Guidelines for the Prevention of Infection in patients with absent or dysfunctional spleen

University Hospitals of Leicester NHS
NHS Trust

Trust reference: B13/2007

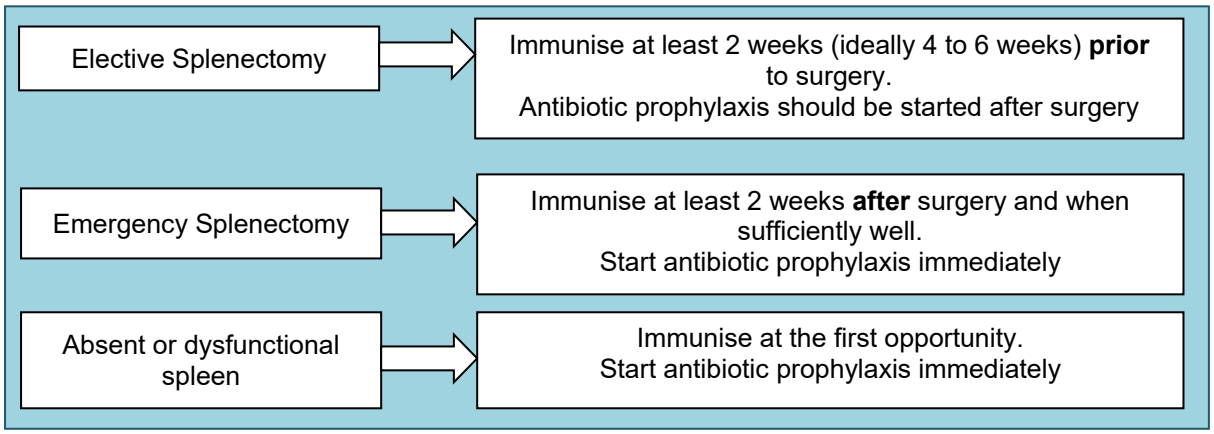
1. Introduction and Who the Guideline applies to

Patients with an absent or dysfunctional spleen due to surgical removal or medical conditions that predispose to hyposplenism (e.g. sickle cell disease or coeliac disease) are at increased risk of severe infection. The risk is greatest in the first 2 years following splenectomy, but persists throughout life.

The infections seen in these patients are most commonly caused by *Streptococcus pneumoniae*, but other organisms, especially encapsulated organisms, also present significant risks e.g. *Haemophilus influenzae* type b (Hib) and *Neisseria meningitidis*.

2. When to offer immunisation and antibiotic prophylaxis

All hyposplenic individuals should be fully vaccinated in accordance with the national schedule and with the additional vaccinations specified below. Patients should be assessed for the need for prophylactic antibiotics. All patients should be given education about their condition and the risk of infections, and how to prevent these.



3. Vaccination

3.1. Recommended vaccines and doses for adults

Recommended Vaccines	Brand of Vaccine (examples)	Recommended dose
Pneumococcal polysaccharide (PPV23)	Pneumococcal polysaccharide vaccine (generic only)	0.5 mL intramuscularly
Pneumococcal polysaccharide (PCV13)	Prevenar 13	0.5mL intramuscularly
Meningococcal groups ACWY conjugate (MenACWY)	Menveo Nimenrix	0.5 mL intramuscularly
Meningococcal group B Multicomponent protein (MenB)	Bexsero	0.5 mL intramuscularly
Seasonal Influenza vaccine	Varies annually *Contact pharmacy for advice*	Refer to product literature or pharmacy

Giving multiple vaccines together increases the risk of vaccine related fever, especially when Bexsero® (MenB) is given alongside other vaccines. Consider the use of prophylactic paracetamol in children
Fever may persist for 48 hours post vaccination and clinical judgement should determine whether additional paracetamol dosing is needed. If being discharged on paracetamol prophylaxis patients and/or their carers should be advised about when to seek advice if pyrexia does not resolve.

Please consult the BNF and BNF for Children for advice on appropriate dose based on age and/or body weight.

3.2. Vaccination Schedule

Before commencing vaccinations for a patient it is important to get a full record of his/her vaccination history. This will determine whether the vaccines given in asplenia are additional or whether the standard vaccination schedule needs to be commenced.

It is important to include details of type and timing of vaccines given during admission and those required post discharge in the patient's discharge letter to ensure the GP is informed of when they should take place. The routine childhood vaccination programme can be found in 'UK immunisation schedule: The Green Book, Chapter 11'which is available online (http://bit.ly/TheGreenBook).

Household and close contacts of hyposplenic patients should be fully vaccinated as per the national vaccination schedule and should be offered additional seasonal influenza, MMR and varicella vaccines through their GP. This boosts herd immunity and protects hyposplenic individuals further. Chapter 7 of The Green Book gives more information on this (http://bit.ly/TheGreenBook).

The following boxes (adapted from The Green Book and the BNF for Children) detail the vaccines required depending on the age at which the patient was diagnosed as being at risk of infection.

Age of diagnosis	Vaccines required
First diagnosed or presenting under 1 year of age	Children should be fully immunised according to the national schedule, and should also receive: • two doses of MenACWY vaccine at least 4 weeks apart during their first year • an additional priming dose of PCV13, such as to receive a total of two priming doses of PCV13 with an 8-week interval in their first year • a booster dose of MenACWY conjugate vaccine 8 weeks after the vaccinations scheduled at one year of age • an additional booster dose of PCV13, to be administered at least 8 weeks after the routine PCV13 booster scheduled at 1 year of age, and • one dose of PPV23 after the second birthday and at least 8 weeks after the last dose of PCV13 • Annual influenza vaccine each season if aged over 6 months
First diagnosed or presenting at 1 year to under 2 years of age	If not yet administered, give the routine vaccines due at 1 year of age plus: • one dose of MenACWY conjugate vaccine at least 8 weeks

	after the vaccines scheduled at 1 year of age • an additional booster dose of PCV13, to be administered at least 8 weeks after the routine PCV13 booster scheduled at 1 year of age • one dose of PPV23 after the second birthday • Annual influenza vaccine each season
First diagnosed or presenting from two years to under ten years of age	Ensure children are immunised according to the national schedule, and they should also receive: • one dose of MenACWY conjugate vaccine • one dose of PPV23 • If they have not received the routine 2+1 schedule for MenB, ensure they have received two doses of MenB 8 weeks apart since first birthday • If they have not received any PCV previously, they should receive a dose of this first followed by the dose of PPV23 at least 8 weeks later • Annual influenza vaccine each season
First diagnosed at age ten years onwards	Older children and adults, regardless of previous vaccination, should receive: • one dose of PPV23, MenB and MenACWY conjugate vaccine • an additional MenB vaccine dose 4 weeks later • Annual influenza vaccine each season

Patients on complement inhibitor therapy (Eculizumab or Soliris®) are not at increased risk of pneumococcal disease and do not require PPV23 or additional doses of PCV13.

Patients with asplenia and splenic dysfunction should receive boosters of PPV23 at five yearly intervals.

4. Prophylactic Antibiotics

Prophylaxis with antibiotics should be offered to all splenectomy patients in the first 2 years after splenectomy. Prophylaxis should be reviewed after 12 months.

The decision to give long term prophylactic antibiotics should be made on a patient by patient basis depending on individual risk factors.

Life-long prophylactic antibiotics should be offered to patients considered at continued high risk of pneumococcal infection.

High risk patients include:

- Children up to the age of 16 years and adults over 50 years
- Inadequate serological response to pneumococcal vaccination
- A history of previous invasive pneumococcal disease
- Severe infection requiring hospitalisation post-splenectomy (not including post-surgical infection)
- Splenectomy for underlying haematological malignancy

Patients not at high risk should be counselled regarding the risks and benefits of long term antibiotics and a decision made with the patient as to whether to continue antibiotics or stop therapy after 2 years.

4.1. Recommended Antibiotic Regimens

	Antibiotic	Adult Dose	Child dose
First line (pneumococcal cover)	Phenoxymethylpenicillin PO	250 mg BD	1 month to 11 months: 62.5 mg BD 1 year to 4 years: 125 mg BD 5 to 17 years: 250 mg BD
Second line (If allergic to phenoxymethylpenicillin)	Erythromycin PO	500 mg BD	1 month to 23 months: 125 mg BD 2 to 7 years: 250 mg BD Over 8 years: 500 mg BD

For adult patients who are nil by mouth or unable to take enteral medication for other reasons, offer IV benzylpenicillin 1.2g BD or IV clarithromycin 500mg BD (if patient has a penicillin allergy); switch to enteral therapy as soon as possible.
In children who are NBM or unable to take enteral medication consult paediatric pharmacist/ microbiology.

Antibiotic prophylaxis should be omitted in patients on antibiotic **treatment** for other reasons (e.g. active infection) that provide an appropriate spectrum of activity. Once **treatment** has finished, the antibiotic prophylaxis should be recommenced if appropriate. If you are unsure, consult a Microbiologist or a Pharmacist.

5. Patient Education

Due to an increased risk of serious and overwhelming infection, patients vaccinated under this guideline should receive detailed counselling and written information on this risk which should cover at a minimum:

- The need to carry a splenectomy card to alert healthcare professionals to the risk of overwhelming infection.

https://www.gov.uk/government/publications/splenectomy-leaflet-and-card

- The risks associated with animal bites and potential risks of tick and mosquito-borne diseases.
- The risks associated with travel to areas where malaria is endemic and the need to take the correct antimalarial chemoprophylaxis and other preventative measures. Patients considering travel to an area where malaria is endemic should be provided with precise information about correct chemoprophylaxis and measures to reduce exposure to mosquito bites.

- That they must consult their doctor if they develop signs or symptoms of infection, and that if their condition deteriorates rapidly or they are seriously unwell, they should attend A&E urgently
- That they must ensure their vaccinations are kept up to date and that they should receive the annual influenza vaccine from their GP or community pharmacist.
- There is no evidence that the lack of a spleen or part of a spleen or a nonfunctioning spleen on its own renders patients at higher risk of Covid-19 but patient should be advised to follow all general guidance outlined above and to ensure they are fully vaccinated.

In addition to this, patients should be encouraged to wear a 'Medic-Alert' bracelet or equivalent and carry more detailed information about their condition, other clinical details, and contact telephone numbers. In an emergency this information may be life-saving.

6. Staff Education and Training

None.

7. Monitoring Compliance

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting arrangements
Prescribing of prophylactic antimicrobials in line with this guideline and Trust policy for antimicrobial prescribing	Via the standards set in the annual Trust wide antimicrobial prescribing audit.	Lead Antimicrobial Pharmacist	Annually	To CMG clinical leads, Antimicrobial working party, and TIPAC.

8. Supporting References

- British Society of Haematology. - 'Guidance on shielding for Children and Adults with splenectomy or splenic dysfunction during the COVID-19 pandemic' https://b-s-h.org.uk/media/18292/covid19-bsh-guidance-on-splenectomy-v2-final-6-may2020_.pdf
- Davies JM, Lewis MP, Wimperis J *et al*. (2011) Review of guidelines for the prevention and treatment of infection in patients with an absent or dysfunctional spleen: prepared on behalf of the British Committee for Standards in Haematology by a working party of the Haemato-Oncology task force. *Br J Haematol* **155**(3): 308-17.
- Department of Health Immunisation against Infectious Disease. - "The Green Book" (http://bit.ly/TheGreenBook)
    - Chapter 7 - Immunisation of individuals with underlying medical conditions
    - Chapter 16 - Haemophilus influenzae type b (Hib)
    - Chapter 19 – Influenza
    - Chapter 22 – Meningococcal
    - Chapter 25 – Pneumococcal
- Kyaw. M. H., et al., (2006) Evaluation of Severe Infection and Survival After Splenectomy, *Am J Medicine*, **119**:276
- Rubin. L. G., Schaffner. W., (2014) Care of the asplenic patient, *NEJM*, **374**:349

9. Key Words

Spleen, Asplenia, Splenectomy, Vaccine, Vaccinations

CONTACT AND REVIEW DETAILS			
Guideline Lead (Name and Title) Dr Nelun Perera – Consultant Microbiologist			**Executive Lead** Medical Director
Guideline Reviewed by: Lauren Ramm			**Ratified by:** Antimicrobial Working Party – Sep 2021
Details of Changes made during review			
Date	**Issue No.**	**Reviewed By**	**Description of change (if any)**
April 2014	3	N Perera C Ashton	• Addition of brand names • Dose amendments made
Sept 2015	4	R Hamilton C Ashton	• Updated vaccine schedule information
July 2017	5	R Hamilton	• Reformatted as per Trust policy for policies • Vaccination schedule updated as per national guidance • Example national vaccination schedule added as an appendix • Guidance regarding household and close contacts added • At-risk group list updated to match current evidence base
August 2021	6	L Ramm S Hackney R Leithead	• Removal of requirement for HIB vaccine due to green book change of guidance as risk of HIB is low • Clarification that antibiotics should be given for at least 2 years post splenectomy but reviewed after 1 year • Change of brand of PCV13 stocked by UHL- brand name updated • Advice that splenectomy is not known to increase the risk of COVID 19 and to follow advice to keep up to date with vaccinations, continue antibiotics if prescribed and seek medical advice if temperatures or signs of infection develop • Amendment in appendix 1 that flu vaccine to be given to primary school children in line with green book • Added doses for patients admitted nil by mouth requiring ongoing prophylaxis

Appendix 1 – National Vaccination Schedule from June 2020 onwards

The current national vaccination schedule is given below. A full vaccination history should be obtained prior to commencing any vaccinations. If this is unknown or incomplete please see the green book for further advice:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/855727/Greenbook_chapter_11_UK_Immunisation_schedule.pdf

While this was correct at the time of guideline ratification it is the responsibility of prescribers to ensure they use the most up to date national guidance. Therefore, all readers are advised to refer to the Gov.uk website if using this UHL guideline: https://www.gov.uk/government/publications/the-complete-routine-immunisation-schedule

Age due	Vaccine content	Trade Name	Method of administration
8 weeks old	Diphtheria, tetanus, pertussis (whooping cough), polio, Haemophilus influenzae type b (Hib) and hepatitis B	Infanrix hexa	Thigh
	Meningococcal group B (MenB)	Bexsero	Left thigh
	Rotavirus	Rotarix	By mouth
Twelve weeks old	Diphtheria, tetanus, pertussis, polio, Hib and hepatitis B	Infanrix hexa	Thigh
	Rotavirus	Rotarix	By mouth
	Pneumococcal conjugate vaccine (PCV13)	Prevenar 13	Thigh
16 weeks old	Diphtheria, tetanus, pertussis, polio, Hib and hepatitis B	Infanrix hexa	Thigh
	Meningococcal group B (MenB)	Bexsero	Left thigh
One year old (on or after the child's first birthday)	Hib and MenC	Menitorix	Upper arm/thigh
	Pneumococcal conjugate vaccine (PCV13)	Prevenar 13	Upper arm/thigh
	Measles, mumps and rubella (German measles)	MMR VaxPRO or Priorix	Upper arm/thigh
	Meningococcal group B (MenB)	Bexsero	Left thigh
Primary school age children (school years reception to six)	Live attenuated influenza vaccine LAIV*	Fluenz tetra	Both nostrils
Three years four months (40 months) old or soon after	Diphtheria, tetanus, pertussis and polio	Repevax or Boostrix-IPV	Upper arm
	Measles, mumps and rubella (check first dose given)	MMR VaxPRO or Priorix	Upper arm

Boys and girls aged 12 to 13 years	HPV (two doses 6 months apart)**	Gardasil	Upper arm
Fourteen years old	Tetanus, diphtheria and polio	Revaxis	Upper arm
	Meningococcal groups A, C, W and Y disease	Nimenrix or Menveo	Upper arm
65 years old	Pneumococcal (23 serotypes)	Pneumococcal polysaccharide vaccine (generic only)	Upper arm
65 years of age and older	Inactivated influenza vaccine every year	Various	Upper arm
70 years old	Shingles	Zostavax	Upper arm

* If live attenuated vaccine is contraindicated and child is in a clinical risk group, give inactivated flu vaccine

** If patient is 14 years or older, Gardasil should be administered according to a 3-dose (0.5 ml at 0, 2, 6 months) schedule. The second dose should be administered at least one month after the first dose and the third dose should be administered at least 3 months after the second dose. All three doses should be given within a 1-year period.