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Intended to assist teachers in either basic or continuing education programs to convey knowledge, techniques, and attitudes pertaining to drugs, the pamphlet outlines instruction which is estimated to require 70 to 100 hours of which 50 to 80 should be scheduled for classroom work and 20 hours for clinical work. Three units containing concepts fundamental to the use of drugs should be presented early in the program in association with some supervised clinical experiences. The remaining units concern concepts for the use of specific drugs such as disinfectants, and drugs that affect the skin and mucous membrane and drugs that affect the circulatory system and the blood, the respiratory system, the gastrointestinal system, the urinary system, the nervous system, and the endocrine and reproduction systems, and should be correlated with teaching in the clinical area and supervised experiences with patients. Each unit outline includes time allotment, objectives, subjects for discussion, and suggested teaching methods. Included are a bibliography and a list of pharmaceutical companies from which teaching materials are available. (JK)
PRACTICAL NURSING EDUCATION.

PAMPHLET NUMBER 4

A GUIDE FOR TEACHING BASIC CONCEPTS AND SKILLS IN THE USE OF DRUGS.

Developed by
Elizabeth M. Smith, R.N., M.Ed.

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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How to Use This Pamphlet

This document is intended to help teachers of practical/vocational nursing in either basic programs or continuing education programs to teach the knowledge, techniques, and attitudes pertaining to drugs and their administration that are essential for many licensed practical/vocational nurses today. Its preparation has resulted from the recognition by the National Association for Practical Nurse Education and Service that the activities of licensed practical/vocational nurses have been increasing tremendously with respect to both the administration of drugs and the observation of patients to whom drugs have been administered. As a consequence of this increased responsibility, considerably more instruction in the use of drugs is being provided in the curriculums of many basic programs in practical/vocational nursing. Also, inservice education programs and other supplementary courses in drug administration are being provided for licensed practical/vocational nurses who, in their basic programs, received less preparation in this area than is being offered in today's basic programs.

The materials presented here can be used in either type of educational offering. They suggest appropriate content and teaching methods for both classroom instruction and the learning experiences in the clinical laboratory. The estimate of the time required is 70-100 hours, of which about 50-80 hours are scheduled for classroom instruction and 20 hours for clinical laboratory experiences.

The classroom content has been divided into thirteen units. The first three units include content which is considered foundational—the characteristics of the various classifications of drugs, pharmacological terminology and measurements, and the principles and other abilities (including arithmetic ability) basic to drug administration. This content should be presented early in the program in association with some supervised clinical experiences. The content in Units IV through XIII should be correlated with teaching in the clinical laboratory and supervised experiences with patients. A recommended general pattern for these clinical learning experiences will be found immediately preceding Unit IV.

These materials were developed and have been tested in the Dayton (Ohio) School of Practical Nursing. It should be emphasized, however, that they are not being issued with the idea that they should be followed in every detail by any program; rather, they should be adapted to the particular program in which they are being used. In basic programs especially, the faculty will doubtless want to arrange for the integration or close correlation of the content in Units IV through XIII with that in the various nursing courses, and in so doing, may change its sequence. Correlation of experiences in administering drugs with the other care measures a student is using with her assigned patients may be facilitated by the use of a nursing care plan. In inservice programs, the content suggested for these units might well be supplemented by a review of relevant knowledge from anatomy and physiology as well as a review of the patient problems and needs for which the use of drugs is indicated.

Likewise, the suggested time allotment should be regarded as only a guide to help faculties or inservice education instructors who are planning to introduce
this content into their programs. The allotment for clinical experience, in particular, should be flexible enough to permit these experiences to be related to the other learning experiences that the students are having with patients. In instances where a review of previously learned content is needed, additional time should be allowed for this activity.

Also, some faculties may wish to augment the content in accordance with the objectives of their programs. For example, in programs that prepare the student for practice in a psychiatric setting, more emphasis might be given to the use of ataractic drugs.

In any event, because of the frequent appearance of new types of drugs and the decreasing use of other types, faculties should undertake a periodic review of the content and, when indicated, revise it in the light of current pharmaceutical materials and practices. In any such revision, faculties should take into consideration the varying practices in the situations in which the graduates of their programs may be employed and should not delete content merely because it would not be essential for the licensed practical/vocational nurses who practice in the hospital or hospitals which they utilize as a learning field. For example, in many hospitals the hospital pharmacy computes the exact dosage of drugs that are to be administered. However, upon graduation some of the students may be practicing in hospitals or nursing homes that have not adopted this procedure; therefore they should be taught to compute fractional doses.

It should also be pointed out that many of the drugs about which information is taught in the classroom will not be administered by the licensed practical/vocational nurse; her need for knowledge about them stems from the fact that she should be able to make intelligent observations of, and reports on, patients to whom they have been administered. It therefore behooves the instructor to give careful thought to the selection of the medicines which the students administer in the clinical laboratory, and these medicines should be given only under her supervision.

In conclusion, it is urged that in teaching the use of drugs to either basic students or licensed practical/vocational nurses emphasis should be placed on the principles involved. This policy, which is of course applicable in all areas of nursing education, is particularly important in this area because of the frequency with which changes occur in it. The licensed practical/vocational nurse who has a sound understanding of the scope of her participation in the administration of drugs and the basic principles underlying this administration can, it is thought, be relied on to incorporate these activities into her nursing care of patients.
Objectives of the Instruction

Central Objective:

To assist the student of practical/vocational nursing (basic student or licensed practical/vocational nurse) to participate appropriately in the total process involved in the administration of a drug to a patient, including the observation, recording, and reporting of the effects of the drug.

Contributory Objectives:

1. To assist the student to develop an appreciation of the fact that the administration of drugs is a part of total patient care.

2. To instill in the student an awareness of the fact that a drug should be administered only on the basis of sound knowledge of its possible actions, both favorable and unfavorable, and that any such administration should be followed by alert and intelligent observation and recording of the effects of the drug and a reporting of any untoward effects.

3. To inculcate in the student a knowledge of the extent, including the limitations, of a licensed practical/vocational nurse's responsibilities for the preparation and administration of drugs.

4. To assist the student to develop the knowledge and skills essential for performing the functions associated with the administration of drugs which might properly be assigned to a licensed practical/vocational nurse.

5. To assist the student to become familiar with reliable sources of information about current drugs and newly developed techniques in drug administration.

6. To assist the student to become thoroughly familiar with regulations that are associated with prescribing, storing, dispensing, administering, and possessing drugs.
**Concepts Fundamental to the Use of Drugs**

**UNIT I: Introduction and Orientation**

**TIME ALLOTMENT:** 3-5 hours

**OBJECTIVES:**

To assist the student:

1. To acquire an understanding of the requisites of the course.
2. To become familiar with the terminology of pharmacology.
3. To become familiar with sources of information about drugs and their administration.
4. To develop an introductory knowledge of the legal regulations governing the use of drugs.
5. To understand fully the scope and the seriousness of the responsibility involved in the administration of drugs and the danger of administering a drug to herself or to others without direction from a physician.
6. To develop an appreciation of the extent of her responsibility in the administration of drugs.

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<td>Samples of crude drugs</td>
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Content

D. Drug standards and references
1. United States Pharmacopeia (U.S.P.)
2. National Formulary (N.F.)
3. New Drugs
4. Physicians' Desk Reference (P.D.R.)

E. Legislation and drugs
1. Federal Food, Drug, and Cosmetic Act
2. Harrison Narcotic Act
3. Special state laws

F. Personnel responsible for drug therapy
1. Physician
2. Pharmacist
3. Nurse
   a. Preparing drugs for administration
      (1) Equipment
      (2) Procedure
   b. Preparing the patient
   c. Administering medication
   d. Observing, recording, reporting effects
   e. Teaching the patient

G. Prescriptions

H. Storage and care of drugs
1. Placement in medicine cabinets
2. Stock drugs
3. Locked drugs
4. Emergency drugs
5. Care and cleaning of cabinet
6. Drugs requiring refrigeration

I. Major problems
1. Availability of drugs
2. Self-medication
3. Protection of public against patent medicines

J. Cost of drugs

Teaching Methods

Lecture
Book display

Review
Guest speaker: Pharmacist

Samples of:
  Prescription
  Kardex
  Medicine ticket
  Equipment

Film (Suggestion: “No Margin for Error,” W. S. Merrell Co.)

Assignment: Be prepared to discuss hospital policy in relation to:
  Drug storage
  Narcotics
  Hypnotics
  Emergency drugs

Clinical assignment

Discussion

Assignment: Prepare list of most frequently used drugs in clinical laboratory and list cost.

Quiz
UNIT II: Drugs and Solutions and Measurements

**TIME ALLOTMENT:** 10-16 hours

**OBJECTIVES:**

To assist the student:

1. To realize the seriousness of the effects of drugs and the importance of accuracy in dealing with drugs.
2. To become familiar with common symbols and abbreviations used in drug therapy.
3. To gain an understanding of the various systems used in weighing and measuring drugs and to learn how to convert from one system to another.
4. To learn to calculate dosage.
5. To gain understanding of the factors which may modify drug dosage.

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<td>weights and measurements</td>
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<td>to another</td>
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<td>2. Measurement of dosage</td>
<td>Blackboard practice</td>
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<td>b. Oral dosage from stock solution</td>
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<tr>
<td>c. Fractional dosages</td>
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<td>3. Conditions modifying dosage</td>
<td>QUIZ</td>
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<tr>
<td>a. Age, weight, sex, etc.</td>
<td></td>
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<tr>
<td>b. Pathologic conditions</td>
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<td>(both physical and emotional)</td>
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</tbody>
</table>
UNIT III: Pharmaceutical Preparations, Drug Action, and Routes of Administration

TIME ALLOTMENT: 2-4 hours

OBJECTIVES:

To assist the student:

1. To develop an appreciation of the extent of her responsibility in the administration of drugs.

2. To acquire knowledge of the various types of pharmaceutical preparations.

3. To acquire knowledge of the channels and techniques of drug administration and to develop an understanding of the necessity of administering the correct drug by the right route.

4. To help the student to develop skill in certain techniques of administration.

Content

A. Pharmaceutical preparations
   1. Liquids
   2. Solids and semisolids
   3. Others—vials, ampules, etc.

B. Types of drug action
   1. Local effect
   2. Systemic effect
      a. Selective
      b. Untoward
      c. Idiosyncratic
      d. Cumulative
      e. Antagonistic
      f. Synergistic
   3. Emotional effect

C. Channels or routes of administration
   1. Channels
      a. Oral
      b. Rectal
      c. Vaginal
      d. Sublingual

Teaching Methods

Lecture
Sample exhibit
Discussion
Definitions and examples
Samples of drugs and equipment for each type of administration
Illustrations of techniques and demonstrations where indicated
Content

e. Parenteral
   (1) Intradermal
   (2) Subcutaneous
   (3) Intramuscular
   (4) Hypodermoclysis
   (5) Intraperitoneal
   (6) Intravenous
   (7) Intracardial
   (8) Intrapleural
   (9) Intraspinal
   (10) Implants
f. Inhalation
g. Inunction
h. Instillation

2. Factors influencing choice of channel

3. Responsibility, including limitations, of the licensed practical/vocational nurse with respect to each type of administration
   a. Measurement
   b. Preparation of the patient and equipment
   c. Administration
   d. Observing, recording, and reporting
   e. Teaching the patient

Teaching Methods

Samples of drugs and equipment for each type of administration
Illustrations of techniques and demonstrations where indicated

Quiz

COM. ENSIVE REVIEW OF UN 13 I-III
Concepts Essential for the Use of Specific Drugs
Instruction Included in Each of Units IV—XIII

So that repetition may be avoided, objectives, content, and learning experiences in the clinical laboratory which apply to each unit in this group are listed here.

Objectives

1. To assist the student to acquire knowledge concerning the characteristics of the commonly used drugs in the area with which the unit deals and to apply this knowledge to the care of patients.

2. To assist the student to develop a thorough understanding of the role of the licensed practical/vocational nurse, including the limitations of this role, in the administration of the drugs studied in the unit.

3. To inculcate in the student the importance of being alert to signs or symptoms of untoward effects and reporting these immediately.

Content to Be Reviewed

Each unit should include a review of the knowledge required for measuring drugs, with special application to the drugs studied in the unit.

In many instances, particularly in basic programs, the content in this section will be integrated in or closely correlated with courses in which the students learn to care for patients of various types. When this is not the case, the unit should include:

1. A review of the relevant anatomy and physiology.

2. A review of the patient problems and needs for which each type of drug is used.

New Content

Instruction should include appropriate information about the commonly used drugs of each type, including:

Name
   a. Generic name
   b. Proprietary, or brand, name
Source
Mode of action
Usual dosage(s)
Usual method(s) of administration
Why given—desired action(s)
Common side effects
Untoward reaction(s) to which student should be alert
How excreted
New Content (cont.)

Nursing measures
Responsibilities which the licensed practical/vocational nurse may be expected to assume
a. Measurement
b. Preparation of the patient and equipment
c. Administration
d. Observing, recording, and reporting
e. Patient teaching

Variations occasioned by the patient's age, socioeconomic background, attitudes, and so on.

Before each unit, the students should be given a reading assignment that is pertinent to the content of the unit.

Learning Experiences in the Clinical Laboratory

TIME ALLOTMENT: 20 hours (distributed throughout Units IV-XIII)

OBJECTIVES:

1. To familiarize the student with hospital policies regarding drugs.
2. To make the student aware of the importance of the correct interpretation of the physician's orders and exactness in following these orders.
3. To help the student to develop an understanding of the principles of the techniques used in drug administration and to develop skill in the techniques which she, as a licensed practical/vocational nurse, may be expected to use.

Content and Techniques

Teacher and Student Activities

A. Preparation of medication for administration
   1. Calculation and preparation of correct medication and dosage for the right patient
   2. Rules and safety measures

B. Nurse's responsibility regarding drug order
   1. Checking the physician's order
   2. Transferring physician's orders
      a. Kardex
         (1) Transferring orders
         (2) Checking with medicine card
      b. Medicine tickets—information required

   3. Method and procedure of re-ordering

Illustrate the Kardex
Illustrate with sample ticket
Demonstrate proper information
Demonstration and practice
Content and Techniques

4. Requisitioning drugs from pharmacy
   a. For individual
   b. For stock supply
5. Narcotic record
6. Medication charting forms and records

C. Procedures and techniques for administering medicines
   1. Oral
   2. Rectal
   3. Vaginal
   4. Parenteral
   5. Eye and nose

D. Special techniques
   1. Aged and senile patients
   2. Infants
   3. Disturbed patients
   4. Others

Teacher and Student Activities

Practice
Practice using forms
Practice
Review and practice
Discussion
Problem-solving: Examples of problems of individual patients (actual or hypothetical)
UNIT IV: Antiseptics, Disinfectants, and Drugs That Affect the Skin and Mucous Membrane

**TIME ALLOTMENT:** 3-5 hours

**OBJECTIVES:** See page 13 for Objectives 1-3

4. To assist the student to learn the methods of preparing simple solutions that are used in carrying out functions which might be expected of the licensed practical/vocational nurse.

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<td>4. Germicide</td>
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UNIT V: Drugs Used in Nutritional Deficiencies

**TIME ALLOTMENT:** 3-5 hours

**OBJECTIVES:** See page 13

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<td>D. Drugs used in the treatment of anemias</td>
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<td>3. Iron</td>
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<td>4. Folic acid</td>
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<td>5. Hydrochloric acid (HCl)</td>
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<td>6. Stomachics</td>
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<tr>
<td>E. Blood transfusion</td>
<td>Demonstration of equipment</td>
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<td>1. Licensed practical/vocational nurse’s responsibilities</td>
<td>Practice in observing technique</td>
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UNIT VI: Drugs That Affect the Circulatory System and the Blood

TIME ALLOTMENT: 4-6 hours
OBJECTIVES: See page 13

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</table>
| A. Drugs that affect the heart  
1. Cardiac stimulants  
2. Cardiac depressants | Lecture  
Films and other materials from Heart Association  
Assigned readings  
Drug samples |
| B. Drugs that act on the blood vessels  
1. Vasoconstrictors  
2. Vasopressors  
3. Vasodilators | Assignment: Prepare a list of cardiac drugs used in the clinical laboratory  
Discuss important observations during therapy  
Review “coagulation time” |
| C. Drugs that act on the blood  
1. Coagulants  
2. Anticoagulants |  
| D. Drugs that modify the reaction of the blood  
1. To treat alkalosis  
2. To treat acidosis | QUIZ |
| E. Drugs used in diagnostic procedures, including drugs used as x-ray contrast media |  

UNIT VII: Anti-infective Drugs

TIME ALLOTMENT: 3-5 hours
OBJECTIVES: See page 13

<table>
<thead>
<tr>
<th>Content</th>
<th>Teaching Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Antibiotics</td>
<td>Lecture</td>
</tr>
<tr>
<td>B. Sulfonamides</td>
<td>Assigned reading</td>
</tr>
<tr>
<td>C. Antisyphilitic drugs</td>
<td>Samples of commonly used antibiotics</td>
</tr>
<tr>
<td>D. Antimalarial drugs</td>
<td>Lecture</td>
</tr>
<tr>
<td>E. Serums and vaccines</td>
<td>Quiz</td>
</tr>
<tr>
<td>F. Antihistamines</td>
<td></td>
</tr>
</tbody>
</table>
UNIT VIII: Drugs That Affect the Respiratory System

TIME ALLOTMENT: 3-5 hours

OBJECTIVES: See page 13 for Objectives 1-3

4. To assist the student to learn the techniques used in inhalation therapy for which the licensed practical/vocational nurse may be responsible.

Content

A. Expectorants
   1. Depressants
   2. Stimulants
B. Pulmonary antiseptics
C. Respiratory detergents
D. Antispasmodics
E. Steroids
F. Inhalation therapy
   1. Oxygen
      a. Equipment used
         (1) Tents
         (2) Masks
         (3) Other
      b. Intermittent positive pressure breathing (IPPB)
      c. Safety measures
   2. Vaporizers used with hot or cold steam
      a. Types
      b. Equipment used
G. Drugs used in treating tuberculosis
   1. Streptomycin
   2. Para-aminosalicylic acid (PAS)
   3. Isoniazid
H. Drugs used in diagnostic procedures, including drugs used as x-ray contrast media

Teaching Methods

- Define terms
- Show drug samples
- Discussion
- Discussion
- Demonstration of equipment
- Observation experience in IPPB and use of nebulizers
- Discussion
- Discussion
- Demonstration of equipment
- Drug samples
- Quiz
UNIT IX: Drugs That Affect the Gastrointestinal System

TIME ALLOTMENT: 3-5 hours
OBJECTIVES: See page 13

Content

A. Drugs that act on the stomach
1. Antacids
2. Anticholinergics
3. Digestants
4. Antinauseants (antiemetics)
5. Carminatives
6. Emetics

B. Drugs that act on the intestines
1. Cathartics (various types)
2. Antidiarrheics
3. Sedatives and antispasmodics
4. Antihelminthics

C. Drugs used in diagnostic procedures, including drugs used as x-ray contrast media

Teaching Methods

Lecture
Assigned reading
Discussion
Drug samples
Define terms

Assignment: Identify cathartics commonly used in clinical laboratory

Guest speaker from radiology department to stress proper preparation and after care
Use of x-ray films to illustrate
QUIZ
UNIT X: Drugs That Affect the Urinary System

TIME ALLOTMENT: 2-4 hours
OBJECTIVES: See page 13

Content

A. Diuretics
B. Urinary antiseptics
C. Bladder sedatives

D. Drugs used to change composition of urine
   1. Drugs that decrease acidity
   2. Drugs that increase acidity

E. Drugs used in diagnostic procedures, including drugs used as x-ray contrast media

Teaching Methods

Lecture
Assigned reading
Review fluid and electrolyte balance
Assignment: Report on patients receiving drugs
Discuss possible effects as a result of combinations of drugs

Quiz
**UNIT XI: Drugs That Affect the Nervous System**

**TIME ALLOTMENT:** 8-10 hours

**OBJECTIVES:** See page 13 for Objectives 1-3

4. To help the student to become thoroughly familiar with the legal regulations that are associated with prescribing, storing, dispensing, administering, and possessing such drugs as hypnotics and narcotics.

<table>
<thead>
<tr>
<th>Content</th>
<th>Teaching Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Drugs that affect the central nervous system</td>
<td></td>
</tr>
<tr>
<td>1. Types</td>
<td>Lecture</td>
</tr>
<tr>
<td>a. Stimulants</td>
<td>Assigned readings</td>
</tr>
<tr>
<td>b. Depressants</td>
<td>Film</td>
</tr>
<tr>
<td>(1) Danger of suicides and accidental deaths</td>
<td>Discussion of nurse’s opportunity to help forestall suicides</td>
</tr>
<tr>
<td>c. Antidepressants</td>
<td>Discussion of habit-forming and hallucinatory characteristics of certain drugs</td>
</tr>
<tr>
<td>d. Hypnotics and sedatives</td>
<td>Assignment: Prepare list of narcotics and hypnotics commonly used in clinical laboratory</td>
</tr>
<tr>
<td>(1) Barbiturates</td>
<td></td>
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<td>(2) Bromides</td>
<td></td>
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<td>(3) Chlortal hydrate</td>
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<td>e. Analgesics</td>
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<tr>
<td>(1) Opium and derivatives</td>
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<tr>
<td>(2) Synthetics</td>
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<td>(3) Salicylates</td>
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<tr>
<td>f. Tranquilizers</td>
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<tr>
<td>g. Antispasmodics</td>
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<tr>
<td>h. Anticonvulsants</td>
<td></td>
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<tr>
<td>i. Muscle relaxants (including review of steroids)</td>
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<tr>
<td>j. Anesthetics</td>
<td></td>
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<tr>
<td>(1) General</td>
<td></td>
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<tr>
<td>(2) Local</td>
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<tr>
<td>2. Legal regulations concerning habit-forming drugs</td>
<td>Discussion of legal regulations concerning drugs and the equipment used with some of them</td>
</tr>
<tr>
<td>Samples of drugs</td>
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<tr>
<td>B. Drugs that affect the autonomic nervous system</td>
<td>Quiz</td>
</tr>
<tr>
<td>1. Adrenergic agents</td>
<td></td>
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<tr>
<td>2. Cholinergic agents</td>
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</tbody>
</table>
UNIT XII: Drugs That Affect the Endocrine and Reproductive Systems

TIME ALLOTMENT: 4-6 hours

OBJECTIVES: See page 13

Content

A. Hypoglycemic agents
   1. Types
      a. Insulin
      b. Other agents
   2. Techniques of administration
   3. Duration of action
   4. Measures for counteracting untoward effects

B. Drugs used for thyroid condition
   1. Hyperthyroidism
      a. Iodine and iodide
      b. Lugol’s solution
      c. Radioactive iodine (I^{131})
   2. Hypothyroidism
      a. Thyroid extract
      b. Thyroxin
   3. Other agents
      a. Natural
      b. Synthetic

C. Drugs that affect the reproductive system
   1. Male sex hormones
      a. Natural
      b. Synthetic
   2. Female sex hormones
      a. Natural
      b. Synthetic
   3. Ecboics and oxytocics
   4. Pituitary hormones

Teaching Methods

Lecture

Student practice in measuring dose of insulin and in subcutaneous injection

Lecture

Illustrations from drug company materials which show the effects of drugs on the reproductive system

Quiz
UNIT XIII: Drugs Used in Neoplastic Diseases

TIME ALLOTMENT: 2-4 hours
OBJECTIVES: See page 13

<table>
<thead>
<tr>
<th>Content</th>
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<tbody>
<tr>
<td>A. Radioactive isotopes</td>
<td>Lecture</td>
</tr>
<tr>
<td>B. Alkylating agents</td>
<td>Speaker from radiology department, if available, or Cancer Society</td>
</tr>
<tr>
<td>1. Nitrogen mustards</td>
<td>Films about chemotherapeutic agents for neoplastic diseases from drug companies</td>
</tr>
<tr>
<td>2. Theo-TEPA</td>
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<td>3. Myleran</td>
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<td>4. 5-Fluorouracil</td>
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</tr>
<tr>
<td>C. Review of drugs used for supportive measures</td>
<td>TERMINAL REVIEW AND EVALUATION OF STUDENT ACHIEVEMENT</td>
</tr>
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</table>
Selected Bibliography


Some Sources of Instructional Materials

Pharmaceutical companies are excellent sources of free illustrative teaching materials pertaining to their products. Information about these materials can be obtained from the field representatives of these companies or by writing to the companies. Some of these companies are listed below. Their addresses can be found in the Physicians' Desk Reference.

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Roche Laboratories
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Warner-Chilcott Laboratories

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