Immunizations and Patients with Chronic Kidney Disease (CKD)

Influenza
Pneumococcal
Hepatitis B
Vaccinating Patients with CKD

- Cardiovascular disease is the leading cause of death among patients with CKD.
- Infectious diseases are the **second** most common cause of death among patients with CKD.
Vaccinating Patients with CKD

- Account for a large portion of hospitalizations among patients on dialysis
- CKD patients have a decreased immune response
INFLUENZA
Influenza

• Centers for Disease Control and Prevention (CDC)
  – 5-20% of the population contracts the flu
  – More than 200,000 people are hospitalized from complications of the flu
  – Approximately 36,000 people die from the flu
What is Influenza?

- Contagious respiratory illness
- Virus replicates in the respiratory tract
- Shedding of the virus occurs in respiratory secretions for 5-10 days
Influenza Epidemiology

- Human and animal hosts
- Seasonal pattern peaking between December and March
- Transmitted 2-3 days before onset of symptoms and 4-5 days after symptom onset
Influenza Clinical Features

- Fever
- Headache
- Extreme tiredness
- Dry cough
- Sore throat
- Runny or stuffy nose
- Muscle aches
- Stomach symptoms
  - Nausea
  - Vomiting
Influenza Complications

• Pneumonia and bacterial infections
• Rye Syndrome
• Respiratory and cardiac ailments
• Worsening of chronic medical conditions (i.e. heart failure, asthma, diabetes)
• Death
Vaccine Delivery in ESRD

- Study looked at Influenza vaccine delivery and effectiveness in ESRD
- Utilized USRDS data for all Medicare patients with ESRD
Vaccine Delivery in ESRD

• RESULTS:
  – Vaccination rates in the ESRD population were less than 50% for the 2 study seasons (97/98 and 98/99)
  – Rates were lower in non-white, women, younger patients, and peritoneal dialysis patients
  – Influenza vaccination was associated with a lower risk of hospitalization and death
The Value of Vaccination in CKD

- Reviewed the effectiveness of vaccinations in patients with CKD
The Value of Vaccination in CKD

- Some vaccines (like influenza) in usual doses provide protection.
- Other vaccines (hepatitis B and pneumococcal) may require more frequent dosing to maintain protective antibody titers.
The Value of Vaccination in CKD

- Centers with vaccination protocols have demonstrated reduced infection rates and decreased morbidity and mortality.
- Vaccination is a readily available intervention and appears to be underutilized in patients with CKD.
Preventing the Flu

• The single best way to prevent the flu is to

GET THE FLU SHOT!

 Patients and staff should be immunized each flu season!
Preventing the Flu – 2 types of vaccines

PATIENTS

• The “flu shot” - patients with CKD can only receive the inactivated vaccine (containing killed virus)
Preventing the Flu – 2 types of vaccines

STAFF

• The nasal-spray flu vaccine – vaccine made with live, weakened flu viruses (live attenuated influenza virus).
• Approved for use in healthy people 5-49 years of age who are not pregnant.
When to give the Flu Shot

- October to November is the best time to get vaccinated
- December or later can be beneficial
- Season runs from early October to as late as May

Remember: The flu shot is given each year
Strategies to Improve Facility Influenza Rates

- Facility procedure for ordering vaccine from the manufacturer in a timely manner
- Systemic offering of the vaccine to patients and staff (possible standing orders)
- Educate patients and staff
- Address concerns and “myths”
- Provider (MD, NP, PA) recommendation
Pneumococcal
Pneumococcal

- Pneumococcal disease kills more people in the United States each year than all other vaccine-preventable diseases combined
What is Pneumococcal?

- Pneumococcal caused by the bacteria *Streptococcus pneumoniae*, also known as pneumococcus
Pneumococcal Epidemiology

- *Streptococcus pneumoniae* is a human pathogen.
- Pneumococci reservoir is the nasopharynx of asymptomatic human carriers.
• Major clinical syndromes of pneumococcal disease include:
  – Pneumonia
  – Bacteremia
  – Meningitis
Pneumococcal Pneumonia

- Most common clinical presentation of pneumococcal disease
- Estimated 175,000 hospitalized cases each year
- Common bacterial complication of influenza

You can catch pneumonia as a result of the flu
Pneumococcal Pneumonia

- Incubation period: 1-3 days
- Transmission occurs via respiratory droplets
- Accounts for up to 36% of adult community-acquired pneumonia and 50% of hospital-acquired pneumonia
- Case-fatality rate is 5-7% (higher in elderly)
Pneumococcal Pneumonia
Clinical Features

- Fever & chills
- Pleuritic chest pain
- Productive cough
- Dyspnea
- Malaise
- Weakness
- Hypoxia
- Tachypnea
Pneumococcal Pneumonia Complications

- Empyema (i.e. infection of the pleural space)
- Pericarditis
- Endo-bronchial obstruction
Preventing Pneumococcal Pneumonia

• The best way to prevent pneumococcal disease is to

GET THE Pneumococcal Vaccine!
Who Should Get Immunized?

- People age 65 or older
- People with:
  - Kidney disease
  - Lung disease
  - Heart disease
  - Liver disease
  - Diabetes
  - Sickle cell
  - HIV

ALL OF OUR PATIENTS
When to Give the Pneumonia Vaccine

- Anytime of the year
  - Winter
  - Spring
  - Summer
  - Fall
- Can be given at the same time the flu shot is given
When to Give the Pneumonia Vaccine

• According to the CDC, most people only need ONE shot. However revaccination is suggested for persons with:
  – Immunosuppression
  – Chronic renal failure
  – Nephrotic syndrome
  – Transplant
  – Persons vaccinated at < 65 years of age
When Should Revaccination Occur?

• The second dose should be administered five or more years after the first dose.
Strategies to Improve Pneumococcal Immunization Rates

- Facility procedure for maintaining vaccine “on hand”
- Systemic offering of the vaccine to patients (standing orders)
- Educate staff on vaccination and revaccination protocols
- Educate patients
- Address concerns and “myths”
- Provider recommendation
Hepatitis B

- According to the CDC, there are > 200 million carriers of Hepatitis B worldwide

- United States:
  - Total Infections: 78,000/year
  - Current carriers: > 1 million
  - New carriers: > 5,000/year
  - Death: 5,000/year

- Leads to 80% of hepatocellular carcinomas
What is Hepatitis B?

• Hepatitis B is a contagious virus that infects the liver
• Virus is found in blood and body fluids of people with Hepatitis B
Hepatitis B Epidemiology

- Human host
- Transmission: Bloodborne
- Communicability: 1-2 months before and after onset of symptoms
- May retain infectivity for at least 1 month at room temperature (Hepatitis B virus has been detected in dialysis centers on clamps, scissors, & dialysis machines)
Hepatitis B Clinical Features

- Nonspecific prodrome of fever, malaise, headache, myalgia
- Illness not specific for hepatitis B
- At least 50% of infections asymptomatic
Hepatitis B Complications

- Fulminant hepatitis
- Hospitalization
- Cirrhosis
- Hepatocellular carcinoma
- Death
Hepatitis B and Dialysis

• In 1977 factors that promote Hepatitis B transmission among hemodialysis patients were identified.
• Recommendations for control were published.
Hepatitis B Recommendations

- Recommendations include:
  - Monthly testing of all susceptible patients for Hepatitis B surface antigen (HBsAg)
  - Placement of patients with a positive HBsAg in a separate room
Hepatitis B Recommendations

• Recommendations include:
  – Assigning staff members to patients with positive HBsAg and avoiding immunocompromised patients during the same shift.
  – Designating dialysis equipment to patients with positive HBsAg and avoiding equipment shared with immunocompromised patients.
Hepatitis B Recommendations

• Recommendations
  – Assignment of a supply tray to each patient (regardless of serologic status)
  – Cleaning and disinfection of nondisposable items (i.e., clamps, scissors) before use on another patient
Hepatitis B Recommendations

- Recommendations
  - Glove use whenever any patient or hemodialysis equipment is touched and glove changes between each patient and station
  - Routine cleaning and disinfection of equipment and environmental surfaces
• The segregation of patients with positive HBsAg and their equipment from hepatitis susceptible patients resulted in 70%--80% reductions in incidence of HBV infection among hemodialysis patients.
Hepatitis B Vaccine

- Hepatitis B vaccine has been recommended for both hemodialysis patients and staff members since the vaccine became available in 1982.
- The Occupational Safety and Health Administration (OSHA) requires that employees in areas where there is a reasonable risk of exposure to blood be offered hepatitis B vaccine.
When to Give the Hepatitis B Series

• Some studies have demonstrated that higher antibody response rates could be achieved by vaccinating patients with chronic renal failure before they become dialysis dependent, particularly patients with mild or moderate renal failure.

• **ALL** patients should have the series!
Hepatitis B Vaccine

- Two types of vaccine have been licensed and used in the United States
  - Recombivax HB™ (Merck & Company, Inc., West Point, Pennsylvania)
    - contains 10-40 µg of HBsAg protein per mL
    - Primary vaccination comprises three intramuscular doses of vaccine, with the second and third doses given 1 and 6 months, respectively after the first
Hepatitis B Vaccine

- Engerix-B® (SmithKline Beecham Biologicals, Philadelphia, Pennsylvania)
  - contains 20 µg/mL
  - Intramuscular injection given at 0, 1, 2, and 6 months to patients on hemodialysis
Hepatitis B Revaccination for Patients

- Few studies have been conducted on the effect of revaccination among hemodialysis patients who do not respond to the primary vaccine series.

- Response rates to revaccination varied from 40%-50% after two or three additional 40 µg intramuscular doses to 64% after four additional 10 µg intramuscular doses.
Hepatitis B Revaccination for Staff

- Among persons who do not respond to the primary three-dose series of hepatitis B vaccine, 25%-50% of those with normal immune status respond to one additional vaccine dose, and 50%-75% respond to three additional doses.
Training and education of patients and their family regarding infection control practices should be given on admission to dialysis and at least annually thereafter and should address the following topics:
Infection Control Training

- Personal hygiene and hand washing technique
- Patient responsibility for proper care of the access and recognition of signs of infection
- Recommended vaccinations
Strategies to Improve Hepatitis B Immunization Rates

- Systemic offering of the vaccine to patients (standing orders)
- Educate staff on vaccination protocols
- Educate patients
- Address concerns and “myths”
- Provider recommendation
Improving Vaccination Rates
A systematic review of published studies looked at the effectiveness of population-based approaches to increasing vaccination coverage for routinely recommended vaccines.
Improving Vaccination Rates

• Conducted by the Task Force on Community Preventive Services & coordinated with the CDC

• Findings included a number of effective approaches
Improving Vaccination Rates

- Client Reminder/Recall Systems: Reminding patients that vaccinations are due (reminders) or late (recall). Delivered through: telephone calls, letters or post cards (in the dialysis setting this can be hand-delivered).
Improving Vaccination Rates

• Assessment and Feedback for Providers: Retrospectively evaluating the performance of providers in delivering one or more vaccinations to a client population
  – Providing data back to providers, delivered through, surveys, chart reviews, payment reviews (this can be done comparing one facility to another at the corporate level).
Improving Vaccination Rates

- **Provider Reminder/Recall Systems**: Developing strategies to inform health care providers their patients are due (reminder) or overdue (recall) for vaccinations.
  - Delivered through chart stickers, computer notification, vital sign stamps, medical record flow sheets and checklists (at the corporate level).
Improving Vaccination Rates

• **Standing Orders:** Established protocols that enable non-physician personnel to prescribe or deliver vaccinations to patients without direct physician involvement during patient visits.
  – Effective in particular for increasing flu and pneumococcal vaccination for adults aged > 65
Improving Vaccination Rates

• Reducing Out of Pocket Costs: Providing insurance for, reducing co-payments associated with, or offering free vaccinations

• Most patients with ESRD are covered by Medicare
Improving Vaccination Rates

- **Expanding Access:** Remember hemodialysis patients visit the facility approximately 3 times a week and peritoneal dialysis patients visit once a month.
- **Access should not be an issue with our population!**
Vaccination of Patients and Staff

- Facility policies/procedures
  - Standing orders
- Documentation
  - Tracking logs
  - Reminder/recall system
- Education
  - Upon admission
  - Yearly
QUESTIONS?