

The postsplenectomy patient in general practice

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Serious infectious disease complications are well recognised in patients with asplenia, and GPs can play an important role in promoting long-term health. Spleen Australia and Therapeutic Guidelines (eTG) recently updated recommendations on antibiotic prophylaxis, vaccinations and patient education, to help optimise postsplenectomy infection prevention in the post-acute care setting.

The spleen is the body's largest lymphatic organ and plays a pivotal role in fighting infection by removing micro-organisms from the blood and producing lymphocytes.¹⁻⁴ Patients with impaired splenic function or asplenia after splenectomy have a lifelong increased infection risk.^{1,5,6} GPs have an important role in promoting the long-term health of their patients with asplenia or hyposplenia. This article discusses recently updated recommendations on investigations, vaccinations, antibiotic prophylaxis and education for these patients.



Asplenia and infection

Infections commonly associated with asplenia are primarily caused by encapsulated micro-organisms (e.g. *Streptococcus pneumoniae*, *Neisseria meningitidis*, *Haemophilus influenzae*), parasites (e.g. malaria) and the bacterium *Capnocytophaga canimorsus* from dog bites.^{1,2,5,6}

Asplenia most commonly results from surgical splenectomy or a haematological disorder. More rarely, a medical (functional) hyposplenic state can occur as a result of conditions such as sickle cell disease, coeliac disease or congenital asplenia.^{1,4-6} Splenic artery embolisation is a less invasive alternative to splenectomy and involves injecting an embolising agent via a catheter into the splenic artery to block the blood supply to the spleen.

In the first three years after splenectomy, patients have an increased risk of overwhelming postsplenectomy infection (OPSI), defined as a severe infection in a patient after splenectomy requiring intensive care admission.^{1,7} These infections are associated with significant morbidity and an estimated 50% mortality.⁸

Although clinically significant, OPSI is relatively rare. According to one Australian retrospective cohort study, of the 3274 patients enrolled in the Victorian Spleen Registry in 2016, 492 reported at least one episode of infection and the incident rate of OPSI was about 1.11/1000 patient-years.⁵

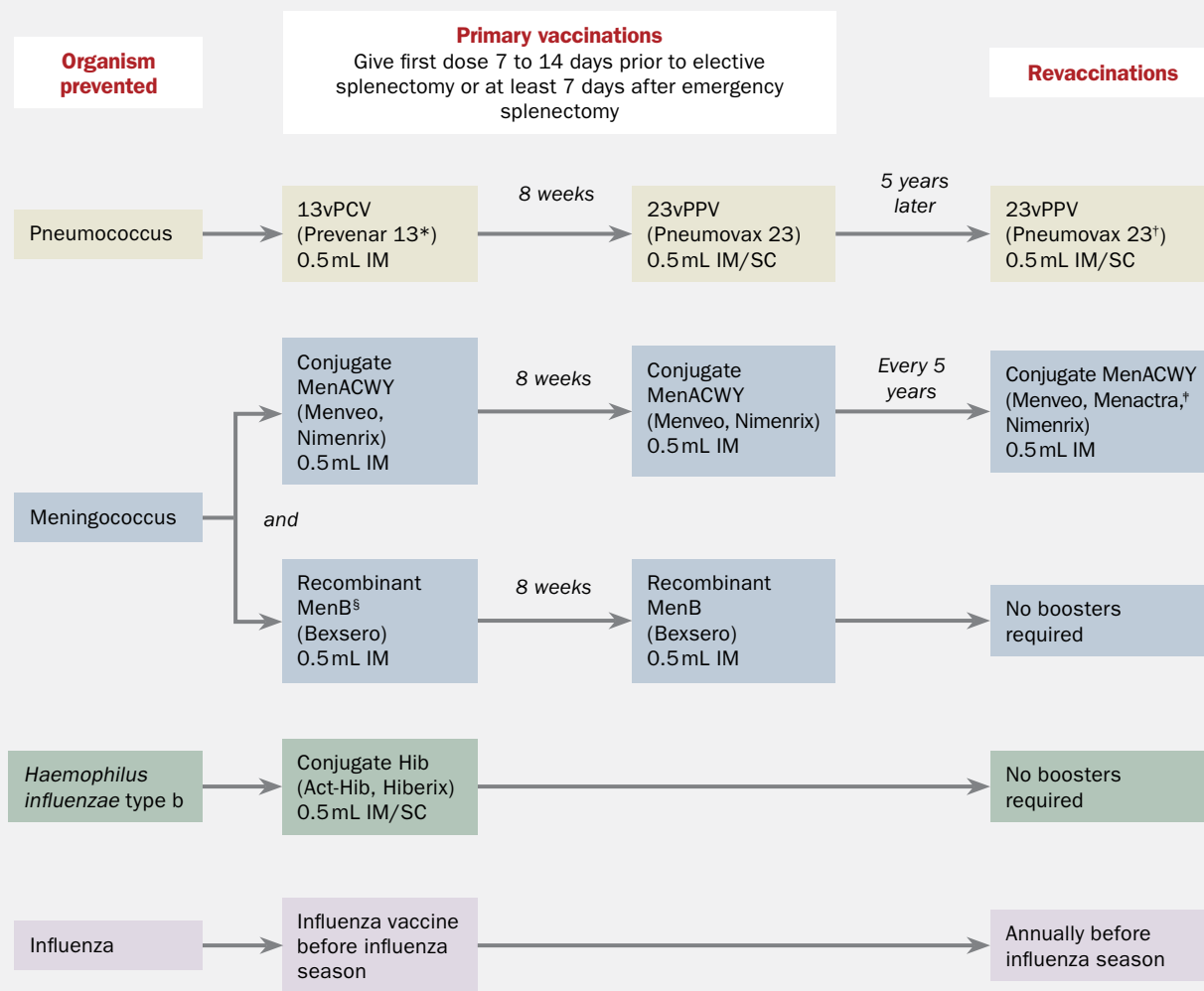
Investigations

Routine investigations are not required in general practice management of patients with established asplenia. In patients with suspected asplenia or functional hyposplenia, assessment of a peripheral blood film is helpful for establishing the diagnosis.

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1. CURRENT POSTSPLENECTOMY VACCINATION RECOMMENDATIONS FOR ADULTS WITH ASPLENIA/HYPOSPLENIA NOT PREVIOUSLY VACCINATED



Abbreviations: 13vPCV = 13 valent pneumococcal conjugate vaccine; 23vPPV = 23 valent pneumococcal polysaccharide vaccine; IM = intramuscular; MenACWY = quadrivalent meningococcal conjugate vaccine; MenB = meningococcal B recombinant vaccine; SC = subcutaneous.

* Prevenar 13 should not be co-administered with Menactra (MenACWY brand).

† A maximum limit of three doses of 23vPPV is recommended in adulthood; a second revaccination (third dose) is recommended at age 65 years (age ≥50 years for Indigenous adults). If asplenia is newly diagnosed at age ≥65 years (≥50 years for Indigenous adults), patients should receive three vaccines five years apart. If 23PPV is given first, wait 12 months to give 13vPCV.

§† Menactra vaccines are licensed in patients up to 55 years of age and Bexsero in patients up to 50 years of age. Spleen Australia recommends the use of these vaccines in people aged over 50 despite lack of studies because of the increased risk of meningococcal disease in this patient group.

§ Trumenba (new MenB) is available but is not interchangeable with Bexsero and requires three doses – refer to The Australian Immunisation Handbook (<https://immunisationhandbook.health.gov.au>).

Adapted from Spleen Australia's guidelines for vaccines recommended for adults (>18 years) with asplenia/hyposplenism who have not previously been vaccinated. Last updated August 2019. The Spleen Australia guidelines are reviewed every year and GPs should always refer to the Spleen Australia website to see the latest version (<https://spleen.org.au>).

Full blood examination and film

Howell-Jolly bodies are clusters of DNA found within circulating erythrocytes that are cannot be filtered by the absent or damaged spleen.^{3,9,10} Asplenia can be diagnosed on a blood film by the presence of

Howell-Jolly bodies, which generally appear after a median of 25 days post-splenectomy.¹⁰ Thrombocytosis and lymphocytosis can also occur in patients with asplenia after a median of 50 days postsplenectomy.^{3,9,10}

Peripheral blood IgM memory B cells

Peripheral blood IgM memory B cells are significantly reduced after penectomy.^{9,10} Although useful to be aware of, peripheral blood IgM memory B cells are not routinely tested. However, some subspecialists

order this test six months after splenectomy to better assess splenic function.¹⁰

Infection prevention

After a diagnosis of asplenia from any cause, intervention is important to ensure that patients are appropriately informed and protected against infectious complications. Medical interventions in general practice may include vaccination, antibiotic prophylaxis and support with an emergency management plan. Although some elements of education and management are typically delivered by hospital services (particularly after surgical splenectomy), GPs should be aware of management plans and ensure that patients have access to recommended care, some of which has changed in recent Australian guidelines.

Vaccination

Spleen Australia 2019 guidelines recommend vaccination against encapsulated organisms for all patients with asplenia. In addition to the annual influenza vaccine, vaccination against pneumococcus, meningococcus and *H. influenzae* type B are recommended (Flowchart 1).^{7,11} When possible, these vaccines should be given a minimum of two weeks and ideally 10 to 12 weeks before an elective splenectomy to ensure an optimal immune response.^{7,11} In the case of an emergency splenectomy from trauma or a surgical complication, patients should be vaccinated within seven days of the procedure.^{7,11} It is important to note that the Spleen Australia guidelines are reviewed every year and GPs should always refer to the Spleen Australia website for the latest version (<https://spleen.org.au>).

Patients with asplenia are able to mount an adequate immune response to vaccines, albeit a lesser response, than healthy individuals.⁵ Importantly, asplenia alone is not a contraindication to live vaccines, except in the case of immunocompromised patients (those with infections, e.g. HIV, or after bone marrow transplant).^{7,11}

In patients who have undergone splenic artery embolisation, it is difficult to predict whether they will develop hyposplenia or

retain normal splenic function in the short term.¹¹ Current guidelines recommend a blood film more than two weeks after embolisation to assess for the presence of Howell-Jolly bodies.^{7,11} Overall, these patients have a lower lifelong risk of infection, and updated vaccination guidelines recommend postprocedure vaccines but no booster vaccines (Flowchart 2).^{7,11}

Despite our best efforts, OPSIs have occurred in patients who received all their scheduled postsplenectomy vaccines.⁹ These infections are thought to be either the result of an infection with a bacterial serotype not contained in the vaccine, or the result of failure to mount an adequate immune response to the vaccine.⁹

Patients with hyposplenia and asplenia should have a clear action plan, with prescribed antibiotics to be kept at home and at work in case of emergency

Antibiotic prophylaxis

The eTG has also updated its recommendations for antibiotic prophylaxis regimens for patients with asplenia and hyposplenia.⁷ In patients who have undergone a splenectomy, antibiotic prophylaxis is recommended for a minimum of three years after the procedure.⁷ Antibiotic prophylaxis is also indicated for children up to five years of age with asplenia or hyposplenia and for patients with impaired splenic function deemed to be at increased risk of invasive pneumococcal infection, including those with incomplete vaccination against pneumococcal disease, a primary immunodeficiency disorder, HIV infection, haematological malignancy, previous invasive pneumococcal disease, or who are receiving immunosuppressive therapy.^{7,9}

The eTG recommends amoxicillin 250 mg orally daily or phenoxymethylpenicillin 250 mg orally twice daily for adults with asplenia or hyposplenia, for the prevention of pneumococcal infection.⁷ In

the event that the patient has a confirmed penicillin allergy, consult the Therapeutic Guidelines - Antibiotic on prophylaxis of asplenia/hyposplenia for alternatives.¹¹

No additional antibiotic prophylaxis is required before dental procedures as the risk of exposure to encapsulated organisms is considered low.¹¹

Australian studies suggest that the overall patient adherence to antibiotic prophylaxis is poor. A survey of the Victorian Spleen Registry in 2007 suggested that there was 59% adherence to antibiotics in the first two years after surgical splenectomy.⁵ Encouragement for continued adherence is a valuable part of periodic patient review.

Emergency action plan

Patients with hyposplenia and asplenia should have a clear action plan, with prescribed antibiotics to be kept at home and at work in case of emergency. Patients should be advised that if they become unwell with a fever, sweats, chills or fatigue, they should take their emergency antibiotics and seek urgent medical attention.

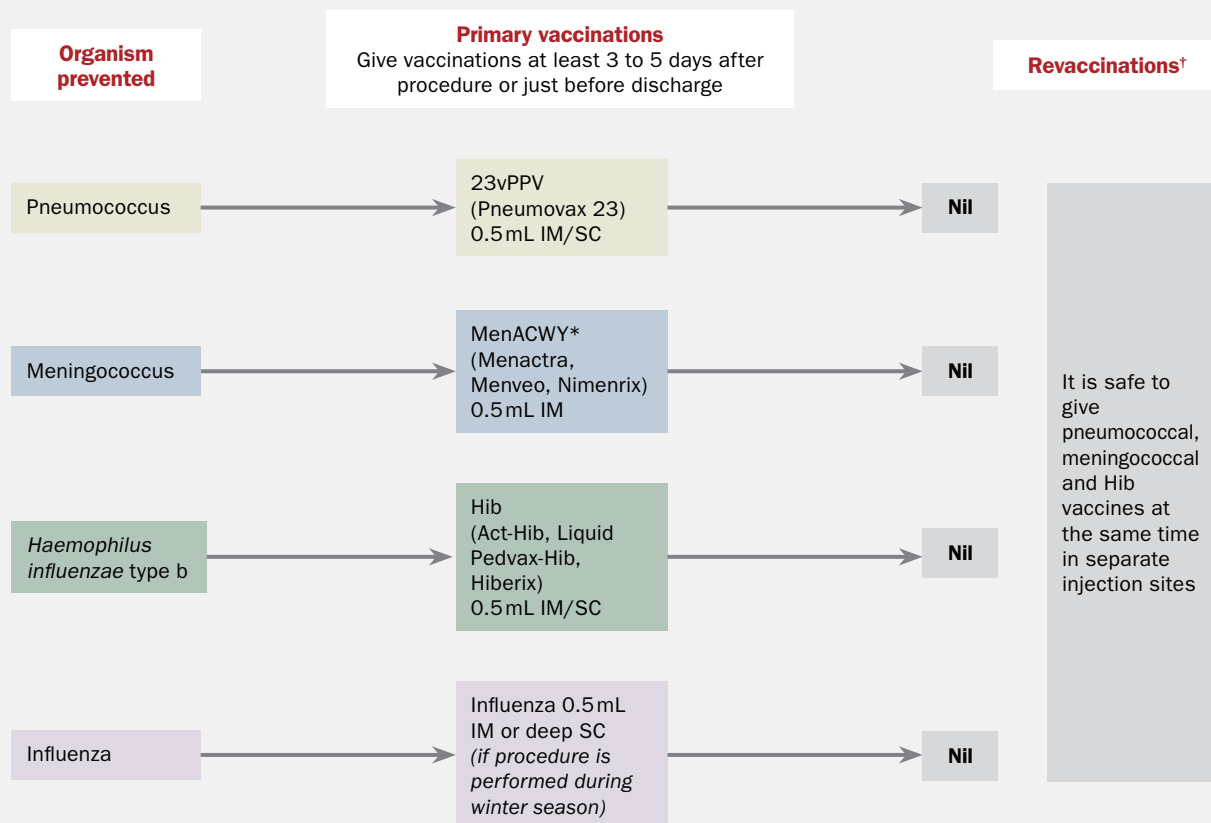
The eTG recommends an emergency antibiotic regimen of amoxicillin 2 g orally as a single dose and then 1 g eight-hourly until medical review. Adults with an immediate nonsevere or delayed nonsevere hypersensitivity to penicillins should be prescribed cefuroxime 500 mg orally 12-hourly until medical review.⁷ In adults with immediate severe or delayed severe penicillin allergy, consult the Therapeutic Guidelines - Antibiotic on prophylaxis of asplenia/hyposplenia for alternatives.¹¹

It is important to ensure that these emergency antibiotics are kept at hand and exchanged when they expire.

Patient education

Patient education is an important facet of infection prevention for patients after splenectomy, and GPs play a key role in the lifelong reinforcement of these messages. A study estimated that 28% of

2. CURRENT VACCINATION RECOMMENDATIONS FOR PATIENTS AFTER SPLENIC ARTERY EMBOLISATION



Abbreviations: 23vPPV = 23 valent pneumococcal polysaccharide vaccine; IM = intramuscular; MenACWY = quadrivalent meningococcal conjugate vaccine; SC = subcutaneous.

* There is no registered upper age limit for use of Menveo. Although both Menactra and Nimenrix are registered for use up to 55 years of age only, either brand can be given to people over 55 years of age, as per The Australian Immunisation Handbook.

[†] No booster vaccination is recommended after an embolisation procedure.

Adapted from Spleen Australia's guidelines for patients after splenic artery embolisation. Last updated August 2018. The Spleen Australia guidelines are reviewed every year and GPs should always refer to the Spleen Australia website to see the latest version (<https://spleen.org.au>).

patients with asplenia were unaware of their infection risk, and that patients who were better informed of their postsplenectomy infection risk, who received their scheduled vaccines and who adhered with their postsplenectomy antibiotics had a lower risk of OPSI.¹²

A scheduled review by a GP after an acute splenectomy hospital admission is an excellent opportunity for invaluable patient education and counselling. Patients should be routinely registered with Spleen Australia during the acute admission, and GPs may be subsequently

contacted by Spleen Australia for further patient details. If patients are unsure about registration, GPs can contact Spleen Australia to check if their patient is registered or update medical details. Contact details are available on the Spleen Australia website (<https://spleen.org.au>).

Patient education should emphasise the importance of infection prevention strategies, including vaccination, antibiotic prophylaxis and awareness of their emergency action plan. We recommend that the patient's family and friends be made aware of the lifelong infection risk

to help facilitate early medical review in the event of a suspected infection.

Spleen Australia distributes useful education kits to patients following registration. These include an information package, a vaccination card and an alert bracelet. The registry provides a lifelong service to patients with asplenia, sending annual newsletters, telephone support and automatic notifications of when vaccinations are due (Box).

Spleen Australia has also developed a smartphone application called Spleen-IE, with an update due for release at the end

KEY PATIENT EDUCATION POINTS

- Spleen Australia education kits with alert bracelet
- Registry vaccination schedule reminders
- Antibiotic prophylaxis for at least three years
- Emergency action plan with early medical attention
- Pretravel clinic recommended

of 2019 or early 2020 (Figure).

Finally, patients should be encouraged to seek medical advice before travel, especially if they intend visiting a malaria-endemic area. Ideally, patients should attend a travel clinic four to 12 weeks before departure to arrange for relevant vaccines, malaria chemoprophylaxis, and mosquito repellent and avoidant advice.^{3,11} Importantly, any illness can progress quickly in patients with asplenia. They should seek early medical attention if they become unwell, including in the event of a tick or animal bite. It is essential that they take their emergency supply of antibiotics with them overseas.

Conclusion

GPs play an important role in the long-term care of patients with asplenia or hyposplenia. Patient education is key for maintaining adherence to postsplenectomy infection prevention strategies. It is important that GPs be aware of the most up-to-date recommendations on post-splenectomy patient care. These include the updated Spleen Australia and eTG recommendations for patients with asplenia and hyposplenia, including vaccination schedule, antibiotic prophylaxis and emergency antibiotic regimens. MT

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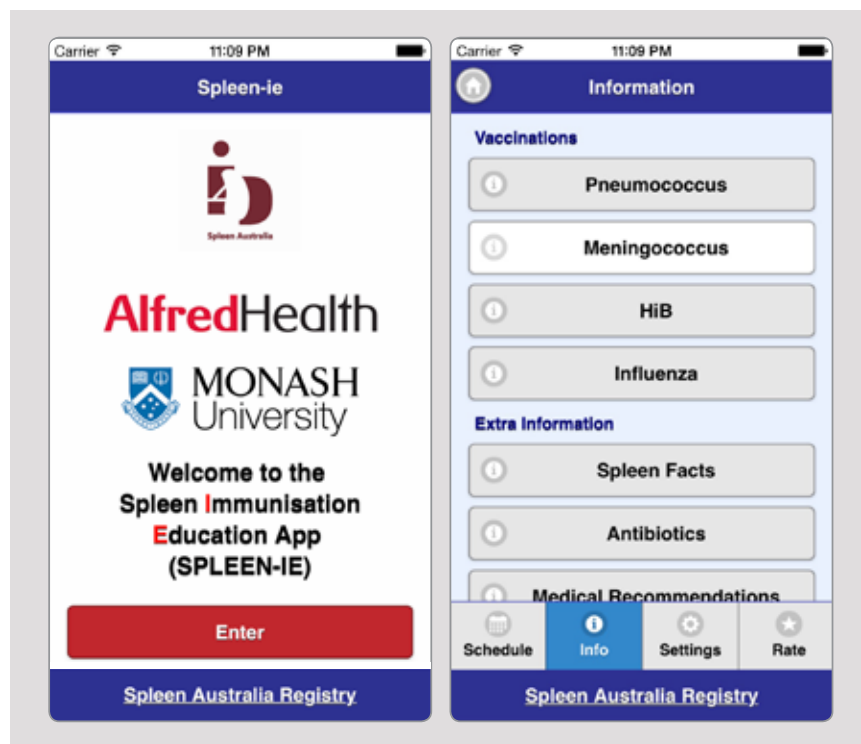


Figure. A screenshot of Spleen Australia's smartphone application, Spleen-IE, designed to provide updated information and support to patients with asplenia/hyposplenia. An update of the app is due for release at the end of 2019 or early 2020.