Secundum Artem

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Current & Practical Compounding
Information for the Pharmacist

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The GAP Analysis for Nonsterile Compounding

Goal: To provide background information and practical procedures for conducting a GAP analysis in a compounding pharmacy for nonsterile compounding.

Objectives: After reading and studying the article, the reader will be able to:

1. Describe the purpose of a GAP Analysis and its importance.
2. Identify the individual sections included in USP Chapter <795> Pharmaceutical Compounding-Nonsterile Preparations.
3. Review the questions of an example GAP Analysis Questionnaire.
4. Identify additional restrictions on compounding for animal patients.

There are at least two analyses that are used to evaluate different aspects of a pharmacy, the GAP Analysis and the SWOT Analysis. A GAP Analysis is a technique for determining the steps to be taken in moving from a current state to a desired state. It is sometimes called a "need-gap analysis", "needs analysis" or "needs assessment". A GAP Analysis consists of:

1. Listing the characteristic factors, including attributes, competencies, performance levels that are currently in place.
2. Cross listing the factors needed to achieve the future standards/practices (where should we be or what are the standards we need to implement)?
3. Highlighting the gaps that exist and how to fill them.

A GAP Analysis is often done by responding to a series of questions.

A SWOT Analysis (sometimes called a SLOT Analysis) consists of listing the following:

1. Strengths – Advantages the company has over other competitors.
2. Weaknesses – Areas that needs improvement compare to competitors (sometimes called Liabilities).
3. Opportunities – Trends and market gaps of which to take advantage.
4. Threats – External factors that can threaten your business.

A SWOT Analysis can be used to evaluate a pharmacy against its peers, while a GAP Analysis is an internal evaluation to identify performance deficiencies compared to a standard. A SWOT Analysis is used for long-term planning while a GAP Analysis is often done to reach short term goals. A SWOT Analysis can be a comprehensive study evaluating a number of aspects of the pharmacy and competitors, whereas a GAP Analysis can be quite simple and targeted towards fine-tuning a process.

In this paper, we are interested in the GAP Analysis where the process we are "fine-tuning" is compliance with the standards in USP General Chapter <795> Pharmaceutical Compounding-Nonsterile Preparations. In summary, a GAP Analysis compares actual performance with potential performance (<795> standards). A GAP Analysis involves analyzing, documenting and implementing the difference between current practice and the required standards. The process involved can include the following six steps and can be accomplished using an in-depth questionnaire developed from the standards being implemented:

1. Identify and evaluate the current procedures.
2. Evaluate the current outcomes, preparations, services produced.
3. Identify the new standards to be implemented.
4. Define the processes to achieve the new standards.
5. Document the GAP that exists.
6. Develop a plan to "fill the GAP" and meet the standards.

Loyd V. Allen, Jr., Ph.D., R.Ph.
- *Professor Emeritus, University of Oklahoma College of Pharmacy*
- *Editor in Chief, International Journal of Pharmaceutical Compounding*
- *Dr. Allen is not affiliated with Perrigo Pharmaceuticals*

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BACKGROUND

The newly revised USP Chapter <795> Pharmaceutical Compounding-Nonsterile Preparations became official May 1, 2011. It is now a combination of two former chapters; one by the same name and the second is USP Chapter <1075> Good Compounding Practices. The informational material previously in USP Chapter <1075> is now in the enforceable <795> chapter. Chapters numbered greater than <1000> are generally informational and those numbered less than <1000> are enforceable by regulatory agencies. USP Chapter <795> consists of the following 15 sections: (1) Introduction, (2) Definitions, (3) Categories of Compounding, (4) Responsibilities of the Compounder, (5) Compounding Process, (6) Compounding Facilities (7) Compounding Equipment, (8) Component Selection, Handling, and Storage, (9) Stability Criteria and Beyond-Use Dating, (10) Packaging and Drug Preparation Containers, (11) Compounding Documentation, (12) Quality Control, (13) Patient Counseling, (14) Training and (15) Compounding for Animal Patients.

A brief discussion of the contents of each of these sections follows and example questions are provided in Table 1. A complete complimentary GAP Analysis for nonsterile compounding is available at www.ijpc.com.

INTRODUCTION

USP General Chapter <795> and applicable USP substance and preparation monographs help to define Good Compounding Practices. The chapter provides general information to support a compounder's ability to extemporaneously compound preparations that are of acceptable strength, quality, and purity.

DEFINITIONS

For consistency in implementing <795>, eleven definitions are provided including active pharmaceutical ingredient, added substances, beyond-use date, component, compounder, compounding, hazardous drug, manufacturing, preparation, stability and vehicle. It is important that compounding personnel be very familiar with these definitions.

CATEGORIES OF COMPOUNDING

For the GAP Analysis, one must formally determine the categories of compounding to be practiced in the pharmacy. It is incumbent upon the compounder to acquire and maintain knowledge and skill in all categories of compounding that occurs in the facility. The nonsterile categories include Simple, Moderate and Complex compounding. Example queries, listed in Figure 1, require the decision of the compounder regarding the level of compounding performed as it may serve as the basis for later standards.

Simple compounding is described as making a preparation from a USP monograph or that appears in a peer-reviewed journal article containing specific quantities of all components, procedures and equipment and stability data; it also involves reconstituting or manipulating commercial products that may require the addition of one or more ingredients as directed by the manufacturer.

Moderate compounding is a step up and requires special calculations or procedures to determine quantities of components for the preparation or per individualized dosage units or making a preparation for which stability data is not available and the USP default BUDs are used. This even includes the mixing of two commercial products for which stability of the mixture is not known.

Complex compounding requires special training, environment, facilities, equipment and procedures to produce an acceptable preparation. This can include transdermal dosage forms, modified-release preparations, some inserts and suppositories where a systemic effect is intended. It would also include innovative dosage forms for which little information may be currently available.

RESPONSIBILITIES OF THE COMPOUNDER

Each compounder is responsible for compounding preparations of acceptable strength, quality and purity according to the prescription or medication order involved. Associated with this responsibility is the dispensing of the finished preparation, appropriate packaging and labeling in compliance with the state agencies, federal law and any other regulatory agencies as appropriate. Compounders are also responsible for obtaining the baseline knowledge required before entering compounding and continually updating and expanding their compounding knowledge by participation in seminars and studying appropriate literature. The compounder is responsible for everything related to compounding under their control.

The chapter lists ten general principles of compounding relating to personnel, ingredients, containers, labeling, OSHA, MSDS, equipment, compounding environment, limited access to compounding area, process oversight and verification, error-prevention, documentation, and procedures for investigating and correcting failures or problems. These general principles should be incorporated into Standard Operating Procedures (SOPs) for the facility.

COMPOUNDING PROCESS

This section explains that the compounder is responsible for confirming that all activities and processes involved in each compounded preparation meets the standards involved. There are fifteen different criteria described in this section and these can be viewed as steps involved in the compounding process.

First, the dose, safety and use of the preparation must be evaluated in terms of the chemical and physical properties of the ingredients. The dosage form needs to be appropriate for the therapeutic goals, route of administration, and factors involved with local and systemic biological disposition. Also, any legal limitations or other factors must be considered.

Next, a Master Formulation Record needs to be on hand or created for each new preparation and followed each time the preparation is made. This leads right into the Compounding Record which is completed for each preparation as it is being compounded and includes vital data for quality assurance purposes. The compounder must confirm that no ingredient is on the list of specific drug products that have been removed from the market for safety or efficacy reasons and, if for food-producing animals, is not on a list of ingredients prohibited for use in food-producing animals. The ingredients need to be confirmed that they meet the requirements of identity, quality and

purity. Certificates of Analysis (C of A) can be used for this purpose. Also, Material Safety Data Sheets (MSDSs) should be consulted for protection of personnel when handling and the patients during administration.

Cleanliness is paramount in a compounding process and only one preparation should be compounded at a time in a specific workspace area. Only equipment that is properly designed, cleaned, calibrated (as necessary), and confirmed to be in good working condition is used for compounding. Also, a reliable beyond-use date is established at this point for the final preparation to ensure that during the period of use, it maintains its accepted potency, purity, quality and characteristics.

The next step is to confirm the use of appropriate clothing (hair bonnets, coats, gowns, gloves, facemasks, shoes, aprons, etc.) as needed for protection of personnel and to prevent contamination of the compounded preparation. The hands are appropriately cleaned and proper hygienic practices followed.

During actual compounding, all the standards in USP Chapter <795> are followed and all the critical processes (weighing, measuring, mixing, etc.) are observed and verified to ensure the final preparation is of the expected quality. The next step involves assessing the final preparation, as appropriate, for weight, volume, mixing adequacy, clarity (as appropriate), odor, color, consistency, pH and analytical testing according to the SOPs of the facilities. The assessments are recorded on the Compounding Record and any analytical testing results are affixed to the Compounding Record when completed and/or received from the testing laboratory.

Packaging in appropriate containers depends upon the dosage form and method of administration. Any packaging used must meet the USP standards; generally it will be a tight or a tight, light-resistant container. Labeling must meet all state and federal requirements as well as include the beyond-use date, storage and handling information. It should also include a statement to the effect that it is a compounded preparation.

Prior to dispensing to the patient or caregiver, the Master Formulation Record and the Compounding Record are reviewed for accuracy and completeness to confirm that no errors have occurred during the compounding process. The final preparation is then provided to the patient or caregiver with appropriate counseling on its use, storage, etc.

COMPOUNDING FACILITIES

Adequate space is required for a quality and successful compounding program. The compounding space should be sufficient for an organized workflow and to prevent errors due to mix-ups involving ingredients, containers, labels, "in-process materials" and others. Separate compounding stations should be available (if needed) and only one item compounded at a time in a specific station.

Potable water is required for hand washing and for washing equipment. However, Purified Water is required for rinsing equipment after it is washed with potable water. Purified water can be prepared by deionization, distillation, ion exchange, reverse osmosis, filtration, or other suitable purification process. The plumbing system in the pharmacy must be in good operating condition and free of defects that may lead to contamination of any compounded preparation. The facility must be well-lit and have proper ventilation and temperature control. Heating, ventilation and air conditioning (HVAC) must be maintained in good order at all times with an SOP regarding the replacement of filters in the system. A preventative maintenance program on the HVAC system is worth the time and money to minimize any downtime that may result from malfunctions. The temperature and humidity should be monitored and recorded according to the SOPs of the facility. In the storage areas, all containers, etc. should be off the floor on appropriate shelving or pallets; this allows for easy inspection, contamination prevention, and cleaning of the area. Hazardous drugs should be stored appropriately according to the SOPs of the facility in a manner to protect the workers involved with handling these materials. Workers should be familiar with the most recent standards/regulations for working with hazardous drugs. Personnel should be trained in the receipt, storage, handling and disposal activities involving hazardous drugs in order to protect themselves (and even their families when drug particles may be carried home in their clothing, hair, skin, etc.). The use of scrubs is a good procedure for appropriate employees.

COMPOUNDING EQUIPMENT

Equipment and utensils must be of appropriate design and capacity. It must be large enough to do quality work but not too large that it is not workable. The surfaces of the equipment and the utensils should not be reactive, additive, or sorptive so they will not contaminate or alter the purity of the preparation. It is up to the compounder to be aware of potential problems and to properly select the most appropriate equipment and utensils for compounding individual preparations.

If automated, mechanical or electronic equipment is used, it must be cleaned, inspected, calibrated and checked for proper performance according to the SOPs of the facility. Generally, each significant piece of equipment should have an SOP for (1) Setup and operation, (2) Cleaning, (3) Maintenance, and (4) Calibration. These SOPs can be combined as appropriate. Just prior to use, the compounder should confirm the item is functioning properly and after use, it should be appropriately cleaned. Items such as balances/scales, should be calibrated daily whereas other items can be calibrated at longer intervals, as described in the SOPs.

Equipment used with antibiotics, cytotoxic drugs, hormones and other potentially hazardous drugs, should be handled with special precautions. Dedicated equipment for these special items is recommended, if possible. Otherwise, appropriate SOPs should address the use, cleaning, handling and storage of these items.

COMPONENT SELECTION, HANDLING AND STORAGE

A critical activity in compounding is sourcing components (active ingredients and excipients) of the required quality, along with their handling, storage and use. If reasonably available, the quality level of drugs used in compounding should be of USP, NF or FCC grade. If not available, BP, EP and other similar or equivalent grades may be appropriate. If these are not available, then the professional judgment of the compounder is used and options include the use of other ACS grades that are appropriate for compounding. Certificates of

Analysis (C of A) should be obtained for each lot of chemical and compared with the standards for the drug in the USP, NF or FCC for the item or, if not monographed, a similar item to confirm it meets the appropriate standards. Components should be obtained from an FDA-registered facility if available.

The labeled expiration dates on ingredient containers can be used as the material is consumed as long as there is minimal exposure of the material each time the container is opened for removal of some of the contents. If excess material is removed from a container, it should only be replaced in the container if appropriate precautions are taken and it is not contaminated, etc.

In the event a component is received without an expiration date from the manufacturer, then the date of receipt of the component should be placed on the label and a conservative expiration date (not to exceed three years) can be assigned to the component and placed on the label. This assigned expiration date should consider the nature of the component and its route of degradation, the container and its storage conditions.

When a commercially manufactured product is used as the source of ingredient(s), the product must be manufactured in an FDA-registered facility and the label contains both a batch control number and expiration date. Since these finished dosage forms contain excipients, these additional ingredients must be considered as to their intended use and the effect they have on manipulating the product as it may impact the therapeutic appropriateness and stability of the components.

When compounding dietary or nutritional supplements, the compounder must also follow the same standards as those for pharmaceuticals as well as comply with other applicable federal and state requirements. If a standard does not exist for a specific item, then components can be used that meet acceptable food-grade quality.

For any component derived from bovine, caprine, ovine or other ruminant animals, there must be documentation that the component complies with all federal laws related to processing, use and importation of these materials. This type of documentation may require a special effort, but needs to be obtained.

One of the first steps involved in compounding a prescription for human use should be confirming that none of the components have been withdrawn or removed from the market for safety or efficacy reasons by the FDA. This list is available either online or from compounding databases. When compounding for food-producing animals, the compounder should consult the list of ingredients that cannot be used in food-producing animals.

STABILITY CRITERIA AND BEYOND-USE DATING

For compounded nonsterile preparations, the beyond-use date (BUD) is the date after which a compounded preparation shall not be used and is determined from the date when the preparation is compounded. If no stability information is available on a specific preparation, recommendations for maximum BUDs have been developed for nonsterile compounded drug preparations that are packaged in tight, light-resistant containers and stored at controlled room temperature.

Many monographed substances and products/preparations contain specific directions for temperature and humidity. If no specific instructions are given, then storage is to include (1) storage at controlled room temperature, (2) protection from moisture and, if indicated, (3) protection from light. Also understood are protection from moisture, freezing, excessive heat and, if necessary, from light during shipping and distribution. The USP defines a number of storage conditions.

Factors to be considered in determining BUDs

BUDs are assigned conservatively and it is the responsibility of the compounder to determine the BUD of a preparation after consulting and applying drug-specific and general stability documentation and literature when available. Factors to be considered include (1) the nature of the drug and its degradation mechanism, (2) the dosage form and its components, (3) the potential for microbial proliferation in the preparation, (4) the container in which it is packaged, (5) the expected storage conditions, and (6) the intended duration of therapy.

During the compounding process, the compounder is to observe the preparation at all stages for signs of instability. Signs of instability may include those for the different dosage forms as delineated in USP <1191> Stability Considerations in Dispensing Practice.

Assigning BUDs

If stability information is available for a specific drug and preparation, that information may be appropriate to use to establish and assign a BUD. This information may derive from peer-reviewed and published stability studies. In some instances, stability studies may be commissioned by a pharmacist or facility and be accomplished using independent commercial analytical laboratories. An analytical laboratory that utilizes Good Laboratory Practices and conducts controlled studies with stability-indicating analytical methods should be used.

If there is no confirmed stability information available, then the default dates in the chapter can be used for nonsterile compounded drug preparations that are packaged in tight, light-resistant containers and stored at controlled room temperature, unless otherwise indicated. Drugs or chemicals that are known to be labile to decomposition will require shorter BUDs.

It is understood that these BUDs are for those preparations that are suitably preserved by containing suitable antimicrobial agents, to protect against bacteria, yeast and mold contamination, as appropriate.

PACKAGING AND DRUG PREPARATION CONTAINERS

Different containers may be required for different compounded preparations depending upon their physical and chemical properties. The materials of which the container is made must not chemically or physically interact with the preparation so that it alters the strength, quality or purity of the article beyond the official standards. The container must be clean so that extraneous material is not introduced into the preparation. Containers must be stored off the floor and must be handled and stored to prevent contamination and rotated so

that the oldest stock is used first. Compounders must ensure that the containers and container closures used in packaging compounded preparations meet USP requirements.

Types of USP containers
The USP describes a number of different types of containers. Most containers that are used are either well-closed or tight-containers.

A well-closed container is one that protects its contents from extraneous solids and from loss of the preparation under ordinary and customary conditions of handling, shipment, storage, and distribution.

A tight-container is one that protects the preparation from contamination by extraneous liquids, solids, or vapors; from the loss of the article, and from efflorescence, deliquescence, or evaporation under ordinary or customary conditions of handling, shipment, storage and distribution; and is capable of tight reclosure.

A light-resistant container is one that protects its contents by virtue of the materials of which it is made. Alternatively, the preparation can be placed in a clear container or translucent container and covered with an opaque covering. Examples include cartons, amber overwraps, aluminum foil, etc.

Other types of containers include the single-unit, single-dose, unit-dose, unit-of-use, multiple-unit container and multiple-dose container. Terminology using single-dose container and multiple-dose container apply to parenteral medications.

With the exception of dispensing within a hospital setting, prescription drugs, oral controlled drugs and certain non-oral prescription drugs for human oral use require special packaging to comply with the Poison Prevention Packaging Act.

COMPOUNDING DOCUMENTATION
Documentation enables a compounder to systematically trace, evaluate and reproduce each of the steps of compounding a preparation if necessary. Compliance with individual state boards of pharmacy is required. When compounding according to a manufacturer's labeling instruction, further documentation is not required, however all other preparations require documentation that must be retained for the same time period required of any prescription under state law. The compounding documentation includes a Master Formulation Record, Compounding Record, Standard Operating Procedures, and Material Safety Data Sheets.

The Master Formulation Record contains the ingredients and their amounts for the preparation. It is generally kept on a computer and is not changed. A new compounded prescription requires a Master Formulation Record to be developed.

The Compounding record is a document where the formula is listed and the pharmacists adds the information concerning the ingredients, quantity compounded, personnel involved, date, assigned control or prescription number, assigned BUD, quality control results and other appropriate information to document its preparation.

Standard Operating Procedures (SOPs) are significant procedures that are performed in the compounding area and consist of a set of fixed instructions or steps for carrying out usually routine operations. The pharmacy must have SOPs for the facility, equipment, personnel, preparation, packaging, and storage of compounded preparations to ensure accountability, accuracy, quality, safety and uniformity in compounding. Only SOPs that are actually implemented should be available in the compounding area. SOPs can be numbered and categorized according to any method suitable for the pharmacy.

Material Safety Data Sheets (MSDSs) must be readily accessible to all employees working with drug substances or bulk chemicals in the pharmacy. These may be hard copy or electronically available. All personnel must know how to retrieve and interpret the needed information. They should be maintained for any drug substance or bulk chemical located in the pharmacy. These data sheets are not required for commercially available finished preparations; the ingredient information on the preparation label is sufficient. The ingredient information consists mainly of physicochemical, toxicity, and handling information. Precautions, information about potential hazards, and shipping instructions are also included. This information should be reviewed for the protection of the pharmacist as well as for that of the patient. MSDSs can be obtained without charge from suppliers and can be easily filed in three ring binders. They may accompany chemicals, be faxed from the supplier or be obtained from the internet from the suppliers.

QUALITY CONTROL
This section relates to USP General Chapter <1163> Quality Assurance in Pharmaceutical Compounding that is dedicated to quality issues. The introduction to USP <1163> states:

> "The safety, quality, and efficacy and/or benefit of compounded preparations depend on correct ingredients and calculations; accurate and precise measurements; appropriate formulation, facilities, equipment, and procedures; and prudent pharmaceutical judgment. As a final check, the compounder shall review each procedure in the compounding process. To ensure accuracy and completeness, the compounder shall observe the finished preparation to ensure that it appears as expected and shall investigate any discrepancies and take appropriate corrective action before the prescription is dispensed to the patient".

This Quality Control section lists 5 areas as Compounding Controls. The first discusses written records and documentation, including the Master Formulation Record, the Compounding Record and written procedures, or Standard Operating Procedures. The second area discusses the procedures and how the compounder shall check and recheck each step. Also, a trained second person should verify each critical step in the process and sign off on it. This can be done in the Compounding Record. Third, the quality tests are described that will be conducted on compounded preparations; these should be listed as a part of the Formulation Record with room for the results in the Compounding Record. Fourth, any aspect of the compounding procedure that may result in any variability in the final compounded preparation should be the subject of appropriate formal control procedures. These should be a part of the SOPs. Finally, it refers to USP <1163> for additional information.

PATIENT COUNSELING

When the compounded prescription is dispensed, the patient or caregiver must be counseled about the proper use, storage, handling and disposal of the drug. This is best accompanied with printed material if possible. Proper disposal will be dependent upon whether the drug was hazardous, controlled or possessed other characteristics. The patient is also requested to report any adverse event resulting from the compounded preparation as well as any observable changes in the characteristics of the preparation, e.g., precipitation, haze, discoloration, off-odor. Any difficulty related to the compounded preparation should be reported to the pharmacy from which it is obtained.

TRAINING

Proper training of each individual involved in any aspect of the compounding process is the responsibility of the pharmacist-in-charge (PIC). In addition to proper training, each individual must be evaluated annually. Each individual involved must read and be familiar with USP <795>, C of As and MSDSs. The SOPs should be reviewed at least annually and any changes recommended to the pharmacist-in-charge. Handling hazardous drugs is an area of utmost importance where employees must be properly and thoroughly trained and evaluated. This involves proper storage, handling and disposal using appropriate precautions and equipment. It also includes the development of appropriate information for the patient to be used during patient counseling. All training activities must be thoroughly documented and may be incorporated into the employees personnel file. The employee must be continually monitored by the compounder as the compounder is solely responsible for the finished compounded preparation.

COMPOUNDING FOR ANIMAL PATIENTS

Compounding for animal patients involves additional regulations and formulations and the compounder must be thoroughly versed in these to participate in this type of practice. Some animals are used as food and the compounding pharmacist must be familiar with drug residues and the time required for the drug to be eliminated, or the drug withdrawal time. Pharmacists must work closely with the prescribing veterinarians when compounding for animal patients. Due to some variations in animal responses to certain ingredients, formulations that are prepared especially for animals should be used.

Note: A complimentary copy of a complete GAP Analysis can be downloaded at:

www.ijpc.com (see under Resources: USP Gap Analysis)

Table 1 Gap Analysis for USP <795> Pharmaceutical Compounding-Nonsterile Preparations: Some Example Queries

INTRODUCTION Is the pharmacist-in-charge (PIC) aware of USP <795> Pharmaceutical Compounding-Nonsterile Preparations?	YES NO Comments:	SOP#
DEFINITIONS Do the pharmacists understand the difference between compounding, repackaging and manufacturing?	YES NO Comments:	SOP#
CATEGORIES OF COMPOUNDING Can the pharmacy discuss the different criteria used to determine the categories of compounding?	YES NO Comments:	SOP#
RESPONSIBILITIES OF THE COMPOUNDER Is documentation available that compounding is only done by individuals that are appropriately trained and validated?	YES NO Comments:	SOP#
Is documentation available that all ingredients used have their expected identity, quality and purity?	YES NO Comments:	SOP#
COMPOUNDING PROCESS Are the physical and chemical properties of each of the components evaluated?	YES NO Comments:	SOP#
Is the dosage form evaluated for suitability for the patient and the drug?	YES NO Comments:	SOP#
Is a Master Formulation Record created for each preparation compounded for the first time?	YES NO Comments:	SOP#
Is a Compounding Record prepared for each compounded preparation?	YES NO Comments:	SOP#
Does the label of each compounded preparation include the BUD, storage and handling information?	YES NO Comments:	SOP#
COMPOUNDING FACILITIES Does there appear to be adequate space for the type of compounding being conducted?	YES NO Comments:	SOP#
Is the heating, ventilation and air conditioning system appropriate to avoid decomposition and contamination in the work and storage areas?	YES NO Comments:	SOP#
Are both the temperature and humidity monitored?	YES NO Comments:	SOP#
COMPOUNDING EQUIPMENT Is sufficient and appropriate equipment available for all the types of compounding being conducted at the facility?	YES NO Comments:	SOP#

Table 1 Gap Analysis for USP <795> Pharmaceutical Compounding-Nonsterile Preparations: Some Example Queries *Continued*

Is the equipment inspected, checked for proper performance and calibrated as necessary to ensure it is properly functioning.	YES NO Comments:	SOP#
COMPONENT SELECTION, HANDLING AND STORAGE Are Certificates of Analysis obtained for each substance used in compounding?	YES NO Comments:	SOP#
If compendial grade components are not available, are other high grade chemicals used according to SOPs in the facility?	YES NO Comments:	SOP#
Are materials handled appropriately by storing in their original container, minimizing exposure when withdrawing material, and withdrawals performed by trained individuals?	YES NO Comments:	SOP#
If using a manufactured drug product as the source of a drug, is there a consideration of the ingredients in the product and how it may impact the therapeutic appropriateness and stability of the final compounded preparation?	YES NO Comments:	SOP#
STABILITY CRITERIA AND BEYOND-USE DATING Does the PIC have an understanding of "beyond-use dates"?	YES NO Comments:	SOP#
Is there an SOP on assigning BUDs?	YES NO Comments:	SOP#
Are BUDs a part of every Formulation Record?	YES NO Comments:	SOP#
Are extended BUDs documented?	YES NO Comments:	SOP#
PACKAGING AND DRUG PREPARATION CONTAINERS Do all personnel understand the difference between the types of containers in the USP (well-closed, tight, light-resistant, etc.)?	YES NO Comments:	SOP#
Are the containers handled and stored to prevent contamination?	YES NO Comments:	SOP#
COMPOUNDING DOCUMENTATION Does the PIC/compounding pharmacist maintain Formulation Records?	YES NO Comments:	SOP#
Does the PIC/compounding pharmacist complete a compounding record for each compounded preparation?	YES NO Comments:	SOP#
Are Certificates of Analysis available for each ingredient used?	YES NO Comments:	SOP#

Table 1 **Gap Analysis for USP <795> Pharmaceutical Compounding-Nonsterile Preparations: Some Example Queries** *Continued*

Are Material Safety Data Sheets (MSDSs) available or readily retrievable?	YES NO Comments:	SOP#
QUALITY CONTROL Does the compounder review each procedure in the compounding process?	YES NO Comments:	SOP#
Are all employees familiar with USP General Chapter <1163>?	YES NO Comments:	SOP#
PATIENT COUNSELING Is the patient properly counseled about the compounded preparation at the time of dispensing?	YES NO Comments:	SOP#
-Proper use	YES NO	
-Storage	YES NO	
-Evidence of instability	YES NO	
-Handling	YES NO	
-Disposal	YES NO Comments:	
Is the patient properly counseled about observing for any physicochemical changes in the compounded preparation?	YES NO Comments:	SOP#
TRAINING Does the pharmacy have a complete training program in place for all employees involved in compounding, evaluation, packaging and dispensing of compounded preparations?	YES NO Comments:	SOP#
Are compounding personnel evaluated at least annually for the activities in which they are involved?	YES NO Comments:	SOP#
COMPOUNDING FOR ANIMAL PATIENTS Is the compounder familiar with all the regulations involved in veterinary compounding?	YES NO Comments:	SOP#
Is the compounder aware of withdrawal times for different drugs?	YES NO Comments:	SOP#
Does the compounder use formulations developed specifically for animal patients as much as possible?	YES NO Comments:	SOP#

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Please circle the most appropriate answer for each of the following questions. There is only ONE correct answer per question.

1. Gap Analysis involves analyzing, documenting and implementing the difference between current practice and the required standards?

True or False

2. Which of the following categories of nonsterile compounding requires special calculations or procedures to determine quantities of components for the preparation or involves the mixing of two commercial products.

A. Simple
B. Veterinary
C. Moderate
D. Complex
E. Nonstable preparations

3. Identify which of the following are sections of USP Chapter <795> Pharmaceutical Compounding-Nonsterile Preparations?

I Responsibilities of the Compounder
II Quality Control
III Age Requirements for the Compounder

A. I only
B. II only
C. III only
D. I, II and III
E. I & II only

4. The GAP Analysis should query the situation on documentation. All but which of the following are required documentation for compounding a preparation:

A. Master Formulation Record
B. Compounding Record
C. Copy of the IND (Investigational New Drug)
D. Certificate of Analysis
E. Material Safety Data Sheets

5. All but which of the following are required SOPs for a significant piece of compounding equipment?

A. Setup and Operation
B. Warranty specifications
C. Cleaning
D. Maintenance
E. Calibration

6. The GAP Analysis should address the question that if an ingredient for compounding is received from a vendor and it does not have an expiration date, if appropriate, the following maximum expiration date can be applied to the ingredient by the pharmacist.

A. 6 months
B. 1 year
C. 2 years
D. 3 years
E. 5 years

7. The responsibility for assigning a beyond-use date rests with the ___ and must be addressed by appropriate SOPs.

A. Pharmacist
B. Technician
C. USP
D. State board of pharmacy
E. FDA

8. The GAP Analysis must document that the pharmacist is aware of the different types of containers described by the USP. The container that protects from extraneous solids and from loss of the preparation under ordinary and customary conditions is a:

A. Tight-container
B. Light-resistant container
C. Single-dose container
D. Well-closed container
E. Translucent container

9. Which of the following topics must be addressed in the GAP Analysis regarding the counseling of the patient?

A. Proper use
B. Proper storage
C. Proper disposal
D. Proper handling
E. All the above

10. Compounding for animal patients is different and must be thoroughly addressed in the GAP Analysis because one must be concerned about:

I. Additional regulations
II. Different formulation factors
III. Withdrawal times for food-producing animals

A. I only
B. III only
C. I and II only
D. II and III only
E. I, II and III

11. My practice setting is:

A. Community-based
B. Managed care-based
C. Hospital-based
D. Consultant and other

12. The quality of the information presented in this article was:

A. Excellent B. Good C. Fair D. Poor

13. Did the ACPE activity meet the participant's educational needs?

A. Yes B. No

14. Approximately how long did it take you to read the Secundum Artem article AND respond to the test questions?

15. What topics would you like to see in future issues of Secundum Artem?

_____

16. Were the objectives of the article met? If not, please describe.

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Do you think that this article was unfair, unbalanced or contained perceived commercial bias? Yes or No If yes, please provide comments below:

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