

SPLEEN AUSTRALIA

Paediatric Guidelines Age 0 to 18 years

Background

- Individuals with a non-functioning spleen are at increased risk of infection with encapsulated bacteria, most importantly *Streptococcus pneumoniae* (pneumococcus), the cause of invasive pneumococcal disease (IPD) which includes: meningitis (brain infection); septicaemia (blood infection) and pneumonia (chest infection)
- Infections with other bacteria, such as *Neisseria meningitidis* (meningococcus) and *Haemophilus influenzae* type b (Hib), *Capnocytophaga canimorsus* (after dog or cat bite) also occur at an increased rate in patients with asplenia/hyposplenism
- The first two years following splenectomy are considered the highest risk for infection, although several reports indicate that the risk is lifelong
- Children with congenital asplenia, cancer related asplenia/hyposplenism, haematological conditions requiring splenectomy and those with sickle cell anaemia are at greater risk of infection than those who have had a splenectomy for trauma. Some of these infections are vaccine preventable diseases and protection can be optimised by appropriate and timely immunisation
- Immunisation status should be reviewed by GP or specialist whenever there is a change in immunisation recommendations e.g. new vaccine; or at least every 5 years. Yearly influenza vaccination is recommended.
- Individual case discussions should be undertaken with the treating specialist
- More information regarding asplenia/hyposplenism can be obtained from Spleen Australia www.spleen.org.au - T (03) 9076 3828 or if in Queensland 1800 SPLEEN (775336).

This guideline is written by paediatric infection specialists, vaccinology experts, immunisation nurses, paediatric pharmacists and Spleen Australia staff.

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Table 1. Additional VACCINES for people with asplenia or hyposplenism

- Assess patient's immunisation history to ensure they have received vaccines as per the National Immunisation Program (NIP) for age <https://beta.health.gov.au/health-topics/immunisation/immunisation-throughout-life/national-immunisation-program-schedule>
- For those requiring catch-up immunisation, use the recommendations available in the *Australian Immunisation Handbook* <https://immunisationhandbook.health.gov.au/>
- Transition to adult care at 18 years of age is an opportune time to revisit immunisation requirements
- Booster doses should be reassessed every 5 years, or when new vaccines become available
- The pneumococcal, meningococcal, influenza and Hib-containing vaccines listed below may be co-administered[‡]

Vaccine type	Pneumococcal [§]	Meningococcal		Haemophilus influenzae type B (Hib)	Influenza
	Pneumococcal Conjugate Vaccine 13vPCV Pneumococcal Polysaccharide Vaccine 23vPPV	Meningococcal Quadrivalent Conjugate Vaccine 4vMenCV ACWY	Meningococcal B Recombinant Multicomponent Vaccine MenBV		
Brands	Prevenar 13 [®] Pneumovax 23 [®]	Nimenrix [®] Menveo [®]	Bexsero [®] [§] (all ages) Trumenba [®] [§] (≥10 YRS OF AGE)	Infanrix hexa [®] ActHIB [®]	Variable*
Age at diagnosis	Prevenar 13 [®] Primary course as per NIP + 1 additional dose at 6 months of age (total 4 doses) [^]	<u>Nimenrix[®], Menveo[®]</u> <u>6-weeks to ≤ 5-months</u> 3 doses (minimum 8 weeks apart) + 1 booster [¶]	<u>Bexsero[®] Ω</u> <u>6-weeks to ≤ 5-months</u> 3 doses (minimum 8 weeks apart) + 1 booster [¶]	Primary course as per NIP [^]	Recommended annually (If aged 6-months to <9 years – two doses, 4 weeks apart of influenza vaccine is recommended in the 1 st year of receiving the vaccine)
< 2 years of age	Pneumovax 23 [®] [§] Due at 4-5 years (minimum of 8 weeks post final Prevenar 13 [®])	<u>6-months to ≤ 11-months</u> 2 doses (minimum 8 weeks apart) + 1 booster [¶]	<u>6-months to ≤ 11-months</u> 2 doses (minimum 8 weeks apart) + 1 booster [¶]		
2-5 years of age	Prevenar 13 [®] Primary course as per NIP + 1 additional dose at 6 months of age (total 4 doses) [^] Pneumovax 23 [®] [§] Due at 4-5 years (minimum of 8 weeks post final Prevenar 13 [®])	<u>Nimenrix[®], Menveo[®]</u> 2 doses (minimum 8 weeks apart)	<u>Bexsero[®]</u> 2 doses (minimum 8 weeks apart)	Primary course as per NIP [^]	
> 5 years of age	Prevenar 13 [®] 1 dose (if no previous doses) Pneumovax 23 [®] [§] (minimum of 8 weeks post Prevenar 13 [®])	<u>Nimenrix[®], Menveo[®]</u> 2 doses (minimum 8 weeks apart)	<u>Bexsero[®][§]</u> 2 doses (minimum 8 weeks apart) <u>Trumenba[®] (≥ 10 YRS OF AGE ONLY)[§]</u> 3 doses in total (0, 1 and 6 months)	1 dose (if no previous doses of a Hib-containing vaccine)	
Boosters	-No recommendation for Prevenar 13 [®] booster -Booster dose of Pneumovax 23 [®] due 5 years post 1 st dose -A further Pneumovax 23 [®] booster dose is given at ≥ 65 years of age OR > 50 years if ATSI OR > 5 years since previous dose (max. 3 doses in a lifetime/adulthood)	-Every 5 years following completion of initial course. -A further adolescent dose is given as per NIP at 14-15 years of age (>5 years since previous dose)	-5 years following completion of initial course. -A further adolescent booster dose is recommended at 13-18 years (>5 years since previous done)	N/A	

*Refer to <http://www.mvec.vic.edu.au/immunisation-references/influenza-vaccine-recommendations/> for age appropriate brands and details

^If not up to date with NIP recommendations refer to <https://immunisationhandbook.health.gov.au/catch-up-vaccination> for catch up advice

‡Ideally Prevenar 13® is administered first followed by Pneumovax 23® a minimum of 8 weeks later. If Pneumovax 23® is inadvertently administered first, a minimum of 12 months should elapse before administering Prevenar 13®

†Booster doses are given at ≥ 12-months of age/8 weeks since previous dose (whichever is later)

Ω Prophylactic administration of paracetamol with every dose of MenBV administered to children <2 years of age is recommended due to the increased risk of fever. The 1st dose of paracetamol (15 mg/kg/dose) is recommended within the 30-minute period prior to, or as soon as practicable after, vaccination. This can be followed by 2 more doses of paracetamol given 6 hours apart, based on child's age and weight.

§Bexsero® and Trumenba® are not interchangeable

‡A study has shown that co-administration of Menactra® (4vMenCV ACWY) with pneumococcal vaccines on the same day, may result in a decreased immune response to some of the pneumococcal serotypes. For this reason, Menveo® and Nimenrix® are the preferred 4vMenCV ACWY brands. If these are not available Menactra® may be considered upon consultation with Spleen Australia or Immunisation specialist.

Table 2. Antibiotics

	Recommendation	Duration
Antibiotic prophylaxis (Daily antibiotics)	<p>Amoxicillin 20 mg/kg (up to 250 mg) orally, daily OR Phenoxymethylpenicillin 250 mg (child younger than 1 year: 62.5 mg to 5 years: 125 mg) orally, 12-hourly.</p> <p>If hypersensitivity to penicillins is reported: Assess whether the patient has immune-mediated hypersensitivity. Refer to the Australian Antibiotic Therapeutic guidelines (circa 2018) "Antimicrobial hypersensitivity – Types of antimicrobial hypersensitivity" and seek infectious disease specialist advice on testing and/or alternative prophylaxis options.</p>	<p>Required duration of antibiotic prophylaxis is difficult to determine – a reasonable recommendation for prophylaxis is up to 16 years of age.</p> <p>Minimum recommended duration is:</p> <ul style="list-style-type: none"> Up to the age of 5 years in children with asplenia Up to the age of 5 years who are hyposplenic due to sickle cell anaemia or another congenital haemoglobinopathy At least 3 years after splenectomy <p>Consider lifelong prophylaxis for patients who:</p> <ul style="list-style-type: none"> are severely immunosuppressed (e.g. those with coexisting hypogammaglobinemia or advanced liver disease, solid organ transplant recipients) have had a splenectomy for haematological malignancy, particularly those with graft-versus-host diseases (GVHD) or receiving ongoing immunosuppressive therapy. have survived overwhelming post splenectomy infection, particularly invasive pneumococcal infection.
Emergency supply of antibiotics	<p>Amoxicillin+clavulanate 22.5mg/kg/dose (amoxicillin component) (max 875mg/dose), orally, twice daily (use DUO preparation)</p> <p>For infants (over 3 months of age) and children with immediate non-severe or delayed non severe hypersensitivity to beta-lactams: Cefuroxime 15mg/kg/dose (up to 500mg/dose) orally 12-hourly</p> <p>For infants and children with immediate severe or delayed severe hypersensitivity to penicillins, seek Infectious Disease Specialist advice.</p>	<p>All patients should also have an emergency supply of antibiotics available at home or when away. An antibiotic course should be commenced if there is sudden onset of unexplained fever and immediate medical review is not available. Once the first dose is taken the patient must be reviewed by a medical practitioner.</p>

Table 3.	Additional information – For Children with Asplenia/Hyposplenism aged 0 - 18 years of age
Antibiotics (refer to Table 2)	<p>DAILY DOSE The required duration of antibiotic prophylaxis is difficult to determine and should be discussed with the treating physician and/or an infectious diseases physician (see Table 2).</p> <p>EMERGENCY SUPPLY If immediate access to medical care is not available (eg. whilst holidaying, patients living in remote areas or out of hours), a supply of antibiotics should be available for immediate use should symptoms of bacterial infection occur such as fever, rigors and/or malaise. Take this supply of antibiotics and see doctor as soon as possible either GP or emergency department in a hospital. (See Table 1 for dosing)</p>
Timing of immunisations	<p>Elective splenectomy- In persons undergoing an elective splenectomy, vaccination should be completed where possible, TWO weeks before the scheduled operation. In some cases, vaccination may need to commence 10-12 weeks before splenectomy to allow the administration of both conjugate and polysaccharide doses of the vaccines to maximise protection.</p> <p>Emergency splenectomy, or when vaccinations are not administered pre-operatively, patients should be immunised more than ONE week after surgery.</p>
Multiple immunisations	It is safe to administer all required vaccines at the same time. However giving the vaccines over a few days might be better tolerated..
Chemotherapy	<p>Patients who are receiving immunosuppressive chemotherapy and/or radiotherapy and require additional vaccines due to asplenia/hyposplenism should receive immunisation as per the attached table and then receive additional post-chemotherapy booster vaccines as recommended in the AIH. (See Australian Immunisation Handbook http://immunise.health.gov.au/internet/immunise/publishing.nsf/Content/Handbook10-home).</p> <p>Antibiotic chemoprophylaxis should be continued throughout this period.</p>
Overseas travel	Seek specialist advice about travel vaccines needed for specific destinations. Patients should be aware of the increased risk of severe <i>Plasmodium falciparum</i> malaria and Babesiosis . It is recommended to adhere to strategies to avoid mosquito bites (e.g. applying insect repellent, wearing long sleeved shirts from dusk until dawn) as well as taking appropriate anti-malarial prophylaxis.
Animal bites	Dog or cat bites/severe scratches can result in bacterial infections with <i>Pasteurella sp.</i> , <i>Capnocytophaga canimorsus</i> , <i>Streptococcus sp.</i> and anaerobic bacteria and therefore require prophylactic antibiotic treatment with Augmentin (Amoxicillin/clavulanate) or if beta-lactam hypersensitive - metronidazole plus Bactrim (trimethoprim/sulfamethoxazole).
Tick bites	Babesiosis is a rare tick-borne infection endemic to certain countries (including North and South America, Europe, Asia and Africa) and patients with asplenia or hyposplenism travelling to these areas should take precautions to avoid tick bites.
Other bacterial pathogens	Other organisms have been reported to cause severe infections in patients with asplenia including <i>Salmonella</i> species, <i>Staphylococcus aureus</i> , <i>Escherichia coli</i> , <i>Campylobacter</i> species, <i>Bacteroides</i> species, <i>Pseudomonas</i> species and <i>Plesiomonas shigelloides</i> .
Other procedures	Dental procedures or general surgery – additional antimicrobial prophylaxis is not required for people with asplenia/hyposplenism
Pregnancy	Underlying risk for overwhelming sepsis is not increased, but immunisation status should be clarified as per Tables above
Education	<p>Parents and patient should be educated regarding the:</p> <ul style="list-style-type: none"> • Need for early investigation and management of any febrile illness • Signs of bacterial infection and when to give emergency supply of antibiotics (after checking expiry of supply) • Recommendation to wear or carry a medi-alert bracelet or alert card to inform health professionals of risk of overwhelming infection • Requirement to update their vaccination cards when booster doses of vaccines are given. These cards are available from Spleen Australia.
Spleen Australia	<p>Registration with Spleen Australia - Clinical Service & Registry for people with non-functioning spleens, based in Melbourne at The Alfred hospital, is recommended as this registry is able to offer telephone advice, reminders and an education kit (with vaccination cards, medical alerts, fridge magnets etc.): www.spleen.org.au or call 03 9076 3828 or if reside in Queensland call 1800 SPLEEN (775336).</p> <p>"Spleen-ie App" is also available and it records vaccines plus additional health tips. All registered patients and their GPs receive an annual newsletter that contains medical updates and the latest information on staying healthy.</p>