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 immunization. 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 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 Why is there a new flu vaccine each year?

A Unlike most vaccines, which contain the most common strains of a pathogen and are rarely changed, the seasonal flu vaccine changes frequently. This is because the strains of influenza viruses that circulate are constantly changing. Each year, researchers choose viruses for the vaccine based on which ones are likely to be circulating over the course of the coming flu season, thus providing protection against the most prevalent strains. So when you get a seasonal flu vaccine, you're usually not getting another dose of the same flu vaccine you were given before. Instead, you're usually getting protection against a whole new batch of flu viruses.

Q If I have to give more than 1 injection in a muscle, are certain vaccines best given together?

A Since DTP and pneumococcal conjugate are the vaccines most likely to cause a local reaction, it's practical to administer them in separate limbs (if possible), so there is no confusion about which vaccine caused the reaction.

Meningitis B vaccine should be given in the left thigh as this is a new vaccine and allows monitoring of reactions. However, if needs to be given in the same limb as another vaccine, use MMR as less likely to cause a local reaction.

Q If a dose of vaccine is given by the wrong route (IM instead of SC or vice versa), does it need to be repeated?

A Although vaccines should always be given by the route recommended by the manufacturer, if a vaccine is inadvertently given by the wrong route it can be counted as valid with two exceptions:
Hepatitis B or rabies vaccine given by any route other than IM should not be counted as valid and should be repeated.

Q The vaccine Summary of Product Characteristics (SPC) states that Zostavax® should not be administered at the same time as 23-valent pneumococcal polysaccharide vaccine (PPV). What does the PHPU advise?

A Zostavax® can be given at the same time as the 23-valent PPV. Although a manufacturer conducted trial showed inferior VZV antibody responses in those receiving zoster vaccine and PPV-23 concomitantly than in those receiving the vaccines four weeks apart, there is no established correlation between antibody titres to VZV and protection from herpes zoster.
In some circumstances the recommendations regarding vaccines given in the Green Book may differ from those in the Summary of Product Characteristics (SPC) for a particular vaccine. When this occurs, the recommendations in the Green Book are based on current expert advice received from the JCVI and this advice should be followed.

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 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 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 biological therapies.

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 you've been given a live vaccine.

Travel vaccination and information resources

Q Where can I get information on travel vaccines and information resources?

A TRAVAX is funded by the Scottish Government Health Department and is provided free to those using the service for NHS purposes in Scotland. It is a very useful resource for Up-to-date travel health information for health care professionals.

Fitfortravel is a public access website provided by the NHS (Scotland). It provides general travel health advice and disease prevention information for people travelling abroad from the UK.

For more info contact**: Travel Health General Enquiries: Health Protection Scotland.**

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