The Role of Health Informatics in the Provision of Continuing Pharmacy Education

By

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Acknowledgement and Endorsement

This report has been written by me and has not received previous academic credit at this or any other institution.

I would like to thank Bev Zwicker, Dr. Ingrid Sketris and all of the faculty and staff of the Division of Continuing Pharmacy Education and the Dalhousie College of Pharmacy for their support and feedback during the internship. I would also like to thank the members of the COPD education initiative project management team.

Marc Richard

I have read the report and it is an accurate reflection of the work completed by Marc Richard during the internship.

_____
Bev Zwicker
Coordinator, Continuing Pharmacy Education
Internship Supervisor

Executive Summary

The internship was completed with the Division of Continuing Pharmacy Education, Dalhousie College of Pharmacy, under the supervision of the director, Bev Zwicker, and Dr. Ingrid Sketris, Professor, Dalhousie College of Pharmacy. The Division operates as part of the Dalhousie College of Pharmacy to provide and facilitate access to continuing education programs and continuing professional development opportunities for pharmacists licensed to practice in the Maritime provinces.

The internship work was performed from January 14, 2005 to April 23, 2005. The intern's role was to research the role of Health Informatics in the provision of continuing pharmacy education, as well as to analyze data obtained from a recent needs assessment designed to gauge Nova Scotia pharmacists' preferences and use of various formats to acquire continuing education, use of technology by practicing pharmacists, and knowledge gaps in the area of Chronic Obstructive Pulmonary Disease (COPD).

Health informatics provides new methods to potentially improve the delivery of continuing education (CE), providing an "any time, any place, any pace" learning environment. These new approaches can offer more interactive learning tools that have been shown to be more effective than traditional didactic learning methods.

Results of a recent needs assessment indicate that traditional print and oral CE formats continue to be the preferred medium by Nova Scotia pharmacists. However, it was also found that although pharmacists prefer the live formats, accessibility can be an issue.

It is recommended that the Division of Continuing Pharmacy Education continue to look into the delivery of technology based CE initiatives. These methods offer the potential to improve learning, as well as increase accessibility to interactive formats of education. Also, for the time being, the Division should continue to provide high quality print and oral CE programs to its membership as these are the preferred methods and

continue to be used frequently. To enhance the efficacy of these methods, they should be made as interactive as possible and post-session reminders should be used to reinforce the material presented.

The internship was a valuable experience to the author and provided an opportunity to understand the role and challenges to the use of technology in continuing education. Further experience in the areas of statistics, research methods and project management was also gained. The results of the internship have been used to help develop a continuing education program on COPD available to all pharmacists in Nova Scotia through various formats. Additionally, the feasibility of publishing the results of the internship is being explored as an avenue to increase knowledge relating to continuing pharmacy education.

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1. Introduction

The 13 week internship was performed at the Division of Continuing Pharmacy Education, Dalhousie College of Pharmacy. The internship's objective was to research the role of technology in the delivery of continuing pharmacy education. More specifically, the intern researched the effectiveness of various formats of delivering continuing education materials, the role of technology in increasing the speed at which new information can be disseminated to health care professionals, the role of technology in reinforcing material presented in continuing education programs and the current level and acceptance of technology by pharmacists in Nova Scotia.

Health care information is constantly being created and updated. To keep up to date with the latest advances, healthcare professionals must commit to life long learning, including participation in continuing education programs. The Accreditation Council for Pharmacy Education defines continuing education (CE) as follows:

> "Continuing education for the profession of pharmacy is a structured process of education designed or intended to support the continuous development of pharmacists to maintain and enhance their professional competence. Continuing education should promote problem-solving and critical thinking and be applicable to the practice of pharmacy." [1]

Research has shown that CE can improve knowledge, skills, and attitudes and effect change in professional practice and patient health outcomes [2][3]. CE is traditionally delivered through print and oral educational programs and is widely mandated as a mechanism to ensure health care professionals achieve life long learning [3][4][5]. Print and oral formats are often preferred by healthcare providers and are to date the most commonly used. Despite the widespread use and acceptance of these formats, there are many concerns with their effectiveness in changing practice and improving health outcomes [3][5][6].

The work of the internship will be used by the Division of Continuing Pharmacy education to improve the delivery of continuing education and increase the uptake of current best evidence based practice in the pharmacy community.

2. Overview of the Organization

The Division of Continuing Pharmacy Education at Dalhousie University operates under the auspices of the Dalhousie College of Pharmacy to provide and facilitate access to continuing education programs and continuing professional development opportunities for pharmacists licensed to practice in the Maritime provinces.

The Division strives to improve both the quantity and quality of the programs it provides and/or facilitates to meet the learning needs of its membership. To this end, it attempts to utilize current evidence with respect to adult education and continuing education of health professionals to optimize the transfer of knowledge into practice. Such initiatives include the development of interprofessional learning opportunities with other health professionals and the incorporation of reflection & reminder components in the education programs it develops.

Over the past few years, the Division has begun to explore various means of offering continuing education through distance technologies such as live internet based seminars and teleconferences. The Division plans to further explore such opportunities to increase access to all pharmacists in the Maritime provinces.

3. Work Performed for the Internship

3.1 Background Information

Chronic obstructive pulmonary disease (COPD) is a chronic medical condition that requires therapy for prevention and control of symptomatic exacerbations. Drug therapy is the cornerstone of therapeutic management, as outlined by the Canadian Thoracic Society [7]. Of the available medications for the prevention & control of respiratory symptoms, inhaled agents such as bronchodilators and corticosteroids are important therapies.

In 1999, the Nova Scotia Department of Health introduced the Drug Evaluation Alliance of Nova Scotia (DEANS) to complement its existing drug program management structures and policies (e.g. formulary management processes and policies that restrict or delist drugs.) The mission of DEANS is "to contribute to the health of Nova Scotians by encouraging appropriate drug use". To accomplish this DEANS does the following: identifies critical drug care issues, collects information, conducts preliminary analyses, prioritizes issues; develops implementation plans and, establishes and manages partnerships and evaluates the impact of the intervention on practitioner behavior and consumer outcomes.

Through previous projects, DEANS has identified the need to improve the prescribing of medications for the treatment of COPD. To help increase the awareness of appropriate therapy and management of COPD, the division of Continuing Pharmacy Education, Dalhousie College of Pharmacy, in conjunction with DEANS, will be conducting a continuing education (CE) program to provide Nova Scotia pharmacists with information about COPD. To further enhance learning, the project will provide pharmacists with tools to assist them in applying this information. The project will also develop a reminder process to reinforce the key messages for learners.

To aid in the development and deliver of the program, a needs assessment was conducted. A written, self-administered survey was developed in the summer of 2004 and subsequently mailed to all pharmacists in Nova Scotia in January 2005. The survey consisted of 3 sections:

Section I: Questions relating to the respondents' attitudes regarding current methods of continuing education delivery allowing for a better understanding of which methods participants find effective and which methods are preferred and accessible.

Section II - Questions relating to COPD education to help identify knowledge gaps and guide the development of the education initiative.

Section III – Demographic questions such as educational background, gender, age, work experience and location as well as questions relating to the use of technology in current practice.

The Survey is included as Appendix I.

3.2 Role of the Intern

The internship objective was to research the potential role of information technology in provision of continuing education to pharmacists in the Maritimes. The work was broken down into two major components: 1) literature search and 2) analysis of the needs assessment. The internship was also composed of various other tasks and duties as described below.

3.2.1 Literature Search

A literature search was conducted to gain knowledge about current technologies and effectiveness of these technologies in the delivery of continuing education to health care professionals. The author searched Medline, the Cochrane Database and the International Pharmaceutical Abstracts database, the bibliographies from articles found and information provided by the project management team for articles relating to the subject.

Several articles were found on the use of technology in continuing medical education, but limited information was found on the same subject in continuing pharmacy education.

3.2.2 Analysis of the Needs Assessment

Data from the needs assessment was entered and analyzed using SPSS. Results were presented to the project management team at meetings throughout February, March and April. Data was used to help develop the project, as well as make decisions regarding the delivery methods for the educational component.

In completing this portion of the internship skills from statistics, research methods and project management were required to provide appropriate results in a timely fashion.

3.2.3 Presentation of Results

Results of the internship were presented at regular intervals to the project management team and directly to the internship supervisors. The results will also be further analyzed and submitted for publication.

3.2.4 COPD Education Initiative Project Management Team

As part of the internship, the intern was a member of the COPD education initiative project management team. The project management team is responsible for ensuring the successful delivery of a best-evidence based continuing education program to pharmacists in the province of Nova Scotia. The project management team also has the task of developing the framework for an evaluation of the educational initiative.

Working with the project management team allowed the intern to work as part of a team consisting of other clinicians, researchers, government officials and representatives of a major pharmaceutical company.

Through the work the project management team, the intern gained further knowledge of the process of disseminating evidence and research to health care practitioners and to better understand how to conduct an evaluation of a major educational project.

3.2.5 Evaluation and Summary of Online and Print COPD Resources

The intern was responsible for evaluating and summarizing a list of available print and online patient and health care professional information resources COPD and smoking cessation resources. Contacts were made with various professional and community organizations. The list of resources will be made available as part of the educational initiative.

4. Relevance to Health Informatics

Healthcare information is continually created and updated as new research is conducted and analyzed. Health care professionals are faced with the major challenge of trying to keep up with this explosion of new information and providing patients with the care based on the best evidence available. Although healthcare professionals commit to life long learning, it is impossible for an individual to keep up with the constantly updated information.

To ensure that healthcare professionals constantly learn new information, many regulatory organizations require professionals to accumulate continuing education credits as part of the yearly licensing process. This includes pharmacists in Nova Scotia who are required to accumulate 15 hours of continuing credit hours per year as outlined in the Nova Scotia Pharmacy Act.

Traditionally, organizations have relied on print based mediums and oral presentations as a method of delivering continuing education. Although many professionals consider these methods to be effective, they also have some limitations. Print material can quickly become outdated and does not provide the opportunity for interactive learning. Live continuing education remains can be difficult to access outside of urban areas, are costly to develop and deliver, may be costly to attend and may not be convenient to health professionals who have busy schedules [6]. Both methods are also targeted at large, broad audiences, and may not provide an individual with the information required in their practice.

Health informatics offers potential solutions to some of these issues with traditional methods. Computers offer the potential to provide customized, one-on-one education as well as "any time, any place, any pace" learning [8].

A large portion of the internship was to gather information on the role of technology in the delivery of continuing education to health professionals. This work involved searching the literature for relevant research and knowledge. Although much research is currently available on the role of informatics in the area of continuing medical education, little published information is available in the field of continuing pharmacy education that is of much interest to the Division. Through this research, the author gained valuable information on the potential role of current technologies in improving the delivery of CE programs, as well as how technology could be better used to provide CE programs. The results of the research will also likely be of value to the Division of

Continuing Pharmacy Education as they continue to provide quality CE programs to pharmacists in the Maritimes.

The intern was also responsible for the analysis of a recent survey mailed out by the Division to all pharmacists in the province of Nova Scotia. Along with a section specific to COPD, the survey also collected information relating to pharmacists' preferences regarding various formats of acquiring continuing education credits as well the use of technology in their current practice. Being able to understand and analyze data is critical in Health Informatics. The above tasks required skills from statistics, research methods and project management to analyze the data and report the data on time to the project management team.

5. Continuing Education: Challenges and Solutions

5.1 Use of Technology in the Delivery of Continuing Education

It has been shown that a wide gap exists between what is known from research and what health care professionals practice. The problem is exemplified through Medline that contains much of the medical literature available. Since 1966 to 1995, the number of new Randomized Clinical Trials indexed by Medline has increased from just over 100, to over 10,000 per year [9].

To transfer all of this new knowledge to health care professionals, the information is disseminated in journals, guidelines and in formal continuing education in printed or oral formats. Although traditional techniques appear to be effective at transferring information, they often fail to achieve success in changing the practice of healthcare professionals or in health care outcomes [3][10]. It appears that continuing education methods which are more interactive such as discussion, role-play, or hands-on are more effective at changing practice and improving outcomes than traditional didactic methods such as lectures [3][10].

Much attention is being focused on the enhancement of traditional continuing education through the use of technology. The use of multimedia, the internet, telehealth and other technologies for the provision of continuing education is becoming more common and more thoroughly studied.

The literature shows that technology can provide effective continuing education programs and are gaining popularity [6][10][11][12][13][14][15]. Although they are becoming more common, many barriers to the use of technology in CE remain. Barriers include lack of computer competence and training, technical difficulties with the programs and speed of access [15][16]. In fact, one study showed that not knowing how to use it was the largest barrier to physician use of computer based learning technology [16]. In another study specific to pharmacists' computer skills, training was once again identified as a possible barrier to the use of computers[17]. Although pharmacists rated themselves as generally computer literate, many believed that they required more computer training. The study also found that pharmacists lacked a familiarity with computer-related terms and rated their ability to manipulate files, use of software help features and installing software to be low[17].

5.2   Analysis of Needs Assessment

5.2.1   Response Rate

Over 33% (350/1057) pharmacists in the province of Nova Scotia returned surveys as part of the needs assessment. The majority of respondents were female (70%), have been practicing for an average of 17 years and work an average of 34 hours per week. Also, the majority of pharmacists work in a community setting (82%) with only 13% working in a hospital setting and less than 5% in other settings. The percentage of pharmacists working in a city setting was slightly lower than those outside of the cities with 42% of respondents working in a city setting and 58% working outside of a city setting.

5.2.2 Current Use of Technology

Technology is widely used by pharmacists in Nova Scotia. Over 92% of pharmacists reported that they have a computer in their home while over 70% also reported that they have high-speed internet. Internet access at work is also becoming more common with over 80% of pharmacists having access.

5.2.3 Use of Continuing Education Formats in Nova Scotia

Pharmacists were also asked questions relating to their use, accessibility and their perceived effectiveness of various formats of methods of delivering CE programs. The results are summarized in Table 1.

Table 1. Pharmacists' ratings of CE formats

Continuing Education Format	Frequency of Use	Accessibility	Ability to Meet Learning Needs
1. Live interactive internet-based seminars	1.25	2.90	2.24
2. Internet-based private studies	2.04	3.71	2.99
3. Live in-person seminars	3.41	3.68	4.34
4. Meetings/Conferences	2.96	3.35	3.78
5. Home study – printed material	3.36	4.63	4.10
6. Teleconferences	1.35	2.20	2.13
7. CD-Rom based	1.29	2.79	2.60
8. Reading Journals and Texts (self-directed learning)	3.27	4.32	3.83
9. Journal Club	1.51	2.32	2.24

5-point Likert scales were used for the questions in the survey with 1 being the lowest in the category and 5 being the highest (please see Appendix I for further details).

Pharmacists in Nova Scotia mostly ranked live-in person seminars and home-study printed materials as the most frequently used formats for obtaining continuing education credit. Newer methods such as internet based private and interactive formats ranked much lower. This is similar to other studies of pharmacists' preferences [6][18].

Private print home-studies were once again ranked very high when looking at accessibility. In fact, all private home based studies ranked high with printed private studies, self-directed learning and internet-based private studies ranking as the top 3. Live in-person seminars ranked fourth.

Finally, pharmacists ranked the CE formats based on the extent to which they meet their learning needs. Live-in person seminars were once again ranked first, with print materials being second.

It is important to note that pharmacists ranked live-in person seminars as first in both frequency of use and meeting their learning needs, but ranked them 4th with respect to accessibility.

6. Conclusions

Continuing education is important in helping health care professionals keep informed with the latest advances in medicine. Research has shown that CE can improve knowledge, skills, and attitudes and effect change in professional practice and patient health outcomes. Even with these improvements, there still remains a knowledge gap between what the evidence shows and what is practiced.

New formats of delivering continuing education such as web based or cd-rom based are becoming more common. These new methods offer the potential to deliver interactive, tailored health information not available in traditional didactic methods. Initial results are promising, but more research is required in this area. They can also deliver the educational content at a lower cost and with a high rate of accessibility. Studies show that health care professionals are accepting of new technologies. Studies also show positive results to the use of technology in the delivery of continuing education.

In a recent survey of pharmacists in Nova Scotia, it was found that printed private materials and live-in person seminars continue to be the preferred methods for obtaining continuing education credit.   Use of newer technologies for the delivery of continuing education remains low.

To increase the use of the newer formats of continuing education, it is important that they be promoted. Training for the new methods should also be provided to ease any anxieties about their use.

Health informatics provides a new opportunity to provide high quality continuing education programs with the potential to increase practice change and improve health outcomes.

7 Recommendations

Based on the research conducted during the internship, the author makes the following recommendations:

- To continue to meet pharmacists' preferences, the Division should continue to deliver high quality live and print CE. To increase impact, the Division should also increase the use of interactive participation and post-session reminders when possible.

- New technologies are becoming more common in the delivery of continuing education. The Division should continue to explore opportunities to deliver CE through means such as live web-based presentations. This will help increase access to live interactive seminars to all pharmacists in the Maritimes.

- Research suggests that there is a need to promote new technologies used to deliver CE. The Division should develop a strategy to promote new methods used in their programs to ensure participation by its members.

- Anxiety about the use of computers may be a significant barrier to the use of technology in completing continuing education. The Division should consider ways to increase computer competence and reduce anxieties about the use of new technologies to deliver their CE programs.

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Appendix I

Pharmacist Continuing Education Needs Assessment
For
Chronic Obstructive Pulmonary Disease (COPD)

This questionnaire will take 10-15 minutes to complete and has been divided into 3 sections:

- Section A deals with your preference for the various continuing education formats
- Section B with your knowledge and current practice regarding COPD
- Section C relating to demographic and professional practice questions.

Section A.	Continuing Education Formats

1. Please rate how often you have used the following formats to acquire continuing education units in the previous 12 months:

1 means "Never" , 3 means "Occasionally", and 5 means "Very Often"					
1. Live interactive internet-based seminars	1	2	3	4	5
2. Internet-based private studies	1	2	3	4	5
3. Live in-person seminars	1	2	3	4	5
4. Meetings/Conferences	1	2	3	4	5
5. Home study – printed material	1	2	3	4	5
6. Teleconferences	1	2	3	4	5
7. CD-Rom based	1	2	3	4	5
8. Reading Journals and Texts (self-directed learning)	1	2	3	4	5
9. Journal Club	1	2	3	4	5
10. Other, Please specify _____	1	2	3	4	5

2. Please rate how accessible the following continuing education formats are for you (ie. It does not matter if you choose to use it, just looking at accessibility):

1 means "Not Accessible" and 5 means "Very Accessible"					
1. Live interactive internet-based seminars	1	2	3	4	5
2. Internet-based private studies	1	2	3	4	5
3. Live in-person seminars	1	2	3	4	5
4. Meetings/Conferences	1	2	3	4	5
5. Home study – printed material	1	2	3	4	5
6. Teleconferences	1	2	3	4	5
7. CD-Rom based	1	2	3	4	5
8. Reading Journals and Texts (self-directed learning)	1	2	3	4	5
9. Journal Club	1	2	3	4	5
10. Other, Please specify _____	1	2	3	4	5

3. Please rate the following continuing education formats based on which format best meets your learning needs (ie. Which format do you find the most useful?):

1 means "Not Useful" and 5 means "Very Useful"					
1. Live interactive internet-based seminars	1	2	3	4	5
2. Internet-based private studies	1	2	3	4	5
3. Live in-person seminars	1	2	3	4	5
4. Meetings/Conferences	1	2	3	4	5
5. Home study – printed material	1	2	3	4	5
6. Teleconferences	1	2	3	4	5
7. CD-Rom based	1	2	3	4	5
8. Reading Journals and Texts (self-directed learning)	1	2	3	4	5
9. Journal Club	1	2	3	4	5
10. Other, Please specify _____	1	2	3	4	5

4. Please rate how useful the following tools are, or would be, in assisting you to incorporate learning into your practice after attending an education program:

1 means "not useful" and 5 means "very useful"					
1. Mailed printed material containing follow up information	1	2	3	4	5
2. Website containing follow up information	1	2	3	4	5
3. Fax template to consult with physician	1	2	3	4	5
4. Education material contained in a Personal Digital Assistant (PDA) program	1	2	3	4	5
5. Laminated cards with follow-up and reinforcement material	1	2	3	4	5
6. Posters to initiate patient-pharmacist interaction	1	2	3	4	5
7. Patient handouts	1	2	3	4	5
8. Videos/CDs for teaching patients	1	2	3	4	5

Section B.   Practice: Chronic Obstructive Pulmonary Disease

1. I am aware of the 2003 Canadian Thoracic Society recommendations for the management of COPD.

    Yes   No

2. I have read the executive summary of the 2003 Canadian Thoracic Society recommendations for the management of COPD.

    Yes   No

3. I have identified an individual/individuals with undiagnosed respiratory symptoms.

    Yes   No

4. Please indicate how often you perform the following activities with patients who are filling prescriptions for respiratory medications:

1 means "Never" and 5 means "Very Often"					
1. Ask patients for their diagnosis	1	2	3	4	5
2. Provide counselling on prescribed respiratory medications	1	2	3	4	5
3. Monitor for adverse reactions in patients on inhaled respiratory medications	1	2	3	4	5
4. Monitor compliance to respiratory medications	1	2	3	4	5
5. Monitor for symptom control	1	2	3	4	5
6. Refer patients with uncontrolled symptoms to physician	1	2	3	4	5
7. Contact physician directly when you identify issues relating to respiratory medications and care	1	2	3	4	5
8. Monitor for appropriateness of therapy and dosages	1	2	3	4	5
9. Assess inhaler technique as appropriate	1	2	3	4	5
10. Provide inhaler training as appropriate	1	2	3	4	5
11. Provide spacer recommendation and training as appropriate	1	2	3	4	5
12. Determine if patient is a smoker	1	2	3	4	5
13. If patient is a smoker, determine patient's readiness to quit	1	2	3	4	5
14. Counsel on smoking cessation as appropriate	1	2	3	4	5
15. Determine if patient has received annual influenza vaccine	1	2	3	4	5
16. Determine if patient has received pneumococcal vaccine	1	2	3	4	5

5. Indicate your level of agreement with the statements below using the following scale:

1 means "Strongly Disagree" and 5 means "Strongly Agree"					
1. I have the professional skills required to assess inhaler technique	1	2	3	4	5
2. I have the skills and knowledge required to provide appropriate inhaler training	1	2	3	4	5
3. I have the knowledge required to counsel patients on respiratory medications	1	2	3	4	5
4. I have the professional skills required to monitor for adverse reactions and toxicities related to respiratory medications	1	2	3	4	5
5. I have the professional skills required to monitor compliance to treatment	1	2	3	4	5
6. I have the professional skills required to determine if a patient should receive a pneumococcal vaccine	1	2	3	4	5
7. I have the professional skills required to determine if a patient should receive an annual influenza vaccine	1	2	3	4	5
8. I have the professional skills required to identify patients with undiagnosed respiratory disease	1	2	3	4	5
9. I have the professional skill required to determine a patient's readiness to quit smoking.	1	2	3	4	5
10. I have the professional skills required to counsel on smoking cessation	1	2	3	4	5
11. I am familiar with support groups and organizations to refer my patients to help quit smoking	1	2	3	4	5

Section C.   Demographics and Professional Practice

1. In what year did you become licensed to practice as a pharmacist? _____

2. Please indicate your pharmacy education: **(Circle all that apply)**

Bachelor (BSc.Pharm)   Pharm.D   Master's degree

Advanced Certificate   Hospital Residency   Ph.D   Other (please

specify)_____

3. What is your gender?   Male   Female

4. How many years have you practiced in a pharmacy since you've been licensed?

_____ years

5. In the past 3 months, on average how many hours per week have you worked in a
    pharmacy?

_____ average hours per week

6. Which of the following is your primary practice setting?

Community   Academia   Other (please specify)

_____

Hospital   Industry

7. In which county is your main pharmacy practice site? **(Circle one answer)**

Annapolis	Inverness
Antigonish	Kings
Cape Breton	Lunenburg
Colchester	Pictou
Cumberland	Queens
Digby	Richmond
Guysborough	Shelburne
Halifax	Victoria
Hants	Yarmouth

8. In which setting is your pharmacy located?

   City   Town   Other

9. Does your pharmacy have an area where you can provide private counselling?

      Yes   No

10. Does your pharmacy have a waiting area with chairs where patients can wait for their prescriptions to be filled?

      Yes   No

11. Do you have a scheduled time during the week when you have overlap in pharmacists on duty in the dispensary?

      Yes   No

12. On average how long does it take you to provide patient counselling on the use of an inhaler?

      1-5 minutes   6-10 minutes   11-20 minutes   20 minutes or

      more

13. In the past 3 months, what was your daily average prescription count Monday through Friday (do not include Saturdays, Sundays or holidays) in your dispensary

      100 per day or less   150-199   300 per day or more

      100-149   200-299   Unsure

14. In the past 12 months, how many times have you participated in a live continuing education event?
      Never   1-3 times   4 or more times

15. In the past 24 months, how many times have you participated in continuing education specific to Chronic Obstructive Pulmonary Disease?

      Never   1-3 times   4 or more times

16. Do you have a computer at <u>home</u>?

   Yes   No

17. Please circle the appropriate answer relating to your internet access at <u>home</u>.

   No Internet Access   Dial-up Internet Access   High-Speed

   Internet Access   Not Sure

18. Do you use a Personal Digital Assistant (PDA)?

Yes   No

19. Do you have internet access at <u>work</u>?

Yes   No

Thank you very much for completing this survey. Please feel free to make any additional comments in the space provided.

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We remind you that this survey is anonymous and all the information given to us will remain confidential.