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An Adult PCV13 Vaccination Protocol in the Retail Healthcare Setting

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Acknowledgements

Where should I begin? I could not have gone this far without the many aspiring people in my life that have helped me through this journey. First, I would like to thank my family for being so supportive of me emotionally throughout the program and giving me words of encouragement. Despite the fact that I hardly see them now, they always cheer me on to be the best person that I can be and to pursue my dreams and goals. For my grandparents, thank you for giving me your words of wisdom about life, sharing your contribution to your legacy to society and instilling in me a caring heart for others. You have taught me at a young age the love to help others and serve those who are underprivileged. To my parents who always believed in me and cheered me up through hard times, thank you for instilling in me a strong work ethic and showing me that hard work does pays off.

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Opening Statement

There were several reasons why I chose to obtain a Doctorate of Nursing Practice (DNP) degree. The main reasons were to learn and develop great clinical skills, to be able to promote health, to build long and lasting relationships with my patients and their families and to be able to work with other people to promote real change in our healthcare system. I have always been interested in pathophysiology and clinical practice. I have a great interest in not just what happens to people when they get sick but to truly understand the relationship between humans and health.

My primary goal for my DNP scholarly practice would be to get the training necessary to be able to provide the best care possible for my patients. Not only would I get the clinical exposure to learn how the different diseases affect people and how to diagnose and treat those diseases, I will also be prepared to critique healthcare research in order to incorporate scientific evidence into patient care that will maximize the scope of my practice and optimally care for my patients.

Secondly, I want to build a relationship with my patients and their families. My prior experience has been in the inpatient setting. A primary care DNP education can change my clinical practice focus from one of brief interactions where I temporize the illnesses of sick patients to one of building long lasting relationships with my patients and their families where I can promote them to live healthy and happy lives.

Finally, I want to develop the skills to work with others in a multidisciplinary team and implement change to better benefit my patients. The DNP program will give me the skills necessary to function within a team and be recognized for my doctorate degree providing parity with the other members of the team.

Abstract

Purpose – To establish an adult Pneumococcal (PCV13) vaccination protocol within a chain of retail healthcare clinics.

Background - Invasive Pneumococcal disease results in significant morbidity and mortality in patients ≥65 and those with immunocompromised status. Despite CDC recommendations, national PCV13 vaccination rates remain low in these populations. No adult PCV13 vaccination protocol existed in the project retail healthcare clinics.

Project Plan Process – An evidence-based PCV13 vaccination protocol based on the CDC guidelines using the Provus Discrepancy Evaluation Model as a framework was implemented. NPs were educated on indications for PCV13 vaccinations and a questionnaire to identify those patients who qualified. Qualified patients were either vaccinated or referred elsewhere for vaccination. The EMR system was reviewed to determine the number of patients who qualified for the PCV13 vaccination who were screened.

Results: Of the 3,202 patients, 4-6% qualified for the PCV13 vaccination, 27.7% were identified and offered the PCV13 vaccination and 11% were vaccinated or referred elsewhere for vaccination. Regarding age, 65.2% of patients who qualified for PCV13 were ≥65 in contrast to 34.8% who were 19-64 years old. As for those patients who were actually vaccinated, 76.5% were ≥65 while 23.5% were 19-64 years old.

Conclusions/Implications - Retail health care clinics can be an effective venue for providing essential vaccinations. Nurse practitioners are well prepared with the knowledge base and skill set to assume a leadership role in the development of vaccination programs within our communities.

Introduction

Public health initiative programs have been extremely successful resulting in the eradication of several very dangerous communicable diseases such as smallpox, diphtheria and polio by the use of vaccinations (Center for Disease Control and Prevention, 1999). Childhood vaccinations have succeeded in decreasing childhood mortality for those over a year old by 99% (Center for Disease Control and Prevention, 1999). However, the success rate has not been replicated with adult immunizations. Despite an aggressive campaign by the CDC to increase adult immunization rates, they still remain very poor for all vaccinations (CDC/NCHS, 2014, Table 75).

Background and Significance

Incidence of Pneumococcal Disease

Streptococcus Pneumoniae (Pneumococcus) was first isolated by Dr. Louis Pasteur in 1881. In the 1940's, penicillin was discovered and the medical community thought they had a tool to eradicate Streptococcus Pneumoniae. However, it was discovered that many patients with invasive Pneumococcal disease (IPD) still died despite antibiotic treatment, especially the elderly ≥65 years old (Plouffe et al., 1996), the young (<2 years old) and those with immunocompromised states (Hamborsky & Kroger, 2015).

IPD (pneumonia, bacteremia and meningitis) results in significant morbidity and mortality. Pneumococcal pneumonia makes up >400,000 hospitalizations a year with a case fatality rate 5% to 7% which may be much higher among elderly persons. There are also >12,000 cases of Pneumococcal bacteremia without pneumonia a year with a case fatality rate of 20% but may be as high as 60% for the elderly. The most severe IPD is Pneumococcal

meningitis. There are 3000 – 6000 cases of Pneumococcal meningitis a year with a case fatality rate of 8% among children and 22% among adults (Hamborsky & Kroger, 2015).

The first Pneumococcal vaccine was licensed in the United States in 1977 with a 14-valent polysaccharide vaccine. In 1983, a 23-valent polysaccharide vaccine was licensed called PPSV23 (Pneumovax). PPSV23 has been found to be highly effective against IPDs in young adults. However, its efficacy is markedly decreased in the elderly ≥65 years old (Plouffe et al., 1996), and the young (<2 years old) (Hamborsky & Kroger, 2015). The first conjugate Pneumococcal vaccine was not licensed until 2000 with a 7-valent polysaccharide conjugate vaccine (PCV7) which was then replaced with a 13-valent Pneumococcal conjugate vaccine licensed in 2010 (Tomczyk, et al., 2014).

While data on immunocompromised patients are lacking, PCV13 has been shown to be 75% effective in preventing IPDs, and 45% effective at preventing non-invasive pneumonia caused by the 13 strains it covers. PPSV23 has been shown to be 60 to 70% effective in preventing invasive disease caused by the 23 strains it covers (Bonten et al., 2015). Furthermore, it has been shown that an initial PCV13 vaccination enhances the protective effects of PPSV23 for most of the serotypes that are found in both vaccines whereas a dose of PPSV23 prior to PCV13 vaccination did not (Greenberg et al., 2014).

The current standard of care is to vaccinate with PCV13 and PPSV23 all adults ≥ 65 and all adults aged 19-64 years old with certain immunocompromised states (Appendix B). A second dose of PPSV23 is also recommended five years after the first PPSV23 dose for these patients. Those who do not have these conditions but have certain other chronic conditions (Appendix B) may not be recommended to get PCV13 but are recommended to get a single dose of PPSV23. Finally, any adult who received their PPSV23 vaccine prior to 65 years of age for

any reason should have a second dose of PPSV23 after they turn 65 years old (Hamborsky & Kroger, 2015).

Since the PCV13 recommendations have only been present since 2012 for those with immunocompromised states and 2014 for those ≥65years old, data is lacking on the PCV13 vaccination rates. Despite the CDC recommendations, nationally, only 21% of adults 19-64 years old at high risk and only 59.7% of adults ≥ 65 receive the Pneumococcal (PPSV23) vaccination. (CDC/NCHS, 2014, Table 75). This is well below the Healthy People 2020 goal of 90% coverage with the Pneumococcal vaccines for patients ≥65 years old (Hamborsky & Kroger, 2015).

There are many barriers to adult vaccinations. Only approximately 30% of general internists or family physicians report that they assess their patients' vaccination status at every visit (Hurley et al., 2014). Information systems can be helpful to track vaccinations but only 8% of general internists and 36% of family physicians use those (Hurley et al., 2014). Another barrier is the lack of vaccines themselves at the clinics. Due to financial constraints (lack of insurance coverage, inadequate reimbursements and lack of a VFC type program for adults), most primary care providers do not stock all the recommended vaccines and instead refer patients to get those vaccinations at a local pharmacy or at the public health department (Hurley et al., 2014). Finally, 50% of general internists and family physicians report management of acute problems taking precedence over vaccinations (Hurley et al., 2014).

Pneumococcus is one of the four major vaccine preventable diseases in the United States for those ≥65 years of age along with influenza, herpes zoster and pertussis. While Pneumococcal diseases only contribute to 8% of the incidence of disease ranking it third highest incidence compared to the other three, it contributes to 25% of the total healthcare utilization of

these four diseases which sets it second in healthcare utilization behind only influenza (Figure 1) (McLaughlin, McGinnis, Tan, Mercatante, & Fortuna, 2015).

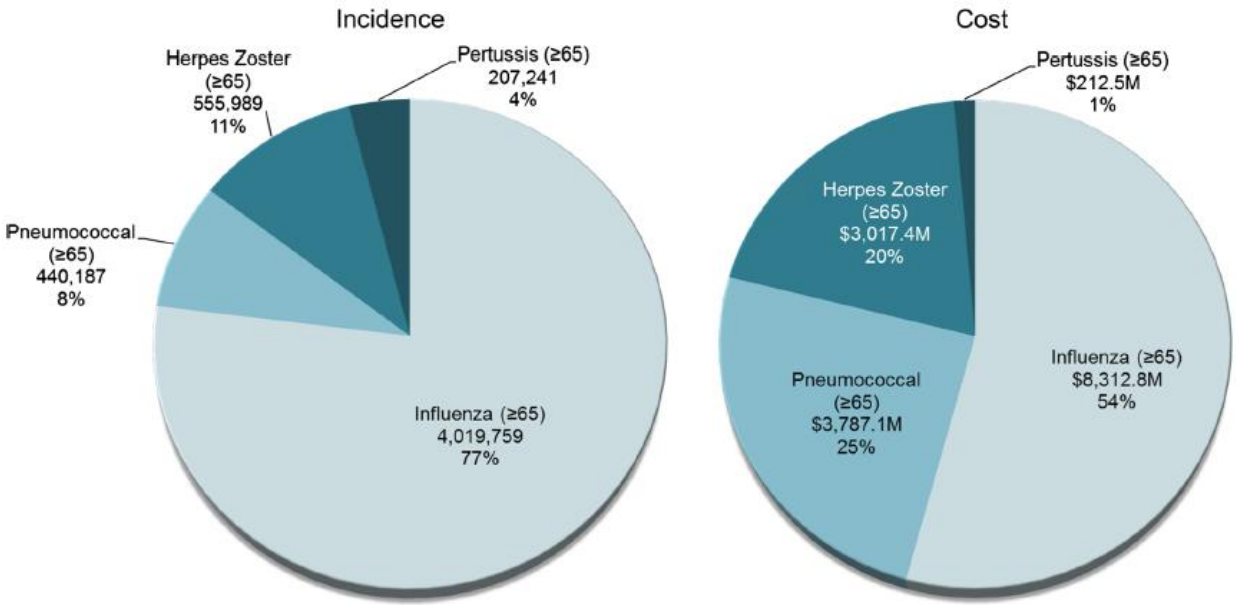


Figure 1 - Percentage of estimated incidence and direct cost of 4 major Vaccine preventable diseases in the United States, 2013 for those ≥65 (McLaughlin et al., 2015)

Retail Healthcare Clinics

Retail healthcare clinics started in 2000. These clinics are general staffed by NPs or PAs and focus on convenient care for minor illnesses as well as vaccinations. The advantages of retail health clinics are price and convenience. A comparison between the average costs of common illnesses treated at a retail healthcare clinic vs. physicians' offices vs. urgent care centers vs. emergency departments were $110 vs. $166 vs. $156 vs. $570 respectively (Mehrotra, 2009). Furthermore, an estimated 10.6% of the total U.S. and 13.4% of the urban U.S. population lives within a five minute driving distance of a retail healthcare clinic (Rudavsky, 2009).

The three largest retail healthcare clinics make up 81% of all retail healthcare clinics in the United States (Mehrotra, 2009). In 2009, 40% of these retail healthcare clinic visits provided immunizations for 1.95 million visits resulting in 1.8 million influenza (including H1N1) vaccinations and almost 60,000 Pneumococcal vaccinations (Uscher-Pines, 2012). This same study reviewed data from the two largest healthcare clinic chains (accounting for 76% of all retail health clinic visits) and discovered that Pneumococcal vaccinations for those ≥65 and those 19-64 with high risk for Pneumococcal infections accounted for only 0.6% each of these total visits or 1.2% of the total clinic visits for these two retail healthcare chains (Uscher-Pines, 2012).

Purpose of Project

The purpose of this evidence-based practice project was to implement a PCV13 vaccination protocol in the Palomar retail healthcare clinic system. Prior to this project, there was no PCV13 vaccination program in this retail healthcare system.

Theoretical Model

The Provus Discrepancy Evaluation Model was used as a framework for this project (Provus, 1969). With the Provus Discrepancy Evaluation Model, problem areas are identified by comparing program performance with an established program design standard. The steps are: 1. Specify program objectives, 2. Plan evaluation based on the objectives, 3. Collect information on program accomplishments, 4. Identify difference between program objectives and program accomplishments and 5. Modify programs (Appendix G).

Practice Change Process

The target population for this project included two populations who receive at least some of their health care in three locations that are part of the Palomar Expresscare clinics system. The proposed three sites are located in Albertson's supermarkets in North inland San Diego region

and Temecula, staffed by NPs. All of the sites takes most insurance coverage, except traditional Medicaid and Medicare. The majority of their patients are walk-in customers. While this retail health clinic system does offer some vaccinations such as influenza and PPSV23 vaccinations, they currently do not have a PCV13 vaccination protocol despite the recent CDC recommendations.

Prior to the initiation of the project, a stakeholder's presentation was made to the Palomar Expresscare provider staff at their monthly staff meeting where the proposal for the project was presented. The provider staff (ten NPs and one physician) voted and agreed to implement the project at their facilities. Next, IRC approval was obtained from both Palomar Health as well as from the University of San Diego. The Palomar Expresscare provider staff members were then emailed written PCV13 educational materials and the vaccinations were stocked in the clinics. An implementation team member went to each clinic to deliver the forms and educational materials as well as to answer questions. This project duration was four months with the data collected and evaluated weekly. Project status updates were provided weekly via email as well as at their monthly staff meetings.

The NPs administered the questionnaires (Appendix C) at the time of evaluation of the patient in clinic to check for eligibility and contraindications for PCV13 vaccination as well as whether the patient accepted the vaccination, declined the vaccination, made a follow-up appointment to receive the vaccination at a later date or was referred elsewhere for the vaccination. If the patient qualified for and agreed to receive the vaccination, they received the patient information sheet (Appendix A) as well as the PCV13 VIS sheet (Appendix H). The PCV13 VIS is developed by the CDC. The vaccination was then administered according to the clinic's PCV13 vaccination protocol developed for the clinic (Appendix B). The documentation

of administering the vaccination was completed on the questionnaire as well as the patient's EMR and vaccination card. The healthcare provider finalized the visit and discharged the patient home.

Those who declined the vaccinations on that date or chose not to receive the vaccinations at the clinics were either given another appointment to receive the vaccinations or referred to their PCP or a local pharmacy for the vaccinations. The most common reason for referral to a local pharmacy was with Medicare patients as the clinic did not accept Medicare insurance whereas the vast majority of the local pharmacies did.

Advertisement flyers for PCV13 were made available in the clinics for all patients to view and copies were given to them on request (Appendix D). Name badges with the logo "ask me about the new pneumonia vaccine" which also had an insert with the prices for the vaccinations for all the insurances the clinic accepted as well as the self-pay price were given to the NPs to wear. Completed patient questionnaires were stored in a clipboard in the clinic and picked up weekly by the project director for data analysis. The data were then entered into a data collection sheet (Appendix E) for analysis.

Evaluation of Benchmarks

The objective of this program was to implement a protocol for identification and administration of the PCV13 immunization to all adults ≥65 years old as well as adults 19-64 years of age with certain immunocompromised states that make them high risk for IPDs. The goal was to demonstrate that it is feasible for retail healthcare clinics to provide this service for older adult patients. The benchmarks were (1) to offer the PCV13 vaccination to a minimum of 20% of those eligible, and (2) to administer PCV13 vaccinations, or refer elsewhere for vaccination, to a minimum of 10% of those eligible based on CDC guidelines.

Cost/Benefit Analysis

The cost of the PCV13 vaccination to our clinic system was $128.40 (the purchase occurred in ten vial packs costing $1284). The reimbursement for the vaccine ranged from $145 to $180 depending on insurance. For those without insurance, a charge of $160/vaccination was incurred which is less expensive than the local pharmacies which averaged approximately $200/vaccination. For those with insurance that was not accepted at the retail healthcare site, a referral was made to their PCP or a local pharmacy for the vaccination depending on their insurance and preference. On average, the clinic made a profit of $30/vaccination.

The benefits of PCV13 vaccination are in decreased healthcare costs and a healthier population. The Quality adjusted life years (QALY) for PCV13 is estimated at $28,900 QALY compared to $34,600 QALY for PPSV23 (Smith et al., 2012). These calculations do not take into account herd immunity. It is still not known at this time whether PCV13 will have a similar herd immunity effect that was seen with PCV7. If so, the benefits of PCV13 may be even higher.

It is also estimated that giving the PCV13 vaccination based on current recommendations to those ≥65 and high risk patients 19-64 will decrease the incidence of IPDs from 858 to 833/100,000, decrease the deaths from pneumonia from 1775 to 1749/100,000 and decrease hospitalizations for Non-Pneumococcal pneumonia from 9292 to 9122/100,000 (Smith et al., 2012). This would result in 25 less incidence of IPDs, 26 fewer deaths and 170 fever hospitalizations for non-Pneumococcal pneumonia/100,000 patients vaccinated.

Results

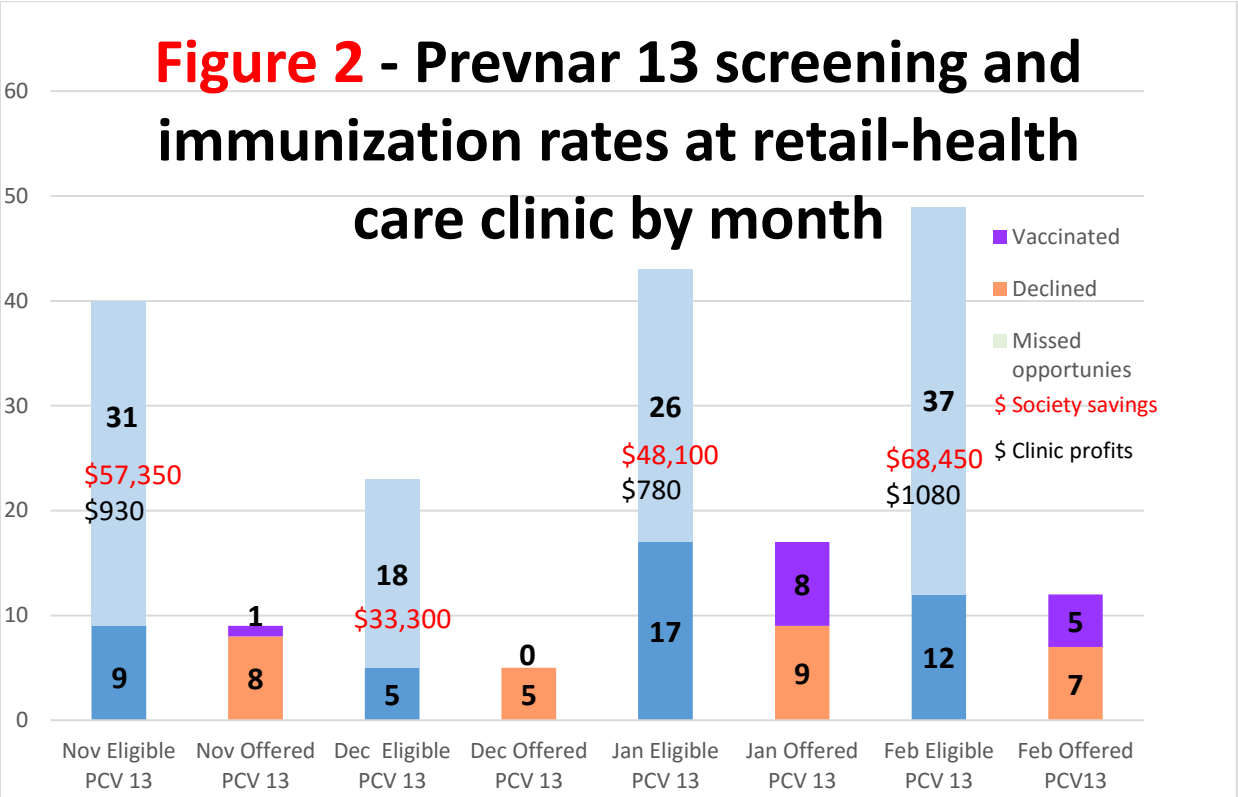
Data analysis extending over the four-month period including November and December 2015 extending through January and February 2016 revealed that 4.3%, 3.8%, 5.9% and 5.3% of

the total patients seen in the clinic system qualified for the PCV13 vaccination with an average of 4.8% (Figure 4). During these 4 months a total of 936, 610, 732 and 924 patients were seen in the Palomar Expresscare system for a total of 3202 patient encounters (Table 1).

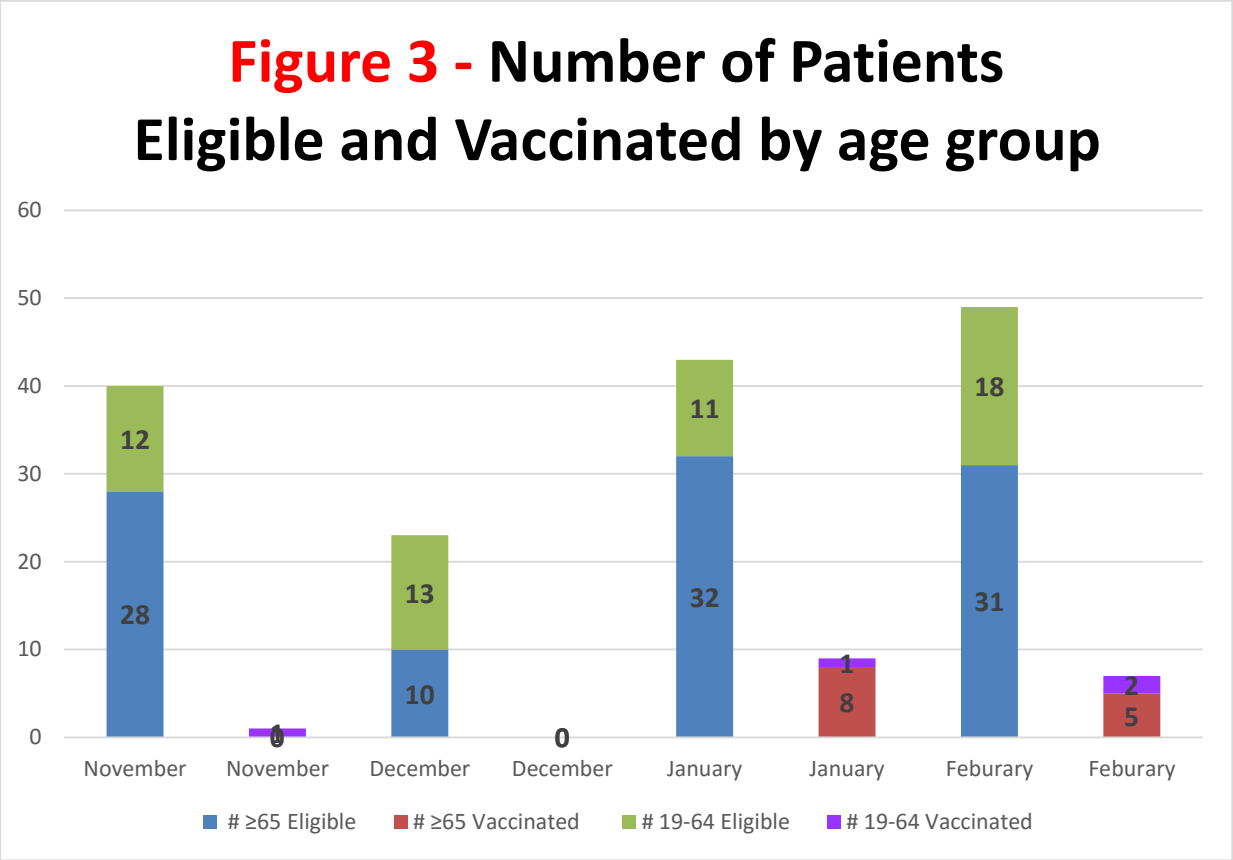
Table 1

Month	Total seen	Number Eligible	# ≥65 Eligible	# 19-64 Eligible	% ≥65 Eligible	% 19-64 Eligible	# Vaccinated or referred	# ≥65 Vaccinated	# 19-64 Vaccinated	%vaccinated ≥65	%vaccinated 19-64
November	936	40	28	12	70.0	30.0	1	0	1.0	0.0	100.0
December	610	23	10	13	43.5	56.5	0	0	0.0	0.0	0.0
January	732	43	32	11	74.4	25.6	9	8	1.0	88.9	11.1
February	924	49	31	18	63.3	36.7	7	5	2.0	71.4	28.6
Totals	3202	155	101	54	65.2	34.8	17	13	4.0	76.5	23.5

In November, there were 40 patients eligible for the vaccination, 9 of those were offered the vaccination, 8 of which declined and 1 person was vaccinated. In December, there were 23 eligible patients, 5 were offered vaccination all of whom declined. In January, 43 patients were eligible, 17were offered the vaccine, 8 declined, 8 were referred elsewhere for vaccination and one patient made a follow-up appointment for vaccination. In February, there were 49 eligible patients, 12 were offered the vaccine, 5 declined, 2 were vaccinated and 5 were referred elsewhere for vaccination (Figure 2). For the 4 months of the study, 31, 18, 26 and 37 eligible patients were not identified and offered PCV13 vaccination (Figure 2).



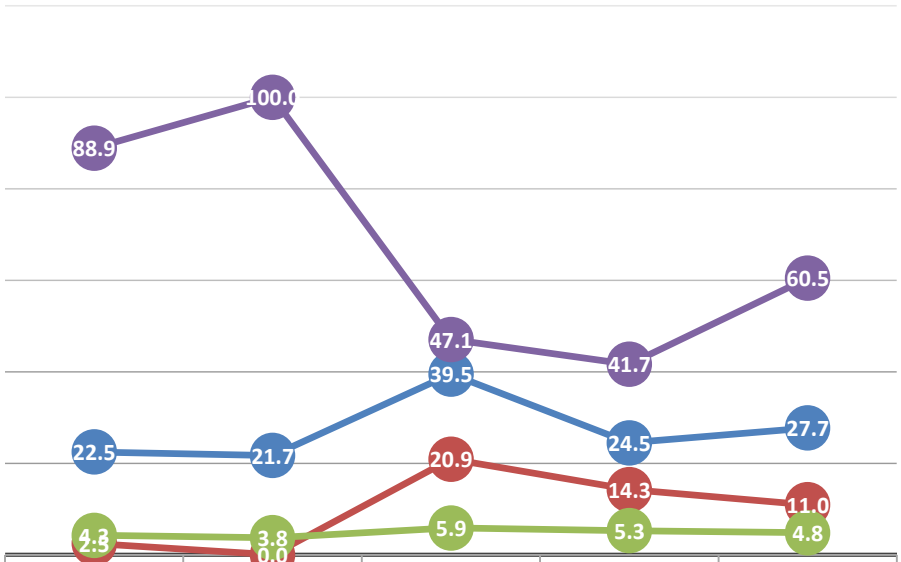
Of those eligible patients, there were 101 patients ≥65 years old compared to 54 patients who were 19-64 years old with high risk for Pneumococcal infections. This resulted in 65.2% of those eligible for PCV13 being ≥65 compared to 34.8% for those 19-64 years old. Furthermore, those ≥65 were more willing to get the PCV13 vaccination with 76.5% of those who were vaccinated or referred elsewhere for vaccination being ≥65 and only 23.5% being 19-64 years old (Table 1). This can also be seen based on the percentages of eligible patients vaccinated by age group and month (Figure 3).



	# ≥65 Eligible	# ≥65 Vaccinated	# 19-64 Eligible	# 19-64 Vaccinated
Totals	101	13	54	4

Thus, both benchmarks were achieved since 11% received the PCV13 vaccination while 27.7% were offered the PCV13 vaccination (Figure 4).

Figure 4 - % of patients eligible and ultimate vaccination results



	November	December	January	Feburary	Total
% eligible offered	22.5	21.7	39.5	24.5	27.7
% eligible vaccinated	2.5	0.0	20.9	14.3	11.0
% eligible	4.3	3.8	5.9	5.3	4.8
% declined	88.9	100.0	47.1	41.7	60.5

Discussion

Evidence-based healthcare must be accessible and available to all patients for health promotion and disease prevention. Pneumococcal vaccinations have been shown to be a cost-effective strategy for decreasing the high burden of Pneumococcal disease to our healthcare system (McLaughlin et al., 2015). Unfortunately, Pneumococcal vaccination rates are poor with the PPSV23 vaccination rates of 59.7% for those ≥65 and 20% of high risk patients 19-64 vaccinated (CDC/NCHS, 2014, Table 75). As adult PCV13 vaccination recommendations are new, there is not sufficient data to establish a current benchmark vaccination rate however it is generally accepted that it is lower than even the abysmal vaccination rates for PPSV23.

Retail healthcare clinics are becoming increasingly common affording adult community residents easy access to primary care including vaccinations (Rudavsky, 2009). Since NPs make up a majority of the staff for these retail healthcare clinics (Mehrotra, 2009), we have an opportunity to improve the health of not only our patients but to the US healthcare system. As such, NPs should assume leadership roles in developing vaccination protocols. Vaccination protocols can also provide good financial revenue for these retail healthcare clinics (Uscher-Pines, 2012) along with providing a service that the current primary care system has clearly shown itself incapable of effectively providing (Hurley et al., 2014). With our retail healthcare system vaccination project, approximately 4% to 6% of the patients seen qualify for PCV13 vaccination. This represents a significant vaccination opportunity for providers to give their patients an important vaccination.

As expected, there was a learning curve with patient screening. The NPs in the project offered only 22.5% and 21.7% of those eligible in the first 2 months of the project respectively which increased to 39.5% and 24.5% for the last 2 months of the project. The same trend was seen with the percent eligible vaccinated being 2.5%, 0%, 20.9% and 14.3% respectively showing a significant increase in January and February 2016 compared to November and December 2015. One outcome that was not anticipated included the decrease in the percent of those who declined the vaccinations in the second half of the project. For November and December of 2015, 88.9% and 100% of the patients offered PCV13 declined versus only 47.1% and 41.7% of those offered the vaccine in January and February of 2016. This likely reflected the NPs being more confident with recommending the vaccination and the patients responding to that confidence. The percentage of the patients who qualified for PCV13 vaccination was stable at 3.8% to 5.9% of total patients qualifying for the vaccination (Figure 4).

There were still many patients who were not properly identified for PCV13 vaccinations. This was estimated to have cost society a total of $207,200 in estimated healthcare expenditures from Pneumococcal disease and cost the clinics an estimated $3,330 in revenue for the 4 months of the project (Figure 2). While this project was a short project with few patients vaccinated it does show that the retail healthcare clinic system can be an effective venue for improving the PCV13 vaccination rate.

Insurance funding was a significant barrier for our clinics. The clinics in this project did not accept Medicare which limited the number of eligible participants to receive vaccinations. These patients were referred to their PCP or to a pharmacy for vaccination. Due to this challenge, Expresscare is currently considering adding Medicare coverage for our clinics.

Another barrier in this project was the continued emphasis on acute illnesses and failure to incorporate more preventative care. As the healthcare system increasingly moves toward increasing use of electronic medical records (EMR), it can be a valuable resource for enhancing primary care. One of the initial intentions for this project was to incorporate a vaccination reminder and the questionnaire into our EMR system which unfortunately did not happen due to technical problems. This would have improved our project as well as possibly counteracted our slow start for the project. At this time, the Expresscare clinic system is still looking into incorporating the changes to our EMR system for long term sustainability beyond the scope of this project.

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Appendix A: Patient education form

Palomar Health Expresscare

New Pneumonia vaccine available in expresscare November 2015
Ask your Nurse Practitioner for the facts!

Pneumonia

Pneumonia is caused by infection with a bacteria called streptococcus pneumonia. This bacteria is found in many people's noses and throats without causing disease and can spread from person to person through coughing, sneezing or contact with respiratory secretions. Pneumococcal disease can lead to severe sicknesses such as pneumonia (lung infection), bacteremia (blood infections) and meningitis (infection of the lining of your brain or spinal cord). Children younger than 2 years old, adults older than 65 years, cigarette smokers and people with certain medical conditions are at higher risk of getting pneumococcal disease. About 4000 adults die each year because from pneumonia. Pneumococcal infections can be hard to treat because some strains are resistant to antibiotics, which is why prevention through vaccination is very important. Pneumococcal disease is the leading cause of vaccine preventable illnesses and deaths in the United States.

Prevnar 13:

Prevnar 13 is a vaccine that has been recommended for children since 2007 (when it replaced the previous Prevnar 7 vaccine) and was recently recommended to be given to adults ≥65 years old and for people with certain medical condition that weakens their immune system. Prevnar 13 protects against the 13 strains of streptococcus pneumonia which makes up about half of the infections in adults. This is in addition to their current pneumococcal vaccine (Pneumovax) recommendations. Prevnar 13 provides extra protection against pneumonia and other invasive pneumococcal diseases.

Risks of the Prevnar 13 vaccination:

Most side-effects of the Prevnar 13 vaccination are mild and go away without any treatments. Vaccine related complications include redness, pain and swelling where the shot was given. Mild fever, fatigue, headache, chills and muscle pain have also been reported. Life-threatening allergic reactions from Prevnar 13 is possible but very rare. Signs of a severe allergic reaction can include hives, swelling of the face and throat, shortness of breath, fast heartbeat, dizziness and weakness that can start a few minutes to a few hours after the vaccination. If you think you may have a severe allergic reaction or other emergency, call your doctor of 911.

Who should not get Prevnar 13?:

You should not get Prevnar 13 if you have ever had a life-threatening allergic reaction to a prior dose of this vaccine, to an earlier pneumococcal vaccine called Prevnar 7 or to any vaccine that contains diphtheria toxoid (ex: DTaP, TDaP), or if you have a severe allergy to any component of Prevnar 13. Also, if you are very sick, it would be good to reschedule the shot until after the sickness has improved. If you have any of these problems, please let your provider know before you are given the vaccination.

References:

Hamborsky, J., Kroger, A., Wolfe, S., (2015). Centers for Disease Control and Prevention Epidemiology and Prevention of Vaccine-preventable Diseases,"Pink Book,".

Tomczyk, S., Bennett, N. M., Stoecker, C., Gierke, R., Moore, M. R., Whitney, C. G., ... & Centers for Disease Control and Prevention (CDC). (2014). Use of 13-valent pneumococcal conjugate vaccine and 23-valent pneumococcal polysaccharide vaccine among adults aged≥ 65 years: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Morb Mortal Wkly Rep*, *63*(37), 822-5.

Appendix B: Patient vaccination protocol

Pneumococcal Vaccine (Prevnar 13 or PCV13)

Definition:

PCV13 is a 13-valent polysaccharide vaccine that targets the prevention of 13 capsular types of pneumococcal strains responsible for about 75% of cases of invasive pneumococcal disease. The effectiveness of PCV13 in preventing invasive pneumococcal disease in adults has been demonstrated. PCV13 contains 12 serotypes in common with PPSV23.

Treatment Plan:

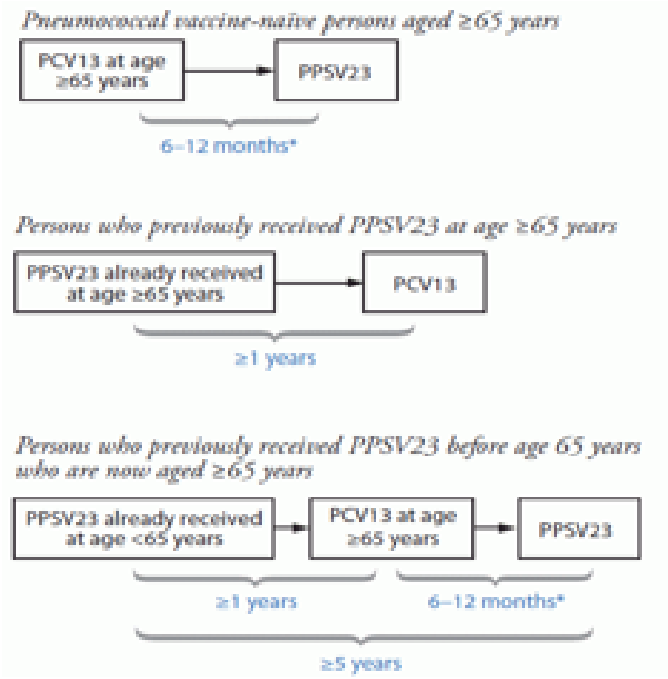
Recommendations for dosing, administration, and indications:

A single dose of PCV13 is recommended for use in the United States among

- adults aged ≥65 years
- adults ≥19 years with chronic diseases who are increased risk of pneumococcal disease:
  - Cerebrospinal fluid leaks
  - Cochlear implant
  - Immunocompromised adults (Not seen in Retail clinic setting)
    - Congenital or acquired asplenia
    - Congenital or acquired immunodeficiency
    - HIV
    - Sickle-cell anemia
    - Severe hemoglobinopathies
    - Hodgkin disease
    - Leukemia
    - Lymphoma
    - Multiple myeloma
    - Chronic renal failure
    - Nephrotic syndrome
    - Generalized malignancy
    - Iatrogenic immunosuppression
    - Solid organ transplant

Administration Schedule for Persons 65 Years Old and Older:

- For those who have not received PCV13 previously, administer a dose of PCV13.
- A dose of PPSV23 should be administered 6-12 months after the dose of PCV13 but a minimum of 8 weeks.
- Do not administer the two vaccines simultaneously.
- Adults who previously received a dose of PPSV23 should receive PCV13 no earlier than 1 year after the dose of PPSV23.



http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6337a4.htm

Contraindications:

- Severe allergic reaction to vaccine component or following prior dose of vaccine.
- Moderate or severe acute illness.

Objective Data:

The following assessment is suggested, and any or all of these findings may be needed:

- Assess patient for any signs of moderate or severe, acute illness. If present, delay the vaccine until illness resolves.

Treatment Plan:

Administer 0.5 ml IM into deltoid muscle
For further recommendations for the dosing, administration, and indications: See CDC Recommendations

Suggested Patient Education:

- Discuss purpose of vaccine as well as side effects that may occur, e.g. mild local reactions, fever, rash or myalgias. Offer VIS.

Follow-up:

Advise patient to see their PCP or visit the Urgent Care or Emergency Room in the event of a severe reaction to the vaccine.

deficiencies), and phagocytic disorders (excluding chronic granulomatous disease).

** Diseases requiring treatment with immunosuppressive drugs, including long-term systemic corticosteroids and radiation therapy. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6140a4.htm#tab

Indication-Prevnar 13/Pneumovax

TABLE. Medical conditions or other indications for administration of 13-valent pneumococcal conjugate vaccine (PCV13), and indications for 23-valent pneumococcal polysaccharide vaccine (PPSV23) administration and revaccination for adults aged ≥19 years,* by risk group — Advisory Committee on Immunization Practices, United States, 2012

Risk group	Underlying medical condition	PCV13	PPSV23	
		Recommended	Recommended	Revaccination 5 yrs after first dose
Immunocompetent persons	Chronic heart disease†		✔	
	Chronic lung disease§		✔	
	Diabetes mellitus		✔	
	Cerebrospinal fluid leak	✔	✔	
	Cochlear implant	✔	✔	
	Alcoholism		✔	
	Chronic liver disease, cirrhosis		✔	
	Cigarette smoking		✔	
Persons with functional or anatomic asplenia	Sickle cell disease/other hemaglobinopathy	✔	✔	✔
	Congenital or acquired asplenia	✔	✔	✔
	Congenital or acquired immunodeficiency¶	✔	✔	✔
	Human immunodeficiency virus infection	✔	✔	✔
	Chronic renal failure	✔	✔	✔
	Nephrotic syndrome	✔	✔	✔
Immunocompromised persons	Leukemia	✔	✔	✔
	Lymphoma	✔	✔	✔
	Hodgkin disease	✔	✔	✔
	Generalized malignancy	✔	✔	✔
	Iatrogenic immunosuppression**	✔	✔	✔
	Solid organ transplant	✔	✔	✔
	Multiple myeloma	✔	✔	✔

* All adults aged ≥65 years should receive a dose of PPSV23, regardless of previous history of vaccination with pneumococcal vaccine.

† Including congestive heart failure and cardiomyopathies, excluding hypertension.

§ Including chronic obstructive pulmonary disease, emphysema, and asthma.

¶ Includes B- (humoral) or T-lymphocyte deficiency, complement deficiencies (particularly C1, C2, C3, and C4 deficiencies), and phagocytic disorders (excluding chronic granulomatous disease).

** Diseases requiring treatment with immunosuppressive drugs, including long-term systemic corticosteroids and radiation therapy. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6140a4.htm#tab

Appendix C: Patient checklist of questions

Date:_____ Clinic site: ESC TEM SEH

Eligibility Questionnaire for Pneumonia Vaccine

1. How old are you? _____
2. Are you 19 years of age or older with chronic medical conditions? _____
3. Have you ever been given the Pneumovax vaccine? _____

Please check the following if you have any of these medical histories:

Medical Histories	PCV13 (Prevnar)	PPSV23 (Pneumovax)
Cerebrospinal fluid leak	X	X
Cochlear implant	X	X
Solid organ transplant	X	X
Sickle cell disease/other blood disorders	X	X
No spleen function	X	X
Immune system disease/HIV	X	X
Cancer	X	X
Iatrogenic immunosupression *	X	X
Chronic renal failure/Nephrotic syndrome	X	X
Chronic heart disease **		X
Chronic lung disease ***		X
Diabetes mellitus		X
Smoker		X
Chronic liver disease,/ cirrhosis/ alcoholism		X
*** Iatrogenic immunosuppression includes diseases requiring treatment with immunosuppressive drugs ex: systemic steroids, chemotherapy and radiation.**		
**** Chronic heart disease includes congestive heart failure and cardiomyopathies, excluding hypertension**		
***** Chronic lung disease includes COPD and asthma**		

(Nurse practitioner) please complete the blue boxes below

*****OFFICE USE ONLY*****

1. Patient agreed to Prevnar 13 vaccine?	Yes	No		
2. Patient received Prevnar 13 vaccine.	Yes	No		
3. Patient given Prevnar 13 VIS	Yes	No		
4. Patient information for Prevnar 13	Yes	No		
5. Patient scheduled for Prevnar 13 appointment	Yes	No		
6. Indications for Prevnar 13 & Pneumovax reviewed. Patient is eligible for:	Prevnar 13	Pneumovax	Neither	Both

Appendix D: Advertisement flyer

PALOMAR HEALTH
expresscare Clinic

NEW VACCINE FOR PNEUMONIA

PALOMAR HEALTH expresscare Clinics now offers Prevnar 13, a vaccine for all people who qualify for the prevention of pneumococcal pneumonia and invasive disease caused by 13 strains of streptococcus pneumonia.*

This vaccine is available for $160.**

Ask about the Merck Vaccine Assistance Program. You may qualify for $30 injections.

- No appointment necessary
- Most visits average 20 minutes
- No insurance required

*www.adult.prevnar13.com

**If you are a member of a participating health plan, the price may be less than the standard of care.

OPEN 7 DAYS A WEEK

Monday – Friday	Saturday	Sunday
9 a.m. – 8:30 p.m.	9 a.m. – 4:30 p.m.	10 a.m. – 5:30 p.m.

Clinicians usually take a daily, required lunch break from approximately 1:30 p.m. – 2:30 p.m. M – F and 1:30 – 2 p.m. Sat/Sun.

Affordable, quality health care now served at select Albertsons/Sav-on Pharmacy™ locations.

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Escondido, CA 92027

Temecula
30530 Rancho California Road
Temecula, CA 92591

San Elijo Hills
1571 San Elijo Road South
San Marcos, CA 92078

PALOMAR HEALTH
A CALIFORNIA HEALTHCARE DISTRICT

To learn more, call **888.738.2452** or visit **www.PalomarHealth.org/expresscare.**

CareNetwork

Appendix E: Data collection sheet

Patient ID	Date	Site	Eligible	Offered	Declined	Received	Made F/u visit for PCV13 shot	Reason elegible for PCV13	ELIGIBLE FOR PPSV23	Why declined PCV13
1										
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Appendix F: CDC adult immunization schedule 2015

Recommended Adult Immunization Schedule—United States - 2015

Note: These recommendations must be read with the footnotes that follow containing number of doses, intervals between doses, and other important information.

Figure 1. Recommended adult immunization schedule, by vaccine and age group[1]

VACCINE ▼ / AGE GROUP ▶	19-21 years	22-26 years	27-49 years	50-59 years	60-64 years	≥ 65 years
Influenza*[2]	1 dose annually					
Tetanus, diphtheria, pertussis (Td/Tdap)*[3]	Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs					
Varicella*[4]	2 doses					
Human papillomavirus (HPV) Female*[5]	3 doses					
Human papillomavirus (HPV) Male*[5]	3 doses					
Zoster[6]					1 dose	
Measles, mumps, rubella (MMR)*[7]	1 or 2 doses					
Pneumococcal 13-valent conjugate (PCV13)*[8]						1-time dose
Pneumococcal polysaccharide (PPSV23)[8]	1 or 2 doses					1 dose
Meningococcal*[9]	1 or more doses					
Hepatitis A*[10]	2 doses					
Hepatitis B*[11]	3 doses					
Haemophilus influenzae type b (Hib)*[12]	1 or 3 doses					

*Covered by the Vaccine Injury Compensation Program

For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection; zoster vaccine recommended regardless of prior episode of zoster

Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indication)

No recommendation

Report all clinically significant postvaccination reactions to the Vaccine Adverse Event Reporting System (VAERS). Reporting forms and instructions on filing a VAERS report are available at www.vaers.hhs.gov or by telephone, 800-822-7967.

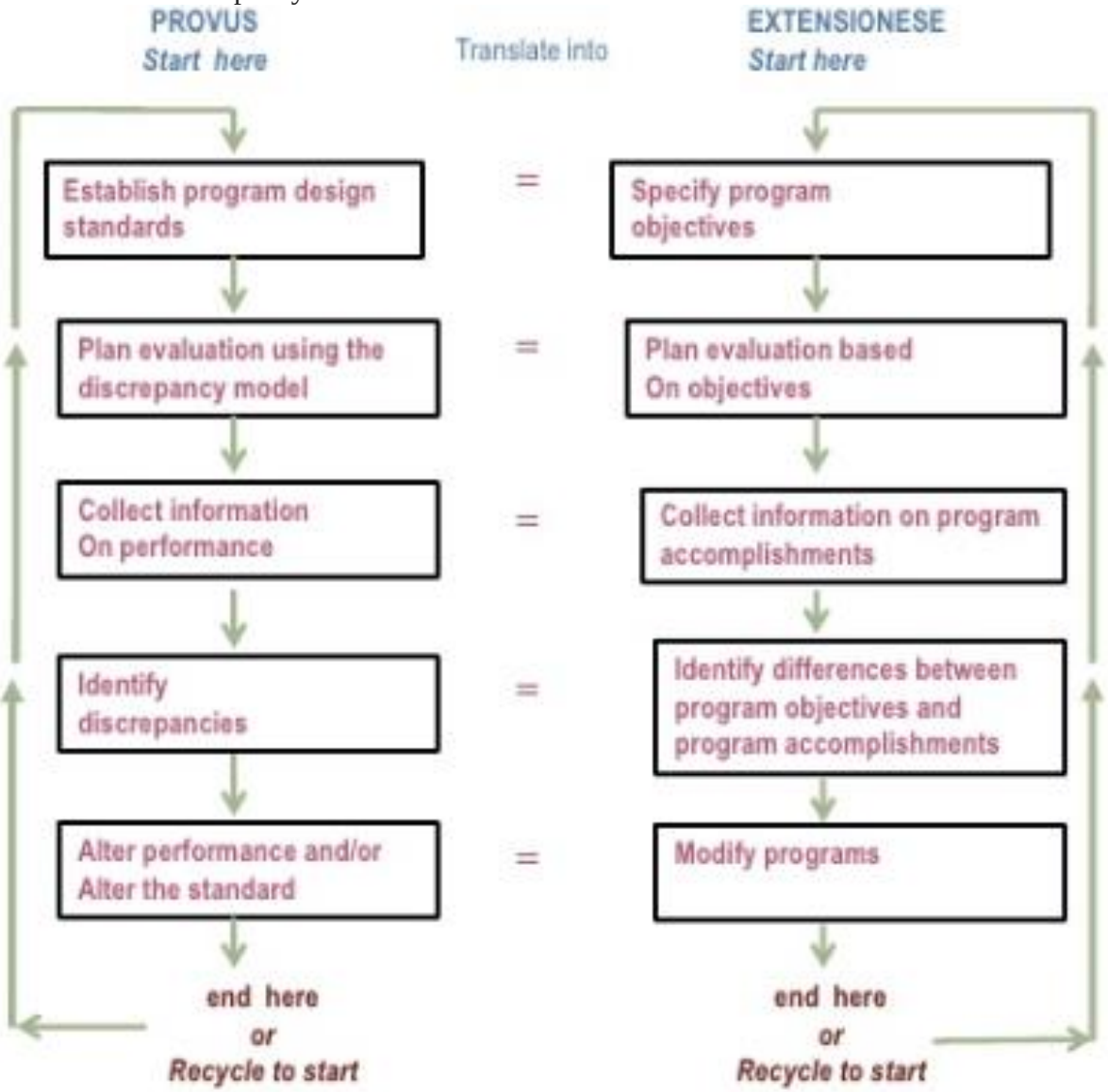
Information on how to file a Vaccine Injury Compensation Program claim is available at www.hrsa.gov/vaccinecompensation or by telephone, 800-338-2382. To file a claim for vaccine injury, contact the U.S. Court of Federal Claims, 717 Madison Place, N.W., Washington, D.C. 20005; telephone, 202-357-6400.

Additional information about the vaccines in this schedule, extent of available data, and contraindications for vaccination is also available at www.cdc.gov/vaccines or from the CDC-INFO Contact Center at 800-CDC-INFO (800-232-4636) in English and Spanish, 8:00 a.m. - 8:00 p.m. Eastern Time, Monday - Friday, excluding holidays.

Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.

The recommendations in this schedule were approved by the Centers for Disease Control and Prevention's (CDC) Advisory Committee on Immunization Practices (ACIP), the American Academy of Family Physicians (AAFP), the America College of Physicians (ACP), American College of Obstetricians and Gynecologists (ACOG) and American College of Nurse-Midwives (ACNM).

Appendix G: Provus discrepancy evaluation



Appendix H: PCV13 Vaccine information statement

VACCINE INFORMATION STATEMENT

Pneumococcal Conjugate Vaccine

What You Need to Know

Many Vaccine Information Statements are available in Spanish and other languages. See www.immunize.org/vis

Hojas de información sobre vacunas están disponibles en español y en muchos otros idiomas. Visite www.immunize.org/vis

☑ **Your doctor recommends that you, or your child, get a dose of PCV13 today.**

1 Why get vaccinated?

Pneumococcal conjugate vaccine (called PCV13 or Prevnar® 13) is recommended to protect infants and toddlers, and some older children and adults with certain health conditions, from **pneumococcal disease**.

Pneumococcal disease is caused by infection with *Streptococcus pneumoniae* bacteria. These bacteria can spread from person to person through close contact.

Pneumococcal disease can lead to severe health problems, including pneumonia, blood infections, and meningitis.

Meningitis is an infection of the covering of the brain. Pneumococcal meningitis is fairly rare (less than 1 case per 100,000 people each year), but it leads to other health problems, including deafness and brain damage. In children, it is fatal in about 1 case out of 10.

Children younger than two are at higher risk for serious disease than older children.

People with certain medical conditions, people over age 65, and cigarette smokers are also at higher risk.

Before vaccine, pneumococcal infections caused many problems each year in the United States in children younger than 5, including:

- more than 700 cases of meningitis,
- 13,000 blood infections,
- about 5 million ear infections, and
- about 200 deaths.

About 4,000 adults still die each year because of pneumococcal infections.

Pneumococcal infections can be hard to treat because some strains are resistant to antibiotics. This makes **prevention through vaccination** even more important.

2 PCV13 vaccine

There are more than 90 types of pneumococcal bacteria. PCV13 protects against 13 of them. These 13 strains cause most severe infections in children and about half of infections in adults.

PCV13 is routinely given to children at 2, 4, 6, and 12–15 months of age. Children in this age range are at greatest risk for serious diseases caused by pneumococcal infection.

PCV13 vaccine may also be recommended for some older children or adults. Your doctor can give you details.

A second type of pneumococcal vaccine, called PPSV23, may also be given to some children and adults, including anyone over age 65. There is a separate Vaccine Information Statement for this vaccine.

3 Precautions

Anyone who has ever had a life-threatening allergic reaction to a dose of this vaccine, to an earlier pneumococcal vaccine called PCV7 (or Prevnar), or to any vaccine containing diphtheria toxoid (for example, DTaP), should not get PCV13.

Anyone with a severe allergy to any component of PCV13 should not get the vaccine. Tell your doctor if the person being vaccinated has any severe allergies.

If the person scheduled for vaccination is sick, your doctor might decide to reschedule the shot on another day.

Your doctor can give you more information about any of these precautions.

4 What are the risks of PCV13 vaccine?

With any medicine, including vaccines, there is a chance of side effects. These are usually mild and go away on their own, but serious reactions are also possible.

Reported problems associated with PCV13 vary by dose and age, but generally:

- About half of children became drowsy after the shot, had a temporary loss of appetite, or had redness or tenderness where the shot was given.
- About 1 out of 3 had swelling where the shot was given.
- About 1 out of 3 had a mild fever, and about 1 in 20 had a higher fever (over 102.2°F).
- Up to about 8 out of 10 became fussy or irritable.

Adults receiving the vaccine have reported redness, pain, and swelling where the shot was given. Mild fever, fatigue, headache, chills, or muscle pain have also been reported.

Life-threatening allergic reactions from any vaccine are very rare.

5 What if there is a serious reaction?

What should I look for?

- Look for anything that concerns you, such as signs of a severe allergic reaction, very high fever, or behavior changes.

  Signs of a severe allergic reaction can include hives, swelling of the face and throat, difficulty breathing, a fast heartbeat, dizziness, and weakness. These would start a few minutes to a few hours after the vaccination.

What should I do?

- If you think it is a severe allergic reaction or other emergency that can't wait, call 9-1-1 or get the person to the nearest hospital. Otherwise, call your doctor.
- Afterward, the reaction should be reported to the Vaccine Adverse Event Reporting System (VAERS). Your doctor might file this report, or you can do it yourself through the VAERS web site at **www.vaers.hhs.gov**, or by calling **1-800-822-7967**.

VAERS is only for reporting reactions. They do not give medical advice.

6 The National Vaccine Injury Compensation Program

The National Vaccine Injury Compensation Program (VICP) is a federal program that was created to compensate people who may have been injured by certain vaccines.

Persons who believe they may have been injured by a vaccine can learn about the program and about filing a claim by calling **1-800-338-2382** or visiting the VICP website at **www.hrsa.gov/vaccinecompensation**.

7 How can I learn more?

- Ask your doctor.
- Call your local or state health department.
- Contact the Centers for Disease Control and Prevention (CDC):
  - Call **1-800-232-4636** (**1-800-CDC-INFO**) or
  - Visit CDC's website at **www.cdc.gov/vaccines**

Vaccine Information Statement (Interim)

PCV13 Vaccine

2/27/2013

42 U.S.C. § 300aa-26

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Concluding Essay

Nurses have been integral to the healthcare system for a long time and their roles are fairly well defined and understood by consumers of healthcare. However, as nurses continue to expand their roles, there are increasing uncertainties as to the multiple and varied roles of nurses.

The roles and responsibilities of APRN's (Advanced Practice Registered Nurses) are to improve the health of their patients and to promote healthcare as a whole. An APRN improves the health of their patients by providing excellent clinical care through critical appraisal of new data to incorporate into patient care while navigating the complex healthcare system. An APRN, specifically a nurse practitioner, must be more than just a great clinician. In order to promote overall improvements in healthcare, APRNs must care for their patients as well as the "dynamics" of healthcare. This requires skills in organizational and systems leadership, healthcare policy and advocacy, and improving inter-professional collaboration with other members of the healthcare field not just for themselves but for APRNs in general.

The roles of doctoral prepared APRNs are not well understood, mostly due to a lack of understanding and experience of working with APRNs who hold a doctorate. Most people both inside and outside of the healthcare field do not know our roles well because they have not had sufficient exposure to us and our skill sets to really understand what we bring to the table. As our numbers grow and we become more involved in healthcare this lack of understanding should lessen. As APRNs get more involved in providing healthcare and patient advocacy, we will be better understood as a profession. Doctoral APRNs are on the forefront of expanding traditional roles of nursing and assuming leadership roles in clinical decision making that is integral to patient care delivery.

My plans for obtaining my DNP degree has been first and foremost to be a great practitioner. I highly value the training that I received on critical appraisal of the evidence and I plan to use it directly on patient management decisions. While there is also a great need out there for nurse practitioners to take leadership roles in forming policy; that need will have to be filled by my colleagues. I do not know exactly what setting it will be yet but my future is going to involve direct patient care. I value the time that I spend with my patients face to face and plan to care for those who need me as long as I possibly can.