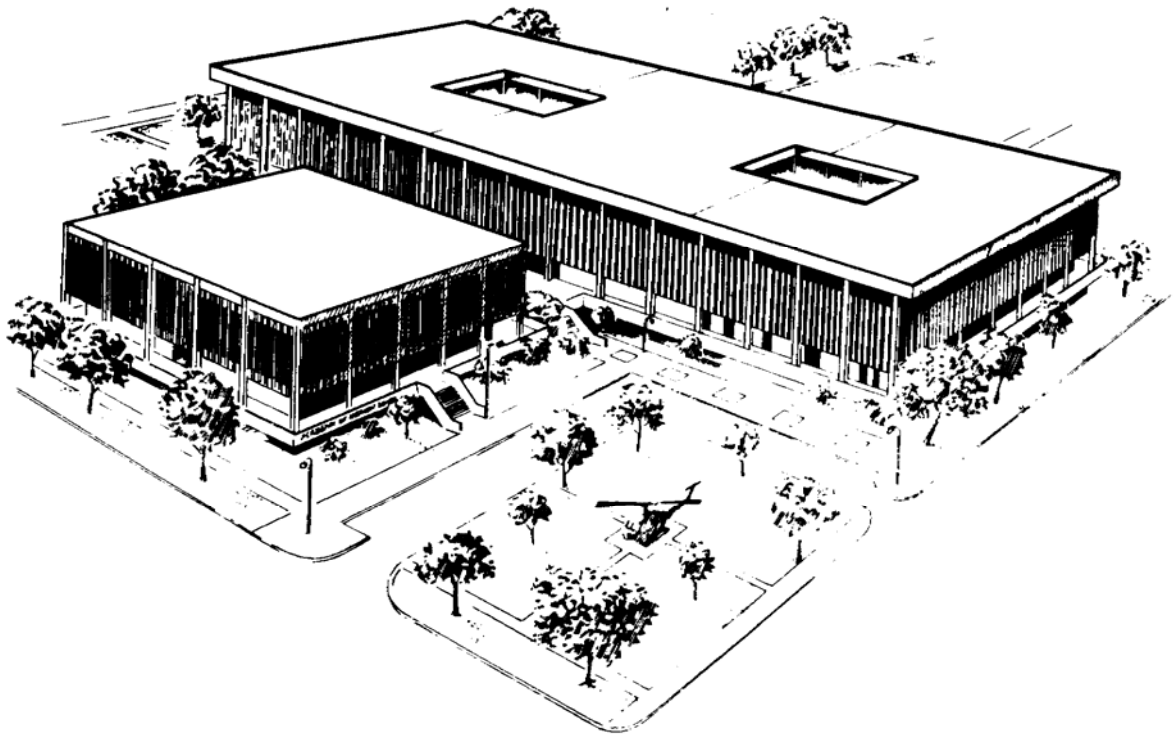

**U.S. ARMY MEDICAL DEPARTMENT CENTER AND SCHOOL
FORT SAM HOUSTON, TEXAS 78234**



INPATIENT DISPENSING

SUBCOURSE MD0811

EDITION 100

DEVELOPMENT

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CLARIFICATION OF TERMINOLOGY

When used in this publication, words such as "he," "him," "his," and "men" are intended to include both the masculine and feminine genders, unless specifically stated otherwise or when obvious in context.

USE OF PROPRIETARY NAMES

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**CORRESPONDENCE COURSE OF THE
U.S. ARMY MEDICAL DEPARTMENT CENTER AND SCHOOL**

SUBCOURSE MD0811

INPATIENT DISPENSING

INTRODUCTION

The hospital pharmacy has historically been a low profile operation. Relegated to the basement, the work consisted of the bulk issue of medications to the wards and bulk compounding of some medications. Space was limited and staffing was minimal. Army pharmacy wasn't much different. Over the years, the role of hospital pharmacy has changed significantly. One of the major changes has been the expansion of services provided by the pharmacy service. In this subcourse you will learn these services and how to provide them.

Subcourse Components:

This subcourse consists of three lessons:

Lesson 1, Ward Issue System

Lesson 2, Unit Dose System

Lesson 3, Sterile Products

Credit Awarded:

Upon successful completion of the subcourse examination, you will be awarded 7 credit hours.

Procedures for Subcourse Completion:

You are encouraged to complete the subcourse lesson by lesson. When you have completed all of the lessons to your satisfaction, fill out the examination answer sheet and mail it to the Academy in the envelope provided. *Be sure that your social security number is on all correspondence sent to the Academy.* You will be notified by return mail of the examination results. Your grade on the exam will be your rating for the subcourse.

LESSON ASSIGNMENT

LESSON 1

Ward Issue System

LESSON ASSIGNMENT

Paragraphs 1-1 through 1-12.

LESSON OBJECTIVES

After completing this lesson, you should be able to:

- 1-1. Describe the ward issue system.
- 1-2. State the advantages and disadvantages of the ward issue system.
- 1-3. Answer questions regarding proper usage of DA Form 3875, Bulk Drug Order.
- 1-4. Answer questions regarding proper labeling of medications repackaged for ward or clinic use.
- 1-5. Answer questions regarding proper usage of DD Form 1289, DOD Prescriptions.

SUGGESTION

After completing the assignment, complete the exercises at the end of this lesson. These exercises will help you to achieve the lesson objectives.

LESSON 1

WARD ISSUE SYSTEM

Section I. ADVANTAGES AND DISADVANTAGES

1-1. INTRODUCTION

The ward issue system is used to dispense medications and stock solutions to patient care areas for general use or for administration to a patient. These medications are issued in bulk containers or as stock solutions. Generally, the patient care areas order these items from the pharmacy based on established stock levels, and the items are referred to as ward stock.

1-2. ADVANTAGES

a. **Less Frequent Ordering.** Sufficient ward stock is ordered at one time to meet required stockage levels. Usually, this is enough medication to last one week or more between orders.

b. **Use of Standard Materials.** Generally, the containers, labels, and medications are the same items as those used in the outpatient section.

c. **Minimal Personnel Requirements.** Far fewer pharmacy personnel are required to serve a patient population under the ward issue system than would be required for the same number of patients under the unit dose system.

d. **Low Cost.** Start up costs are minimal because equipment, medications, supplies, and personnel are already in place within the pharmacy.

1-3. DISADVANTAGES

a. **Medications Stocked Throughout the Hospital.** Under this system, a large number of drugs are stocked in all patient care areas, which increases the total inventory. This may cause some items to expire before use.

b. **Drug Identity is Compromised.** The potential for medication errors increases due to the number of people handling the items. Identical drugs with different expiration dates may be mixed, allowing an expired drug to be given to a patient. Large amounts of medication, rather than a single dose, may become contaminated.

c. **Lack of a Patient Profile.** The patient profile, discussed in lesson 2, is not available in the ward issue system. Medications sent to wards are for general use, and pharmacy personnel have no way of monitoring their use.

d. **Inadequate Pharmacy Review.** Since ward stock is for general use, the pharmacy cannot check for things such as overdoses, drug interactions, allergies, or contraindications before a medication is administered to a specific patient.

Section II. BULK DRUG ORDER (DA FORM 3875)

1-4. GENERAL

DA Form 3875 (figure 1-1) is used for ordering and issuing noncontrolled medications and solutions with the ward issue system. This form is a set consisting of three pages. The form is initiated by the patient care area requiring the medications and/or stock solutions. It is then forwarded to the pharmacy, where the order is filled and returned to the requesting area. One copy is retained by the requestor, the second copy by the pharmacy, and the third copy is returned with the completed order. DA Form 3875 CANNOT be used for controlled substances or individual prescriptions.

1-5. CONTENTS

Upon receipt of a bulk drug order, pharmacy personnel must ensure the form is prepared correctly and contains the following information (as a minimum):

- a. Authorized signature.
- b. Date of order.
- c. Page number (one set constitutes one page).
- d. Number of pages.
- e. Ordering activity (patient care area).
- f. Each individual item by name, strength, unit of issue, and quantity of drug requested.

1-6. PHARMACY ACTION COLUMN

After the DA Form 3875 has been checked for completeness, the order must be filled. The pharmacy will note the appropriate comments in the Pharmacy Action column of the DA Form 3875.

- a. If the pharmacy has the drug in the amount specified, the amount provided is noted (figure 1-1, item #1).
- b. If only part of the requested amount can be filled, indicate the amount, asterisk the line, and note at the bottom of the form when the remaining amount may be expected (figure 1-1, item #5).

BULK DRUG ORDER				DATE 31 Mar XX	
Not to be used for controlled substances, or any other stock record item, or for individual prescriptions. Submit in duplicate to Pharmacy, duplicate copy will be returned with drugs to using agency.				PAGE NUMBER	NUMBER OF PAGES
				1	1
TO: PHARMACY SERVICE			FROM: (Ward, Clinic, or Department) WARD 7A		
ITEM	UNIT	NO. OF UNITS	PHARMACY ACTION		
1 Lidocaine 1% ^{1:100,000} Epinephrine	V1	3	3		
* 2 Histapan Caps 8 mg #30	Bt	1	DNS		
* 3 Garamycin Inj 40mg/cc	V1	2	TOS		
4 Demerol Tabs 50mg #20	Bt	1	CONT		
* 5 Keflex Caps 250mg #100	Bt	4	2		
6 BELLADONNA ALKALOID & PHENOBARBITAL Donnatal Tabs #20	Bt	1	1		
7					
8					
9 #2- PERHAPS YOU CAN USE CTM 8mg REPETABS INSTEAD					
10 #3- WILL ARRIVE IN 3 DAYS					
11 #5- WILL ARRIVE IN 5 DAYS					
12					
13					
14					
15					
SIGNATURE Rulla Cosmo, CPT, ANC			FOR PHARMACY USE ONLY (Total Work Units) 6 RLA		

DA FORM 3875
1 JUN 72

REPLACES DA FORM-8-236, 1 SEP 61,
WHICH WILL BE USED.

For use of this form, see AR 40-2; the proponent agency is Office of The Surgeon General.

Figure 1-1. DA Form 3875, Bulk Drug Order.

c. If a trade name item is requested and a generic substitution is made, put a single line through the trade name and write in the generic name above (figure 1-1, item #6).

d. If an item is temporarily out of stock, place the letters temporarily out of stock (TOS) in the column, asterisk the line, and note at the bottom of the form when the item is expected in or suggest an alternate drug (figure 1-1, item #3).

e. If an item is not stocked by the pharmacy, place the letters DNS (do not stock) in the column. Asterisk the line and suggest an alternate drug if possible (figure 1-1, item #2).

f. For controlled drugs or stock record items place a single line through the item and place the letters CONT (controlled) in the column (figure 1-1, item #4).

1-7. ADDITIONAL NOTATIONS

The specialist who fills the order will place his initials in the block titled "For Pharmacy Use Only" (figure 1-1). Information that might be helpful to nursing personnel, or indicates special handling considerations, should be noted.

Section III. LABELING DRUGS

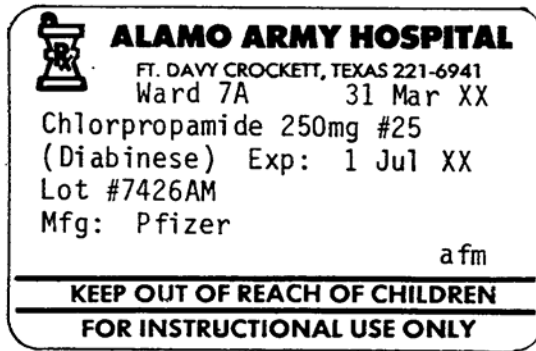
1-8. GENERAL

Certain medications may be sent to a ward in the original manufacturer's container. In these situations, all the pharmacy has to do is pull the original container from the shelf and send it to the ward. Many times, the original manufacturer's container must be repackaged into smaller units for either ward use or reissue to outpatients when the pharmacy is closed. In these cases the containers must be labeled by the pharmacy. There are two types of label formats for repackaged medications, depending on how they will be used. The first type is for repackaged medications strictly for ward or clinic use. The second type is for medications sent to the emergency room or clinics for reissue to outpatients (refer to MED Subcourse 809, Introduction to Compounding and Manufacturing).

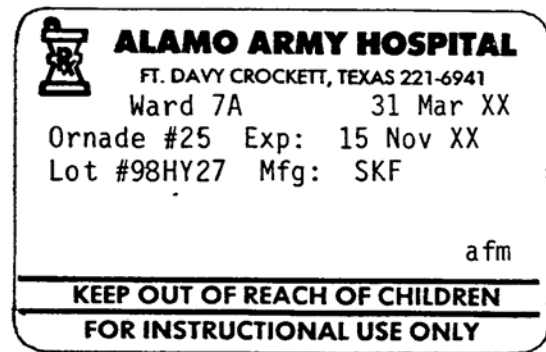
1-9. CONTENTS

When medications are repackaged for ward or clinic use, the label should contain the following information (figure 1-2):

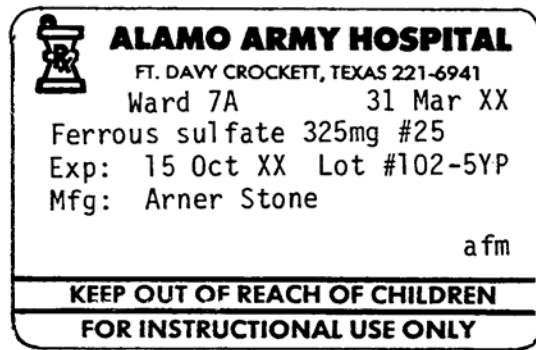
- a. Name of ward or ordering facility.
- b. Date.



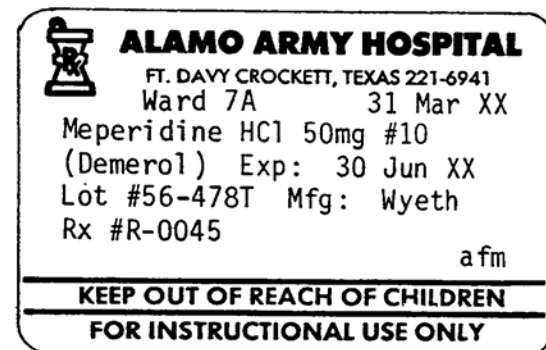
a.



b.



c.



d.

Figure 1-2. Examples of repackaged labels.

c. If a trade name product is dispensed, put it in parentheses below the generic name (figure 1-2a).

d. Only the trade name is required on products with more than one ingredient (combination drugs) (figure 1-2b). If there is no trade name, all ingredients must be listed (figure 1-2c).

e. Manufacturer's name.

f. Strength of drug (usually not required for combination drugs).

g. Amount of drug (number of tablets, capsules, milliliters).

- h. Potency period/expiration date.
- i. Lot number.
- j. Initials of individual filling order.
- k. Rx number if applicable (only used when controlled medications are repackaged). (figure 1-2d).

Section IV. DOD PRESCRIPTION (DD FORM 1289)

1-10. GENERAL

Controlled substances for ward stock are ordered on DD Form 1289 (DOD Prescription Form). The DD Form 1289 must be prepared as outlined in Subcourse MD0810, Outpatient Dispensing. Because the drug is intended forward use, the request must be signed by a physician or registered nurse. When the form is received in the pharmacy, it is checked for completeness and taken to the vault to be filled.

1-11. PROCEDURE

After the order is prepared and labeled, the drug is ready to be checked and dispensed. Regardless of how drugs and medications are delivered to user areas, there are some steps that must be followed when dispensing controlled substances under these conditions. First, a nurse should receive the drug, check it against the original DD Form 1289, and sign the reverse side of the form acknowledging receipt of the medication. Next, the nurse must record receipt of the drug in the nursing equivalent of the Controlled Substances Record. Finally, the pharmacy specialist should verify the transaction on the pharmacy's copy of the DA Form 3862 (Controlled Substances Record) and file the DD Form 1289.

Section V. DELIVERY OF WARD STOCK

1-12. PROCEDURE

Controlled substances and non-controlled ward stock may be delivered directly to user areas or be picked up at the pharmacy by user area personnel, in accordance with local SOP. The completed order must be verified by the receiver.

[Continue with Exercises](#)

EXERCISES, LESSON 1

INSTRUCTIONS: Answer the following items by completing the statements or by writing the answer in the space provided at the end of the item.

After you have completed all of these items, turn to "Solutions to Exercises," at the end of the lesson and check your answers with the solutions.

1. Medications dispensed through the ward issue system are issued in _____ containers or as stock solutions.

2. Medications issued to patient care areas through the ward issue system are generally referred to as _____.

3. Name four advantages of the ward issue system.
 - a. _____
 - b. _____
 - c. _____
 - d. _____

4. Name four disadvantages of the ward issue system.
 - a. _____
 - b. _____
 - c. _____
 - d. _____

5. The DA Form 3875, Bulk Drug Order, is used to order and issue _____ medications and solutions with the ward issue system.

6. DA Form 3875 is used for ordering and issuing noncontrolled medications and solutions. The form is initiated by the _____.

7. Name two things for which the DA Form 3875 cannot be used.

a. _____

b. _____

8. Name items that must be contained within the bulk drug order form.

a. _____

b. _____

c. _____

d. _____

e. _____

f. _____ (including _____, _____, _____, and _____).

9. A patient care area puts in a bulk drug order on the DA Form 3875 on the following page. You are to fill the order. Make the correct notations for the following situations on the DA Form 3875. Be sure to initial the order.

a. You are able to provide the Vistaril® injection in the amount requested.

b. You are only able to supply 4 bottles of the Mylanta® liquid, but you expect the remainder to be available in 3 days.

c. You substitute hydrochlorothiazide for the Hydrodiuril® 50 mg.

d. You are temporarily out of Lotrimin* cream 15 gm. You expect more in 5 days.

e. You do not stock Sinequan* 50 mg. But you recommend Adapin® 50mg instead.

f. Xanax® 0.25 mg is a controlled item.

BULK DRUG ORDER		DATE 24 Aug XX	
Not to be used for controlled substances, or any other stock record item, or for individual prescriptions. Submit in duplicate to Pharmacy, duplicate copy will be returned with drugs to using agency.			
TO: PHARMACY SERVICE		FROM: (Ward, Clinic, or Department) WARD 4A	
ITEM	UNIT	NO. OF UNITS	PHARMACY ACTION
1 Vistaril Inj 25 mg ^{10 ml} / ml	VI	3	
2 Mylanta Sig 5oz	BT	10	
3 Hydrodiuril Tabs 50 mg ^{# 30}	BT	1	
4 Iotrimin Cream 1% ^{# 30}	15gm	3	
5 Sinequan Caps 50 mg ^{# 30}	BT	1	
6 Xanax Tabs 0.25 mg ^{# 30}	BT	1	
7			
8			
9			
10			
11			
12			
13			
14			
15			
SIGNATURE Jennifer Clark, CPT, ANc		FOR PHARMACY USE ONLY (Total Work Units)	

DA FORM 1 JUN 72 3875

REPLACES DA FORM-8-236, 1 SEP 61, WHICH WILL BE USED.

For use of this form, see AR 40-2; the proponent agency is Office of The Surgeon General.

10. Name the items required on the labels of medications which are repackaged for ward or clinic use:

a. _____

b. _____

c. _____

d. _____

e. _____

f. _____

g. _____

h. _____

i. _____

j. _____

k. _____

11. You receive the order below that requires repackaging of medication for ward use only. Complete the labels on the following page according to the information provided.

BULK DRUG ORDER		DATE 10 Jun XX	
Not to be used for controlled substances, or any other stock record item, or for individual prescriptions. Submit in duplicate to Pharmacy, duplicate copy will be returned with drugs to using agency.		PAGE NUMBER	NUMBER OF PAGES
		1	1
TO: PHARMACY SERVICE		FROM: (Ward, Clinic, or Department) WARD 4	
ITEM	UNIT	NO. OF UNITS	PHARMACY ACTION
1	Diazide Caps #25	BT	1
2	TABS #50 Amitriptyline 25 mg	BT	1
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
SIGNATURE Donna Smith, CPT, ANK		FOR PHARMACY USE ONLY (Total Work Units)	

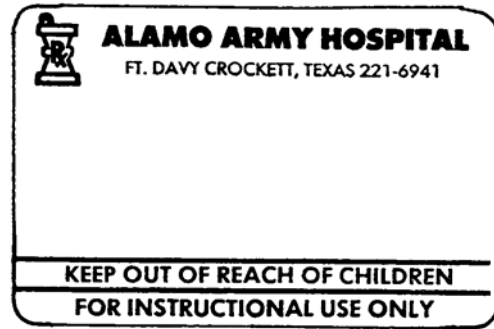
DA FORM 3875
1 JUN 72

REPLACES DA FORM-8-236, 1 SEP 61,
WHICH WILL BE USED.

For use of this form, see AR 40-2: the proponent agency is Office of The Surgeon General.

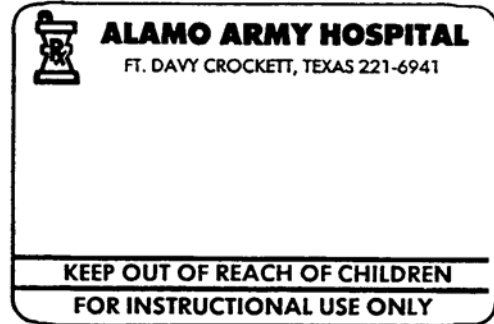
a. DYZAZIDE® CAPSULES

Ingredients:
Hydrochlorothiazide 25 mg
Triamterene 50 mg
Lot #: HM437
Exp. date: July XX
MFG: Smith Kline & French



b. AMITRIPTYLINE® 25 mg TABLETS

Lot #: 4Y6U
Exp. date: Dec XX
MFG: Geneva Generics



12. Controlled substances for ward stock are ordered on DD Form _____ .
13. DD Form 1289 must be signed by a physician or _____ .
14. The pharmacy receiving a DD Form 1289 checks it for completeness and takes it to the _____ to be filled.
15. After receiving a controlled substance, a ward nurse should check it against the original DD Form 1289, sign the reverse side, and record receipt in the nursing equivalent of the _____ .
16. After the controlled item is received by the ward nurse, the pharmacy specialist should verify the transaction on the pharmacy's copy of the DA Form _____ and file the DD Form 1289.

Check Your Answers on Next Page

SOLUTIONS TO EXERCISES, LESSON 1

1. bulk. (para 1-1)
2. ward stock. (para 1-1)
3. Less frequent ordering. (para 1-2a)
Use of standard materials. (para 1-2b)
Minimal personnel requirements. (para 1-2c)
Low cost. (para 1-2d)
4. Medications stocked throughout the hospital. (para 1-3a)
Drug identity is compromised. (para 1-3b)
Lack of a patient profile. (para 1-3c)
Inadequate pharmacy review. (para 1-3d)
5. noncontrolled. (para 1-4)
6. patient care area. (para 1-4)
7. Controlled substances.
Individual prescriptions. (para 1-4)
8. Authorized signature.
Date of order.
Page number.
Number of pages.
Ordering activity.
Each individual item (including name, strength, unit of issue, and quantity).
(para 1-5)

End of Lesson 1

LESSON ASSIGNMENT

LESSON 2

Unit Dose System.

LESSON ASSIGNMENT

Paragraphs 2-1 through 2-23.

LESSON OBJECTIVES

After completing this lesson, you should be able to:

- 2-1. Describe the unit dose system.
- 2-2. Identify the advantages and disadvantages of the unit dose system.
- 2-3. Identify items required on a patient medication profile.
- 2-4. Identify proper usage of the DA Form 4256, Clinical Record--Doctor's Orders.
- 2-5. Identify correct procedures for prepacking unit dose materials.
- 2-6. Identify items required on labels for unit dose packages.
- 2-7. Identify correct usage of cassettes used for delivery of unit dose packages to nursing units.
- 2-8. Identify procedures for discontinuing medications and discharging patients.

SUGGESTION

After completing the assignment, complete the exercises at the end of this lesson. These exercises will help you to achieve the lesson objectives.

LESSON 2

UNIT DOSE SYSTEM

Section I. ADVANTAGES AND DISADVANTAGES

2-1. GENERAL

How does the unit dose system differ from the ward issue system? Unit dose is a system in which medications are dispensed to wards for administration to a specific patient, in a specific dose, at a specific time, on a regular basis. In this system, each dose is individually prepared, packaged, and labeled.

2-2. NO IDEAL SYSTEM.

Like the ward issue system, the unit dose system has its own advantages and disadvantages. There is no one ideal system for delivery of medications to patients. The best that can be hoped for is to find a system where the advantages significantly outweigh the disadvantages.

2-3. ADVANTAGES.

a. **Patient Medication Profile.** This is one of the most significant advantages of the unit dose system. With the advent of the unit dose system and the patient medication profile, the pharmacy has a method of following each individual patient and his medications and becomes involved in monitoring patient care.

b. **Drug Identity Maintained.** With the numerous generic drugs on the market today, it has become increasingly difficult to identify unpackaged tablets and capsules. In the unit dose system, each dose of medication is individually packaged and identified according to name, strength, and the patient for which it is intended. This has greatly reduced the number of medication errors.

c. **Central Location of Drugs.** Under the unit dose system, the size of ward stock is reduced, with most of the stock located in the pharmacy. This helps to reduce cost as inventory control can be maximized and monitored more efficiently. Also with the drugs centrally located in the pharmacy, the amount of medication on the ward is restricted to exactly what the patient needs for a 24 hour period. This results in reduced pilferage.

d. **Medications Ready for Administration.** With the unit dose system, the medications are in a cart which can be taken directly to the patient's bedside. The dose is simply removed from the medication cart, opened, and administered directly to the patient.

e. **Greater Interaction.** The unit dose system results in much more interaction among the pharmacy staff, ward personnel, and physicians. This factor increases efficiency significantly.

f. **Patient Safety.** This is the over-riding advantage of the unit dose system because the system reduces the chances for medication errors.

2-4. DISADVANTAGES

a. **Increased Cost.** A unit dose system requires additional equipment and more expensive "forms" of medications. Today, many medications are commercially prepared and available in unit dose packages. Of course, there are still medications that are received in bulk and must be broken down into unit dose. Medications already available in unit dose packages usually cost more per dose than the same medications in bulk packaging. This cost is inherent not only in establishing the system but continuing throughout the life of the system.

b. **Time Consuming.** It takes pharmacy personnel more time to handle each dose individually rather than send the drug in bulk to a ward. It also takes time to check and transcribe orders and to check for drug interactions and contraindications. All these procedures are time consuming, but necessary, for the unit dose system to work correctly.

c. **Increased Staffing.** Since the unit dose system is so time consuming, there is a need for additional pharmacy personnel. The unit dose system is labor intensive, and it requires more people to make it work.

d. **Frequent Ordering.** In the ward issue system, orders are placed periodically. Unit dose orders are prepared at least daily and more often if necessary.

2-5. UNIT DOSE SYSTEM

Because the advantages of the unit dose system far outweigh the disadvantages, most hospitals have converted to the unit dose system.

Section II. PATIENT MEDICATION PROFILE

2-6. CONTENTS

The patient medication profile is one of the major advantages of the unit dose system. The medication profile gives pharmacy personnel the opportunity to actively participate in monitoring patient care. The form used for the profile is designed locally and may vary from one hospital to another, but the information contained on the form should be similar. The form shown in figures 2-1 and 2-2 is a representative example. The patient medication profile is divided into six sections, patient information, scheduled medications, nonscheduled/nonrecurring medications, wardstock/floorstock medications, controlled drugs, and sterile products.

a. **Patient Information.** This identifies the patient and should include information such as name, age, sex, weight, social security number, ward, and bed number.

b. **Allergy Information.** It is important to know of any allergies the patient has to allow the pharmacy to make sure the patient is not being given medication to which he is allergic. The physician should have checked this before ordering the medication, but this allows for one more safety check.

c. **Diagnosis and Preexisting Conditions.** This allows the pharmacy to check for medications which may be contraindicated [could cause harm to patient because of an ailment currently being treated, a different ailment, or other drugs the patient is taking] for the diagnosed condition. This also allows the pharmacy to make sure that any preexisting conditions are receiving treatment. An example might be a patient in for surgery who also has high blood pressure for which he is taking medication. With the pharmacy aware of this condition, the physician can be notified if he forgot to continue the medication.

d. **Scheduled Medications.** This portion of the profile is a major safety check for the patient. With all medications listed, the pharmacy is now able to check for drug interactions. The medications identified on this part of the form are those ordered by the physician. Scheduled medications are those that are prescribed to be given at definite intervals.

e. **Nonscheduled/Nonrecurring Medications.** A nonscheduled/ nonrecurring medication is one that is ordered for a one-time administration or for prn (as needed) medications. These medications do not have a specific time-span between doses. STAT and now doses also indicate non-recurring medications.

f. **Floorstock/Wardstock Medication.** These are medications that are already on the wards in accordance with the local SOP. They are handled by the bulk drug order section of the pharmacy.

PATIENT INFORMATION (NAME, AGE)			MEDICATION PROFILE CARD																																																													
			DATE _____ BY _____																																																													
			DIAGNOSIS																																																													
			PHYSICIAN																																																													
ALLERGENS:			SCHEDULED MEDICATIONS																																																													
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Figure 2-1. Patient medication profile.

Trans	Start	WARDSTOCK/FLOORSTOCK MEDICATION ORDERS	Stop

Trans	Start	CONTROL DRUG MEDICATION ORDERS	Stop

Trans	Start	STERILE PRODUCTS MEDICATION ORDERS	Stop

Figure 2-2. Patient medication profile.

g. **Controlled Medications.** These items come from the vault section of the pharmacy.

h. **Sterile Products.** These medications come from the sterile products section of the pharmacy.

2-7. DA Form 4256

The information on the profile is obtained from the DA Form 4256, Clinical Record-Doctor's Orders (figure 2-3) and other documents found in the inpatient record (chart). DA Form 4256 is a set made up of three copies. The original copy stays in the patient's chart, the second copy goes to the pharmacy, and the third copy is placed in the nurse's book. The second copy is pink in color and is referred to in the pharmacy as the "pink sheet." The form is perforated at four places so that as an order is written, that portion may be removed and sent to the pharmacy. When the profile is prepared, the specialist should transcribe the patient information data, allergies, diagnosis, and preexisting conditions as listed in the chart. He should transcribe the physician's order exactly as it is written on the DA Form 4256 and place his initials in the appropriate space.

2-8. TRANSCRIBING AND CHECKING

After the information has been transcribed from the DA Form 4256, the profile form is checked for medication errors, overdoses, drug interactions, contraindications, and possible allergic reactions. The pharmacy copy of the DA Form 4256 should also be checked against the completed patient profile to make sure there are no transcription errors. The specialist who performs this check should place his initials in the appropriate space. Ideally, these two steps, transcribing and checking, should be performed by different individuals. This reduces the chance for errors.

2-9. SUBSTITUTIONS

The information from the DA Form 4256 in figure 2-2 has been transcribed to the medication profile in figure 2-3. Because hypertension is a known preexisting condition, the pharmacy should check to see if the patient is on any medication for that condition. As new orders are written for a patient, they will be added to his profile sheet when they are received in the pharmacy.

a. No order should be changed without new orders from a physician. The only exceptions are generic and strength substitution. The rules for these substitutions are similar to those made in the outpatient pharmacy. The changes should be posted to the profile sheet.

b. For a strength substitution, line through the original strength, write in the new strength, and initial the change. Remember to change the number of doses to reflect the new strength

CLINICAL RECORD - DOCTOR'S ORDERS				
For use of this form, see AR 40-400; the proponent agency is the Office of The Surgeon General.				
THE DOCTOR SHALL RECORD DATE, TIME AND SIGN EACH SET OF ORDERS. IF PROBLEM ORIENTED MEDICAL RECORD SYSTEM IS USED, WRITE PROBLEM NUMBER IN COLUMN INDICATED BY ARROW BELOW.				
PATIENT IDENTIFICATION SMITH, JOHN O. 123-45-6789 MALE, 41 YR, 190 lb.		DATE OF ORDER 1 Jan XX	TIME OF ORDER 0700 HOURS	LIST TIME ORDER NOTED AND SIGN
NURSING UNIT 7A		ROOM NO. 711	BED NO. 2	
PATIENT IDENTIFICATION		DATE OF ORDER	TIME OF ORDER	
		Pre-existing conditions: hypertension, diabetes W.T. Valentine, CPT, MC		
NURSING UNIT ROOM NO. BED NO.				
PATIENT IDENTIFICATION		DATE OF ORDER 1 Jan XX	TIME OF ORDER 0930 HOURS	
NURSING UNIT ROOM NO. BED NO.				
PATIENT IDENTIFICATION		DATE OF ORDER	TIME OF ORDER	
NURSING UNIT ROOM NO. BED NO.				

DA FORM 4256
1 APR 79

REPLACES EDITION OF 1 JUL 77, WHICH MAY BE USED.

Figure 2-3. A Form 4256, Clinical Record--Doctor's Orders.

Section III. PREPARING UNIT DOSE PACKAGES

2-10. PREPACKAGING

Those medications not available in unit dose packages must be pre-packaged by the pharmacy. There are numerous machines available for prepackaging unit dose materials; however, the basic procedures followed in the pharmacy are the same regardless of the equipment used.

2-11. QUALITY CONTROL INFORMATION

First, select the desired medication in the required dose and strength from stock. Next, select the appropriate packaging material to use with the type and form of the medication. Record the quality control information in the prepackaging log in accordance with local SOP. This information should include, but is not limited to, the following:

- a. The date the medication is packaged.
- b. Both the generic and trade names of the medication, when applicable.
- c. The medication strength.
- d. The manufacturer's name.
- e. The manufacturer's lot number.
- f. The expiration date before packaging (manufacturer's date).
- g. The amount packaged.

h. The expiration date after packaging. It is recommended that medications prepacked in the pharmacy be given an expiration date six months from the date of packaging. The manufacturer's expiration date should be used if it is less than six months.

2-12. LABEL

After the quality control information has been recorded, a label is prepared for each prepacked medication. Labeling the unit dose package ensures that drug identity is maintained. The following information should be included on each label:

a. **Drug Name.** This may be either the generic name or the trade name if the actual trade named item is used. If a combination drug is given, the generic names for all active ingredients must be listed. Ideally, both trade and generic names should be used whenever possible.

b. **Drug Strength.** Normally, this is not required for combination drugs. Liquid strengths are usually expressed in volume.

c. **Manufacturer's Name.** This is necessary in case of a drug recall and aids in product identification.

d. **Manufacturer's Lot Number.** Again, this aids in identifying medications in a recall situation.

e. **Expiration Date.** Use the expiration date discussed in paragraph 2-11h.

2-13. PACKAGING

The medication is then packaged utilizing the equipment available and following local SOP. The unit dose package is now ready to be placed in the cassette for delivery to the nursing unit.

Section IV. PREPARING THE CASSETTE

2-14. DESCRIPTION

At this point, the cassettes are prepared for delivery to the respective nursing units. A cassette is a commercially manufactured device resembling a box, a rack, or a tray (see figure 2-4). Each cassette contains drawers that are used to hold medications. The number of cassettes delivered to a nursing unit will depend on the patient census as well as the number of medications ordered. Each drawer is used to hold the medications for a particular patient. More than one drawer may be used for a patient, depending on the number of medications ordered for that patient. Normally, a cassette contains enough medications to be administered over a 24-hour period.

2-15. FILLING DRAWERS

Ideally, the drawers are filled using patient medication profiles as guides. The profiles should be grouped by nursing unit designation and further divided by room or bed order. As each medication order is placed in the drawer, the profile is annotated appropriately.

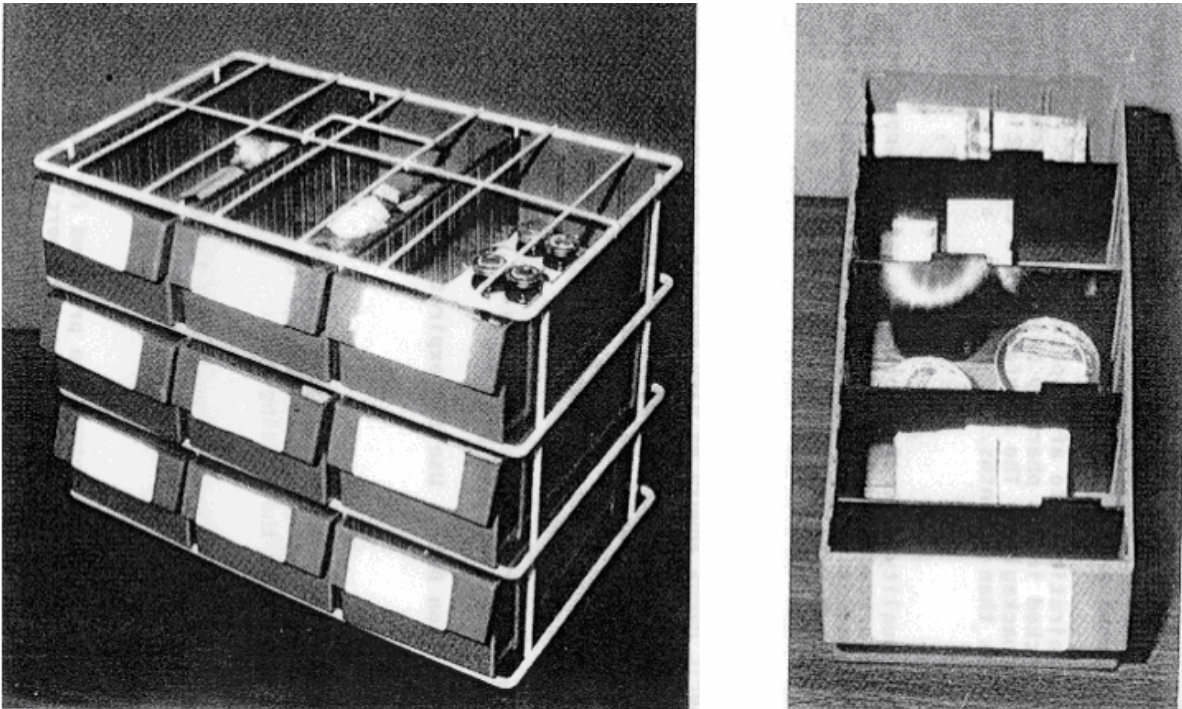


Figure 2-4. Unit dose cassette/drawer.

2-16. DIVIDING DRAWERS

Normally, dividers are used to separate the medications in the drawer. The two most common ways of dividing the drawer are by time or by medication type. When using the time method, all doses to be administered at a particular time are placed in one compartment of the drawer. Using the medication type system, all doses of the same drug are placed in one compartment regardless of time due. The unit dose package is placed in the proper compartment of the correct patient tray, and the number of individual items placed in the drawer is entered on the profile sheet under the date across from the medication.

2-17. SPECIAL NOTATIONS

In figure 2-5, two tablets of Dimetapp were placed in the drawer and a 2 was entered under the 1 Jan column across from the Dimetapp entry. Two tablets were placed in the drawer because the order is for one tablet two times a day. Eight 250 mg erythromycin tablets were placed in the drawer and an 8 entered on the profile sheet. This process is followed until all the required medications for a patient have been placed in the drawer and the entries made on the profile sheet.

Patient Information NAME: Smith, John O.		MEDICACTION PROFILE CARD																	
SSN: 123-45-6789 AGE: 41yr WT: 190 lb SEX: M WARD: 7A BED: 2 ALLERGIES:		PEC: Hypertension, Diabetes DIAGNOSIS: Pneumonia																	
		PRIMARY PHYSICIAN: CPT W.T. Valentine																	
		SCHEDULED MEDICATIONS																	
DRUGS ORDERED		START DATE	1	2	3	4	5	6	7	8	9								
	Dimetapp																		
	Po 1 bid																		
	E-mycin 500mg																		
	Po 500mg qid																		
	Dyazide																		
	Po 1 qam																		
		NONSCHEDULED & NONRECURRING MEDICATION																	

Figure 2-5. Patient medication profile--Sample 1.

Trans	Start	WARDSTOCK/FLOORSTOCK MEDICATION ORDERS	Stop
WS	DATE	ASA 325MG 1-2 Q4-6H PRN PO	

Trans	Start	CONTROL DRUG MEDICATION ORDERS	Stop
WS	DATE	XANAX 0.5MG PO HS PRN	

Trans	Start	STERILE PRODUCTS MEDICATION ORDERS	Stop
WS	DATE	0.9% SODIUM CHLORIDE 1000CC Q12h	

Figure 2-5. Patient medication profile--Sample 2

Note: WS (wardstock) means the item is kept on the ward.

a. The abbreviation "Ref" is used for an item requiring refrigeration. It is indicated on the patient profile under the date column. In many cases, a multi-dose refrigerated item will be sent to the ward. An item such as insulin may be sent in a quantity great enough to last for several days. The day the vial of insulin is sent to the ward is marked 1; the days until the next vial will be sent are noted "Ref." Note the insulin entry in figure 2-5. A tag is placed in the patient's tray noting the name, strength, and amount of medication required.

b. Now, STAT, and prn (as needed) medication will be annotated on the Nonscheduled/nonrecurring section of the patient profile and will be either put in the patient drawer or taken up to the ward prior to cart delivery in accordance with local SOP.

c. Controlled drugs are ordered as discussed in lesson 1, Section IV and are annotated on the Controlled medication part of the patient profile.

d. Sterile products orders will be annotated on the sterile products section of the patient profile, but will be dispensed in accordance with the sterile product SOP.

NOTE: Floorstock/wardstock medication, sterile products and controlled medications should be annotated on the patient profile as shown in figure 2-5.

2-18. PATIENT IDENTIFICATION DATA

After the drawer has been filled, it should be tagged with patient identification data. This facilitates the identification of the patient's medications once the cassette is delivered to the ward.

2-19. CHECKING DRAWERS

After the cassette(s) for a nursing unit is (are) filled, the drawers should be checked by a registered pharmacist whenever possible. The pharmacist will check each medication drawer, compare it with the patient profile, and ensure that each medication listed on the patient profile has the corresponding medication and/or a tag in the drawer. The correct medication, strength, and number of doses must be present. The pharmacist may also make one more check for overdoses, allergies, drug interactions, contraindications, and incompatibilities. This check becomes one more step in the quality assurance program to insure patient safety. After the drawers are filled and checked, the cassette is ready for delivery to the ward.

Section V. DELIVERING THE CASSETTES

2-20. TIMES AND METHODS

Every facility will have to establish a local policy concerning the time and method for cassette exchange. Most facilities have found it convenient to exchange the whole hospital at one time although it may not be possible in larger facilities with their greater number of wards. Convenient times for the wards should be considered. Since 0600, 1200, 1800, and 2400 are often busy times for dispensing medications on a ward, these would not be good times to exchange cassettes. Likewise, mealtimes and shift-change would not be good times for cassette exchange. Since each cassette normally has 24 hours worth of medication in it, care must be taken not to exchange the cassette before the last dose of medication in the cassette on the ward has been given. Care must also be taken to insure the new cassette arrives on the ward with enough time for the nurse to check the cassette before the administration of the first dose. All these factors must be taken into account when establishing a cassette exchange policy. Be sure to consult with ward personnel when establishing the cassette exchange and when changes are to be made in an established program.

Section VI. DISCONTINUING MEDICATIONS AND DISCHARGING PATIENTS

2-21. DISCONTINUING MEDICATION

When a medication is discontinued, the medication profile must reflect the change. A diagonal line is drawn after the last date entry for the discontinued drug. The abbreviation "D/C" is entered to show that the item is discontinued along with the date and the initials of the individual making the entry.

2-22. DISCHARGING PATIENT

When a patient is discharged from the hospital, the profile sheet is annotated to reflect this action. The word "discharged" is entered in the vertical column corresponding to the date of discharge and the entry is initialed by the individual making the entry. Any medications in the pharmacy or on the ward prepared for the patient will be handled in accordance with local SOP. The profile sheet will be filed following local policy.

2-23. NOTING ENTRIES

These entries will be noted on the profile sheet when the pink slip authorizing the changes is forwarded pharmacy from the nursing unit.

[Continue with Exercises](#)

EXERCISES, LESSON 2

INSTRUCTIONS: Answer the following items by marking the lettered response that best answers the item, by completing the statement, or by writing the answer in the space provided at the end of the item.

After you have completed all of these items, turn to "Solutions to Exercises" at the end of the lesson and check your answers with the solutions.

1. With the unit dose system, medication is dispensed to wards for administration to a(n) _____ patient in a _____ dose.
2. The pharmacy is able to monitor each patient and his medications with the patient medication _____.
3. In the unit dose system, each dose of medication is individually packaged and identified according to name, _____, and patient.
4. All of the following are advantages of the unit dose system except:
 - a. Reduction of ward stock.
 - b. Reduction of risks of errors.
 - c. Reduction of cost per dose.
 - d. Direct administration to patients.
5. The unit dose system is _____ (more or less) time consuming than the ward issue system.
6. The unit dose system creates a need for additional _____ because the procedures take more time.

7. With the ward issue system, orders are placed periodically. Unit dose orders are prepared at least _____ .
8. Of the two systems used to dispense inpatient medications, the _____
_____ system is the more efficient.
9. The patient medication profile includes information which identifies the patient and indicates medications to which he might be _____.
10. Listing the diagnosis on the patient medication profile allows the pharmacy to check for medications which may be _____.
11. In addition to the diagnosis, _____ conditions should be listed so the pharmacy can be sure they are receiving treatment.
12. With all of a patient's medications listed on the medication profile, the pharmacy is able to check for drug _____ .
13. The medications identified on a medication profile include those which are both _____ and _____.
14. The information on the profile is obtained from the DA Form _____ and other documents in the inpatient record.
15. The original copy of the Clinical Record-Doctor's Orders form stays in the patient's chart, the second copy goes to the pharmacy, and the third goes in the _____ book.

16. After the information has been transcribed from the DA Form 4256, the profile form is checked for medication errors, overdoses, drug interactions, contraindications, and possible allergic_____.
17. No order should be changed without new orders from a physician. The only exceptions are _____ and _____ substitution.
18. The information from the DA Form 4256 below has been transcribed onto the patient medication profile on the following page. The profile has been checked for errors and initialed. On the profile, make the correct notations for:
- Generic substitution of Doxycycline 100 mg capsules for Vibramycin 100 mg capsules.
 - Strength substitution of two Mefloquine 250 mg capsules for each Mefloquine 500 mg capsule.

PATIENT IDENTIFICATION			4/13	DATE OF ORDER	TIME OF ORDER
Jeff Davis					1400 HOURS
599-63-9876				<u>Med. Orders</u>	
				1. U. bromycin 100mg BID	
				2. Mefloquine 500mg qd x 3 days	
				R. E. Lee, MD, MC	
NURSING UNIT	ROOM NO.	BED NO.			
12	4	B			
PATIENT IDENTIFICATION				DATE OF ORDER	TIME OF ORDER
					HOURS
NURSING UNIT	ROOM NO.	BED NO.			
DA FORM 4256			REPLACES EDITION OF 1 JUL 77, WHICH MAY BE USED.		
1 APR 79					

PATIENT INFORMATION (NAME, AGE)		MEDICATION PROFILE CARD															
Jeff Davis 599-63-9876 12-4/B		PAGE <u>1</u> OF <u>1</u> PAGES															
ALLERGIES: NKA		DIAGNOSIS <u>Malaria</u> PRIMARY PHYSICIAN <u>Dr. R.E. Lee</u>															
DRUGS ORDERED		SCHEDULED MEDICATIONS															
		START DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
TRANS	<input checked="" type="checkbox"/>	Vibramycin 100mg															
CHECKED		ROUTE	DOSE														
TRANS	<input checked="" type="checkbox"/>	Mefloquine 500mg															
CHECKED		ROUTE	DOSE														
TRANS																	
CHECKED		ROUTE	DOSE														
TRANS																	
CHECKED		ROUTE	DOSE														
TRANS																	
CHECKED		ROUTE	DOSE														
TRANS																	
CHECKED		ROUTE	DOSE														
NON-SCHEDULED & NON-RECURRING MEDICATIONS																	
TRANS																	
CHECKED		ROUTE	DOSE														
TRANS																	
CHECKED		ROUTE	DOSE														
TRANS																	
CHECKED		ROUTE	DOSE														
TRANS																	
CHECKED		ROUTE	DOSE														

19. When prepackaging unit dose materials, you must record the _____ information in the prepackaging log.
20. Name the items which must (as a minimum) be listed in the prepackaging log.
- a. _____
 - b. _____
 - c. _____
 - d. _____
 - e. _____
 - f. _____
 - g. _____
 - h. _____
21. Medications prepackaged in the pharmacy should be given an expiration date _____ months from the date of packaging. The manufacturer's expiration date should be used if it is less than _____ months.
22. The five items needed on a unit dose package label are:
- a. _____
 - b. _____
 - c. _____
 - d. _____
 - e. _____

23. You are preparing a label for prepackaged medication; a combination drug has been prescribed so you must list _____ the names for all active ingredients.
24. The devices used to deliver unit dose packages to nursing units are called _____.
25. Each cassette contains _____ to hold the medications (usually for the next 24 hours) for a particular patient.
26. Cassette drawers are filled using the _____ as guides.
27. The medications in a drawer may be divided by _____ or by _____.
28. You are preparing cassettes for delivery to a nursing unit. The order for one of the patients is for two aspirin tablets three times a day. You need to place _____ tablets in the drawer for that patient.
29. After the cassettes for a nursing unit have been filled, it should be checked by a _____.
30. Before exchanging cassettes, it is important to be sure that the _____ dose of medication in the old cassette has already been given. The new cassette must arrive early enough for the _____ to check it prior to administration of the first dose.
31. You will make profile sheet entries regarding discontinuation of medication or discharge of a patient from a hospital when the _____ authorizing the changes is forwarded to the pharmacy from the nursing unit.

Check Your Answers on Next Page

SOLUTIONS TO EXERCISES, LESSON 2

1. specific, specific. (para 2-1)
2. profile. (para 2-3a)
3. strength. (para 2-3b)
4. c (paras 2-3 c, d, f)
5. more (para 2-4b)
6. pharmacy personnel (para 2-4c)
7. daily (para 2-4d)
8. unit dose (para 2-5)
9. allergic (para 2-6 1a)
10. contraindicated (paras 2-6, 2-1b)
11. preexisting (para 2-6,1b)
12. interactions (para 2-6)
13. daily; nonrecurring (paras 2-6, 2-3)
14. 4256 (para 2-7)
15. nurse's (para 2-7)
16. reactions (para 2-8)
17. generic, strength (para 2-9a)

End of Lesson 2

LESSON ASSIGNMENT

LESSON 3

Sterile Products.

LESSON ASSIGNMENT

Paragraphs 3-1 through 3-19.

LESSON OBJECTIVES

After completing this lesson, you should be able to:

- 3-1. Name the advantages of pharmacy preparation of sterile products.
- 3-2. Name the factors involved in personal hygiene and infection control.
- 3-3. Select the correct answers to questions regarding usage of the laminar airflow hood (LAFH).
- 3-4. Select the correct answers to questions regarding cleaning of the LAFH.
- 3-5. Select the correct answers to questions regarding sterile product forms, procedures, and labels.

SUGGESTION

After completing the assignment, complete the exercises at the end of this lesson. These exercises will help you to achieve the lesson objectives.

LESSON 3

STERILE PRODUCTS

Section I. GENERAL

3-1. PHARMACY STERILE PRODUCTS PROGRAM

When the idea of sterile products and intravenous solutions began to be accepted as standard medical practice, it was felt that only physicians had the skills and knowledge to prepare them. Later it was admitted that a registered nurse had the necessary skills and knowledge for their preparation. Finally, it was accepted that a specially trained pharmacy specialist could do the job. With this acceptance, many hospital pharmacies began to introduce a pharmacy sterile products program.

3-2. ADVANTAGES

There are many advantages when the pharmacy prepares sterile products--the pharmacy utilizes a quality control program unavailable to a nurse preparing the product on the ward; product production is standardized; septic techniques are utilized; information on product labels is standardized; and the pharmacy has a complete incompatibility library which is missing on the ward. The greatest advantage is that the pharmacy utilizes an aseptic work environment unavailable on the ward. This insures complete sterility of all products produced in the pharmacy.

3-3. EXPLANATION OF LESSON

This section on sterile products is not intended to produce sterile products technicians. It is simply a general overview of sterile product production. Special training is required to produce a qualified sterile product technician.

Section II. INFECTION CONTROL

3-4. OVERALL PERSONAL HYGIENE

Personal hygiene is the most important factor in infection control. Aseptic technique requires the individual preparing a sterile product to be as clean (aseptic) as possible. Overall personal hygiene is important to reduce possible contamination; fingernails should be short and clean; hair should be kept short or controlled through the use of caps or hair nets so it will not contaminate the work area; and clothing should be clean.

3-5. PATIENT CARE HANDWASH

Since the hands and forearms actually enter the work area, they must be very clean. All jewelry must be removed from the hands and forearms since these items collect dirt and microorganisms. Using warm water and as surgical scrub, wash the hands and forearms 3 to 4 minutes, paying particular attention to the fingernails and folds in the skin where dirt, dead skin, and microorganisms may collect. The hands should be dried with a lint free towel or a mechanical hot air dryer. Take care not to recontaminate the hands. The hands should be washed between different type products, and a complete washing of the hands and forearms should be done whenever the sterile products area has been left and reentered.

Section III. LAMINAR AIRFLOW HOOD

3-6. DESCRIPTION

Proper conditions for the preparation of sterile products can be provided by a laminar airflow hood (LAFH) (figure 3-1). Laminar airflow provides a total sweep of an area because the entire body of air moves with uniform speed along vertical or horizontal lines, originating through filters. Therefore, the LAFH bathes the entire work area with very clean air, sweeping away all possible contaminants.

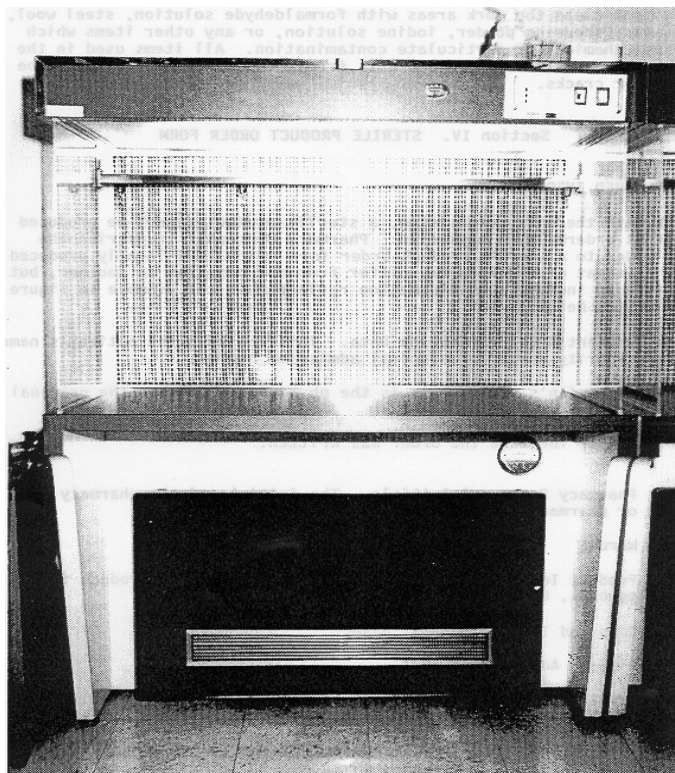


Figure 3-1. Laminar airflow hood (LAFH).

3-7. PROCESS

The LAFH removes airborne particulate matter through the use of two types of filters. The air first enters through a pre-filter where large particulate matter is removed. Then the air is forced through a high-efficiency particulate air filter or HEPA filter. This filter removes 99.97 percent of all particles larger than .3 micrometers in diameter. Since microbial contaminants in the air are found on other particulates, the removal of these particulates results in air-flow free of both microbial contaminants and particulate matter. The LAFH should be located in a clean area with little traffic flow past the front of the hood. The hood must be properly maintained and operated in order to achieve an aseptic environment in which to prepare sterile products.

3-8. CERTIFICATION

The LAFH must be periodically certified, showing that the hood meets federal standards of operation. This is not done by the pharmacy! The pharmacy may request the certification, but it involves complicated tests and equipment that the pharmacy cannot provide. AR 40-2 requires certification every 12 months.

3-9. PURGING THE ROOM AIR

The hood should be allowed to run for 30 minutes before it is cleaned and used to prepare products. This allows the hood to initially "purge" the room air and establish an aseptic environment.

3-10. INITIAL CLEANING

After the LAFH has been running for 30 minutes, it is necessary to clean it. A complete cleaning of the LAFH is done at the beginning of each shift (or at the beginning of the day if there is only one shift).

a. To clean the work area of the LAFH, gauze pads, a nonfilming water-soluble disinfectant/detergent solution, and 70 percent isopropyl alcohol are needed. The disinfectant/detergent is used to remove any water-soluble contamination and disinfect the surfaces. The 70 percent isopropyl alcohol will remove any alcohol soluble contamination and disinfect the surfaces. Both liquids are applied with the gauze pads, which are changed every time another area of the hood is cleaned.

b. The first cleaning is done with the nonfilming disinfectant/detergent. The hood is cleaned from top to bottom and from back to front. The first item to be cleaned is the light cover. The suspension bar is then cleaned starting with the top of the bar and moving to the bottom. After the suspension bar, the sides are then cleaned. Either side may be done first but both sides are cleaned before the work surface. Starting at the back of the hood, clean the sides. Use vertical movements from the top to bottom. Remember to clean from back to front. After the sides have been cleaned, the work surface must be cleaned. Using horizontal movements, work from the back to the front.

c. The whole process of cleaning is repeated using isopropyl alcohol, starting with the top of the suspension bar. The light cover is not cleaned with alcohol, as it will damage the plastic components.

d. This cleaning process is a series of logical steps starting with the top so any contamination will fall to the work surface. Next, the sides are cleaned vertically from top to bottom and back to front. This moves any liquid or contamination from the top of the sides to the work surface or the front of the hood where it is then removed by air flow. Finally, the work surface is cleaned from the rear to the front of the hood where liquid and contamination can be removed from outside the hood. Two complete cleanings insure removal of all contaminants and disinfects work surfaces.

3-11. PERIODIC CLEANING

After the initial cleaning, work surfaces should be cleaned between different products or when solutions are spilled in the work area. This periodic cleaning need not be as elaborate as the initial process, just sufficient to prevent cross-contamination between different products or to wipe up spills.

3-12. WORK AREA

Besides cleaning the LAFH, the walls and floors in the work areas need to be kept clean. The work areas should be cleaned frequently with nonfilming disinfectant/detergent, 70ds. Do not clean the work areas with formaldehyde solution, steel wool, paper towels, scouring powder, iodine solution, or any other items that could cause chemical or particulate contamination. All items used in the LAFH work area should be clean and dust free. Glass containers should be inspected for cracks.

Section IV. STERILE PRODUCT ORDER FORM

3-13. REQUIRED INFORMATION

As with the unit dose system, a sterile product cannot be produced unless it is ordered by a physician. Pharmacy personnel transcribe the doctor's order to a sterile product order form which is a locally produced form. The format of the form may differ from one hospital to another, but they all should include the information reflected on the example in figure 3-2a and listed below:

- a. Patient's identification data (includes the patient's name and social security number of hospital admission number).
- b. Physician's Name (the physician who wrote the original order).
- c. Date (the date the order was written).

d. Pharmacy personnel initials (initials of the pharmacy specialist or pharmacist who transcribed the order).

e. Ward.

f. Product identification (identifies how the product is to be used--piggyback, continuous, etc.).

g. Date and time of initial dose.

h. Time of administration.

i. Additives (list of additives to the parent solution--leave some blank lines for the pharmacy to enter additives not listed).

j. Quantities (identify the amount of the additive to the parent solution).

k. Solution (identifies the parent solution to be used--blank lines should be included to identify any solution not listed).

l. Volume (identifies the amount of parent solution to be used).

3-14. FOLLOW-UP PROCEDURE

The order is checked for completeness and possible errors. If the product is not required immediately, the order form should be filed until it is time to prepare the product. The system used to control the filing and production of products is established locally.

PATIENT'S NAME:		PHYSICIAN'S NAME:				Rx NO:		
ADDITIVES	QUANTITIES	VOLUME	CHECK	SOLUTION	CHECK	Hyperallimentation	QUANTITIES	DATE
Potassium Chloride	mEq	1000 ml		D5W		Crystalline AA - 5.5%	ml	WARD
Amikacin	mg							
Aminophylline	mg	500 ml		D51/4NS		Crystalline AA - 8.5%	ml	INIT OF RPh
Ampicillin	Gm							
Carbenicillin	Gm	300 ml		D51/2NS			ml	DATE & TIME FIRST IV NEEDED
Cephapirin	Gm							
Cimetidine	mg	250 ml		NS		Total Vol	ml	
Chloramphenicol	Gm							
Clindamycin	mg	150 ml		Ringers Lactate				Administration Schedule
Dopamine	mg							
Gentamycin	mg	100 ml		D5RL		CaGlucaptate	mEq	STAT
Heparin	Units							
Hydrocortisone Sod Succ	mg	50 ml		D5NS		Folic Acid	mg	01 13
Lidocaine HCl	Gm							
Methylpred Sod Succ	Gm	20 ml		1/2NS		L-Cysteine	mg	02 14
Multivitamins	ml							
Nitroprusside	mg	10 ml		D10W		MgSO4	mEq	03 15
Nafcillin	Gm							
Neosporin GU	ml	Syringe		SWF1		Multiple Vits	ml	04 16
Pot Penicillin G	Units							
Sodium Bicarbonate	mEq			Fat Emulsion 10%		KC1	mEq	05 17
Ticarcillin	Gm							
Tobramycin	mg					K-Phosphate	mEq	06 18
Vancomycin	mg							
						NaBcarb	mEq	07 19
						NaCl	mEq	08 20
						Vit B-12	mEq	09 21
						Heparin Na	Units	10 22
								11 23
								12 24
						Remarks:		
						Rate: _____ ml/hr q _____ hrs		
						For Irrigation		

BAMC Form 305 NS
1 Nov 80

Edition of 1 Sep 77 may be used.

PHARMACY STERILE PRODUCTS ORDER

a.

QUALITY CONTROL RECORD						
Order #	Time Due	Container #	Date	Made By	Name & Amount Additive Fluid - Diluent	Manufacturer Lot Number Expiration Date

b.

Figure 3-2. Sterile product order form.

Section V. PRODUCTION TECHNIQUES

3-15. MATERIALS

The first step in the production of a sterile product is to gather the materials. This includes the parent solution, any additives, and supplies and equipment necessary for the production (needles, syringes, alcohol swabs, disinfectant/detergents). All sterile items (needles, syringes) should be inspected to ensure their sterility. All containers should be disinfected and inspected for irregularities. These materials are then placed on the work surface of the LAFH.

3-16. QUALITY CONTROL INFORMATION

At this point, it is necessary to record quality control information (one example, figure 3-2b). The quality control information is sometimes listed on the reverse side of the sterile product order forms.

- a. **Order Number:** This is the prescription or serial number assigned to the order and is used to reference the product to the quality control record. This order number is also included on the product label.
- b. **Time Due:** This is the time the product is to be administered.
- c. **Container Number:** This column identifies the container in reference to the total number of containers requested.
- d. **Date:** Date the product is to be administered.
- e. **Made By:** The initials of the individual preparing the product.
- f. **Name and Amount Additive (Fluid-Diluent):** This identifies the additive and parent solution, and the amounts of both, that are used to prepare the product.
- g. **Manufacturer, Lot Number, Expiration Date:** List this information for both the additive and the parent solution.

3-17. CALCULATIONS

Any mathematical calculations that are performed in conjunction with the product preparation should be done on the form, and space should be provided for this purpose. If the calculations are performed on a separate piece of paper, it should be permanently attached to the order form. These calculations should be double-checked by a second person.

3-18. PREPARATION

Now it is time to actually prepare the product. Aseptic technique is more critical during this stage than at any other time. This is where the materials, especially the solutions, can become contaminated. Once a sterile product enters a patient's body, it cannot be retrieved as an oral dose may be. If it is administered intravenously, it has also bypassed a number of the body's natural defenses.

a. The first step is to disinfect all stoppers and entry ports. This is accomplished using alcohol swabs. Use a dabbing or patting motion with the swab to reduce the chances of leaving fibers of the swab on the stopper or entry port.

b. Attach needles to syringes using aseptic technique. Care should be taken here as it is very easy to contaminate the shaft or the inside of the needle hub and the syringe hub. This can occur when removing the items from their packages or when attaching them. Today, many syringes and needles are packaged in plastic containers. When opening the container, the cap has to be "snapped" off. If the cap does not "snap," assume that the sterility of the contents has been compromised and should not be used. After use, both syringes and needles should be destroyed to prevent their reuse.

c. When several additives are to be added it may be necessary to add them in a specific order to prevent precipitation. The order in which they are to be added will be determined by the ingredients and local policy. To draw up the drug, place the beveled edge of the needle perpendicular to the stopper. Place slight back pressure on the shaft of the needle by pushing the syringe body in the direction of the bevel. This causes the tip of the needle to go through the rubber stopper without "coring" the stopper. Coring is when the needle cuts out a portion of the stopper on its way through. This stopper fragment will then contaminate the fluid. If a glass ampule must be used, use a filter needle to draw up the fluid. This will filter out glass particles. If a filter needle is unavailable, place the bevel of the needle against the interior wall of the ampule when drawing up the liquid. This causes the glass particles to be trapped between the bevel and the wall of the ampule. Always draw up more additive than is required. This excess fluid is then expelled, which aids in eliminating air from the syringe.

d. Once the required amount of additive is drawn into the syringe, it is ready to be added to the base or parent solution. Again, take care not to core the stopper. If the parent solution is in a vacuum bottle, the contents of the syringe will empty into the bottle with little or no pressure on the plunger. If the solution is in a plastic IV bag, lift the bag so the liquid is away from the entry port. After the additive has been added to the base solution, they must be thoroughly mixed. Check materials used again to insure the correct ingredients in the correct amounts were used, and inspect the solution for visible particulate matter.

e. After the solution has been prepared, it must be labeled. The label should include the following information:

- (1) Patient's name and location.
- (2) Serial number or prescription number of the solution.
- (3) Generic name(s) of drug(s) added and amount.
- (4) Basic solution.
- (5) Date and time of administration.
- (6) Date and time to be discarded.
- (7) Refrigeration instructions (if applicable).
- (8) Initials of person who prepared solution.

f. It is common practice to place the label on the container of IV solution so it may be read while the solution is running (the bottle is upside down). Labels on irrigation solutions are placed so they are upside down while the solution is running. This prevents irrigations from being given intravenously. Irrigation solutions should be labeled "For Irrigation Only" as well. When placing labels on base solution containers, ensure that the name, amount, manufacturer, lot number, and expiration date of the solution are not covered.

Section VI. WORK COUNTS

3-19. GENERAL

Every product produced in the sterile products area must be counted, as do the items prepared in both the ward issue and unit dose systems. This work count is used for manpower and budget requirements. For definitive guidance on performing inpatient pharmacy work counts, refer to Subcourse MD0812, Introduction to Pharmacy Administration.

[Continue with Exercises](#)

EXERCISES, LESSON 3

INSTRUCTIONS: Answer the following items by marking the lettered response(s) that best answers the item, by completing the statement, or by writing the answer in the space provided at the end of the item.

After you have completed all of these items, turn to "Solutions to Exercises" at the end of the lesson and check your answers with the solutions.

1. Name three advantages of pharmacy preparation of sterile products.
 - a. _____
 - b. _____
 - c. _____

2. In order to become a qualified sterile products technician, one must have special _____.

3. The most important factor in infection control is _____.

4. An individual preparing a sterile product must abide by _____ technique.

5. Name three aspects of personal hygiene which are required for infection control in a work area.
 - a. _____
 - b. _____
 - c. _____

6. The work area can be prepared for sterile product preparation with the _____ airflow hood (LAFH).

7. The LAFH uses two types of filters, a _____ (for removal of large particulate matter) and a high-efficiency particulate air filter or _____ filter.
8. The LAFH should be located in a clean area with little _____ flow past the front of the hood.
9. The LAFH must be tested for certification every _____.
10. The LAFH should be allowed to run for _____ before it is cleaned and used.
11. A complete cleaning of the LAFH is done at the beginning of each _____.
12. Name three things needed to clean the LAFH.
- a. _____
- b. _____
- c. _____
13. The first cleaning of the LAFH is done using the _____ and the second, using the _____.
14. List the LAFH items in the order they are to be cleaned using the disinfectant/detergent.
- a. _____
- b. _____
- c. _____
- d. _____

15. When cleaning the sides of the LAFH, work from the _____ to the _____ using vertical movements from top to bottom.
16. When cleaning the work surface, use horizontal movements from the _____ to the _____.
17. When cleaning the LAFH with the isopropyl alcohol, you use the same procedure as you did with the disinfectant/detergent except that you omit the _____.
- 18 Name the three things used to clean the walls and floors of your work area.
- a. _____
- b. _____
- c. _____
19. Glass containers used in the LAFH work area should be inspected for _____.
20. A sterile product cannot be produced unless it has been ordered by a _____.
21. Before you prepare a sterile product, you must transcribe the doctor's order to a _____.

22. List eight of the items required on a Sterile Product Order Form.

- a. _____
- b. _____
- c. _____
- d. _____
- e. _____
- f. _____
- g. _____
- h. _____

23. When you receive the sterile product order form, you must check it for completeness and possible _____.

24. The first step in the production of a sterile product is to gather _____. All sterile items should be inspected to insure _____. Containers should be disinfected and inspected for _____. The materials are then placed on the work surface of the _____.

25. Name 4 of the items required on the quality control record for a sterile product.

- a. _____
- b. _____
- c. _____
- d. _____

26. Any mathematical calculations performed in conjunction with the product preparation should be done on the form or (if on a separate piece of paper) permanently _____ to the order form.
27. Name two reasons why aseptic technique is so critical during preparation of a sterile product.
- a. _____
- b. _____
28. Name the five major steps involved in preparation of a sterile product.
- a. _____
- b. _____
- c. _____
- d. _____
- e. _____
29. When disinfecting the stoppers and entry ports with the alcohol swabs, use a _____ or _____ motion.
30. When preparing a sterile product, if your needle and syringe are packaged in plastic containers, be sure the caps _____ when opened. After use, be sure to _____ needles and syringes.

31. When several additives are being used in preparation of a sterile product, you must add them in a specific order to prevent _____. To draw up the additive, place the edge of the needle _____ to the stopper. Place slight back pressure on the shaft of the needle. This keeps the tip of the needle from _____ the rubber stopper. If you use a glass ampule, use a _____ needle or place the bevel of the needle against the _____ wall of the ampule. Always draw up more additive than is required.

32. When adding the additive to the base or parent solution, be careful not to _____ the stopper. If the parent solution is in a _____ bottle, there should be no pressure on the plunger. But if it is in a plastic IV bag, _____ the bag so the liquid is away from the entry port. After the additive has been added to the base solution, they must be _____ thoroughly. Check materials again and inspect the solution for visible _____ matter.

33. Name five of the items required on the sterile product label.

- a. _____
- b. _____
- c. _____
- d. _____
- e. _____

34. You should place the label on the IV solution container so that it can be read while the solution is _____. Labels on _____ solutions are placed so they are upside down while the solution is running. Irrigation solutions should also be labeled "_____." Be sure the label is placed so that the name, amount, manufacturer, lot number, and _____ are not covered.
35. For manpower and budget requirements, every product produced in the sterile products area must be considered in the _____.

Check Your Answers on Next Page

SOLUTIONS TO EXERCISES, LESSON 3

1. A correct answer consists of any three of the following:
Quality control program is utilized.
Product production is standardized.
Aseptic techniques are utilized.
Information on product labels is standardized.
The pharmacy has a complete incompatibility library.
The pharmacy utilizes an aseptic work environment.
(para 3-2)
2. training (para 3-3)
3. personal hygiene (para 3-4)
4. aseptic (para 3-4)
5. A correct answer consists of any three of the following:
Short and clean fingernails.
Use of caps or hair nets.
Clean clothing.
Removal of all jewelry from hands and forearms.
thorough washing of hands and forearms; use of a lint free
towel or a mechanical hot air dryer for drying.
(paras 3-4 and 3-5)
6. laminar (para 3-6)
7. Prefilter, HEPA. (para 3-7)
8. traffic (para 3-7)
9. 12 months (para 3-8)
10. 30 minutes (para 3-9)
11. shift (para 3-10)
12. Gauze pads.
Nonfilming water soluble disinfectant/detergent solution.
70 percent isopropyl alcohol.
(para 3-10a)
13. disinfectant/detergent; isopropyl alcohol. (paras 3-10b and c)

14. a. Light cover.
b. Suspension bar (top to bottom).
c. Sides.
d. Work surface. (para 3-10b)
15. back, front (para 3-10b)
16. back, front (para 3-10b)
17. light cover (para 3-10c)
18. Nonfilming disinfectant/detergent.
70 percent isopropyl alcohol.
Nylon scouring pads.
(para 3-12)
19. cracks. (para 3-12)
20. physician. (para 3-13)
21. Sterile product order form. (para 3-13)
22. A correct answer consists of any 8 of the following:
Patient's identification data.
Physician's name.
Date.
Pharmacy personnel initials.
Ward.
Product identification.
Date and time of initial dose.
Time of administration.
Additives.
Quantities.
Solution.
Volume.
(para 3-13a-l)
23. Errors. (para 3-14)
24. Materials, sterility, irregularities, LAFH. (para 3-15)

25. A correct answer consists of any 4 of the following:
Order number.
Time the product is to be administered ("time due").
Container number.
Date the product is to be administered.
The initials of the individual preparing the product ("made by").
Name and amount of additive (fluid and diluent).
Manufacturer, lot number, and expiration date.
(para 3-16a-g)
26. Attached. (para 3-17)
27. The product cannot be retrieved as an oral dose could.
If administered intravenously, it bypasses many of the body's natural defenses.
(para 3-18)
28. Disinfect stoppers and entry ports.
Attach needles to syringes.
Draw additive(s) into syringe.
Add additive to base or parent solution (and mix).
Label the solution.
(paras 3-18a-e)
29. Dabbing, patting. (para 3-18a)
30. "snap," destroy. (para 3-18b)
31. precipitation, beveled, perpendicular, coring, filter, interior. (para 3-18c)
32. Core, vacuum, lift, mixed, particulate. (para 3-18d)
33. A correct answer consists of any five of the following:
Patient's name and location.
Serial number or prescription number of the solution.
Generic name(s) of drug(s) added and amount.
Basic solution.
Date and time of administration.
Date and time to be discarded.
Refrigeration instructions (if applicable).
Initials of person who prepared solution.
(para 3-18e (1)-(8))
34. Running, irrigation, "For Irrigation Only," expiration date. (para 3-18e)
35. Work count. (para 3-19)

End of Lesson 3