Disclosure

I do not have a vested interest in or affiliation with any corporate organization offering financial support or grant monies for this continuing education activity, or any affiliation with an organization whose philosophy could potentially bias my presentation.

Objectives

- Explain USP/NF and its role in pharmaceutical compounding
- Explain non-sterile compounding; Chapter <795>
- Describe 'Official' compounding formulations
- List 3 requirements of a USP monograph

Objectives

- List the different time frames for Beyond Use Date (BUD)
- Explain the differences in determining the Beyond Use Date
- Describe two steps in the process for compounding a preparation

Introduction

The United States Pharmacopeia and The National Formulary (USP–NF)

Introduction

- Since 1980 USP/NF is Established as official compendia for the United States
- The Food, Drug and Cosmetic Act of 1938 make their (USP/NF) standards of strength, purity, packaging and labeling enforceable under federal law.
### Introduction
- Today, the USP/NF is an independent organization
- Work is conducted through 60 expert committees
- More than 650 volunteers from pharmacy practice, academia, and related support companies.

### Introduction
- Combined compendia, previously published, every 5 years until 2002
- Now yearly updates are available
- Comprised of more than 2000 chapters

### Chapters Related to Compounding
- Chapters numbered <1> to <999> are requirements and official monographs and standards
- Chapters numbered from <1000> to <1999> are informational, and
- Chapters above <2000> apply to nutritional supplements

### Chapters Related to Compounding
- In 1997, non-sterile compounding (<795>) chapter became enforceable
- In 2004, sterile compounding (<797>) chapters became enforceable
- Both <795> and <797> are now requirements

### Chapters Related to Compounding
- Pharmacies are subject to inspection against these standards
- State boards of pharmacy (inspection)
- Food and Drug Administration (FDA) For enforcing USP/NF guidelines
- Accreditation organizations such as the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and others

### Official Compounded Formulations
- The USP/NF contains monographs of most commonly compounded preparations
- These “official” formulations have the advantage of USP/NF testing, quality assurance and “beyond use date” assignment
Official Compounded Formulations

When formulations are compounded as described in a monograph

- Stability is assumed to be identical to that stated in the monograph applied to the compounded formulation

Official Compounded Formulations

- The USP/NF Council of Experts and its expert committees have developed monographs for approximately 150 most commonly compounded preparations used today

Official Compounded Formulations

- USP/NF will continue its work to
- Add more drugs when available
- It is possible that more than 1,000 other compounded preparations will require a USP/NF monograph

Official Compounded Formulations

- Inclusion of compounding monographs in the USP
- Helps ensure quality and benefit of a compounded formulation
- Provides uniformity in prescribing and preparing these formulations, as required by law.

Official Compounded Formulations

- A prescriber writing for a specific compounded prescription that appears in the USP/NF has defined the product to be prepared
- Pharmacists, adhering to compendia, prepare product with defined quality standards
- Pharmacists have to use their professional judgment in compounding a formulation, when the USP does not have monograph

Pharmaceutical Compounding Non-sterile Preparations <795>

- Chapter distinguishes “manufactured products” and “compounded preparations”
- Differentiates the output of pharmaceutical companies (products) and pharmacies (preparations)
- Deals with non-sterile dosage forms
### Responsibility of the Compounder

- Pharmacist or other licensed health care professional
- Centers on quality assurance of personnel, ingredients, finished preparations, processes, environment, stability, consistency, error prevention and documentation

### Stability of Compounded Preparations

- Beyond use dates (BUD) are assigned to compounded preparations
- Expiration dates are assigned to manufactured products
- Compounder is responsible for assigning the beyond use date (BUD)

### Stability of Compounded Preparations

- To determine an appropriate beyond use date, compounders can consult literature and manufacturers analytical laboratories
- In the event no data are available, the chapter provides guidelines

### Stability of Compounded Preparations

- BUD: for solids and non-aqueous liquids prepared from commercially available dosage forms
- 25% of the remaining expiration date of the commercial product, or six (6) months, whichever is earlier

### Stability of Compounded Preparations

- Solids and non-aqueous liquids prepared from bulk ingredients– up to 6 months
- Water containing formulations (prepared from ingredients in solid form) – up to 14 days when stored in a refrigerator
- All other formulations – up to 30 days or the intended duration of therapy, whichever is earlier

### Sources of Ingredients

- USP and NF grade ingredients should be used, if available.
- If unavailable, the pharmacist must select a reasonable high-quality grade ingredient from a reliable source
- Certificates of analysis can be useful for establishing quality of the ingredients used, both active and excipients
Calculations

- Metronidazole Solution from Tablets
- Pravastatin capsules from tablets

Calculations

Rx. Metronidazole solution 250 mg/5 mL
Sig: 1 tsp; po; tid; for 2 weeks
Dis: q.s (210 mL)
Metronidazole is available as 250 mg tablet; lot # SJ2015; Exp. Date Aug. 2016

Calculations

To prepare 210 mL of solution, we will need
10,500 mg (10.5 grams of metronidazole)
5 mL 250 mg
210 mL 10,500 mg

\[
\frac{210 \text{ mL} \times 250 \text{ mg/5mL}}{5 \text{ mL}} = 10,500 \text{ mg}
\]

Calculations

- Take 42 tablets and powder them in mortar and pestle; mix the powder in q.s.
  of water to make 210 mL.
- Filter the solution and transfer into 8 oz.
  bottle and label it
- BUD: 14 days (since it is an aqueous
  solution, BUD cannot be greater than
  14 days

Calculations

Rx Pravastatin 15 mg (Strength)
sig: 1 capsule; hs; daily
Dis. 60 capsules (dosage form)
Pravastatin is available as 20, 40 mg and 80
mg tablets; for illustrations of calculations, I
selected
Pravastatin 20 mg tablets
Lot # SSJ # 815 Exp.: Aug 2016

Calculations

- 250 mg 1 tablet
- 10,500 mg X tablets
- \[\frac{10,500 \text{ mg}}{250 \text{ mg/tablet}} = 42 \text{ tablets}\]
Calculations

1 cap  15 mg
60 caps  X mg

60 caps x 15 mg
------------------- =
1 cap
900 mg of pravastatin

Calculations

20 mg  1 tablet
900 mg  X tablets

900 mg x 1 tablet
------------------- = 45 tablets
20 mg

Calculations

• Take 45 pravastatin 20 mg tablets and powdered them in a mortar and pastel and mix well
• Let us assume that each tablet weighs 200 mg
Therefore, 45 tablets x 200 mg = 9000 mg of powder contains 900 mg of pravastatin

Calculations

• Prepare 60 capsule by using capsule filling machine;
• Each capsule (size # 3 or 4) will contain 150 mg of powder, which contains 15 mg of pravastatin

Label

Label the prescription containers to include the following items:
• Name of the preparation
• Internal identification number
• Beyond use date
• Initials of the compounding, who prepared the label
• Any storage requirements
• Any other statements required by law

Label the bottle
Beyond use date (BUD):

Expiration period remaining x 0.25 (25% of the remaining expiration period) for solids
12 months x 0.25 = 3 months
Compounded Preparations
The term “compounded preparations” is amplified to include “compounded dosage forms,” “compounded drug,” and “compounded formulations.” This section provides:
• Quality suggestions
• Technical procedural guidance specific to four groups of compounded preparations

Compounded Preparations
• The following dosage form may be prepared in a non-sterile compounding pharmacy:
  • capsules, powders, lozenges, and tablets
  • emulsions, solutions, suspensions, and suppositories
  • creams, topical gels, ointments, and pastes

Compounding Records and Documents
• The purpose of these records is to meet state boards of pharmacy record keeping requirements and to enable another compounder to duplicate the preparation.
  • The compounding record contains the following:
    • Sources and lot numbers of the ingredients, calculations, processes used, results of any testing done.
    • An assigned beyond use date, identification numbers, name of the compounder, quantity of the preparation compounded and other pertinent information

The Compounding Process
• Steps presented to minimize error and maximize the prescriber’s intent.
  • These all should be covered in the standard operating procedures (S.O.P) of the pharmacy and are good practice standards to follow.

Thank you for your interest
I will entertain questions at this time
The Compounding Process

- Judge the suitability of the prescription to be compounded in terms of its safety and intended use.
- Determine what legal limitations, if any, are applicable.
- Perform necessary calculations to establish the amount of each ingredient needed.

The Compounding Process

- Wear the proper attire and wash hands.
- Clean the compounding area and needed equipment.
- Compound only one prescription at one time in a specified compounding area.

The Compounding Process

- Compound the preparation following the formulation record or prescription according to the art and science of pharmacy.
- Assess weight variation, adequacy of mixing, clarity, odor, color, consistency and pH as appropriate.
- Annotate the compounding log and describe the appearance of the formulation.

The Compounding Process

- Sign and date the prescription, affirming that all procedures were carried out to ensure uniformity, identity, strength, quantity and purity.