

*Mercer County  
Community College  
Division of Science  
&  
Health Professions*

*Nursing Program*

*NRS 110  
College Lab Manual*

*Spring 2011*

Welcome to College Lab - The college lab is an environment to learn the skills essential to nursing practice. It is a place to learn a nursing procedure and safely practice the skills in a controlled setting. The college lab will include demonstration, videos, interactive learning, and clinical simulation of critical skills essential to the fundamentals of nursing practice. Students should practice the skill until a comfort level is achieved. All students will be required to perform a return demonstration for the critical skills outlined in this manual.

Students must achieve a satisfactory grade on all required critical skill procedures to pass the college lab portion of NRS 110. It is essential that students attend all college lab sessions to stay current with skills and topics. The college lab's goal is to prepare you for safe patient care in the healthcare facility.

Have a great semester!

*The NRS 110 Course Team*

Mercer County Community College  
Division of Science and Health Professions  
Nursing Department  
NRS 110 Lab Manual Spring 2011

**NRS 110 students are expected to:**

1. Review related class notes, reading assignments and specific lab objectives prior to each college lab.
2. Participate in discussion topics listed for each lab.
3. Bring college lab manual to each lab.
4. Bring required equipment to each lab.
5. Properly perform return demonstration on selected skills.
6. Obtain instructor sign-off on all critical skills.
7. Attend all scheduled college lab sessions.
8. Arrive at the scheduled time for lab (repeated late arrivals will require intervention by NRS 110 Course Coordinator).

**College Lab Weekly Content**

Week 1: Introduction to College Lab, Hand Washing, Bed Making, Medical Asepsis.

Week 2: Body Mechanics, Lifting and moving patients, Bed bath, Range of Motion (ROM) exercises, Placing patient on bedpan.

Week 3: Surgical Asepsis and Infection Control.

Week 4: Dosage Calculation

Week 5: Dosage Calculation

Week 6: Medication Administration (oral & topical)

Week 7: Medication Administration (parenteral) Landmarking & needle selection

Week 8: Medication Administration (parenteral) Drawing up medication and injection administration.

Week 9: Dosage Calculation Exam

Week 10: Oxygen delivery devices, pulse oximeter, lung expansion techniques.  
anti-embolic techniques

Week 11: Elimination Lab, specimen collection, intake and output measurement

Week 12: Elimination Lab, incontinence and skin care

Week 13: Nutrition Lab, use and care of feeding tubes; nasogastric tubes; checking feeding tube residual; checking feeding tube placement

Week 14: Visual examinations and sign-offs

Week 15: Final sign-off of skills

### **Procedure for College Lab Critical Skill Sign-off**

Students will be required to view the skill demonstration, practice the skill to achieve competency, and perform a return demonstration of the skill observed by the lab instructor. The student will have two (2) attempts to successfully complete the skill. If unsuccessful after the first attempt the student will need to practice and perform a second return demonstration of the skill observed by the lab instructor. If after the second attempt, the student remains unsuccessful, remediation with the NRS 110 lab instructor is required. The student will have an opportunity for a third attempt. If after the third attempt the student remains unsuccessful, the student will need to meet with the NRS 110 course coordinator for determination of further progress in the course. Students must obtain instructor sign-off on all NRS 110 critical skills by the end of the semester to successfully pass the college lab component of the course.

#### Required Textbooks/Resources:

1. Smith, S.F., Duell, D.J.; Martin, B.C. (2008). *Clinical Nursing Skills: Basic to Advanced Skills*. (7<sup>th</sup> ed.). Upper Saddle River: Pearson Education, Inc.
2. Pickar, G.D., Abernethy, A.P. (2008) *Dosage Calculations*. (8<sup>th</sup> ed.). Clifton Park: Thompson Delmar Learning
3. Potter, P. A., Perry, A. G. (2009) *Fundamentals of Nursing*. (7th ed.). St. Louis: Elsevier Mosby.

**NRS 110 Lab Skills Evaluation**

**Student:** \_\_\_\_\_

CRITICAL SKILLS	DATE/INSTRUCTOR SIGNATURE	
	1 <sup>ST</sup> ATTEMPT	2 <sup>ND</sup> ATTEMPT
Bed Making		
Hand washing		
Body mechanics, Lifting, Moving, Transfer of patients		
Bed Bath & ROM exercises		
Donning sterile gloves		
Medication Administration (oral & topical)		
Medication Administration (IM & SC) (can be signed off in clinical)		
Dosage Calculation exam (Score of 90% or better)		
Application of oxygen devices, pulse oximeter, lung expansion techniques		
Application of anti-embolic therapies (SCD)		
Enteral feedings (NG or PEG)		
Incontinence Care		
Specimen collection (stool & urine)		
Care of nasogastric tube		
Intake & Output Calculation		

*Skills may also be signed off in clinical by your clinical instructor*

## **LAB #1**

**TITLE:** INTRODUCTION TO COLLEGE LAB

MEDICAL ASEPSIS, HAND WASHING, BEDMAKING, STANDARD PRECAUTIONS,

### **LAB OBJECTIVES:**

At the completion of this lab, the student will be able to:

1. Make an occupied bed.
2. Demonstrate the ability to apply principles of medical asepsis to hand washing.
3. Perform proper procedure for hand washing.
4. Explain standard precautions
5. Demonstrate the ability to apply principles of medical asepsis to hand washing and the control of infection.

### **REQUIRED READING:**

Smith, Duell & Martin: pgs. 177-184, 420-427, 428-433

### **CRITICAL SKILLS:**

1. Hand washing
2. Bed making

## **LAB #2**

**TITLE:** PERSONAL CARE & BED BATH, BODY MECHANICS, LIFTING & MOVING PATIENTS, RANGE OF MOTION(ROM) EXERCISES

### **LAB OBJECTIVES:**

At the completion of this lab, the student will be able to demonstrate correct techniques for:

1. Assisting a client with hygiene needs related to bathing:
  - a. Back care
  - b. Foot care
  - c. Perineal care
2. Assisting a client with hygiene needs related to:
  - a. Oral care
  - b. Shaving
  - c. Shampoo
3. Provide denture care.
4. Assisting a client with the use of a bedpan/urinal.
5. Moving a client in bed.
6. Linen handling.
7. Identify the importance of maintaining proper body alignment for clients and nurses.
8. Demonstrate techniques for transferring a client.
9. Choose the appropriate assistive device for the client.
10. State two expected outcomes of using proper body mechanics.
11. Demonstrate the procedures for moving a client to the side of the bed, up in bed, turning to a lateral position and assisting out of bed.
12. Demonstrate active and passive range of motion (ROM) exercises

### **REQUIRED READING:**

Smith, Duell & Martin: pgs. 185-223, 228-247, 343-355, 356-373, 381-386

**CRITICAL SKILLS:**

Bed Bath  
Body Mechanics  
Lifting, Moving, Transfer of patients  
Range of motion (ROM) exercises

**Additional skills**

Shaving - pgs. 222-223  
Denture Care – pg. 216  
Preventing Skin Breakdown - pgs. 196-198  
Back Care - pgs. 202-204  
Foot Care - pg. 229  
Perineal Care - pgs. 236-238  
Use of a Bedpan/Urinal – pgs. 232-233  
Oral Care - pgs. 214-215, 217-218

### **LAB #3**

**TITLE:** SURGICAL ASEPSIS AND INFECTION CONTROL

#### **LAB OBJECTIVES:**

At the completion of this lab, the student will be able to:

1. Demonstrate correct method of gloving, gowning, and mask use for isolation.
2. Discuss the various types of isolation precautions utilized in health care.
3. Demonstrate the ability to apply principles of surgical asepsis by donning sterile gloves.

#### **REQUIRED READING:**

Potter & Perry - Chap. 34

Smith, Duell and Martin - Chap. 14, pgs. 405-419, 434-443, 884-886

#### **CRITICAL SKILLS ( From Smith, Duell & Martin)**

Donning and Removing Isolation Attire – pgs. 435-437

Donning and Removing Clean Gloves - pgs. 424-426

Donning Sterile Gloves – pgs,884-886

## LAB # 4 & 5

TITLE: DOSAGE CALCULATION (ORAL & PARENTERAL)

### LAB OBJECTIVES:

At the completion of this lab, the student will be able to:

1. Perform nursing math to accurately calculate medication dosages
2. Accurately perform metric conversions
3. Calculate one and two step oral and parenteral medication metric conversion problems.

### REQUIRED READING:

Website [www.testandcalc.com](http://www.testandcalc.com)

Smith, Duell & Martin – Chap. 18, pgs. 567-601, 1090

Pickar – Chapters 10, 11, 12, 13, 14 (Review chapters 1-9)

### PRACTICE ASSIGNMENT:

Worksheet for Dosage Calculation

### CRITICAL SKILLS: ( From Smith, Duell & Martin)

***Successfully complete the required Drug & Dosage Calculation Test with a score of 90%.*** Students who do not achieve 90% on this exam must retest until they achieve the required 90%. The dosage calculation exam will be given during lab week 9.

Oral Drugs - pgs. 580-584

Topical Medications - pg. 586

Transdermal Drugs - pgs. 587-588

Eye Medications - pgs. 588-590

Eardrops - pgs.590-591

IV Flow Rate Calculation - pg. 1090

Sublingual Drugs - pg. 594

Parenteral Medication Administration – pgs,602-622

Mercer County Community College  
Division of Science & Health Professions  
Nursing Program  
**NRS 110 Dosage Calculation Worksheet**

The purpose of this worksheet is to prepare students for the dosage calculation portion of the course.

This is a self taught module. The chapters will be assigned from the textbook, *Dosage Calculations* 8<sup>th</sup> Edition by Pickar. The student will be expected to review the content in the assigned chapters and solve assigned practice problems. If the student has difficulty with solving problems, please review chapter content and seek out an instructor for additional assistance. The dosage calculation exam will be given week 9 of the semester. This exam will be given in college lab. Calculators will be allowed. The exam will be timed. The expectation for this exam is 90% or better. If the student does not achieve the 90 % on the first attempt, a remediation session must be attended by the student and a new test will be taken. The Dosage Calculation exam is graded as pass/fail with a grade of 90% or better designating the pass grade. **Please bring the Pickar book to college lab for the next 4 weeks**

**Textbook: Dosage Calculations 8<sup>th</sup> Edition by Pickar.**

Review basic math concepts in Chapters 1 and 2 (mathematics review). Take the self evaluation on page 54 to assess your math ability. Most of the math involved with dosage calculation centers on these basic math concepts. If you feel comfortable with these concepts and problems you should have no problem with dosage calculations.

If you are having difficulty with solving the problems in Chapter 1 & 2 you may benefit from visiting the campus Learning Center and seek out some assistance with basic math.

Next review concepts specific to nursing math and dosage calculation. The following Pickar chapters should be reviewed for understanding of content.

Chapter 3: Systems of Measurement

Chapter 4: Conversions: Metric, Apothecary and Household

Chapter 6: Equipment Used in Dosage Measurement

Chapter 7: Interpreting Drug Orders

Chapter 8: Understanding Drug Labels

Chapter 9: Preventing Medication Errors

Solve a few problems in each of the above chapters to see if you have an understanding of the content. It is not necessary to solve all the problems. Again, if you are having difficulty understanding a particular content area, review the chapter and seek out additional assistance.

To further prepare for the dosage calculation exam, the student should be able to solve the problems found in the following Pickar chapters. The answer key for all practice problems are located in the back of the Pickar book. There is also a User Tutorial CD-ROM that is included with the textbook.

It is beneficial to first review the chapter content then solve a few of the assigned problems. Check your answers for accuracy then move on to the next chapter. The actual dosage calculation exam will include problems similar to what is assigned in this worksheet. Note: Practice with a few problems from each of the assigned review sets and practice problems.

Chapter 10 Oral Dosage of Drugs

Please complete problems in review sets 23, 24 and practice problems – Chapter 10, pgs. 194-195

Chapter 11 Parenteral Dosage of Drugs

Please complete problems in review set 25, 26 and practice problems – Chapter 10, pg. 231

Chapter 12 Reconstitution of Solutions

Please complete problems in review set 27 and practice problems – Chapter 12, pg. 277

Chapter 15 Intravenous Solutions, Equipment and Calculations

Please complete problems in review set 34, 35, 37, 38

Chapter 14 Pediatric and Adult Dosages Based on Body Weight

Please complete problems in review set 32 and practice problems – Chapter 14, pgs. 328-339

Chapter 13 Alternative Dosage Calculation Methods: Ratio-proportion and dimensional analysis presents an alternate way of calculating drug dosages using the ratio-proportion method.

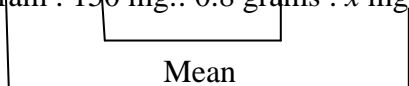
## BODY WEIGHT CONVERSIONS

Change 150 lbs. to Kilograms. Divide 150 by 2.2 = 68 Kg.

Change 60 Kgs. to Pounds. Multiply 60 x 2.2 = 132 lbs.

## USE OF RATIO AND PROPORTION

1 gram : 150 mg :: 0.8 grams : x mg



Extremes

$$1x = 0.8 \times 150$$

$$1x = 120$$

$$x = 120 \text{ mg.}$$

## IV FLOW RATE

Calculate mL/hr

Total volume = mL/hr

Total time = (hours)

Calculate drops per minute

Total volume x Drop factor = gtt/min

Total time (minutes)

$$\frac{1000 \text{ mL}}{6} = 166.6 \text{ mL/hr or } 167$$

$$\frac{1000 \text{ mL} \times 15}{480 \text{ min}} = \frac{15,000}{480}$$

$$= 31.25 \text{ gtt/min or } 31 \text{ gtt/min}$$

## CALCULATE ML/HR FOR VOLUMETRIC INFUSION PUMP

$$\frac{\text{Amount of Solution}}{\text{Minutes to Give}} = \frac{\text{mL/hr}}{60 \text{ min}}$$

$$\frac{50 \text{ mL}}{30 \text{ min}} = \frac{x \text{ mL}}{60 \text{ min}}$$

$$30x = 3000$$

$$x = 100 \text{ mL/h}$$

## **LAB 6 & 7 & 8**

**TITLE: MEDICATION ADMINISTRATION (ORAL, TOPICAL, INTRAMUSCULAR & SUBCUTANEOUS)**

### **LAB OBJECTIVES:**

At the completion of these labs, the student will be able to:

1. Demonstrate safe administration of oral and topical medications.
2. Document medication administration on the medication administration record (MAR)
3. Calculate oral and parenteral drug problems
4. Recognize and perform appropriate metric conversions
5. Select proper equipment for intramuscular and subcutaneous medication administration
6. Demonstrate correct landmarking for parenteral injections
7. Demonstrate correct needle selection for parenteral injections.
8. Demonstrate safe administration of parenteral (IM, SC) medications.
9. Calculate large volume intravenous drip rates.
10. Identify parts of a syringe and indicate those that must remain sterile.
11. Demonstrate correct procedure for preparing injections from a vial, pre-filled syringe, and ampule.

### **REQUIRED READING:**

Smith, Duell & Martin – Chapter 18

### **CRITICAL SKILLS:**

Preparing injections – pg.603  
Administering Subcutaneous Injections – pg 608  
Administering Intramuscular Injections – pg.617 - 620  
Administering Insulin Injections – pg. 610  
Preparing Oral Medications 580-583  
Administering Oral Medications – pg. 582-583

**LAB # 9**

TITLE:                   DOSAGE CALCULATION EXAM

LAB OBJECTIVES:

At the completion of this lab, the student will be able to:

1.   ***Successfully complete the required Drug & Dosage Calculation Test with a score of 90%.*** Students who do not achieve 90% on this exam must retest until they achieve the required 90%. Calculators will be provided by lab instructor. Students are required to show all math calculations on the test paper.

## **LAB # 10**

**TITLE:** OXYGENATION, OXYGEN DELIVERY DEVICES, PULSE OXIMETRY & ANTI-EMBOLIC TECHNIQUES

### **LAB OBJECTIVES:**

At the completion of this lab, the student will be able to:

1. Discuss the importance of respiratory preventive and maintenance measures such as coughing and deep breathing and incentive spirometry.
2. Discuss selected oxygen delivery devices.
3. Demonstrate correct application of nasal cannula and face masks.
4. Discuss positioning and techniques for administering chest physiotherapy.
5. Demonstrate proper technique for oral suctioning.
6. Demonstrate proper use of an incentive spirometer.
7. Discuss the correct use of the pulse oximeter.
8. Demonstrate anti-embolic therapies

### **REQUIRED READING:**

Smith, Duell & Martin – Chap. 26, pgs. 942-966; Chap. 10, pg. 272; Chap. 26, pg. 959  
Chapter 27 pgs. 1020-1024.

### **REQUIRED PROCEDURES: (In Smith, Duell & Martin)**

Instructing client to deep breath and cough - pg. 947  
Use of incentive spirometer - pg. 948  
Use of nasal cannula - pg. 962  
Using Pulse Oximetry-pg.959  
Using an Oxygen Face Mask-pg. 962-963  
Anti-embolic devices pgs 1020-1024

## **LAB # 11 & 12**

**TITLE:** ELIMINATION LAB, URINE & STOOL COLLECTION, INCONTINENCE CARE

### **LAB OBJECTIVES:**

At the completion of this lab, the student will be able to:

1. Discuss the importance of urinary and bowel elimination as a basic human need.
2. Demonstrate application of a condom catheter.
3. Demonstrate specimen collection methods for urine and stool.
4. Discuss enema administration..
5. Demonstrate incontinence care.
6. Demonstrate care of urinary and suprapubic catheters

### **REQUIRED READING:**

Smith, Duell & Martin - Chap. 22,- pgs. 756-769, 789-794; Chap. 23 - pgs. 811-837, Chap. 20, pgs. 684-688, 689-693, Chap. 9 - pg. 238

### **CRITICAL SKILLS (In Smith, Duell & Martin):**

Male Condom Catheter - pg. 767  
Collecting Midstream Urine - pg. 685  
Collection Specimen from a Closed System - pg. 793  
Monitoring Intake & Output - pgs. 1104-1106, 764-765  
Providing Incontinence Care - pg. 238

## **LAB #13**

**TITLE:** NUTRITION & ENTERAL FEEDING TUBES

### **LAB OBJECTIVES:**

At the completion of this lab, the student will be able to:

1. Identify various types of tubes used for enteral feedings.
2. Describe the safe care of a patient requiring an enteral tube feeding.
3. Identify the type of patient that would require tube feedings.
4. Demonstrate irrigation and checking residual of a feeding tube.
5. Demonstrate checking placement of a feeding tube.
6. Calculate intake and output for patient

### **REQUIRED READING:**

Smith, Duell & Martin - Chap. 19

### **CRITICAL SKILLS::**

Irrigating/Maintaining Nasogastric Tube - pg. 657

Giving a Feeding Via a Nasogastric or PEG Tube- pgs. 664-666

Monitoring Intake & Output - pgs. 1104-1106, 764-765

**LAB #14**

Complete visual examinations and sign-offs

**LAB #15**

**Final visual evaluation sign-offs.**

*Developed : 8/09*

*Revised: 1/10, 6/10, 12/10*