

***“Prevention of Pneumococcal Infections through Vaccination: The Pharmacist’s Role in Immunization”***

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## Overall Goal & Objectives

The overall goal for this initiative is to increase pneumococcal vaccination rates, primarily within UF & Shands (the University of Florida Academic Health Center), as well as throughout the State of Florida, via improved pharmacist performance and contribution to interdisciplinary care in outpatient and primary care settings. Key objectives to achieve this goal are as follows:

- Facilitate pharmacists' identification of patients at risk for pneumococcal disease and concurrent implementation (or recommendation) of vaccinations according to current guidelines for immunization and reimmunization against pneumococcal disease
- Increase the impact of pharmacists educating at-risk patients on the importance of receiving a pneumococcal vaccination
- Establish a collaborative model between pharmacists and other medical staff focused on improving pneumococcal vaccination rates
- Provide practical strategies to overcome barriers to pneumococcal vaccine uptake, with an emphasis on pharmacy practice-specific barriers
- Expand the role of the pharmacists in pneumococcal vaccine administration within the University of Florida healthcare system

Challenges to achieving optimal pneumococcal vaccination rates include concerns regarding vaccine safety and efficacy, as well as difficulties in determining patient vaccination history and acute problems taking precedence over preventive care. In order to improve pneumococcal immunization rates in adults, pharmacists participating in the current initiative will recognize the burden of pneumococcal disease, implement (or recommend) current vaccination guidelines, and readily identify and overcome potential barriers that prevent adults from receiving recommended immunizations.

## Technical Approach

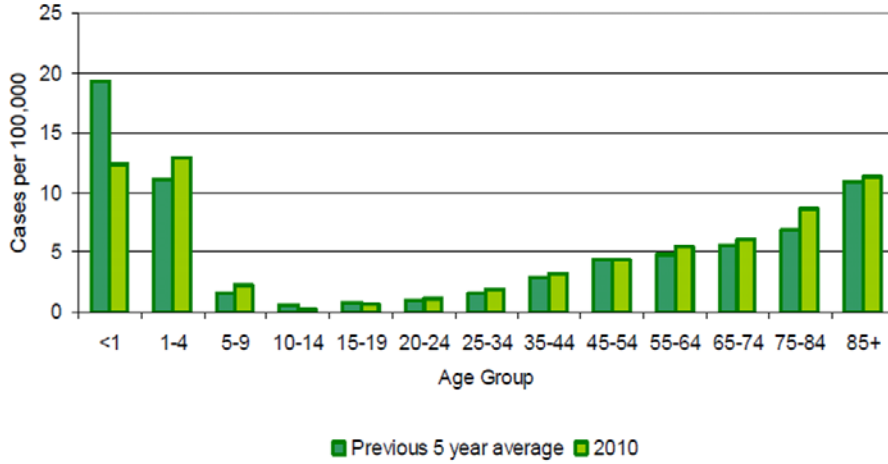
### ***Current assessment of need in target area***

#### ***Baseline data summary***

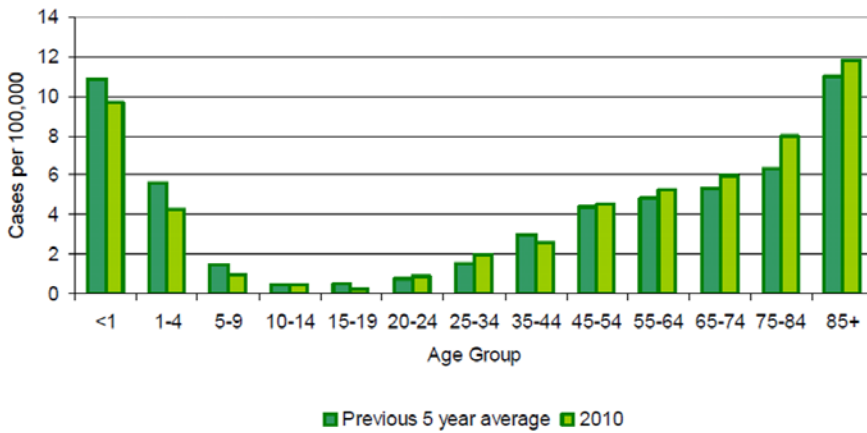
##### ***I. Burden of pneumococcal disease in the state of Florida***

Pneumococcal disease, which is caused by *Streptococcus pneumoniae* bacteria, is a leading cause of vaccine-preventable illness and death in the United States;<sup>1</sup> indeed, the most effective way of preventing pneumococcal infections, including drug resistant and drug susceptible, is through vaccination. According to the Florida Department of Health, there were 1509 reported confirmed and probable cases of invasive disease caused by *Streptococcus pneumoniae* in 2010 and 1324 cases reported in 2011; approximately 80% of these cases were reported in individuals over the age of 19.<sup>2-4</sup>

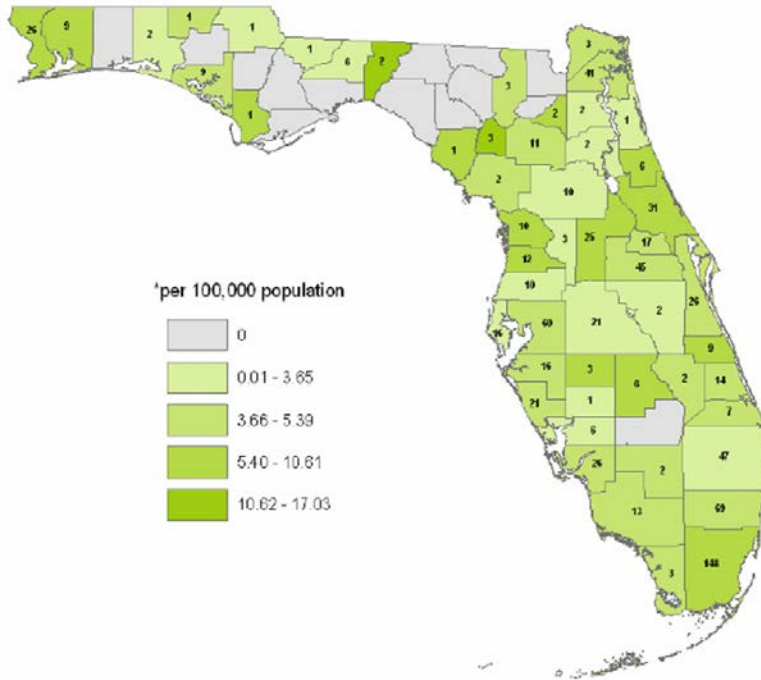
**Figure 1. *Streptococcus pneumoniae*, Invasive Disease, Drug-Resistant Incidence Rate by Age Group, Florida, 2010**



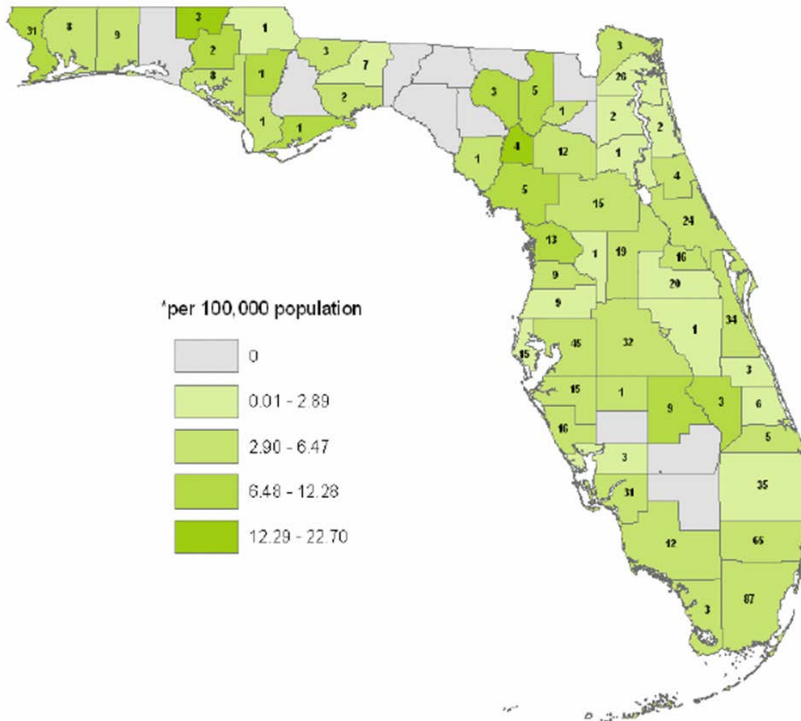
**Figure 2. *Streptococcus pneumoniae*, Invasive Disease, Drug-Susceptible Incidence Rate by Age Group, Florida, 2010**



**Figure 3. *Streptococcus pneumoniae*, Invasive Disease, Drug-Resistant Cases and Incidence Rate\* by County, Florida, 2010**



**Figure 4. *Streptococcus pneumoniae*, Invasive Disease, Drug-Susceptible Cases and Incidence Rate\* by County, Florida, 2010**



This burden of disease is accentuated by the fact that Florida is in the top quartile of states with designated primary care health professional shortage areas (HPSAs) in 2012.<sup>5</sup> Indeed, there are 248 HPSAs in Florida (all of Florida's 67 counties are designated in part or whole as HPSAs) and nearly a quarter of the state's population lives in one of these areas. As 753 primary care practitioners are needed to achieve a population to full-time-equivalent practitioner ratio of 3,500:1 (or 3,000:1 in high needs areas) and remove the HPSA designation in Florida, many Floridians are receiving suboptimal health care – including recommended vaccinations. Indeed, in 2010, 69.9% of adults aged 65 and over in Florida had ever received the pneumonia vaccine, which is significantly below the Healthy People 2010/2020 goal of 90%.<sup>6,7,8</sup>

A potential solution for this problem involves increasing the roles and responsibilities of the pharmacist as a primary care practitioner. According to Pharmacy Choice and Access Now (PCAN), a coalition of consumers, local business and pharmacists across the nation committed to preserving quality and affordable health care and pharmacy services for patients, *“There's a shortage of physicians in both urban and rural areas [in Florida], so the convenience of being able to get vaccinated when a patient goes to pick up their medication is one creative way to deliver health care. The added convenience of being able to be vaccinated while waiting to pick up medications should also help to increase the number of Floridians who get vaccinated against those diseases. One only needs to look to Florida's increased flu vaccination rates to understand the big win for Floridians— since 2007 when pharmacists were permitted to administer the flu vaccine, there's been a marked increase in flu vaccinations and a corresponding decrease in hospitalizations due to complications from the flu.”*<sup>9</sup>

The average Floridian visits a pharmacy at least once a month, increasing opportunities for immunization information to be delivered and the likelihood that patients entering the pharmacy for incidental items will elect to be immunized. To facilitate the pharmacist's role as an immunizer, a new law (the Vaccines Access Act) has passed in Florida expanding the types of vaccinations pharmacists can be certified to administer -- effective July 1, 2012, pharmacists certified to administer vaccinations in Florida have the ability to administer the pneumococcal and varicella zoster vaccines (in addition to the influenza vaccine). It is hoped that passing of the Vaccine Access Act will promote a healthier Florida by increasing qualified pharmacists' ability to expand the reach of the pneumococcal vaccine.

- II. *Suboptimal pneumococcal vaccination rates among students at the University of Florida*  
The University of Florida Student Health Care Center (SHCC) offers a wide variety of general health and wellness services, including vaccinations, to a potential patient population of approximately 50,000 students; 300 students are seen each day. In addition, the SHCC Pharmacy is on-site at the main SHCC location and is a complete outpatient pharmacy staffed by licensed pharmacists who fill prescriptions written by both SHCC medical staff and outside physicians.

Demographic data obtained for the covered patient populations indicate significant at-risk adult segments (eg, asthma in the top 50 diagnoses at the SHCC), with UF undergraduate and graduate students self-reporting asthma (5.2%), diabetes (0.4%), cigarette use (6.6%), Hookah use (6.9%), and cigar use (6.0%) in the last 30 days; thus, assuming no overlap in conditions/indications, this data suggests that as many as 12,500 students (25%) at UF should be vaccinated against pneumococcal disease.

A random chart audit of adult patients under the age of 65 of the SHCC with medical conditions that indicate pneumococcal vaccination was recently conducted by the Director of the SHCC, and the following baseline pneumococcal vaccination rates were obtained:

Medical Condition or Other Indication	Healthy People 2020 - Target Pneumococcal Vaccination Rate	Actual Pneumococcal Vaccination Rate
Cigarette smoking	60%	0%
Asthma	60%	0%
Diabetes	60%	20%

As the Healthy People 2010 and 2020 goals for pneumococcal vaccination in high-risk adults are 60%, there is a clear gap between the actual and target vaccination rates in high-risk adult patients of the UF SHCC.

**III. Suboptimal pneumococcal vaccination rates among adult patients of primary care practices within the UF & Shands healthcare system**

An educational curriculum, “*Long-Term Prevention of Pneumococcal Disease in Adults: An Interprofessional Approach to Improving Patient Outcomes*”, was launched in 2011 and reached 2 practices from the University of Florida (70 healthcare providers), as well as 4 regional cohorts across the United States each comprised of 1,250 primary care physicians (5,000 professionals total). This curriculum combined hands-on performance improvement (PI) coaching at the 2 University of Florida Physicians clinics with a platform of on-demand educational activities and practical tools increase pneumococcal immunization rates. Prior to initiation of the educational curriculum at the University of Florida practices, pneumococcal vaccination rates in adults were assessed (Stage A assessment of the PI activity) and then compared to the national average in the United States, as well as Healthy People 2010 Goals for Pneumococcal Vaccination in adults.

Results from this baseline assessment demonstrated that pneumococcal vaccination rates were suboptimal in adult patients for whom the vaccination was indicated:

Patient Description	Healthy People 2010 Goal for Pneumococcal Vaccination	National Average	University of Florida Physicians – Stage A Assessment
65 years and older	90%	60%	57%
19-64 years at high risk	60%	18%	20%

These data demonstrate the further need for increased education on this topic in order to prevent pneumococcal infections in adults through increased vaccination rates.

### Primary audience(s)

The primary audience targeted for this intervention is pharmacists and last year pharmacy students within the University of Florida Healthcare System. The secondary audience comprises community and health system pharmacists, with a focus on outpatient and primary care pharmacists in the State of Florida.

Adults for whom pneumococcal vaccination is recommended will directly derive benefit from the project outcomes. We will be able to demonstrate the direct impact on the patient population through the tracking and reporting of vaccination uptake rates within the identified populations.

### ***Intervention Design and Methods***

To reduce the professional practice gaps identified in the accompanying needs assessment, we propose an educational curriculum composed of multiple modalities including a live webcast, on-demand activity formats, and a series of live meetings, as well as a PI/QI practice integration initiative. All outcomes from the multi-component initiative will be analyzed and reported to assess the impact on learner knowledge (declarative and procedural), competence and performance.

The basic principles of adult learning serve to guide this comprehensive activity's design, including the following:

- Multiple exposures to education are more effective than a single exposure
- Multi-media interventions are more effective than a single medium intervention
- Multiple instructional techniques (eg, live meeting & interactive online) are preferred over a single technique
- Education is most effective when it's problem-centered (ie, relevant to the adult learners' needs)
- Sequential interventions have a greater impact on behavior, by allowing for a period of practical application using a "learn-work-learn" model<sup>10,11</sup>

#### **1. CPE-certified live multimedia webcast and teleconference**

The first component of the curriculum will be a CPE-certified live multi-media webcast and teleconference. It will feature an interactive presentation comprising three (3) distinct content segments in addition to Q&A sections and supporting point-of-care practice tools. During the live webcast, the faculty presentation will be streamed over the web in real-time for online learners; clinicians who prefer to access simply via teleconference will be offered that option as well. All content from the live presentations and Q&A (approx. 45-60 mins. in length) will also be recorded for re-formatting for use in the subsequent polished enduring program formats.

Proposed agenda topics are as follows:

- Implications of low vaccinations rates in adult patients in terms of public health burden caused by pneumococcal disease
- Review of current pneumococcal vaccination recommendations for adult patients
- Efficacy and safety of currently available pneumococcal vaccines
- Patient, provider, and system barriers currently impeding optimal immunization rates among adult patients
- Potential strategies to overcome such barriers and improve immunization rates among these patient cohorts (e.g. increased/improved pharmacist intervention, patient counseling/education, expanded access, computerized record reminders and alerts)
- Role of pharmacists in educating at-risk patients on the importance of receiving a pneumococcal vaccination
- Role of pharmacists in improving pneumococcal vaccination rates

As part of the live webcast, participants will be provided with tools and reminders for use within their practices. These simple and effective resources will assist in the implementation of vaccination protocols and provide much needed strategies in the area of patient education. All materials will be housed on the initiative website.

Proposed point-of-care practice tools include the following:

- Fact Sheet about Pneumococcal Disease
- Fact Sheet about the Pneumococcal Vaccine
- Patient Education Questionnaire
- Current Pneumococcal Immunization and Reimmunization Guidelines
- Pharmacist Strategies for Improving Pneumococcal Vaccination Rates in Adults
- Pneumococcal Vaccine Products and Indications
- Current Vaccination Recommendations for Adults
- Communication Strategies to Address Patient Concerns about Vaccination
- Pneumococcal Vaccination Reimbursement FAQs
- Standing Orders to facilitate nonphysicians to carry out vaccination responsibilities

## **2. Set of enduring materials, including CPE-certified on-demand online and print monograph activities, and audio/video podcast formats**

The second modality will consist of a set of enduring materials including CPE-certified on-demand online and print monograph activities, and audio/podcast formats. The content for the enduring components will be derived from the live webcast outlined above.

The live webcast/teleconference and the enduring online, print, and podcast formats will be publicized and delivered to 5,000 community and health system pharmacists in the State of Florida. In addition, as pharmacy students in their final year at the University of Florida College of Pharmacy (~300 students) are required to complete 12 hours of self-study, the webcast will be integrated as a component the self-study materials.



The web-based training module and related tools and resources website will be available for on-demand access for 12 months.

### **3. Series of four (4) live meetings held at UF College of Pharmacy sites in Jacksonville, Orlando, Tampa, and Gainesville**

The live webcast and on-demand activity will be utilized as tools to prepare the live meeting learners to engage in the live meeting component of this curriculum, and a selection of slides from this part of the activity will be utilized during each meeting.

A faculty expert will provide a concise update on the latest evidence, recommendations, and best practices for pneumococcal disease prevention at each meeting. Presentations will be highly interactive, designed to drive a meaningful and measurable impact on the knowledge and competence of the learners that will ultimately translate into improved patient health.

Participants of the live meetings will be encouraged to review the on-demand activity online and/or in print prior to participating in the live learning session, allowing the live meeting session to be more practically-focused. Twenty-five (25) clinicians at each site are expected to attend (ie, 100 participants total).

### **4. Pillar of the platform – Practice integration: PI/QI systems-focused interventions led by practice champions**

The PI/QI component will take place at the following three (3) UF care sites, all of which offer onsite pharmacy services:

- The UF Student Health Care Center (>70,000 primary care/women’s health visits annually; 4.8 FTE pharmacists and 2.0 FTE pharmacy techs; 13 PCPs; 10 NPs and 3 PAs)
- UF Shands Eastside Community Practice (14,000 family practice visits annually)
- UF & Shands Family Medicine at Main (residency and faculty practice site with 25,000 family medicine visits annually)

Each of the three sites has a faculty preceptor who will serve as the practice champion. They will be fully educated on the initiative and the related goals. In their role as practice champion, they will ensure that their staff at each site takes part in either the live or enduring educational initiative understands and utilizes the point-of-care/practice tools, and implements the new procedures listed below designed to increase vaccination rates.

The first goal of this set of interventions is to identify adult patients in whom pneumococcal vaccination is recommended. All patients over the age of 65 will be “flagged”; for high-risk patients under the age of 65 will be identified via previously prescribed medications for high-risk diseases or conditions. The three targeted risk factors as part of this initiative for

patients 19-64 are asthma, smoking and diabetes. The proposed flow of the intervention would be as follows:

1. Patient file is flagged during chart review/EMR audit
2. Upon arrival to next appointment, patient is screened as a candidate for pneumococcal vaccination
3. Pharmacist directly meets with patient and provides education regarding the importance of pneumococcal vaccination; encouragement to receive the vaccination will also be provided.
  - Via participation in the live webcast and/or enduring programs, the pharmacist will have all of the practical tools and resources to facilitate pneumococcal vaccination in appropriate patients
4. Upon receiving patient consent, pharmacist will immediately administer the pneumococcal vaccine

#### CURRICULUM EDUCATIONAL DESIGN - SUMMARY

Taken together, this multi-intervention, multi-technique, and multi-media approach to educating the target audience is designed to ensure the following:

- The educational content addresses relevant, practical needs of self-directed learners by responding to clinician questions and case submissions.
  - The live webcast is designed to be interactive throughout, minimizing didactic lecture while emphasizing practically oriented and/or case-based educational design, and maximizing the linkage with learner opportunities for practical clinical application (eg, via Practice Aid tool integration).
  - The on-demand components not only extend the reach of the live event, but they serve as a reinforcement of key learnings to move learners further down the path toward changes in knowledge, competence, performance, and, eventually, improved patient health.

Both the live meetings and the QI/PI initiative draw upon the content and teachings of the webcast and enduring offering and bring practice-related education directly to the point-of-care where it can be efficiently integrated.

#### ***Evaluation Design***

##### *Addressing the practice gap*

Demographic data will be obtained for the patient populations within the UF Student Health Care Center, UF Shands Eastside Community Practice, and UF&Shands Family Medicine at Main, and the **IDEAL** number/percentages of patients who should receive the pneumococcal vaccination will be obtained. A subsequent baseline chart review/EMR audit will determine the **ACTUAL** number/percentages of patients who have been vaccinated.

Data will be collected by the Director of Clinical Quality and be provided to the Practice Champions to facilitate data collection while protecting patient/resident/employee privacy.

Appropriate measures will be employed by the Practice Champions to ensure the following: optimal number of records pulled/evaluated and a stratified selection process.

After the multifaceted interventions proposed within this initiative, pneumococcal vaccination rates in appropriate adult patients will be reassessed via chart review/EMR audit to measure the activity's impact against the professional practice gaps.

In order to control for other factors outside this intervention, we propose the following:

- Comparison of baseline vaccination rates obtained from other recent QI interventions related to pneumococcal disease prevention conducted at UF
- Follow-up evaluation of students with confirmed risk factors seen at the University of Florida Student Health Care Center who filled their scripts (related to their high-risk disease or condition) elsewhere. These individuals will be surveyed and asked if they received counseling regarding the importance of vaccination and if so, did they receive the vaccination.
- Survey of ~300 UF pharmacy students at the 3 branch campuses (Jacksonville, Orlando, Tampa) who will not take part in the live webcast/enduring programs. These students at the branch campuses will serve as a control group for the 300 students at the Gainesville site participating in the live webcast and/or enduring activities.

#### Quantifying the amount of change in practice habits

The previous educational curriculum, *“Long-Term Prevention of Pneumococcal Disease in Adults: An Interprofessional Approach to Improving Patient Outcomes”*, was implemented in a similar manner to the proposed initiative and achieved an 11% increase in pneumococcal vaccination rates in the 65 years of age and older population, and a 43% increase in pneumococcal vaccination rates in the 19-64 years of age high-risk population. Thus, we predict the following increases in pneumococcal vaccination rates after implementation of the current intervention:

- 10% increase in the 65 years of age and older population
- 30% increase in the 19-64 years of age at high risk population

#### Determining target audience engagement

In order to encourage interaction and fully engage the audience, the live webcast will include the following features:

- **Ask the Faculty Q&A/Discussion Forum:** The live webcast will include an interactive question and answer (Q&A) session during which participants will have the opportunity to submit questions to the expert through a user-friendly interface (similar to an instant messaging feature), allowing real-time learner-faculty interaction. Following the live webcast, participants will maintain the ability to submit questions and/or challenging patient scenarios to the faculty.<sup>12</sup> A document listing the questions and answers from both the live and on-demand learners will be posted on the program's website, as well as emailed to all participants who have requested this information electronically.

The onDemand version of the webcast will feature an additional interactive component, a Discussion Forum designed to enable learners to interact and communicate with their fellow peers.<sup>13</sup> Message threads will delve into key points of interest about the scientific content. All learners will be able to access, read and post in the Discussion Forum, which will facilitate dialogue and further the educational impact of each activity.

- **Challenge Questions:** Research has shown that interactive continuing education, which requires some response from participants, yields the best outcomes in studies of physician knowledge and practice patterns.<sup>14</sup> Further, physicians are likely to respond to questions challenging their knowledge when they are posed within an activity.<sup>15</sup> Therefore, all presentations during the live webcast will include a series of Challenge Questions. Learners will be able to submit their answers via the web interface and see how their answers compare with those of their peers through an instant polling feature. The same Challenge Questions component will be built into the enduring webcast as well.

The live meetings will be interactive in nature and designed to engage the learner. The faculty member will come prepared to stimulate the discussion and the assembled learners will have the opportunity to discuss best practices and potential protocol updates within their specific practices.

Lastly, the PI/QI Initiative will utilize some informal and incidental small group meetings and gatherings led by the Practice Champions to coach the pharmacists and related practices through the performance improvement effort.

#### Disseminating project outcomes

The outcomes will be shared with all of the practices upon the conclusion of the initiative through practice specific presentations. It is our objective to disseminate the QI/PI methodology and outcomes gathered from this curriculum to the wider clinical and continuing education community via a multifaceted publication plan, including posting the results on the curriculum website, submission of an abstract to a professional education meeting, such as the Alliance for Continuing Education as well as submission to peer-reviewed journal. Examples of publications within the education community include but are not limited to: *CE Measure*, *Journal of Continuing Education in the Health Professions (JCEHP)*.

#### **Detailed Workplan and Deliverables Schedule**

The workplan for this initiative is outlined below. This multi-intervention, multi-technique, and multi-media approach to educating the target audience is designed to engage the learners when, where and how they learn. The roll out of each educational component and the timing of the deliverables support maximum reach and educational impact resulting in improved patient care. The steps of the curriculum are listed below.

	2013											
	Q1			Q2			Q3			Q4		
	January	February	March	April	May	June	July	August	September	October	November	December
Educational Briefing Call												
Course Director (CD) and Faculty Recruitment												
CD Planning Call												
Draft Content Outline												
CD to Review and Revise Content Outline												
Website and Publicity Build and Review												
Content Development, Draft Slides, Practice Tools												
CD Call to Discuss Draft Slides and Additional Materials												
Content Development and Revisions												
Internal Accuracy Review												
CD/Faculty Review												
CE Review/Accreditation												
Final Faculty Call												
Webcast (Live)												
Content Development for onDemand Activity												
CE Review/Accreditation												
Launch Announcement of Enduring Webcast/onDemand Activity												
Publicity Campaign for Enduring Webcast/onDemand Activity												
Invite Faculty for Live Meetings												
Confirm Dates/Locations (live meetings)												
Create and Finalize Publicity Pieces for Meetings												
Begin Publicity Campaign for Live Meetings												
Finalize Select Slides & Meeting Materials												
CE Review/Accreditation for Live Meetings												
Live Meetings												
Initial Assessment/Chart Review of Florida Sites by Director of Clinical Quality												
Kick Off Meeting at Practice Sites												
Tool Implementation and New Practices Put into Place												
Weekly Meetings Led by Practice Champions												
Conclusion of PI/QI Initiative and Reassessment of Charts												
Presentation of Outcomes to the Practices												
Review and Analyze Data from all 4 Components												
Compilation of Curriculum Outcomes												
Creation of Initiative/Outcomes Article & Submission for Publication												
Final Outcomes to Grantor												

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Publication No. 07-E006. Rockville, MD: Agency for Healthcare Research and Quality. January 2007.

11. Mazmanian PE, Davis DA, Galbraith R; American College of Chest Physicians Health and Science Policy Committee. Continuing medical education effect on clinical outcomes: effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. *Chest*. 2009;135(3 Suppl):49S-55S.
12. In a 2007 research study of 1,100 US professionals, 75% of physicians stated they were interested in the ability to interact with CME faculty in Internet-based CME, and 73% would want to receive a comprehensive, expertly-authored document with questions and answers from their peers.
13. The Discussion Forum is moderated and user posts will not be made live until verified as appropriate by the PVI editorial team.
14. Davis DA, O'Brien MA, Freemantle N, et al. Impact of formal continuing medical education. Do conferences, workshops, rounds, and other traditional continuing education activities change physician behavior or health care outcomes? *JAMA*. 1999;282:867-874.
15. In a December 2008 study, 592 physicians responded to a question asking their likelihood of responding to questions within a CME activity. 77% claim they are likely to do so (i.e., >5 response on a Likert scale of 1-7, with 7 being the most likely; mean score was 5.5).