Clinical Guideline

Splenectomy Vaccination and Antimicrobial Prophylaxis (Adult Asplenic and Hyposplenic Patients) Clinical Guideline

Objective file number: 2017-01514
Policy developed by: South Australian expert Advisory Group on Antimicrobial Resistance (SAAGAR)
Approved by SA Health Safety & Quality Strategic Governance Committee on: 11 April 2017
Next review due: 30 May 2022

Summary
The Splenectomy Vaccination and Antimicrobial Prophylaxis (Adult Asplenic and Hyposplenic Patients) Clinical Guideline has been developed by the SA expert Advisory Group on Antimicrobial Resistance (SAAGAR) to provide a consistent and evidence-based guideline available for clinicians concerning the care of asplenic or hyposplenic adult patients in order to best protect them from overwhelming post-splenectomy infection (OSPI).

The Clinical Guideline aims to be as consistent as possible with national treatment guidelines. Consumer information for post-splenectomy treatment is also provided.

Keywords
Antimicrobial, prophylaxis, vaccination, adult, splenectomy, asplenic, hyposplenic, infection, prevention, OPSI, treatment, consumer, Splenectomy Vaccination and Antimicrobial Prophylaxis (Adult Aplenic and Hyposplenic Patients) Clinical Guideline

Policy history
Is this a new policy? N
Does this policy amend or update an existing policy? Y
Does this policy replace an existing policy? N
Vaccination and Antimicrobial Prophylaxis for Adult Asplenic (Splenectomy) and Hyposplenic Patients Clinical Guideline

Applies to
All Health Networks
CALHN, SALHN, NALHN, CHSALHN, WCHN, SAAS

Staff impact
All Clinical, Medical, Nursing, Allied Health, Emergency, Dental, Mental Health

PDS reference
CG257

Version control and change history

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<th>Version</th>
<th>Date from</th>
<th>Date to</th>
<th>Amendment</th>
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</thead>
<tbody>
<tr>
<td>1.0</td>
<td>11/04/2017</td>
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</tbody>
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Splenectomy Vaccination and Antimicrobial Prophylaxis (Adult Asplenic and Hyposplenic Patients) Clinical guideline

May 2017
Disclaimer

This guideline provides advice of a general nature. This statewide guideline has been prepared to promote and facilitate standardisation and consistency of practice, using a multidisciplinary approach. The guideline is based on a review of published evidence and expert opinion.

Information in this statewide guideline is current at the time of publication.

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Health practitioners in the South Australian public health sector are expected to review specific details of each patient and professionally assess the applicability of the relevant guideline to that clinical situation.

If for good clinical reasons, a decision is made to depart from the guideline, the responsible clinician must document in the patient’s medical record, the decision made, by whom and detailed reasons for the departure from the guideline.

This statewide guideline does not address all the elements of clinical practice and assumes that the individual clinicians are responsible for:

- Discussing care with consumers in an environment that is culturally appropriate and which enables respectful confidential discussion. This includes the use of interpreter services where necessary;
- Advising consumers of their choice and ensure informed consent is obtained;
- Providing care within scope of practice, meeting all legislative requirements and maintaining standards of professional conduct; and
- Documenting all care in accordance with mandatory and local requirements.

Document title: Clinical Guideline for Vaccination and Antimicrobial Prophylaxis for Adult Asplenic (Splenectomy) and Hyposplenic Patients
First developed: April 2017
Version Number: 1.1
Author: SA expert Advisory Group on Antimicrobial Resistance (SAAGAR)
Audience: Medical, nursing, midwifery and allied health staff in South Australia public and private services
Endorsed by: South Australian Medicines Advisory Committee (SAMAC)
Contact: 08 7425 7169
Introduction

Patients with an absent or dysfunctional spleen are at a life-long increased risk of bacterial infection due to pneumococcus, meningococcus and *Haemophilus* spp., as well as infection acquired from animal bites or overseas travel (e.g. malaria). This guideline provides recommendations on appropriate vaccination and antibiotic prophylaxis schedules for patients who have undergone a splenectomy (removal of the spleen), or who are in a clinically hyposplenic (reduced function of the spleen) state.

Background

This guideline has been developed by the SA expert Advisory Group on Antimicrobial Resistance (SAAGAR) to provide a consistent and evidence-based guideline available for clinicians concerning the care of asplenic or hyposplenic patients in order to best protect them from overwhelming post-splenectomy infection (OPSI). The guideline aims to be as consistent as possible with national treatment guidelines presented by Spleen Australia (https://spleen.org.au), the *Australian Immunisation Handbook*, and the *Therapeutic Guidelines* [1-3].

The spleen is the largest lymphatic organ in the body and plays an important role in fighting infection. It works to remove micro-organisms and their products circulating within the bloodstream, and to produce antibodies to enhance the immune response. The asplenic or hyposplenic state can be confirmed by the detection of Howell-Jolly bodies on a blood film or by the demonstration of decreased IgM memory B cells in the blood.

Splenectomy is the most common cause of asplenia. In patients on the Victorian Spleen Registry, authors found that the most frequent reasons for surgical removal of the spleen are: trauma (40%), haematological disorders and malignancies (35%), and incidental trauma at the time of intra-abdominal surgery (24%) [4]. Less commonly, an asplenic state may occur in medical conditions such as coeliac disease or sickle cell anaemia. Congenital asplenia is rare; screening of family members is recommended in affected patients.

Prevention of Overwhelming Post-Splenectomy Infection (OPSI)

Recommended strategies to prevent OPSI include vaccination, the use of preventive and emergency antibiotics, and the education of patients and their families. Consensus guidelines appropriate to the Australian setting were published in 2008 [5]. There is some evidence that these strategies work. In one series, asplenic patients with a better knowledge of the infectious risks, those who received pneumococcal vaccine, and those who had taken post-splenectomy antibiotics had a lower incidence of OPSI [6]. However, despite the availability of best practice guidelines, preventive strategies are not always implemented and preventable cases of severe post-splenectomy sepsis continue to occur [7].

Immunocompromised patients and children are at the highest risk of OPSI. The most common pathogens are the encapsulated bacteria, especially *Streptococcus pneumoniae*, *Neisseria meningitidis* and *Haemophilus influenzae*. Other bacteria (including those associated with animal bites) and parasites (including malaria) can also cause OPSI [8].
Definitions

**Asplenic / asplenia** means: having no functional spleen

**HSCT** means: haematopoietic stem cell transplant

**Hyposplenism** means: reduced function of the spleen

**IBW** means: patient’s ideal body weight

**SAAGAR** means: South Australian SA expert Advisory Group on Antimicrobial Resistance (SAAGAR)

**SOT** means: solid organ transplant

**TDM** means: therapeutic drug monitoring

Standards

The following National Safety and Quality Health Service Standard (NSQHSS) standards apply:

**Standard 3 – Preventing & Controlling Healthcare Associated Infections**

> Criterion 3.14 – Developing, implementing and regularly reviewing the effectiveness of the antimicrobial stewardship system.

**Standard 4 – Medication Safety**

> Criterion 4.1 – Developing and implementing governance arrangements and organisational policies, procedures and/or protocols for medication safety, which are consistent with national and jurisdictional legislative requirements, policies and guidelines.

Principles of the standards

Standard 3 aims to prevent patients from acquiring preventable healthcare associated infections and effectively manage infections when they occur by using evidence-based strategies that are based on the risk to both patients and staff.

Standard 4 aims to ensure competent clinicians safely prescribe, dispense and administer appropriate medicines to informed patients and carers.
General

Part 1: Vaccination guidelines
Note: This guideline is applicable for patients over 18 years of age.

Vaccination schedule for asplenic or hyposplenic patients
The vaccination guidelines below are consistent with the recommendations of Spleen Australia. Refer to the following link for the Spleen Australia vaccination flowcharts (alternatively access via https://spleen.org.au). All patients undergoing splenectomy, or those who are asplenic or hyposplenic, should receive the initial and follow-up vaccinations specified in table 1 and 2 below.

Initial vaccines to be given to all patients
> Elective splenectomy: Give vaccines 2 weeks before procedure.
> Urgent / Emergency splenectomy: Give vaccines at least 7 days postoperatively or on day of discharge, whichever comes first. The optimal time is when the patient has recovered from surgery (7 days postoperatively if this is possible). However it may be more convenient and appropriate (especially where patient compliance is an issue) that all the initial vaccines are administered prior to discharge from hospital as soon as the patient is clinically stable.
> It is safe to give all the initial vaccinations at the same time using different administration sites.

Table 1. Initial vaccines to be administered

<table>
<thead>
<tr>
<th>Type of vaccine</th>
<th>Vaccine brand name</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 valent pneumococcal conjugate vaccine (13vPCV)</td>
<td>Prevenar 13®</td>
</tr>
<tr>
<td>Quadrivalent (ACWY) meningococcal conjugate vaccine (4vMenCV)</td>
<td>Menactra® / Menveo® / Nimenrix®</td>
</tr>
<tr>
<td>Meningococcal B recombinant vaccine (4CMenB)</td>
<td>Bexsero®</td>
</tr>
<tr>
<td>Haemophilus influenzae type b conjugate vaccine (Hib)</td>
<td>Hiberix®</td>
</tr>
</tbody>
</table>

Single dose only

Follow-up vaccines to be given at least 8 weeks after the initial set
> If the patient has previously received different initial vaccinations from those specified above, then follow this link to view the separate flowchart on page 2 of the Spleen Australia recommendations, titled ‘Vaccines recommended for adults (>18 years) with asplenia/hyposplenism who have previously been vaccinated’.
> The initial pneumococcal conjugate vaccine (13vPCV) is different to the follow-up pneumococcal polysaccharide vaccine (23vPPV).
> Medical staff should ensure there is a plan in place to facilitate administration of the follow-up vaccinations at least 8 weeks after the initial set and this must be communicated to the patient prior to discharge.
Table 2. Follow-up vaccines to be administered

<table>
<thead>
<tr>
<th>Type of vaccine</th>
<th>Vaccine brand name</th>
</tr>
</thead>
<tbody>
<tr>
<td>23 valent pneumococcal polysaccharide vaccine (23vPPV)</td>
<td>Pneumovax 23®</td>
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<td>Bexsero®</td>
</tr>
</tbody>
</table>

Ongoing follow-up and recommendations

> Annual influenza vaccination is recommended as the prevention of influenza may reduce the risk of secondary bacterial infection. Two doses of influenza vaccine are required in the first year influenza vaccine is given following splenectomy, if the asplenic person has another underlying immunocompromising condition such as post SOT or HSCT.

> A second dose of Pneumovax 23® (23vPPV) should be repeated at 5 years and then a third dose is recommended at the age of 65 years (50 years for Indigenous adults), or a minimum of 5 years after the second dose, whichever is later [9]. There is a maximum of 3 doses of Pneumovax 23® (23vPPV) during adulthood (> 18 years). If asplenia is diagnosed ≥ 65 years (age ≥ 50 years for Indigenous adults), only a single revaccination dose of Pneumovax 23® (23vPPV) is recommended (i.e. the third pneumococcal vaccine dose is omitted).

> Quadrivalent (ACWY) meningococcal conjugate vaccine (4vMenCV) should be repeated at 5 yearly intervals.

Part 2: Antibiotic prophylaxis

The risk of overwhelming infection post-splenectomy remains life-long and is highest in immunocompromised patients. Antimicrobial prophylaxis should be assessed for each individual patient, particularly those at highest risk. The recommendations below are taken from the Australian Therapeutic Guidelines [3].

Minimum recommendations for duration of antibiotic prophylaxis:

> Prophylaxis for at least three years following splenectomy

> At least 6 months following an episode of severe sepsis

Consider lifelong prophylaxis for:

> Asplenic patients who are severely immunosuppressed

> Patients who have had a splenectomy for haematological malignancy, particularly for those with ongoing immunosuppression

> Patients who have had an episode of severe sepsis, particularly after a second episode

Recommended prophylactic antibiotics:

> Amoxycillin 250mg orally once daily

OR

> If allergic to penicillin, roxithromycin 150mg orally once daily

Due to the increasing prevalence of macrolide resistance in S. pneumoniae, penicillins are the preferred prophylaxis.
Part 3: Self-care – emergency supply of antimicrobials

Adherence to prophylactic therapy is often a problem. Patients should be given clear instructions to seek prompt medical attention if a fever develops. All patients should also have an emergency supply of antibiotics to take before medical review in the event of a sudden onset of unexplained fever. For adults, suggested regimens include:

> **Amoxycillin 3g** orally for the first dose, then 1g 8-hourly.

OR

> **If allergic to penicillin, roxithromycin 300mg** orally once daily.

Taking antibiotics is not a substitute for medical review, which should occur as soon as possible and ideally on the same day that the fever is noted.

Patients should be advised to store the antibiotics at room temperature away from direct sunlight and moisture. The expiry date of all antibiotics should be checked regularly.

Part 4: Patient information and education

Education of the patient, their family members, and their General Practitioner about the increased lifelong risk of bacterial infections and prevention strategies is crucial [10]. Patients and their families should be given verbal and written information concerning these recommendations. The SA Health Post-Splenectomy Patient Discharge Advice Sheet has been developed for this purpose. Please utilise this sheet to guide the education you provide. Asplenic patients should always carry a medical alert in the form of a laminated card or medallion and an up-to-date vaccination card. With the consent of the patient, his/her general practitioner should be informed and given written information. Up-to-date recommendations should be readily accessible to all general practitioners. Adult immunisation records should now be logged on the Australian Immunisation Register (AIR).

Travel

People with asplenia or hyposplenism are at increased risk of severe malaria, so expert travel advice for malaria prevention when travelling to a malaria endemic region should be encouraged [11]. This advice includes vector avoidance (e.g. wearing long sleeved clothing, using insect repellent), anti-malarial medications, and early medical attention in the setting of symptoms.

Animal handling

There is an increased risk of severe OPSI (e.g. due to *C. canimorsus*) following dog, cat or other animal bites. Tick bites are also a concern. Early medical attention is recommended.

Alerts and follow-up

The patient should be encouraged to wear or carry a Medic Alert medallion/bracelet or wallet card at all times. The patient’s medical case notes and Alerts sheet should be updated to say the patient has had a splenectomy. It is the Home Team’s responsibility to organise follow-up vaccinations and ongoing antimicrobial therapy.
References


Consumer information

Post-splenectomy treatment

You have had a splenectomy to remove your spleen due to damage or disease.

What is the spleen?
The spleen is a small organ that sits underneath your ribs on the left side. The spleen has several functions. The main function is to help the body fight infections.

What can happen if I don’t have a spleen?
If your spleen is removed (or not functioning properly), you have a higher risk of life-threatening infections. You will have this risk for the rest of your life.

Although these infections do not happen very often, it’s important to take the following precautions to prevent them:

1. Get vaccinated
   You will be given vaccinations against some of the bacteria that can cause serious infections. These include vaccinations for pneumococcal disease, meningococcal disease, and for Haemophilus influenzae type B. A yearly influenza (flu) vaccination is also recommended.
   
   Your vaccination schedule is outlined on the second and third pages of this information sheet.

2. Take preventative antibiotics
   Antibiotics are often prescribed to be taken daily for the first three years after you have your spleen removed. This is when you are most at risk of infection. Some people may need to take an antibiotic every day for the rest of their life. Your doctor will discuss this with you.

   The antibiotic we recommend is amoxycillin 250mg once each day, however if you are allergic to penicillin (amoxycillin), then roxithromycin 150mg once each day will be recommended.

3. Have emergency antibiotics and know when to use them
   As well as the daily preventative antibiotics, you will be provided with an emergency supply of antibiotics to take immediately when required. It is important for you to know when to take your emergency antibiotics:

   - You should have 6 amoxycillin capsules (500mg) on hand at all times.
   - If you feel unwell or have an unexplained fever then take all 6 capsules of amoxycillin 500mg together at once and see your doctor immediately.
   - If you are allergic to penicillin (amoxycillin), then you should take roxithromycin 300mg at once and see your doctor immediately.
   - You should also see a doctor straight away if you get an animal bite that breaks the skin.
All antibiotics should be stored at room temperature away from direct sunlight and moisture. You should check the expiry date of all antibiotics regularly.

4. **Take good care of yourself**

   - **Be careful when travelling.** See your doctor if you are planning on travelling overseas. You may need additional vaccines.
   - **Wear a Medic-Alert® (or similar) bracelet or necklace.** Having a bracelet or necklace that has important information about your condition or a number to call for more information may help healthcare professionals assist you if you are severely injured or unwell. Application forms for a Medic-Alert® bracelet or necklace can be downloaded at [http://www.medicalert.org.au](http://www.medicalert.org.au).
   - **Inform healthcare providers.** Make sure you tell your doctor, dentist and other healthcare professionals that you do not have a spleen.

### YOUR VACCINATION SCHEDULE

**Date of splenectomy:** ………………………………………
Insert the date of the surgery when your spleen was removed.

**First set of vaccines**
If your surgery to remove your spleen was planned, you should be vaccinated with the first set of vaccines 2 weeks before the surgery. If you had unplanned emergency surgery to remove your spleen, you will be vaccinated with the first set of vaccines while you are in hospital.

<table>
<thead>
<tr>
<th>Type of vaccine</th>
<th>Vaccine brand name</th>
<th>Date given</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumococcal <em>conjugate</em> vaccine (13vPCV)</td>
<td>Prevenar 13&lt;sup&gt;®&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Meningococcal <em>conjugate</em> vaccine (4vMenCV)</td>
<td>Menactra&lt;sup&gt;®&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Meningococcal B <em>recombinant</em> vaccine (4CMenB)</td>
<td>Bexsero&lt;sup&gt;®&lt;/sup&gt;</td>
<td></td>
</tr>
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<td>Hiberix&lt;sup&gt;®&lt;/sup&gt;</td>
<td></td>
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</tbody>
</table>

**Second set of vaccines (follow-up vaccines)**
Should be given at **at least 2 months** after the first set of vaccines.

<table>
<thead>
<tr>
<th>Type of vaccine</th>
<th>Vaccine brand name</th>
<th>Date given</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumococcal <em>polysaccharide</em> vaccine (23vPPV)</td>
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</tbody>
</table>

It is very important that you visit your local doctor for the second set (follow-up) vaccines if you are discharged from hospital before they are given to you. You should take this information sheet with you to appointments and record all dates that vaccines were given to you.
Re-vaccination (after second set of vaccines)
You will need ongoing vaccines as follows:

<table>
<thead>
<tr>
<th>Type of vaccine</th>
<th>Vaccine brand name</th>
<th>Instructions</th>
<th>Date(s) given</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza vaccine (Flu vaccine)</td>
<td>Multiple</td>
<td>&gt; A yearly flu vaccination is recommended.</td>
<td></td>
</tr>
</tbody>
</table>
| Pneumococcal polysaccharide vaccine (23vPPV) | Pneumovax 23<sup>®</sup> | > A second dose of Pneumovax 23<sup>®</sup> (23vPPV) should be repeated 5 years after the second set of vaccines above.  
> A third dose is recommended at the age of 65 years (50 years for Indigenous adults) OR a minimum of 5 years after the second dose, whichever is later.  
> You can have a maximum of 3 doses of Pneumovax 23<sup>®</sup> (23vPPV) as an adult (> 18 years). If you have your spleen removed after 65 years of age (or ≥ 50 years for Indigenous adults), only a single booster dose is recommended (i.e. the third and final dose is not given). |               |
| Meningococcal conjugate vaccine (4vMenCV) | Menactra<sup>®</sup> | > Menactra<sup>®</sup> (4vMenCV) should be repeated every 5 years.          |               |

The information contained within this leaflet is for general information only. Ask your doctor if you have any questions about the leaflet or about your medical care.

For more information

Infection Control Service
Communicable Disease Control Branch
Telephone: 1300 232 272
www.sahealth.sa.gov.au/antimicrobials

Public-I1-A1

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