SPLENECTOMY AND DYSFUNCTIONAL SPLEEN PROPHYLAXIS GUIDANCE IN ADULTS AND CHILDREN

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Version Control

Date	Author	Version/Page	Reason for Change
31/03/2022	Esperanza Palenzuela	Version 1.0	Immunisation updated, antibiotics dose frequency terminology and updated some links
09/01/2023	Esperanza Palenzuela	2.0 Page 4	Updated link for Immunisation and coeliac disease
11/01/2023	Esperanza Palenzuela	2.0 Page 8	Spelling corrected for MenACWY
07/02/2023	Esperanza Palenzuela	2.1 Page 4	Clarification of antibiotic prophylaxis in coeliac patients with dysfunctional spleen

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INTRODUCTION

This guideline gives recommendations for the prevention of infection in patients who have recently undergone a splenectomy or who have recently been diagnosed with a dysfunctional spleen.

Splenectomy: Elective: e.g., for haematological disease or splenic abscess, cysts, mass, and neoplasm. **Emergency**: e.g., for traumatic injury to spleen or intra operative splenic injury.

Dysfunctional Spleen: e.g., conditions such as homozygous sickle cell disease and coeliac disease may lead to splenic dysfunction.

Immunisation is recommended in all patients with coeliac disease. The Lothian consensus guidance Immunisation and coeliac disease from NHS Lothian Coeliac Services and Lothian Immunisation Co-ordinating Group should be followed for vaccines.
Coeliac patients with a splenectomy require antibiotic prophylaxis. In coeliac patients with functional hyposplenism there is less consensus on the need for antibiotic prophylaxis and it is not routinely given.

RISKS OF ASPLENIA OR DYSFUNCTIONAL SPLEEN

Overwhelming infection is a major risk in patients with an absent or dysfunctional spleen and although uncommon, is associated with a high mortality. These infections are often due to encapsulated bacteria such as *Streptococcus pneumonia*, *Haemophilus influenzae* type B and *Neisseria meningitides,* more than half of those infected die. Other serious infections include malaria, babesiosis (caused by tick bite) and *Capnocytophagia canimorsus* (caused by dog bites) and secondary infections following influenza. For these reasons, it is imperative that all patients with an absent or dysfunctional spleen are appropriately immunized, receive appropriate antibiotics and counselling.

VACCINATION

ELECTIVE SPLENECTOMY

Start immunisation course at least TWO weeks **prior** to surgery (ideally four to six weeks).

EMERGENCY SPLENECTOMY

Start immunisation course at least TWO weeks **post**-surgery. However, if the patient is discharged earlier than this, they should start their immunisation schedule immediately before discharge. However, functional antibody response are better with delayed 14 days vaccination.

Given the changing pattern of routine vaccination, patients of different ages may have different “routine” vaccination histories. It is therefore essential to assess vaccination requirements against an individual’s vaccination history.
Check patient has been vaccinated according to UK schedule:
www.gov.uk/government/publications/the-complete-routine-immunisation-schedule

VACCINES FOR FIRST DIAGNOSED UNDER 1 YEAR OF AGE

Children should be fully immunized according to the national schedule, and should also receive

- Two doses of **MenACWY** vaccine at least one month apart during their first year
- An additional priming dose of **PCV13,** such as to receive a total of two priming doses at least 8 weeks apart commencing no earlier than 6 weeks of age) in their first year**.** One additional booster dose of**PCV13** and one dose of **MenACWY** conjugate vaccine 8 weeks after the vaccinations scheduled at 1 year of age
- One dose of **PPV23** after the second birthday and at least 8 weeks after the last dose of **PCV13**
- Annual **influenza** vaccine each season for patients aged over 6 months.

FIRST DIAGNOSIS AT 12-23 MONTHS OF AGE

If not yet administered, give the routine 1 year of age vaccines: **Hib/MenC**, **PCV13**, **MMR** and **MenB**, plus

- One additional dose of **PCV13** and one dose of **MenACWY** conjugate vaccine 8 weeks after the vaccinations 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

FIRST DIAGNOSED FROM TWO YEARS TO UNDER TEN YEARS OF AGE

Ensure children are immunized according to the national schedule, and they should also receive:

- One dose of **PPV23**, followed by
- One dose of **MenACWY** conjugate vaccine
- If not already 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** followed by
- One additional MenB vaccine dose 4 weeks later
- Annual **influenza** vaccine each season

VACCINATION SCHEDULE

- Offer annual influenza vaccine to all patients
- **Boosters of PPV23** vaccination every 5years

Small number of individuals (particularly those with sickle cell anaemia or lymphoproliferative disorders) should have their pneumococcal antibody levels checked 3 years later after the last dose of vaccine. If levels are found to be unprotected, then boosting would be appropriate. If levels are found to be protective, then levels should be rechecked annually until 5 years after the last dose when a booster should be given routinely.

VACCINES TERMINOLOGY

MenACWY Conjugate =Meningococcal A, C, W135 and Y conjugate vaccine (Menveo, Nimenrix)

Men B =Meningococcal B vaccine (Bexsero

Hib/Men C =Haemophilus type B conjugate vaccine (Menitorix)

PCV13 = Pneumococcal conjugate vaccine (Prevenar 13)

PPV23=Pneumococcal polysaccharide vaccine

MMR=Measles, mumps, and Rubella vaccine (Priorix)

ANTIBIOTIC PROPHYLAXIS

Since the vaccines do not protect against all strain's lifelong antibiotic prophylaxis should be offered to all patients. The increased risk of infection in patients with an absent or non-functioning spleen is life-long, but is highest early after splenectomy, with the biggest risk being from pneumococcal infection.

All adults should receive antibiotic prophylaxis for at least 2 years following a splenectomy.

Children should continue antibiotic prophylaxis until at least 16 years of age, and for a minimum of 2 years following splenectomy (lifelong treatment is however preferred).

Penicillin prophylaxis is highly effective in children with sickle cell disease.

Patients deemed to be at higher risk:

- Aged <16 years or >50 years old
- Inadequate serological response to pneumococcal vaccination
- A history of previous invasive pneumococcal disease
- Splenectomy for underlying haematological malignancy, particularly those who have received splenic irradiation or who have ongoing graft versus host disease (GvHD) are also at continuing high risk.
- Patients with active ongoing graft-versus-host disease

All patients** are at **high risk of infection** in the immediate post-operative period- antibiotic prophylaxis should be **started immediately post-operatively.

CHILD ANTIBIOTIC PROPHYLAXIS		
	Prophylaxis	Duration
First line	**Phenoxymethylpenicillin** (Penicillin V)**:** **Under 1 year;** 62.5mg every 12 hours, orally **1month–5 years;** 125mg every 12 hours, orally ➢ **5 years;** 250mg every 12 hours, orally If cover also needed for ***H.influenzae*** in child give **Amoxicillin** instead: **1 month-5 years;** 125mg every12 hours, orally **5 years -12 years;** 250mg every 12 hours,	Antibiotic prophylaxis should be continued until at least 16 years of age, and for a minimum of 2 years (lifelong treatment preferred). However, antibacterial prophylaxis may be discontinued in children older than 5 years of age with sickle-cell disease who have received pneumococcal immunization and who do not have a history of severe pneumococcal infection.

	orally ➢ **12 years;** 500mg every 12 hours, orally	
If penicillin allergy	**Erythromycin:** **1month -2years;** 125mg every 12 hours, orally **2-8 years;** 250mg every 12 hours, orally ➢ **8-18 years**; 500mg every 12 hours, orally	
If nil-by-mouth following splenectomy	**Benzylpenicillin:** **1month -17years**; 25mg/kg every 12 hours, intravenously	Additional cover with IV Benzylpenicillin is not required if the patient is already receiving antibiotics with appropriate activity (e.g., amoxicillin, cephalosporins or other beta-lactams). If unsure or patient is allergic to penicillin discuss with Microbiology.

ADULT ANTIBIOTIC PROPHYLAXIS		
	Prophylaxis	Duration
First line	**Phenoxymethylpenicillin** (Penicillin V)**:**250mg every 12 hours, orally	Minimum 2 years; lifelong preferred.
If penicillin allergy	**Clarithromycin** 250mg every 12 hours, orally	
If nil-by-mouth following splenectomy	**Benzylpenicillin** 1.2g every 12 hours, intravenously	Additional cover with IV Benzylpenicillin is not required if the patient is already receiving antibiotics with appropriate activity (e.g., amoxicillin, cephalosporins or other beta-lactams). If unsure or patient is allergic to penicillin discuss with Microbiology.

RESCUE ANTIBIOTIC THERAPY

Patients may develop infection despite vaccination and antimicrobial prophylaxis. An emergency supply of oral antibiotics should be given to all the patients to keep at home - advise them to replace before the expiry dates.

Rescue antibiotics can be used however it is vital that patients seek immediate medical attention if they are unwell with symptoms in-keeping with infection e.g., raised temperature, malaise, or shivering.

For patients already taking antibiotic prophylaxis, the rescue antibiotic should be from a different antibiotic class to minimize possibilities of bacterial resistance. Choice of antibiotic should be made with regard to appropriate microbiology advice and local guidelines.

CHILDREN RESCUE TREATMENT – PROVIDE 5 DAYS SUPPLY	
First line:	**Amoxicillin:** Child from 1 month -11 months; 125mg every 8 hours, orally Child **1-4 years**; 250mg every 8 hours, orally Child **5 -11 years;** 500mg every 8 hours, orally Child **12 to 17 years**; 500mg every 8 hours, orally
If penicillin allergy	**Erythromycin:** Child **2-7 years;** 250mg every 6 hours, orally Child **8-17 years;** 500mg every 6 hours, orally

ADULT RESCUE TREATMENT PROVIDE 5 DAYS SUPPLY	
First line:	**Amoxicillin** 500mg every 8 hours, orally
If penicillin allergy	**Clarithromycin** 500mg every 12 hours, orally

SPECIAL PATIENTS GROUPS AND ADDITIONAL INFORMATION

CHEMOTHERAPY, RADIOTHERAPY OR OTHER IMMUNOSUPPRESIVE TREATMENT

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

- Vaccinations should be given at least two weeks (ideally 4 -6 weeks) before initiation of treatment such as chemotherapy or radiotherapy. Where it is not possible vaccination beforehand, splenectomy, chemotherapy or radiotherapy should never be delayed.

- If not practicable to vaccinate two weeks before the initiation of chemotherapy and/or radiotherapy, immunisation can be delayed until at least three months after completion of therapy to maximise the response to the vaccine, whilst ensuring adequate antibiotic cover is prescribed in the interim.

- Individuals with immunosuppression should be vaccinated in accordance with the standard schedule but it should be borne in mind that these individuals may not make full antibody response.

- The NHS Lothian Oncology Online Quality System (OOQS) provides guidance and information for patients and carers following splenectomy (from NHS inform)Patient information on vaccination post splenectomy

- Patients who have undergone allogeneic bone marrow transplant* have functional hyposplenism. These patients require specific re-vaccination according to a separate policy, as per the National Allogeneic Bone Marrow Transplant Centre at the QEH, Glasgow.
  This is available at: Scothaem Vaccination Policy

  *(i.e., using stem cells from a bone marrow donor, including related and unrelated donors)

PREGNANCY/BREAST-FEEDING

1. VACCINES

Influenza vaccine should be given to all before the flu season, regardless of the stage of pregnancy.

Pneumococcal, Haemophilus and Meningococcal vaccine should be given when protection is required without delay.

Pertussis should be offered to all women from 16 weeks 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 vaccine or toxoids.

2. ANTIBIOTICS

Penicillin's may be used in pregnancy if clinically indicated. However, other risk factors may be present in individual cases which may independently increase the risk of adverse pregnancy outcome. Clinicians are reminded to perform a case-specific risk assessment.

Do not suggest Erythromycin as there is an increased overall risk of congenital malformation or cardiac malformation.

Further information available from:

- https://www.toxbase.org
- https://www.sps.nhs.uk/articles/safety-in-lactation-macrolides/

TRAVEL

Patients with an absent or dysfunctional spleen are at 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 increased risk of meningitis and other travel associated infections. Please check specific requirements with Travax website (username and password required).

Online: https://www.hps.scot.nhs.uk/a-to-z-of-topics/travellers-health/

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. All animal bites need to be treated quickly with antibiotics. Lothian

TICK BITES

Babesiosis 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.

CLINICAL MANAGEMENT AND DISCHARGE CHECKLIST

Appropriate vaccinations given	☐
Appropriate antibiotic prophylaxis prescribed	☐
Given course of emergency antibiotics on discharge?	☐
Patients should receive a "no spleen" card and leaflet" A guide for people without a working spleen", available from Health Protection Team: http://www.healthscotland.com/documents/25070.aspx Health Directorates: ☎ 0131 244 2241 or email:immunisationprogrammes@gov.scot	☐
Advise patients that they may wish to invest in an alert bracelet/tag	☐
Discuss annual influenza vaccine and Pneumococcal vaccine every 5 years	☐
Discuss need for immediate medical attention following animal bite and further vaccines if travelling and malaria precautions	☐
IDL informs GP that a splenectomy has been performed	☐
Signpost patients to NHS inform https://www.nhsinform.scot/healthy-living/immunisation/when-to-immunise/children-and-adults-without-a-spleen-asplenia	☐

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