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The Design of a Sterile Product Laboratory Module as Preparation for an Institutional IPPE Course

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The Design of a Sterile Product Laboratory Module as Preparation for an Institutional IPPE Course

Abstract

Objectives: To develop a pharmaceuticals laboratory module on compounded sterile products for the second year pharmacy students as preparation for an institutional pharmacy experiential course. **Method:** A 5-week lab module was designed and implemented as part of the Pharmaceuticals Lab Course to provide training in the basic skills of sterile product compounding. The module included techniques in the handling of sterile products, aseptic techniques, medium risk products, and hazardous products. A practical exam was given at the end of this module to ensure student competency. Upon completion of the lab module, students enrolled in a required 4-week institutional pharmacy experiential course (IPPE-2), where students were required to compound a minimum of 10 sterile products. Students were then asked to participate in a survey assessing the effectiveness and relevance of the lab module as preparation for their IPPE-2. **Results:** The sterile product lab module was offered in the spring semester with 75 students enrolled. All students passed the sterile product lab module and continued onto the IPPE-2 course during the following summer. The student survey indicated that the students felt well prepared for the IPPE-2 and that the preceptors were satisfied with their prior training in sterile compounding. The average scores ranged from 4.8 - 6.5 (scale of 1-7) for the various products addressed in the lab module. **Implications:** The 5-week sterile product lab module progressively prepares the students with the basic skills and knowledge in compounding sterile products. This preparedness allows the students to transition smoothly into the subsequent institutional pharmacy experiential course.

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Comments

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The Design of A Sterile Product Laboratory Module as Preparation for an Institutional IPPE Course

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OBJECTIVE

To develop a pharmaceuticals laboratory module on compounded sterile products for the second year pharmacy students as preparation for an institutional pharmacy experiential course.

INTRODUCTION

- At WSOP, sterile product preparation is a required learning objective in IPPE-2, the second of the four introductory rotation courses. IPPE-2 is offered to students during the summer after their P-2 year. The focus of this rotation is on institutional pharmacy, and each student is required to compound at least 10 sterile products under the supervision of a preceptor.
- Few students have experience in an institutional pharmacy setting, especially in the area of sterile product preparations. Many students are apprehensive about the use of sterile product supplies, environmental control and aseptic techniques. Therefore, it is prudent to provide the students with some basic training on sterile product compounding as preparations for their IPPE-2 rotation.
- This poster describes the design and implementation of a sterile product lab module as part of the pharmaceuticals lab course for the P-2 students during the spring semester prior to IPPE-2.

METHODS

- A 5-week lab module was designed to include the basic skills in the handling of sterile products, aseptic techniques, medium risk products, and hazardous products. The detailed lab design and schedule are presented in Table 1.
- The students prepared two sterile products during each lab. Due to space limitation, students prepared only one product in a laminar flow hood nested within the simulated clean room. They prepared the second product in the main lab and were asked to follow the same techniques required for compounding in the hood.
- Teaching assistants (P-3 students) and faculty volunteers were utilized to provide one-on-one coaching for the students in the simulated clean room.
- All students were asked to complete the course evaluation. A small group of nine students were asked to complete a short survey after they completed the IPPE-2 rotation.

Table 1. Lab Design and Schedule

Week-1	<ul style="list-style-type: none"> • Basic techniques on handling needles, syringes, ampules, vials and IV bags. • Techniques to reconstitute solid products and transfer liquids. • Proper labeling of compounded sterile products
Week-2	<ul style="list-style-type: none"> • Proper use of the laminar flow hoods and aseptic techniques. • Selection of compatible diluents or vehicles based on proper reference materials.
Week-3	<ul style="list-style-type: none"> • Preparing a parenteral nutrition product – an example of medium risk level products with potential incompatibility issues among additives. • Demo of automated TPN compounder
Week-4	<ul style="list-style-type: none"> • Precautions and techniques for handling hazardous products • Practicing gowning procedures
Week-5	<ul style="list-style-type: none"> • Lab practical (two products) • For one product, students were evaluated individually for their compounding techniques by TAs or faculty volunteers

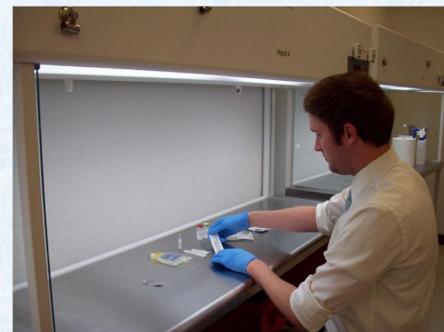


Figure 1. A student getting ready to prepare an IV admixture in a horizontal laminar flow hood.



Figure 2. Students were given a demonstration on the use of an automated compounder to prepare a TPN product, an example of medium risk level products.



Figure 3. Students preparing products in the main teaching lab. The bench was taped at 6-inch from the edge to mimic the horizontal laminar flow hood.



Figure 4. Students practicing sterile product compounding using horizontal laminar flow hoods in a simulated clean room.

RESULTS AND DISCUSSION

- The sterile product lab module was offered in the spring semester of 2008 – 2010 with 53 – 75 students enrolled each semester. All students passed the sterile product lab module and continued onto the IPPE-2 course during the following summer.
- A number of students requested and were given extra lab practice sessions to improve their compounding skills prior to the lab practical. An extra week has been scheduled for this lab module in 2012.
- For the 2010 lab course evaluation (scale of 1 – 7), the average student rating was 6.42 for “The course objectives were met” and 6.45 for “I’m able to accurately compound a medication product”.
- A group of nine students were surveyed after the IPPE-2 rotation in 2010. These students indicated that they felt well prepared for the IPPE-2 (score 6.57 out of 7) and that the preceptors were satisfied with their prior training in sterile compounding (score 6.43 out of 7). These students also provided written feedback for the two questions shown below. Selected answers are included after each question.

What aspect of the sterile product lab module was most beneficial to you during IPPE-2?

- Plenty of hands-on experience
- Use of syringes and IV bags
- The techniques and the rationale behind them
- Working in the hood
- The variety of labs

How can the lab module be improved in the future to prepare students for IPPE-2?

- Have videos for review
- Consistency in sterile techniques
- Gowning practice for every lab
- This is hard, because many sites have their own policies and procedures.

CONCLUSIONS AND IMPLICATIONS

- The 5-week sterile product lab module progressively prepares the students with the basic skills and knowledge in compounding sterile products.
- The preparations from this lab module allow the students to transition smoothly to the subsequent institutional pharmacy rotation.
- The students are able to focus on higher level experiential learning objectives during the rotation than basic compounding skills.