MEDICATION INCOMPATIBILITIES, CONTRAINDICATIONS, AND ADVERSE EFFECTS

LEARNING OBJECTIVE:

Identify the three classifications of medication incompatibility and what causes these medication incompatibilities to occur.

Occasionally, the medications used to improve a patient's condition may not work in the manner intended. The outcome may be contrary to that which was expected, and, indeed, could even cause harm to the patient. It is important to be aware of symptoms that may indicate a medication is not doing its job properly.

INCOMPATIBILITIES

There are instances when a medication used simultaneously with another medication or substance does not perform as intended. These medications or substances may be incompatible together and should not be administered at the same time. A medication incompatibility can also occur when medications are compounded together in the pharmacy. There are three classes of medication incompatibilities: therapeutic, physical, and chemical.

Therapeutic Incompatibilities

Therapeutic incompatibilities occur when agents antagonistic to one another are prescribed together. Such circumstances seldom occur, but when they do, the HM should bring the perceived incompatibility to the attention of the physician. The pharmaceutical agents may have been used together for one agent to modify the activity of the other. The physician will verify the prescription as necessary.

Physical Incompatibilities

Physical incompatibilities are often called pharmaceutical incompatibilities and are evidenced by the failure of the medications to combine properly. It is virtually impossible for uniform dosages of medicine to be given from such solutions or mixtures. Ingredients such as oil and water (which are physically repellant to each other) and substances that are insoluble in the prescribed vehicle are primary examples of physical incompatibilities.

Chemical Incompatibilities

Chemical incompatibilities occur when prescribed agents react chemically upon combination to alter the composition of one or more of the ingredients (constituents).

Manifestations of Incompatibility

The following list outlines the various ways incompatibility between or among medication agents may be manifested. The respective type of incompatibility is also noted.

- Insolubility of prescribed agent in vehicle (physical)
- Immiscibility (incapable of being mixed) of two or more liquids (physical)
- Precipitation due to change in a solution that results in decreased solubility (called salting out) (physical)
- Liquification of solids mixed in a dry state, called cutexia (physical)
- Cementation (hardening) of insoluble ingredients in liquid mixtures (physical)
- Evolution or changes in color (chemical)
- Reduction or explosive reaction (called oxidation) (chemical)
- Precipitation due to chemical reaction (chemical)
- Inactivation of sulfa medications by procaine HCl (therapeutic)
It is impossible to eliminate all medication-agent incompatibilities, some combinations may respond to one of the following corrective measures.

- Addition of an ingredient that does not alter the therapeutic value (such as the addition of an ingredient to alter solubility of an agent)
- Omission of an agent that has no therapeutic value or that may be dispensed separately
- Change of an ingredient (e.g., substitution of a soluble form of an ingredient for an equivalent insoluble form)
- Utilization of special techniques in compounding

**CONTRAINDICATION AND ADVERSE MEDICATION REACTIONS**

**LEARNING OBJECTIVE:**

*Identify medication contraindications, adverse medication reactions, and interactions.*

**CONTRAINDICATION**

Contraindication is any condition which makes a particular treatment or procedure inadvisable. These conditions include, but are not limited to, the disease process and other administered medications.

**ADVERSE MEDICATION REACTIONS**

Adverse medication reactions may occur when a medication, administered in a dose appropriate for human prophylaxis, diagnosis, or therapy, has an unintended and harmful effect on the patient receiving it. HMs must be aware of the possibility of adverse effects of medications so that they can be prevented or at least minimize the impact on the patient.

**MEDICATION INTERACTIONS**

Patients may receive more than one medication at a time (as happens frequently in the case of hospitalized patients). Combining medications may cause the individual medications to have a positive or negative outcome that would not usually occur if the medications were administered separately. Such interactions may affect the intensity of a medication's response, the duration of its effect, and side effects that may occur. As stated above, medication interactions can be positive as well as negative, and two or more medications are often administered to achieve a greater therapeutic effect.

**INFORMATION CONCERNING MEDICATION CONTRAINDICATIONS, ADVERSE REACTIONS, AND INTERACTIONS**

Descriptions of medication contraindications, adverse reactions, and interactions may be found in several publications, most notably the *Drug Facts and Comparisons*. However, the most important location for finding this information is the manufacturer's package insert and associated literature that accompanies each medication.

**PRESCRIPTIONS**

**LEARNING OBJECTIVES:**

*Identify the parts of a prescription and authorized prescribers.*

*Identify how prescriptions are written, filled, verified, labeled, and filed.*

The most important tool used by the pharmacy is the prescription. A prescription is a written or computerized order from a Healthcare Provider (prescriber) directing the pharmacy to compound and dispense a medication for a patient to use.
Of special importance is understanding and conformance to the following protocols:

- All information pertaining to a prescription is confidential and should not be divulged to any persons not specifically involved in the treatment.
- No prescription or any of its parts may be applied to or transferred to any person other than the patient specified.

To fill a prescription correctly, the HM must thoroughly understand the prescription writing and filling process. Because regulations and policies governing pharmacies sometimes change, it is important for to be familiar with pharmacy policies in the Manual of the Medical Department (MANMED), NAVMED P-117. Chapter 21 of the MANMED is the basic guide to pharmacy operations.

PARTS OF THE PRESCRIPTION

Currently, there are two standardized forms used for prescriptions: the DoD Prescription, DD Form 1289 (Fig. 18-5) and the Polyprescription, NAVMED 6710/6 (Fig. 18-6). Information placed on these forms must be either typewritten or legibly handwritten in ink or indelible pencil. In addition to these two forms, many of today’s treatment facilities now have automated pharmacy systems that allow healthcare providers to enter prescription orders into computers in their offices instead of handwriting prescriptions. Prescriptions, written or computerized, have, for the most part, the same information requirements. The only major difference is that automated prescriptions do not require the prescriber’s signature (they are completed electronically).

The DD 1289 is used extensively for outpatient prescriptions. The DD 1289 will contain only one medication order. All controlled medications should be written on the DD 1289. The Polyprescription is available for up to four prescriptions for one patient to be written together. If a controlled medication must be written on a polyprescription due to unavailability of a DD 1289, it must be the only medication prescribed on that form. See Figure 18-5 for examples of specific block entries.
Figure 18-5.—DOD Prescription Form

Figure 18-6.—Polyprescription Form
**Patient Information Block**

In the patient information block, located at the top of the DD 1289, the patient's full name and date of birth are required. At most treatment facilities additional patient information is added to this block. This additional information may include the patient's duty station; social security number with family member prefix; rate; and branch of service.

**Medical Facility and Date Block**

The treatment facility block, located below the patient information block, should contain the name of the treatment facility where the prescription was written. Completion of this block is important if the source of the prescription needs to be traced.

The date block, located to the right of the treatment facility block, should contain the date in which the prescription was written.

**Prescription Block**

The large block in the center of the DD 1289 is the prescription block. It contains four parts: the superscription, the inscription, the subscription, and the signa.

**SUPERSCRIPTION.**—The superscription "Rx" means "take" or "take thou" or, in effect, "I want this patient to have the following medication."

**INSCRIPTION.**—The inscription is that part of the prescription that lists the name and quantity of the medication to be used. This part of the prescription is of greatest importance, since the spelling of many unrelated medications is similar. **Whenever there is doubt as to the medication or the amount listed in the inscription, the individual filling the prescription should always verify the inscription with the prescriber.**

**NOTE:**
The medication should be written generically, and the dosage size or strength written metrically.

**SUBSCRIPTION.**—The subscription follows the inscription and is that part of the prescription that gives directions to the compounder.

**SIGNA.**—The signa, not to be confused with the prescriber's signature, is the part of the prescription that gives the directions for the patient. This portion is preceded by the abbreviation “Sig.”

**Prescriber Signature Block**

Finally, the prescriber signature block, located at the bottom of the form, must contain a legible signature of the prescriber, as well as the prescriber's full name, rank, corps, and service, stamped, typed, or hand-printed. Mimeographed, preprinted, or rubber-stamped prescriptions may be used, but signatures must be original and in the handwriting of the prescriber. Facsimiles are not acceptable.

**AUTHORIZED PRESCRIBERS**

Prescriptions from treatment facilities and DoD authorized providers for formulary drugs will be honored. Authorized prescribers may include: Medical and Dental Corps Officers, Optometrists, Physician Assistants, Pharmacists, Physical Therapists, Podiatrists, Nurse Practitioners (Certified Nurse Anesthetists, Nurse Midwives, Women's Health Nurse Practitioners, Family and Pediatric Nurse Practitioners), Veterinarians (when prescribing medications for military working animals), or civilian Physicians employed by the Navy or the Military Health System.
Authorized prescribers also include Navy Independent Duty Hospital Corpsmen (IDC) personnel authorized in Section IV of MANMED Chapter 21, and others authorized in writing by the Commanding Officer (CO) (or delegated representative) to prescribe in their official capacities and defined by the treatment facilities' Professional Affairs office.

Prescriptions written by civilian prescribers, other than those employed by the Navy, may be filled for authorized beneficiaries, at treatment facilities with a licensed Pharmacist assigned, provided the prescribed item is on the treatment facility's formulary (a published listing of medications) and the prescribed quantity is within limitations established by the command.

With the exception of the polyprescription, prescriptions are limited to one item per prescription. The quantity of the medication prescribed should be a reasonable amount needed by the patient. Excessive or unrealistic quantities should not be prescribed. Erasures on prescriptions are prohibited, and interlineations (information inserted between lines of writing) must be initialed.

Persons authorized to prescribe cannot write prescriptions for themselves or members of their immediate families.

**FILLING PRESCRIPTIONS**

When receiving a prescription for filling, certain basic steps must be followed to make sure that the correct patient receives the correct medicine in the correct amount in the correct way.

**Prescription Verification**

Verify that the prescription received is a bonafide one and the patient providing the prescription is entitled to have it filled by the pharmacy. Be thorough with the verification process due to high abuse and fraud potential. The simplest and best way is to ask for an ID card to verify the name and expiration date on the ID card.

Review the prescription carefully and make sure that the medication prescribed is reasonable; that its amount or dosage is realistic in consideration of the patient's age and that the quantity of the medication is practical. A prescription calling for 1,000 tetracycline tablets or a pint of Ipecac®, for example, warrants further inquiry.

If, in the process of verification, it is believed that there is a discrepancy, an ambiguity, an incompatibility, or for any reason; the HM must consult the prescriber. Be careful to never allow the patient to suspect that anything is amiss. Never fill a prescription that is not completely understood or appears incorrect. What appears to be an overdose may be the desired dose for a specific patient; the prescriber will appreciate being called for verification.

When the HM understands the prescription and is satisfied that it is correct, it is filled. Most mistakes are made when the person filling the prescription is either interrupted while doing so or is trying to accomplish more than one task at a time.

During the process of filling a prescription, the label on the containers used in filling the prescription should be verified at least three times. Initially, the label should be read when the container is taken from the shelf. Then it should be read again when the contents are removed from the container. The container's label should be read before it is returned to the shelf. By following these three verification steps for each prescription filled, there is a reduction in the possibility of making a prescription error.
Prescription Labeling

Proper labeling of a prescription is as important as filling it correctly. It is reasonable to assume that if a great deal of accuracy is necessary to properly compound a prescription, it is just as important that the patient take the correct amount of medication in the right manner to receive its maximum benefits. Improperly written or misunderstood directions on a prescription label can be disastrous. Make sure all labels are typed clearly and their directions translated into simple layman’s language. Keep in mind that the prescription label serves two purposes. First, it gives the patient directions pertaining to the medication. Second, in case of misuse or error, it is the quickest means by which the contents of the prescription container, the person who wrote the prescription, and the person who filled it can be traced. The following information, illustrated in Figure 18-7, should always be on the label:

- The name and phone number of the dispensing facility
- A serialized number that corresponds with the number on the prescription form,
- The date the prescription is filled
- The patient’s name
- The directions to the patient, transcribed accurately from the prescription, in clear, concise layman’s language
- The prescriber’s name and rate or rank
- The initials of the compounder
- Authorized refills, if any
- The expiration date, if applicable
- Name, strength, and quantity of medication dispensed

**NOTE:**
Pharmaceutical preparations should be identified and labeled with the generic name. However, trade or brand names may be used if the trade or brand name is actually on the container.

<table>
<thead>
<tr>
<th>NAVAL HOSPITAL</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>BETHESDA, MD 20814</td>
<td>295-2113</td>
</tr>
<tr>
<td>(keep out of reach of children)</td>
<td>295-550</td>
</tr>
</tbody>
</table>


Take one (1) tablet every 12 hours if needed for cold symptoms.

Dosette $30 Dr. Johnson
No Refills

| 117765 |

**Figure 18-7.—Prescription Label**

Other information that may need to be attached to the prescription container are labels that read "Shake Well Before Using" or "For External Use Only." "Poison" labels should be omitted when a preparation is intended for external use, as many physicians prefer the "For External Use Only" labels.

After the prescription is labeled, check the ingredients again by some systematic method to ensure accuracy.

As an added precaution and to aid expeditious identification of medications in case of undesirable effects, note the manufacturer and the lot number of the proprietary medication dispensed on the prescription form (see Figs. 18-5 and 18-6). This procedure, however, does not apply to medications consisting of a mixture of several ingredients. The initials or the code of the person filling the prescription must also be written on the prescription form (see Fig. 18-5 and 18-6).
Filling Prescriptions

Prescriptions that have been filled must be maintained in one of three separate files:

- **Schedule II (narcotics):** Prescriptions containing narcotics are numbered consecutively, proceeded by the letter "N", and filed separately.

- **Schedule III, IV, and V (controlled medications):** These prescriptions are numbered consecutively, preceded by the letter "C" and filed separately.

- **General files:** All other prescriptions are numbered consecutively and filed together.

Currently, prescriptions are required to be kept on file for at least 2 years after the date of issue.

**REGULATIONS AND RESPONSIBILITIES PERTAINING TO CONTROLLED SUBSTANCES, ALCOHOL, AND DANGEROUS MEDICATIONS**

**LEARNING OBJECTIVES:**

1. Identify HM responsibilities and accountability pertaining to controlled substances.

2. Identify controlled substance schedules.

3. Identify controlled substance security, custody, inventory, and survey procedures.

HMs who handle controlled substances and other medications are held responsible for the proper distribution and custody of those substances and medications. Nowhere is the demand for strict integrity more important. Misuse, abuse, loss, and theft of these substances have always, sooner or later, ended in tragedy and severe consequences. No one has ever profited by their misappropriation.

Every HM must understand the responsibility concerning the custody and handling of controlled substances and other medications and to be familiar with the regulations and laws.

**RESPONSIBILITY**

The MANMED specifically assigns custodial responsibility for controlled substances to a Commissioned Officer. The HM has the responsibilities of administering and securing them properly. All controlled substances and other medications are to be kept under lock and key. Neither keys nor medications should ever be entrusted to a patient.

**ACCOUNTABILITY**

HMs are held accountable for medications entrusted to them. Great care should be exercised to prevent the loss or unauthorized use of medications. No medication should be administered without proper authority. In addition, U.S. Navy Regulations forbid the introduction, possession, use, sale, or other transfer of marijuana, narcotic substances, or other controlled substances.

**CONTROLLED SUBSTANCE SCHEDULES**

Controlled substances and medications require special handling and security measures. The Controlled Substance Act of 1970 established five schedules (categories) related to a medications potential for abuse, medical usefulness, and degree of dependency, if abused.

Controlled substances may migrate between schedules, and new products may be added. In addition, local commands may designate certain drugs having abuse potential and require security measures similar to those for controlled substances. The CO will establish special security and accounting procedures for these command-sensitive items designated as “Locally Controlled Substances.”

18-40
Schedule I

Substances that have high abuse potential and no accepted medical use. Examples include heroin, marijuana, and LSD.

Schedule II

Substances that have high abuse potential and severe psychological and/or physical dependence liability. Examples include narcotics, amphetamines, and barbiturates. Prescriptions for schedule II substances can never be ordered with refills and in most cases must be filled within 7 days of the date originally written. See MANMED Chapter 21 for further information.

Schedule III

Substances that have less abuse potential than schedule II substances and moderate dependence liability. Examples include nonbarbiturate sedatives, nonamphetamine stimulants, and medications that contain a limited quantity of certain narcotics. Prescriptions must be filled within 30 days of the date written and may be refilled up to five times within 6 months.

Schedule IV

Substances that have less abuse potential than schedule III substances and limited dependence liability. Prescriptions must be filled within 30 days of the date written and may be refilled up to five times within a 6-month period.

Schedule V

Substances that have limited abuse potential. Schedule V substances are primarily antihistamines or antidiarrheals. Prescriptions must be filled within 30 days of the date written and may be refilled up to five times within 6 months.

SECURITY AND CUSTODY OF CONTROLLED SUBSTANCES

Schedule I and II controlled substances require vault or safe storage and inventory by the Controlled Substance Inventory Board (discussed in more detail in the section entitled “Inventory of Controlled Substances”). Working stock may be kept in a locked area within the pharmacy. A copy of the safe combination must be kept in a sealed envelope on file with the CO or representative.

Schedule III, IV, and V controlled substances require locked cabinet security for storage of bulk medications. A minimum amount of working stock may be dispersed among other pharmacy stock, provided the pharmacy stock itself is secure. Otherwise, all stock in this category must be kept in locked cabinets.

Custodial responsibility for controlled substances at treatment facilities is entrusted to a Commissioned Officer or a civilian Pharmacist who is appointed in writing by the CO. At remote Branch Health Clinics that do not have a Commissioned Officer or a civilian Pharmacist, the CO will designate, in writing a member of the branch clinic as custodian. On board large naval vessels, the CO will appoint an officer of the Medical Department or another officer, in writing, as the bulk custodian.

This officer will be responsible for, and maintain custody of, all bulk controlled substances. On board smaller naval vessels, access to controlled substances is limited to the bulk custodian and the Senior Medical Department Representative (SMDR). Only individuals whose official duties require access to such spaces are provided the safe combinations.
INVENTORY OF CONTROLLED SUBSTANCES

Quarterly, or more frequently if necessary, the Controlled Substances Inventory Board (CSIB) takes an unannounced inventory of controlled substances.

NOTE:
An exception to this frequency may be made for ships with an Independent Duty Corpsman.

On these ships, the inventory may be conducted on a quarterly basis if there have been no transactions of controlled substances (including filled prescriptions or receipts of items requisitioned from supply).

The CO appoints the members of the CSIB in writing. The board consists of three members, at least one of whom is a Commissioned Officer. After the board conducts the inventory, it submits a report to the CO. The officer having custodial responsibility cannot be a member of the board. On small ships and installations, the SWDR may be a board member. For further guidance on controlled substance inventory procedures, refer to MANMED Chapter 21 Pharmacy Operation and Drug Control and BUMEDINST 6710.70 series.

SURVEY OF CONTROLLED SUBSTANCES

Schedule I and II controlled substances and locally controlled medications that have become outdated, deteriorated to the point of not being usable, are of questionable purity or potency, or have had their identity compromised, must be reported to the CO. If destruction is indicated and directed by the CO, destruction must be accomplished in the presence of a member of the CSIB. A certification of destruction form contains the complete nomenclature and quantity of the substances to be destroyed together with the method of destruction to be used.

After certification is completed, approved by the CO, and signed by the members witnessing the destruction, the certification of destruction is retained and filed as required by current instructions. The destroyed substances should then be removed from the stock records and the controlled substance log.

SUMMARY

Inpatients and the majority of outpatients will receive pharmaceutical products as part of the treatment. As a healthcare provider administering these products or filling prescriptions, it is crucial to have a good foundation of knowledge in pharmacology, toxicology, and the proper handling of prescriptions and controlled substances. This chapter provided a review of these topics to assist in the duties. Always consult the recommended publications, such as the Manual of the Medical Department, Drug Facts and Comparisons, and the Drug Information Handbook, to provide the guidance and knowledge needed to provide the best possible care for patients.