ABSTRACT

INCIDENCE OF STREPTOCOCCUS PNEUMONIAE IN THE ELDERLY NURSING HOME PATIENT AFTER PNEUMOCOCCAL VACCINATION

Streptococcus Pneumoniae infections cause more than 100,000-135,000 hospitalizations per year and death occurs in 14% of hospitalized adults with the disease. Fatality rates from invasive pneumococcal infections are highest in the elderly and patients with co-morbid conditions such as chronic lung disease, heart disease, or diabetes. The Health Belief Model is the theoretical framework that guided this descriptive study. The model explains why individuals use health services or seek medical care. In this project, a sample of 128 elderly clients’ charts were used to find the incidence of newly diagnosed streptococcus pneumoniae infections after inoculation with the Pneumonia polysaccharide vaccine. Descriptive cross-tabulations with percentages were used for analysis. Results of the study showed that 109 (85%) of the 128 residents were inoculated with the Pneumonia polysaccharide vaccine. Of the 109 that received the Pneumonia polysaccharide vaccine, 3 (2.7%) acquired pneumonia. Of the 3 (2.7%) that acquired pneumonia after vaccination, 3 (100%) fell within the recommended parameters for re-inoculation. Of the 3 (2.7%) that acquired pneumonia after inoculation 3 (100%) received diagnosis after positive chest x-ray and 1 (33%) by culture and x-ray. These findings show evidence for the continual use of the Pneumococcal polysaccharide vaccine in the elderly or immunocompromised client. The findings also confirm the appropriateness of use of the Pneumococcal polysaccharide vaccine in future advanced nursing practice.

Cynthia Schaefer, BSN, RN

April 15, 2008
INVESTIGATIVE PROJECT

Cynthia D. Schaefer, BSN, RN

School of Nursing and Health Professions
Northern Kentucky University
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INCIDENCE OF STREPTOCOCCUS PNEUMONIAE IN THE ELDERLY NURSING HOME PATIENT AFTER PNEUMOCOCCAL VACCINATION

INVESTIGATIVE PROJECT

An investigative project submitted in partial fulfillment of the requirements for the degree of Master of Science of Nursing at Northern Kentucky University

By

Cynthia D. Schaefer, BSN, RN
Highland Heights, Kentucky

Director: Dr. Denise Robinson, Professor of Nursing
Highland Heights, Kentucky

2008
Cynthia Schaefer BSN, RN

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CHAPTER I
Review of Literature

Background and Significance

Streptococcus pneumoniae, also known as pneumococcus, can cause common illness such as sinus and ear infections. However, streptococcus pneumoniae can also cause life-threatening infections such as meningitis and pneumonia.

Pneumonia is an inflammatory illness of the lung that can be caused by a variety of organisms such as bacteria, viruses, fungi, or parasites. Pneumonia can also be caused by chemical or physical injury to the lungs such as by inhaling fumes or fragments of matter. Persons with pneumonia may exhibit a number of symptoms that include: cough, chest pain, difficulty breathing, shortness of breath, fatigue, or lethargy. To definitively diagnose pneumonia, a chest x-ray and or blood culture must be performed. Bacterial pneumonia is treated with antibiotics, while viral pneumonia does not typically require prescriptive interventions.

Pneumonia affects about 1,000,000 elderly each year and may prove fatal in up to 40% of those diagnosed. The Center for Disease Control (CDC, 2003) recommends that all persons who are over the age of 65, have a co-morbid condition such as heart disease or diabetes, or anyone residing in a long term care facility regardless of age, receive the pneumonia polysaccharide vaccine. There are over 80 serotypes of pneumococcus; the pneumonia polysaccharide vaccine targets 23 of these bacterial serotypes that may cause pneumonia.
Despite CDC recommendations, some argue that the pneumonia polysaccharide vaccine is not necessary because there are several bacteria not in the streptococci pneumoniae group that may cause pneumonia; plus, streptococcus pneumoniae bacteremias are relatively uncommon. The pneumonia vaccine is only effective when the bacteria Streptococcus pneumoniae get into the bloodstream (Jackson et al, 2003).

It has also been argued that since it is uncommon for bacteremias to occur, the pneumococcal polysaccharide vaccine does not protect the elderly from acquiring pneumonia. According to Jackson et al (2003), the pneumonia vaccine is ineffective for the elderly because pneumococcal bacteremias are uncommon and because the vaccine reduces the risk of contracting the disease by only about 50% (Jackson et al, 2003). However, even at 50%, prevention of morbidity and mortality from infectious diseases makes this immunization cost effective.

Although it is not clear if the 23-valent-pneumococcal-polysaccharide vaccine is in fact effective for the elderly, it has been shown to be associated with a significant reduction in the risk of pneumococcal bacteremias in this population. A study by Jackson et al (2003) resulted in a 44% reduction of pneumococcal bacteremias after the receipt of the pneumococcal polysaccharide vaccine. If indeed receiving the vaccine results in fewer deaths, the research related to the vaccine administration will be significant and should be shared with those who provide care to the elderly.
The emergence of antibiotic-resistant strains of streptococcal pneumoniae is now occurring, which further increases the importance of inoculation with the pneumococcal polysaccharide vaccine. Healthy People 2010 (healthypeople.gov, 2000) aim for 90% of the elderly and 60% of younger high-risk patients to be vaccinated. Health care providers must work to help this goal be obtained to assist with curtailing the mutation of and possibly even eradicating of these harmful bacteria.

Research Question

What is the incidence of newly diagnosed pneumonia in nursing home patients that have received the pneumococcal polysaccharide vaccine?

Other questions that were addressed are: If the vaccine was received, was it within parameters for re-inoculation? What co-morbidities exist, i.e. were the subjects already health compromised or frail? What was the level of mobility of the subjects, i.e. were they bedridden or actively mobile?

Conceptual Framework

The Health Belief Model (HBM) was developed in the late 1950s by a group of psychologists that worked for the United States Public Health Service. The psychologists focused on the effectiveness of attitudes and beliefs of individuals as related to health behaviors. According to Irwin Rosenstock (1965), one of the original developers of the HBM, the model does not attempt to provide a comprehensive explanation of all health action. Rather what is attempted is the specification of several variables that appear to contribute significantly to an understanding of behavior in the health area (Rosenstock, 1965).
The HBM has 4 concepts that help to explain or predict healthy behaviors: perceived susceptibility, perceived seriousness, perceived benefits of taking action and barriers to taking action, and cues to taking action (Rosenstock, 1965). Perceived susceptibility looks at one’s opinion of what chance he/she has of acquiring a condition while perceived seriousness looks at how serious an action or consequence may be. Perceived benefits looks at one’s belief in the efficacy of the advised action that can reduce the seriousness of an action while perceived barriers considers the tangible and psychological costs to taking the action. And finally, cues to action looks at strategies that activate one’s readiness to act. Anticipated outcomes relating this study to the HBM include: giving clients the ability to choose whether or not to receive the vaccination while helping them to understand the relation between inoculation with the pneumococcal vaccine and the possible consequences of acquiring a Streptococcus pneumoniae bacteremia.

Variables

In this study, variables were defined as follows:

**Nursing home resident** (conceptual): patients who reside in a nursing home.

**Nursing home residents** (operational): elderly patients who are over the age of 65 who reside at a long term care facility and that have received the pneumonia vaccine.

**Mobile nursing home resident** (conceptual): patients that are able to ambulate with or without assistive device, such as with a cane or walker, or are able to ambulate with or without assistance.
Mobile nursing home resident (operational): residents that move about freely throughout the facility, without assistance or with an assistive device such as a cane or walker.

Non-mobile nursing home resident (conceptual): patients who are bedridden or in a wheelchair who are unable to ambulate with or without assistance.

Non-mobile nursing home resident (operational): residents that are bedridden or wheelchair bound throughout all or most of the day.

Pneumonia (conceptual): Inflammation of the lungs with consolidation (Pneumonia, 1997-2005).

Pneumonia (operational): Positive chest x-ray showing consolidation.

Pneumonia Vaccine (operational): PPV or Pneumococcal polysaccharide vaccine; vaccination that protects against 23 types of pneumococcal bacteria (Center for Disease Control, 1997).

Limitations

Limitations included inadequate documentation of if and when vaccination was given and possible misinformation from residents or those with poor short-term memories as these resident’s are poor historians.
CHAPTER II

Introduction

This chapter will discuss the pneumococcal polysaccharide vaccine and the research done identifying its effectiveness.

Pneumonia affects about 1 million elderly each year and is the sixth leading cause of death in the United States. The pneumococcal polysaccharide vaccine is a once (possibly twice) in a lifetime inoculation. The vaccine is highly recommended for the immunocompromised, the elderly (speciously the hospitalized or institutionalized), those who are HIV +, Diabetics, organ transplant recipients, and many others as well. The CDC recommends the pneumococcal polysaccharide vaccine to that all persons who are over the age of 65, have a co-morbid condition such as heart disease or diabetes, or anyone residing in a long term care facility regardless of age (CDC, 2003). Healthy People 2010 are aiming for 90% of the elderly and 60% of younger high-risk patients to be vaccinated (healthypeople.gov, 2000). The Pneumococcal polysaccharide vaccine has been shown to reduce the risk of pneumococcal bacteremias, and yet according to the CDC in 2003 only about 64% of those over the age of 65 received the vaccine (CDC, 2003).

Although some research articles show that the vaccine is ineffective for the elderly as the incidence of the bacteria of Streptococcus Pneumoniae getting into the bloodstream is relatively uncommon, the CDC shows that it is effective in 97% of invasive disease caused by vaccine serotypes. The CDC also shows on
their website that the Pneumococcal polysaccharide vaccine is overall 73% effective against pneumonia in general (CDC, 2003).

Many elderly people believe they are unlikely to get the flu and don’t realize they need the pneumonia vaccine. Even with treatment 30-40 percent of deaths among the elderly are due to pneumonia (Zimmerman, Santibanez, & Fine, 2003). These numbers are high due to the fact that many do not receive the vaccine because they have refused it, they do not realize that it is available, or because it is not offered to them. Only 54 % of elderly have received the vaccine according to the Agency for Healthcare Research and Quality (Mieczhowski, 2002). It is also reported that vaccination numbers for blacks and Hispanics are even lower than that of white elderly clients (Zimmerman et al, 2003). About 34 % of those who had never received the pneumonia vaccine did not know that they needed it, 22 percent believed they were not likely to contract pneumonia, and 18 percent said that their doctor had not recommended it (Zimmerman, Santibanez, and Fine, 2003).

The Pneumococcal polysaccharide vaccine is recommended for all immunocompetent individuals who are age 65 years or older or otherwise at increased risk for pneumococcal disease (DiGuiseppi, 1995). However, there is insufficient evidence to recommend for or against pneumococcal vaccine for high-risk immunocompromised individuals, but recommendations for vaccinating these persons may be made on other grounds (DiGuiseppi, 1995). Pneumococcal diseases are not currently reportable conditions in the United States, even though they are a significant cause of both mortality and morbidity.
Pneumococcal diseases account for nearly 18 percent of community acquired pneumonias. The highest case fatality rates from invasive pneumococcal infections occur in the elderly (30-43 percent) and patients with co-morbid conditions (25-27 percent) (DiGuiseppi, 1995). More recently new pneumococcal strains are surfacing which have become or are drug resistant. It is estimated that approximately 15 percent of pneumonias are now drug resistant.

The CDC estimates that the incidence of pneumonia bacteremias is 15-30 cases per 100,000 individuals, and 50-83 cases per 100,000 in the elderly population (CDC, 2003). However, Streptococcus pneumoniae (pneumococcus) is the leading cause of serious community acquired infections, especially pneumonia, the sixth leading cause of death in the United States (Flanders, 2001). It has been reported that 75 percent of individuals hospitalized with the diagnosis of pneumococcal infection have been hospitalized in the previous 3-5 years. Flanders (2001), suggested that hospital based pneumococcal vaccinations should be performed in all individuals who are considered high risk. Patients ≥ 65 years of age, or patients with certain chronic illnesses, including chronic cardiovascular disease, chronic pulmonary disease, diabetes, alcoholism, chronic liver disease, and functional or anatomic asplenia, are deemed high risk (Flanders; 2001). He also recommended that, immunocompromised patients (due to HIV infection, leukemia, lymphoma, long term steroid use, or organ transplantation, among other causes) and any patient
admitted with a diagnosis of community-acquired pneumonia be vaccinated (Flanders, 2001).

**Barriers to vaccination**

The Agency for Healthcare Research and Quality reports that despite national goals to inoculate 90 percent of elderly and 60 percent of non-elderly at-risk adults against pneumonia by the year 2010, pneumonia vaccination rates remain low, and racial disparities persist (Mieczhowski, 2002). Numbers show that 57% of white elderly have been immunized versus a mere 36% of blacks and 35% of Hispanics (Mieczhowski, 2002). Studies from University of Pittsburgh School of Medicine and University of Pittsburgh Medical Center (Mieczhowski, 2002) have shown that doctors believe that the pneumonia vaccine is safe and efficacious. However, between 42 and 57 percent of doctors in primary care said that it was difficult to determine patient immunization status, and many did not agree on what to do if a patient’s vaccination status was unknown. According to the Agency for Healthcare Research and Quality (2001), unvaccinated adults are often unaware of the benefits of the Pneumonia vaccine.

Based on patient self-report, 55% of all elderly have been immunized against Pneumococcus. Both the Agency of Healthcare Research and Quality and the University of Pittsburgh School of Medicine have recently conducted studies examining the accuracy of patient self-report (Mieczhowski, 2002). These parallel studies ended with similar results. The researchers found that sensitivity—the ability to recall having the vaccine—when compared with records of the primary care physician was high for both the influenza vaccine and
pneumococcal vaccine, but specifically the ability to accurately recall not having the vaccine was lower (Zimmerman et al, 2003). Based on these findings it can be concluded that physicians can confidently recommend vaccination to all adults who have denied receiving the vaccination. Both the Agency of Healthcare Research and Quality and the University Of Pittsburgh School Of Medicine’s studies also found that common reasons for not being vaccinated were: their physician did not recommend the vaccination; they did not know that the shot would be beneficial, and they did not think it probable that they would indeed acquire Pneumonia.

Cost remains a potential barrier to widespread immunization, although Medicare continues to and has paid for the vaccine since 1981. Many privately owned insurance companies pay for the Pneumococcal polysaccharide vaccine as well if it is deemed medically necessary for younger high-risk patients. Insurance companies have realized that the prevention of morbidity and mortality that the Pneumococcal polysaccharide vaccine provides makes this immunization cost effective.

There are other barriers to widespread vaccination such as missed opportunities to vaccinate adults, lack of vaccination delivery systems in the private/public sector, patient/provider fears concerning the vaccines adverse events following vaccine, and lack of awareness among patients and providers of seriousness of pneumococcal disease and benefits of the Pneumococcal polysaccharide vaccine. All of these barriers contribute to the mere 64% of those
whom are 65 and over being vaccinated. There is much work to be done to achieve the goals of Healthy People 2010.

Conclusion

After this review of literature was performed, it is ascertained that similar views have been expressed by all or most of the studies reviewed. Although the cost of vaccine can be a potential barrier to widespread immunization, research has shown that the prevention of morbidity and mortality from infectious diseases makes immunizations cost effective. Taking a better safe than sorry approach can hopefully decrease the incidence of pneumoniana infections. Therefore, the purpose of this study is to determine the incidence of newly diagnosed Pneumonia in nursing home patients that have received the Pneumococcal polysaccharide vaccine.
CHAPTER III

Procedures and Methods

This section will explain in detail the procedures and measures used to gather data to find the significance of newly diagnosed pneumonia in nursing home patients that have received the pneumococcal polysaccharide vaccine. Areas that will be addressed are as follows: research design, setting, sample, instruments, human subject protection, and data collection.

Research Design

The study was a descriptive study because there was no treatment administered to any subjects and because only charts of elderly clients who received the pneumococcal polysaccharide vaccine were included for review. According to Nieswiadomy (2002), the difference between descriptive versus experimental research is that in exploratory studies little is known about the phenomenon of interest while in a descriptive study phenomena are described (Nieswiadomy, 2002).

Setting

The research study was performed at a skilled nursing and rehabilitation facility. The nursing and rehabilitation center in this study caters to the client that is in need of skilled care services for a designated time frame or those who are in need of long term care services. The nursing and rehabilitation facility is a 130-bed facility, but is currently undergoing construction that will add 20 skilled beds.
Sample

The subjects for this study were elderly patients over the age of 65 who reside in a nursing home for long-term care in a small rural community near a large Midwestern metropolitan area. Elderly became eligible for the study by residing at the named facility. A sample of 130 elderly clients was used, which was all of the elderly clients who reside at the named facility. Excluded from this study were those who were not yet 65 years in age residing at the facility as this study is looked at the incidence of streptococcus pneumonia in the elderly nursing home client.

Instruments

Data concerning pneumonia vaccination was taken through retrospective chart review. The researcher reviewed records for each individual or resident of the nursing home using a data collection tool (See Appendix A) that was developed by the researcher. The data collection tool: helped to determine: whether or not the client was over the age of 65, whether or not co morbidities existed, what the client’s level of mobility was, was the vaccine within recommended parameters for re-inoculation, were there any positive streptococcal pneumonias since immunization (if so has it been at least one month since inoculation) and whether or not diagnostic tests such as culture or chest x-ray confirmed the diagnosis.

Data Collection

The data was collected and recorded by the researcher using a data collection tool (See Appendix A and B). A current list of residents was
generated and the researcher then pulled each chart individually for review. To keep from disrupting the facility, charts were reviewed in a separate but empty office that resides behind the central nursing station.

Human Subject Protection

This project was approved by the Northern Kentucky University’s internal review board and also by the facility that this research was performed in prior to the study being performed (See Appendix C and D). No risk to any of the subjects occurred, as this was merely a chart reviewing process. All information that was collected from chart reviews has been and will be kept confidential. No names or other identifying data was used or disclosed in this study. All data reported, was recorded as group data and the utilized facility was not identified in any manner.

Data Analysis

All data collected was entered into a spreadsheet and reviewed for outliers and correct entry. The sample of nursing home residents was described using descriptive statistics. Descriptive cross-tabulations with percentages were used for analysis. A 95% confidence interval was intended to be the statistical procedure for this descriptive study. However, due to the low sample number, it was determined by the researcher and statistician that there is not a statistical procedure that could be used for such low numbers.
CHAPTER IV.

Presentation, Analyses, and Interpretation of Data

The following table shows how many residents were vaccinated with the Pneumococcal polysaccharide vaccine, how many residents were diagnosed with a positive pneumonia, and how many residents were diagnosed with a positive pneumonia after inoculation with the Pneumococcal polysaccharide vaccine.

Table 1

<table>
<thead>
<tr>
<th>Vaccinated</th>
<th>Positive Pneumonia</th>
<th>Positive Pneumonia after PPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes 109</td>
<td>Yes 5</td>
</tr>
<tr>
<td>No</td>
<td>Yes 5</td>
<td>No 123</td>
</tr>
<tr>
<td></td>
<td>No 19</td>
<td>No 2</td>
</tr>
<tr>
<td>Total</td>
<td>Total 128</td>
<td>Total 5</td>
</tr>
</tbody>
</table>

Answers to Research Questions

What is the incidence of newly diagnosed pneumonia in the nursing home patients that have received the pneumococcal polysaccharide vaccine? If the vaccine was received, was it within the recommended parameters for re-inoculation? Table 2 shows that of the 5 positive pneumonias in this nursing home population, 3 had received the Pneumococcal polysaccharide vaccine.
Table 2 also shows that of the 3 that acquired pneumonia after vaccination, 3 were within recommended parameters for re-inoculation.

Table 2

PPV Status

<table>
<thead>
<tr>
<th>Positive Pneumonia After PPV</th>
<th>PPV within parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Yes</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
</tr>
<tr>
<td>Yes</td>
<td>3</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
</tr>
</tbody>
</table>

What co-morbidities exist? Table 3 shows co-morbidities of the 5 residents who acquired pneumonia. Three out of 5 have heart disease and 3 out of five have diabetes. Two out of the 5 have lung disease while 0 out of 5 were in an immunosuppressed or immunocompromised state.

Table 3

Co morbidities of those who had positive pneumonia

<table>
<thead>
<tr>
<th>Heart Disease</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes</td>
<td>3</td>
</tr>
<tr>
<td>Lung Disease</td>
<td>2</td>
</tr>
<tr>
<td>Immunosuppressed</td>
<td>0</td>
</tr>
</tbody>
</table>
What was the level of mobility of the subjects? Table 4 shows that 3 out of 5 were actively mobile while 2 out the 5 were non-mobile.

**Table 4**

<table>
<thead>
<tr>
<th>Mobility</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile</td>
<td>3</td>
</tr>
<tr>
<td>Non-mobile</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5</strong></td>
</tr>
</tbody>
</table>

Results of the study show that one hundred nine (85%) of 128 residents that reside in the targeted facility have been vaccinated with the Pneumococcal polysaccharide vaccine. Five (3.9%) of the 128 residents have indeed had a positive pneumonia diagnosis. Three (2.7%) of 109 that were vaccinated with the Pneumococcal polysaccharide vaccine, had a positive pneumonia diagnosis after inoculation. Three (100%) of the patients that had a positive pneumonia diagnosis after inoculation with Pneumococcal polysaccharide vaccine, had vaccination status that was within the recommended parameters for re-inoculation (while 0% were not within recommended parameters for re-inoculation). Of the five (3.9%) out of 128 residents that indeed had a positive pneumonia, all five (100%) had a confirming chest x-ray, while three (60%) of the five had positive blood cultures to confirm diagnosis as well. The five (3.9%) out of 128 residents with positive pneumonia diagnosis had the following co-morbidity results:

- three (60%) out of 5 had heart disease,
three (60%) out of 5 had diabetes mellitus,

- two (40%) out of 5 had lung disease,
- zero (0%) out of 5 were or are considered immunosuppressed.
- two (40%) out of 5 had only one co morbidity
- three (60%) out of 5 had 2 co morbidities.

As for mobility, three (60%) out of 5 were actively mobile while two (40%) out of 5 were considered non-mobile.

This study has shown a low amount of diagnosed streptococcal pneumonias in this particular nursing home population, five (3.9%) diagnoses out of a total 128 residents and three (2.7%) diagnoses out of the 109 residents who were vaccinated. However, since the sample size was not large enough to perform statistical analysis, no concrete conclusions can be drawn from any of the above data.
CHAPTER V.

Discussion and Implications

Discussion of Findings

The results of this study are not as useful since the sample size was not large enough. The reason for the small sample size was due to the lower than anticipated number of positive pneumonias that were reported or recorded in this particular nursing home.

Even with the small sample size however, the results of this study show that the pneumococcal polysaccharide vaccine was helpful in preventing bacteremic disease in both the elderly and or immunocompromised in this particular nursing home sample.

Discussion of Study Results

It is important to note that this study revealed that 85% of the 128 residents that reside in this particular nursing home, or 109, had been inoculated with the pneumonia vaccine. Of the 109 residents that have been inoculated, 88%, or 96 of 109, fall within the recommended parameters for re-inoculation. The 15%, or 19 residents, that have never been inoculated were offered the vaccine but refused for various reasons. With the low incidence of pneumococcal disease in this particular nursing home sample, the pneumococcal polysaccharide vaccine should continue to be recommended for both the elderly and or immunocompromised in the nursing home setting.
Implications for Research, Theory, and Practice

Research

The research that was performed in this study should be repeated with a larger sample size in order to definitively test the efficacy of the pneumococcal polysaccharide vaccine in the elderly nursing home patient. If the study was indeed repeated, the researcher would need to collect data on more than one nursing home to ensure a larger sample size and then compare the data of all nursing facilities involved.

Theory

Relating to the HBM, it appears that many elderly or immunocompromised in this facility do understand or can comprehend the perceived seriousness of contracting a pneumococcal bacteremia and that a huge benefit of being inoculated with the pneumococcal polysaccharide vaccine is that their susceptibility to pneumococcal bacteremia is drastically reduced. Further research is needed to determine just how to immunize all other elderly or immunocompromised that would indeed benefit from administration of the pneumococcal polysaccharide vaccine in this setting.

Practice

Based on the performed research, data supports the need to continue to encourage both the elderly and immunocompromised to get immunized with the Pneumococcal polysaccharide vaccine.
Conclusion

Streptococcus pneumoniae can cause life-threatening infections such as meningitis and pneumonia. Pneumonia affects about 1,000,000 elderly each year and may prove fatal in up to 40% of those diagnosed (CDC, 2003). Although it is not clear if the 23-valent-pneumococcal-polysaccharide vaccine is in fact effective for the elderly, it has been shown to be associated with a significant reduction in the risk of pneumococcal bacteremias in this population. Cost of widespread vaccination continues to be a potential barrier, however, the prevention of morbidity and mortality from infectious disease makes the immunization more than cost effective to many eyes. Further research is warranted in this area to increase the awareness of and prevent serious pneumococcal disease in the United States. All healthcare professionals need to make it a priority to ensure that the pneumococcal polysaccharide immunization is available to and is administered within the recommended parameters for the immunocompromised and or elderly.
### APPENDIX A

Data Collection Tool

<table>
<thead>
<tr>
<th>Age</th>
<th>Vaccine within parameters:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any positive pneumonias</td>
<td>Blood CX CXR</td>
</tr>
<tr>
<td>Diagnostic tests to confirm:</td>
<td>Blood CX CXR</td>
</tr>
<tr>
<td>Co-morbidities</td>
<td></td>
</tr>
<tr>
<td>Mobility</td>
<td></td>
</tr>
</tbody>
</table>
## APPENDIX B

### Data Collection Tool Spread Sheet

<table>
<thead>
<tr>
<th>ID #</th>
<th>Age</th>
<th>Comorbs</th>
<th>Mobility</th>
<th>Received Pneumonia Vaccine</th>
<th>Is vaccine within Parameters</th>
<th>Any Positive Pneumonias</th>
<th>Diagnostic tests to confirm Strep Pneu</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1=Heart Disease 2=Diabetes 3=Lung Disease 4=Immunocompromised</td>
<td>1=Mobile 2=non-mobile</td>
<td>0=No 1=Yes</td>
<td>0=No 1=Yes</td>
<td>0=No 1=Yes</td>
<td>1=Culture 2=X-ray</td>
</tr>
</tbody>
</table>
APPENDIX C

IRB Approval -Schaefer IRB08-124
Lisa Davis-Roberts <davisroberts@nku.edu>
View Friday, February 15, 2008 1:18:24 PM
To: cynthiadawnschaefer@yahoo.com
Cc: Denise Robinson <ROBINSON@nku.edu>; Lisa Davis Roberts
davisroberts@nku.edu

This email is to let you know that your IRB application has been approved and you may begin your research. The official letter will be coming from my office shortly. If you have any questions feel free to contact me at any time.

Lisa Davis Roberts
IRB Administrator
AC 616
572-5137
APPENDIX D

January 30, 2008

XXXX Nursing and Rehabilitation Facility
XXX XXXXXXX XX
XXXXXXXXXX, XX XXXXX
XXX-XXX-XXXX

To whom it may concern:

XXXX does not have an internal review board or internal review board process. I, XXXXXXXX XXX, assistant administrator of XXXX, give Cynthia Schaefer permission to review charts of nursing home residents for research purposes at this facility as long as: No identifying data will be recorded, thus maintaining resident anonymity and confidentiality.

If there are any questions or concerns please feel free to notify me at XXX-XXX-XXXX.

Sincerely,

XXXXXXXX XXX
Assistant Administrator XXXX
References


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http://www.ahpr.gov/research/jun02/0602RA16.htm
www.ahpr.gov Web site:
http://www.ahpr.gov/research/jun02/0602RA16.htm


http://links.jstor.org/sici?sici=0026-3745%28196607%2944%3C94%3AWPUHS%3E2.0.CO%3B2-U

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VITA

Cynthia D. Schaefer BSN, RN

EDUCATION

2004  BSN  University of Missouri St. Louis
       St. Louis, MO

1996  ADN  Lincoln University
       Jefferson City, MO

PROFESSIONAL EXPERIENCE

2006-2008  Clinical Nursing Instructor
            Northern Kentucky University
            Highland Heights, KY

2000-2003  Substitute School Nurse
            Muscatine Community Schools
            Muscatine, IA

2001-2003  Clinical Nursing Instructor
            Eastern Iowa Community College District
            Davenport, IA

1999-2003  Staff Nurse, Intensive Care/Emergency Room
            Unity Hospital
            Muscatine, IA

2001-2002  Staff Nurse, Home Care
            Unity Home Care
            Muscatine, IA

1996-1998  Staff Nurse, Telemetry
            Phelps County Regional Medical Center
            Rolla, MO