Implementation of a Pseudoclinical Drug Information Clerkship in a Japanese School of Pharmacy Without Hospital or Community Pharmacy Affiliations

Shin Iguchi
Mikiko Suenaga
Kyohei Hosono
Toshio Nishiyama
Chisae Umezawa
Eiichi Akaho

ABSTRACT. Objectives of this study were to create a pseudoclinical drug information (DI) clerkship in a school of pharmacy in Japan and to evaluate the activities of the students who participated in the study. The

33

school was not affiliated with a hospital or a community pharmacy. Alumni pharmacists assisted in this project, and a local community pharmacy and university cooperation system was developed. The clerkship was scheduled for eight days, including on-site DI activity by use of telephone. Students stated that they experienced real tension and communication benefit by talking to alumni practicing pharmacists. In conclusion, by creating a virtual reality DI center (realistic DI center as if it existed), this teaching method of DI activity required no additional facilities, thereby requiring no extra cost for those facilities. Five keys to an effective DI communication mode were emphasized for students to apply. To create the real challenge of DI training activity, it would be better if teachers do not know the answers to the DI questions in advance. *[Article copies available for a fee from The Haworth Document Delivery Service: 1-800-342-9678. E-mail address: <getinfo@haworthpressinc. com> Website: <http://www.haworthpressinc.com>]*

KEYWORDS. Drug information, clinical clerkship, pharmacy education, community pharmacy, communication

INTRODUCTION

The world's first drug information (DI) center was established in 1962 at the University of Kentucky Medical Center in the United States (1). One year later, medical centers at the University of Tokyo, Osaka University, and Kyushu University founded DI units under the direction of pharmacists (1). Since 1962, the operation, management, administration, and education of the DI activity of pharmacists and pharmacy students have been reported and discussed (2-16). However, the existence of clinically oriented, on-site DI clerkship education in schools or colleges of pharmacy without hospital or community pharmacy affiliations has not been documented.

It is a routine practice for schools or colleges of pharmacy with an affiliated hospital to conduct clinical DI clerkship for pharmacy students (6, 17). However, financial and circumstantial problems tend to prevent schools that do not have clinical settings from conducting clinical clerkship. Unfortunately, only a limited number of schools or colleges of pharmacy in Japan have an affiliated hospital (18). Some other countries will have similar situations. Regardless of the status of hospital affiliation, it is important to offer students on-site clinical training to teach them communication skills and professional manners

to handle problems and issues created in the clinical setting. Various methods can be applied to accomplish these goals.

An innovative method to implement a pseudo-clinical DI clerkship was attempted at Kobe Gakuin University. "Pseudoclinical" can be interpreted as "semiclinical" or "clinical-like." Using class periods in an advanced laboratory course and a regular classroom and laboratory, students were familiarized with on-site clinical practice of DI activity.

PROCESS/METHODS

Prior to the clerkship, a local community pharmacy and university cooperation system was developed. Nearby alumni pharmacists were selected based on the questionnaire on current community pharmacy practice in Japan sent out in May 1997 (19). The survey consisted of a set of questionnaires sent to all pharmacies operated by alumni. It asked questions about types of management, types of operation, and size of pharmacy. These pieces of information enabled us to generate a list of potential collaborative pharmacies. Selection criteria used were their pharmacy's proximity to the university and their willingness to cooperate with us. Alumni pharmacists were reached by telephone to ascertain their willingness to support this DI project. The alumni pharmacists who accepted our request received a brief instruction note in which various key points about the project were listed. The note pointed out the following items:

1. The purpose of this DI clerkship is for students to experience an actual DI question-and-answer process by phone.
2. When the student answers the phone, please ask him/her your DI question just as you would ask it in practice.
3. Please keep in mind that our students have no previous DI question-and-answer experience.
4. Our students cannot give you a quick answer by phone. So, please allow the student to return your call.
5. We would like to emphasize the process of this DI clerkship rather than the quality of the answer, and your cooperation on this point is greatly appreciated.
6. It would be nice if you can provide us with answers to the questions, but it is not mandatory.

General Procedure

Although not mandatory, instructions sent to the alumni pharmacists asked that they prepare an answer to the DI question to be asked of the students. Most of the pharmacists did not provide the answer, creating a challenge for teachers to find a satisfactory answer.

The clinical DI clerkship laboratory is one of ten laboratory courses and is termed Advanced Laboratory. This is a required course for graduation, and third-year pharmacy students have to take at least one out of the ten laboratory courses. The course was scheduled for eight days and a series of DI activities for students was designed as follows:

Day 1: Prelaboratory Lecture

The general features of DI activities were presented. Major information sources used for DI activities were introduced. The clerkship training process of the entire sessions (Day 1 to Day 8) was explained so that students were able to understand the scope of DI activities covered by the course. Reference books related to DI activities were assigned to each student. The students were told to examine and study the contents and to prepare a presentation on the materials to be given to fellow students during the Day 3 presentation session.

Day 2: Computer Literature Search

Computer literature searches, including CD-ROM searches, were conducted, and students were rotated through the following one-hour sessions:

1. CD-ROM search on "Drugs in Japan (Ethical Drugs)"
2. CD-ROM search on "PharmaLand®," and the Internet browsing of pharmacy-related home pages (20)
3. CD-ROM search on "Package Inserts of Japanese Ethical Drugs" and the Internet search on JMEDICINE of JOIS (JICST-Online Information System) (JICST stands for Japan Information Center of Science and Technology, and JMEDICINE is a database on medical literature published mainly in Japan).

Day 3: Presentation of DI Reference Books Previously Assigned

The students made presentations to fellow students on the DI reference books that were assigned on Day 1. A question-and-answer session followed and was conducted in the classroom.

*Day 4: Question-and-Answer Practice by Using Questions
Reported in DI Reference Books*

Twenty-three questions from DI books were used as practice questions. Each student was assigned a question accompanied by a DI question-and-answer form. The question-and-answer form was a modified version of the University of Kentucky Drug Information Center Form. Dozens of reference books were selected and placed in the seminar room where the clerkship was conducted. Two computers were made available for Medline searches. Students then worked on their assigned questions with teachers' assistance when necessary. Upon the completion of their searches, the students filled out a DI question-and-answer form and handed it to a teacher in charge for evaluation.

Days 5 and 6: On-Site DI Activity by Use of Telephone

Those alumni pharmacists who were willing to participate in the DI clerkship had prepared DI questions that would be used in this clinical DI clerkship. Reference books were available for use in the clerkship laboratory. Students also had access to the Internet, CD-DOM references containing the essential drugs in Japan, and PharmaLand. During the DI clerkship session, an alumni pharmacist phoned a teacher in charge at the DI clerkship laboratory of Kobe Gakuin University. The teacher then handed the phone to a student according to the previously allotted alphabetical sequence. The student then played the role of DI pharmacist and was charged with responding to the DI question. The student worked on the DI question, filled out a DI question-and-answer form, which was a modified version of the one used at the University of California at San Francisco, and then called the alumni pharmacist with his/her answer.

Day 7: Evaluation of Questions and Answers
Handled by Students on Days 5 and 6

Each student made a DI case presentation to fellow students and teachers based on the work done on Days 5 and 6. Question and discussion sessions were conducted under the guidance of a teacher.
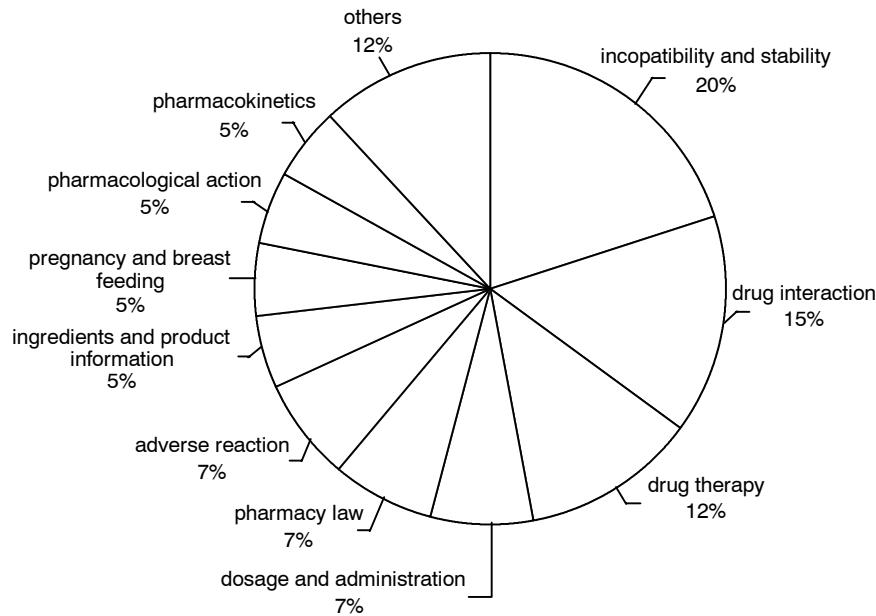
Day 8: Overall Review

Teachers provided students with additional information on some of the difficult questions and explained the background of those questions. Teachers also introduced some of the responses from the alumni pharmacists who asked questions of the students. Finally, teachers asked students to write down and turn in their comments about the entire DI clerkship course.

At the end of the review session, students were asked to write a review (essay style) to critique the clerkship so teachers would be able to elicit relevant information about the students' reaction to this pseudoclinical DI clerkship. Six teachers were assigned the responsibility of course instruction. An average of three teachers per day undertook teaching responsibilities. Twenty-three students were enrolled in the course. The course was given in the afternoon (1-5 PM) each day with Saturdays and Sundays off.

RESULTS AND DISCUSSION

Alumni pharmacists asked a variety of questions. Figure 1 shows types of questions asked. Questions on incompatibility and stability represented the majority (20%) of the questions, followed by drug interactions (15%), drug therapy (12%), and adverse reactions and pharmacy law (both 7%). Table 1 shows comments from the students who participated in the DI clerkship. Students mentioned that having a telephone conversation with a practicing pharmacist created a feeling of "reality, tension, and fulfillment." At the same time, they felt that it was necessary to have communication skills to hold an effective conversation with a practicing pharmacist. As far as the computer session is concerned, they stated that one day was not enough. In fact, since only one computer with CD-ROM drive was available, each student

FIGURE 1. Types of Questions Asked by Alumni Pharmacists

others
12%

pharmacokinetics
5%

pharmacological action
5%

pregnancy and breast
feeding
5%

ingredients and product
information
5%

adverse reaction
7%

pharmacy law
7%

dosage and administration
7%

incopatibility and stability
20%

drug interaction
15%

drug therapy
12%

only spent 10 minutes on his or her CD-ROM search. While one student was using the CD-ROM, the rest of the students worked on the Internet, which has become popular with medical professions (21-23). The students also stated that there were not enough computers for them to use, and at the same time, they felt that computer information retrieval was useful. This positive attitude toward and interest in computers by pharmacists and students seems to be prolific (24). Comments which pleased all six teachers in charge of this clerkship included, "This clerkship was the first real pharmacy-oriented clerkship," and "I felt this laboratory was more practical for pharmacy students than the other laboratory courses such as the ones using beakers and flasks."

Table 2 shows types of information sources and frequency of their use by the students who worked in the DI clerkship. Reference books and journals were most frequently used, with reference books being the number one source used. The students used the Internet quite often, which indicates that many students have gained skills to search the Internet.

TABLE 1. Responses from the Students Who Participated in the Drug Information (DI) Clerkship.

---

1) Real tension was experienced when talking to a practicing pharmacist, but it was a beneficial experience for me. (6)
2) I had a hard time understanding how to use the computer. (5)
3) It would have been better if we had more and varied reference books. (3)
4) I understand the value of reference books on DI activities. (2)
5) This type of clerkship is useful for pharmacy practice. (2)
6) I wish we had a copy of questions and answers from other students so that we could learn and compare responses. (2)
7) I felt it was useful and interesting to use a computer for literature searches. (2)
8) Presentation practice on Day 3 of previously assigned DI reference books enabled us to work with the on-site telephone DI activity session.
9) Pre-practice using DI reference books helped us to work with the on-site telephone DI activity session.
10) More time was needed to fully understand the use of CD-ROM.
11) I felt it necessary to be familiarized with up-to-date drug information.
12) I furthered my understanding of DI from the other presentations.
13) I felt it was important to explain and talk clearly and precisely.
14) I worked hard to obtain an answer as precisely as possible.
15) Although we had a lecture course on DI, it was difficult to comprehend the real DI activity. This clerkship course clarified the DI activity.
16) I thought it would be more interesting if we had questions from physicians also.
17) Although an English reference book was assigned to me, there was no chance to use it.
18) I wish we were able to phone directly to a pharmaceutical company instead of going through a teacher.
19) Since my question was similar to the one in the classroom session held previously, I neglected to elicit pertinent background information of the patient.

Note: The numbers in parentheses represent the number of students who provided the responses.

A Local Community Pharmacy and University Cooperation System

Fourteen alumni pharmacists participated in this program (Table 3). They were all community pharmacists: eight were from independent pharmacies and six were from local chain-store pharmacies. An average of 3 questions per pharmacist was asked by those in the independent pharmacy setting versus an average of 1.6 questions per pharmacist by those in the chain-store setting.

In colleges or schools of pharmacy that have neither an affiliated hospital nor a community pharmacy, it is difficult to conduct a clinical clerkship. Therefore, faculty at those institutions need to establish some other cooperative system that exposes students to a clinical atmosphere. A cooperative system such as this can be established and operated with a minimal amount of expense. A survey conducted by the Center for Clinical Pharmacy Research and Education, Kobe Ga-

TABLE 2. Types of Information Sources and Frequency of Their Use by Students to Obtain Answers in the Drug Information (DI) Clerkship.

Types of DI Information Sources		Frequency of Their Use
Books and journals	Drug formularies	19
	Reference books	37
	Journals	5
	Package inserts	14
Computer searches	Internet	4
	Medline	1
Outside sources	Manufacturers	4
	Local DI center	1

Note: The total number of DI questions was 34. Some students used more than one source to obtain answers to DI questions.

kuin University, helped to identify potential collaborators (19). Schools without access to a survey of this type could use their alumni roster or local phonebook to identify pharmacies near the school.

Clinical Nature of the Experience

We attempted to conduct a DI clerkship similar to the one conducted in the real settings of hospitals or community pharmacies. This was accomplished by connecting the classroom to pharmacy practice sites by telephone. The first part of the clerkship was designed so that students could acquire basic skills in DI activity by examining major reference books, performing a CD-ROM search, and working on DI questions as previously reported. By experiencing this first part, students were directed to perform on-site DI activity. Students stated that they felt an ambience of real clinical settings (Table 1). This provides evidence that our seven-day attempt was successful. In the real circumstances of DI activity created in the regular laboratory room, students and teachers, who assisted students, worked together to find answers to the questions asked by alumni pharmacists. The fact that teachers did not have the answers to the questions made the DI activity even more realistic. Furthermore, since teachers did not compel the alumni pharmacists to send an answer in advance, the teachers were able to minimize the burden on alumni pharmacists. The pharmacists did not have to spend extra time in preparing answers to the questions.

TABLE 3. Types of Pharmacies and Number of Questions Received by the Drug Information Clerkship.

Type of Pharmacy	Pharmacy Identification	Number of Alumni Pharmacists in Charge	Number of Questions Received
Independent pharmacy	A	2	7
	B	2	7
	C	1	4
	D	2	4
	E	1	2
Chain pharmacy	F	1	2
	G	1	2
	H	1	2
	I	1	2
	J	1	1
	K	1	1

Communication Skills

The recognition of communication skills as a necessary component of pharmacy practice dates back to at least 1975 and the publication of the Millis Report (25). Our communication training was initiated in the on-site training portion of the DI clerkship. In this portion of the course, a DI question-and-answer form, which was a modified version of the one used at the University of California at San Francisco, was handed out to the students in advance. This DI question-and-answer form was used by the students as a tool to communicate effectively with alumni pharmacists. The students were instructed to collect the information that was listed on the DI question-and-answer form. It listed such items as name of inquirer, date and time of inquiry, name of pharmacy, phone number of pharmacy, contents of question, and time limit to answer the question. Furthermore, students were told to identify themselves clearly. By following these instructions, most students communicated well enough to work on their questions. However, several students could not communicate effectively with the pharmacist and noted the importance of communication skills, as shown in Table 1. On these occasions, the alumni pharmacists assisted students

in improving their communication skills by demonstrating an actual way of talking and listening. Teaching communication was performed comfortably, mainly because of the good relationship between alumni and students. A couple of students had to ask the alumni pharmacists to clarify the question presented. Through these experiences, the students realized how important it is to listen to the inquirer carefully. Upon planning and completion of this DI clerkship, the following five items (keys) were emphasized as DI communication skills:

1. Be a better listener than talker.
2. Identify the question thoroughly and repeat it back to the inquirer for clarification.
3. Obtain specific background information of the patient (or the situation) as related to the question. (For example, is the patient hypersensitive to a particular drug?)
4. Ask the inquirer what form of answer he/she wants to have back. (For example, did the patient just want to know mechanism of drug interaction or did the patient want to know its substitute to avoid the drug interaction as well?)
5. Always remember the five *W*'s (who, what, where, when, why) and one *H* (how). (For example, remember not just the name of the pharmacy but also the name of the person to whom you talked.)

In retrospect, to ensure that students can communicate well, one might consider explicitly covering these points and incorporating the aspects of communication skills adopted by Monaghan and colleagues in their communication course for Pharm.D. students (26). These were interpersonal communications, nonverbal communications, empathy and listening, conflict management and self-regulation in conflict, information gathering and compliance, and information giving and gathering.

Overall Management of the Course

As indicated in the methods section, the first portion of the clerkship was a preparatory session to build basic knowledge and skills necessary to perform the DI activities. Without this preparatory session the students would have had a difficult time coping with and handling DI questions asked by alumni pharmacists because it was their first clinical clerkship. The latter question-and-answer session by phone consisted of a practice session in which students received, by

telephone, DI questions from alumni community pharmacists. They then worked on these questions to be able to return, by telephone, the answers to the alumni pharmacists. All these sessions contributed to create an atmosphere of a clinical pharmacy in a regular laboratory room. The prior arrangement with alumni pharmacists made the entire session proceed smoothly without a sense of incompatibility. The discussion session on Day 7, as a case presentation, provided students with the opportunity to present their work and to receive reviews of their work from other students and teachers. This session prevented students from misunderstanding DI questions and answers. Each session not only accomplished its own function but also overlapped with other sessions to create a single productive DI clerkship course offering students with realistic DI on-site training.

Although Day 2 was assigned for a computer session, due to the insufficient number of CD-ROM computers students did not have enough time to practice CD-ROM information retrieval. Moreover, too many computer search practices at three different computer sessions were presented in a short period of time. Thus, students did not have sufficient time to assimilate information from each unit. On Days 5 and 6, only one type of CD-ROM was made available for students' use due to the limited availability of computers. In September 1998 (after the clerkship), all computers in the computer laboratory room were equipped with CD-ROM drives. Future DI clerkship students will be able to spend more time on computer CD-ROM searches.

At the completion of the clerkship, the alumni pharmacists were contacted, and about 90% of them mentioned that students answered the questions satisfactorily. About 10% of the pharmacists stated that they learned something from the students. We did not receive any negative responses from the alumni pharmacists. This indicates that this DI clerkship project went fairly well, although some minor areas mentioned above should be improved. Those areas include spending more time on computer searches, teaching students key points of communication, and allowing students to contact pharmaceutical manufacturers independently whenever possible.

CONCLUSIONS

It is important and essential that teachers at schools or colleges of pharmacy offer students clinical professional training to develop vari-

ous patient assessment skills in the clinical setting (27). However, it is difficult to conduct clinical pharmacy training in schools or colleges of pharmacy that have neither an affiliated hospital nor a community pharmacy. The challenge of implementing a pseudoclinical DI clerkship taught us about various aspects of pharmacy education. Specifically, it taught us:

1. Our pseudoclinical DI clerkship created a virtual reality DI center by using the telephone through which alumni pharmacists sent DI questions to students participating in the DI clerkship. As far as we know, this was the first educational attempt in Japan to simulate actual DI activity, and this kind of clerkship can also be conducted in any other country in the world using the clerkship presented in this paper as a universal model.
2. A currently presented teaching method of DI activity required no additional facilities. Money was not required to create a clinical setting of a DI center, which generally requires a considerable amount of money and space (1, 28).
3. A community pharmacy and university cooperative system with the aid of alumni pharmacists was initiated and was well integrated into an on-site DI clerkship.
4. Five DI communication skills were emphasized: (a) be a better listener, (b) repeat the question back to the inquirer, (c) obtain the specific and background information of the patient (or situation), (d) make sure what form of answer he/she wants to receive, and (e) always remember the five *W*'s and one *H*. We hope that these keys will serve to achieve better DI question-and-answer communications.
5. To create a realistic DI training activity, it is better if teachers do not know the answers to the DI questions in advance.
6. Improvements can be made in the future by (a) allowing students to call pharmaceutical manufacturers independently whenever possible, (b) emphasizing communication skills, (c) providing students with more DI reference books, and (d) allowing more time for computer searches.

REFERENCES

1. Saitoh T. Clinical pharmacy series. Tokyo: Chijinn-Shokan, 1980.

2. Skoutakis VA, Wojciechowski NJ, Carter CA, Hayes JM, Hudson BL, Martin JA. Drug information network: need, effectiveness, and cost justification. Drug Intell Clin Pharm 1987;21:49-56.

3. Touton WG. Consensus-driven objectives for drug information education. Drug Info J 1994;28:791-6.

4. Shiratake S. Analysis of the actual situation and proposal of a new system for drug information in Japan. Jpn J Hosp Pharm 1996;22:315-21.

5. Shiratake S, Koizumi H. Analysis of the actual situation and proposal of a new system for drug information in Japan III: database and LAN system of personal computer, and national database. Jpn J Hosp Pharm 1996;22:531-46.

6. Kaplen IP, Patton LR, Hamilton RA. Adaptation of different computerized methods of distance learning to an external PharmD degree program. Am J Pharm Educ 1996;60:422-5.

7. Levin GM, Kane MP, Fortin L. Preclinical exposure in a baccalaureate program in pharmacy. Am J Pharm Educ 1996;60:179-82.

8. Markind JE, Stachnik JM. European drug information centers. J Hum Lact 1996;12(3):239-42.

9. Stachnik JM, Numm-Thompson CL, Simon PA, et al. Self-directed work teams: application to a drug information center. Ann Pharmacother 1997;31:357-62.

10. Mullerova H, Vlcek J. Drug information centre–analysis of activities of a regional centre. Int J Med Inf 1997;45:53-8.

11. Gora-Harper, ML, Bradt BF. An educational design to teach drug information across the curriculum. Am J Pharm Educ 1997;61:296-302.

12. Therese I, Laux P, Laux R. Redesign of a drug information resources course: responding to the needs of nontraditional PharmD students. Am J Pharm Educ 1997;61:306-9.

13. Ferrill MJ, Norton LL. Drug information to biomedical informatics: a three-tier approach to building a university system for the twenty-first century. Am J Pharm Educ 1997;61:81-6.

14. Tsourounis C, Schroeder DJ. Implementation of a computerized drug information database. Am J Health-Sys Pharm 1997;54:1763-4.

15. Thompson CA. Drug information centers pool resources. Am J Health-Sys Pharm 1997;54:1930-1.

16. Rosenberg JM, Fung HB, Satyabal R. Clerkship rotation at an international drug information center with emphasis on computerized database retrieval for post-baccalaureate Pharm.D. students. AACP Ann Meeting 1997;95:79.

17. Restino MS, Knodel LC. Drug information quality assurance program used to appraise students' performance. Am J Hosp Pharm 1992;49:1425-9.

18. Anon. Commonly-used new drugs. Tokyo: Nippon-shinyaku Co., Ltd, 1998.

19. Iguchi S, Ohnishi M, Nishiyama T, Hosono K, Umezawa C. Current community pharmacy practice in Japan. Results of a survey. J Clin Pharm Ther 1998; 23:223-7.

20. PharmaLand® (ARIS: adverse reaction database and Beluga: drug interaction database). Japan: Odashima Drug Information Center, 1997.

21. Sylvester R. Incorporation of Internet databases into pharmacotherapy course-work. Am J Pharm Educ 1997;61:50-5.

22. Ramanathan M, Chau RI, Straubinger RM. Integration of Internet-based technologies as learning tools in a pharmaceutical calculation course. Am J Pharm Educ 1997;61:141-8.

23. Fung SM, Norton LL, Ferrill MJ, Supernaw RB. Promoting professionalism through mentoring via the Internet. Am J Pharm Educ 1997;61:166-9.

24. Shumway JM, Jacknowitz AI, Abate MA. Attitudes of community pharmacists, university-based pharmacists, and students toward online information resources. Methods Inf Med 1996;35(2):142-7.

25. Study Commission on Pharmacy. Pharmacists for the future: the report of the Study Commission on Pharmacy. Ann Arbor, MI: Health Administration Press, 1975.

26. Monaghan MS, Gardner SF, Hastings JK, et al. Student attitudes toward the use of standardized patients in a communication course. Am J Pharm Educ 1997;61:131-6.

27. Dolovich L, Hudson A. Collecting evidence. Pharm Pract 1997;13(5):68-77.

28. Marking JE, Stachnik NM. European drug information centers. J Hum Lact 1996;12(39):239-42.

APPENDIX

Drug information questions asked by alumni pharmacists:

1) Patient lost a prescription drug on the way home and reported to his pharmacy. Can the pharmacist dispense the drug to the patient again?

2) When iron preparation is taken with lemon, the ion absorption is delayed. What is a possible mechanism for this interaction?

3) What kind of dietary incompatibility would you expect when calcium antagonists are taken with grapefruit juice?

4) Can Euglucon[®] (glipenclamide), oral antidiabetics, be triturated?

5) Can Seloken[®] (metoprolol tartrate), -blocker, be triturated?

6) Can warfarin sodium, oral anticoagulant, be triturated? If so, how long will it be effective?

7) Can Spiropent[®] (clenbuterol hydrochloride), bronchodilater, be excreted in the breast milk?

8) Can an expectant mother take Zovirax[®] (aciclovil)?

9) Prozac[®] is not sold in Japan yet. Are there any substitutes available in Japan?

10) A patient who is on Halcion[®] (triazolam) for a long time took Tagamet[®] (cimetidine). How high will the blood level of Halcion[®] be raised?

11) Can Futhan[®] (nafamostat mesilate) be mixed with Bisolvon[®] (bromhexine hydrochloride), both used for injection?

12) The instruction of steroids package inserts for external use sometimes may not be appropriate in the practical situation. What is your recommended instruction for application and administration frequency of steroids?

APPENDIX (continued)

13) Is it all right to dilute Incremin® syrup (ferric pyrophosphate solution) with drinking water?

14) A child ingested tobacco accidentally. What is an appropriate use of activated charcoal preparations?

15) Is it inappropriate to take antibiotics with acidic food? If so, which antibiotics and why?

16) What is the administration order between two eye drops, Pivalephrine® (dipivefrine) and Timoptol® (timolol maleate), Pivalephrine first, or Timoptol first?

17) What kind of chronological change can you observe when you mix ointment with cream?

18) Are there any prescription antitussive agents available which are neither granules nor powder?

19) Sucrose is recommended for Grimicron® and glucose for BASEN® in order to prevent hypoglycemia; why? Is it correct to use orange juice for this purpose, then?

20) What is the calorie number of lozenge and syrup for the treatment of diabetics?

21) MRSA was detected from a patient. What is an appropriate treatment for the patient? How should you sanitize the surroundings of the patient?

22) What types of products can you triturate in general?

23) What kind of drug interaction can you expect from pravastatin and bezafibrate?

24) Why can't you take Dopaston® (levodopa) in an empty stomach?

25) Is it all right to use eye drops (solution and suspension) for contact lens (soft and hard)?

26) What kind of dietary incompatibility exists between warfarin and "nattoh (fermented soybeans)" or "chlorella (algae) food," and why?

27) There is no drug in Japan which is officially approved for Alzheimer's disease. What kind of drug would you recommend for Alzheimer's disease that is available now in Japan?

28) A patient taking Tagamet (cimetidine) complained of swelling of the breasts. What is the alternative drug of choice?

29) What kind of caution should a patient pay when carrying insulin injections?

30) How long is the dispensing license for controlled drugs effective?

31) A physician wanted to switch Lipovus® (simvastatin) to Mevalotin® (pravastatin) for his patient. What size of Mevalotin would you recommend?

32) A patient found at home PL® granules (cold remedy) which was dispensed one year ago. Are there any problems involved if the patient takes the granules?

33) What kind of side effects and drug interactions should you have to pay attention to for patients taking terfenadine?

34) Can a store handling home care supplies sell Glutestace® (equipment to measure blood glucose level) without a license to sell medical supplies?