VACCINATION

Pre-vaccination questionnaire

The following information is needed to assess the fitness of a person for vaccination. (Inform the parents, that the conditions listed below do not necessarily mean that their child cannot be vaccinated today). But they should inform the doctor if any of the following conditions are present:
The person to be vaccinated:

- is unwell today;
- is having treatment which lowers immunity (e.g. steroids such as cortisone and prednisolone, radiotherapy, or chemotherapy);
- has had a severe reaction to any vaccine;
- has any severe allergies to vaccine components (e.g. neomycin);
- has a disease which lowers immunity (e.g. leukaemia, cancer);
- has had a vaccine containing live viruses within the last month (e.g. measles, poliomyelitis, yellow fever or rubella vaccines), or an injection of immunoglobulin or a blood transfusion within the last three months;
- has a disease of the brain or the spinal cord.

Standard vaccination procedure Before administering vaccines

the following procedures should be followed:

- Provide details to parents on risks of vaccination and risks of not being vaccinated;
- Check whether preparations have been made to respond immediately to adverse reactions;
- Read the product information;
- Ensure that valid consent is given;
- Provide the parent or guardian with a pre-immunization questionnaire;
- Check whether there are any contra-indications to vaccination from the pre-vaccination assessment;
- Check the identity of the recipient;
- Check the identity of the vaccine to be administered;
- Ensure that vaccines have been stored correctly;

• Check the vaccine to be administered for obvious signs of deterioration (check expiry date and note any particular matter or colour change that may indicate damage to the vaccine);
• Administer the vaccine, using the correct technique (see details below on needle selection, needle angle, injection location, and position of the subject).

General contra-indications to vaccination

All vaccines are contraindicated in those who have had:
1) a confirmed anaphylactic reaction to a previous dose of a vaccine containing the same antigens, or
2) a confirmed anaphylactic reaction to another component contained in the relevant vaccine, e.g. neomycin, streptomycin or polymyxin B (which may be present in trace amounts in some vaccines).
3)Live vaccines contraindicated in individuals who are:
1) immunosuppressed (see below)
2) pregnant.
4)Egg allergy Individuals with a confirmed anaphylactic reaction to egg should not receive influenza or yellow fever vaccines
5)Severe latex allergy Some pre-filled syringes may contain latex proteins in the tip cap and/or rubber plunger of the syringe. Similarly, the stoppers of some vaccines supplied in vials may contain latex proteins.
The following individuals should not receive live vaccines:
• patients with evidence of severe primary immunodeficiency, for example, severe combined immunodeficiency, Wiskott-Aldrich syndrome and other combined immunodeficiency syndromes
• patients who have received a solid organ transplant and are currently on immunosuppressive treatment
• patients who have received a bone marrow transplant, until at least12 months after finishing all immunosuppressive treatment, or longer where the patient has developed graft-versus-host disease.
• patients receiving systemic high-dose steroids, until at least three months after treatment has stopped. 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.
• patients receiving other types of immunosuppressive drugs (e.g. azathioprine, cyclosporin, methotrexate, cyclophosphamide, leflunomide and the newer cytokine

inhibitors) alone or in combination with lower doses of steroids, until at least six months after terminating such treatment.

• patients with immunosuppression due to human immunodeficiency virus (HIV) infection

Precautions and contraindications relating to scheduled vaccines

Children with minor illness may be vaccinated safely. But, if they are suffering from a major illness or high fever (102o F) they should not be vaccinated. These children should be vaccinated after they recover.

Conditions which ARE NOT contraindications to immunization

The list below of conditions comprises some examples of « false contraindications».

If an infant or adult presents with any of these, they should be vaccinated.

• Minor illnesses such as upper respiratory infections, or diarrhoea with fever < 38.5°C.
• Allergy, asthma, or other atopic manifestations such as hay fever or ‘snuffles’.
• Prematurity ; low-birth-weight infant.
• Malnutrition.
• Infant being breastfed.
• Family history of convulsions.
• Treatment with antibiotics, low-dose corticosteroids or locally acting (e.g. topical or inhaled) steroids.
• Dermatoses, eczema or localized skin infection.
• Chronic diseases of the heart, lung, kidney and liver.
• Stable neurological conditions, such as cerebral palsy and Down syndrome.
• History of jaundice after birth.

BCG vaccine

It is a live attenuated strain of Mycobacterium bovis known as bacillus Calmette-Guérin (BCG) uses shared antigens to stimulate the development of cross-immunity to Mycobacterium tuberculosis.

It lost its virulence in humans by being specially cultured in an artificial medium for years.which gives considerable protection against TB.

It is given routinely to all newborns, when vaccination is delayed to end of first year prior tuberclin testing is important, vaccine can be given to tuberclin negative children and to adolescent.
The dose is 0.1ml intradermal in the deltoid region, successful vaccine produces a small indurated area (2-4mm) after 3-4weeks. The lesion progresses to a papule or shallow ulcer of approximately 10 mm diameter and heals within 12 weeks to form a small, flat scar.
Side effects
local abscess, axillary lymphadenitis, allergy, dizziness, vertigo, keloid scarring and disseminated BCG in immuncompromised patient.
No live vaccine should be given within 3weeks except (OPV) and there be no vaccination in the same area for 3months.
Efficacy 80%.

Polio vaccines

Poliovirus

Enterovirus (RNA), Three serotypes: 1, 2, 3,Human is the reservoir, transmission by fecal-oral or possible oral-oral, communicability 7-10 days before onset, the virus present in stool for 3-6 weeks. Entry into mouth, Replication in pharynx, GI tract, local lymphatic's, Hematologic spread to lymphatic's and central nervous system ,Viral spread along nerve fibers leads to Destruction of motor neurons. Most poliovirus infections are asymptomatic The two vaccines have eradicated polio from most of the countries in the world and reduced the worldwide incidence from an estimated 350,000 cases in 1988 to less than 2000 cases in 2008.

Salk's Polio vaccine "Inactivated Polio Vaccine" IPV injectable

Based on polio grown in a type of monkey kidney tissue culture, which is then inactivated with formalin.Contains 3 serotypes of vaccine virus, the injected Salk vaccine confers IgG-mediated immunity in the bloodstream, which prevents polio infection from progress to viremia and protects the motor neurons, thus eliminating the risk of bulbar polio and post-polio syndrome. It offers no protection to the mucosal lining of the intestine; i.e. people vaccinated with Salk's vaccine can still carry the disease and spread it to unvaccinated individuals.
IPV has essentially no adverse effects associated with it other than possible rare hypersensitivity reactions to trace quantities of antibiotics.

Sabin's polio vaccine "Oral live-attenuated vaccine"

Sabin's “Oral Polio Vaccine" is a live-attenuated vaccine, Contains 3 serotypes of vaccine virus It replicates very efficiently in the gut, the primary site of infection and replication, Unable to replicate efficiently within nervous system tissue, Shed in stool for up to 6 weeks following vaccination

The OPV proved to be superior in administration, and also provided longer lasting immunity than the Salk vaccine. The trivalent Oral Polio Vaccine (Sabin) on very rare occasions has been associated with paralysis (vaccine-associated paralytic poliomyelitis, about 1 case per 750,000 vaccine recipients).

It is given in 3doses, each of 2drops(oral) at age of 2,4,6 months. A booster dose is given at age of (1.5-2years). 2nd booster dose is given at age of 4-6yrs.a period of fasting for 1-2hrs after vaccination is recommended.
Efficacy is 95%.

DPT vaccine

Diphtheria

Caused by Aerobic gram-positive bacillus; *Clostridium diphtheriae*, complication most attributable to toxin
Severity generally related to extent of local disease, most common complications are myocarditis and neuritis, death occurs in 5%-10% for respiratory disease

Tetanus

Caused by Anaerobic gram-positive spore-forming bacteria; Clostridium tetani, *Spores found in soil,animal fece.s*, tetanus Complications: Laryngospasm, Aspiration pneumonia and Death

Pertussis

Highly contagious respiratory infection caused by Bordetella pertussis, complication: Pneumonia, Seizures, Encephalopathy
Mixture of 3vaccines (toxoid of diphtheria, tetanus and killed highly antigenic organism of pertussis). Dose is 0.5ml IM given to all infants same as for OPV.
Efficacy diphtheria 87% , pertussis 80%.

DTaP Contraindications

- Severe allergic reaction after a previous dose or to a vaccine component
- Encephalopathy (e.g., coma, decreased level of consciousness; prolonged seizures) within 7 days of administration of previous dose of DTP or DTaP
- Progressive neurologic disorder, including infantile spasms, uncontrolled epilepsy, progressive encephalopathy; defer DTaP until neurologic status clarified and stabilized.

Precautions
Fever of >40.5° C<48 hr
Collapse or shock-like state (i.e., hypotonic hyporesponsive episode) <48 hr post vaccination
Seizure<3 days post vaccination
Persistent, inconsolable crying lasting >3 hours <48 hr after vaccine
Moderate or severe acute illness with or without fever

DT vaccine

It is a mixture of toxoid of diphtheria & tetanus is given to children >6years of age, as pertussis vaccine is contraindicated after this age. Dose 0.5mlIM

Measles vaccine

It is a live attenuated vaccine given to all infants at age of 9-10 mos. But it can be given to children & adolescent too.
Dose 0.5ml S.C.(single dose). It is generally safe vaccine,
Children with egg allergy &asthmatic patient it should be given under hospital supervision. vaccine is contraindicated in individuals with a history of allergy to neomycin and genuine severe egg allergy.

MMR vaccine

It is a mixture of 3 vaccines (live attenuated of measles, mumps &rubella).
dose is 0.5ml subcutaneously (single dose).the vaccine is safe because MMR is a live-attenuated vaccine, non– allergy-related side effects are noted 5 to 12 days following immunization.

1. Fever and rash are relatively common, experienced by 5% to 15% of recipients.
2. Transient arthritis has been reported.
3. Thrombocytopenia (rare)
4. Encephalopathy (very rare)

Contraindications and Precautions

1. Severe allergic reaction to vaccine component or following prior dose
2. Pregnancy
3. Immunosuppression
4. Moderate or severe acute illness
5. Recent blood product

Efficacy ; mumps 90%, rubella 95%.

Hepatitis B vaccine

Vaccine usually is given intramuscularly as a three-dose series, (0, 1, and 6). Three doses induce seroconversion in 90-95% of healthy infants, children and adults.
Dose for infants and children is 0.5ml IM (not in the buttock).
It is indicated in children & adults who are at risk of infection especially health care personnel and patients subjected to repeated blood transfusion.

Side effects

Transient erythema and induration at the site of injection, fever malaise, flu-like illness, arthritis, myelgia and arthralgia.

Rotavirus vaccine

In early childhood, the single most important cause of severe dehydrating diarrhea is rotavirus infection. Rotaviruses; Reoviridae family,The Pentavalent vaccine protects against rotavirus gastroenteritis, Oral route, Three doses; 2,4, and 6 months .

Meningococcal vaccine

It is indicated at age > 2years (it is live attenuated vaccine) in cases of

1- Functional or anatomic asplenia.

2- Travel to an endemic area.

3- Local outbreak.

4- HIV.

5- Contact of cases.

6- Terminal complement or properdin deficiency.

Dose 0.5ml SC (single dose), booster is given after 2-3 years especially in school age children.

Efficacy is 90%.

Hemophilus influenza type b vaccine

It is indicated for prevention of invasive diseases caused by H.influenza especially meningitis, septicemia, epiglottitis, arthritis & cellulitis,Important for infants and children <5years (universal splenectomy& asplenia &HIV).

Dose 0.5ml IM or SC.

Efficacy 94-100%.

Pneumococcus vaccine

2 types

1- Polysaccharide protein conjugate for <2yrs 2-3 doses

2- Polysaccharide >2yrs single dose

It is indicated for

1. Chronic respiratory diseases
2. Diabetes mellitus

3. Chronic heart diseases
4. Chronic renal diseases
5. Chronic liver diseases
6. Asplenia
7. Immunosuppression

8. Immunodeficiency
9. Hemoglobinopathies

Efficacy; type1 = 98% type2 = 60-70%

Influenza vaccine

Inactivated virus trivalent (TIV) minimal age 6 mos.or 2 yrs. For live attenuated (LAIV)
Efficacy 50-90%.
Dose 0.5ml IM or SC for children >6yrs, 0.025ml for 1-6yrs.
Indicated in
1. Immunosuppression
2. Cardiac disease
3. Chronic lung diseases
4. Chronic renal diseases
5. Hemoglobinopathy
6. Long term aspirin treatment
7. Chronic metabolic diseases
8. Given in epidemic
9. Close contacts to above
10. Diabetes mellitus

Rabies vaccine

Inactivated virus vaccine, human diploid cell vaccine (HDCV) is available in 5 doses (1ml) at 0, 3, 7, 14, 30 days.
Efficacy; 98% in pre exposure.

Chicken pox vaccine

Live attenuated virus vaccine, it can be given above 1year of age in a dose of 0.5ml IM or SC. And >12yrs, 2doses with one month interval. It is indicated to a child with 13yrs of age with no history of chicken pox and negative serology and for immunocompromised children and these with increased risk for varicella.
Precautions; DON'T give salicylate for 6weeks after vaccination.
Efficacy 97%.

Hepatitis A vaccine

Inactivated virus, it is given as one dose followed by booster dose at 6-12mo.
Dose 0.5ml IM (1-5yrs) of age, 1ml (adult)
Indications
1. Travel to endemic area
2. During outbreak
3. Hemophilia
4. Hepatitis B, C and other chronic liver diseases

Efficacy; 80-90%.

Passive immunization

A- anti-toxins ; derived from hoarse serum used for prophylaxis and treatment of tetanus , diphtheria & others
B- Human Immunoglobulins , from human plasma , generally safe. Used for:
1- Prophylaxis against infections as chicken pox and measles.
2- Treatment of agammaglobulinemia e.g. IV immunoglobulin used in treatment of Gullain- Barrie syndrome, acute and a chronic I.T.P and neonatal septicemia.