

تفريغ حساب وتركيب الأشكال الصيدلانية



اسم الموضوع: ديس / المحاضرة الاولى

إعداد الصيدلاني / محمد ياسين



لجان الرفعات

نعطي مقدمة لل **compounding** لو رجعنا للتاريخ راح تلاقي الانسان بمرض ومن زمان بحاول يلاقي دواء شو كان يتوفر عنده هاض الانسان ؟ كان يتوفر عنده الحيوان الاشجار الصخور فكان يحاول انه يوخذ منهم وهذا الاشوي موجود سواء **Greek,Egyption** كانوا يحاولوا يطلعوا الادوية من **animal ,vegetable** شائع عندهم لانه الي بنكسر ينجرح يسولوهم بخدروهم .


Liquorice:ايش هو ال **liquorice** ؟عرق السوس نبتة بتعطي **energy**

*كل محاولات الانسان مع الادوية كانت بالتجربة والخطأ هاض كان اول مصدر **source** المصدر الثاني كان الحيوانات الاغلب كان عنده حيوانات ف اكيد الحيوان بمرض كانوا يلاحظوا انه الحيوان بتجه لنبته معينة الفكرة انه كان يحاول يوصل لاحسن نقاء للدواء فتطور لحد ما مشينا **Formulate preparation**

- الي بده يوخذ **Aquol** ايش هو ال **Aquol**؟ هو الخشخاش الي هو المخدر الي بطلعوا منه المورفين الي بوخذوا برأيك بتتوقع او بتتخيل بحكي انا تعافيت من هاض الاشوي اسمه ترسيب يعني تهيأ له انه تعالج في **parseed** وفي ال **real** ال **parseed** هو بتياً له انه تعالج ال **parseed** بنعطيه للمكتب

اما **real** بنعطيه لالم الرجلين او ارتفاع درجة الحرارة

-في اشوي بنسميه **pharma copeia**:دستور الادوية ايش يعني دستور الادوية ؟هي مرجع للوصفات الطبية



Introduction to Pharmaceutical Compounding



History of Pharmacy Profession

- It is impossible to specify when humans first started to mix materials and formulate preparations that produced either perceived or real therapeutic effects.
- However, it is known that the compounding of medicinal preparations from animal, vegetable (liquorice, mustard, myrth) , and opium and mineral sources has been practiced in a sophisticated form by ancient civilisations such as The Ancient Egyptians, Mesopotamian civilization, the Ancient Greek.



Formula : التركيبه الي بتبلش اول اشي **active ingradient** الي هي الدواء
اللي له تأثير دوائي **inactive + pharma college scraptic**

دواء الاطفال ايش لازم يكون عليه حكينا زي الرائحة واللون وعشان يضل ماسك
بنحط عليه مادة بزيد الزوجه بتكون **inactive**

اذا ال **formula** : مجموعة مواد اهمها الدواء او مجموعة من الادوية زائد
inactive مواد مواد ما الها اي تأثير دوائي

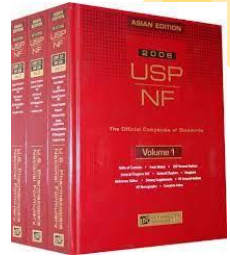
الهدف من **inactive** تعطيني شكل صيدلاني مقبول من اي ناحية مقبول للمريض
عشان تعطيني تاثير دوائي بضل الدواء ثابت

Definition of Pharmaceutical Compounding

Based on United States Pharmacopeia (USP-NF) chapter <795>: pharmaceutical compounding—nonsterile preparations, compounding can be defined as :

united state pharma copia

غير معقم



بكتريا

“The preparation, mixing, assembling, altering, packaging, and labeling of a drug, drug-delivery device, or device in accordance with a licensed practitioner’s prescription, medication, order, or initiative based on the practitioner/patient/pharmacist/compounder relationship in the course of professional practice”.

mixing : إضافة البره مع البره و نخلطهم بي التغذية saline
 assembling : تجميع اشياء
 altering : لما يجيني دواء من animal و اغير فيه عشان
 packaging : نفسي * مفي شرط الي
 يهر مقبول النا //

1-4 : يجمع
 الومنه
 1-2 : يجمع
 health care

يعمل packaging دواء

1. - Pediatric patients requiring diluted adult strengths of drugs.
2. - Patients needing an oral **solution or suspension** of a product that is only available in another form. الأ لفلان
3. - Patients with **sensitivity** to dyes, preservatives, or flavoring agents found in commercial formulations. مواد حافظه
4. - Dermatological formulations with fortified (strengthened) or diluted concentrations of commercially available products.
5. - Compounding for **animals**. رجعا لشكلها الحقيقي
6. - **Reconstitution** of a lyophilised powder to form a simple solution احدى طرق التخفيف والتعقيم
7. - In hospital compounding involves the preparation of IV admixtures, parenteral nutrition solutions, and radiopharmaceuticals بعده عن ال GI و دحت لدا injection
8. - In home health care compounding requires the preparation of syringes and other devices for home-infusion administration

Why Extemporaneous compounding is needed??

الأطفال اللي عندهم كربي ما بقدر تعطيهم الدواء الادي اللي كله كركر

intral : جر بااد GI عن طريق الفم

parental : Lipid protein
 جرعه تعطى للريفن مره واحده : bolus
 one injection

... over a long time

معلومة نحتت انه الصيدلاني ما بقدر يكون **compounder** الا اذا ترخصه او تدرب

في عنا **term** اسمه **extintisher** هو تركيب الدواء في وقته لما تروح تدرب
بالصيدلية الدواء يكون اجى من المصنع فبكون مرق عليه وقت اما **extratious**
بكون اله صلاحية لانه الدواء الي بتركب بالصيدلية ما بكون اله مواد حافظة

*لما تحله بكون اله فترة صلاحية لو الدواء **stable** او بتحمل كان المصنع صنعه
سائل بس المصنع ما صنعه سائل صنعه بودرة وقلك حله وقت الاستعمال

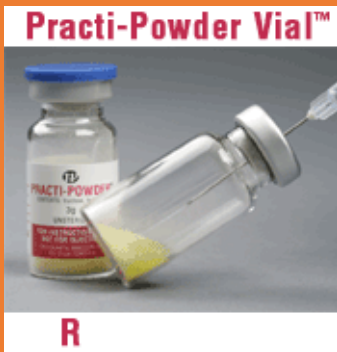
اذا لما يكون بودره بكون **stable** وبعد ما تحله بقعد اسبوع وكبه

*ادوية **extratious** بتكون بالصيدلية والمستشفى

- مر عليكم اطفال بنصابوا بالسكري او عندهم غدة درقية ؟ الجواب نعم في امراض
لللكبار بنصابوا فيها الاطفال بشرط تحسب الجرعة على وزن الطفل هاض اسمه

compound

غالبا الدواء اول ما ينعطى بعمل الم شديد بتخفف كيف ؟ بنعطى الدواء على زمن
طويل او منعطيه على تركيز معين اسمه **infusion**



• What is Reconstitution? *صحة جدا للابر*

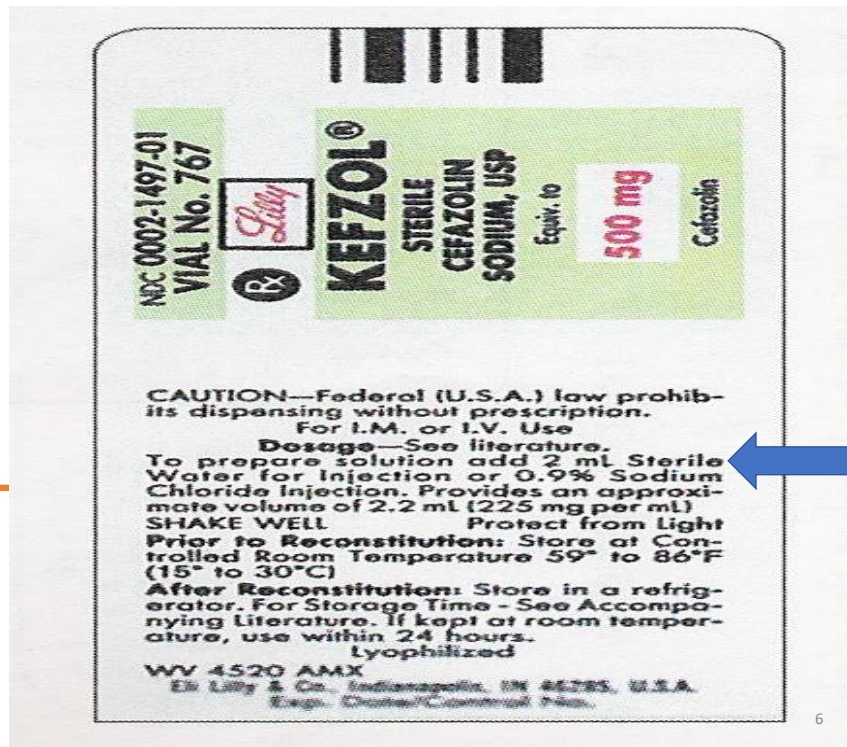
Some drugs must be stored in powdered form because they rapidly lose their power once they are mixed into a solution. These drugs will then have to be **reconstituted**, or mixed with a liquid, called the **diluent**, before they can be administered.

من باور الى solution

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active ال اختصارا API

Example



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Diagnose: تشخيص prevention: منع
 mitigation: تخفيف
 treatment: علاج تام

Dosage form (Preparation)

Active Pharmaceutical ingredient (API):
 Any substance or mixture of substances intended to be used in the compounding of a drug preparation, thereby becoming the active ingredient in that preparation and furnishing pharmacological activity or other direct effect in the diagnosis, cure, mitigation (alleviation), treatment, or prevention of disease in humans and animals or affecting the structure and function of the body.

Added substances
 Ingredients that are necessary to compound a preparation but are not intended or expected to cause a pharmacologic response if administered alone in the amount or concentration contained in a single dose of the compounded preparation.
 The term is used synonymously with the terms inactive ingredients, excipients, and pharmaceutical ingredients.

amount: وحدة الوزن mass

Concentration: mass/volume

General Principles of Compounding

تستفيد منها

1. Personnel are appropriately trained and are capable of performing and qualified to perform their assigned duties. Such training should be documented.

2. **Compounding ingredients of the appropriate identity, purity, and quality are purchased from reliable sources and are properly stored according to manufacturer specifications or pharmacopeial standards.**

storage condition: Temperature humidity

3. Bulk component containers are labeled with appropriate Occupational Safety and Health Administration (OSHA) **hazard communication labels***, and **Material Safety Data Sheets (MSDS)*** are available to compounding personnel for all drugs and chemicals used in compounding.

كل دواء يكون معاه sheet بتحكيك عن الاعراض الجانبية

4. All equipment used in compounding is clean, properly maintained, and used appropriately.

ناشف

*** Refer to the PDF documents provided with the lecture notes on MS Teams**

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شرح نقطه ٣ / الفكره كل ماده بتدخل بالدواء لازم يكون معروف شو هيا الماده بالزبط متأكدين أنه هيك تركيبتها / شو نسبة ال purity

• **Material Safety Data Sheets (MSDSs):**

They are needed for all drug substances or bulk chemicals located in the compounding pharmacy.

NATURAL SOURCING Specialty Bulk Chemicals and Ingredients		341 Christian Street, Oxford, CT 06478 USA Tel: (203) 267-6061 Fax: (203) 267-6065 www.naturalsourcing.com info@naturalsourcing.com
MATERIAL SAFETY DATA SHEET		
SOYBEAN OIL		MSDS
1. PRODUCT NAME AND COMPANY IDENTIFICATION		
Product Name:	SOYBEAN OIL	
Product Use:	Personal Care Formulations	
Company Name:	Natural Sourcing	
Company Address:	341 Christian Street, Oxford, CT 06478, USA	
Date Issued:	1/1/2008	
Emergency Telephone Number:	Chemtec Tel: (800) 262-8200	
2. COMPOSITION/INGREDIENT INFORMATION		
Ingredients:	Vegetable Oil Triglycerides 100%	
Hazardous Components:	None	
CAS #:		
3. HAZARDS IDENTIFICATION		
Routes of Entry:		
Eye Contact:	Mild irritation may occur.	
Skin Contact:	May cause irritation in sensitive individuals with prolonged exposure	
Ingestion:	Food Grade	
Inhalation:	Inhalation of fine mist may effect respiratory system	
4. FIRST AID MEASURES		
Eyes:	Flush with plenty of water or eye wash solution for 15 minutes. Get medical attention if irritation persists.	
Skin:	Wash with soap and flush with plenty of water	
Ingestion:	N/A	
Inhalation:	Remove to fresh air and seek medical attention	
Medical Conditions Generally Aggravated by Exposure:	None	
5. FIRE FIGHTING MEASURES		
Flash Point (Method Used):	> 550°F Close Cup	
Flammable Limits:		
LEL:	Low	
UEL:	Low	
Extinguishing Media:	Dry Chemical, Carbon Dioxide, Foam	
Special Firefighting Procedures:	Cool containers exposed to flame with water. Limit the spread	

2/24/2024

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اتأكد ما يكون فيه خطأ

General Principles of Compounding

مكان منفصل

- The compounding environment is suitable for its intended purpose; and procedures are implemented to prevent cross-contamination, especially when compounding with drugs (e.g., hazardous drugs and known allergens like penicillin) that require special precautions.
فقط الشخص المرخص له
بجهد حسابي
- Only authorised personnel are allowed in the immediate vicinity of the drug compounding operations.
- There is assurance that processes are always carried out as intended or specified and are reproducible.
اشي محدد
امنع الأخطاء
- Compounding conditions and procedures are adequate for preventing errors.
- All aspects of compounding are appropriately documented.
لا تعتمد على ذاكرتك
كل اشي اكتبو
- Adequate procedures and records exist for investigating and correcting failures or problems in compounding, testing, or the preparation itself.
نحفظ بكل اشي

investigating = عشان اذا فيه تحقيق

* كل ما كنت منظم كل ما كانت امورك كامله بتكون امورك سهله

Grades of Materials used in compounding

I. **Pharmacoepial grade:**
Meets USP/NF or BP standards

جداً غالية
وشركات مهينه وقتليه
بتمنعها

II. **American Chemical Society (ACS) grade:**

Meets the specifications of the Reagent Chemicals Committee of the American Chemical Society. ACS requires the chemicals to be at least 95% pure. Hence, materials of this grade are considered of high quality.

شركة
مختصة
بالكيمياء

III. **Analytical grade (AR):**

Very high purity reagents.

في امور التحليل

IV. **High-performance liquid chromatography (HPLC) grade:**

Very high purity.
Used in high pressure chromatography.

ورقة صغير وبتحليلها
ب الجاهل و بصير قسني

V. **Ultra Performance Liquid Chromatography (UPLC) grade :**

Very high purity.
Used in UPLC.

اعلى purity

1 - الاولى

2 - الثانية

3 - الرابعة والخامسة

4 - الثالثة

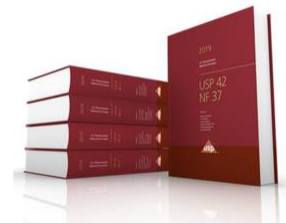
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Pharmacopeias

The term pharmacopeia originates from the Greek word *pharmakon*, meaning drug, and *poiein*, meaning make.

1. The British Pharmacopoeia (BP)
2. The European Pharmacopoeia (Ph Eur)*
3. The unites States Pharmacopoeia (USP)

*The European Pharmacopoeia (Ph Eur) is included in the British Pharmacopoeia which is available online



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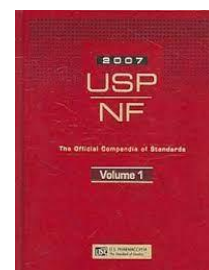
Pharmacopeias are reflecting the best in the current practices of medicine and pharmacy and provide suitable tests and assay procedures for demonstrating compliance with these standards in which these standards are used by regulatory agencies and manufacturers to help to ensure that these products are of the appropriate:

- identity,
- strength,
- quality,
- purity, and
- consistency.

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United States Pharmacopeia (USP)

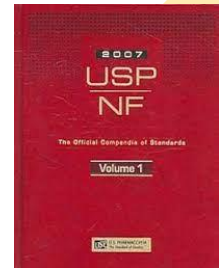
- The **United States Pharmacopeia (USP)** is the official pharmacopeia of the United States, it is a combination of two official compendia that are published together, the United States Pharmacopoeia (USP) and the National Formulary (NF).
- The USP/NF is published every year by **United States Pharmacopeial Convention** (usually also called the USP) who the trademark and the copyrights.
- The Prescription and over-the-counter medicines and other health care products sold in the United States are required to follow the standards in the USP-NF. USP also sets standards for food ingredients and dietary supplements.



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Major Sections of USP-NF

1. Preface: By-laws, changes from previous USP
2. General Notices: Definitions and assumption
3. USP Monographs :Drug substance, product standards
4. General Chapters: General test methods, information
5. Reagents: Materials used in Monographs
6. Reference Tables: Description, solubility, etc.
7. NF Monographs: Excipients
8. Dietary Supplement Monographs :Substance and product standards



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USP/NF Chapters

Chapters <795> - Pharmaceutical Compounding - Nonsterile Preparations

- Published in 2000
- Enforceable

Chapter <797> - cPharmaceutical Compounding - Sterile Preparations

- Became official in 2004.

Other Chapters

- Containers <661>
- Good Compounding Practices <1075>
- Pharmaceutical Stability <1150>
- Pharmaceutical Dosage Forms <1151>

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The British Pharmacopoeia (BP)



The BP consists of six volumes:

- Volumes I and II: Contain medicinal substances.
- Volume III: Contains formulated preparations, Blood related preparations, Immunological products, Radiopharmaceutical preparations, Surgical materials, Homeopathic preparations.
- Volume IV: Contains appendices, supplementary chapters, Infrared Reference Spectra, Index.
- Volume V: The veterinary British Pharmacopoeia.
- Volume VI: Contains CD ROM for the electronic version of the BP.

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Compounding (Extemporaneous) preparation is an inherently risky activity; therefore, before we proceed with this topic we need to identify the **risk levels** associated with it.

Chapter <795> classified the compounding into three main categories based on the following criteria:

1. The degree of difficulty or complexity of the compounding process.
2. The stability information and warnings.
3. Packaging and storage requirements.
4. Dosage forms.
5. Complexity of calculations.
6. Local versus systemic biological disposition.
7. Level of risk to the compounder.
8. Potential for risk of harm to the patient.



➤ Compounding categories practice examples

➤ Simple

Making a preparation that has a USP compounding monograph or that appears in a peer-reviewed journal article that contains :

- **specific** quantities of all components,
- compounding procedure
- equipment, and
- stability data for that formulation with
- appropriate BUDs (*Beyond-Use Dates*); or
- reconstituting or manipulating commercial products that may require the addition of one or more ingredients as directed by the manufacturer.

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➤ Moderate

Making a preparation that requires special calculations or procedures (such as calibration of dosage unit mold cavities) to determine quantities of components per preparation or per individualized dosage units;

or making a preparation for which stability data for that specific formulation are not available. For instance, mixing two or more manufactured cream and the stability of the mixture is not known.

➤ Complex

Making a preparation that **requires special** training, environment, facilities, equipment, and procedures to ensure appropriate therapeutic outcomes. Transdermal dosage forms and modified-release preparations are examples.

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Pharmacist who are engaged in drug or dietary supplement compounding shall be proficient in compounding and should continually expand their compounding knowledge by participating in seminars and/or studying appropriate literature.

They shall be knowledgeable about the contents of this chapter and should be familiar with:

- [Pharmaceutical Dosage Forms <1151>](#).
- [Pharmaceutical Calculations in Pharmacy Practice <1160>](#).
- [Quality Assurance in Pharmaceutical Compounding <1163>](#).
- [Prescription Balances and Volumetric Apparatus Used in Compounding <1176>](#) and [<1191>](#).
- [Written Prescription Drug Information—Guidelines <1265>](#).
- All applicable compounding laws, guidelines, and standards.

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The main compounding steps:


1. Pharmacist **receives prescription** or **medication order**.
2. Review and interpret (translate) the prescription.
3. Compounding the preparation*
4. Packaging*
5. Labelling*
6. Verification : Involves checking to ensure that all the process were appropriate and performed accurately. Additionally, the **Master Formulation Record** and the **Compounding Record** have been reviewed by the compounder to ensure that errors have not occurred in the compounding process and that the preparation is suitable for use
7. Patient counseling: The preparation is delivered to the patient or caregiver with the appropriate consultation about use, storage, and evidence of instability (visual changes, odor, etc.).

* [Detailed explanation will be presented in the following slides.](#)

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1. Prescription and Medication order.

- Both are legal orders by which the prescriber communicate with the pharmacist with regard to the treatment for a patient.
- Prescriptions are used for outpatient (on the right) and medication orders are for inpatients (on the left).

Patient: John Smith Age: 68		Medical record number: 145693 Room: 3B-154	B. Pajamo, M.D. 4701 Main St. Baltimore, MD 12345	
Date	Medication	Prescriber	Name <i>Jane Rusky</i>	DOB <i>1/5/62</i>
8/10 8:23 am	Vancomycin 1,500 mg IV q12 hours x 3 days	B. Pajamo, MD	Address <i>309 South Street</i>	Date <i>8/10/14</i>
	D/c clindamycin 600 mg IV q6 hours	B. Pajamo, MD	 Ciprofloxacin 500 mg Sig: take 1 tab po bid x 7 days Disp: 14 tabs	
8/10 9:15 am	KCl 20 mEq in 1 L 0.9%NS IV at 100 ml/hr x 1 liter	B. Pajamo, MD		
	Acetaminophen 650 mg PO q6 hours prn temp >101 F	B. Pajamo, MD	Refills <i>0</i>	<i>B. Pajamo</i> M.D.

3. Compounding the preparation*

The compounder is responsible for ensuring that each individual incidence of compounding meets the given following criteria:

1. Evaluated the dose, safety, and intended use of the preparation for suitability in terms of, the chemical and physical properties of the components, dosage form therapeutic appropriateness and route of administration, including local and systemic biological disposition, legal limitations, if any.
2. Created a master **formulation record** before compounding a preparation for the first time. (This record shall be followed each time that preparation is made).
3. A Compounding Record should be completed each time a preparation is compounded.
4. Identify the materials and the equipment needed and Inspected the equipment for cleanliness and correct functioning.

5. Clean and sanitised the area dedicated to compounding.
6. Personnel engaged in compounding maintain good hand hygiene and wear clean clothing appropriate to the type of compounding performed (e.g., hair bonnets, coats, gowns, gloves, facemasks, shoes, aprons, or other items) as needed for protection of personnel from chemical exposures and for prevention of drug contamination.
7. Only one preparation is compounded at one time in a specific workspace.
8. Critical processes (including but not limited to weighing, measuring, and mixing) are verified by the compounder to ensure that procedures, when used, will consistently result in the expected qualities in the finished preparation.
9. The final preparation is assessed using factors such as weight, adequacy of mixing, clarity, odor, color, consistency, pH, and analytical testing as appropriate; and record this information in the **Compounding Record** (log) (Refer to chapter [\(1163\)](#)).
10. Clean all equipment thoroughly and promptly, and store properly.

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4. Packaging

- The compounder shall ensure that the containers and container closures used in packaging:
1. Meet *USP* requirements and when available, compounding monographs.
 2. Made of a material that doesn't change the quality, strength, or purity of the preparation.
 3. Stored off the floor, handled and stored to prevent contamination, and rotated so that the oldest stock is used first.
 4. Selected based on the physical and chemical properties of the preparation to avoid container–drug interaction. Some materials might have sorptive or leaching properties.
 5. Finally, the compounder need to make sure that the container is properly sealed, and the preparation is protected against damage/contamination.

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5. Labeling

The preparation container is labeled according to all applicable laws and guidelines.

➤ Label on the dispensed preparation has two main functions:

1. To uniquely identify the contents of the container.
2. To ensure that patients have a clear and a concise information that enable them to take or to use their medication in the most effective and appropriate way.

➤ There are two types of labels: Main label and Auxiliary label

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The Main Label

1. Name and address of the pharmacy
2. The patient's name
3. The name of the preparation, written as

quantity of preparation (50 ml, 40 tablet, 30 gm) , the **name of preparation**, the **name of dosage form**, **the strength number** written as whole numbers where decimal should be avoided but if the decimals are un-avoided write (zero decimal then the number, (0.5), then **the unit of concentration** and **the source of the formula** if it is an official product.

Ex: **50 mL** of **sodium salicylate mixture** **10 % W/V** **BP.**

1. The use of the preparation, give the patient clear and complete instructions on how to take the drug, quantity to be taken, frequency, route of administration and the method of use: Take 5mL three times daily orally after food.
2. Storage conditions: "*Store in cool place*", "*store in dry place*", "*store in dark place*"
3. The date of the compounding, written as day/ month/ year.

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7. Beyond-Use Date (BUD): The date after which a compounded preparation shall not be used; determined from the date the preparation is compounded according to references, this time is different from expiry date which is longer, written as day/month/year.
8. The prescription reference number: number written on the prescription and on the container, this allows the record to be traced easily if the patient brings the container and not the prescription when a further supply is needed.

200 mL	<u>BN#020323</u>
Glucose, Sodium Chloride and Sodium Citrate Oral Solution BP	
Use when required	
Store in a refrigerator	
Do not take after: 03/03/2023, 10:00 am	
Any portion remaining after 24 hours should be discarded	
Mr. Ahamd mohammad	02/03/2023, 10 am.

Shoroq M.I. , Faculty of pharmaceutical sciences, Zarqa'a, Jordan	

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Stability

Stability

- The extent to which a dosage form retains the same properties and characteristics that it possessed at the time of its manufacture.

Expiration date

- The date until which the manufacturer can guarantee of the safety and full potency of a drug- usually determined after extensive study of the product's stability.

Beyond-use dates

- Used for compounded preparations only and are generally in the order of "days" or "months."

Shelf life

- Length of time a packaged drug will last without deteriorating

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Assigning a Beyond-Use Date

For **non-sterile compounded preparations** that have no stability data; the following BUD are assigned:

- **For Nonaqueous liquids and solid formulations**
 - If the source of the active drug is a manufactured drug product, the beyond-use date is not later than 25% of the time remaining until the drug product's expiration date, or 6 months, whichever is earlier.
 - If the source of the active drug is a USP or NF substance, the beyond-use date is not later than 6 months.
- **For Water containing formulations**
 - When prepared from ingredients in solid form, the beyond-use date should be not later than 14 days when stored at **cold temperature**.
- **For all other formulations**
 - The beyond-use date is not later than the intended duration of therapy or 30 days, whichever is earlier.

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Storage Requirements

Term	Definition*
Freezer	-25°C to -10°C
Protect from Freezing	Store above 0°C
Cold	temperature not exceeding 8°C
Refrigerator	Between 2°C and 8°C
Cool	Between 8°C and 15°C
Room Temperature (Ambient temperature)	Temperature in the working environment
Controlled Room Temperature	Thermostatically controlled at 20°C to 25 °C
Warm	Between 30° and 40°C
Excessive Heat =	temperature above 40° C
Dry place	A place that does not exceed 40% average relative humidity at 20°C
Do not refrigerate:	the storage temperature of 20°–25°C
Protect from light	The article must be packaged in a light resistant Container.

- *USP Chapter (659) Packaging And Storage Requirements

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Auxiliary Labels

- The auxiliary labels: arranged on the other side of the container, these labels are cautionary or advisory depending on the type of dosage form.
- Needed to provide supplementary information regarding proper and safe administration, use, or storage of the formulation
- *"keep out of reach of children" for oral use" "for external use", "not to be taken orally", "flammable", "not to be swallowed", and "shake the bottle before use".*
- Controlled substances from schedules II,III, and IV must carry an auxiliary label stating
- "Caution: Federal Law prohibits the transfer of this drug to any person other than the patient for whom it was prescribed"



Preparations lables and packaging examples

Type of preparation	Color of print	Packaging	Auxiliary labels
Oral solutions (ORS,Elixir,syrups)	Black	Plain bottle(glass, plastic)	For oral use
Ear drops	Red	Fluted hexagonal glass dropper bottle or plastic squeeze bottle	Not to be taken orally, for ear use only
Eye drops	black	Fluted hexagonal glass dropper bottle or plastic squeeze bottle	Not to be taken orally, for eye use only, sterile till open
Nasal drops	black	Fluted hexagonal glass dropper bottle or plastic squeeze bottle	Not to be taken orally, for nasal use only
External solutions(antiseptic, lotions)	Red	Fluted bottle (glass, plastic)	For external use only

Caution !

- Reviewing and understanding the prescription as well as labeling the compounded preparation involve a “language” that must be learned and utilised to assure the quality and the efficacy of the preparation and to avoid any errors that will put the patient life at risk.
- Care **must be taken when interpreting any abbreviation, some abbreviations are prone to misinterpretation, so their use is not encouraged**
- <https://www.ismp.org> , the website for the institute of safe medication practices provide lists and tools to help preventing medication errors.

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Prescription abbreviations in Pharmacy

Abbreviations in pharmacy cover the following aspects:

1. Route of administration
2. Dosage Form
3. Frequency or times of administration
4. Dosage

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Route of Administration Abbreviations

Abbreviation	Latin term	Meaning
IM	-	Intramuscular
IV	-	Intravenous
p.o.	Per os	By Mouth, Orally
SL	-	Sublingually, Under the tongue
ad	Auris Dextra	Right ear
a.s. or a.l.	Auris Sinister, Auris Laeva	Left ear
a.u.	Auris Utraque	Each ear
o.d.	Oculus Dexter	Right eye
o.s.	Oculus Sinister	Left eye
o.u.	Oculus Uterque	Both eyes

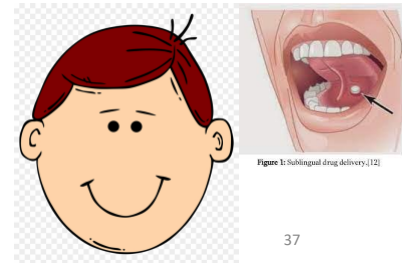


Figure 1: Sublingual drug delivery (12)

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Time of Administration Abbreviations

Abbreviation	Latin term	Meaning
ac	Ante Cibum	Before meals
pc	Post Cibum	After meals
hs	Hora Somni	At bedtime
qd	Quaque Die	Every day
prn	Pro Re Nata	As needed
qid	Quater In Die	Four times a Day
tid	Ter In Die	Three times a Day
bid	Bis In Die	Two times a Day

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Dosage Form Abbreviations

elix → elixir

Supp → suppository

ung → ointment

tab → tablet

Cap → capsule

sol → solution

susp → suspension



NDC 0078-0446-05

Voltaren®-XR 100 mg
(diclofenac sodium extended-release) tablets, USP

100 tablets Rx only

PHARMACIST: Dispense with Medication Guide attached or provided separately.

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Measurement Abbreviations

I, II, III → 1,2,3

gm → Gram

gr → Grain

L → Liter

mg → microgram

µg (mcg) → microgram

meq → milliequivalent

ml → milliliter

qs → a sufficient quantity

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Label wording instructions

1. Indicate the dosage form to be administered.

“Take one capsule every day” instead of “Take one every day”.

2. Use words NOT of numbers.

“Take one capsule every day” instead of “Take 1 capsule every day”

3. Specify the route of administration if the medication is not intended for oral use.

“Insert one suppository vaginally every night at bedtime”

4. Specify which side is to receive the medication if more than one organ is present.

“Instill two drops in left eye daily” instead of “instill two drops daily”

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5. Do not use abbreviations.

“Take two capsules twice a day” and not “Take two caps twice a day.

8. Use familiar words

Teaspoonful or 10 mL

6. Specify the amount of active ingredient per dosage unit.

Amoxicillin 250mg/5ml, Phenergan 25mg/ suppository.

7. When dispensing medications in bulk, such as solutions, suspensions, emulsions, ointments, or creams, express the amount of active ingredients as a percentage strength.

Hydrocortisone cream 1%, Betadine solution 2%.

8. When writing direction for use, start with a verb, Take, instill, inhale, insert, or apply. And indicate the route of administration, apply to affected area. Take one tablet by mouth. Insert rectally. Place one tablet under the tongue.

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At last:



1

Don't add information!

- Never add information based on what you assume the prescriber meant. The prescriber has knowledge of the patient's condition that you don't.

2

Check against the original!

- During the fill process, always refer to the original prescription first and then refer to the label.

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*Equipment used
Pharmaceutical
Compounding*

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Types of Equipment

Measuring

- Balance, weights, weighing containers, volumetric glassware (graduates, pipets, flasks, syringes).

Molding

- Hot plates, suppository molds, capsule shells, ointment slabs.

Mixing

- Beakers, Erlenmeyer flasks, spatulas, funnels, sieves, mortar and pestle.

Packaging

- Prescription bottles, capsule vials, suppository boxes, ointment jars.

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Pharmaceutical Calculations

- As we mentioned earlier, compounding is an inherently risky activity. One of the greatest sources for error in prescription compounding is in the area of pharmacy calculations.
- There is no place for ignorance in this area and an individual how are incompetent to do the necessary calculations should not be involved in pharmaceutical compounding.
- A misplaced decimal or “estimated” value for a medication can have serious consequences including death.

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Thu 2 Mar 2000 02:17 GMT



Chemists fined over deadly medicine

Two Boots pharmacists who dispensed a peppermint solution which killed a four-day-old baby were fined yesterday after they admitted supplying defective medicine.

The medicine given to Matthew Young, from Runcorn, Cheshire, contained 20 times too much chloroform. He suffered a heart attack and brain damage, and died in hospital 18 days later.

At Chester crown court yesterday a verdict of not guilty to manslaughter was ordered against pharmacist Lisa Taylor-Lloyd, 27, and Ziad Kattab, 25, a trainee pharmacist, who were fined £1,000 and £750 respectively after they admitted supplying the solution.

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'He was gaslighting'