General vaccination principles

Q. How long do childhood immunisations last?

A. In general, the live childhood vaccines (i.e. MMR) are expected to give life-long immunity. The degree of protection from other vaccines (e.g. DTaP/IPV/Hib and Men C) declines with time unless the immunity is boosted. The immunity can be boosted by re-immunisation, in which case protection is gained quickly instead of being delayed by 2-3 weeks as would happen if the person had not been previously immunised. This is why re-immunisation is offered to someone who has the type of injury which could cause tetanus. If the natural infection continues to be common in a community, children's immunity gets boosted by exposure to the natural infection. Once a disease comes under control, booster immunisations will extend immunity.

Q. Why do we need to immunise children if the diseases that we immunise against are on the decline?

A. Immunisations have played a major part in reducing infectious diseases. However, until an infectious disease has been eradicated globally, there is a risk that the infection can be brought into a high-immunised community from abroad. When immunisation levels fall, the disease can recur. Immunisation levels need to be maintained at a high level to prevent outbreaks of such diseases.

Q. Are all vaccines 100% effective?

A. No vaccine offers 100% protection and a small proportion of individuals get infected despite vaccination. Vaccines are designed to generate an immune response that will protect the vaccinated individual during future exposures to the disease. Individual immune systems, however, are different enough that in some cases, a person's immune system will not generate an adequate response. As a result, he or she will not be effectively protected after immunisation. Vaccines can fail in two main ways:

Primary failure occurs when an individual fails to make an initial immunological response to the vaccine.

Secondary failure occurs when an individual responds initially but then protection wanes over time. The incidence of secondary vaccine failure therefore increases with time. Individuals who acquire infection despite vaccination may have a modified, milder form of disease and are less likely to suffer serious complications than those who have never been vaccinated.

Q. Is there mercury in vaccines?

A. Thiomersal, a compound containing ethyl mercury, is a preservative to prevent bacterial and fungal contamination. It was used in the DTP ("triple") vaccine until recently. The amount of ethyl mercury was 50 micrograms per dose, which was within the safety limits advised for babies by the World Health Organisation. However, manufacturers have stopped using thiomersal, and the new DTaP/IPV/Hib/HepB vaccine does not contain thiomersal or any mercury compound. MMR vaccines do not and never have contained mercury. None of the vaccines used in the routine childhood immunisation programme in the UK contain thiomersal or other form of mercury.

Q. Is a child with lactose intolerance at any risk of a reaction from immunisations?

A. No. Lactose intolerance affects the bowel, when foods containing lactose are eaten. Most current childhood vaccines are given by injection. Rotarix®, oral vaccine, is contraindicated in infants with rare hereditary problems of fructose intolerance, glucose-galactose malabsorption or sucrase-isomaltase insufficiency.

Q. How important is it to have the routine immunisations at two, three and four months old?

A. The greatest risk of serious illness with whooping cough and Hib is in the first few months of life, and it is recommended to start immunisations at 2 months of age, when the baby's immune system is able to respond. This includes babies who are born prematurely who should start their immunisations when they are two months old. The second and third immunisations should be given at intervals of a month because immunisations repeated at less than a month do not give the best long-term protection.

Q. Should you administer vaccine to a person who is taking antibiotics?

A. Treatment with antibiotics is not a valid reason to defer vaccination. If the child or adult is otherwise well, or has only a minor illness, vaccines should be administered. But if the person has a moderate or severe acute illness (regardless of antibiotic use) vaccination should be deferred until the person's condition has improved.

A "moderate or severe acute illness" is a precaution for administering any vaccine. A mild acute illness (e.g., diarrhoea or mild upper-respiratory tract infection) with or without fever is not. The concern in vaccinating someone with moderate or severe illness is that a fever following the vaccine could complicate management of the concurrent illness (that is, it could be difficult to determine if the fever was from the vaccine or due to the concurrent illness). In deciding whether to vaccinate a patient with moderate or severe illness, the clinician needs to determine if forgoing vaccination will increase the patient's risk to vaccine-preventable diseases, as is the case if the patient is unlikely to return for vaccination or to seek vaccination elsewhere. It is important to ensure vaccination soon after the person recovers.

Q. Should vaccines be withheld in people on steroids?

A. Steroid therapies that are short term (less than 2 weeks); alternate day; physiologic replacement; topical (skin or eyes); aerosol; or given by intra-articular, bursal, or tendon injection are not generally considered contraindications to the use of live virus vaccines. The immunosuppressive effects of corticosteroid treatment vary, however patients receiving systemic high-dose steroids, until at least three months after treatment has stopped are considered as sufficiently immunosuppressive to raise concern about the safety of vaccination with live virus vaccines (e.g., MMR, varicella, LAIV, yellow fever). This would include children who receive prednisolone, orally or rectally, at a daily dose (or its equivalent) of 2mg/ kg/day for at least one week, or 1mg/kg/day for one month. For adults, an equivalent dose is harder to define but immunosuppression should be considered in those who receive at least 40mg of prednisolone per day for more than one week.

Inactivated vaccines and toxoids can be administered to all immunocompromised patients in usual doses and according to schedules, although the response to these vaccines may be suboptimal.

Q. Should family members of immunosuppressed individuals be vaccinated?

A. The family members and other direct contacts of the immunosuppressed person should be considered for vaccination to reduce the risk of vulnerable individuals being exposed to vaccine preventable conditions. All household and close contacts of immunosuppressed individuals should be fully vaccinated according to the national schedule. Most live vaccines can be safely given to close contacts of immunosuppressed individuals; although some additional precautions are advised

Close contacts of patients with severe immunosuppression (i.e. those who would normally be in isolation) should not be given live attenuated influenza vaccine but receive the inactivated vaccine instead

Ref Green Book Chapter 6

Q. What are the special recommendations for administering intramuscular injections in people with clotting disorders?

A. IM injections should be scheduled shortly after antihaemophilia therapy or prior to a dose of anticoagulant. For both IM and SC (subcutaneous) injections, a fine needle (23 gauge or smaller) should be used and firm pressure (subcutaneous) applied to the site, without rubbing, for at least 2 minutes. Providers should not administer a vaccine by a route that is not approved for that particular vaccine (e.g., administration of IM vaccines by the SC route).

Q. Where can I access more specific guidance on vaccination of immunocompromised individuals and specific diseases?

A. Refer to the Compendium of Organisational Outputs (Immunocompromised Individuals and specific disease) (2016). This compendium contains a list of organisational outputs in relation to Vaccination of Immunocompromised Individuals and specific diseases including, guidance, tools, education resources, literature reviews and research by specialist organisations and any additional documents that are applicable for use in NHSScotland for example, Department of Health and specialist advisory bodies.

It aims to provide NHSScotland staff with an overview of all materials available relating to immunisation of persons with underlying medical conditions and specific diseases.

Q. What is the Hepatitis B vaccine schedule for babies following the introduction of the hexavalent vaccine which contains Hep b into the routine schedule?

A. The hexavalent vaccine, containing Hep B vaccine, was introduced into the UK Routine Childhood Immunisation Schedule on 1st October 2017 for babies born after 1st August 2017. The vaccine is offered in the routine schedule at 8, 12 and 16 weeks of age. However, those babies at high risk of Hep B will continue to be immunised at birth and at one month of age with the monovalent HepB vaccine before commencing on the routine childhood schedule at 8 weeks. See NHS Scotland Patient Information Leaflet 2018 and the HPS, NHS Scotland, NES Guidance, for healthcare practitioners

Q. What are current recommendations for Hepatitis A vaccination in MSM?

A. Existing 'Green Book' recommendation states that all MSM reporting multiple sexual partners should be offered Hepatitis A vaccination. It is now recommended that all MSM attending HIV, GUM or Sexual Health clinics should be opportunistically offered vaccination against Hepatitis A

Q. What about vaccinations and arthritis?

A. Some types of arthritis and their treatments can affect the immune system and lead to an increased risk of infection. This can be due to the condition itself or its treatment, such as (DMARDs) or steroids. There are vaccinations routinely recommended such as influenza and pneumococcal vaccine. However, if an individual is immunosuppressed they should not have live vaccines.

If an individual is taking rituximab, a biological therapy used for treating rheumatoid arthritis and certain types of connective tissue disease, you should try to have the flu vaccination either before or six months after an infusion as rituximab affects the cells which produce antibodies for about six months after infusion. If the flu vaccine is given within six months of taking rituximab, you may respond less well to the vaccination and so you may not be fully protected against flu.

The small dose of a live organism in live vaccines may be enough to cause symptoms of the disease in people who are immunosuppressed. For this reason, live vaccines aren't recommended if individuals are on certain DMARDs or biologicaltherapies.

As biological therapies, cyclophosphamide and methotrexate aren't usually prescribed by the patient's GP, and, as such, the medication may not appear on the records you hold for these patients, it's always worth speaking with individuals about their drug treatments before you administer vaccination.

Normally a live vaccine would only be given if immunosuppressive drugs are stopped at least three months before the vaccination. Sometimes live vaccines will be given before immunosuppressive drugs are started. Immunosuppressive drugs shouldn't be started for at least two weeks, preferably four weeks, after administration of a live vaccine.