sugarless mints, black coffee, tea and alcoholic beverages.
3. Smoking is not permitted during the test.
4. Keep activity to a minimum. You should sit comfortably and rest during the test period. Leaving the laboratory area during the test is discouraged. Unnecessary activity will affect results of your test.
5. Because you have not eaten, you may feel a little lightheaded or nauseated. If you do, please notify a receptionist or blood drawer. We have a bed where you can rest if you need to do so.
6. As soon as the test is completed, eat a full meal containing starchy foods, such as bread, rice, potatoes. If you are not feeling well at the end of the test, notify the blood drawer. You may need someone available to drive you home. You may rest here until you feel ready to resume your normal activities.

TIMED DRAWS
Aminoglycoside Monitoring
Peak and Trough Levels
Amikacin, Gentamycin, Tobramycin, & Vancomycin
Saint Alphonsus Regional Medical Center Laboratory

Clinical Information

Monitoring serum levels for aminoglycosides is necessary because of poor predictability of levels from dosage. Drug level measurements are particularly important when attempting to attain levels necessary to treat resistant microorganisms. The importance of routine monitoring of aminoglycosides to prevent toxic serum concentrations while maintaining therapeutic drug concentrations is well documented. The half-life of aminoglycosides in normal subjects is 2-3 hours. The aminoglycosides, which are not metabolized, are dependent upon renal function for clearance. Patients in renal failure exhibit significant prolongation of aminoglycoside half-lives.

The following table provides specific information for each drug.

ANTIBIOTIC	THERAPEUTIC RANGE	TOXIC RANGE	WHEN TO DRAW SAMPLE
Amikacin L939	Peak		1 hour after start of infusion
	15-30 ug/ml		
Amikacin L940	Trough	>10 ug/ml	Just before next dose
	1-8 ug/ml		
Gentamycin L497	Peak		1 hour after start of infusion
	4-10 ug/ml		
Gentamycin L284	Trough	>2.0 ug/ml	Just before next dose
	0.0-1.9 ug/ml		
Tobramycin L283	Peak		1 hour after start of infusion
	4-10 ug/ml		
Tobramycin L304	Trough	>2.0 ug/ml	Just before next dose
	0.0-1.9 ug/ml		
Vancomycin L477	Peak		1 hour after end of infusion
	30-40 ug/ml		
Vancomycin L305	Trough	not clearly defined	Just before next dose
	5-10 ug/ml		

Just before the next dose: within 30 minutes of start time for next dose. Updated 11/95

Blood Specimen Collection from Infants by Skin Puncture

By Keith B. Hammond, M.S., F.I.M.L.S.

Category A-7 continuing education credit is available to anyone who studies a C/E Update series and completes a written exam. Exams can be ordered from the ASCP and will be sent to participants following the appearance of the final article of each series in LABORATORY MEDICINE. After receipt of a completed answer sheet at ASCP prior to the deadline stated on the exam, a certificate of credit will be awarded to each participant. An exam order form appears on page 8 in this issue.

Introduction

There appears to be no such thing as a "typical" pediatric laboratory. Even those laboratories that offer service exclusively to the pediatric patient differ considerably in workload patterns and in the type and complexity of instrumentation used. The provision of laboratory services for pediatric patients, particularly the newborn, can be a major headache for the director of a clinical laboratory in a general hospital. Not only is a uniform approach to tackling the analytical problems associated with small samples lacking, but no uniform procedure for collecting skin-puncture blood specimens is in widespread use.

A recent survey of blood collection techniques conducted by the Pediatric Clinical Chemistry Committee of the American Association for Clinical Chemistry (AACC) showed that a wide variety of needles, lancets and even scalpel blades are being used to obtain blood by puncture of the heel or finger, often with little regard to the anatomic location of blood vessels, bones and tendons. The information gathered by this survey was used to develop a "Proposed Selected Method for Skin-Puncture and Blood-Collecting Techniques for Infants." At about the same time the Subcommittee for Blood Collection of the National Committee for Clinical Laboratory Standards (NCCLS) published a document entitled "Standard Procedures for the Collection of Diagnostic Blood Specimens by Skin Puncture."² A comparison reveals virtually no contradiction between these two proposed standard procedures. Their simultaneous publication, from two unrelated sources, is indicative of the concern pathologists and clinical chemists have felt for some time about this seemingly simple and innocuous procedure.

Unquestionably, the need exists for a reliable-and safe technique for the collection of blood by skin puncture. Collection of blood specimens by venipuncture from infants is impractical, since children under the age of two have very small superficial veins. The puncture of deep veins is associated with a number of hazards (Table I) and should be performed with caution. In addition, it is very important to minimize loss of blood in small infants. One must bear in mind that a premature infant of 26 weeks' gestation weighing 900 g has a blood volume of little more than 100 ml.³ Obviously it would not require many blood samplings to produce anemia in such an infant.

Fortunately, as many as ten to 20 routine blood chemistry determinations can now be performed conveniently on as little as one-half to one milliliter of blood. This sample size is collected most conveniently and safely by skin puncture.

Composition of Skin-Puncture Blood

Blood obtained by skin puncture consists of a mixture of blood from arterioles, venules and capillaries. Because blood pressure in arterioles' and the arterial limb of capillaries is greater than in venules, the composition of skin-puncture blood more closely resembles arterial than venous blood. In addition, blood collected by skin puncture is affected by the presence of interstitial and intracellular fluid and by the blood flow to the skin at the time of collection⁵. Thus, if a laboratory is to analyze skin-puncture blood, important differences between its composition and blood obtained from other sources must be well understood. References (normal) values that are used in the interpretation of test results also should be established for skin-puncture samples.

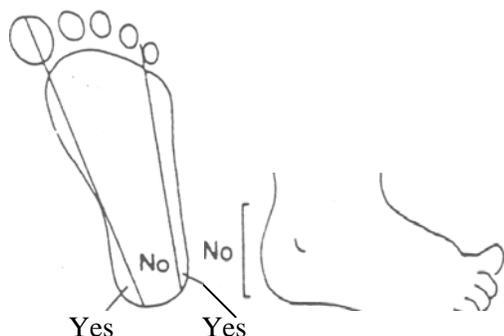
Table 1 – Hazards Associated with Puncturing Deep Veins in Children

1. Cardiac arrest
2. Hemorrhage
3. Venous thrombosis
4. Reflex arteriospasm and gangrene of an extremity
5. Damage to surrounding tissues or organs, i.e., puncturing the apex of the lung or piercing the trachea
6. Infection
7. Injury caused by restraining patient

Selection of Puncture Site

The heel is the site most commonly used for obtaining skin-puncture blood from infants under three months of age. When choosing the puncture site (Fig. 1), care should be taken to avoid both previous puncture sites and the curvature of the heel. The site should be on the plantar surface, either medial to a line drawn posteriorly from the mid-great toe to the heel, or lateral to a line drawn posteriorly from between the fourth and fifth toes to the heel.⁶

Blumenfeld and colleagues⁶ have published a detailed study of the distances from the surface of the skin to the junction of the dermis and the subcutaneous tissue, where the skin's primary blood supply is located. In addition, the distances from the surface of the skin to the perichondrium of the calcaneus were measured at various locations on the heel.



1. Perform punctures on the most medial or most lateral portion of the plantar surface (outside of the lines on the diagram).
2. Puncture no deeper than 2.4mm.
3. Do not perform punctures on the posterior curvature of the heel.

Do not puncture through previous sites which may be infected.

Fig. 1. Recommendations for heel skin punctures in newborns. Redrawn with permission from reference 2.

Blumenfeld's data show that it is necessary to puncture only to a depth of between 0.35 mm and 1.6 mm in order to reach the maximum concentration of blood vessels. The distance from the skin surface to the calcaneus increases in rough proportion to the infant's weight. When the smallest infant studied (560 g) was measured at the plantar surface of the heel, it was found that the distance from the skin surface to the bone was only 2.4 mm, and when measured at the posterior curvature of the heel, the distance was only half of that.

These data have led to the recent recommendations^{1,2} that infant heel punctures be no deeper than 2.4 mm. This depth will allow adequate blood flow from the puncture wound with only slight risk of calcaneal puncture.

Skin-Puncture Lancets

A variety of skin-puncture lancets of different designs are available commercially. The blade length of some lancets is such that a risk of puncturing the heel bone is incurred. Unfortunately, those lancets of acceptable length (e.g., B-D Microlance, 2.5 mm, Becton-Dickinson, Rutherford, NJ) do not possess a sufficiently wide blade to achieve optimal blood flow. Since the flow of blood from the puncture site is partially a direct function of the number of vessels cut, it is apparent that a lancet with a width of 2.3 mm will produce better blood flow than one with a width of 1.5 mm. Perhaps we can look forward to the manufacture of a lancet designed specifically for pediatric use with these limitations in mind.

A warning should be included regarding the use of Bard-Parker #11 surgical blades (Bard-Parker Co., Lincoln, NJ), which are still used for skin puncture in a number of institutions. Since this blade was designed to make a surgical incision, there is a significant risk that when used for skin puncture the blade will create a wound much deeper than is necessary. The Bard-Parker blade should not be used to perform skin punctures to obtain blood for diagnostic laboratory tests.²

Cleansing the Puncture Site

The obvious danger of accidental puncture of the heel bone is that osteomyelitis will result. Several cases of neonatal osteomyelitis of the calcaneus resulting from heel puncture have already been reported.⁷ Even if osteomyelitis does not develop, infection of the puncture tract may occur resulting in cellulitis and abscess formation. Therefore, skin punctures should be performed only after careful cleansing of the puncture site.

The antiseptic currently favored for this purpose is isopropanol/water (70/30 by volume or 70%). The use of ether as an antiseptic is contraindicated; not only is it too explosive to permit use in the presence of electrical equipment, but it also cools the skin, thereby reducing the blood flow to that area.

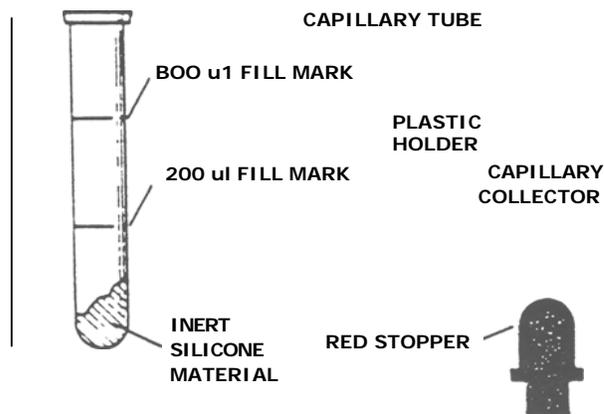
Another acceptable antiseptic is povidone-iodine (Betadine). Swabs saturated with povidone-iodine are available commercially (Holland-Rantos Co., Inc., Hospital Div., Piscataway, NJ). It has been reported that povidone-iodine interferes with certain chemical assays and therefore should not be used for this purpose.⁸ A careful study of this problem was conducted at the University of Colorado Health Sciences Center (Hammond, K. B., and Osberg, I. M., 1979, unpublished data) in which assays for a number of blood constituents were performed both in the presence of varying concentrations of povidone-iodine and in its absence. Since no significant differences between the two groups of assays were noted, we believe that this antiseptic is suitable for cleansing the skin prior to skin puncture. In fact povidone-iodine may be superior to isopropanol/water as an antiseptic.

Whether povidone-iodine or isopropanol/water is used, it is imperative that the antiseptic remain in contact with the skin for at least one minute; it is not sufficient to simply swab the area with antiseptic and wipe it off immediately. The antiseptic-treated area should be dried thoroughly by rubbing vigorously with a dry sterile swab. Failure to dry the skin adequately may result in hemolysis of the sample and also difficulty in directing the flow of blood into the collection container.

Warming the Puncture Site

At this point, the pros and cons of warming the foot prior to blood collection should be considered. Warming the heel can increase blood flow through arterioles and capillaries sevenfold. Since warming increases primarily the arterial blood flow, the specimen thus obtained has been called "arterialized skin-puncture blood."²

The simplest and least expensive method of warming is to cover the puncture site for three minutes with a



hot moist towel at a temperature no higher than 42°C. This technique will adequately increase the blood flow, will not burn the skin and will not result in a significant change in the values of any chemical blood constituent routinely measured in hospital chemistry laboratories.⁵

With the exception of pH and blood gas determinations, it is permissible to omit warming the foot prior to blood collection provided that a good flow of blood can be obtained, since this procedure can add appreciably to the overall time taken to collect the blood sample.

Puncture Technique

Having warmed the heel (if necessary) and having selected and cleaned the area for skin puncture, the next step is to puncture the skin in one continuous, deliberate motion, in a direction almost perpendicular to the puncture site. The first drop of blood must be assumed to contain an excess of intracellular and interstitial fluid, with surface debris, and so is discarded by wiping it off with a sterile swab. Moderate pressure, without squeezing, may be required near the puncture site to assure an adequate flow of blood.

Blood Collection Containers

A variety of containers have been used for pediatric blood collection.¹ One that has achieved almost instantaneous popularity is the B-D Microtainer (Becton-Dickinson, Rutherford, NJ). This device (Fig. 2) consists of a polypropylene tube measuring 45 mm x 6 mm (inside diameter) with rulings on the side that indicate blood volumes of 200 ul and 600 ul. The bottom of the tube contains about 100 ul of an inert silicone material which, after centrifugation, divides serum from cells. The cap of the tube is penetrated by a glass capillary filling device. Blood flowing from a heel puncture drains easily through the capillary collector into the tube. When sufficient blood has been collected, the cap threaded with the capillary is discarded and substituted with a plug-style cap.

After allowing approximately 30 minutes for clotting to occur, the Microtainer tubes can be centrifuged in a high-speed microcentrifuge for 90 seconds during which time the silicone separator will rise to the interface between the cells and serum. An advantage of the Microtainer tube is that the serum can remain in contact with the silicone separator for a significant period of time without alteration in its chemical composition; for example, values for potassium and lactate dehydrogenase did not change even after 24 hours.⁹

Another advantage of the Microtainer is that the serum can be decanted from the tube directly into a sample cup or other container without the risk of introducing cells. This feature eliminates the need for a pipetting step and increases the actual yield of serum for a given quantity of whole blood.

When collecting blood for glucose or blood gas determinations, other types of containers are required. Since glucose disappears quite rapidly from the blood in the presence of cells, it is important to separate the serum and cells immediately by centrifugation. Since immediate separation is not always practical, an alternative is to prevent glycolysis with an agent such as fluoride. A convenient blood collection tube containing sodium fluoride and ammonium heparin is commercially available (W. Sarstedt, Inc., Princeton, N). This tube has a maximum capacity of 300 but volumes as low as 50 ul can be used without any significant dilution of the specimen with the anticoagulant/antiglycolytic agent.

Specimens for pH and blood gas determinations can be collected into heparinized capillary tubes after first cleaning the foot as described earlier. Care should be taken to avoid the introduction of air bubbles into the capillary tube. The blood should be mixed well to prevent clotting; a metal "flea" and a magnet are useful for this purpose. Capillary tubes containing specimens obtained for pH and blood gas analysis should be sealed at both ends and placed in water containing ice chips to prevent a significant change in blood pH. The pH will not significantly change for four hours if this procedure is followed. It should be noted that a danger of contamination exists when collecting blood in capillary tubes. Sometimes an artifactually high blood pH is seen, caused by the introduction of residual soap from beneath the collector's fingernails onto the metal "flea" as it is inserted into the tube.

Post-Puncture Bleeding

Following collection of blood samples from a skin puncture, a sterile swab should be pressed to the puncture site until the bleeding stops. This procedure will be facilitated if the patient's foot is held above the level of the heart. The use of adhesive bandages should be avoided in infants six months old or younger, because the neonates skin is sensitive to the adhesive, and because of the potential hazard of the infant placing the bandage in his mouth and aspirating it.

Hemolysis of the Blood Specimen

Hemolysis of the sample is a significant problem but not an overwhelming one. Even when the blood collection procedure is followed carefully, approximately 5% of all skin-puncture samples may show visible hemolysis. Obviously, such samples should not be used in assays where hemolysis or contaminating materials will affect the result.

Unfortunately, significant hemolysis may occur that is not visible to the naked eye because of the thickness of the container through which the specimen is viewed. In addition, the presence of other pigments (e.g., bilirubin) may make the detection of visible hemolysis even more difficult.

Artifactual elevations of potassium are just as likely to occur as a result of "squeezing" the foot during blood collection as from hemolysis. If difficulty is experienced in obtaining a good flow of blood from an infant, a notation to this effect should appear on the laboratory report.

Summary

A reliable and safe skin-puncture collection procedure is vital to any laboratory that claims to provide service to pediatric patients. While this procedure is subject to a number of pitfalls, as outlined in this article, it is relatively easy to learn and can contribute greatly to the successful medical care of the sick infant.

References

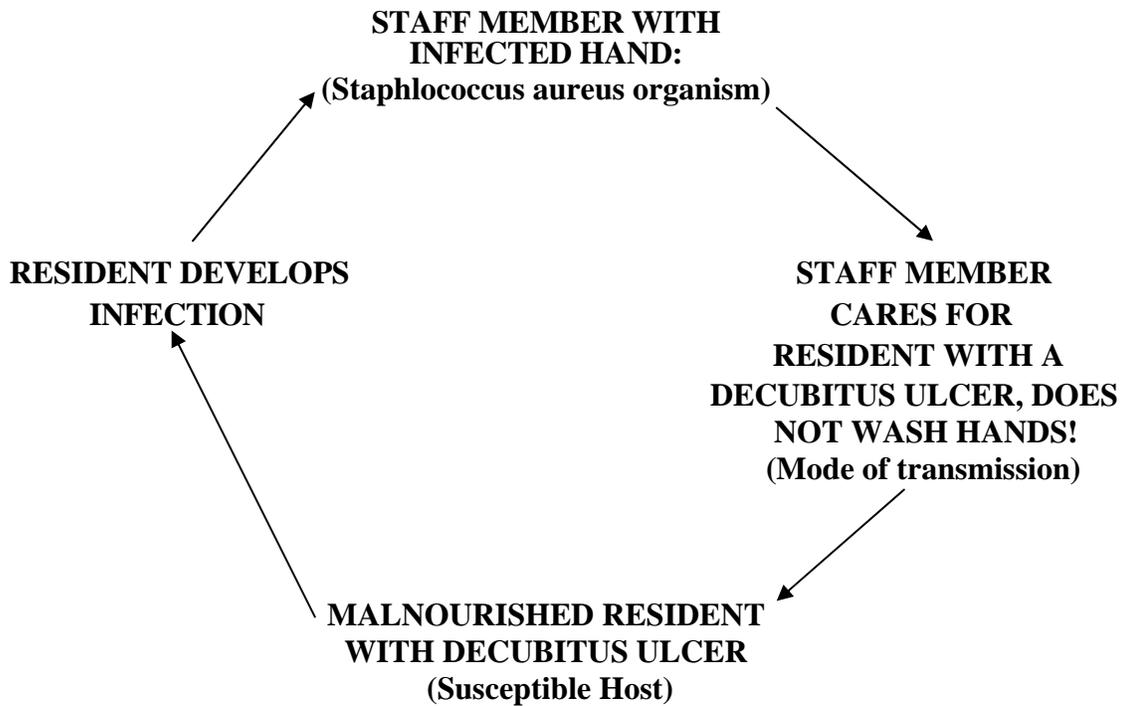
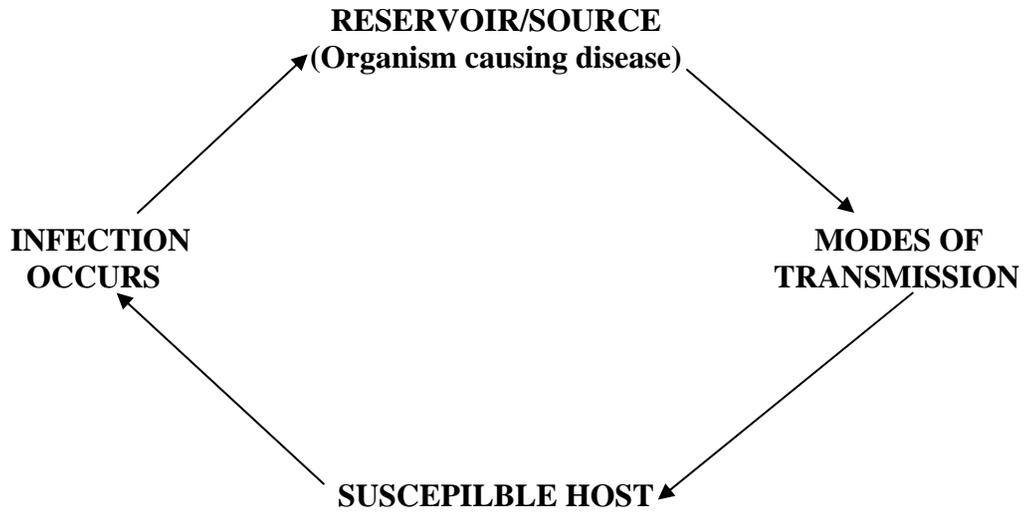
1. Mertes, S. and Levitt, M.J. 1979. Skin-puncture and blood-collecting techniques for infants. *Clin. Chem* 25:183
2. NCCLS Subcommittee for the Standardization of Blood Collection Procedures in Hematology. Biochemistry and Serology. 1979 TSH-4 Standard Procedures for the Collection of Diagnostic Blood Specimens by Skin Puncture. Villanova, Pa. National Committee for Clinical Laboratory Standards.
3. Blumenfeld, T A. 1976. Clinical applications of microchemistry. In *Micro-techniques for the Clinical Laboratory' Concepts and Applications*. Edited by Werner, M New York, John Wiley and Sons. pp. 1-15
4. McKay, R.J. Jr. 1966. Risks of obtaining samples of venous blood in infants *Pediatrics* 38:906.
5. Blumenfeld, T.A. Henelenay, W.G. and Ford, S H. 1977 Simultaneously obtained skin-puncture serum, skin-puncture plasma and venous serum compared and effects of warming the skin before puncture. *Clin. Chem.* 23:1705.
6. Blumenfeld, T A., Turf, G.K. and Blanc, W.A. 1979 Recommended sites and depth of newborn heel skin punctures based on anatomic measurements and histopathology. *Lancet* 1:213
7. Liken, L.D. et al. 1976 Neonatal osteomyelitis of the calcaneus. Complication of heel puncture. *J. Pediatrics* 88:478
8. Van Steirtegnem, A.D. and Young, D S. 1977 Povidone-iodine ("Beta-dine") disinfectant as a source of error *Clin. Chem* 23 1512.
9. Hicks, J M. Rowland, G L. and Buflone, G J 1976 Evaluation of a new blood collecting device ("Microtainer") that is suited for pediatric use *Chem* 22 2034

SECTION I

INFECTION CONTROL AND

COMMUNICABLE DISEASES

Transmission of Infection



PREVENTING INFECTION

Infection-	major safety and health hazard
Microorganism-	located in air, food, mouth, nose, respiratory tract, stomach, intestines, or skin
Pathogens-	microbes which cause infection and are harmful
Nonpathogens-	microbes which usually do not cause infection

I. Types of Microorganisms:

Bacteria-	microbes which rapidly multiply-germs-single celled bacteria
Fungi-	plants which live on other plants-yeast (candida) is common
Protozoa-	one celled animals
Rickettsiae-	found in tissue of fleas, ticks, lice-transmitted to humans by insect bites
Viruses-	grow on living cells

II. Requirements of Microorganisms:

reservoir(host)-	environment to grow and live
	human, plant, animal, soil, food, water
	organism receives nourishment and water from reservoir
	warm, dark, moist area optimal for growth

III. Normal Flora:

microorganisms necessary within body to maintain life
example: E. Coli-intestinal tracts for digestion

IV. Infection:

disease state resulting from invasion and growth of microorganism
signs and symptoms of infection

- fever
- pain or tenderness
- fatigue
- loss of appetite
- nausea
- vomiting
- diarrhea
- rash
- sores on mucus membranes
- redness and swelling of body parts
- discharge or drainage from infected area

V. Methods of Transmission:

Direct contact-	air, food, water, animal, insects
	eating/drinking utensils, dressings, personal care
	equipment which is contaminated

VI. Ability to Resist Infection:

natural immunity
acquired immunity
passive immunity
related to age, sex, nutritional status, fatigue, general health, medication, presence/absence of other illness

VII. Medical Asepsis:

Asepsis	absence of all disease producing microbes or pathogens
Medical Asepsis	techniques/practice used to prevent the spread of pathogens microorganisms from one person or place to another person or place
Disinfection	destroying of pathogenic microbes
Sterilization	destruction of all microbes
Contamination	process of becoming unclean pathogens are present

VIII. Common Aseptic Techniques:

Washing hands frequently and after very contaminating action
personal use hygiene items
observe sanitary practices

****Review Hand washing Techniques****

IX. Decontamination of Equipment:

Forms of disinfection	boiling water chemical disinfection
Forms of sterilization	autoclave (steam under pressure) radiation liquid chemical Chemical gas

X. Infection Precautions:

Prevent the pathogen spread from one area to another

Purpose:

prevent spread of communicable/contagious diseases
may be used to protect patients who's ability to fight infection is reduced (due to age, weakness, illness and certain medications used by • patients—anti-rejection! chemotherapeutics)

**VIDEO: OSHA BLOOD BORN PATHOGEN BODY DEFENSES
AGAINST DISEASE AIDS PREVENTION FOR THE
NURSING PROFESSIONAL INFECTION CONTROL
TECHNIQUE**

Survey: Drug-resistant

Tuesday, May 9, 1995 Section B

Bugs gain ground

Penicillin-type drugs didn't work for almost 12% in Idaho

By Colleen LaMay The Idaho Statesman

Common antibiotics don't work quite as well as they used to against some cases of pneumonia, ear infections and other ailments, according to a new survey. From Dec. 15 to April 15, hospital laboratories in Boise isolated 128 cases of streptococcus pneumoniae, a common cause of bacterial pneumonia in the elderly and ear infections in kids. Of those 128 cases, 11.7 percent were resistant to penicillin-type drugs, usually doctors' first choice for treatment.

This is no cause for public alarm, according to public-health officials. The bacteria were not immune to *every* antibiotic, said Dr. Jesse Greenblatt, state epidemiologist. "It's something to watch out for, but at this point it's nice to know we still have things to treat with," Greenblatt said Monday.

The study did not track patient deaths. Strep pneumoniae is not related to invasive strep A, the so-called "flesh-eating" bacteria. Drug-resistant bugs are an emerging issue nationwide. Boise, despite its geographic isolation and homogenous population, is not immune. In 1991, a study of 10 large U.S. hospitals, none in Idaho, found resistance rates of 7 percent to 8 percent. However, more recent studies show that percentage increasing. "There have been reports in parts of the country, and around the world, of rates as high as 20 percent," Greenblatt said.

Dr. Tom Coffman, an infectious disease specialist in Boise, said drug resistance has changed the way doctors approach immediately life-threatening strep-pneumoniae illnesses, like meningitis, but not more run-of-the-mill problems, like sinus or ear infections. Patients with ear infections still are likely to get a common penicillin-type drug, such as amoxicillin. That will work, most of the time. If it doesn't, then doctors might look at the possibility the patient has a resistant bug.

Will the bacteria continue to get more resistant? "There are rates that are 25-plus in other parts of the country," Greenblatt said. "It could be that Boise remains to some extent protected from that "I don't know if there's an upper ceiling."

Survey

Results

Highlights of the survey:

Total streptococcus pneumoniae cases studied: 128.

Total resistant to penicillin-type drugs: 11.7 percent. - Age of sick patients: three months old up to 92 years old.

Among the fluids tested for the bacteria: sputum, blood, phlegm, cerebrospinal fluid.

Number of cases in patients from Ada, Boise, Elmore and Valley counties: 87.

Percentage of penicillin-resistant cases in this subgroup: 16 percent (Note: Because of the way the survey was conducted, public-health officials say they do not consider this figure to be as reliable as the smaller, 11.7 figure.)

Percentage of total cases not just resistant, but highly resistant, to penicillin: 2 percent.

Percentage of total cases resistant to antibiotics called cephalosporins: 4 percent.

Number of cases resistant to vancomycin, the antibiotic of last resort: 0.

Source: Idaho Department of Health and Welfare, Bureau of Preventive Medicine. Reproduced from the original by Robert Beauregard.

The survey was conducted by the State Department of Health and Welfare, in cooperation with St. Alphonsus and St. Luke's regional medical centers and the Veterans Affairs Medical Center.

Name _____ Date _____ Class _____

Student Activity: Understanding communicable diseases and protection

Directions:

In the following chart, label in the mode of transmission, infected materials, and protective measures

Disease	Mode of Transmission	Infected Material	Protective Measures
AIDS			
Gonorrhea			
Hepatitis B			
Hepatitis Non A Non B			
Hepatitis A			
Malaria			

Disease	Mode of Transmission	Infected Material	Protective Measures
Mononucleosis			
Pneumonia			
Syphilis			
Tuberculosis			

Background Information

Acquired Immunodeficiency Syndrome (AIDS) and Hepatitis B merit serious concern for workers occupationally exposed to blood, other potentially infectious materials and certain other body fluids that contain bloodborne pathogens such as the human immunodeficiency virus (HIV) and the Hepatitis B virus (HBV). According to OSHA, workers in health care and public safety occupations could be potentially exposed to these viruses.

Why Mandates?

The OSHA standard mandates engineering controls, work practices and personal protective equipment that, coupled with employee training, will reduce on-the-job risks for all employees exposed to blood and other potentially infectious materials. The greatest bloodborne risk workers face is the threat of infection posed by the hepatitis B virus. OSHA estimates that occupational exposures account for roughly 5,900 to 7,400 cases of HBV infection each year.

Who is Covered?

Since any exposure to blood and/or other infectious materials could result in transmission of bloodborne pathogens and lead to disease or death, the standard covers employees who may be reasonably anticipated to come into contact with human blood and other potentially infectious materials in order to perform their jobs. The OSHA standard does not attempt to list all occupations where exposures could occur. The standard does however; establish that "Good Samaritan" acts such as assisting a co-worker who has a nosebleed is not considered occupational exposure.

More than three quarters of the workers affected by the standard—4.9 million—are employed in healthcare facilities such as hospitals, nursing homes and physicians' and dentists' offices. Other occupations where exposures occur include, but are not limited to, funeral services, linen services, medical equipment repair, emergency responders, correctional facilities and law enforcement. Overall more than half a million establishments are covered.

What is Required?

The standard requires employers to establish a written exposure control plan, identifying workers with anticipated occupational exposure to blood and other potentially infectious material and specifying means to protect and train them.

It addresses the methods of compliance which include emphasis on: engineering controls such as puncture-resistant containers for used needles; work practices such as hand washing to reduce contamination; and appropriate personal protective equipment such as gowns and gloves.

There are also requirements for housekeeping covering decontamination procedures, a written schedule for cleaning, discarding of contaminated needles and other sharps and handling of regulated wastes. The standard specifies procedures for handling contaminated laundry. It regulates practices and addresses training of workers in HIV and HBV research laboratories and production facilities.

The standard requires employers to offer, at their expense, voluntary hepatitis B vaccinations to all employees with occupational exposure and prescribes appropriate medical

follow-up and counseling after an exposure incident. Employees who choose not to accept the vaccine must sign a declination form, but may be vaccinated at a later date if they change their minds.

OSHA is also requiring appropriate labels and training to alert workers to the risks posed by bloodborne pathogens. Employers must keep records of exposure incidents, post exposure follow-up, hepatitis B vaccinations and employee training

Taken from Exposure Control for Blood and Other Potentially Infectious Material: A Protocol Document for Health Occupations Education Programs in West Virginia. Loretta Cole, Supervisor, Health Occupations Education, Division of Technical and Adult Education Services, West Virginia, September, 1992.

FOREWORD

Occupational hazards are a part of many jobs, and the risks are significant for health care workers and health occupations students—especially when dealing with blood-borne pathogens. The Occupational Safety and Health Administration (OSHA) have issued a final bloodborne pathogens standard to protect more than 5.6 million workers and prevent more than 200 deaths and 9,200 bloodborne infections each year. The standard follows guidelines issued by the Centers for Disease Control (CDC) and covers all employees who could come in contact with blood or infectious materials while working. The regulation fails, however, to specifically include students participating in clinical experiences in health care settings.

Concern for the health and safety of health occupations students, combined with the fact that all health care settings utilized for clinical experience are bound by the OSHA standard, makes it imperative that guidelines for student participation in health care be established.

**COMPLYING WITH THE OSHA STANDARD FOR
OCCUPATIONAL EXPOSURE TO
BLOODBORNE PATHOGENS
29 CFR Part 1910.1030
(And related information, including
OSHA Guidelines for Tuberculosis)**



BIOHAZARD

For entire document contact the telephone number on this cover or call locally at the OSHA office.

In Boise: 334-1867

or: 1-800-482-1370

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Bloodborne Facts

Reporting Exposure Incidents

U.S. Department of Labor Occupational Safety and Health Administration

OSHA's new bloodborne pathogens standard includes provisions for medical follow-up for workers who have an exposure incident. The most obvious exposure incident is a needlestick. But any specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials *is* considered an exposure incident and should be reported to the employer.

Exposure incidents can lead to infection from hepatitis B virus (HBV) or human immunodeficiency virus (HIV) which causes AIDS. Although few cases of AIDS are directly traceable to workplace exposure, every year about 8,700 health care workers contract hepatitis B from occupational exposures. Approximately 200 will die from this bloodborne infection. Some will become carriers, passing the infection on to others.

WHY REPORT?

Reporting an exposure incident right away permits immediate medical follow-up. Early action is crucial. Immediate intervention can forestall the development of hepatitis B or enable the affected worker to track potential HIV infection. Prompt reporting also can help the worker avoid bloodborne infection to others. Further, it enables the employer to evaluate the circumstances surrounding the exposure incident to try to find ways to prevent such a situation from occurring again.

Reporting is also important because part of the follow-up includes testing the blood of the source individual to determine HBV and HIV infectivity if this is unknown and if permission for testing can be obtained. The exposed employee must be informed of the results of these tests. Employers must tell the employee what to do if an exposure incident occurs.

MEDICAL EVALUATION AND FOLLOW-UP

Employers must provide free medical evaluation and treatment to employees who experience an exposure incident. They are to refer exposed employees to a licensed health care provider who will counsel the individual about what happened and how to prevent further spread of any potential infection. He or she will prescribe appropriate treatment in line with current U.S. Public Health Service recommendations. The licensed health care provider also will evaluate any reported illness to determine if the symptoms may be related to HBV or HIV development.

The first step is to test the blood of the exposed employee. Any employee who wants to participate in the medical evaluation program must agree to have blood drawn. However, the employee has the option to give the blood sample but refuse permission for HIV testing at that time. The employer must maintain the employee's blood sample for 90 days in case the employee changes his or her mind about testing—should symptoms develop that might relate to HBV or HIV infection.

The health care provider will counsel the employee based on the test results. If the source individual was HBV positive or in a high risk category, the exposed employee may be given hepatitis B immune globulin and vaccination, as necessary. If there is no information on the source individual or the test is negative, and the employee has not been vaccinated or does not have immunity based on his or her test, he or she may receive the vaccine. Further, the health care provider will discuss any other findings from the tests.

The standard requires that the employer make the hepatitis B vaccine available, at no cost to the employee, to all employees who have occupational exposure to blood and other potentially infectious materials. This requirement is in addition to post-exposure testing and treatment responsibilities.

WRITTEN OPINION

In addition to counseling the employee, the health care provider will provide a written report to the employer. This report simply identifies whether hepatitis B vaccination was recommended for the exposed employee and whether or not the employee received vaccination. The health care provider also must note that the employee has been informed of the results of the evaluation and told of any medical conditions resulting from exposure to blood which require further evaluation or-treatment. Any added findings must be kept confidential.

CONFIDENTIALITY

Medical records must remain confidential. They are not available to the employer. The employer must give specific written consent for anyone to see the records. Records must be maintained for the duration of employment plus 30 years in accordance with OSHA's standards on access to employee exposure and medical records.

This is one of a series of fact sheets that discusses various requirements of the Occupational Safety and Health Administration's standards covering exposure to bloodborne pathogens. Single copies of fact sheets are available from OSHA Publications, Room N.3101, 200 Constitution Avenue, N.W. Washington, DC 20210 and from OSHA regional offices. Reproduced from the original by Robert Beauregard.

Bloodborne Facts

Holding the Line on Contamination

U.S. Department of Labor Occupational Safety and Health Administration

Keeping work areas in a clean and sanitary condition reduces employees' risk of exposure to bloodborne pathogens. Each year about 8,700 health care workers are infected with hepatitis B virus, and 200 die from contracting hepatitis B through their work. The chance of contracting human immunodeficiency virus (HIV), the bloodborne pathogen which causes AIDS, from occupational exposure is small, yet a good housekeeping program can minimize this risk as well.

DECONTAMINATION

Every employer whose employees are exposed to blood or other potentially infectious materials must develop a written schedule for cleaning each area where exposures occur. The methods of decontaminating different surfaces must be specified, determined by the type of surface to be cleaned, the soil present and the tasks or procedures that occur in that area.

For example, different cleaning and decontamination measures would be used for a surgical operatory and a patient room. Similarly, hard surfaced flooring and carpeting require separate cleaning methods. More extensive efforts will be necessary for gross contamination than for minor spattering. Likewise, such varied tasks as laboratory analyses and normal patient care would require different techniques for clean-up.

Employees must decontaminate working surfaces and equipment with an appropriate disinfectant after completing procedures involving exposure to blood. Many laboratory procedures are performed on a continual basis throughout a shift. Except as discussed below, it is not necessary to clean and decontaminate between procedures. However, if the employee leaves the area for a period of time, for a break or lunch, then contaminated work surfaces must be cleaned.

Employees also must clean (1) when surfaces become obviously contaminated; (2) after any spill of blood or other potentially infectious materials; and (3) at the end of the work shift if contamination might have occurred. Thus, employees need not decontaminate the work area after each patient care procedure, but only after those that actually result in contamination.

If surfaces or equipment are draped with protective coverings such as plastic wrap or aluminum foil, these coverings should be removed or replaced if they become obviously contaminated. Reusable receptacles such as bins, pails and cans that are likely to become contaminated must be inspected and decontaminated on a regular basis. If contamination is visible, workers must clean and decontaminate the item immediately, or as soon as feasible.

Should glassware that may be potentially contaminated break, workers need to use mechanical means such as a brush and dustpan or tongs or forceps to pick up the broken glass—never by hand, even when wearing gloves.

Before any equipment is serviced or shipped for repairing or cleaning, it must be decontaminated to the extent possible. The equipment must be labeled, indicating which portions are still contaminated. This enables employees and those who service the equipment to take appropriate precautions to prevent exposure.

REGULATED WASTE

In addition to effective decontamination of work areas, proper handling of regulated waste is essential to prevent unnecessary exposure to blood and other potentially infectious materials. Regulated waste must be handled with great care—i.e., liquid or semi liquid blood and other potentially infectious materials, items caked with these materials, items that would release blood or other potentially infected materials if compressed, pathological or microbiological wastes containing them and contaminated sharps.

Containers used to store regulated waste must be closable and suitable to contain the contents and prevent leakage of fluids. Containers designed for sharps also must be puncture resistant. They must be labeled or color-coded to ensure that employees are aware of the potential hazards. Such containers must be closed before removal to prevent the contents from spilling. If the outside of a container becomes contaminated, it must be placed within a second suitable container.

Regulated waste must be disposed of in accordance with applicable state and local laws.

LAUNDRY

Laundry workers must wear gloves and handle contaminated laundry as little as possible, with a minimum of agitation. Contaminated laundry should be bagged or placed in containers at the location where it is used, but not sorted or rinsed there.

Laundry must be transported within the establishment or to outside laundries in labeled or red color-coded bags. If the facility uses Standard Precautions for handling all soiled laundry, then alternate labeling or color coding that can be recognized by the employees may be used. If laundry is wet and it might soak through laundry bags, then workers must use bags that prevent leakage to transport it.

RESEARCH FACILITIES

More stringent decontamination requirements apply to research laboratories and production facilities that work with concentrated strains of HIV or HBV.

Bloodborne Hepatitis B Vaccination – Protection For You

Facts

U.S. Department of Labor Occupational Safety and Health Administration

WHAT IS HBV?

Hepatitis B virus (HBV) is a potentially life-threatening bloodborne pathogen. Centers for Disease Control estimates there are approximately 280,000 HBV infections each year in the U.S.

Approximately 8,700 health care workers each year contract hepatitis B, and about 200 will die as a result. In addition, some who contract HBV will become carriers, passing the disease on to others. Carriers also face a significantly higher risk for other liver ailments which can be fatal, including cirrhosis of the liver and primary liver cancer.

HBV infection is transmitted through exposure to blood and other infectious body fluids and tissues. Anyone with occupational exposure to blood is at risk of contracting the infection.

Employees must provide engineering controls: workers must use work practices and protective clothing and equipment to prevent exposure to potentially infectious materials. However, the best defense against hepatitis B is vaccination.

WHO NEEDS VACCINATION?

The new OSHA standard covering bloodborne pathogens requires employers to offer the three-injection vaccination series free to all employees who are exposed to blood or other potentially infectious materials as part of their job duties. This includes health care workers, emergency responders, morticians, first-aid personnel, law enforcement officers, correctional facilities staff, launderers, as well as others.

The vaccination must be offered within 10 days of initial assignment to a job where exposure to blood or other potentially infectious materials can be "reasonably anticipated." The requirements for vaccinations of those already on the job take effect July 6, 1992.

WHAT DOES VACCINATION INVOLVE?

The hepatitis B vaccination is a noninfectious, yeast-based vaccine given in three injections in the arm. It is prepared from recombinant yeast cultures, rather than human blood or plasma. Thus, there is no risk of contamination from other bloodborne pathogens nor is there any chance of developing HBV from the vaccine.

The second injection should be given one month after the first and the third injection six months after the initial dose. More than 90 percent of those vaccinated will develop immunity to the hepatitis B virus. To ensure immunity, it is important for individuals to receive all three injections. At this point it is unclear how long the immunity lasts, so booster shots may be required at some point in the future.

The vaccine causes no harm to those who are already immune or to those who may be I-D3V carriers. Although employees may opt to have their blood tested for antibodies to determine need for the vaccine, employers may not make such screening a condition of receiving vaccination nor are employers required to provide prescreening.

Each employee should receive counseling from a health care professional when vaccination is offered. This discussion will help an employee determine whether inoculation is necessary.

WHAT IF I DECLINE VACCINATION?

Workers who decide to decline vaccination must complete a declination form. Employers must keep these forms on file so that they know the vaccination status of everyone who is exposed to blood. At any time after a worker initially declines to receive the vaccine, he or she may opt to take it.

WHAT IF I AM EXPOSED BUT HAVE NOT YET BEEN VACCINATED?

If a worker experiences an exposure incident such as a needlestick or a blood splash in the eye, he or she must receive confidential medical evaluation from a licensed health care professional with appropriate follow-up. To the extent possible by law, the employer is to determine the source individual for HBV as well as human immunodeficiency virus (HIV) infectivity. The worker's blood will also be screened if he or she agrees.

The health care professional is to follow the guidelines of the U.S. Public Health Service in providing treatment. This would include hepatitis B vaccination. The health care professional must give a written opinion on whether or not vaccination is recommended and whether the employee received it. Only this information is reported to the employer. Employee medical records must remain confidential. HIV or HBV status must NOT be reported to the employer.

SPECIAL CHILDHOOD POPULATIONS

Immigrant and refugee children from parts of the world where HBV infection is common (Asia, Africa, South America, South Pacific and eastern and western Europe) are at high risk of HBV infection. All immigrant and their children 7 years of age and younger should get hepatitis B vaccine.

ADULTS AND OTHER GROUPS

Hepatitis B vaccine is also recommended for adolescents and adults at high risk of getting HBV infection. This includes 1) people who are exposed to blood or blood products in their work (health care workers or emergency care responders, for instance); 2) clients and staff of institutions for the developmentally disabled, as well as clients and staff of group homes, where any of the residents is a chronic carrier of HBV; 3) hemodialysis patients; 4) men who have sex with men; 5) users of injectable drugs; 6) people with medical conditions (such as hemophilia) who receive blood products to help their blood clot; 7) people who live with, or have sex with, HBV carriers; 8) people who have more than one sexual partner, or people who are treated for sexually transmitted diseases; and 9) people who travel to, or live in, parts of the world where HBV infections are common.

Hepatitis B vaccine is also recommended for people who have been exposed to HBV. This includes people who have never been vaccinated for hepatitis B, and who: (1) have an accident in which blood containing HBV enters their body through the skin or mucous membrane; or, (2) have sexual contact with someone with acute hepatitis B. In some cases, hepatitis B vaccine should be started at the same time as treatment with HBIG (see below).

HEPATITIS B IMMUNE GLOBULIN (HBIG)

HBIG is often given along with hepatitis B vaccine to people who have been exposed to HBV. It gives protection from the virus for the first 1 to 3 months; then the vaccine takes over and gives long lasting protection. HBIG is made from human plasma (a part of the blood). Any viruses found in the blood are killed during its preparation, and no one has ever been known to get hepatitis B or AIDS or another virus from HBIG. Most people need only one dose to protect them from exposure to HBV.

WHO SHOULD GET HEPATITIS B IMMUNE GLOBULIN?

HBIG is recommended for the following people. (For most people, the first dose of hepatitis B vaccine should be given at the same time as the HBIG.)

Infants

1. Infants born to women who are infected with HBV - These infants should get one dose of HBIG and the first dose of vaccine within 12 hours of birth (see above).
2. Unvaccinated infants less than 12 months old whose mother (or primary caregiver) has acute hepatitis B - All infants less than 12 months can easily become HBV carriers after hepatitis B infection. Exposed infants who have not been vaccinated should get one dose of HBIG and begin the hepatitis B vaccine series. Infants who have already been vaccinated do not need HBIG.

Adults and Others

1. Persons accidentally exposed to blood or body fluids that may contain HBV - Exposed persons who have not been vaccinated should get one dose of HBIG and begin the hepatitis B vaccine series. Exposed persons who have had hepatitis B shots may also need HBIG. A doctor or nurse should make that decision.
2. People having sexual contact with anyone who has acute hepatitis B - These people should get a dose of HBIG within 14 days of the most recent sexual contact with anyone who has acute hepatitis B. They may also need to get hepatitis B vaccine.

POSSIBLE SIDE EFFECTS FROM HEPATITIS B VACCINE AND HBIG

The most common side effect of hepatitis B vaccination is soreness where the shot is given. Tenderness at the injection site has been reported in up to 46% of infants vaccinated. Of children who get the vaccine, 2% to 5% may get a fever greater than 102°F or become irritable. When hepatitis B vaccine is given with other childhood vaccines, it does not make these mild reactions worse than would be seen with the other vaccines alone. HBIG has sometimes been associated with swelling and hives. As with any drug, there is a slight chance of allergic or more serious reactions with either the vaccine or HBIG. However, no serious reactions have been shown to occur due to the hepatitis B recombinant vaccines. (These are the ones currently in use.) A person cannot get hepatitis B or AIDS from a hepatitis B shot or from an HBIG shot.

Before recombinant vaccines were used in the United States, another type of hepatitis B vaccine (plasma-derived) was used. Surveillance showed that getting the first dose of plasma-derived hepatitis B vaccine may have been associated with the paralytic illness Guillain-Barre' syndrome (GBS). However, the recombinant vaccine has not been shown to be associated with GBS.

PREGNANCY

Very little information is available about the safety of the vaccine or HBIG for unborn babies. If a pregnant woman gets an HBV infection, it can cause severe disease in the mother and chronic HBV infection in the newborn baby. On the other hand, both the vaccine and HBIG should be safe for the unborn baby because they contain no infectious material. Therefore, pregnant women who are at risk of HBV infection can be given both hepatitis B vaccine and HBIG.

QUESTIONS

If you have any questions about hepatitis B, HBIG, or hepatitis B vaccine, please ask us now or call your doctor or health department before you sign this form.

MAGIC VALLEY REGIONAL MEDICAL CENTER

Title/Description: BLOODBORNE PATHOGENS EXPOSURE CONTROL PLAN	Effective Date: 11/14/03
Applies To: ALL EMPLOYEES	
Authorized By: Janie Draney, MS, RN, V.P. Patient Care Service	Supersedes: Bloodborne Pathogens Exposure Control Plan Dated: 11/29/02
Approved by: _____	

Reviewed _____ Date _____
Reviewed _____ Date _____
Reviewed _____ Date _____

I. POLICY PURPOSE/STATEMENT:

A. Magic Valley Regional Medical Center (MVRMC) is committed to protecting all its employees and patients against health hazards associated with bloodborne pathogens in accordance with the Center for Disease Control (CDC) and Occupational Safety and Health Administration (OSHA) standards and guidelines. This policy explains how this is accomplished.

II. Implementation:

A. Responsible Persons:

1. The Hospital Board and the Chief Executive Officer (CEO) are ultimately responsible for the support of the Bloodborne Pathogens Compliance Program.
2. The Infection Control Practitioner (ICP), Employee Health Nurse (EHN), and the Safety Officer are responsible for the overall management of the Bloodborne Pathogens Compliance Program. Activities include, but are not limited to:
 - a. Overall responsibility for implementing the Exposure Control Plan for the facility and all employees.
 - b. Working with administrators and other employees to develop and administer any additional bloodborne pathogens related policies and practices needed to support the effective implementation of this plan.
 - c. Collecting and maintaining a suitable reference library on the Bloodborne Pathogens Standard and bloodborne pathogens safety and health information.
 - d. Knowing current legal requirements concerning bloodborne pathogens.
 - e. Acting as facility liaison during OSHA inspections.
 - f. Presenting appropriate information to employees via staff meetings, poster presentations, or any other material deemed appropriate to inform about bloodborne pathogen safety.
 - g. Conducting periodic facility audits to maintain an up-to-date Exposure Control Plan.
3. Department Directors or designees are responsible for:
 - a. exposure control in their respective areas, working directly with the EHN, ICP, Safety Officer and employees to ensure that proper exposure control procedures are followed.
 - b. reporting noncompliance and assisting in deciding the action to be taken in response to noncompliance.
4. The Education Department is responsible for:
 - a. assisting in developing suitable education/training programs.
 - b. assisting when appropriate.

- c. coordinating with the EHN, ICP, and Safety Officer for the most current information pertaining to Bloodborne Pathogens.
- 5. Employees are responsible for:
 - a. knowing what tasks they perform that puts them at risk for occupational exposure.
 - b. attending the bloodborne pathogens educational programs.
 - c. planning and conducting all operations in accordance with designated work practice controls.
 - d. developing good personal hygiene habits.
 - e. following the requirements of this policy.
- B. Availability of the Exposure Control Plan to Employees:
 - 1. The Exposure Control Plan is available to employees at any time. Employees are advised of the availability during their education/training sessions. Copies of the Exposure Control Plan are kept in the following locations:
 - a. Infection Control Office.
 - b. Employee Health Office.
 - c. Housewide policy manual, which is located on the intranet and in paper form in the Emergency Department (ED).
- C. Review and Update of the Plan:
 - 1. To keep the Exposure Control Plan up-to-date, the plan will be reviewed and updated:
 - a. Annually.
 - b. Whenever new or modified tasks and procedures are implemented which affect the risk of occupational exposure to employees.
- D. Exposure Determination:
 - 1. To identify employees who routinely encounter high-risk tasks, there is a list of employees whose daily job duties put them at potential risk for exposure to bloodborne pathogens (see Attachment 1).
 - 2. Tasks and procedures involving potential exposure to bloodborne pathogens includes, but are not limited to the following:
 - a. Handling linen contaminated with blood or other potentially infectious materials (OPIM).
 - b. Performing direct patient care procedures.
 - c. Testing of blood and body fluids.
 - d. Cleaning equipment or the hospital environment.
 - e. Handling infectious waste material.
 - 3. The EHN and ICP will work with department directors and/or designee to revise and update this list as tasks, procedures, and classifications change.
- E. Methods of Compliance:

There are a number of areas that must be addressed in order to effectively eliminate or minimize exposure to bloodborne pathogens. These areas are reviewed with employees during their bloodborne pathogens related training.

 - 1. Standard Precautions:
 - a. Standard Precautions are used to prevent contact with blood and OPIM. As a result, we treat all body substances as potentially infectious.
 - b. The Infection Control Committee (ICC) is responsible for overseeing the Standard Precautions Program.
 - 2. Engineering Controls:
 - a. MVRMC uses equipment such as sharps disposal containers, resheathing devices, safety syringes, needle protection devices, needleless IV tubing and ventilated laboratory hoods to minimize exposure to bloodborne pathogens.
 - b. The following engineering controls are used throughout the facility.

1. Handwashing facilities, sinkless antiseptic handrubs, and towelettes, which are readily accessible to all employees who have the potential for exposure.
2. Self-sheathing needles, resheathing devices, needleless IV tubing, and needle protection devices.
3. NIOSH approved containers for contaminated sharps having the following characteristics:
 - a. Puncture-resistant
 - b. Color-coded or labeled with a biohazard-warning label
 - c. Leak proof on the sides and bottom.
4. Specimen containers that which are:
 - a. Leak-proof
 - b. Color-coded or labeled with a biohazard warning label
 - c. Puncture-resistant
- c. Sharps devices will be evaluated annually and *as* new technology becomes available for replacement with safety devices that decrease the risk of exposure to bloodborne pathogens. This process will include:
 1. involvement of the end user (the employees using the item at the bedside) of the product being evaluated.
 2. Review of the various types of technology commercially available.
 3. review of current availability of the product.
 4. evaluation of the product's effectiveness with the employees, not cost.
 5. summary of the evaluations are available and attached to the Infection Control Practitioner's copy of the Bloodborne Pathogens Exposure Control Plan.
3. Work Practice Controls:
 - A The ICP works in conjunction with department directors and/or designees and the Education Department to implement work practice controls.
 - B. MVRMC has adopted the following work practice controls as part of the Bloodborne Pathogens Compliance Program:
 1. Employees will perform hand hygiene prior to encountering a patient or their environment, before leaving the patient or environment, immediately after removal of gloves or other personal protective equipment (PPE).
 2. Following any contact of blood or OPIM to their hands or any other exposed skin, the employee will wash with soap and water as soon as possible. In the case of eyes or mouth, they are to flush exposed mucous membranes with water. No bleach, VirexTM, or other harsh chemicals should be used to cleanse the site, as that will cause further damage to the site.
 3. Contaminated needles and other contaminated sharps are not to be bent, recapped, manipulated or removed unless:
 - a. It can be demonstrated that there is no feasible alternative.
 - b. The action is required by a specific medical procedure.
 - c. In the two situations above the needle is to be made safe by using a needle protection devices. As a last resort, recapping or needle removal is accomplished through the use of a resheathing device or safe one-handed technique.
 4. Contaminated sharps are placed in the appropriate container immediately or as soon as possible after use.
 5. Eating, drinking, smoking, applying cosmetics or lip balm and handling contact lenses is prohibited in work areas where there is potential for exposure to bloodborne pathogens; this includes nurse's stations, chart boxes, and other patient care areas.

6. Food and drinks are to be kept in refrigerators, freezers, on counter tops or storage areas specifically designated for food and not where blood or OPIM are present.
7. Mouth pipetting or suctioning of blood or OPIM is prohibited.
8. During procedures involving blood or OPIM, minimize splashing, spraying or other actions that will generate droplets of these materials. Use Personal Protective Equipment to protect areas at risk for exposure (i.e. goggles, mask, faceshields).
9. Specimens of blood or OPIM are placed in designated leak-proof containers that are appropriately labeled for handling and storage.
10. If outside contamination of a primary specimen container occurs, that container is within a second leak-proof container, appropriately labeled, for handling and storage (If the specimen can puncture the primary container, the secondary container must be puncture-resistant as well).
11. Contaminated equipment that requires servicing outside the facility or requires shipping is examined prior to servicing or shipping, and decontaminated as necessary.
 - a. If it is demonstrated that decontamination is not feasible, then the following will be done:
 1. An appropriate biohazard warning label is attached to any contaminated equipment, identifying the contaminated portions.
 2. Information regarding the remaining contamination is conveyed to all affected employees, the equipment manufacturer and the equipment service representative prior to handling, servicing or shipping.
4. When a new employee starts work or a current employee changes jobs within the facility, the following process takes place to ensure that they are trained in the appropriate work practice controls:
 - a. The employee's job classification and the tasks and procedures that they will perform are checked against those they currently perform.
 - b. The employee is then trained regarding any new work practice controls. The training is provided by the department director or supervisor in conjunction with the ICP, EHN, and the Safety Officer.
5. Personal Protective Equipment (PPE):
 - a. MVRMC provides (at no cost to employees) any PPE that the employee needs to be protected against such exposure. This equipment includes, but is not limited to:
 1. gloves
 2. gowns
 3. lab coats
 4. face shield/masks
 5. safety glasses
 6. goggles
 7. resuscitation mouthpieces or bags
 8. pocket masks
 9. hoods
 10. shoe covers

***Hypoallergenic gloves, powderless gloves and similar alternatives are available to employees who are allergic to the gloves MVRMC normally uses and are available by consulting with the Employee Health Nurse (EHN).
 - b. Department directors and/or designees are responsible for ensuring that His/her department and all work areas therein have appropriate PPE available to all affected employees.
 - c. Employees are trained regarding the use of the appropriate PPE for their job classification and tasks or procedures they perform. Additional training is provided, when necessary, if an employee takes a new position or new job functions are added

- to their current position.
- d. To ensure that PPE is not contaminated and is in the appropriate condition to protect employees from potential exposure, MVRMC adheres to the following practices:
 1. All reusable PPE is inspected periodically and repaired or replaced as needed to maintain its effectiveness.
 2. Hospital owned, reusable PPE is cleaned, laundered, inspected and decontaminated, as needed, by the Linen Department
 - e. To make sure that this equipment is used as effectively as possible our employees are to adhere to the following practices when using their PPE:
 1. Any garment penetrated by blood or OPIM is to be removed immediately, or as soon as feasible.
 2. Any personal clothing that is contaminated by blood or OPIM, is to be removed, and sent to the Linen Department to be cleaned before being taken home.
 3. All PPE is to be removed prior to leaving a work area.
 4. Gloves are to be worn in the following circumstances:
 - a. Whenever an employee anticipates hand contact with blood or OPIM
 - b. When performing vascular access procedures
 - c. When handling or touching contaminated items or surfaces
 5. Disposable gloves are to be replaced *as soon as* practical after contamination or if they are torn, punctured or otherwise lose their ability to function as an "exposure barrier".
 6. Utility gloves are to be decontaminated for reuse unless they are cracked, peeling, torn or exhibit other signs of deterioration, at which time they are disposed of.
 7. Masks and eye protection (such as goggles, face shields, etc.) are to be used whenever splashes or sprays may generate droplets of infectious materials.
 8. Protective clothing (such as a gown or an apron) is to be worn whenever potential exposure to the body is anticipated.
 9. Surgical caps/hoods and/or shoe covers/boots are to be used in any instances where "gross contamination" is anticipated.
 6. Housekeeping:
 - a. Environmental Services (ES) or other designated staff are to follow these practices:
 1. All equipment and surfaces are cleaned and decontaminated with a hospital approved germicidal agent after contact with blood or OPIM:
 - after the completion of the procedure.
 - immediately (or as soon as feasible) when surfaces are overtly contaminated.
 - after any spill of blood or OPIM.
 - at the end of the work shift if the surface may have been contaminated during that shift.
 2. Protective coverings (such as absorbent paper) are removed and replaced:
 - As soon as it is feasible when overtly contaminated.
 - At the end of the work shift if they may have been contaminated during the shift.
 3. All pails, bins, cans and other receptacles intended for use routinely are inspected, cleaned and decontaminated as soon as possible if visibly contaminated.
 4. Potentially contaminated broken glassware is picked up using mechanical

- means (such as dustpan and brush, tongs, forceps, etc.).
5. Contaminated reusable sharps are stored in containers that do not require "hand processing."
- b. The following procedures are used when handling regulated waste such as contaminated sharps, laundry and OPIM.
 1. Regulated waste is discarded or contained in receptacles that are:
 - Closable
 - Puncture-resistant
 - Leak-proof, if the potential for fluid spill or leakage exists
 - Red in color or labeled with the appropriate biohazard warning label
 2. Containers for this regulated waste are located throughout MVRMC within easy access of employees and as close as possible to the sources of the waste.
 3. Waste containers are to be maintained upright, routinely replaced and not allowed to overfill.
 4. Contaminated laundry is to be handled as little as possible and is not sorted or rinsed at the site of use.
 5. Whenever containers of regulated waste are moved from one area to another the containers are immediately closed and placed inside an appropriate secondary container, if leakage is possible from the first container.
- F. Hepatitis B Vaccination, Post-Exposure Evaluation and Follow-Up:
1. Hepatitis B Vaccination Program
 - a. Hepatitis B virus (HBV) infection is the major infectious bloodborne occupational hazard to healthcare workers. In accordance with current CDC guidelines, MVRMC has established a vaccine and post exposure follow-up program (See Employee Health Policies, Hepatitis B Vaccine and Significant Exposure to Blood/Body Fluids).
 1. All employees whose jobs are designated in the Exposure Determination (Section III) section of this plan will be offered the vaccine under the following conditions:
 - Within 10 days of job assignment.
 - After training has taken place.
 - Is not medically contraindicated.
 - Employee has not received the vaccine previously.
 - b. The vaccine will be:
 - free of charge.
 - available during the employees regular hours.
 - administered by the Employee Health Nurse (EHN), Infection Control Practitioner (ICP) or other designated nurse.
 - c. A consent/declination will be on file in the Employee Health records for each employee whose job is designated as exposure prone. See the Hepatitis B Vaccine policy.
 - d. Each employee whose job is designated as exposure prone will receive a written opinion on the advisability of receiving the vaccine from the EHN within 10 days of job assignment.
 - e. Documentation of this education will be recorded by the Education Department.
 2. Hepatitis B Post-Exposure Evaluation and Follow-Up:
 - a. In accordance with CDC guidelines, MVRMC has established a post-exposure evaluation and follow-up plan, see the Significant Exposure to Blood/Body Fluids policy.
 3. Post Exposure Record Keeping:

- a. The Employee Health File is a separate locked file maintained in the EHN office. The file contains the following information:
 - Name and social security number of each employee upon exposure.
 - Copy of the employee's Hepatitis B vaccination status.
 - All information specific to any exposure incident *as* outlined in the Significant Exposure to Blood/Body Fluids policy. Included in this information will be:
 - Documentation of the route of exposure and circumstances surrounding the incident
 - Identification and documentation of the source individual. HBV, HBC and HIV testing will be attempted with consent.
 - Information on source testing will be made available to the employee.
 - A copy of the Hepatitis B information form and Employee Health Questionnaire.
 - b. All information in the health file will be maintained in a confidential manner and will be disclosed only with the employee's written consent. These records will be maintained for the duration of employment plus 30 years.
- G. Labels and Signs:
1. MVRMC has implemented a comprehensive biohazard warning labeling program. The following items are to be labeled:
 - Containers of regulated waste.
 - Refrigerators/freezers containing blood or OPIM.
 - Sharps disposal containers.
 - Other containers used to store, transport or ship blood or OPIM.
 - Contaminated equipment.
- H. Information and Training:
1. All employees who have the potential for exposure to bloodborne pathogens are put through a comprehensive training program and furnished with as much information as possible on this issue.
 2. Employees will be re-educated at least annually to keep their knowledge current. Additionally, all new employees, as well as employees changing jobs or job functions, will be given any additional training their new position requires at the time of their job assignment.
 3. The Education Department in cooperation with Human Resources (HR), Infection Control, Employee Health and department directors or designees will be responsible for employee education.
 - Training Topics
 - Where to find a copy of the standard and explanation of the contents.
 - An explanation of symptoms and transmission of bloodborne diseases.
 - An explanation of the employer's plan for dealing with exposures and how to get a copy of it.
 - How to recognize job tasks that might expose an employee to bloodborne diseases.
 - How to reduce exposure by using work practices, engineering controls and PPE. - How to choose, use, select and dispose of PPE.
 - Information on the Hepatitis B vaccine.
 - How to act in an emergency involving blood.
 - The procedure to follow if an exposure occurs, including the follow-up and evaluation. An explanation of signs, labels, and color-coding.
 - An opportunity to ask questions of a knowledgeable person.
- I. Record Keeping:
1. MVRMC maintains training records containing the following information:

- Dates of all training sessions.
 - Contents/summary of the training sessions
 - Names and qualifications of the instructors.
 - Names and job titles of employees attending the training sessions.
2. A computer system is used to facilitate this record keeping.
 3. These training records are available for examination and copying to our employees and their representatives, as well as any regulatory agency and its representatives.
 4. A sharps injury log and incident investigation records will be maintained by Employee Health.

III. Evaluation:

- A. All bloodborne pathogen exposures will be reviewed by the ICP or EHN and recommendations for possible interventions to prevent future exposures will be discussed.
- B. Sharps safety devices will be reviewed yearly and as new technology may warrant. The end user will be involved in the evaluation.

VI. Approved By:

Infection Control Committee: 10/29/03

Initial Development and Revision Dates:

400.415: 11/29/02, 8/22/01, 11/10/00, 10/28/99, 10/98, 6/24/98; 911.524: 6/6/96, 12/5/94, 6/24/93, 5/5/92

JOB DESCRIPTIONS DESIGNATED AS HIGH RISK FOR EXPOSURE TO BLOOD AND BODY FLUIDS

Employees eligible for Hepatitis B vaccine:

Adult & Pediatric Care Units

2N, 3N, Intensive Care Unit (ICU), Intermediate Care Unit (IMCU), Transitional Care Unit (TCU), all Mother/Child Units, Unit Support Team (UST), Patient Care Coordinators (PCC), Emergency Room (ED), Cath Lab, Home Health & Hospice:

- LPN
- RN
- CNA
- Clinical Assistants
- Registered Cardiovascular Invasive Specialist
- Floor Specific Care Coordinators
- Health Unit Coordinators--evaluated on a unit-by-unit basis since the duties vary

Canyon View:

- LPN
- RN
- Counselors
- Assessment & Referrals
- Occupational Therapist
- Mental Health Specialist
- Adolescent School Teacher
- Patient Financial Representative (PFR2)

Cardiopulmonary:

- Non-invasive Cardiology Tech
- Cardiopulmonary Tech
- CRTT
- CRTT-E
- RRT
- R.R.T-E
- Respiratory Therapy Tech

Coumadin Clinic:

- Pharmacist

Diabetic Clinic:

- Dietitian

Diagnostic Imaging/Women's Health and Imaging Center:

- Imaging Specialist
- Radiology Aide
- EEG Tech
- RN
- Nuclear Medicine Tech

Emergency Transport Services:

- EMT I
- EMT II
- Paramedic
- Supervisors

Employee Health:

- RN

Engineering:

- Mechanic
- Supervisors
- Biomed Technician
- Electrical Safety Coordinator

Enterstomal Therapy:

- RN

Environmental Services/Linen:

- Supervisors
- ES Aide
- ES Team Leader
- Linen Aide I
- Linen Aide II

Infection Control:

- RN

Laboratory:

- Triage Personnel
- Secretary
- Histotech
- Phlebotomist
- Med Tech I
- Med Tech H
- Lab Assistant

Occupational Health/Drug Screening:

- RN
- Drug Screening Coordinator
- Drug Collectors/Phlebotomists

Out-Patient Clinical Staff:

- **Medical Assistant**
- **CMA**
- **CNA**
- LPN
- RN

Rehabilitation:

- Speech Therapist
- Occupational Therapist
- Physical Therapist
- Physical Therapy Aide
- Certified Occupational Therapy Aide

Safety Department/Security:

- Safety Officer
- Security Officer

Sleep Lab:

- Technicians

Surgical Services:

Operating Room (OR), Same Day Surgery Center (SDSC), GI Lab, Anesthesia Recovery, Pre-admissions, Central Sterile Processing (CSP):

- RN
- LPN
- Health Care Assistants
- CSP Instrument Tech
- CSP Supervisor
- Anesthesia Tech
- Certified Surgical Techs

Transport:

- Transporters
- Valet Parking Attendants

Vascular Lab:

- Vascular Lab Tech

Contract Services & Volunteers:

These will be evaluated by the Employee Health Nurse and administered on an individual basis.

Revised 10/29/03 PHeath RN BSN CIC, ICP

SECTION J

SAFETY

Bloodborne Facts

Protect Yourself When Handling Sharps

U.S. Department of Labor Occupational Safety and Health Administration

A needlestick or a cut from a contaminated scalpel can lead to infection from hepatitis B virus (HBV) or human immunodeficiency virus (HIV) which causes AIDS. Although few cases of AIDS have been documented from occupational exposure, approximately 8,700 health care workers each year contract hepatitis B. About 200 will die as a result. The new OSHA standard covering bloodborne pathogens specifies measures to reduce these risks of infection.

PROMPT DISPOSAL

The best way to prevent cuts and sticks is to minimize contact with sharps. That means disposing of them immediately after use. Puncture-resistant containers must be available nearby to hold contaminated sharps—either for disposal or, for reusable sharps, later decontamination for re-use. When reprocessing contaminated reusable sharps, employees must not reach by hand into the holding container. Contaminated sharps must never be sheared or broken.

Recapping, bending, or removing needles is permissible only if there is no feasible alternative or if required for a specific medical procedure such as blood gas analysis. If recapping, bending, or removal is necessary, workers must use either a mechanical device or a one-handed technique. If recapping is essential—for example, between multiple injections for the same patient—employees must avoid using both hands to recap. Employees might recap with a one-handed "scoop" technique, using the needle itself to pick up the cap, pushing cap and sharp together against a hard surface to ensure a tight fit. Or they might hold the cap with tongs or forceps to place it on the needle.

SHARPS CONTAINERS

Containers for used sharps must be puncture resistant. The sides and the bottom must be leak proof. They must be labeled or color coded red to ensure that everyone knows the contents are hazardous. Containers for disposable sharps must have a lid, and they must be maintained upright to keep liquids and the sharps inside.

Employees must never reach by hand into containers of contaminated sharps. Containers for reusable sharps could be equipped with wire basket liners for easy removal during reprocessing, or employees could use tongs or forceps to withdraw the contents. Reusable sharps disposal containers may not be opened, emptied, or cleaned manually.

Containers need to be located as near to as feasible the area of use. In some cases, they may be placed on carts to prevent access to mentally disturbed or pediatric patients. Containers also should be available wherever sharps may be found, such as in laundries. The containers must be replaced routinely and not be overfilled, which can increase the risk of needlesticks or cuts.

HANDLING CONTAINERS

When employees are ready to discard containers, they should first close the lids. If there is a chance of leakage from the primary container, the employees should use a secondary container that is closable, labeled, or color coded and leak resistant.

Careful handling of sharps can prevent injury and reduce the risk of infection. By following these work practices, employees can decrease their chances of contracting bloodborne illness.

This is one of a series of fact sheets that discusses various requirements of the Occupational Safety and Health Administration's standards covering exposure to bloodborne pathogens. Single copies of fact sheets are available from OSHA Publications, Room N.3101, 200 Constitution Avenue, N.W. Washington, DC 20210 and from OSHA regional offices. Reproduced from the original by Robert Beauregard.

Bloodborne Personal Protective Equipment Cuts Risk Facts

U.S. Department of Labor Occupational Safety and Health Administration

Wearing gloves, gowns, masks, and eye protection can significantly reduce health risks for workers exposed to blood and other potentially infectious materials. The new OSHA standard covering bloodborne disease requires employers to provide appropriate personal protective equipment (PPE) and clothing free of charge to employees.

Workers who have direct exposure to blood and other potentially infectious materials on their jobs run the risk of contracting bloodborne infections from hepatitis B virus (HBV), human immunodeficiency virus (HIV) which causes AIDS, and other pathogens. About 8,700 health care workers each year are infected with HBV, and 200 die from the infection. Although the risk of contracting AIDS through occupational exposure is much lower, wearing proper personal protective equipment can greatly reduce potential exposure to all bloodborne infections.

SELECTING PPE

Personal protective clothing and equipment must be suitable. This means the level of protection must fit the expected exposure. For example, gloves would be sufficient for a laboratory technician who is drawing blood, whereas a pathologist conducting an autopsy would need considerably more protective clothing.

PPE may include gloves, gowns, laboratory coats, face shields or masks, eye protection, pocket masks, and other protective gear. The gear must be readily accessible to employees and available in appropriate sizes.

If an employee is expected to have hand contact with blood or other potentially infectious materials or contaminated surfaces, he or she must wear gloves. Single use gloves cannot be washed or decontaminated for reuse. Utility gloves may be decontaminated if they are not compromised. They should be replaced when they show signs of cracking, peeling, tearing, puncturing, or deteriorating. If employees are allergic to standard gloves, the employer must provide hypoallergenic gloves or similar alternatives.

Routine gloving is not required for phlebotomy in voluntary blood donation centers, though it is necessary for all other phlebotomies. In any case, gloves must be available in voluntary blood donation centers for employees who want to use them. Workers in voluntary blood donation centers must *use* gloves (1) when they have cuts, scratches or other breaks in their skin- (2) while they are in training. .and (3) when they believe contamination might occur.

Employees should wear eye and mouth protection such as goggles and masks, glasses with solid side shields, and masks or chin-length face shields when splashes, sprays, splatters, or droplets of potentially infectious materials pose a hazard through the eyes, nose or mouth. More extensive coverings such as gowns, aprons, surgical caps and hoods, and shoe covers or boots are needed when gross contamination is expected. This often occurs, for example, during orthopedic surgery or autopsies.

AVOIDING CONTAMINATION

The key *is* that blood or other infectious materials must not reach an employee's work clothes, street clothes, under skin, eyes, mouth, or other mucous membranes under normal conditions for the duration of exposure.

Employers must provide the PPE and ensure that their workers wear it. This means that if a lab coat is considered PPE, it must be supplied by the employer rather than the employee. The employer also must clean or launder clothing and equipment and repair or replace it as necessary.

Additional protective measures such as using PPE in animal rooms and decontaminating PPE before laundering are essential in facilities that conduct research on "HIV or HBV.

EXCEPTION

There is one exception to the requirement for protective gear. An employee may choose, temporarily and briefly, under rare and extraordinary circumstances, to forego the equipment. It must be the employee's professional judgment that using the protective equipment would prevent the delivery of health care or public safety services or would pose an increased hazard to the safety of the worker or co-worker. When one of these excepted situations occurs, employers are to investigate and document the circumstances to determine if there are ways to avoid it in the future. For example, if a firefighter's resuscitation device is damaged, perhaps another type of device should be used or the device should be carried in a different manner. Exceptions must be limited—this is not a blanket exemption.

DECONTAMINATING AND DISPOSING OF PPE

Employees must remove personal protective clothing and equipment before leaving the work area or when the PPE becomes contaminated. If a garment is penetrated, workers must remove it immediately or as soon as feasible. Used protective clothing and equipment must be placed in designated containers for storage, decontamination, or disposal.

OTHER PROTECTIVE PRACTICES

If an employee's skin or mucous membranes come into contact with blood, he or she is to wash with soap and water and flush eyes with water as soon as feasible. In addition, workers must wash their hands immediately or as soon as feasible after removing protective equipment. If soap and water are not immediately available, employers may provide other handwashing measures such as moist towelettes. Employees still must wash with soap and water as soon as possible.

Employees must refrain from eating, drinking, smoking, applying cosmetics or lip balm, and handling contact lenses in areas where they may be exposed to blood or other potentially infectious materials.

Material Safety, Data Sheet

Phenyltrimethylammonium hydroxide, 0.1M in methanol ACC# 28086

Section 1 - Chemical Product and Company Identification

MSDS Name: Phenyltrimethylammonium hydroxide, 0.1M in methanol

Catalog Numbers: AC422020000, AC422021000, AC422025000

Synonyms: Trimethylanilinium hydroxide; Benzenaminium, N, N, N-trimethyl-, hydroxide; Trimethylphenylammonium hydroxide; Phenyltrimethylammonium hydroxide.

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
67-56-1	Methyl alcohol	98.47	200-659-6
1899-02-1	Phenyltrimethylammonium hydroxide	1.53	217-592-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. Flash Point: 10 deg C.

Danger! Flammable liquid and vapor. Harmful if inhaled. May be fatal or cause blindness if swallowed. Causes respiratory tract irritation. Causes eye and skin irritation. May be absorbed through intact skin. May cause central nervous system depression. May cause liver, kidney and heart damage. This substance has caused adverse reproductive and fetal effects in animals. Cannot be made non-poisonous.

Target Organs: Kidneys, heart, central nervous system, liver, eyes.

Potential Health Effects

Eye: Produces irritation, characterized by a burning sensation, redness, tearing, inflammation, and possible corneal injury. May cause painful sensitization to light.

Skin: Causes moderate skin irritation. May be absorbed through the skin in harmful amounts. Prolonged and/or repeated contact may cause defatting of the skin and dermatitis.

Ingestion: May be fatal or cause blindness if swallowed. May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause systemic toxicity with acidosis. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. May cause cardiopulmonary system effects.

Inhalation: Harmful if inhaled. May cause adverse central nervous system effects including headache, convulsions, and possible death. May cause visual impairment and possible permanent blindness. Causes irritation of the mucous membrane.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion. Chronic exposure may cause reproductive disorders and teratogenic effects. Laboratory experiments have resulted in mutagenic effects. Prolonged exposure may cause liver, kidney, and heart damage.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Effects may be delayed. Ethanol may inhibit methanol metabolism.

Section 5 - Fire Fighting Measures

General Information: Containers can build up pressure if exposed to heat and/or fire. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. Vapors can travel to a source of ignition and flash back. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Water may be ineffective. Material is lighter than water and a fire may be spread by the use of water. Flammable liquid and vapor. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. May be ignited by heat, sparks, and flame.

Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective. Use agent most appropriate to extinguish fire. For large fires, use water spray, fog or alcohol-resistant foam. Do NOT use straight streams of water.

Flash Point: 10 deg C (50.00 deg F)

Autoignition Temperature: 464 deg C (867.20 deg F)

Explosion Limits, Lower: 6.0

Upper: 36

NFPA Rating: (estimated) Health: 1; Flammability: 3; Instability: 0

Section 6 – Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Clean up spills immediately, observing precautions in the Protective Equipment section. Use water spray to disperse the gas/vapor. Remove all sources of ignition. Provide ventilation. A vapor suppressing foam may be used to reduce vapors. Water spray may reduce vapor but may not prevent ignition in closed spaces.

Section 7 – Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Keep away from heat, sparks and flame.

Storage: Keep away from sources of ignition. Keep refrigerated. (Store below 4°C/39°F.) Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area. Store under an inert atmosphere. Do not store in aluminum or lead containers.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Methyl alcohol	200 ppm TWA; 250 ppm STEL; Skin - potential significant contribution to overall exposure by the cutaneous route	200 ppm TWA; 260 mg/m ³ TWA 6000 ppm IDLH	200 ppm TWA; 260 mg/m ³ TWA
Phenyltrimethylammonium hydroxide	none listed	none listed	none listed

OSHA Vacated PELs: Methyl alcohol: 200 ppm TWA; 260 mg/m³ TWA Phenyltrimethylammonium hydroxide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear chemical splash goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: clear, colorless

Odor: alcohol-like

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: 1.1

Evaporation Rate: Not available.

Viscosity: Not available.
Boiling Point: 64 deg C
Freezing/Melting Point:
Not available.
Decomposition Temperature: Not available.
Solubility: Miscible.
Specific Gravity/Density: 0.8
Molecular Formula: C₉H₁₅NO
Molecular Weight: 153.22

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: High temperatures, ignition sources.
Incompatibilities with Other Materials: Strong oxidizing agents, strong acids, caustics (e.g. ammonia, ammonium hydroxide, calcium hydroxide, potassium hydroxide, sodium hydroxide), aliphatic amines, isocyanates.
Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, formaldehyde.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 67-56-1: PC1400000

CAS# 1899-02-1: BT2275000

LD50/LC50:

CAS# 67-56-1:

Draize test, rabbit, eye: 40 mg Moderate;
Draize test, rabbit, eye: 100 mg/24H Moderate;
Draize test, rabbit, skin: 20 mg/24H Moderate;
Inhalation, rabbit: LC50 = 81000 mg/m³/14H;
Inhalation, rat: LC50 = 64000 ppm/4H;
Oral, mouse: LD50 = 7300 mg/kg;
Oral, rabbit: LD50 = 14200 mg/kg;
Oral, rat: LD50 = 5600 mg/kg;
Skin, rabbit: LD50 = 15800 mg/kg;

CAS# 1899-02-1:

Carcinogenicity:

CAS# 67-56-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 1899-02-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: Effects on Newborn: Behavioral, Oral, rat: TDLo=7500 mg/kg (female 17-19 days after conception). Effects on Embryo or Fetus: Fetotoxicity, Inhalation, rat: TCLo=10000 ppm/7H (female 7-15 days after conception). Specific Developmental Abnormalities: Cardiovascular, Musculoskeletal, Urogenital, Inhalation, rat: TCLo=20000 ppm/7H (7-14 days after conception).

Reproductive Effects: Paternal Effects: Spermatogenesis: Intraperitoneal, mouse TDLo=5 g/kg (male 5 days pre-mating). Fertility: Oral, rat: TDLo = 35295 mg/kg (female 1-15 days after conception). Paternal Effects: Testes, Epididymis, Sperm duct: Oral, rat: TDLo = 200 ppm/20H (male 78 weeks pre-mating).

Mutagenicity: DNA inhibition: Human Lymphocyte = 300 mmol/L. DNA damage: Oral, rat = 10 umol/kg. Mutation in microorganisms: Mouse Lymphocyte = 7900 mg/L. Cytogenetic analysis: Oral, mouse = 1 gm/kg.

Neurotoxicity: ACGIH cites neuropathy, vision and CNS under TLV Basis.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: 29.4 g/L; 96 Hr; LC50 (unspecified) Fish: Goldfish: 250 ppm; 11 Hr; resulted in death Fish: Rainbow trout: 8000 mg/L; 48 Hr; LC50 (unspecified) Fish: Rainbow trout: LC50 = 13-68 mg/L; 96 Hr.; 12 degrees C Fish: Fathead Minnow: LC50 = 29400 mg/L; 96 Hr.; 25 degrees C, pH 7.63 Fish: Rainbow trout: LC50 = 8000 mg/L; 48 Hr.; Unspecified Bacteria: Phytobacterium phosphoreum: EC50 = 51,000-320,000 mg/L; 30 minutes; Microtox test No data available.

Environmental: Dangerous to aquatic life in high concentrations. Aquatic toxicity rating: TLm 96>1000 ppm. May be dangerous if it enters water intakes. Methyl alcohol is expected to biodegrade in soil and water very rapidly. This product will show high soil mobility and will be degraded from the ambient atmosphere by the reaction with photochemically produced hydroxyl radicals with an estimated half-life of 17.8 days. Bioconcentration factor for fish (golden ide) < 10. Based on a log Kow of -0.77, the BCF value for methanol can be estimated to be 0.2.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series:

CAS# 67-56-1: waste number U154 (Ignitable waste).

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	METHANOL	METHANOL SOLUTION
Hazard Class:	3	3(6.1)
UN Number:	UN1230	UN1230
Packing Group:	II	II
Additional Info:		FLASHPOINT 12 C

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 67-56-1 is listed on the TSCA inventory.

CAS# 1899-02-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 67-56-1: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 67-56-1: immediate, fire.

CAS # 1899-02-1: immediate, delayed.

Section 313

This material contains Methyl alcohol (CAS# 67-56-1, 98.47%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 67-56-1 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 67-56-1 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, and Massachusetts.

CAS# 1899-02-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC

Directives Hazard Symbols:

TF

Risk Phrases:

R 11 Highly flammable.
R 23/24/25 Toxic by inhalation, in contact with skin and if swallowed.
R 39/23/24/25 Toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.
S 36/37 Wear suitable protective clothing and gloves.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 7 Keep container tightly closed.

WGK (Water Danger/Protection)

CAS# 67-56-1: 1
CAS# 1899-02-1: No information available.

Canada - DSL/NDSL

CAS# 67-56-1 is listed on Canada's DSL List.
CAS# 1899-02-1 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, D2A, D2B.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 67-56-1 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information
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MSDS Creation Date: 9/02/1997

Revision #7 Date: 10/03/2005

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Medical Chemical Corp.
1909 Centinela Ave.
Santa Monica, CA 90404
Phone (310)829-4304
Fax (310)453-1212

MSDS For Gram's Iodine

The following information is believed to be correct but is not warranted as such, nor does it purport to be all inclusive

Section 1 - Shipping Data

Description: An aqueous solution of iodine and potassium iodide in water.

DOT Shipping name: Not applicable Telephone Number for Information: (310)829-4304
DOT Hazard Class: Not applicable Emergency Telephone Number: (800)424-9300
DOT Identification Number: Unregulated Prepared By: **P.B.** Date: Mar. 30, 1995

Section II - Hazardous Ingredients/identity Information

Ingredients	CAS#	OSHA Pel	ACGIH TLV	%
Iodine	7553-56-2	1.0 mg/m ³ TWA ceiling	1.0 mg/m ³ TWA ceiling	0.33% w/v

Section III - Physical/Chemical Characteristics

Boiling Point: 100°C Specific Gravity: 1.01
Vapor pressure (mm Hg): 18 @ 20° C Evaporation Rate (water = 1): 1
Vapor Density (air = 1): 0.6 Solubility In Water: complete
Appearance and Odor: An opaque purple solution with the characteristic odor of iodine

Section IV - Fire and Explosion Hazard Data

Flash Point (method used): Not applicable Flammable Limits: Not applicable
Extinguishing Media: Not applicable.
Special Fire Fighting Procedures: Not applicable
Unusual Fire and Explosion Hazards: Pyrolysis will release corrosive iodine vapor.

Section V - Reactivity Data

Stability: The material is stable Conditions to Avoid: Heat
Incompatibilities: Nothing unusual.
Precautions To Be Taken In Handling And Storage: Store at room temperature.

Section VI - Health Hazard Data

Routes of Entry	Inhalation?	Skin?	Ingestion?
	yes	yes	yes

Health Hazards (Acute and Chronic): Large doses of iodine cause severe vomiting, diarrhea, abdominal pain, thirst, shock, fever, delirium, stupor and death. Prolonged exposure to iodine compounds may produce iodism and deficiency of thyroid hormone.

Carcinogenicity?	NTP?	IARC Monographs?	OSHA Regulated
no	no	no	no

Signs and Symptoms of Exposure: May cause contact dermatitis. Repeated exposure to iodine compounds may cause rash, swelling of the vocal cords, severe generalized allergic reaction, joint pain and swelling. Iodine is absorbed through intact skin.

Medical Conditions Generally Aggravates by Exposure: Individuals with thyroid, lung or kidney disease may wish to consult a physician before working with iodine compounds.

Emergency And First Aid Procedures: In case of eye contact, flush with water for at least 15 minutes and get medical attention if irritation persists. In case of skin contact, remove contaminated clothing and flush with water, get medical attention if irritation persists. In case of ingestion do not induce vomiting if patient is unconscious or extremely drowsy. Otherwise administer two glasses of water and induce vomiting. Get immediate medical attention even if symptoms improve.

Section VII - Precautions For Safe Handling And Use

Steps To Be Taken In Case Of Spill Or Release: Absorb with a suitable absorbent (such as paper towels) and dispose.

Waste Disposal Method: Usually not restricted but local ordinances vary. Iodine may often be neutralized with thiosulfate and flushed down drain with excess water. Insure compliance with all government regulations.

Section VIII - Control Measures

Respiratory Protection: Not required.

Ventilation: Ordinary general ventilation is usually sufficient.

Protective Gloves: Not required.

Eye Protection: Not required but laboratory safety goggles or similar products are recommended as part of good laboratory practice.

Other protective Clothing Or Equipment: Not required.

Work/hygienic Practices: Wash well after handling, especially before eating or smoking.

SIGMA-ALDRICH
MATERIAL SAFETY DATA SHEET

Date Printed: 02/25/2005
Date Updated: 30/06/2004
Version 1.4

Section 1 – Product and Company Information

Product Name	NIGROSIN WATER SOLUABLE
Product Number	N4754
Brand	SIGMA
Company	Sigma-Aldrich
Street Address	3050 Spruce Street
City, State, Zip, Country	SAINT LOUIS MO 63103 US
Technical Phone:	314-771-5765
Emergency Phone:	414-273-3850 Ext. 5996
Fax:	800-325-5052

Section 2 – Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
NIGROSIN	8005-03-6	No

EMERGENCY OVERVIEW

Caution: Avoid contact and inhalation

HMIS

HEALTH: 0
FLAMMABILITY: 0
REACTIVITY: 0

NFPA RATING

HEALTH: 0
FLAMMABILITY: 0
REACTIVITY: 0

For additional information on toxicity, please refer to section 11.

Section 4 – First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

INHALATION EXPOSURE

If inhaled, remove to fresh air. If breathing becomes difficult, call a physician.

DERMAL EXPOSURE

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes.

EYE EXPOSURE

In case of contact with eyes, flush with copious amount of water for at least 15 minutes. Assure adequate flushing by separating eye lids with fingers. Call a physician.

Section 5 – Fire Fighting Measures

FLASH POINT

N/A

AUTOIGNITION TEMP

N/A

FLAMMABILITY

N/A

EXTINGUISHING MEDIA

Suitable: Water spray, Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Section 6 – Accidental Release Measures

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear protective equipment.

METHODS FOR CLEANING UP

Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

Section 7 – Handling and Storage

HANDLING

User Exposure: Avoid inhalation. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE

Suitable: Keep tightly closed.

Section 8 – Exposure Controls/PPE

ENGINEERING CONTROLS

Mechanical exhaust required.

PERSONAL PROTECTIVE EQUIPMENT

Other: Wear appropriate government approved respirator, chemical-resistant gloves, safety goggles, other protective clothing.

GENERAL HYGIENE MEASURES

Wash thoroughly after handling.

Section 9 – Physical/Chemical Properties

Appearance

Physical State: Solid
Color: Black
Form: Fine crystals

Property

Value

At Temperature or Pressure

Molecular Weight	N/A	pH	N/A
BP/BP Range	N/A	MP/MP Range	N/A
Freezing Point	N/A	Vapor Pressure	N/A
Vapor Density	N/A	Saturated Vapor Conc.	N/A
SG/Density	N/A	Bulk Density	N/A
Odor Threshold	N/A	Volatile %	N/A
VOC Content	N/A	Water Content	N/A
Solvent Content	N/A	Evaporation Rate	N/A
Viscosity	N/A	Surface Tension	N/A
Partition Coefficient	N/A	Decomposition Temp.	N/A
Flash Point	N/A	Explosion Limits	N/A
Flammability	N/A	Autoignition Temp	N/A
Refractive Index	N/A	Optical Rotation	N/A
Miscellaneous Data	N/A	Solubility	N/A

N/A = not available

Section 10 – Stability and Reactivity

STABILITY

Stable: Stable.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Nitrogen oxides, Sulfur oxides.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

Section 11 – Toxicological Information

ROUTE OF EXPOSURE

Multiple Routes: May be harmful by inhalation, ingestion, or skin absorption. May cause irritation.

SIGNS AND SYMTOMS OF EXPOSURE

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

CONDITION AGGRAVATED BY EXPOSURE

The toxicological properties have not been thoroughly investigated.

Section 12 – Ecological Information

No data available.

Section 13 – Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

Section 14 – Transport Information

DOT

Proper shipping Name: None

Non-Hazardous for transport: This substance is considered to be non-hazardous for transport.

IATA

Non-Hazardous for Air Transport: Non-Hazardous for air transport.

Section 15 – Regulatory Information

EU ADDITIONAL INFORMATION

S: 22 24

Safety Statements: Do not breathe dust. Avoid contact with skin.

US CLASSIFICATION AND LABEL TEXT

US Statements: Caution: Avoid contact and inhalation

UNITED STATES REGULATORY INFORMATION

SARA LISTED: No

Section 16 – Other Information

DISCLAIMER

For R&D use only. Not for drug, household or other uses.

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc. shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2005 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

Material Safety Data Sheet
Potassium Hydroxide 0.2N Solution in Methanol

ACC# 21391

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium Hydroxide 0.2N Solution in Methanol

Catalog Numbers: S336 3, S336 500

Synonyms: None known.

Company Identification:

Fisher Scientific

1 Reagent Lane

Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
Not available	Potassium Hydroxide	0.56	215-181-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Not available.

Target Organs: None known.

Potential Health Effects The toxicological properties of this material have not been investigated. Use appropriate procedures to prevent opportunities for direct contact with the skin or eyes and to prevent inhalation.

Section 4 - First Aid Measures

Eyes: Not available.

Skin: Not available.

Ingestion: Not available.

Inhalation: Not available.

Notes to Physician: Treat symptomatically.

Section 5 - Accidental Release Measures

General Information: Not available.

Extinguishing Media: Not available.

Flash Point: 59 deg F (15.00 deg C)

Autoignition Temperature: Not applicable. **Explosion Limits, Lower:** 2.0
Upper: 12.0
NFPA Rating: Not published.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Not available.

Section 7 - Handling and Storage

Handling: Not available.
Storage: Not available.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls:
Exposure Limits
OSHA Vacated PELs:
Personal Protective Equipment
Eyes: Not available.
Skin: Not available.
Clothing: Not available.
Respirators: Not available.

Section 9 - Physical and Chemical Properties

Physical State: Not available.
Appearance: Not available.
Odor: Not available.
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: Not available.
Specific Gravity/Density: Not available.
Molecular Formula: Not available.
Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Not available.
Conditions to Avoid: Not available.

Incompatibilities with Other Materials: Not available.

Hazardous Decomposition Products: Not available.

Hazardous Polymerization: Not available.

Section 11 - Toxicological Information

RTECS#:

No CAS#s in product.

LD50/LC50:

Carcinogenicity:

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazard class	No information available
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.**Clean Air Act:**

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE**California Prop 65**

None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC****Directives Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:****WGK (Water Danger/Protection)****Canada - DSL/NDSL**

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Section 16 - Additional Information
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MSDS Creation Date: 3/23/2001

Revision #1 Date: 3/04/2004

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

SECTION K

TRANSPORTING, ACCESSIONING,

AND PROCESSING OF SAMPLES

MAGIC VALLEY REGIONAL MEDICAL CENTER

Title/Description:	COMPUTERIZED TUBE SYSTEM (CTS) PROCEDURE	
Applies To:	ALL EMPLOYEES	Test #: 709-09-020
Prepared by:	SANDRA JUSSEL MT (ASCP)	Supercedes No: 709-09-020 Dated 1999

Reviewed _____ Date _____
Reviewed _____ Date _____
Reviewed _____ Date _____

I. POLICY STATEMENT/PURPOSE:

A. The Computerized Tube System (CTS) is used to transport supplies, records, specimens, medications, and other small items. The purpose of this procedure is to establish guidelines for the operation of the system.

II. IMPLEMENTATION:

A. Users

1. Station numbers are assigned as they are implemented.
2. All users must be skill validated before being allowed to use the system. Training will consist of basic use of the system to transport materials, items that may not be send through the system, and correct packaging and immobilization of items being transported.

B. Basic System/Operating Instructions

1. Sending an Item

- a. The message STATION READY indicates your station is for sending a carrier. Hit does not display this message; see DISPLAY MESSAGES on Section II E of this policy.
- b. Place items to be sent in an empty carrier. Ensure that contents are immobilized and/or securely contained. (See packaging instructions Section IV).
- c. Close carrier and ensure that both latches are engaged. -
- d. Place carrier in dispatcher.
- e. Enter the correct destination station address using the keypad or press the pre-programmed Speed Dial key for the desired destination.
- f. Press SEND.
- g. The message SELECTION ACCEPTED PLEASE WAIT indicates your carrier has been accepted for processing and will be processed as soon as possible.
- h. For messages that may be displayed when a carrier cannot be dispatched, see DISPLAY MESSAGES Section II E in the procedure.
- i. If an item that you have sent has not arrived at its destination, contact Plant Engineering (ext 2080).

2. Clearing or Canceling a Transaction

- a. If an error is made while keying an entry, press CLEAR and start over.
- b. If an improper keyboard entry is made, a shot "beep" will sound. Press CLEAR and start over.
- c. If you wish to stop a transaction after the SEND button has been pressed and SELECTION ACCEPTED is displayed, press CANCEL. Note: The transaction cannot be canceled if the dispatcher has started to move.
- d. If TRANSACTION WAS ABORTED is displayed, press CANCEL and start over.

3. Receiving as Item
 - a. The messages INCOMING CARRIER and INCOMING SECURE CARRIER indicate carriers will be arriving at your station.
 - b. Remove catheters promptly to prevent receiver bin from becoming full and shutting off station, observing Standard Precautions when necessary. Note: If a carrier is suspected of being contaminated, follow the system Spill Procedures in Section VI, A of this procedure.
 - c. If carriers or latches are damaged, remove from system and send to Plant Engineering to be repaired.
 - d. Deleted step
 - e. If RETURN SURPLUS CARRIERS is displayed, send extra carriers including liners and Zip "N" Fold bag, to Station 0.

4. Carriers
 - a. There are normally four carriers assigned to each tube station. Extra carriers with no return designation should be returned to destination "0". Hoarding carriers will slow down the system. E.

5. Display Messages
 - a. DISPLAY MESSAGES
 1. The following are other display message possibilities and the appropriate action required.

<u>MESSAGES</u>	<u>ACTION</u>
a. Station Full	Empty your receiver bin
b. Station Scheduled Off	Call plant engineering (ext 2080)
c. Station Signed Off	See special function #83 (Sect. VII)
d. Station Not In Service	Call plant engineering (ext 2080)
e. Traffic Forwarded to X"	See special function #75 (Sect. VII)
f. Secure Carrier Arrived/Secure Authority Code	See special function #73 (Sect. VII)
g. Selection Full/Try Later	Call destination station to empty receiver bin
h. Selection Does Not Exist	Check selection
i. Selection Scheduled Off	Call plant engineering (ext 2080)
j. Selection Signed Off	Call destination
k. Selection Not In Service	Try again later
l. Selection Not Permitted	Call plant engineering (ext 2080)
m. Transaction Aborted	Press "cancel"/try again
n. Selection Accepted	No action required

C. ITEMS NOT APPROVED FOR TRANSPORT IN THE CTS SYSTEM

1. Laboratory
 - a. 24 hour urines collection containers
 - b. Blood specimens for Cryoglobulins
 - c. Blood specimens for Cold Agglutinin titers
 - d. Tissue specimens for Pathology
2. Pharmacy
 - a. IV or Irrigation bags larger than 2000 ml
 - b. Controlled Drugs
3. Other
 - a. Drinks or food items
 - b. Contaminated supplies (example: used surgical instruments)
 - c. Money/checks

d. **SHARPS SHOULD NOT BE PUT INTO THE TRANSPORT SYSTEM**

- e. Patient valuables
- f. Non-leaktight containers containing liquids
- g. Items over 7 lbs.
- h. Flammables (examples: colloidian, alcohol)
- i. Explosives (example: xylene)
- j. Radiation sources
- k. Medical records greater than 1/2' thickness
- l. More than ten 14 X 17 x-ray films at one time
- m. Personal items
- n. Platelets function screening

D. PACKAGING

1. Potentially dangerous or infectious items must be contained and transported in a manner that prevents breakage, leakage or contamination of the system. In accordance with Standard Precautions and OSHA Bloodborne Pathogen regulations, all blood and body fluids must be handled as potentially infectious. Refer to the Infection Control Plan in the Administrative Policy and Procedure Manual for handling of biohazard materials.
 - a. **DOUBLE BAG ALL FLUIDS and include an absorbent pad in the bag.**
 - b. Clean gloves must be worn while inserting or removing ANY specimens of blood and/or body fluids from carriers.
 - c. Leakage is primarily due to:
 1. Improper packaging and non-immobilization of contents.
 2. Use of non-leaktight containers or failure to tighten container lids.
 - d. To prevent spillage or breakage, remember:
 1. Containment prevents leakage
 2. Immobilization ensures integrity
 - e. A combination of Ziploc bags (such as the Bio-Hazard bags) and Zip "N" Fold pouches, and foam liners will be used to package and immobilize items. See the following for specific packaging procedures.
 1. Urine and Stool Specimens (120 mls or less plastic container)
 - a. Make sure container cap is secure and patient's name is on the specimen.
 - b. Place sealed and labeled specimen in Bio-hazard zip-lock bag containing an absorbent pad.
 - c. Completely seal bag. Place any accompanying paperwork into outside pocket of bag.
 - d. Place bag in Zip "N" Fold bag, completely sealing bag, and folding over until Velcro strip is engaged.
 - e. Place in carrier with appropriate size foam liner.
2. Blood/Body Fluids-Vacutainer Tubes
 - a. Place labeled tubes in Bio-hazard zip-lock bag. Multiple tubes must be rubber banded together or placed in individual sleeves of plastic tube holders.
 - b. Completely seal bag. Place any accompanying paperwork into outside pocket of bag.
 - c. Place bag in Zip "N" Fold bag, completely sealing bag, and folding over until Velcro strip is engaged.
 - d. Place in carrier with appropriate size foam liner.
3. Culture Specimens (Cultures, Sterile Containers Less than 150 ml)
 - a. Make sure specimen is securely contained in primary container. NOTE: Do not send needle attached to syringe. Remove needle and replace with STERILE Syringe Leur Lock Tip cap. If a sterile leur lock cannot be located, hand

- transport the syringe.
 - b. Place labeled specimen in Bio-hazard zip-lock bag.
 - c. Completely seal bag. Place any accompanying paperwork into outside pocket of bag.
 - d. Place bag in Zip "N" Fold bag, completely sealing bag, and folding over until Velcro strip is engaged.
 - e. Place in carrier with appropriate size foam liner.
4. Blood Gas Specimens
- a. Remove needle from syringe and replace with Syringe Leur Lock Tip.
 - b. Place labeled specimen in Bio-hazard zip-lock bag containing wet ice.
 - c. Completely close Ziploc bag. Place any accompanying paperwork into outside pocket of bag.
 - d. Place bag in Zip "N" Fold bag, completely sealing bag, and folding over until Velcro strip is engaged.
 - e. Place in carrier with appropriate size foam liner.
5. Blood Products
- a. Patient Care Units
 - 1. Call Blood Bank (ext. 2034) with any requests to sign out blood products.
 - 2. Send a Blood Products request to the lab, complete with the patient's addressograph card stamp, and the transfusing nurse's printed names and signature. The nurse will be listed in the LIS as the receiving person.
 - b. Blood Bank
 - 1. Sign out the product in LIS and log using Blood Product request form.
 - 2. Make sure product is securely contained in primary container with no leaks.
 - 3. Place labeled product in Plasma thawing bag containing an absorbent pad, and then into a second Biohazard zip-lock-bag.
 - 4. Call RN who will be starting the transfusion before product is sent to ensure prompt retrieval.
 - 5. Place bag in carrier with appropriate size foam liner.
NOTE: Blood Bank will call the sender if there is any problem with the specimen. If the blood product is not started within 30 minutes of leaving the Blood Bank, the product should be returned to the Blood Bank.
6. Specimens on glass slides
- a. Make sure patient's name is on the slide.
 - b. Place slide into plastic or firm cardboard slide folder. Fasten closed with a rubber band.
 - c. Place slide folder in Bio-hazard zip-lock bag.
 - d. Completely close Ziplock bag. Place any accompanying paperwork into outside pocket of bag.
 - e. Place bag in Zip "N" Fold bag, completely sealing bag, and folding over until Velcro strip is engaged.
 - f. Place in carrier with appropriate size foam liner.
7. Medications
- a. Make sure primary container is properly sealed and labeled.
 - b. Place labeled medication container in Ziplock bag. Do not use Specimen transport bags used by laboratory.
 - c. When sending Intravenous Immune Globulin serum, label ziplock bag with biohazard stickers.
 - d. Insert absorbent pad if liquid more than 25 ml. completely close bag.
 - e. Place bag in Zip "N" Fold "Clean" sealing bag, and folding over until

Velcro strip is engaged.

f. Place in carrier with appropriate size foam liner.

8). Chemotherapy

- a. Chemotherapy will be sent via the CTS system using the **Secure Transaction** feature. See procedures in Section IV G 6 for sending a secure transaction. Chemotherapy will be sent in special "seal tight" transport units. These transport units will be utilized only for Chemotherapy and will be returned to Pharmacy by nursing as soon as possible. Chemotherapy must be double-bagged in zip-lock bags and labeled as `CHEMOTHERAPY". If any seepage is detected inside the zip-lock bags, the dose must be returned to Pharmacy **BY HAND**. The transport unit will be returned to Pharmacy as soon *as* the dose is received on the nursing unit.

E. PROCEDURES FOR SENDING A SECURE TRANSACTION

1. Place properly latched carrier in dispatcher.
2. Press SPECIAL FUNCTION
3. Select #73.
4. Press ENTER.
5. Enter Authority Code.
6. Press ENTER.
7. Enter destination station number.
8. Press SEND
9. Carrier will dispatch is message SELECTION ACCEPTED is displayed.
10. Call destination station to give the Authority Code.

F. PROCEDURES FOR RECEIVING A SECURE TRANSACTION

1. Enter Authority Code (phoned to receiver by sender). Carrier will drop down into receiver station.
2. Press SPECIAL FUNCTION. Press Enter.
3. Select #73.
4. Press ENTER.
5. Enter Authority Code (phoned to receiver by sender). Carrier will drop down into receiver station.

G. DECONTAMINATION PRECEDURES

1. Responsibility of Environmental Services
 - a. Approved disinfectants:
 1. Carrier Liners: Soak in 10% bleach for 10 minutes. Rinse and allow to dry.
 2. Plastic Carriers: Soak in 10% BLEACH FOR 10 minutes. Rinse and allow to dry.
 3. Zip "N" Fold bags: Soak in 10% bleach for 10 minutes. Rinse and allow drying.
- NOTE: Do not autoclave plastic carriers *as* high temperature will damage

H. SYSTEM SPILL PROCEDURES

1. Procedure for Users

NOTE: Always utilize Standard Precautions when handling carriers that may be contaminated.

- a. Stop sending carriers from the station where the contamination was first noticed and initiate EMERGENCY SHUTDOWN from your station (if available at your station).
- b. Call Environmental Services (ext 2075) and Plant Engineering (ext 2080), page if no answer.
- c. Notify Environmental Services and Plant Engineering and state:
 1. Receiving station's number
 2. Sending station's number (if known)

3. Type of spill (specimen type and suspected amount)
 4. Time the contaminated carrier arrived (or was first noticed)
 5. Number of contaminated carriers that have arrived
 - d. Notify Infection Control (ext 2594) or Employee Health (ext 2881) of system spill.
 - e. Follow the Decontamination process in this procedure.
 - f. Remove contents of carrier using protective clothing (utilizing Standard Precautions).
 - g. If sample is CSF fluid or other non-recollectable sample, contact laboratory before discarding sample.
 - h. Call the sending station and request another specimen.
 - i. Contact Sterile Processing Department (ext 2062) for further decontamination of the carrier. Place the carrier in a biohazard waste bag and deliver to Central Sterile Processing.
 - j. Plant Engineering is responsible for decontamination of the system and will return the system to service when cleaning is completed.
 - k. Contact Environmental Services (ext 2075) for any spills outside of the station. (Example: carpet cleaning).
 1. The department that was first aware of the spill and initiated the system spill procedure should complete a Quality Assurance report and send to Plant Engineering.
2. Plant Engineering Action
- a. Immediately verify that the system has been shut down. The system can be turned off at the System Control Center (SCC) or at any station.
 - b. From the system transaction printout, verify from which station the carrier was dispatched and when. Use the riser diagram to determine the route that the carrier traversed from the source station to the destination station. Use the transaction printout to determine if other source station to the destination system. Use the transaction printout to determine if other transactions used that route or any part of it before the system was shut off.
 1. Determine from the "System Traffic Display" if any transactions were in process, when the system was shut off, used that route or any part of it.
 2. If any of these transactions used the same route or any part of it, determine their source and destination stations and clean out those routes in addition to the route in which the spill occurred.
 - c. Purge the entire system to clear the "Emergency Stop" status of the system. Be careful to assign contaminated stations as the recovery stations in those zones with contaminated routes. This procedure will eliminate the spread of contamination to other routes in contaminated zone.
 - d. From the SCC, individually schedule "Off" all stations on any zone with one or more contaminated routes.
 - e. Assign "Off Dispatch" to any station on contaminated routes. This will allow cleanout carriers to be sent back to the stations from which they were dispatched.
3. Procedure for Disinfecting Stations and Tubing
- a. The basic procedure consists of sending a carrier containing the cleanout bottle from station to station until all affected segments of the system have been traversed. This procedure will require one person except when cleaning the interzone lines, which will require two people and communication between them.
 - b. As the carrier travels through the tubing, the cleanout bottle dispenses the cleaning solution, while the carrier rubbing bands act as swabs.
 1. While wearing protective clothing, mix the appropriate cleaning solution (s 1:10, dilution of bleach is effective).
 2. Fill the cleanout bottle with cleaning solution to within V. inch of the top holes on

bottle.

3. Place the lid on the bottle.
 4. While maintaining the upright position of the bottle, place it in a carrier.
 5. Close and latch the carrier.
 6. Periodically check the level of the cleaning solution. When there is less than an inch of solution left in the bottle, refill it and towel dry the carrier rubbing bands.
- c. Environmental Services will disinfect the carpet in each affected station's receiver bin as you would any other carpet.
 - d. After cleaning, a slight amount of cleaning solution may remain in the tubing. This will not affect the system operation.
 1. Use diagnostics to clean out any contaminated interzone lines.
 - e. Turn the contaminated zones on.
 - f. Send the cleanout carrier back to yourself from all stations suspected of being contaminated to clean out the contaminated routes.
 - g. Reassign all stations on "off" schedules to their original on/off schedules when clean out is completed.
 1. When the schedules have been entered, the system will be fully operational.
 - h. Remember; use good judgment in cleaning up after an accident. Use the same precautions you would apply if the spill were out in the open.

I. DOWNTIME

1. If the CTS system is down for any scheduled or unscheduled maintenance, each department is responsible for following their contingency plan to manually transport materials. Plant Engineering will notify all user departments a minimum of 48 hours prior to scheduled downtime.
2. Any problems should be reported immediately to Plant Engineering (ext 2080).
3. If Plan Engineering is unable to correct the problem, they will be responsible for contacting Translogic for service.

J. SPECIAL FUNCTIONS

1. Special Functions are transactions that can be initiated can be initiated at the station by the user. Following Special Functions are available at all CTS:

<u>FUNCTION</u>	<u>CODE</u>
Stat Function	70
Transaction Tracking	71
Discontinue Tracking	72
Secure Transaction	73
Traffic Forwarding	74
Stop Traffic Forwarding	75
Carriers Present	80
Incoming Carrier Query	81
Sign-Off Request	82
Sign-On Request	83
Audible Full Station	84
Audible Carrier Station	85
Key Click	86
Emergency Shutdown	91 Initially

Special Function #91 Emergency Shutdown will be available at all CTS stations. Other Functions may be added as necessary.

III. EVALUATION

- A. All adverse occurrences will be reviewed by Infection Control, Employee Health, or Engineering and reported to the Safety Committee.

IV. REFERENCES

- A. Computerized Tube System Guidelines, Translogic Corporation, May 1999;

V. SUBMITTED BY

- A. Susan Morris, Director Lab
- B. Curtis Carmen, Safety Officer
- C. Trish Heath, Infection Control

Policy initiated/revised:

**COMPUTERIZED TUBE SYSTEM
USER SKILL VALIDATION**

Name: _____

Position: _____

Dept.: _____

Date: _____

Demonstrates the ability to perform in the following areas	Met	Not Met
Locates, reads and understands tube system procedure. Asks for clarification if needed.		
Defines and identifies items not approved for transport in the CTS system.		
Labeling specimens / appropriate documentation		
Packaging: <ul style="list-style-type: none"> • Bio-hazard bag • Ziploc bag • Zip & fold pouch • Rubber bands for multiple tubes / vials • Absorbent pads • Foam liners 		
Sending items in the system		
Closing carrier properly		
Sending and receiving a secure transaction		
STAT transaction		
Returning extra carriers to the system		
Standard Precautions and Infection Control issues		
Not following CTS procedure can lead to System Spill procedure: <ul style="list-style-type: none"> • Contamination of the system • System shutdown and cleaning for 8 hours • De-certification 		
Understands additional orientation is required before transporting blood products or chemotherapy agents through the system.		

Preceptor/Trainer Signature: _____ Initials: _____

Employee Signature: _____

MAGIC VALLEY REGIONAL MEDICAL CENTER

Location: MVRMC PHLEBOTOMY	
Procedure: BAR CODE LABEL PLACEMENT	Test #: 706-1-070
Prepared by: FRANCES MALONE	Original Date Written: 9/94
Revised by: ANGIE KNIGHT DTC-PHLEB TEAM LEADER	Date: 1/06
Approved by: _____	Date Executed: 1/06

Reviewed _____ Date _____
Reviewed _____ Date _____
Reviewed _____ Date _____

I. POLICY:

A. Bar code labels will be used wherever possible on specimen containers to decrease the possibility of sample misidentification.

II. PURPOSE:

A. To demonstrate the manner in which bar code labels need to be placed on specimen tubes that will be acceptable to the instruments or devices used to read the information.

III. POLICY IMPLEMENTATION:

A. Chemistry: Place the bar code over the tube label on pre-labeled tubes so that the name on the original label is still visible and aligned so that it reads from left to right from the stopper end of the tube. Wrinkles or misalignment will interfere with scanning.

1. 10 ml vacutainer tube: The left edge of the bar code label should be placed just below the red bar that says "CLOT ACTIVATOR".
2. 5 ml corvac tube: Place with the left edge just below the line that reads "CLOT ACTIVATOR".
3. 5 ml non-corvac tube: Place with the left edge just below the red bar that reads "NO ADDITIVE" or "LITHIUM HEPARIN".

B. Hematology: Place the bar code label on the sample tube with the end of the label flush with the stopper. The bars on the label must be parallel to the stopper. If the label is skewed more than 5°, the scanner may not read it.

C. Microbiology: The bar code label should be placed on the specimen and the small one on the requisition. Include all extra labels with requisition. Placement and alignment on the specimen should be as illustrated below.

D. Blood Bank: Use the small Hollister label from the left edge of the label sheet on the tube, placed just below the stopper. Place the medium-sized bar code label on the tube. Initial, date, and time should be written on the bar code label. Write the date on the Hollister label sheet (see example on next page).

IV. SUBMITTED BY:

Merlin Fullmer, MT (ASCP) Administrative Director

V. APPROVAL:

John Gray, M.D. Laboratory Medical Director

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Saint Alphonsus Regional Medical Center

Laboratory Policy for Labeling

Clear and accurate specimen identification is essential and must begin immediately upon collection and continue through disposal of the specimen.

Specimens should be labeled at the patient's bedside or ambulatory setting and consistently include the following information:

- patient's full name
- patient's ID number
- date of collection
- time of collection
- phlebotomist's initials

Patient location is optional for hand written labels. Computer labels will indicate location. Phlebotomist's initials are necessary to help clarify questions about the specimen if any arise during laboratory processing or testing.

ROUTINE LABELING/COMPUTER LABEL AVAILABLE

- a. For samples which have computer labels printed before the patient is drawn, the preprinted label may be placed on the tube at the time of the draw. This includes routine outpatient and inpatient blood samples and outpatient urine collection.

PRELABELING TUBES IS NOT RECOMMENDED. Identification mistakes can easily be made if pre-labeled tubes are not used, then inadvertently selected for use when drawing blood from another patient.

- b. It is the responsibility of the phlebotomist to verify patient identification according to policy and to double check computer labels for accuracy of information. If errors exist (i.e. incorrect spelling, wrong time of draw, wrong age, wrong sex, etc.), the phlebotomist should change the information on the label and in the computer or alert front office personnel to make these changes. Labels can be reprinted after information has been corrected.
- c. Labeling is the responsibility of the person obtaining the specimen. To avoid mix-up of specimens, ONLY the person obtaining the specimen should handle the sample(s) in question.

ROUTINE LABELING/COMPUTER LABEL NOT AVAILABLE

- a. All blood samples drawn without preprinted labels (i.e. in Emergency Department) must be labeled at the patient's bedside with patient's first and last name before being transported back to the lab for analysis.
- b. Specimens drawn outside the hospital by laboratory personnel are included and must meet in house standards. House call specimens (from nursing homes, private homes, businesses, health fairs, clinics, other hospitals, etc.) must be labeled at the site of collection before delivery to the laboratory for processing.

After the specimen is returned to the lab, a computer label should be generated (by Central Processing during the hours they are open & by front office at other times) and placed on the tube. Responsible phlebotomist is determined from house call book. Person applying computer label is responsible for double checking computer labels for accuracy, as in B above.

Computer labels are NOT to be placed over the hand-written label for any cross match tube to be used by Transfusion Service. The entire original label on the tube, including initials of the phlebotomist, must be legible.

CONTINGENCY LABELING WHEN COMPUTER IS DOWN

- a. If the laboratory computer system is down, all labels need to be handwritten. This is done in accordance with Sunquest down-time protocol. Labels will be generated by front office.
 1. Using blank labels (located in the office) with down-time accession numbers assigned, print patient's first and last name, date and time of draw, identification number, patient location, and test(s) to be done. Use the same format as the preprinted labels, or write above information on pre-pasted labels on vacuum tubes.
 2. Use an extra label with the above information to document workload. Workload can be entered in Sunquest when computer is back up.
- b. Tubes drawn for cross match or possible cross match must have patient's hospital number, fluorescent sticker, and date of birth, as well as the above information. Date and time of draw are critical information for cross match tubes, since these can only be used for 72 hours.
- c. When the Sunquest computer system is down, down-time labels and the IHS order slip should accompany each tube of blood. Date and time must also be recorded on the IHS slip to expedite subsequent entry of results in computer and to avoid confusion should there be several samples on a patient drawn at different times.

SPECIMENS NOT GENERATED BY LABORATORY

- a. All specimens (blood, urine, culture material, etc) submitted from other hospital departments or from outside the laboratory must be legibly labeled with patient's first and last name to avoid errors in patient identification. Addressograph labels may be used. Date and time of collection is required for transfusion service specimens and is preferred for all specimens submitted.
- b. The person who accepts a sample is responsible for making sure the labeling and identification meet laboratory criteria.

SPECIAL INSTRUCTIONS

- a. **ABGS...**Arterial specimen submitted for blood gas analysis (ABGs) must have patient's first and last name, time the sample was drawn, and amount of O₂, if any, being administered. Indicate room air for patients not on O₂.
- b. **MICROBIOLOGY...**All specimens received in the Microbiology Department must be labeled with patient's first and last name, source of culture and date of collection. The specimen must be accompanied with the proper requisition which includes patient's name, room number, hospital number, and doctor's name, source of culture, test requested, and time of collection. Specimens should be processed immediately upon arrival in the laboratory. Sample(s) and requisition(s) should be taken to Microbiology.

Specimens which fail to meet the above criteria, but which cannot be collected again, may be properly labeled and/or identified by i.e. nursing personnel, if they come to the department within 15 minutes and verify the proper identification of the specimen and/or provide information as needed. Specimens not meeting the above criteria which can be collected again will be discarded and another specimen will be requested.

- c. **TRANSFUSION SERVICE...**Computer labels should not be placed on top of hand written label on cross match tubes. Original labeling cannot be covered by computer label. Put the computer label next to original label. Take extra computer labels to blood bank.
- d. **URINALYSIS...**Indicate if specimen is other than a routine collection i.e. clean catch, catheterized, suprapubic tap, etc.). This information is needed for computer entry.
- e. **MISCELLANEOUS CONTAINERS...**Capillary tubes, microcollection tubes and vials, or other containers without labels must be identified either by:
 1. Marking directly with permanent felt tip pen
 2. Wrapping adhesive label around tube(s)
 3. Placing tubes into larger labeled test tube for transport (individual tubes must also be labeled)
 4. Placing small printed computer labels on tubes (large labels could be used on larger transport tubes)

- f. **CLINICAL DATA**...Therapeutic drug levels must have pertinent clinical data for time of draw. Information of patient use of anticoagulants must be included for coagulation testing. Antibiotics given and suspected micro-organism information is important for the harvesting of bacteria in microbiology. Any other clinical data which would be important to the proper testing and resulting of laboratory tests must be provided by the person ordering the test.

UNLABELED, INCOMPLETE, OR IMPROPERLY LABELED TUBES OR SPECIMENS CANNOT BE ACCEPTED BY THE LABORATORY

- a. In the case of unacceptable blood samples, the patient must be redrawn, with strict attention to proper identification and labeling procedures.
- b. It is the responsibility of the person who submits unlabeled tubes to redraw the patient or to see that the patient is redrawn, and to fill out occurrence report.
- c. Appropriate disciplinary action will occur upon repeated violations of policy.

REFERENCES

Garza, Becan-McBride (1994). Phlebotomy Handbook, Fourth Edition.

NCCLS Procedures for the Collection of Diagnostic Blood Specimens by Venipuncture. Second Edition. 1984.

So You're Going To Collect A Blood Specimen. 6th Edition. 1994.

McCall, Tankersley(1994). Phlebotomy Essentials.

SECTION L

QUALITY ASSURANCE

QUALITY CONTROL

**LAB QA TRACKING FORM
MAGIC VALLEY REGIONAL MEDICAL CENTER**

PERSON REPORTING ERROR: _____

DATE REPORTED: _____

PATIENT NAME: _____

SPECIMEN NUMBER: _____

ERROR DETECTED BY: LAB CUSTOMER

DATE AND TIME COLLECTED: _____

PERSON RESPONSIBLE FOR ERROR: _____

SPECIMENT ERROR DESCRIPTION:

CORRECTIVE ACTION AND RESOLUTION:

PERSON RESPONSIBLE NOTIFIED: YES NO

**ST. ALPHONSUS REGIONAL MEDICAL CENTER
LABORATORY INTERNAL QUALITY IMPROVEMENT**

PATIENT NAME:	LOCATION:
DEPARTMENT INVOLVED:	DATE & TIME:

ORDER PROBLEM:	COLLECTION PROBLEM:	RESULT PROBLEM:
<input type="checkbox"/> Incorrect Patient	<input type="checkbox"/> Clot in Tube	<input type="checkbox"/> Clot in Specimen
<input type="checkbox"/> Incorrect Date & Time	<input type="checkbox"/> Improper Collection Technique	<input type="checkbox"/> Comment Not Entered for C&S
<input type="checkbox"/> Incorrect Location	<input type="checkbox"/> Improper Mixing	<input type="checkbox"/> Delta Values Ignored
<input type="checkbox"/> Incorrect Physician	<input type="checkbox"/> Incomplete Information on Label	<input type="checkbox"/> Failure to Include Comment
<input type="checkbox"/> Missed Test on Requisition	<input type="checkbox"/> Incorrect Collection Time	<input type="checkbox"/> Heparin Contamination
<input type="checkbox"/> Test Canceled by Mistake by Lab	<input type="checkbox"/> Incorrect Patient Drawn	<input type="checkbox"/> Inaccurate Results Caught Before Released
<input type="checkbox"/> Other	<input type="checkbox"/> Incorrect Test Drawn	<input type="checkbox"/> Inaccurate Result Released
	<input type="checkbox"/> Incorrect Tube Drawn	<input type="checkbox"/> Incorrect Calculation
	<input type="checkbox"/> Insufficient Amount of Specimen	<input type="checkbox"/> Incorrect Labeling in Histology
	<input type="checkbox"/> Specimen Handled Improperly	<input type="checkbox"/> Incorrect Patient Resulted
	<input type="checkbox"/> Spec. Not Received in Reasonable Time	<input type="checkbox"/> Panic Value Not Called
	<input type="checkbox"/> Specimen Stored Incorrectly	<input type="checkbox"/> Platelets Clumped
	<input type="checkbox"/> Unlabeled Specimen	<input type="checkbox"/> Specimen Icteric Not Commented
	<input type="checkbox"/> Wrong on Tube	<input type="checkbox"/> Specimen Hemolyzed Not Commented
	<input type="checkbox"/> Other	<input type="checkbox"/> Specimen Lipemic Not Commented
		<input type="checkbox"/> Turnaround Time Too Long
		<input type="checkbox"/> Other

DESCRIPTION OF PROBLEM:

CORRECTIVE ACTION/SOLUTION TAKEN:

REPORTED BY _____ (OPTIONAL)

INVESTIGATION FORM FOR OCCURRENCE REPORTING SYSTEM

INSTRUCTIONS: Complete this form for all significant events and for all employee accidents. Send it with the Occurrence Report form. If this is an employee accident, fill out NOTICE OF INJURY FORM also. Send EMPLOYEE ACCIDENT FORMS DIRECTLY to OCCUPATIONAL HEALTH NURSE AS SOON AS POSSIBLE.

PERSON INVOLVED: _____ **DATE:** _____

PART 1: TO BE COMPLETED BY EMPLOYEE:

A. Describe what happened and the circumstances under which the event occurred:

B. Were corrective actions required? YES NO
If yes, please describe them:

C. How will you change your practice to prevent a recurrence?

SIGNATURE OF EMPLOYEE: _____

PART 2: TO BE COMPLETED BY SUPERVISOR:

What actions were taken to prevent recurrence of event?
Actions may include, but are not limited to the following:

<input type="checkbox"/> Education to Individual	<input type="checkbox"/> Education to Staff	<input type="checkbox"/> Counsel to Individual
<input type="checkbox"/> Contract Performance Plan	<input type="checkbox"/> Work Order for Repair	<input type="checkbox"/> Request for Replacement
<input type="checkbox"/> Back School	<input type="checkbox"/> Other – Describe:	

SIGNATURE OF SUPERVISOR: _____

Accident Committee Review Date: _____ Reviewed by: _____
Another Review Needed: YES NO If YES, Why: _____

QC Reference

The Clinical Laboratory Improvement Amendments:

Prompted by press and television reports of deaths resulting from misdiagnosed Pap smears, Congress passed the Clinical Laboratory Improvement Amendments (CLIA) of 1988. The CLIA are intended to regulate all human testing and apply to anyone who performs testing of human specimens for the diagnosis, prevention, or treatment of disease or health problems.

Three categories of testing have been established: waiver tests, moderate complexity tests, and high complexity tests. Waiver tests are simple, stable tests that require a minimal degree of judgment and interpretation. Waiver tests also include tests approved by the Food and Drug Administration (FDA) for patient self -testing at home.

Moderately complex tests make up approximately 75% of the 10,000 laboratory tests and test methods performed on human specimens in bacteriology, mycobacteriology, mycology, parasitology, virology, immunology, chemistry, hematology, and immunohematology. High complexity tests include the more complex tests performed in each of these disciplines as well as those performed in clinical cytogenetics, histopathology, histocompatibility, and cytology disciplines.

All laboratories, including waiver laboratories, must participate in three proficiency testing events each year and at least one on-site inspection to maintain a certificate of approval to perform the tests and continue receiving Medicare laboratory payments.

Quality Assurance:

The CLIA requirements include a QA program for all laboratory testing. QA is an ongoing program designed to monitor and evaluate objectively and systematically the quality and appropriateness of patients care, to pursue opportunities to improve patient care, and to resolve identified problems in the laboratory. The six characteristics of any QA assurance program include the following:

1. Written policies on the standards of patient care and professional behavior.
2. A QC program
3. A training and continuing education program
4. An instrument maintenance program
5. Documentation requirements
6. Evaluation methods and frequency

Quality Control:

In the laboratory, QC methods include the following:

1. Running control samples for each test performed
2. Reagent management
3. Instrument calibration
4. Documentation
5. Preventive maintenance of the equipment.

A control sample is a manufactured sample that resembles a human specimen. The control sample has an exact, known value. Each time a test is performed, a control sample should be run as if it were another patient specimen to ensure that the reagents, temperatures, instruments, and techniques at the time the test is performed are within an acceptable range of accuracy. Control samples also should be run every time a

new kit or new lot of reagents is opened to ensure that the materials have not been damaged or altered in shipping or storage.

For qualitative tests, a positive and negative control sample should be run; for quantitative tests, at least two samples of different concentrations should be run.

Reagents are testing substances used to produce chemical reactions. Each resulting chemical reaction helps the physician to detect or measure a change in a body function or to identify the characteristics of a condition or disease.

Each reagent is manufactured with a lot number and an expiration date. Reagent package inserts describe the stability of the reagent, its expected shelf-life, and storage requirements. Both the lot number and the expiration date must be recorded into a reagent QC log both when it is received and on the date it is opened. The log helps to identify reagents that should be replaced. Reagents and control samples should be carefully labeled. The labels should indicate the identity, storage requirements, preparation dates, and expiration dates. Do not use expired reagents or interchange different lot numbers of reagents.

Quality control logs must be updated every time a control sample is run. The entry should include the date and time, the expected results of the control, whether the expected results were obtained, and any corrective actions taken.

Should a control sample or standard fail, the expiration dates of all reagents should be checked first, if the expiration date is not the problem, then a control sample should be repeated using reagents with different lot numbers.

A QC daily worksheet helps with the review of reagent and control expiration dates and provides documentary proof that reagents and equipment are functioning properly.

STUDENT CHECKLISTS OF ABILITIES

Learner's Name _____

Date _____

Checklist for Handwashing Techniques

Equipment:

- Soap
- Brush
- Paper towels
- Warm water

Note: sink and door handle are considered contaminants.

1.	Turn on water and adjust the temperature.	YES	NO
2.	Wet hands with fingertips pointed downward.	YES	NO
3.	Apply soap to hand and wrists (using enough soap to produce a lather).	YES	NO
4.	Rub hands in a circular motion, washing fingers by interlacing back and forth between each other, back of hands and wrists (for 15 seconds) (add water when necessary to keep moist).	YES	NO
5.	Use a nail brush if necessary. If none is available, rub fingernails on palms of hands.	YES	NO
6.	Rinse hands from the wrist to the fingers with fingertips pointed downward.	YES	NO
7.	Dry hands with a paper towel; discard wet towel	YES	NO
8.	Turn off faucet with a dry paper towel (the faucet is always considered dirty).	YES	NO
9.	Throw the paper towel into the wastebasket. (Do not touch sink.)	YES	NO
10.	Leave area clean and neat.	YES	NO

Comments:

Satisfactory Demonstration: YES NO

Student Signature _____

Evaluator's Signature _____

Learner's Name _____

Date _____

Checklist for Donning and Removing Gloves

- | | | | |
|----|--|-----|----|
| 1. | Wash hands. | YES | NO |
| 2. | Put on clean gloves. (If wearing gown, be sure cuff of gloves overlaps cuff of gown.) | YES | NO |
| 3. | When removing gloves, use preferred hand to pull off opposite glove without touching inside of opposite gloves. Discard glove. | YES | NO |
| 4. | Remove second glove by reaching inside the glove with ungloved hand and pull glove off. Discard glove. | YES | NO |
| 5. | Wash hands. | YES | NO |

Comments:

Satisfactory Demonstration: YES NO

Student Signature _____

Evaluator's Signature _____

Learner's Name _____

Date _____

Checklist for Donning and Removing Masks

Donning

- | | | | |
|----|---|-----|----|
| 1. | Wash hands. | YES | NO |
| 2. | Pick up clean mask and unfold if necessary. | YES | NO |
| 3. | Place mask over nose and mouth. | YES | NO |
| 4. | Tie top and then lower strings behind head. | YES | NO |

Removing

- | | | | |
|----|---|-----|----|
| 1. | If wearing gloves, remove gloves first and then wash hands.
(See checklist for gloving.) | YES | NO |
| 2. | Untie strings of mask in back of head. | YES | NO |
| 3. | Remove mask by holding strings and discard. | YES | NO |
| 4. | Wash hands. | YES | NO |

NOTE: If wearing gown, gown can be removed first, wash hands, and then proceed with mask.

Comments:

Satisfactory Demonstration:

Student Signature _____

Evaluator's Signature _____

Learner's Name _____

Date _____

Checklist for Donning and Removing an Isolation Gown

Donning

- | | | | |
|----|--|-----|----|
| 1. | Wash hands; roll up sleeves if wearing any sleeves. | YES | NO |
| 2. | Unfold gown so that opening is at the back. | YES | NO |
| 3. | Put arms into sleeves of gown and pull up over hands. | YES | NO |
| 4. | Tighten gown close around the neck and around uniform, making sure that uniform is covered completely. | YES | NO |
| 5. | Tie neck tie or fasten appropriately. (Note: Neck band and ties are always considered clean.) | YES | NO |
| 6. | Grasp ties on front and bring to back. | YES | NO |
| 7. | Grasp edges of back and pull together, making sure they cover uniform. | YES | NO |
| 8. | Tie waist ties. (Note: Waist ties are contaminated after being in unit.) | YES | NO |

Removing

- | | | | |
|-----|---|-----|----|
| 1. | Untie the waist ties. | YES | NO |
| 2. | If not wearing gloves: | | |
| | a. Wash hands and dry with paper towel. | YES | NO |
| | b. Turn off faucet with dry paper towel. | YES | NO |
| 3. | If wearing gloves, remove and discard in trash container in room. | YES | NO |
| 4. | Wash hands using dry paper towel to dry hands.
Use dry paper towel to turn off faucet. | YES | NO |
| 5. | Untie ties at the neck and reach inside neck band with both hands, pulling gown from inside away from you. Roll gown into a ball, inside out, as you take gown off. | YES | NO |
| 6. | Dispose of paper gowns in trash, linen gowns in hamper. | YES | NO |
| 7. | Remove mask. (Note: Ties on mask are always considered clean.)
Dispose accordingly, depending on whether mask is disposable or linen. | YES | NO |
| 8. | Wash hands using a dry paper towel to turn off faucet and a different dry paper towel to dry hands. | YES | NO |
| 9. | Open door with paper towel. Dispose of towel in unit before leaving. | | |
| 10. | Wash hands. | YES | NO |

Comments:

Satisfactory Demonstration: YES NO

Student Signature _____

Evaluator's Signature _____

Learners' Name _____

Date _____

Checklist for Venipunctures using the Evacuated Tube method

1.	Greet and identify patient	YES	NO
2.	Introduce yourself.	YES	NO
3.	Verify the lab tests.	YES	NO
4.	Wash hands and put on gloves.	YES	NO
5.	Explain the procedure to the patient.	YES	NO
6.	Position and prepare the patient.	YES	NO
7.	Assemble equipment.	YES	NO
8.	Apply the tourniquet.	YES	NO
9.	Palpate and locate vein.	YES	NO
10.	Remove the tourniquet	YES	NO
11.	Cleanse the site with alcohol wipe and allow to air dry.	YES	NO
12.	Reapply the tourniquet (if necessary).	YES	NO
13.	Examine the needle.	YES	NO
14.	Anchor the vein.	YES	NO
15.	Insert the needle into the vein at the appropriate angle.	YES	NO
16.	Advance and change the tubes in the correct order of draw.	YES	NO
17.	Remove the tourniquet (if not already done so upon venous access).	YES	NO
18.	Invert tubes as soon as they are removed from the adaptor.	YES	NO
19.	Remove the last tube from the adaptor before removing the needle.	YES	NO
20.	Remove the needle.	YES	NO
21.	Apply pressure at the site with gauze.	YES	NO
22.	Immediately activate the needle safety device.	YES	NO
23.	Label all tubes with necessary information.	YES	NO
24.	Check the site and apply bandage.	YES	NO
25.	Thank the patient	YES	NO
26.	Dispose of all used supplies in appropriate containers.	YES	NO
27.	Remove gloves and wash hands.	YES	NO
28.	Deliver specimens to the appropriate area.	YES	NO

Comments:

SATISFACTORY DEMONSTRATION

YES

NO

Student Signature _____

Evaluator Signature _____

Learners' Name _____

Date _____

Checklist for venipunctures using the Syringe Method

1.	Greet and identify patient	YES	NO
2.	Introduce yourself.	YES	NO
3.	Wash hands and put on gloves.	YES	NO
4.	Explain the procedure to the patient.	YES	NO
5.	Position and prepare the patient.	YES	NO
6.	Assemble equipment.	YES	NO
7.	Apply the tourniquet.	YES	NO
8.	Palpate and locate vein.	YES	NO
9.	Remove the tourniquet	YES	NO
10.	Cleanse the site with alcohol wipe and allow to air dry.	YES	NO
11.	Reapply the tourniquet (if necessary).	YES	NO
12.	Check syringe plunger to free movement	YES	NO
13.	Examine the needle.	YES	NO
14.	Anchor the vein.	YES	NO
15.	Insert the needle into the vein at the appropriate angle.	YES	NO
16.	Pull back the plunger evenly to withdraw the blood.	YES	NO
17.	Remove the tourniquet.	YES	NO
18.	Remove the needle.	YES	NO
19.	Apply pressure to the site using gauze.	YES	NO
20.	Immediately activate the needle safety device.	YES	NO
21.	Remove the needle and dispose in sharps container if using a syringe adaptor.	YES	NO
22.	Apply the syringe to the adaptor and fill tubes using the appropriate order of draw.	YES	NO
23.	Immediately invert the tubes after filling	YES	NO
24.	Label all tubes with necessary information.	YES	NO
25.	Check the site and apply bandage.	YES	NO
26.	Thank the patient	YES	NO
27.	Dispose of all used supplies in appropriate containers.	YES	NO
28.	Remove gloves and wash hands.	YES	NO
29.	Deliver specimens to the appropriate area.	YES	NO

Comments:

SATISFACTORY DEMONSTRATION

YES

NO

Student Signature _____

Evaluator Signature _____

Learners' Name _____

Date _____

Checklist for venipunctures using the Winged Infusion Method

1.	Greet and identify patient	YES	NO
2.	Introduce yourself.	YES	NO
2.	Verify the lab tests.	YES	NO
3.	Wash hands and put on gloves.	YES	NO
4.	Explain the procedure to the patient.	YES	NO
5.	Position and prepare the patient.	YES	NO
6.	Assemble equipment.	YES	NO
7.	Apply the tourniquet.	YES	NO
8.	Palpate and locate vein.	YES	NO
9.	Remove the tourniquet	YES	NO
10.	Cleanse the site with alcohol wipe and allow to air dry.	YES	NO
11.	Reapply the tourniquet (if necessary).	YES	NO
12.	Anchor the vein.	YES	NO
13.	Holding the butterfly wings, insert the needle at appropriate angle.	YES	NO
14.	Hold the needle in place by one wing with thumb of opposite hand.	YES	NO
15.	Collect sample using the correct order of draw inverting tubes after filling	YES	NO
16.	Release the tourniquet (if not already done).	YES	NO
17.	Remove the needle and apply pressure to the site using gauze	YES	NO
18.	Immediately activate the needle safety device.	YES	NO
19.	Discard needle and tubing in sharps container.	YES	NO
20.	If using syringe, attach syringe to adaptor and fill tubes using the correct order of draw and inverting the tubes.	YES	NO
21.	Label all tubes with necessary information.	YES	NO
22.	Check the site and apply bandage.	YES	NO
23.	Thank the patient	YES	NO
23.	Dispose of all used supplies in appropriate containers.	YES	NO
24.	Remove gloves and wash hands.	YES	NO
26.	Deliver specimens to the appropriate area.	YES	NO

Comments:

SATISFACTORY DEMONSTRATION YES NO

Student Signature _____

Evaluator Signature _____

Learners' Name _____

Date _____

Checklist for Active Communication

Upon entering a room to communicate be sure to:

- a. knock on door; wait for response
- b. greet patient by preferred name; (check wristband to identify as needed)

1.	Listens carefully for feelings as well as words.	YES	NO
2.	Uses eye contact during the conversation.	YES	NO
3.	Shows sensitivity to feelings.	YES	NO
4.	Tone of voice is appropriate.	YES	NO
5.	Verbal and non-verbal responses are appropriate in choice of words and gestures.	YES	NO
6.	Uses silence when appropriate.	YES	NO
7.	Gives time for respondent to answer.	YES	NO
8.	Clarifies what the message is.	YES	NO
9.	Repeats important words or ideas of respondent.	YES	NO
10.	Uses open-ended sentences, avoiding Yes and No answers.	YES	NO
11.	Uses touch and other non-verbal techniques when appropriate.	YES	NO
12.	Avoids judgments or value statements.	YES	NO
13.	Summarizes, using respondent's words to help clarify the message.	YES	NO

Comments:

Satisfactory Demonstration: YES NO

Student Signature_____

Evaluator's Signature_____

Learners' Name _____

Date _____

Checklist For Answering the Telephone at the Healthcare Facility

1.	Uses friendly voice with a "smile.	YES	NO
2.	Identify self and institution with "May I help you?"	YES	NO
3.	Uses moderate tone; avoid high, screeching voice.	YES	NO
4.	Answers telephone promptly (by second ring).	YES	NO
5.	Holds receiver about 1 inch from lips.	YES	NO
6.	Takes complete message: name, telephone number, message summary, date, time, action taken, initials form.	YES	NO
7.	Uses discretion if person called is busy.	YES	NO
8.	Returns promptly to caller if caller is placed on "Hold."	YES	NO
9.	Follows policy if caller is irate or angry.	YES	NO
10.	Completes call by saying "Thank you for calling."	YES	NO

Comments:

Satisfactory demonstration: YES NO

Student Signature_____

Evaluator's Signature_____

FORMS FOR CLINICAL ROTATION

PHLEBOTOMY CHECKLIST OF ABILITIES

Students name: _____ Date: _____

(Check mark indicates that understanding is acceptable)

- ___ Identifies the major departments of the lab, knows the basic procedures (tests) run in each. Can collect the specimen requirements for each after only a brief explanation.
- ___ Understands that each facility has some procedures that may differ from others and easily adapts to yours.
- ___ Understands the importance and use of Personal Protective Equipment.
- ___ Knows the most appropriate sites for drawing blood as well as where to look when those aren't good.
- ___ Demonstrates adequate understanding of all equipment used in venipuncture and when to use it.
- ___ Demonstrates proper patient preparation. (making proper approach to a patient to inform them of the procedure and make them feel comfortable).
- ___ Demonstrates proper patient identification for in-patients and outpatients.
- ___ Demonstrates proper venipuncture site preparation, tourniquet placement, palpation and cleansing.
- ___ Demonstrates proper venipuncture collection.
- ___ Demonstrates proper care of wound after the venipuncture and concern for the patient's safety throughout the procedure.
- ___ Demonstrates proper specimen labeling.
- ___ Demonstrates understanding of Standard Precautions and disposal of used venipuncture equipment.
- ___ Demonstrates proper transport of specimens to the lab with understanding of time restrictions.
- ___ Demonstrates ethical behavior with emphasis on confidentiality, realization of professional liability, and importance of following protocol.

Comments:

Preceptor's signature: _____

Sample letter to phlebotomy clinical preceptors

Phlebotomy Preceptors,

Thank you for your willingness to be a preceptor for one of the phlebotomy students from the College of Southern Idaho. The goal of the phlebotomy course is to prepare them for the ASCP national certification exam. In order for each student to complete the course they must first attend lectures and labs at the college, with a minimum of 40 hrs. Currently the hours average approximately 50-55.

Also, as a requirement for ASCP testing the phlebotomy student must complete clinical laboratory experience that must include:

- 120 hours completed in a lab setting
- 100 successful venipunctures
- 25 successful capillary punctures

The student will provide you with two separate logs. One to log their time spent in the laboratory and one to log their successful venipunctures and capillary punctures. It is the responsibility of the student to make sure the log is available to you for documentation. The student will also provide for you a Checklist of Abilities that will assist you in identifying key principles that the student would need to be successful in a laboratory setting as a phlebotomist

I have made an effort to place students with preceptors based on work schedules that will accommodate both. As a preceptor you will be their mentor, instructing and advising, in phlebotomy and general laboratory procedures. This is essential for them in gaining knowledge and confidence in their skills.

The student should never be left alone or sent anywhere alone to perform venipuncture or capillary procedures. Remember that they are new to these procedures and to insure success it would be best for the student to perform venipunctures on patients with relatively good veins. Allowing them to observe their preceptors with more difficult venipunctures will save work time for you while they are learning by observing.

The successful venipuncture and capillary procedures must be documented. In order to document them you must see the procedure. Remember only successful procedures are to be documented. Also, the student may encounter problems and will need your expertise.

It will not be your responsibility to make sure that your student completes the hours and venipunctures necessary. This is entirely their responsibility.

Thank you

If you have any questions please you may reach me at _____

Instructor: _____

Documented Successful Venipunctures

Name: _____

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Documented Venipunctures and Capillary Sticks

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	DATE	INITIALS
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	DATE	INITIALS
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Verified by Preceptor: _____

Phlebotomy For Licensed Health Care Workers

Appreciation is extended to Sandy Perotto for her assistance in selecting the tasks for this program.

Phlebotomy for Licensed Health Care Workers

A Short Term Training Program Taken From Phlebotomy Course Vo.Ed. #303I

Introduction

The following task list for training licensed health care workers is taken from the comprehensive phlebotomy curriculum for training Phlebotomists, Vo.Ed. #303I. This shorter course was developed with the understanding that licensed health care workers (i.e. LPNs and RNs) are already skilled in many of the generic tasks in the comprehensive version of phlebotomy training.

Before starting to teach this course, the instructor must obtain and be very familiar with the comprehensive training program. References, teaching tools and other resources are contained in the guide for that program.

Delivery of Instruction: This course will be offered through the vocational-technical delivery system. Each of the postsecondary vocational-technical institutions may choose to offer this short-term training program to persons licensed in health care occupations.

Instructor Qualifications: The qualified instructor is one who meets the vocational education requirements for education and/or experience as a phlebotomist, or as a health care worker specifically trained in the techniques of phlebotomy.

Length of the Program: This is a competency-based program of 16 hours in the classroom and laboratory with an additional requirement of a minimum of ten (10) venipunctures under supervision of a qualified phlebotomist. It is expected that some students, because of background and experience, may need less time while other students will need more time to be competent.

Textbooks and Other Resources: The required textbook for students is: Phlebotomy Handbook written by Garza D. & Becan-McBride, K., published by Appleton & Lange, latest edition. Instructors will find a listing of textbooks and resources in Vo.Ed. #303I Instructors Guide.

Curriculum for Instruction in Phlebotomy for Licensed Health Care Workers

The following units of instruction are taken from the Instructor's Guide for Training Phlebotomists, Vo.Ed. #303I. Instruction will include the enabling objectives for each task as they are listed in the document.

The instructor has the flexibility to arrange the units of instruction as he/she desires to teach them as long as all objectives and tasks are taught.

Note: This shortened curriculum does not contain the content that relates to blood draws on neonates and pediatric patients and the procedures requiring capillary punctures.

Unit I

Tasks 01.01 through Task 03.07 and Tasks 06.01 through 07.01: Review the tasks and enabling objectives as they are listed in the instructor's Guide.

Unit II

Task 04.01 through 04.0: Demonstrate understanding of ethical behavior, professional liability, legal aspects and the importance of following protocol and chain of command.

Unit III

Task 05.02: Identify the major departments/sections within the clinical laboratory, the major types of procedures run in each department/section and their specimen requirements.

Task 05.04: Describe the phlebotomist's role and responsibilities in problem-solving situations.

Task 05.05: Identify phlebotomy procedures that may change from facility to facility.

Unit IV

Task 08.01: Review - Describe and define the major body systems with emphasis on the circulatory system.

Task 08.03: Identify with 100% accuracy, the main superficial veins used in performing venipunctures.

Task 08.04 Identify with 100% accuracy the most appropriate sites for venipunctures.

Task 08.05: Describe with 90% accuracy, the characteristics of the following blood components: erythrocytes, thrombocytes, leukocytes, plasma and serum.

Task 08.06: List the sequences of reactions of the coagulation factors in the intrinsic, extrinsic, common and fibrinolytic pathways.

Unit V

Task 09.01: Gather with 100% accuracy, proper equipment needed to collect various clinical laboratory blood specimens by venipunctures.

Task 09.04: Discuss with 95% accuracy, the proper use of the various types of anticoagulants, preservatives, and gels used in blood collection and the vacuum tube color-codes for these additives.

Task 10.01 through 10.03: Identifies and understands errors before, during, and after specimen collection that can cause erroneous results, and severe patient complications.

Unit VI

Task 11.01: Demonstrate application of established protocols when identifying patients.

Task 11.02: Discuss/perform, with 100% accuracy, methods for facilitating venipuncture collection and capillary collection.

Task 11.03: List With 100% accuracy, appropriate antiseptic agents useful in preparing sites for venipuncture/capillary punctures.

Task 11.04: Perform With 100% accuracy, appropriate methods for preparing a site for venipuncture/capillary puncture including best site.

Task 11.05: Perform venipuncture by evacuated tube and syringe systems, demonstrating appropriate use of supplies, proper handling of equipment and specimens and patient care.

Task 11.06: Describe the correct order of draw during venipunctures/capillary collection.

Task 11.08: Explain with 90% accuracy, the most common complications/physical problems associated with venipuncture, their causes, prevention and treatment.

Task 11.09: Perform with 100% accuracy, procedures for disposing of used or contaminated supplies.

Task 11.13: Perform with 100% accuracy, special collection techniques for: crossmatch (and other collections depending on group of students and their needs).

Unit VII

Task 15.01: Demonstrate with 100% accuracy, proper transport of blood specimens to lab or other stations.

Task 15.02: Describe with 90% accuracy, the significance of time constraints for specimen collection and delivery.

Unit VIII

Task 16.02: Discuss QC measures for phlebotomy procedures performed by phlebotomists.

Task 13.01: Demonstrate knowledge and practice appropriate to patient safety (learners should already know CPR; do not include here).

Task 13.03: Review - follow documentation procedures for work related accidents.

PHLEBOTOMY TRAINING

By Sandy Perotto, Phlebotomy Scientific Assembly Chair

Improving the quality of training may be the first step in reducing turnover rates for phlebotomy. Here are some ideas for developing and implementing a phlebotomy training program.

1. **Review the job description.**

Find out what it actually says. If necessary, update the job description to reflect what phlebotomists are doing. Use the ASMT body of knowledge or NAACLS list of suggested competencies as a guideline. An accurate description of duties and responsibilities is the first step to a salary increase, another important aspect of recruiting and retaining phlebotomists.

2. **Develop a procedure manual for specimen collection and handling.**

If you have one, be sure all information is current, complete and is updated on an ongoing basis. If you don't have one, start gathering information. Use books, journals, articles, videos, package inserts, and other literature from manufacturers. Check departmental reference books and procedure manuals for sections on specimen collection and handling. You will be amazed at how much information you can accumulate, most at little or no cost. Get everything written down. This will eliminate confusion for trainees who ask three people the same question and get three different answers. Share the information. Many phlebotomists and some medical technologists were trained by the "watch one, do one" method. These employees usually have excellent phlebotomy skills, but no theory and little technical information to go along with it. Expand the knowledge base for all staff.

3. **Develop an orientation checklist.**

Use the job description and table of contents from the phlebotomy procedure manual as a start. Discuss each item and record date of completion. If several people are involved in training, the checklist lets each know what has already been covered and what still needs to be discussed. The checklist gives the new employee ownership, responsibility, and a sense of active involvement in the training process. It affirms your commitment to provide them information they need to know to do the job. Include a list of difficult situations phlebotomists may encounter. Discuss how to handle these events before they actually happen. This will give the phlebotomist knowledge and confidence to make better decisions when actually confronted with problems in a stressful setting. Leave blank spaces to add things that come up as you do the training. Experiment with the checklist. Revise it until it works for you. Use the checklist to monitor progress throughout the orientation period.

4. **Be committed to the training process.**

Make orientation a priority. Introduce the new phlebotomist to all lab co-workers as well as key people in other departments. Tour the entire facility. Explain each area and its impact or relationship to the employee and the job. Communicate your values and expectations early. Spend the first few days discussing other (besides being able to obtain a blood sample) important aspects of the job: customer service, patient identification and specimen labeling policies, safety, confidentiality, accountability, patient bill of rights, etc. Give lots of positive feedback and recognition for a job well done. It takes a long time to develop confidence in one's ability, but only moments to destroy it. Deal with problems right away. Do not allow unacceptable performance or behavior to continue. It takes ten times longer to unlearn a bad habit than to spend the time initially training personnel to do it correctly.

5. **Be supportive.**

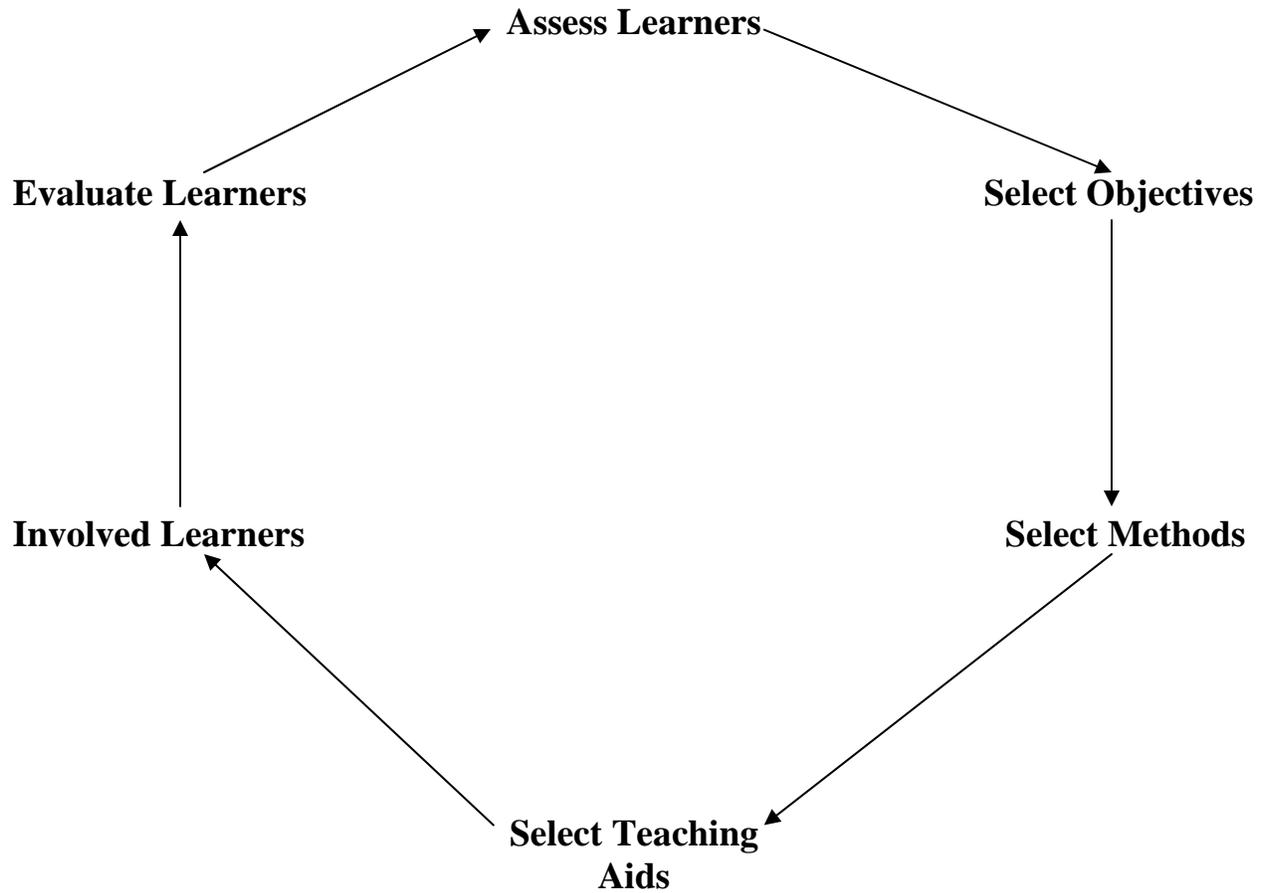
Keep in mind that phlebotomy can be overwhelming for new hires who have limited experience or no previous exposure to a hospital or health care setting. Not only do they have to adjust to new people and a new work environment, they worry about whether they can find a vein, what to do if they can't, what color tube is used for which test, and how fast they can learn the medical terminology and jargon just so they can understand and communicate with us. On a daily basis they are exposed to a variety of highly stressful situations: they see death and dying; they are constantly on the run; they encounter elderly, adult, pediatric, and newborn patients, each of whom requires special handling and/or special equipment; everything seems to be STAT; and they are often expected to be in two or three places at one time. Answer every question, even those which don't seem to be directly related to phlebotomy. It takes months to acquire the broad base of knowledge and to develop all the skills necessary to become a good phlebotomist. Challenge all employees to continue the learning experience by preparing for a national certification exam. Help them study and prepare them for the exam.

Adapt these ideas to any situation, no matter how large or small. Customize the program to meet your needs.

TEACHING AND LEARNING RESOURCES

Teaching/Learning Process

All of these Components are Part of Every Lesson



TEACHING TIPS FOR ADULT LEARNING

- Start and end on time. Always.
- Use preliminary diagnostic, data collection, and needs analysis techniques.
- Always use warm up and acquaintance exercises to get people talking, learning about and from each other.
- After warm-up, tell the group what is going to happen.
- Be sure the room arrangement is conducive to the activity you want.
- Be careful of the fine line between entertaining and being an entertainer.
- Be cautious about the use of films, overheads, audio-visuals, etc.
- Use small group activity a lot, having each group discuss a topic and report their conclusions to the total group.
- The learners, not the teacher, should be the major source of content in adult education.
- Use active techniques (case studies, simulations, role play, etc.) that provide a direct experience and build on the learner's experiences.
- Allow for transfer of learning - help people apply learning to their own situation.
- Undertake continuous formative evaluations. (Immediate, on-going feedback to students about their progress).

Adapted from Adult and Continuing Education Today, LERN, Volume 16, #23, Nov. 24, 1986

TIPS IN TEACHING PEOPLE WITH LOW LITERACY SKILLS

1. Teach the smallest amount possible to do the job. Enough knowledge to do what is expected
 - a. What specific actions (performances) are required to complete the task, to meet the expectation
 - b. What is the best attitude needed to perform the actions correctly, to meet the expectations.
2. Make your point(s) as vividly as possible.
 - a. Use simple language
 - b. Be short, precise
 - c. Illustrate and repeat main points
 - d. Summarize main points
 - e. Use a variety of teaching techniques (visual, auditory, hands-on)
3. Have learners restate and demonstrate information and actions required.
 - a. Provide a variety of ways for learners to show they understand
 - b. Provide for small group discussions and interaction
4. Provide for repeated reviews.
 - a. Have learners practice skills
 - b. Have learners take practice tests on skills
 - c. Use teaching methods that include several previously learned skills and request a review of them (i.e. Case studies of residents' care plans)
 - d. Allow learners to teach each other

Primary Source: Doak, C. C., Doak, L. G. & Root, J. H. (1985). *Teaching patients with low literacy skills*. Philadelphia, PA: J. B. Lippincott. Adapted by Dr. Dorothy Witmer, Supervisor of Health Occupations, Idaho.

PRINCIPLES OF LEARNING IN ADULTS

1. They respond best to a non-threatening learning environment where there is a good teacher-learner relationship.
2. They want to assess themselves against a relevant standard to determine their educational needs.
3. They want to select their own learning experiences - to be increasingly self-directing.
4. They prefer a problem oriented, client-centered approach to learning.
5. They want to apply their new knowledge and skills immediately.
6. They want to know how they are progressing.
7. They want to contribute from their own reservoir of knowledge and skills to help others to learn.

FUNCTIONS OF A TEACHER WORKING WITH ADULT LEARNERS

1. Create a comfortable non-threatening learning environment.
2. Provide assessment opportunities to help learners diagnose their educational needs.
3. Help the learners plan the sequence of experiences which will meet their educational needs and produce the desired learning.
4. Create conditions that will motivate the learner to learn.
5. Select, with the learners, the most effective methods for producing the desired learning.
6. Provide, with the help of the learners, the human and material resources necessary to produce the desired learning.
7. Help the learner measure the outcome of their learning experiences.

CHARACTERISTICS OF EFFECTIVE TEACHERS

A. Components of Effective Teaching as Perceived by Students (Kenneth Eble, The Recognition and Evaluation of Teaching, 1971).

1. Analytic/Synthetic Approach
 - a. Discusses points of view other than his/her own.
 - b. Contrasts implications of various theories.
 - c. Discusses recent developments in the field.
 - d. Presents origins of ideas and concepts.
 - e. Gives references for more interesting and involved points.
 - f. Presents facts and concepts from related fields.
 - g. Emphasizes conceptual understanding.
2. Organization/Clarity
 - a. Explains clearly.
 - b. Is well prepared.
 - c. Gives lectures that are easy to outline.
 - d. Is careful and precise in answering questions.
 - e. Summarizes major points.
 - f. States objectives for each class session.
 - g. Identifies what he/she considers important.
3. Instructor-Group Interaction
 - a. Encourages class discussion.
 - b. Invites students to share their knowledge and experiences.
 - c. Clarifies thinking by identifying reasons for questions.
 - d. Invites criticism of his/her own ideas.
 - e. Knows if the class is understanding him/her or not.
 - f. Has interest and concern in the quality of his/ her teaching.
 - g. Have students apply concepts to demonstrate understanding.
4. Instructor-Individual Student Interaction
 - a. Has a genuine interest in students.
 - b. Is friendly toward students.
 - c. Relates to students as individuals.
 - d. Recognizes and greets students out of class.
 - e. Is accessible to students out of class.

B. A Checklist for Good Teaching (Ron Smith, Concordia University, Teaching and Learning, Vol. 7, No. 1, Sept. 1980).

1. Good teaching tests/assesses pre-requisite skills.
2. Good teaching provides feedback to the teacher.
 - a. Non-credit tests, quizzes
 - b. Discussions with students
 - c. Questionnaires
 - d. Non-verbal messages that students are not listening
 1. Drops in attendance
 2. Students sleeping
 3. Students reading newspaper

4. Good teaching adapts to individual differences.
5. Good teaching provides (specific) feedback to the students.
6. Good teaching is flexible.
7. Good teaching promotes active student learning.
8. Good teaching motivates students.
9. Good teaching is clear and well-organized.

Sample Lesson Plan

Instructor _____ Course _____ Date _____

Objectives: (i.e.) Given equipment and supplies and skill checklist in the laboratory, make a bed with 100% accuracy according to the checklist. If accuracy is less than 100%, tell students what steps they must do by marking the steps with an asterisk (*).

**Time
Column**

5 min.	<u>Introduction:</u> (Preparation)	(Prepares students, gets student's attention, helps to motivate. Includes purpose, importance and relevancy of the lesson to overall course of study). <u>Tell students what they will learn.</u>
25 min.	<u>Presentation:</u> (method used)	(What method will be used to deliver content {lecture/demonstration} group activity, etc.
	Vary your methods every 20 minutes if possible. Vary with student application below.	Outline content to be presented. List teacher activities – include techniques for special needs students. <u>Tell students what they are learning.</u>
25 min.	<u>Application:</u> This step must be part of every lesson.	(Learning activities of students – what will students do to apply and reinforce content. May include supplemental worksheets and skill checklists). May include laboratory session, team work on problem solving, games and other activities.
5 min.	<u>Summary:</u>	(List key points) <u>Tell students what they learned or ask videotape key questions about lesson.</u>
	<u>Resources:</u>	(i.e.) videotape: “making a bed”.
	<u>Equipment:</u>	(i.e.) Lab setting, bed, linens.
	<u>References:</u>	Textbook: Will & Eighmy Being a Nursing Assistant, pp 20-44. Skill checklist on making a bed.
	<u>Evaluation:</u>	Sate how you will evaluate students. (i.e.) Return demonstration after practice, using checklist; short quiz of 10 questions on critical steps. (If evaluation is to be done same day, provide time allowed in time column).

TIPS FOR TEST ITEM CONSTRUCTION

The test from Psychological Corporation is a multiple choice test. Learners should have practice in taking these tests throughout the course of instruction. The following paragraphs provide a rationale and some assistance in the construction of these tests.

Why Multiple Choice? If well-constructed, multiple choice tests can measure all levels of cognitive achievement.

Advantages: Assesses many different levels of achievement; scoring is more objective; useful for diagnostic purposes if incorrect alternatives cover common errors; provides basis for productive post-test discussion (discuss why incorrect responses were wrong as well as why correct answers were right).

Limitations: Difficult and time-consuming to construct well; may be misinterpreted by students who read too much into questions.

MULTIPLE CHOICE TEST CONSTRUCTION

- All choices should be grammatically consistent.
- It is generally better to use direct questions than incomplete sentences for the stem.
- Alternatives should be listed on separate lines.
- Alternatives for an item should be about the same length.
- All options should be plausible responses to the stem.
- Try to use the same number of alternatives for each question (at least 4 answers).
- Use capital letters for responses as they are more easily discriminated.
- Using "all-" or "none of the above" changes the items to true-false items.

Avoid these Types of answers.