## Management of Patients with an Absent or Dysfunctional Spleen

<table>
<thead>
<tr>
<th>Author:</th>
<th>Health Protection Team</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsible Lead Executive Director:</td>
<td>Director of Public Health</td>
</tr>
<tr>
<td>Endorsing Body:</td>
<td>Health Protection Committee</td>
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<tr>
<td>Governance or Assurance Committee:</td>
<td>Health Protection Committee</td>
</tr>
<tr>
<td>Implementation Date:</td>
<td>April 2017</td>
</tr>
<tr>
<td>Version Number:</td>
<td>Version 1</td>
</tr>
<tr>
<td>Review Date:</td>
<td>April 2019</td>
</tr>
<tr>
<td>Responsible Person:</td>
<td>Jim White</td>
</tr>
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### Consultation and Distribution Record

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| Consultation Process / Stakeholders: | • Health Protection Staff  
|                                  | • Infection Prevention and Control Staff  
|                                  | • NHSL Pharmacy Staff |
| Distribution: | • NHS Lanarkshire intranet – Firstport  
|                | • NHS Lanarkshire external website  
|                | • Control of Infection Manual |

### Change Record

<table>
<thead>
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<th>Date</th>
<th>Author</th>
<th>Change</th>
<th>Version No.</th>
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<tr>
<td>30-11-2016</td>
<td>Jim White</td>
<td>Content reviewed and updated. New policy template applied.</td>
<td>1.0</td>
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</table>
1. INTRODUCTION

Asplenic patients and those with impaired splenic function are at risk of severe infection. In post splenectomy patients, two thirds of infections occur within the first 2 years but patients are at a lifelong risk of serious infection. Patients must be instructed of this. The commonest infections are due to encapsulated bacteria, including:

- Streptococcus pneumoniae is the most common causative organism, causing around 60% of cases. Haemophilus influenzae type b and Neisseria meningitidis are other less common causes.
- Other rare causes of sepsis include Gram-negative bacilli, Staphylococcus aureus, other Streptococci, babesiosis (tick bites) and Capnocytophaga canimorsus (animal bites).

It is crucial that these individuals adhere to the preventive measures outlined below and that they inform all caregivers of their asplenic state. Therefore, it is imperative that all patients with an absent or dysfunctional spleen are appropriately immunised and receive appropriate antibiotic prophylaxis.

2. AIM, PURPOSE AND OUTCOMES

Aim
To ensure appropriate and timely treatment on and on-going management of adult patients who have an absent or dysfunctional spleen.

Outcomes
- All patients who have a dysfunctional spleen or who have a splenectomy performed at a hospital within NHS Lanarkshire will be vaccinated at the appropriate time with the appropriate vaccine.
- All patients with an absent or dysfunctional spleen will be offered appropriate lifelong antibiotic prophylaxis.
- All patients with an absent or dysfunctional spleen will be offered appropriate emergency antibiotic treatment to have at home.
- All of the above information will be communicated with the patient’s GP.
- All patients who have an absent or dysfunctional spleen will be provided with a Scottish Government ‘A Guide for People Without a Working Spleen’ leaflet and card.
3. SCOPE

3.1 Who is the Policy intended to Benefit or Affect?

The policy will benefit all patients who have an absent or dysfunctional spleen.

3.2 Who are the Stakeholders?

This policy is aimed at all healthcare staff working in NHS Lanarkshire.

4. PRINCIPAL CONTENT

Vaccination and Antibiotic Prophylaxis;

Ideally, vaccination should be given four to six weeks prior to elective splenectomy, if this is not possible can be given up to two weeks before operation.

In the case of emergency splenectomy vaccination should be delayed until at least two weeks after the operation.

A summary of the vaccine schedule can be found on page eight (8).

Full detail on individual vaccine can be found in the “Green Book” at:


- Influenza vaccine should be given annually usually between September and November to all those aged over 6 months. Vaccination should also be given if the current immunisation season has not ended. Two doses of inactivated vaccine are required to achieve adequate antibody levels in those who have not previously received an influenza vaccine.
- PPV vaccination is usually required every 5 years.

PASSIVE IMMUNISATION AND ANTIVIRALS

Use of passive antibody should be considered in immunosuppressed individuals after exposure to measles or chickenpox i.e. appropriate immunoglobulin (VZIG) or normal human immunoglobulin (HNIG). Antivirals such as prophylactic aciclovir may be considered, e.g after exposure to chickenpox.
**Antibiotic prophylaxis**

Lifelong antibiotics should be offered to all patients considered at high risk of pneumococcal infection and patients should be educated to ensure adherence to antibiotic prophylaxis:

- Hyposplenic patients up to age 16 and over 50 years
- Patients who have had a previous episode of invasive pneumococcal disease
- Inadequate serological response to pneumococcal vaccination
- Splenectomy for underlying haematological malignancy particularly in the context of ongoing immunosuppression.

For patients not at high risk, the risk of overwhelming infection is most common in the first 2 years after splenectomy but may occur decades later. The risks and benefits of lifelong antibiotics should be discussed with these patients who may choose to continue or discontinue prophylactic antibiotics but every effort should be made to encourage patients to take antibiotics in the early stages\(^1,2\).

**IDENTIFICATION OF PATIENTS WITH AN ABSENT OR DYSFUNCTIONAL SPLEEN**

- Clear identification of these patients is essential, to recognise the potential implications of bacterial and viral infections.
- All information concerning immunisation and antibiotic prophylaxis should be conveyed to the patient’s GP.
- Patients should be given, and encouraged to carry, a Scottish Government “A guide for people without a working spleen leaflet alert card”.
- Patients should be encouraged to wear a medical alert bracelet/tag.

**CHEMOTHERAPY (OR OTHER IMMUNOSUPPRESSIVE TREATMENT)**

The vaccines used are inactivated and therefore cannot replicate, they can be administered to immunosuppressed individuals, although they may elicit a lower response than in an immunocompetent individual.

There may be a few occasions when deferral of immunisation is required and immunisation may be postponed and resumed following an assessment made on clinical judgement and a complete understanding of the patient.

**PREGNANCY**

Immunisation Against Infectious Disease (Green Book) advises the following:

- **INFLUENZA**: pregnant women should be vaccinated before the influenza season, regardless of the stage of pregnancy
- **PNEUMOCOCCAL**: - containing vaccines may be given to pregnant women when the need for protection is required without delay.

- **HAEMOPHILUS**: - Hib-containing vaccines may be given to pregnant women when protection is required without delay.

- **MENINGOCOCCAL**: - vaccines may be given to pregnant women when clinically indicated.

- **PERTUSSIS**: - offered to all women from 16 week of pregnancy ideally by 32 weeks but beneficial until 38 weeks gestation.

There is no evidence of risk from vaccinating pregnant women or those who are breast feeding with inactivated viral or bacterial vaccines or toxoids.

The UK Teratology Information Service provides the following information for antibiotics during pregnancy:

- **Penicillins may be used in pregnancy if clinically indicated.**
  The vast majority of the large amount of available data shows no increased risk of congenital malformation, spontaneous abortion, intrauterine death, low birth weight, preterm delivery or neonatal complications following maternal exposure to therapeutic doses of penicillins when studied either as a group or individually (although data are more limited), with the exception of flucloxacillin, piperacillin, temocillin or ticarcillin, for which there are no epidemiological studies assessing drug-specific risk. Exposure to penicillins at any stage in pregnancy would not usually be regarded as medical grounds for termination of pregnancy or any additional foetal monitoring. However, other risk factors may be present in individual cases which may independently increase the risk of adverse pregnancy outcome. Clinicians are reminded of the importance of consideration of such factors when performing case-specific risk assessments. Available at [https://www.toxbase.org/Poisons-Index-A-Z/P-Products/Penicillin-antibiotics-in-pregnancy/](https://www.toxbase.org/Poisons-Index-A-Z/P-Products/Penicillin-antibiotics-in-pregnancy/)

A patient information leaflet for use of amoxicillin in pregnancy is available from [http://medicinesinpregnancy.org/Medicine--pregnancy/Amoxicillin/](http://medicinesinpregnancy.org/Medicine--pregnancy/Amoxicillin/)

The considerable data for macrolides as a class, and for erythromycin specifically, do not suggest an increased overall risk of congenital malformation or of cardiac malformations specifically. Exposure to a macrolide antibiotic at any stage in pregnancy would not usually be regarded as medical grounds for termination of pregnancy or any additional fetal monitoring. However, other risk factors may be present in individual cases which may independently increase the risk of adverse pregnancy outcome. Clinicians are reminded of the importance of consideration of such factors when performing case-specific risk assessments. Available at [https://www.toxbase.org/Poisons-Index-A-Z/M-Products/Macrolides-in-pregnancy/](https://www.toxbase.org/Poisons-Index-A-Z/M-Products/Macrolides-in-pregnancy/)
A patient information leaflet for use of macrolide antibiotics in pregnancy is available from http://medicinesinpregnancy.org/Medicine--pregnancy/Macrolides/

Lactation

For Penicillin use during lactation, the UKMi online database for safety of medicines in lactation available from the Specialist Pharmacy Service states: Monitor infant for gastrointestinal disturbances and oral candida infection, especially if used for prolonged periods or in high doses, although these effects are unlikely to occur. There is also a theoretical risk of hypersensitivity.

Available at https://www.sps.nhs.uk/articles/safety-in-lactation-penicillins/

For Erythromycin use during lactation, the UKMi online database for safety of medicines in lactation available from the Specialist Pharmacy Service states: Epidemiologic evidence indicates that the risk of hypertrophic pyloric stenosis in infants might be increased by use of maternal macrolides, especially in infants exposed in the first 2 weeks after birth. This risk may be greater with erythromycin. Monitor infant for gastro-intestinal disturbances and oral candida infection, especially if used for prolonged periods or in high doses, although these effects are unlikely to occur.

Available at https://www.sps.nhs.uk/articles/safety-in-lactation-macrolides/

However, other risk factors may be present in individual cases which may independently increase the risk during lactation. Clinicians are reminded of the importance of consideration of such factors when performing case-specific risk assessments.

TRAVEL

Patients with an absent or dysfunctional spleen are at increased risk of severe falciparum malaria. Guidance should be given on appropriate malaria prophylaxis and the need for close adherence to it. They are also at an increase risk of meningitis and other travel associated infections. Please check with Travax (username and password required). Online: http://www.hps.scot.nhs.uk/Travel/index.aspx.

ANIMAL BITES

All animal bites need to be treated quickly, to reduce the chance of infection from Capnocytophaga canimorsus, which can lead to fulminant sepsis. Antibiotics are usually prescribed.

TICK BITES

A third of cases of clinical human babesiosis have occurred in splenectomised individuals. It is a rare tick borne infection that can cause moderate to severe disease, including
haemolytic anaemias. Therefore it is essential to take precautions against being bitten in endemic areas.

**SPLENECTOMY CARD**

All patients/parents or carers of children undergoing a splenectomy or those with a dysfunctional spleen should be issued with a Scottish Government ‘A Guide for People Without a Working Spleen’ leaflet and card.


They should be encouraged to wear a medical alert bracelet/tag.

**EARLY SIGNS OF INFECTION**

Patients should be advised to see a doctor immediately, if they develop any signs of infection e.g. sore throat, fever, malaise, severe headache, and flu-like symptoms

**ADMINISTRATION OF VACCINES**

All of the necessary vaccines in this policy, i.e. two or more, can be given on the same day. If vaccines are administered in the same limb, each should be at least 2.5cm away from the other one.

- Vaccines are routinely given intramuscularly into the upper arm or anterolateral thigh. This is to reduce the risk of localised reactions, which are more common when the vaccine is given subcutaneously. For individuals with a bleeding disorder, however, vaccines should be given by deep subcutaneous injection to reduce the risk of bleeding.
- Nurses, who are competent in administering injections, can give the vaccines.

**Pneumococcal Vaccine (Generic 23-valent PPV or PREVENAR 13®)**

PPV consists of purified pneumococcal capsular polysaccharide antigens derived from 23 serotypes. These serotypes account for ~90% of invasive pneumococcal disease types and the vaccine offers splenectomised individuals ~70% protection.

However PPV fails to produce an adequate antibody response in children < 2 years.

Prevenar 13® (PCV) is effective in young children but protects against 13 of the most common pneumococcal serotypes.
## PNEUMOCOCCAL VACCINATION DOSAGE AND SCHEDULE

<table>
<thead>
<tr>
<th>PATIENT AGE AT PRESENTATION</th>
<th>VACCINE GIVEN AND WHEN TO IMMUNISE</th>
</tr>
</thead>
<tbody>
<tr>
<td>13-valent PCV</td>
<td>23-valent PPV</td>
</tr>
<tr>
<td>At-risk children 2 months to 13 months of age who have asplenia or splenic dysfunction or who are immunosuppressed</td>
<td>Vaccination according to routine immunisation schedule at 2, 4 and 13 months.</td>
</tr>
<tr>
<td>At-risk children 14 months to under 5 years of age who have asplenia or splenic dysfunction or who are immunosuppressed</td>
<td>If previously unvaccinated with PCV, two doses with an interval of 2 months between doses</td>
</tr>
<tr>
<td>At-risk children aged 5 years and over and at-risk adults</td>
<td>PCV is not recommended</td>
</tr>
</tbody>
</table>

## REINFORCING - IMMUNISATION?

**PCV** - Young children may have a suboptimal immunological response to vaccination, those aged <2 years are recommended to have an additional PCV13 dose, ideally two months after their first birthday, or as soon as possible thereafter.

**PPV** – Antibody levels are likely to decline rapidly in individuals with no spleen, splenic dysfunction or chronic renal disease (Stages 3 – 5) therefore re-immunisation with 23-valent PPV is recommended every five years in these groups. Revaccination is well tolerated. Testing of antibody levels prior to vaccination is not required.

## HAEMOPHILUS INFLUENZAE TYPE B (HIB) AND MENINGOCOCCAL C VACCINES

Vaccination against Haemophilus Influenza Type B (Hib) infection

Hyposplenic patients are at increased risk of invasive Haemophilus influenzae. This is currently available as a combined product of Hib with Meningococcal group C conjugate vaccine (Menitorix®). Unimmunised patients should receive one dose at the same time as pneumococcal vaccination. Those who have been fully immunized with Hib as part of a routine immunisation programme who then develop splenic dysfunction should also receive a dose of Menitorix®.
Vaccination against Meningococcal infection

Current guidelines recommend one dose of a meningitis C conjugate vaccine such as the Hib/ MenC vaccine (Menitorix®) and a meningococcal B (Bexsero®) vaccine, in hyposplenic children aged ≥2 years and adults. This should be followed by a single dose of quadrivalent MenACWY conjugate vaccine and a further dose of Meningococcal B (Bexsero®) vaccine one month later (2 months later in the case of children between 2-11 years), irrespective of the patient’s previous immunisation status.

Patients travelling to a country where there is an increased risk of serogroup A, W135 or Y meningococcal infection, should receive an additional vaccine of the quadrivalent MenACWY conjugate vaccine before travelling. For example travel to Sub-Saharan Africa or Saudi Arabia during the hajj pilgrimage. Vaccination may also be necessary for visitors to the Indian subcontinent or other parts of Asia during outbreaks of meningococcal infection.

ANTIBIOTIC PROPHYLAXIS GUIDELINES

- Following splenectomy, patients are at a higher risk of overwhelming infection.
- Susceptibility to infection may be greatest in the first few years following splenectomy, but persists lifelong. However, compliance with lifelong antibiotics can be a problem.
- All adults should therefore receive antibiotic prophylaxis for at least 2 years following splenectomy.
- Children should receive antibiotic cover until 16 years of age and for a minimum of 2 years following splenectomy.
- Lifelong antibiotic prophylaxis should be considered for patients with lymphoproliferative disease or sickle cell disease.
- An emergency supply of antibiotics is commonly given to the patient on discharge, which would be available for them to take at the first signs of any infection. Likewise following the two-year prophylaxis course, an emergency dose of amoxicillin or erythromycin can be prescribed for use at home prior to seeking urgent medical attention.
- A supply of oral antibiotics should be kept at home and used immediately should infective symptoms of raised temperature, malaise or shivering develop. Patients should be advised to seek immediate medical attention and to check the expiry date of antibiotics regularly.
ANTIBIOTIC PROPHYLAXIS

<table>
<thead>
<tr>
<th>Drug</th>
<th>Indication</th>
<th>Dose</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>In non-penicillin allergic patients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phenoxymenthylpenicillin (Penicillin V)</td>
<td>Child 1-4 years</td>
<td>125mg twice daily</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Child 5-17 years</td>
<td>250mg twice daily</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adult</td>
<td>250mg twice daily</td>
<td></td>
</tr>
<tr>
<td>In penicillin allergic patients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erythromycin</td>
<td>Child 2-7 years</td>
<td>250mg twice daily</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Child 8-17 years</td>
<td>500mg twice daily</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adult</td>
<td>500mg twice daily</td>
<td></td>
</tr>
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</table>

ANTIBIOTIC (TO TAKE HOME) TREATMENT PACK

<table>
<thead>
<tr>
<th>Drug</th>
<th>Indication</th>
<th>Dose</th>
<th>Notes</th>
</tr>
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<tbody>
<tr>
<td>In non-penicillin allergic patients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amoxicillin</td>
<td>Child 1-4 years</td>
<td>250mg three times daily</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Child 5-11 years</td>
<td>500mg three times daily</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Child 12-17 years</td>
<td>500mg three times daily</td>
<td>Can increase to maximum 1g three times daily if infection severe.</td>
</tr>
<tr>
<td></td>
<td>Adult</td>
<td>500mg three times daily</td>
<td></td>
</tr>
<tr>
<td>In penicillin allergic patients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erythromycin</td>
<td>Child 2-7 years</td>
<td>250mg four times daily</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Child 8-17 years</td>
<td>500mg four times daily</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adult</td>
<td>500mg four times daily</td>
<td></td>
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</table>

If a patient becomes nil-by-mouth following a splenectomy, IV benzylpenicillin should be given:

**ADULTS:** IV benzylpenicillin = 1.2g twice daily
**CHILDREN:** IV benzylpenicillin = 25mg/kg twice daily
Additional cover with IV benzylpenicillin is not required if the patient is already receiving antibiotics with appropriate activity (e.g. cephalosporins, other β-lactam agents; if unsure check with microbiology). If patient is allergic to penicillins, again discuss with microbiology.

5. ROLES AND RESPONSIBILITIES

<table>
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<th>Who</th>
<th>Roles &amp; Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NHS Board</strong></td>
<td>• To implement this policy across NHS Board</td>
</tr>
<tr>
<td><strong>Hospital Management Teams</strong></td>
<td>• Support the HCWs, HPT and the IPCT in following this policy.</td>
</tr>
</tbody>
</table>
| **HPT** | • Keep this policy up to date.  
• Engage with staff to support implementation of IPC precautions described in this policy as required.  
• Review national guidance  
• Provide education opportunities on this policy. |
| **Senior Charge Nurse (Ward Manager)**  
**Care Home Manager**  
**Health and Social Care Partnerships** | • To provide leadership within the clinical area and act as role models in relation to IPCT.  
• To ensure implementation and ongoing compliance with SICPs and TBPs and take appropriate action to address any area of non compliance.  
• To report any difficulty in accessing or providing sufficient resource to achieve this.  
• Recognise and report to the IPCT/HPT any incidences of clinical conditions where the signs/symptoms are suggestive of an outbreak. |
| **HCWs** | • To ensure implementation and ongoing compliance with SICPs and TBPs.  
• Recognise and report to the IPCT/HPT any incidences of clinical conditions where the signs/symptoms are suggestive of an outbreak. |
| **Medical Staff /Pharmacy Staff** | It is the responsibility of the Medical Staff caring for a patient with an absent or dysfunctional spleen to arrange for appropriate antibiotic prophylaxis and vaccinations at the appropriate time.  
Medical or Pharmacy staff should discuss the precautions that required to be followed following a splenectomy or in patients whose spleen is not functioning. |
A checklist for discharging patients from hospital following a splenectomy follows:

Discharge checklist - Prophylactic measures before leaving hospital

1. Regular prophylactic antibiotics given
   • See section 4 of guideline

2. Vaccines administered? At least 2 weeks (ideally 4-6 weeks) prior to surgery or 2 weeks after surgery or on day of discharge if sooner
   • Pneumococcal - repeat every 5 years
   • Hib/ MenC (Menitorix®)
   • MenB protein vaccine (Bexsero®)

3. Discuss quadrivalent MenACWY conjugate vaccine and MenB vaccine (Bexsero®) one month after Menitorix® vaccine – obtain from GP if vaccines given postoperatively.


5. Given course of emergency antibiotics on discharge prescription?
   • See section 4 of guideline
   • Advise to check expiry date regularly

6. Discuss medical alert jewellery.

7. Discuss annual influenza vaccine and Pneumococcal vaccine every 5 years from GP.

8. Discuss need for immediate medical attention following animal a bite.

9. Discuss further vaccines if travelling and malarial/tick bite precautions

6. RESOURCE IMPLICATIONS

There are no resource implications.
7. COMMUNICATION

Policy will be launched and distributed as follows:
• Staff brief
• Electronic launch through dissemination by Chiefs of Nursing Services
• The Policy will be available on the ‘Policies’ section on First Port

8. QUALITY IMPROVEMENT, MONITORING AND REVIEW

The HPT/IPCT will continue to monitor the Guideline for the Control and Treatment of Scabies and review nationally for changes.

9. EQUALITY AND DIVERSITY IMPACT ASSESSMENT (EDIA)

This policy meets NHSL EDIA

10. ABBREVIATIONS

<table>
<thead>
<tr>
<th>CRA</th>
<th>Clinical Risk Assessment</th>
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<tr>
<td>HCWs</td>
<td>Health Care Workers</td>
</tr>
<tr>
<td>HPT</td>
<td>Health Protection Team</td>
</tr>
<tr>
<td>ICU</td>
<td>Intensive Care Unit</td>
</tr>
<tr>
<td>IPCN</td>
<td>Infection Prevention and Control Nurse</td>
</tr>
<tr>
<td>IPCT</td>
<td>Infection Prevention and Control Team</td>
</tr>
<tr>
<td>NHSL</td>
<td>NHS Lanarkshire</td>
</tr>
<tr>
<td>SICPs</td>
<td>Standard Infection Control Precautions</td>
</tr>
<tr>
<td>TBPs</td>
<td>Transmission Based Precautions</td>
</tr>
</tbody>
</table>
11. REFERENCES


Konradsen, Rasmussen, Ejstrud and Hansen: Antibody levels against Streptococcus pneumoniae and Haemophilus influenzae type b in a population of splenectomised individuals with varying vaccination status, Epidemiology and Infection (1997) 119: 167-174


