

# Splenectomy Vaccine Protocol

PIDPIC

6.24.14

# Rationale

- Spleen clears encapsulated bacteria and infected erythrocytes
- Serves as one of the largest lymphoid tissues where B cells are educated against encapsulated bacteria and an IgG response is initiated

# Organisms that pose a problem

- Streptococcus pneumoniae 57%
- Hemophilus influenzae 22%
- Neisseria meningitis
- Babesia
- Malaria (primary)
- ?ehrlichia
- ?CMV

# Time Frame for Vaccines

- Depends on vaccine status of the candidate
- Minimum is 2 weeks, ideal is more like 10 weeks
- If there is  $< 2$  weeks until surgery, immunization should be delayed until 2 weeks post-op expect in the presence of immunosuppression, then should be delayed 3 months

# Pneumococcal vaccines

- The 23-valent [pneumococcal polysaccharide vaccine](#) (PPSV23) contains capsular polysaccharides from 23 common serotypes of *S. pneumoniae*. This vaccine is for use in children > 2 years of age and does not produce memory responses so needs to be repeated every 5 years
- A 13-valent conjugate pneumococcal vaccine (PCV13) protects against 13 capsular serotypes which are known to cause 90% of invasive disease in children and is more effective than PPSV23 in children younger than two years and has comparable or enhanced immunogenicity compared with PPSV23 in adults. The conjugate vaccine produces memory responses by eliciting T cell immunity.

# General considerations

- Pneumococcal disease susceptibility is lifelong but with higher incidences at the extremes of age <2 years and > 65years
- In general, all children should receive the routine PCV13 series with doses at 2,4,6 and 12-15 mo. If this series is not finished before splenectomy is considered then as many doses to get to 4 as possible should be administered at 4 week intervals followed in 8 weeks after the last dose with PPSV23 in children > 2years of age

**Table 1. Pneumococcal Vaccine**

Pneumococcal Vaccine Status	Vaccines before Splenectomy	Booster after Splenectomy
<b>Child with 4 doses PCV13*</b>	<b>If &gt; 2yrs PPSV23 8 weeks after last PCV dose</b>	<b>PPSV23 every 5 years</b>
<b>Child with 1-3 doses PCV13** (the least number of effective doses is usually 2</b>	PCV13 and if > 2yrs followed by PPSV23 8 weeks after last PCV dose	PPSV23 every 5 years
<b>Child with 0 doses of PCV13**</b>	2 doses of PCV13 8 weeks apart and if > 2yrs followed by PPSV23 8 weeks after last PCV dose	PPSV23 every 5 years

\* If the PCV administered was PCV7 then a dose of PCV13 is warranted before the PPSV23

\*\*some sources state that children > 6 years of age can receive one dose of PCV13 and not the two priming doses, but we prefer 2 for transplant candidates if time allows

# Hemophilus Vaccine

- *There is one vaccine licensed in the US. Haemophilus influenzae* type b (Hib) conjugate vaccine, but multiple manufacturers. Causes memory responses by eliciting T cell immunity and is part of the routine childhood series, 3-4 doses depending on the brand.
- Most individuals are immune even if unimmunized by 6 years of age



**Table 2. Haemophilus influenzae vaccine**

HIB Vaccine Status	Vaccines before Splenectomy	Booster after Splenectomy
<b>Child with 2-4 doses*</b>	<b>1 dose</b>	<b>none</b>
<b>Child with 0-1 doses</b>	< 5 years 2 doses 8 weeks apart > 5 year 1 dose	<b>none</b>

\*some sources state that children > 5 with any previous doses and children <5 who are fully immunized would not require an additional dose, but we feel all transplant candidates should have a booster before splenectomy

# Meningococcal Vaccine

- Three meningococcal vaccines are available for use in the United States. None cover the serogroup B, which is a major type in infant disease.
- The disease is biphasic with the highest incidence in young infants and a second peak in college age people.
- The quadrivalent meningococcal conjugate vaccines are Menactra (MenACWY-D) and Menveo (MenACWY-CRM). These vaccines cause immunologic memory. Menactra should not be given with the primary series of pneumococcus or between the ages of 9-23 months when pneumococcus is also being given.
- The quadrivalent meningococcal polysaccharide vaccine is Menomune (MPSV4) and does not induce memory.

**Table 3. Meningococcal Vaccine**

Vaccine Status	Vaccines before Splenectomy	Booster after Splenectomy
<b>Child &lt;2 years</b>	<b>two doses of Menveo, three months apart second dose after 12 mo</b>	<b>Menactra or Menveo after 3 years then every 5 years</b>
<b>Child &gt;2 years</b>	two doses of Menveo or menactra 2 months apart	Menactra or Menveo after 3 years then every 5 years

# Exposure FAQ

# Varicella

- Varicella Zoster Virus (VZV) is a highly contagious virus that causes chicken pox
  - Spread through secretions, aerosol, direct contact
- After primary infection, latency is established and reactivation causes zoster
  - Spread through direct contact
- Spread after contact with either clinical entity causes chicken pox in susceptible hosts

# Immunity

- Natural infection and two doses of vaccine are thought to provide lifelong immunity
- Correlates of immune protection not established
  - No VZV specific AB titer proven to be protective
  - T cell immunity important for viral clearance
  - Therefore serostatus not considered for most VZV exposures in immunocompromised hosts

# Immunocompromised

- Severe and fatal disease well documented
- Disseminated disease also well documented
  - Lungs, liver, CNS
- Prophylaxis is not 100% effective even in immunized hosts
- Immunization and prophylaxis appear to have some effect on severity
- Given potential for disease severity and unknown immune correlates, many providers ignore immune status when deciding what to do for exposures

# Prophylaxis

- Immunoglobulin preferred
  - As soon as possible, no later than 96 hours
  - Varizig
  - Ivig 400 mg/kg
- Antiviral therapy
  - If > 96 hours has elapsed
  - Acyclovir preferred as it has 10x activity of ganciclovir. Valacyclovir more bioavailable.



# FAQ

- A transplant patient is exposed to a person with chicken pox.
  - Depends of exposure
    - Household, face to face, hospital considered high risk
      - Give immunoglobulin or aciclovir depending on timing
    - Other may give flexibility and rely on immune status
- A transplant patient is exposed to a person with zoster.
  - Only high risk if direct contact
    - Give immunoglobulin or aciclovir depending on timing

# FAQ

- Should household members receive immunization
  - Yes, natural disease poses much higher risk
- How long to stay out of school once there is an outbreak
  - Usually virus will stop circulating within 7 days, may return sooner if given immunoglobulin