

Royal Children's Hospital Immunisation Service

Prophylaxis against infection in asplenic subjects

Children and adults without a functional spleen are at increased risk of infection with encapsulated bacteria, most importantly *Streptococcus pneumoniae* (pneumococcus). Infections with other bacteria, such as *Neisseria meningitidis* (meningococcus) and *Haemophilus influenzae* type b (Hib), also occur at an increased rate in such patients. Moreover, congenitally asplenic children and those with sickle cell anaemia are at greater risk than those with post-traumatic or elective splenectomy for other reasons. The following interventions will reduce, but not abolish the risk of sepsis. Therefore asplenic patients should be made aware of the need for early investigation and management of any febrile illness.

Table 1. Recommendations for prophylaxis against infection in asplenic patients

INTERVENTION	AGE AT DIAGNOSIS		
	Under 2 years	2-5 years	Over 5 years / Adult
Antibiotic Prophylaxis*	Amoxycillin (20mg/kg daily) essential until 2 years age then Amoxycillin (250mg daily) recommended until 5 years of age but optional** thereafter	Amoxycillin (250mg daily) recommended until 5 years of age but optional** thereafter	Amoxycillin (250mg daily) optional**
Pneumococcus	<p>Pneumococcal conjugate vaccine (Prevenar) primary course according to age (table 2)</p> <p>Administer single dose of pneumococcal 23-valent polysaccharide vaccine (Pneumovax 23, 0.5mL IM or deep subcutaneous) at 2 years of age (but not less than 6 weeks since last Prevenar dose)</p> <p>Repeat Pneumovax 23 booster every 5 years (0.5mL deep subcutaneous or intramuscular)</p>	<p>Administer two doses of pneumococcal conjugate vaccine (Prevenar), 2 months apart, followed by pneumococcal 23-valent polysaccharide vaccine (Pneumovax 23, 0.5mL IM or deep subcutaneous) 6-8 weeks later</p> <p>Repeat Pneumovax 23 booster every 5 years (0.5mL deep subcutaneous or intramuscular)</p>	<p>Administer single dose of pneumococcal conjugate vaccine (Prevenar) followed by pneumococcal 23-valent polysaccharide vaccine (Pneumovax 23, 0.5mL IM or deep subcutaneous) 6-8 weeks later</p> <p>Repeat Pneumovax 23 booster every 5 years (0.5mL deep subcutaneous or intramuscular)</p>
<i>Haemophilus influenzae</i> type b	As per routine Childhood Schedule	Single dose if not previously vaccinated (no booster required)	Single dose if not previously vaccinated (no booster required)

Table 1. Recommendations for prophylaxis against infection in asplenic patients (continued)

INTERVENTION	AGE AT DIAGNOSIS		
	Under 2 years	2-5 years	Over 5 years / Adult
Meningococcus	<p>Meningococcal type C conjugate vaccine primary course according to age (table 3)</p> <p>Administer single dose of meningococcal quadrivalent polysaccharide vaccine (0.5mL deep subcutaneous) at 2 years of age (but not less than 6 weeks since last conjugate vaccine dose)</p> <p>Repeat meningococcal quadrivalent polysaccharide vaccine booster every 5 years (0.5mL deep subcutaneous)</p>	<p>Administer single dose of meningococcal type C conjugate vaccine followed by meningococcal quadrivalent polysaccharide vaccine (0.5mL deep subcutaneous) 6-8 weeks later</p> <p>Repeat meningococcal quadrivalent polysaccharide vaccine booster every 5 years (0.5mL deep subcutaneous)</p>	<p>Administer single dose of meningococcal type C conjugate vaccine followed by meningococcal quadrivalent polysaccharide vaccine (0.5mL deep subcutaneous) 6-8 weeks later</p> <p>Repeat meningococcal quadrivalent polysaccharide vaccine booster every 5 years (0.5mL deep subcutaneous)</p>
Influenza***	Annual Influenza vaccine in infants ≥6 months age (table 4)	Annual Influenza vaccine (table 4)	Annual Influenza vaccine (table 4)

* Phenoxymethylpenicillin (penicillin V) may be substituted for amoxycillin at a dose of 125mg BD for children <2 years and 250mg BD for children >2 years. If hypersensitive to beta-lactam antibiotics then use roxithromycin 4mg/Kg (up to 150 mg) daily or erythromycin 250 mg daily (all ages).

** Some authorities recommend lifelong oral antibiotic prophylaxis in all cases and particularly in the first two (2) years following splenectomy in adults and children aged over five (5) years. Adults with underlying immunosuppression, particularly those with malignancy, should be given antibiotic prophylaxis. Discussion with an infectious diseases physician will allow individualisation of the treatment regimen.

*** Annual influenza vaccination is recommended for asplenic patients aged six (6) months or older to reduce the risk of secondary bacterial, particularly pneumococcal, infection. Note that children aged less than nine (9) years who are receiving the influenza vaccine for the *first* time require two (2) doses at least one (1) month apart.

Additional notes:

- Patients should be educated regarding the risk of and need for prompt recognition and treatment of infections. They should be encouraged to wear a medi-alert bracelet and carry a medical alert card (see attached) to inform other health professionals of their condition and risk of overwhelming infection.
- For elective splenectomy, it is advisable to administer vaccinations at least two (2) weeks prior to surgery although, when possible, a period of 8-10 weeks is preferable to allow the administration of two doses of the vaccines for better antibody response. For emergency splenectomy, or when vaccinations are not administered preoperatively, patients should be immunised within two (2) weeks of surgery or at the time of discharge from hospital. In patients who have not been immunised prior to splenectomy and who will be receiving immunosuppressive chemotherapy and/or radiotherapy, vaccination should be delayed until six (6) months after therapy is completed. Antibiotic chemoprophylaxis should be continued throughout this period.
- If immediate access to medical care is not available (for example, whilst holidaying or for patients living in remote areas), a supply of antibiotics should be available for immediate use should symptoms of infection (such as fever, rigors, malaise etc.) develop. Recommended antibiotics have included amoxicillin, augmentin, cotrimoxazole, azithromycin or 'third-generation' quinolones such as sparfloxacin or levofloxacin. The β -lactamase inhibitor in augmentin will provide some activity against β -lactamase-producing strains of *H. influenzae* and *Capnocytophaga canimorsus*. The quinolone will have activity against penicillin resistant pneumococci. The appropriate choice of antibiotic should be based on drug allergy and local antimicrobial resistance patterns and discussion with an infectious diseases physician will facilitate the development of an individualised antibiotic regimen.
- When travelling, asplenic patients should be aware of the increased risk of severe *Plasmodium falciparum* malaria. Precautions to avoid mosquito bites as well as appropriate antimalarial prophylaxis should be adhered to.
- Babesiosis is a rare tick-borne infection endemic to certain countries (including North and South America, Europe, Asia and Africa) and asplenic patients travelling to these areas should take precautions to avoid tick bites.
- Adequate prophylactic antibiotic cover (such as augmentin or erythromycin for patients allergic to beta-lactam antibiotics) following dog and other animal bites is important as asplenic patients are particularly susceptible to infection with *C. canimorsus*.
- Other bacterial pathogens have been reported to cause more severe infection in asplenic patients including *Salmonella* species, *Staphylococcus aureus*, *Escherichia coli*, *Campylobacter* species, *Bacteroides* species, *Pseudomonas* species and *Plesiomonas shigelloides*.
- Antimicrobial prophylaxis during bacteraemia-associated dental procedures is not recommended for asplenic patients unless they have an associated condition, such as a cardiac abnormality, where antimicrobial prophylaxis is recommended. Further information may be obtained from the current edition of Therapeutic Guidelines: Antibiotic.
- Pregnant asplenic women are not at increased risk of infection.

Table 2. Pneumococcal conjugate vaccine (Prevenar) dosing for asplenic patients

Age (months)	Dose	Primary course	Additional dose
2 - 6	0.5 mL IM	3 doses, 2 months apart	1 dose at 12 months
7 - 11	0.5 mL IM	2 doses, 2 months apart	1 dose at 12 months [#]
12 – 59	0.5 mL IM	2 doses, 2 months apart	none
> 59	0.5 mL IM	Single dose	none

[#] minimum interval between doses is 8 weeks

Table 3. Meningococcal type C conjugate vaccine dosing

Age (months)	Dose	Schedule
2 - 5	0.5 mL IM	3 doses, 1-2 months apart
6 - 11	0.5 mL IM	2 doses, 1-2 months apart
> 11	0.5 mL IM	Single dose

Table 4. Influenza vaccine dosing

Age (years)	Dose	Number of doses***
6 months – 1	0.125 mL deep S/C	1 or 2 doses
2 – 5	0.25 mL deep S/C	1 or 2 doses
6 - 9	0.5 mL deep S/C	1 or 2 doses
> 9	0.5 mL deep S/C	1

IM = intramuscular, S/C = subcutaneous

Suggested medical alert card to be carried by patient

MEDICAL ALERT	
(name) _____ LACKS A FUNCTIONAL SPLEEN AND IS AT RISK OF OVERWHELMING INFECTION.	
ASSOCIATED CONDITION(S): _____	
IN CASE OF SUSPECTED INFECTION PLEASE ADMINISTER:	
Benzylpenicillin 60 mg/Kg up to 1.8 g IV/IM or Cefotaxime / Ceftriaxone 50 mg/Kg up to 2g IV/IM	
IF ALLERGIC TO THE ABOVE ANTIBIOTICS, ADMINISTER:	
Vancomycin 10mg/Kg up to 500mg IV	
AND REFER IMMEDIATELY TO HOSPITAL FOR FURTHER MANAGEMENT.	
CONTACT DETAILS:	
MEDICAL PRACTITIONER: _____	Phone: _____
RELATIVE: _____	Phone: _____

IMMUNISATION RECORD									
Meningococcus	Conjugate					Polysaccharide			
						5 yearly			
Hib	Childhood schedule or single dose if >2 years								
Influenza	yearly booster								
insert date of vaccination or NI = not indicated									

A medical alert card (laminated) and immunisation record may be obtained for a nominal fee from the RCH Immunisation Service by contacting the Immunisation Coordinator on (03) 9345 6599.

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on behalf of the Royal Children's Hospital Immunisation Committee, December 2002.