



Improving Pneumococcal Immunization Rates in New Jersey through Collaboration  
A Requested Full Proposal in Support of Grant ID 458890  
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New Jersey Academy of Family Physicians  
224 West State Street  
Trenton, NJ 08608  
T: 609/394-1711  
F: 609/394-7712  
W: [www.njafp.org](http://www.njafp.org)

*\*Deadline requested and received, RE: Hurricane Sandy*

## C. Main Section

### 1. Overall Goal & Objectives

The overall goal for this initiative is to increase the number of adults in New Jersey (NJ) age 65 or older who receive pneumococcal vaccine, especially among Black, Hispanic and Asian residents, thereby improving health and well-being, while reducing healthcare costs through an reductions in avoidable hospitalization and emergency department visits. The **key objectives** of the program are to: 1) Increase adult pneumococcal immunizations by approximately 5% by implementing practice protocols to identify, address and overcome the physician and patient barriers contributing to low immunization rates; 2) Develop and expand activities across vaccine provider and healthcare settings (health departments, hospitals, specialists, pharmacists/ pharmacy, etc.) to foster communication and coordination of adult pneumococcal immunization by creating a patient-centered medical community; 3) Identify and implement interventions targeted to addressing and overcoming financial barriers related to adult pneumococcal vaccinations; 4) Disseminate learnings from the local (state) level to broader audiences through publications, presentations and the development of an on-line tool kit containing materials, resources and information to increase pneumococcal immunization rates.

### 2. Technical Approach

The New Jersey Academy of Family Physicians (NJAFP) is a medical specialty society representing family physicians in NJ. NJAFP will be responsible for developing and executing the educational and quality improvement (QI) programs, recruiting practices (both the intervention and control groups) for participation, identifying and securing project partners, and managing the daily logistics of the educational and performance improvement aspects of the project. NJAFP partners in this project include the NJ Regional Extension Center (NJ-REC) (Regional Extension Centers, or RECs were established and are funded by the U.S. Department of Health, Office of the National Coordinator to provide technical assistance to primary care providers to meaningfully use electronic health record systems), a leading NJ Health Plan, and an independent assessment company to perform an impartial assessment of the program.

#### a. Current Assessment of Need in the Target Area

The needs assessment was developed through examination of national, state, and county healthcare data, national and state QI data, literature reviews, personal conversations with NJ family physicians and a survey of family physicians regarding current pneumococcal immunizations procedures in their practice.

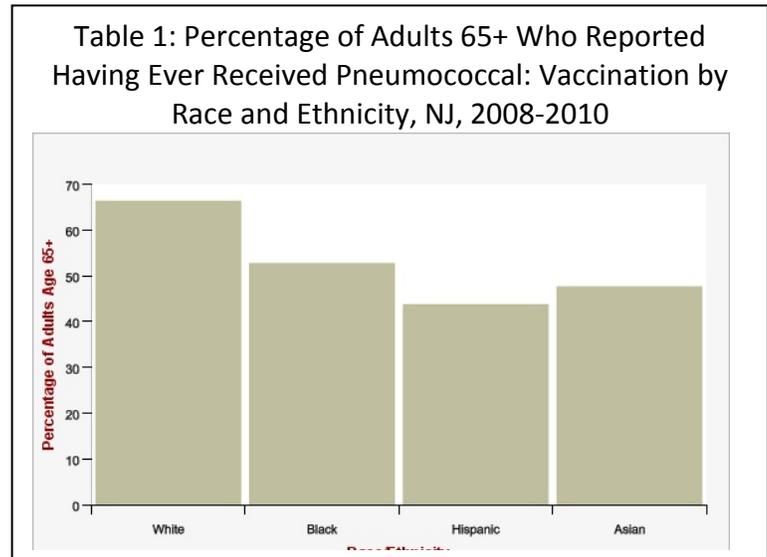
#### i. Quantitative Analysis

*Streptococcus pneumoniae* is a major cause of illness and death in the U.S. In 2010, *S. pneumoniae* was responsible for 39,750 cases of disease and 4,000 deaths.<sup>1</sup> The highest incidence of the disease was among children and elderly adults aged 65 or older.<sup>2</sup> Most incidences of pneumococcal disease occur in institutional settings and small, closed communities.<sup>3</sup> When outbreaks of *S. pneumoniae* occur the common theme is over-crowding, which facilitates the transmission of the organism to susceptible populations. Over the last

several years, the introduction of vaccines that address the most common serotypes for pneumococcal disease have resulted in a decrease in the incidence of the disease.<sup>4, 5</sup>

*NJ Department of Health Data on Pneumococcal Disease:* Even with the introduction of new vaccines, pneumococcal disease remains the tenth leading cause of death in NJ.<sup>6</sup> Overall, NJ's pneumococcal vaccination rates for adults 65 or older have significantly improved, rising from 55% in 1999 to 64% in 2010, achieving the *Healthy People NJ 2010* target. However, data show pneumococcal vaccination remains significantly lower among Blacks, Hispanics and Asians in the state compared to Whites (Table 1).<sup>7</sup>

An additional review of the literature revealed a substantial number of adults in NJ are not vaccinated against pneumococcal disease. AHRQ State Snapshots for NJ show one of the weakest quality measures for the state are the number of adults 65 or older who ever received a pneumococcal vaccine.<sup>8</sup> A comparison of 2010 national immunization rates by state, as reported by the Behavioral Risk Factor Surveillance System (BRFSS), shows NJ ranked as the fourth worst state in the U.S., with an immunization rate of 64.3% for adults 65 or older who ever received a pneumococcal vaccine.<sup>9</sup> NJ ranked as the tenth worst state in the U.S. for influenza and pneumonia deaths.<sup>10</sup>



*Risk for Pneumococcal Disease:* Socioeconomic conditions put adults at risk for acquiring pneumococcal disease. One explanation for this trend is low immunization rates among urban populations that live below the poverty level.<sup>11</sup> Burton et al. found that people were 4.4 times more likely to contract pneumonia when living in areas where 20% or more of the population lived in poverty as compared to those who lived in areas where only 5% of the population lived in poverty.<sup>12</sup>

NJ specific examples can be found in the quality measures for NJ hospitals. Three hospitals in Newark, Essex County (one of the poorest cities/counties in the state) have pneumonia mortality rates of 4.3, 4.1, and 3.6, while two hospitals in Monmouth County (one of the more prosperous counties) have pneumonia mortality rates of 0.7 and 2.5.<sup>13</sup> While available county health data does not specifically reflect pneumococcal disease or immunization rates, comparing collected health measure data between Essex County and Monmouth County, data show a greater number of the population is unemployed (11% vs. 8.6%), uninsured (19% vs. 12%), have a greater number of hospital stays (76 vs. 68), and have less access to social support (28% vs. 20%) in Essex county.<sup>14</sup> This data can be extrapolated to other counties in the state

with a lower socioeconomic standing to determine the risk to the population for pneumococcal disease and the importance of immunization.

*Disparities of Care:* A 2003 report published by the Institute of Medicine concluded that a large number of studies have shown serious disparities in health care and health outcomes among racial and ethnic minorities.<sup>15</sup> This is reflected in the great disparity in the immunization rates between Whites and minorities, as well as between minority groups. In 2010, vaccination rates for pneumococcal disease in adults were 64% for non-Hispanic Whites, compared with 46% for African Americans and 39% for Hispanics.<sup>16</sup> In addition, both Hispanic and Asian American adults over age 65 were less likely to have ever received a pneumococcal vaccine, as compared to non-Hispanic Whites of the same age group.

Based on the population of the state, closing immunization gaps represents an area of QI for NJ where, according to the 2010 Census, 54.4% of the population of Newark, NJ (Essex County) is African American. Other cities in Essex County with a high African American population include Irvington Township (85.4%) and East Orange (88.5%). NJ cities with the highest Hispanic population include Newark (33.8%), Patterson (Passaic, 57.6%) and Elizabeth (Union, 59.5%). The largest Asian populations reside in Palisades Park Borough (Bergen, 57.8%), Edison Township (Middlesex, 43.2%) and South Brunswick Township (Middlesex, 35.9%).<sup>17</sup>

*ACIP Recommendations for Prevention of Invasive Pneumococcal Disease:* In 2012 ACIP issued pneumococcal immunizations that adults aged 65 or older be immunization for invasive pneumococcal disease (IPD). Later ACIP recommendations recognized asthma as an independent risk factor for IPD and included it in the group of chronic pulmonary diseases (COPD and emphysema) for which the vaccine is indicated, and concluded any adult who smoked was at increased risk for IPD and recommended these persons be immunized too.<sup>18</sup> In 2012, ACIP updated the guidelines to include adults 19 years or older with immunocompromising conditions, functional or anatomic asplenia, CSF leaks, or cochlear implants.<sup>19</sup>

*What is: system barriers, physician barriers, patient barriers*

“Some of the reasons for low immunization rates in NJ include competing demands for other preventative health services, like mammography, discussing PSA, lab tests, colonoscopy and lack of time, patient reluctance to be vaccinated due to misinformation regarding side effects and efficacy, physician reluctance to administer vaccines because of a lack of knowledge of recommendations for immunization in high-risk groups, and anti-immunization attitudes among patients and, less commonly, physician or staff without pro-immunization beliefs.”

*Personal correspondence from Everett Schlam, MD, Assistant Director  
Mountainside Hospital Family Medicine Residency Program*

*System barriers:* Barriers in the structure of our health care system that contribute to the low immunization rates in adults include a lack of systems, such as vaccine registries and electronic health records (EHRs), to ensure adults receive the vaccines they need; lack of health care insurance or insurance that does not cover vaccines for adults; the high cost of vaccines; the

cumbersome Medicare process for reimbursement of vaccines and the fact that Medicare Part B does not cover all adult vaccines resulting in high out-of-pocket expenses for the patient.<sup>20</sup>

*Physician barriers:* Missed opportunities to immunize patients - Lu and Nuorti found among people aged ≥65 years who reported never receiving pneumococcal vaccine, 90.6% stated at least one missed opportunity to receive it.<sup>21</sup> Competing medical problems - 24% of primary care physicians surveyed felt the reason they do not immunize patients is the need to attend to other active medical problems.<sup>22</sup> Physicians do not recommend the vaccine to patients - In a 1996 survey of Medicare beneficiaries regarding why they did not receive the pneumococcal vaccine, 13.4% reported their doctor did not recommend it.<sup>23</sup> This finding was supported through a literature review conducted by Mieczkowskia and Wilson, who found a large number of patients did not recall receiving a recommendation for the pneumococcal vaccine.<sup>24</sup>

*Patient barriers:* Misinformation - Many adults are misinformed about the safety and efficacy of vaccines and so avoid immunizations. A survey conducted by the National Foundation on Infectious Diseases found that 35% of adults reported that they read or heard vaccines were not safe, 25% reported fear the vaccine would make them sick, and 14% felt that vaccines do not work.<sup>20</sup> Lack of recommendation: In a 2002 study of consumers, one reason cited as to why a person failed to receive a pneumococcal vaccine is because their physician did not recommend it.<sup>25</sup> Misunderstanding: In the same survey people reported they did not receive a vaccine because they felt that healthy people do not need them.<sup>25</sup> Lack of patient awareness: Morbidity and Mortality Weekly reported the results of a survey regarding the reasons why Medicare beneficiaries did not receive influenza and pneumococcal vaccines. The most common reason cited (57%) for not receiving pneumococcal vaccine was that the person did not know that they needed it.<sup>23</sup> More recent surveys have revealed that many adults were unaware that vaccines were available to protect them from diseases and the mistaken assumption that healthy people do not need to be immunized.<sup>20</sup>

*NJ Barriers:* NJ family physicians cited additional barriers to pneumococcal immunization as being confusion about what immunizations to give and when the appropriate time was to administer immunizations. They also stated that being able to educate their patients about vaccines would increase immunization rates in the state.<sup>26</sup> ***When queried about their interest to be involved in a QI project to increase pneumococcal immunization rates, more than 40 practices applied with intent to participate should the award be granted.*** Practices who were interested in participating in this submitted an early assessment indicating gaps in immunization for their patients 65 or older. ***Random assessment of the data showed more than half of the eligible patients in the physicians' population had not been immunized for pneumococcal disease.***<sup>26</sup>

*Immunizations and the Patient Centered Medical Home:* The Patient Centered Medical Home (PCMH) is a model of care coordinated by the primary care physician office, where healthcare professionals work as a team to provide care that is determined to meet each patient's specific need. This approach fosters an environment in which patients develop and maintain an ongoing relationship with their primary care physician and the healthcare team who focus on enhanced

care coordination, office-based disease management planning, and administration of prevention and wellness services through patient population management. As such, the practice becomes the patient's "home" for preventive, chronic, and ambulatory care.

Medical homes help patients navigate the confusing healthcare system by coordinating services among providers. This coordination reduces the focus on catastrophic care, results in more appropriate use of services, and reduces uninsured patients' reliance on hospitals and emergency departments for primary care. A goal of the PCMH model is for primary care practices to integrate care across all settings of the complex healthcare system. Savings are achieved through efficiencies, appropriate use of care, and elimination of duplication.

A report from the Commonwealth Fund found that a medical home can reduce or even eliminate racial and ethnic disparities in access and quality for insured persons.<sup>27</sup> ***When adults have a medical home their access to needed care, receipt of routine preventive screenings, and management of chronic conditions improve substantially.***<sup>27</sup> The Commonwealth Fund also reports that Denmark has organized its entire healthcare system around medical homes, achieving the highest patient satisfaction ratings in the world. Primary care physicians are highly accessible and supported by an outstanding information system that assists them in coordinating care. Among Western nations, Denmark has among the lowest per capita health expenditures and highest primary care rankings.<sup>28</sup>

Care delivered by PCMH primary care physicians is consistently associated with better outcomes, reduced mortality, fewer preventable hospital admissions, lower utilization, improved patient compliance, and lower Medicare costs. A research team from RAND and the University of California at Berkeley undertook a rigorous evaluation of care provided according to PCMH principles. For almost 4,000 patients with diabetes, congestive heart failure, asthma and depression, they found that: 1) Patients with diabetes had significant reductions in cardiovascular risk; 2) Congestive heart failure patients had 35% fewer hospital days; and 3) Asthma and diabetes patients were more likely to receive appropriate therapy.<sup>29</sup>

NJAFP has been providing education and training to assist practices to become recognized by nationally by NCQA, a Washington DC-based non-profit QI organization, as a PCMH practice since 2009. To date, NJAFP has worked with more than 500 physicians at more than 250 practice sites. Practices that achieved NCQA PCMH recognition worked with NJAFP to demonstrate their ability to provide patient centric, team-based care.

***Shared decision making:*** The patient is the most important person in the healthcare team. Until the patient accepts responsibility for self-management repeated educational efforts become a source of frustration for the patient and healthcare team.<sup>30</sup> Helping patients understand how to maintain good health is the first step in improving outcomes. Research has shown that patients who understand their treatment regimens experience less anxiety, are more satisfied with treatment, have a higher rate of compliance, and experience better outcomes.<sup>31</sup>

Shared decision aids are a method of helping the physician and the patient work through all the options available for a clinical issue. O'Connor, et al. stated that "decision aids are interventions designed to help people make specific and deliberative choices among options (including status quo) by providing (at a minimum) information on the options and outcomes relevant to a person's health status."<sup>32</sup> The most recent update to O'Connor et. al., found that, for physicians, the use of decision aids resulted in greater knowledge, lower decisional conflict related to feeling uninformed, and lower decisional conflict related to feeling unclear about personal values. For patients, decision aids were found to reduce the proportion of people who were passive in decision-making, and reduced the proportion of people who remained undecided post-intervention.<sup>33</sup>

NJ is one of the most diverse states in the U.S., with a large immigrant population, and ranks 6<sup>th</sup> in the country of people "who speak English less than very well."<sup>34</sup> Given the great diversity of the population, creating simple shared decision aids regarding the importance of pneumococcal immunization that the entire healthcare team can use with patients will be a goal of this program.

#### ii. Primary Target Audiences and Benefits from Project Outcomes

The entire primary care team (physicians, nurses, care coordinators, etc.) are the target audience for this project. Additional audiences targeted include specialists (cardiologist, pulmonologists, endocrinologists) and community partners (local health departments, home care organizations, hospitals, and local pharmacies/pharmacists).

There are several audiences who will directly utilize and benefit from the project and its outcomes. First, patients will receive better care through increased immunizations, mitigating pneumococcal disease and pneumococcal complications. Second, the community will benefit through increased herd immunity, improved community health, and potential reduction of healthcare costs due to avoidable hospitalizations and emergency department use. Third, physicians, multi-disciplinary team members, health plans, health systems and community partners will be positively affected by increasing pneumococcal immunizations through enhanced communications, and more efficient and effective use of resources. Communication and coordination of immunizations will result in primary care staff spending less time and resources to determine patients' immunization status and outreaching to already immunized patients, as well as reduce duplication of immunizations. Practice staff will benefit through the anticipated increase in utilization of standing orders to administer and increase pneumococcal immunization. Fourth, the overall health system will directly benefit from project outcomes through a reduction in costly hospital admissions and emergency department visits. A study published in *Virology Journal* indicated that immunization of the elderly was linked to a decrease in hospital admissions and a decrease in the length of stay.<sup>35</sup>

#### **b. Intervention Design and Methods**

The project is modeled after the Institute for Healthcare Improvement (IHI) Breakthrough Series model.<sup>36</sup> The Breakthrough Series is a collaborative model that assists providers to engage in rapid cycle QI changes within their practice. The structure of the model provides

extensive opportunities for practices to learn how to make identified improvements in practice from topic experts in specific fields, while learning from each other, resulting in project outcomes that close the gap between what is done and what is known.

The model uses a short-term learning time frame, approximately six to 15 months, during which all practice teams come together three times for learning sessions. Learning sessions are typically attended by three practice team members. These team members then go back to the practice, and during the action period (action period is the time between learning sessions) work with the entire staff to introduce the intended changes through rapid plan-do-study-act (PDSA) cycles, to foster the generation of the intended outcomes. Teams working with IHI on the Breakthrough Series Collaborative model have documented successful outcomes including “reducing waiting times by 50 %, reducing worker absenteeism by 25%, reducing ICU costs by 25%, and reducing hospitalizations for patients with congestive heart failure by 50%.”<sup>34</sup>

The proposed project will work with practices to implement a three-step model of education, prompts and patient education. Several studies foster this intervention strategy including Redfield and Wang, who documented an increase in pneumococcal vaccination rates for persons aged 65 or older from 56.7% prior to interventions to 75.8% after interventions.<sup>36</sup> In addition, *Morbidity and Mortality Weekly Report* stated that multiple interventions had the most success in increasing pneumococcal immunization rates among patients who were <65 years of age and considered high risk.<sup>37</sup>

*Practice Participant Selection:* NJAFP will recruit approximately 20 - 30 NCQA recognized Patient-Centered Medical Home (PCMH) practices with electronic health record (EHR) systems for this program. Recruitment will be based on the number of patients in the practice who are age 65 or older and are located in areas with a high minority population or in counties with a large number of adults aged 65 or older. Recruitment of smaller practices will be a priority for this project. NJAFP has developed a comprehensive recruitment strategy including target practice lists and communications materials that describe the project, roles and responsibilities, and anticipated time frames for activities. Interested practices will complete a short application form for NJAFP review, which includes key information about the practice. Those practices selected to participate will be divided into an **Intervention Group** and a **Control Group**. Both groups will complete a Letter of Participation that will be signed by the lead physician indicating and acknowledging the practice’s commitment of time and resources for the project.

*Panel Meeting:* NJAFP will convene a panel of experts to assist in the development of the educational materials and the deployment strategy for this project. The panel will include physicians, practice team members, QI experts, and community partners, who may include, but not be limited to, local department of health officers, pharmacists, and others involved in immunization efforts. Project partners, who include health plan representatives and the NJ Regional Extension Center (NJ-REC), will also participate in the development and deployment of project activities. In addition, panel members may also serve as faculty members for the educational sessions during the project.

*Intervention Group Activities:* A major focus of PCMH practices is use of a multi-disciplinary care team responsible for care coordination and communication across settings and specialties. Intervention initiatives, therefore, will focus on expanding the walls of the PCMH practice to begin to build a PCMH community focused on increasing pneumococcal immunization rates.

Building a PCMH community will begin with learning collaboratives comprised of the healthcare team and identified community partners. Learning collaboratives come together in a series of learning sessions and action periods designed to facilitate increased immunization rates by addressing known patient, physician, and system barriers to immunization. There will be a series of three learning sessions and three action periods. The first session will be primarily NJAFP staff and experts providing the content, working towards the final session where the practice teams and community partners will conduct presentations to foster sharing and spreading of best practices and lessons learned.

*First Learning Session and Action Period:* The first learning session will provide education on pneumococcal disease, the need to increase immunization rates, discussion of best practices to increase immunization rates, data collection and monitoring, strategies for motivational interviewing to assess and overcome patient barriers, and identification of the most appropriate community partners to work in collaboration with the practice. During the learning sessions, practice teams will receive change packets (a change packet outlines best practice interventions that can be implemented to initiate desired outcomes. The packet provides access to evidence-based (EB) knowledge of proven tactics and methods to drive change) and develop an improvement plan to take back to the practice for implementation during the action period of the project. To assist with development and initiation of the improvement plan, practices will also receive education regarding the Plan-Do-Study-Act (PDSA) cycle for change. This change model provides an opportunity for practices to follow four steps to bring about the desired change. In the Plan Stage the practice will work to develop the aims or goals of the intervention and the necessary processes that are needed to drive the desired results. In the Do Stage, the practice team will deploy the plan and collect data to review in the next phase, the Study Stage. During this stage, the practice team will review the data and determine if change is happening, and if the change will bring about the desired outcomes. In the next stage, the Act Stage, the practice will use the data from the Study Stage to either make corrective actions or continue on course to achieve the desired results. ***This session will address healthcare provider and patient barriers and meet key objectives # 1, #2 (identified in Goal and Objective Section).***

In addition, during this session, practices will begin to identify community partners that will be invited with the practice team to the Second Learning Session. NJAFP staff will conduct site visits during the action period to ensure the plan is put into action, assess barriers and challenges encountered, and assist the practice in implementing interventions to increase immunization rates. NJAFP will provide the practice with communication materials that they can use to engage local partners in immunization efforts, as well as be used to invite these partners to future learning sessions.

Second Learning Session and Action Period: During Learning Session 2 attendees will expand to include local partners for each practice, which may include local health departments, hospitals, specialists, pharmacies/pharmacists (many of whom provide immunizations) and others. During these sessions specific focus will be on communications, partnerships, and expectations to build a community focused on increasing pneumococcal immunizations, and the documentation and reporting of immunization among the local community partners. Communication and coordination across settings and specialties will also be addressed; specifically introduction of compacts between primary care, specialists and community partners. Compacts outline roles and responsibilities for primary care and the coordinating specialists or community partner, as well as communicate expectations and more. Specifically, compacts detail how the primary care practice and the specialist or community partner will work together to coordinate care and services, improve patient outcomes, and communicate and access key patient information.

In addition, best practices to mitigate financial barriers to immunization will be discussed. Presentations will be provided by our partner, the NJ-REC, which will assist practices in using registries records and reporting of immunization data. Recording and reporting immunization data positively positions practices for participation in quality incentive programs, both locally and nationally, which can assist in mitigating financial barriers associated with immunizations. NJAFP staff will conduct site visits during the action period to ensure the plan is put into action, assess barriers and challenges encountered, and assist the practice in implementing interventions to increase immunization rates. ***This session will address system, coordination, and economic barriers, and meet key objectives # 1, #2, #3 (Goal and Objective Section).***

Third Learning Session and Action Period: The final Learning Session will focus on sharing and spreading best practices and lessons learned and sustaining new community relationships. The majority of the presentations will be from practice teams; sharing what worked, what did not, successes, materials, resources and continuing forward. Additional presentations will focus on information gathered by NJAFP staff during the Action Periods that can be of benefit to the participating practices as each strives to sustain changes made within the practice to increase immunization rates; topics may include physician leadership, team-based care, partnerships, communications, use of data to drive change, and developing and implementing action plans and strategies. Practices and community partners will attend this meeting. ***This session will address overcoming physician, patient, system, coordination, and economic barriers.***

Control Group Activities: A Control Group will be identified to assist in measuring and assessing project activities' impact upon increasing immunization rates. Practices that are participating in the Control Group will submit data at the beginning and end of project activities, which will be compared to data collected from the Intervention Group.

Tool Kit: NJAFP will develop a tool kit of best practices and make it available on the NJAFP website to increase the scope impact to practices not able to participate, thereby encouraging and fostering increasing pneumococcal immunization rates beyond initial project activities. This tool kit will include change packets, QI plan templates and instructions for use, PDSA education and resources, suggested community partners and templates to engage community partners in

immunization efforts, data collection instruction and resources, contact information, sample compacts, and other materials used during project activities. ***This activity will address physician, patient, system, coordination, and economic barriers, and meet key objectives # 1, #2, #3, #4 (Goal and Objective Section).***

### **c. Evaluation Design**

#### **i. Metrics, Data, Design, and Analysis**

*Independent Quantitative Review:* NJAFP will collaborate with CE Outcomes, LLC, to determine the impact of the educational program on physician performance and patient health. The evaluation of the educational program is designed to assess the impact of the education and practice improvement with regard to increasing the percentage of adults age 65 or older in NJ who received pneumococcal vaccine, with special focus on Black, Hispanic and Asian adults. Our framework for the assessment of learning, based on Moore's 7 levels of CME outcomes measurement is Level 5, Performance, and Level 6, Patient Health.<sup>38</sup> Specifically, it is proposed that NJAFP and CE Outcomes will assess outcomes of the educational initiative by: 1) evaluating physician knowledge, skills, perceptions, and barriers related to pneumococcal immunization for patients age 65 or older for those who participated in the educational program as compared to those physicians who did not participate in the education; and 2) examining the rates of pneumococcal vaccination in adults age 65 or older prior to the education as well as following the education among the sample of NCQA-recognized PCMH practices who were exposed to the education as well as among a control group of PCMH practices who did not receive the education. This two-phase approach allows for the demonstration of educational impact on physician knowledge and performance as well as the impact of the education on increasing pneumococcal immunization rates in practice.

*Overall Design:* Based on the educational model that NJAFP has proposed, each participating practice will be assigned as matched pairs, either as a participant in the intervention group or the control group, based on a pre-determined set of criteria developed through the needs assessment. The intervention group will include 10-15 practices and the control group will also include 10-15 practices. The control group will also allow for an examination of the impact of environmental factors introduced during the project period.

*Physician Performance Impact:* NJAFP and CE Outcomes propose to assess the impact of the educational program on physician performance through the use of a survey containing patient case vignette(s) and associated questions, based on the educational objectives and content of the CME program. Case vignettes have gained considerable support for their value in predicting physician practice patterns. Results from recent research demonstrate that case vignettes (compared to chart review and standardized patients) are a valid and comprehensive method to measure processes of care in actual clinical practice.<sup>39, 40</sup> Furthermore, case vignettes are more cost-effective and less invasive than other means of measurement. In addition to clinical cases and questions, items will be designed to assess attitudes, perceptions, and barriers to pneumococcal vaccination in patients age 65 or over. The case vignette survey will be fielded to the participants of the educational program following completion of the program, and the same instrument will be fielded to the control group during the same time

period. The control clinician sample will serve as a peer comparison group to identify statistically significant differences in knowledge and EB application of skills within clinical practice decision-making. The physicians that respond to the survey will receive an honorarium for their time and input.

Responses to the measurement surveys will be collected and analyzed to identify differences between intervention and control groups and any level of statistical significance of such differences ( $\alpha < 0.1$ ). Additionally, CE Outcomes will calculate an effect size score, which is used to assess the summary impact of an educational activity on participant practice choices, knowledge and attitudes in a single reportable measure. Physicians will be recruited 30 days or more following commencement of participation in the applicable educational activities.

*Patient Health Impact:* NJAFP and CE Outcomes propose to assess the impact of the educational program on patient health by assessing the rate of pneumococcal immunization among adults age 65 or older based on data extracted from the HER of a sample of practices within the state of NJ before and after the educational intervention.

At the initiation of the project and prior to the implementation of the educational program, NJAFP will request that each practice pull a specific set of data from their EHR system that will allow for quantification of the number of patients seen during a specific time period who are 65 years or older and who should have been provided the pneumococcal vaccine, based on the inclusion criteria defined for the study. The time frame for the data pull will consist of a period of three months and is planned to assess immunizations provided between October and December 2012. Each practice will be given a worksheet, which NJAFP and CE Outcomes will design that requests specific data information to assess the percentage of patients receiving pneumococcal vaccination out of the total number of eligible patients seen, as well as control for case mix (e.g., patient characteristics that may independently influence the decision to vaccinate). NJAFP will coordinate the distribution and collection of the data from each practice in collaboration with NJAFP's partner, the NJ-REC. The Intervention and control group practices will both collect data, so comparisons can be made. ***The Meaningful Use measure, Pneumonia Vaccination Status for Older Adults will be used as the metric. This provides data regarding the percentage of patients 65 years of age or older who have ever received a pneumococcal vaccine (this measure is endorsed by NQF as measure 0043 and CMS PQRI 111).***

The same data will be requested from all practices following completion of the education, which will consist of a second three-month time period in the following calendar year (currently planned for October through December 2014). The selection of two matched time frames will allow for alignment of the assessment time frame from year to year. The two points of assessment, including data collected prior to and, separately, following the education, with data collected through the use of one standardized data tool will enable comparative analysis to evaluate the impact of the program on rates of pneumococcal immunization. The data will be compiled by CE Outcomes to compare the pre-education phase relative to the data gathered in the post-education phase for the practices that received the educational intervention. In

addition, the participant data will be compared to that collected from the control practices data to examine the impact of the education relative to program goals.

CE Outcomes submits all research protocols related to patient health studies for approval to the Western Institutional Review Board (WIRB), prior to the start of the study. Though patient identifiable information will not be collected, for the purposes of ensuring research that may yield results appropriate for dissemination, we will request a waiver of exemption from full WIRB review. The Board is required to review all protocols that include patients, and Board approval or exemption is required before initiation of any patient study.

CE Outcomes, LLC will analyze the assessment results and compare the rates of pneumococcal immunization in patients age 65 or older between the intervention and control practices. Parametric and nonparametric statistical analyses will be performed. Possible statistical tests include matched paired T-test, Chi-squared analysis, Cohn's D effect size, or linear regression depending on the outcome measure used. These tests will allow for the control of independent variables and the assessment of the influence of the intervention on vaccination rates.

Report data will be furnished on an aggregate level to maintain confidentiality of the healthcare professionals and practices participating in the research. CE Outcomes and NJAFP will provide a final written report with data, analysis and findings from both the performance-level assessment and patient health impact assessment.

NJAFP Qualitative Assessment: Practices will be provided a qualitative survey pre- and post-intervention to assess the extent to which the practice has advanced from a patient-centered practice, to a patient-centered community. This survey will also be given to the control group practices for comparison. The qualitative survey will assess the practice's engagement and relationships with external partners. The analysis of these data will provide an assessment regarding the practice's involvement with immunization coordination activities prior to intervention and after project completion. The survey will also assess the practice's communications with external partners (specialists, health departments, home care, hospitals, and pharmacists) pre-and post-intervention. NJAFP staff will also validate survey responses via on-site visits and review of communication documentation provided by the practice. This is a critical aspect of PCMH activities, and NJAFP has reviewed and assessed practice documentation related to communications and coordination of care for more than 250 practices and 500 physicians, locally and nationally.

#### ii. Amount of Change Expected From This Intervention

As part of the QI learning sessions practices will establish practice goals. A 5-10% increase in immunization rates will be the target for the intervention group. In addition, there is expectation that improvement in the qualitative survey will also result: intervention practices that indicate "no to little involvement or engagement with community partners" will increase to "some or moderate involvement with community partners," and intervention practices that indicate "no to little communication with community partners" will increase to "consistent communications with community partners" at the conclusion of the project. This survey will use

a Likert scale, and therefore an analysis can be made to determine practice “progression” regarding coordination of immunization services and communications with external partners.

### iii. Target Audience Engagement

A comprehensive plan has been developed to determine target audience engagement in the intervention. This comprehensive plan outlines all project tasks, time frames and goals, and is used as an internal quality control document. In addition, measures will be developed and deployed to monitor and evaluate project activities and all training sessions. These measures serve as criteria to determine what constitutes active physician/practice project involvement. Criteria will include proxy measures that will alert NJAFP staff to potential issues. NJAFP will collect this qualitative and quantitative data via learning sessions (attendance, surveys), and site visits to the practices (observations, QI plan assessments). NJAFP will contact and communicate concerns to practices, indicating the physician/practice’s project participation status is in jeopardy. NJAFP will work with the practice to assist in overcoming project participation barriers, if possible. If, after issuing the warning, and based on developed criteria, it is determined that a physician/practice is not actively participating or engaged in the project, this practice shall be removed from the project, and will therefore, forfeit any potential stipend payments. This monitoring and evaluation strategy will assist NJAFP project staff in identifying what is working, what is not, and if and when adjustments are needed to ensure successful project implementation. In addition, barriers encountered and project successes achieved will also be documented.

### iv. Dissemination of Outcomes

Project outcomes will be broadly disseminated through:

*Live Meetings:* Each year NJAFP conducts a scientific assembly attended by approximately 250 family physicians, medical residents, medical students and other healthcare team members. A presentation of best practices learned during project will be offered to disseminate project outcomes on a statewide scale. The 2014 assembly will include a poster session outlining the project and the accomplishments to date. The 2015 assembly will host a live session presenting the program in detail, the results, and the learned best practices.

*Publications:* NJAFP publishes and distributes *Perspectives: A View of Family Medicine in NJ*, a quarterly, peer-reviewed, continuing medical education journal to close to 2000 family physicians, medical residents, medical students and other key stakeholders both in NJ and nationally. NJAFP will write and publish articles in this journal to disseminate project progress and outcomes beyond participating practices. NJAFP will also offer these articles to other state chapters for inclusion in their journals.

Based on the study results NJAFP, in collaboration with CE Outcomes, will develop a manuscript for submission for publication to an educational or clinical journal. The use of validated, rigorous, scientific assessment methodologies is critical to the submission of manuscripts to peer-reviewed publications. Journals under consideration for submission are *Journal of Continuing Education in the Health Professions* and *Preventing Chronic Disease*, a peer-reviewed

electronic journal published by the Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion.

*Mass Communications:* NJAFP will foster wide-spread dissemination of project outcomes through the use of our website, electronic newsletter, and presentation opportunities and poster sessions. The development of a toolkit, contents of which are described above, that includes successful project interventions will be posted on our website to facilitate broad dissemination of project outcomes. These additional mediums will expand knowledge of project outcomes to a larger audience, including statewide, regional and national audiences.

### **3. Detailed Workplan and Deliverables Schedule**

*Pre-Project Readiness Activities:* To demonstrate NJAFP's capabilities and practices' willingness and eagerness to participate in project, NJAFP disseminated inquiries to PCMH practices throughout NJ. The inquiry explained the project and asked interested practices to sign a Letter of Intent indicating interest and commitment to participate in the project (should NJAFP be awarded the grant), as well as requested submission of relevant practice data, including PCMH recognition status, use of EHR systems, and current vaccination rates for patients in the practice. To date, NJAFP has received Letters of Intent from 49 practices. This pre-work maximizes project time frames, NJAFP resources and Commercial Interest funding, as NJAFP will be able to hit-the-ground running upon project award, having completed much resource-intensive practice recruitment work prior to contract award and engagement.

*Project Initiation Activities:* At the start of the project the NJAFP project team will meet with the Faculty Panel to finalize project activities and begin to deploy activities. This will include, but not be limited to final practice selection, assignment of intervention and control groups, practice notification, meeting logistics, agenda and faculty for first learning session, and finalization of baseline assessment tools. In addition, the project team and chosen faculty will design the educational materials for the first learning session, leveraging already existing content (i.e. materials created under previous immunization grants) and creating new content where necessary. Through on-going team meetings, future learning sessions will be developed, project activities reviewed, budget tracked and overall scope of work monitored.

*Baseline Assessments:* The project team will work with CE Outcomes to conduct a baseline assessment of selected intervention and control practices from January - April 2013. It is anticipated data will be collected from October - December 2012.

*Learning Session and Action Period 1 (June - October 2013):* The NJAFP Team will coordinate Learning Session 1 for physicians and other healthcare office staff. This session provides important information regarding project activities, change packets, goal setting, intervention selections, review of clinical and quality measures related to pneumococcal disease and immunizations and identification of external community partners for each practice. This session will be presented by expert faculty. Development of QI plans, rapid cycle improvement and other topics will be presented. During the Action Period (which begins after the conclusion of

Learning Session 1) the NJAFP team communicates with and visits the practice to assist with intervention selection, population care management and other project activities.

*Learning Session and Action Period 2 (November 2013 - February 2014):* Learning Session 2 builds on the previous session and action period. This session and will be attended by the same individuals, in addition to the community partners identified by each practice during Learning Session 1. During this session attendees will discuss their intervention and progress. Expert faculty will be present to offer direction and guidance as plans unfold. Communication and care coordination across settings and specialties will be a key topic of discussion. In addition, practices will discuss challenges, lessons learned and successes to foster sharing among project participants. Action Period 2 will begin in December of 2013. The NJAFP team will communicate and assist practices during site visits regarding intervention selection, population care management, communication, coordination and other project activities.

*Learning Session and Action Period 3 (March - December 2014):* Learning Session 3 builds on the first two learning sessions. This session is driven by and focused on broad dissemination of practice learnings. Each practice will present successes, challenges, and best practices to date. Expert faculty will be present to offer comment and feedback. Topics to assist the practice in sustaining changes made will be provided including leadership, communications, use of data, and strategic planning. The NJAFP team communicates and assists practices in the office setting in completing their interventions and ensuring QI processes are embedded into the practice's culture of transformation. In addition, NJAFP team members will assist the practices in ensuring sustainability of pneumococcal vaccination QI efforts through on-going generation of physician, provider, and staff feedback reporting.

*Re-measurement (Post-Intervention) Assessments:* NJAFP and CE Outcomes will conduct re-measurement assessment of selected intervention and control practices beginning in February 2015. It is anticipated that re-measurement data will be from October - December 2014. In addition, the qualitative survey to assess communication and coordination with external partners will be completed by both the intervention and the control practices.

*Develop Intervention Tool Kit and Post on Website:* The NJAFP team will work with CE Outcomes to identify successes and lessons learned and compile a tool kit of interventions to be posted to the NJAFP Website. The NJAFP team will also promote availability of the tool kit via publications, live meetings, and other communication sources.

*Compile Data, Final Report and Write Article for Professional Journal Publications:* The NJAFP team and CE Outcomes will compile data from the project activities into final report for submission to the funder, as well as for publication.

*AAFP prescribed credit:* Learning sessions will be accredited for AAFP Prescribed credit, which is accepted by the American Medical Association as equivalent to AMA PRA Category 1 Credit™ toward the AMA Physician's Recognition Award, therefore any member of the learning team whose organization accepts AMA Category 1 Credit will be able to receive credit.

## Deliverables Schedule

Below are proposed activities, time frames, and correlation to the budget. It is important to note the information below is an at-a-glance outline, which serves as an estimate for overall project implementation, with a focus on high-level milestones and time frames.

Milestone	Key Tasks To Complete Milestone	Dates	Budget Item
<b>Project Initiation Activities</b>	<p>Faculty</p> <ul style="list-style-type: none"> <li>• Identification, recruitment, confirmation</li> </ul> <p>Faculty Meeting</p> <ul style="list-style-type: none"> <li>• NJAFP, partners, and faculty attend</li> <li>• Discuss/finalize goals and objectives, tactics and strategies, evaluation measures, criteria, tools</li> <li>• Development of content for Learning Sessions                             <ul style="list-style-type: none"> <li>○ Agendas, change packages, identification of presenters (if needed), confirm presenters</li> </ul> </li> </ul> <p>NJAFP Team Meetings</p> <ul style="list-style-type: none"> <li>• NJAFP and partners</li> <li>• Finalize recruitment of practices</li> <li>• Finalize measurement tools</li> <li>• Finalize intervention and control groups</li> <li>• Prepare Learning Session logistical information</li> <li>• Develop and produce materials from Faculty Meeting</li> <li>• Begin process to apply for CME credits from AAFP</li> <li>• Disseminate project information to selected practices</li> <li>• Monitoring overall project plan (scope of work, time frames and budget)</li> </ul> <p>CE Outcomes</p> <ul style="list-style-type: none"> <li>• Study design</li> </ul> <p>Practices</p> <ul style="list-style-type: none"> <li>• Confirm participation</li> </ul>	1/2013 to 3/2013	A, B

Milestone	Key Tasks To Complete Milestone	Dates	Budget Item
	<ul style="list-style-type: none"> <li>• Identify physician and practice staff champion</li> <li>• Prepare for data submission and upcoming learning sessions</li> </ul>		
<b>Complete Baseline Assessment</b>	<p>NJAFP Team Meetings</p> <ul style="list-style-type: none"> <li>• NJAFP and partners</li> <li>• Conduct baseline assessments (qualitative and quantitative)</li> <li>• Finalize Learning Session logistics</li> <li>• Monitoring overall project plan (scope of work, time frames and budget)</li> </ul> <p>CE Outcomes</p> <ul style="list-style-type: none"> <li>• Data collection and assessment</li> <li>• Prepare aggregate analysis at Learning Session 1</li> </ul> <p>Practices</p> <ul style="list-style-type: none"> <li>• Confirm participation</li> <li>• Identify physician and practice staff champion</li> <li>• Complete baseline assessments (qualitative and quantitative)</li> <li>• Prepare for upcoming learning sessions</li> </ul>	4/2013 to 5/2013	B
<b>Deploy Learning Session 1</b>	<p>NJAFP Team Meetings</p> <ul style="list-style-type: none"> <li>• NJAFP and partners</li> <li>• Review results of baseline assessments (qualitative and quantitative)</li> <li>• Monitoring overall project plan (scope of work, time frames and budget)</li> </ul> <p>NJAFP Team</p> <ul style="list-style-type: none"> <li>• Finalize and produce materials for Learning Session</li> <li>• Deploy Learning Session</li> </ul> <p>Practices</p> <ul style="list-style-type: none"> <li>• Attend Learning Session</li> </ul>	6/2013 To 7/2013	C

Milestone	Key Tasks To Complete Milestone	Dates	Budget Item
	<ul style="list-style-type: none"> <li>• Develop quality improvement action plan</li> <li>• Identify potential community partners</li> </ul>		
<b>Action Period 1</b>	<p>NJAFP Team Meetings</p> <ul style="list-style-type: none"> <li>• NJAFP and partners</li> <li>• Monitor engagement of practices in all project activities</li> <li>• Monitoring overall project plan (scope of work, time frames and budget)</li> <li>• Plan/finalize content for Learning Session 2               <ul style="list-style-type: none"> <li>○ Agendas, resources, identification or practice presenters, other presenters (if needed), confirm presenters</li> </ul> </li> </ul> <p>NJAFP Team</p> <ul style="list-style-type: none"> <li>• Schedule and conduct site visits to practices</li> <li>• Develop and provide materials to practices to use to recruit and invite community partners to Learning Session 2</li> <li>• Report and monitor practice activities</li> <li>• Assist practices as needed on-site and virtual (e-mail, conference call, WebEx)</li> </ul> <p>Practices</p> <ul style="list-style-type: none"> <li>• Implement quality improvement action plan</li> <li>• Conduct PDSA cycles</li> <li>• Meet with NJAFP team</li> <li>• Contact NJAFP team, as needed, for additional assistance</li> <li>• Invite community partners to Learning Session 2</li> </ul>	8/2013 to 10/2013	D
<b>Deploy Learning Session 2</b>	<p>NJAFP Team Meetings</p> <ul style="list-style-type: none"> <li>• NJAFP and partners</li> <li>• Review activities to date and progress to date</li> <li>• Provide assistance in overcoming identified barriers</li> </ul>	11/2013	C

Milestone	Key Tasks To Complete Milestone	Dates	Budget Item
	<ul style="list-style-type: none"> <li>• Identify and share successes and lessons learned to date</li> <li>• Monitoring overall project plan (scope of work, time frames and budget)</li> </ul> <p>NJAFP Team</p> <ul style="list-style-type: none"> <li>• Deploy Learning Session</li> </ul> <p>Practices</p> <ul style="list-style-type: none"> <li>• Attend Learning Session with community partners</li> <li>• Conduct presentations to share lessons learned to date</li> </ul>		
<b>Action Period 2</b>	<p>NJAFP Team Meetings</p> <ul style="list-style-type: none"> <li>• NJAFP and partners</li> <li>• Monitor engagement of practices in all project activities</li> <li>• Monitoring overall project plan (scope of work, time frames and budget)</li> <li>• Plan/finalize content for Learning Session 3 <ul style="list-style-type: none"> <li>○ Agendas, resources, identification or practice presenters, other presenters (if needed), confirm presenters</li> </ul> </li> </ul> <p>NJAFP Team</p> <ul style="list-style-type: none"> <li>• Schedule and conduct site visits to practices</li> <li>• Develop and provide materials to practices, if needed</li> <li>• Report and monitor practice activities</li> <li>• Assist practices as needed on-site and virtual (e-mail, conference call, WebEx)</li> </ul> <p>Practices</p> <ul style="list-style-type: none"> <li>• Re-work, if needed, continue implementing quality improvement action plan</li> <li>• Conduct PDSA cycles</li> <li>• Meet with NJAFP team</li> <li>• Contact NJAFP team, as needed, for additional assistance</li> </ul>	12/2013 to 4/2014	D

Milestone	Key Tasks To Complete Milestone	Dates	Budget Item
	<ul style="list-style-type: none"> <li>Implement activities with community partners</li> </ul>		
<b>Deploy Learning Session 3</b>	<p>NJAFP Team Meetings</p> <ul style="list-style-type: none"> <li>NJAFP and partners</li> <li>Review activities to date and progress to date</li> <li>Provide assistance in overcoming identified barriers</li> <li>Identify and share successes and lessons learned to date</li> <li>Monitoring overall project plan (scope of work, time frames and budget)</li> </ul> <p>NJAFP Team</p> <ul style="list-style-type: none"> <li>Deploy Learning Session</li> </ul> <p>Practices</p> <ul style="list-style-type: none"> <li>Attend Learning Session with community partners</li> <li>Conduct presentations to share successes and lessons learned to date</li> </ul>	5/2014	C
<b>Action Period 3</b>	<p>NJAFP Team Meetings</p> <ul style="list-style-type: none"> <li>NJAFP and partners</li> <li>Monitor engagement of practices in all project activities</li> <li>Monitoring overall project plan (scope of work, time frames and budget)</li> </ul> <p>NJAFP Team</p> <ul style="list-style-type: none"> <li>Schedule and conduct site visits to practices</li> <li>Develop and provide materials to practices, if needed</li> <li>Report and monitor practice activities</li> <li>Assist practices as needed on-site and virtual (e-mail, conference call, WebEx)</li> <li>Prepare and display poster presentation at NJAFP 2014 Annual Scientific Assembly</li> </ul> <p>Practices</p> <ul style="list-style-type: none"> <li>Re-work, if needed, continue implementing quality improvement action plan</li> </ul>	6/2014 to 12/2014	D

Milestone	Key Tasks To Complete Milestone	Dates	Budget Item
	<ul style="list-style-type: none"> <li>• Conduct PDSA cycles</li> <li>• Meet with NJAFP team</li> <li>• Contact NJAFP team, as needed, for additional assistance</li> <li>• Implement activities with community partners</li> </ul>		
<b>Re-measure (Post-Intervention) Assessments</b>	<p>NJAFP Team Meetings</p> <ul style="list-style-type: none"> <li>• NJAFP and partners</li> <li>• Conduct re-measurement assessments (qualitative and quantitative)</li> <li>• Monitor overall project plan (scope of work, time frames and budget)</li> </ul> <p>CE Outcomes</p> <ul style="list-style-type: none"> <li>• Data collection and assessment</li> <li>• Prepare aggregate analysis</li> </ul> <p>Practices</p> <ul style="list-style-type: none"> <li>• Complete re-measurement assessments (qualitative and quantitative)</li> </ul>	1/2015 to 3/2015	B
<b>Develop Intervention Tool Kit and Post on Website</b>	<p>NJAFP Team Meetings</p> <ul style="list-style-type: none"> <li>• NJAFP and partners</li> <li>• Review practice reports and analysis to develop materials for Tool Kit</li> <li>• Monitoring overall project plan (scope of work, time frames and budget)</li> </ul> <p>NJAFP Team</p> <ul style="list-style-type: none"> <li>• Compile materials for Tool Kit and post to web site</li> <li>• Begin to prepare report to document practice project activities</li> <li>• Prepare and present presentation at NJAFP 2015 Annual Scientific Assembly</li> </ul>	4/2015 to 7/2015	E
<b>Article for Professional Journal</b>	<p>NJAFP Team Meetings</p> <ul style="list-style-type: none"> <li>• NJAFP and partners</li> <li>• Review practice reports and analysis to develop article for professional journal</li> </ul>	5/2015 to 7/2015	B, F

Milestone	Key Tasks To Complete Milestone	Dates	Budget Item
<b>Publication</b>	<ul style="list-style-type: none"> <li>• Write article for submission</li> <li>• Submit article for publication</li> </ul> <p>CE Outcomes</p> <ul style="list-style-type: none"> <li>• Write article for submission</li> <li>• Prepare poster applications</li> </ul>		
<b>Final Report</b>	<p>NJAFP Team Meetings</p> <ul style="list-style-type: none"> <li>• NJAFP and partners</li> <li>• Review practice reports and analysis to develop final report for commercial interest</li> <li>• Write report</li> <li>• Submit report</li> </ul>	7/2015	G