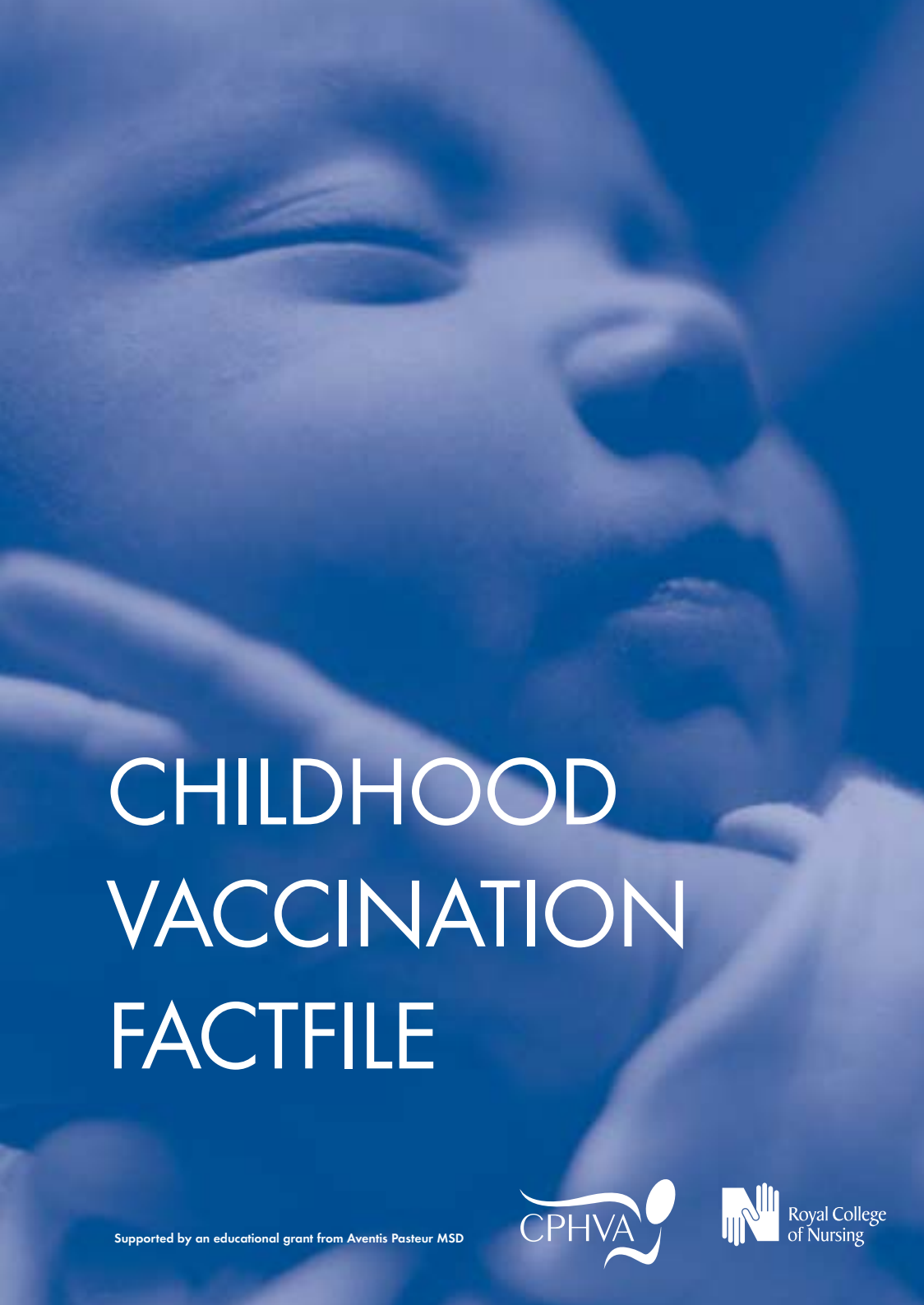

CHILDHOOD VACCINATION FACTFILE

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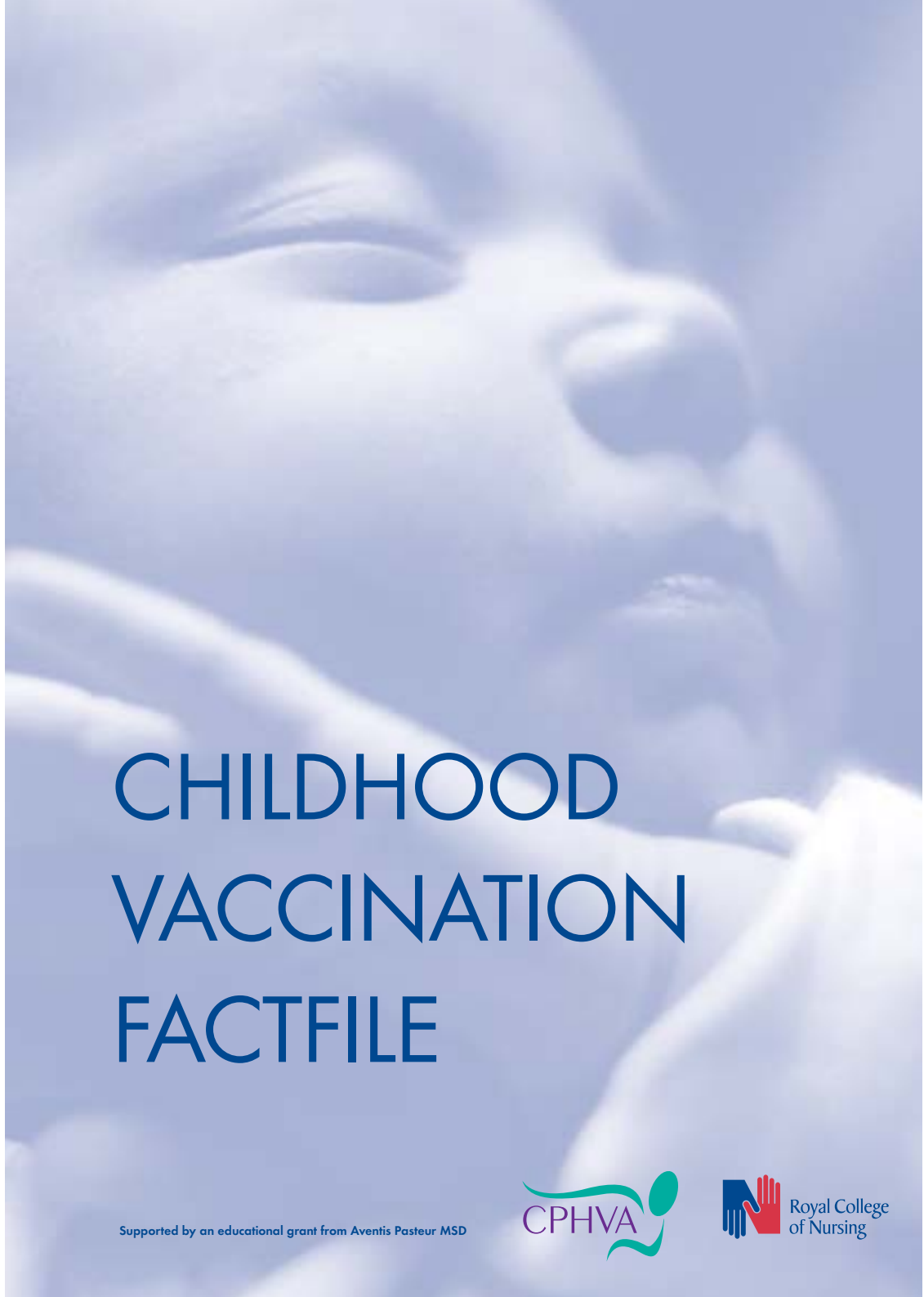

CHILDHOOD VACCINATION FACTFILE

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The purpose of this information pack is to provide healthcare professionals with accurate information, covering all key aspects of the immunisation of children.

District Immunisation Co-ordinator, Judith Moreton, developed the original edition of this pack in 1999. In light of recent changes in various aspects of childhood immunisation in the UK, the previous edition has been comprehensively revised and updated by a panel of leading healthcare professionals. This panel comprised:

- Jackie Burns, Independent Primary Care Adviser
- Mark Jones, Director, Community Practitioners' and Health Visitors' Association (CPHVA)
- Lynn Young, Primary Healthcare Adviser, Royal College of Nursing (RCN)
- Sara Richards, Vice-chair of RCN Practice Nurse Association

The content of this edition has been updated to reflect issues among healthcare professionals, parents and the media and to include the latest expert advice.

The Childhood Vaccination Factfile (CVF) has been designed to give healthcare professionals useful information from the available scientific literature, that will help them to formulate evidence-based advice when counselling parents on immunisations. The aim is to facilitate best practice in vaccination, which goes further than the appropriate prescribing of vaccines and ensuring protocols comply with the current regulations. The focus of this pack is to support nurses and health visitors or other appropriately trained clinicians, in their day-to-day work. In particular, it has been developed to help provide healthcare professionals with:

- Suggestions to aid effective consultation
- Suggestions for good practice
- A sound working knowledge of immunisation practice
- Enhanced knowledge of vaccines and immunology

The CVF comprises the following sections:

1. Disease information
2. Vaccine development
3. Basic principles behind immunisation
4. Current practice
5. Working with parents
6. Working with adolescents
7. Information sources
8. Frequently asked questions
9. Glossary

This resource has been developed by healthcare professionals for healthcare professionals. Much of the information has been produced to complement and support consultations with parents/guardians with regard to childhood vaccination. In particular there is a section, entitled 'Frequently asked questions', which addresses many of the common queries that parents have with regard to their child's vaccination.

SECTION 1: DISEASE INFORMATION

- Diphtheria
- *Haemophilus influenzae* type b (Hib)
- Hepatitis B
- Influenza
- Measles
- Meningococcal group C disease
- Mumps
- Pertussis
- Pneumococcal disease
- Poliomyelitis
- Rubella
- Tetanus
- Tuberculosis (TB)
- Varicella

All of the diseases in this section carry a substantial risk of either mortality or morbidity. This section contains information on, for example, what causes the disease, how it is transmitted and any potential complications.

DIPHTHERIA

- Diphtheria is caused by a bacterium, *Corynebacterium diphtheriae*, which produces a toxin (poison) that affects the heart and the nerves. Growth of the bacteria and damage to the tissues can cause the formation of a membranous pharyngitis, often referred to as a pseudo-membrane. This membrane can block the airway, which may lead to death by suffocation.
- It is highly infectious and is spread via respiratory droplets i.e. coughing or sneezing, or by contact with soiled articles (e.g. a handkerchief).
- The incubation period is 2-5 days.
- People can carry the disease without having symptoms themselves. This means the only effective way of preventing the disease is by vaccination.

HAEMOPHILUS INFLUENZAE TYPE b (Hib)

- Hib disease is caused by a bacterium, *Haemophilus influenzae* type b. It can be treated if antibiotics are given quickly, however, because it is so serious (1 in 20 children who develop Hib meningitis die and sequelae even after adequate treatment are relatively common) prevention by vaccination is very important.
- Like many other bacteria that inhabit the throat, Hib is spread via respiratory droplets, i.e. coughing or sneezing, or close contact with an infected person.
- The incubation period is 2-4 days.
- Invasive Hib infection can manifest in various different ways, such as meningitis, septicaemia (blood poisoning) and epiglotitis. Epiglotitis is a medical emergency as it can result in airway blockage and death due to suffocation.
- Hib was the most common cause of bacterial meningitis in children under 5 years of age before the conjugate Hib vaccine was introduced into the childhood programme in 1992.
- Hib meningitis can result in death or serious complications, such as permanent disabilities e.g. deafness or brain damage.

HEPATITIS B

- Hepatitis B is a blood-borne viral infection, which presents as jaundice and fever. Some infected patients may have no symptoms but can still pass the virus to others.
- Hepatitis B can be transmitted from an infected person during sex, through sharing contaminated needles or other drug injecting equipment and through blood transfusion (in the UK blood is tested for hepatitis B). An infected mother can also pass it to her newborn baby.
- The incubation period is 40-160 days.
- Hepatitis B can cause chronic infection in 10% of all cases (70-90% in children less than one year) and ultimately may result in cirrhosis and liver cancer. In addition the carrier remains a source of infection for others.
- Antenatal screening for hepatitis B is recommended for all pregnant women. Immunisation is recommended for all babies born to infected mothers.
- Hepatitis B immunisation is recommended for individuals who are at increased risk of hepatitis B due to their lifestyle, occupation or close contact with a case or a carrier.

INFLUENZA *(flu)*

- Flu is caused by influenza viruses that attack the respiratory tract. There are 3 types of influenza virus: A, B and C. Influenza A and B viruses cause virtually all of the clinical illness. The symptoms of influenza C infection are usually mild.
- Flu is a highly infectious disease, spread by respiratory droplets i.e. coughing or sneezing.
- The incubation period is 1-3 days.
- The disease is characterised by the sudden onset of fever, chills, headache, myalgia and extreme fatigue. Although most people recover from flu within 1-2 weeks, the infection can be more serious and potentially may lead to complications such as bronchitis and pneumonia. These illnesses may require treatment in hospital and can be life-threatening, especially in the very young, the elderly and people with chronic diseases or conditions such as chronic respiratory disease, chronic renal disease or immunosuppression due to disease or treatment.
- Flu epidemics result in widespread illness and disruption to health and other services. A vaccine is produced every year based on the strains of virus expected to be circulating following surveillance by the World Health Organisation (WHO).

MEASLES

- Measles is one of the most infectious viruses known and, without effective vaccination, everyone would be at risk from measles.
- Measles is transmitted via respiratory droplets, i.e. coughing or sneezing.
- The incubation period is about 10 days.
- It is not just a minor disease of childhood. Death is more common in babies under a year and rises with advancing age after 9 years. Deaths from measles still occur in developed countries. The last death from measles in the UK occurred in 1992. Pregnant women who contract measles risk premature labour or miscarriage.
- Complications occur in approximately 1 child out of every 15 who contract the disease.
- Complications include ear infections, bronchitis, pneumonia, febrile convulsions and encephalitis. A rare but fatal complication, subacute sclerosing pan-encephalitis (SSPE) may occur years after an initial measles infection earlier in life.

MENINGOCOCCAL GROUP C DISEASE

- Meningococcal group C disease is caused by a bacterium, *Neisseria meningitidis*, and can lead to meningitis and/or septicaemia (blood poisoning). Although it is carried in the throats of many people at any one time, only a tiny percentage will ever show signs of the disease.
- It is transmitted via respiratory droplets, i.e. coughing or sneezing, or close contact with a case or carrier of the disease.
- The incubation period is 2-3 days.
- Symptoms of meningitis can include neck stiffness, drowsiness or confusion, photophobia (sensitivity to light) and severe headache. If septicaemia is present, symptoms may also include a rash of red or purple spots that do not fade under pressure (the glass test).
- Survivors may suffer permanent brain damage, need to have limbs amputated or suffer from seizures or hearing loss.

MUMPS

- Mumps is caused by a virus and is characterised by the swelling, either unilateral or bilateral, of the parotid glands.
- Mumps is highly infectious. It is spread via respiratory droplets, i.e. coughing or sneezing.
- The incubation period is 14-21 days.

- It was a common cause of viral meningitis and hospital admission of children under the age of 15 years before the introduction of the MMR vaccine in 1988.
- Complications include encephalitis, sensorineural hearing loss, pancreatitis, and inflammation of the testes (orchitis) or ovaries (oophoritis).

PERTUSSIS *(whooping cough)*

- Pertussis is caused by a bacterium, *Bordetella pertussis*, that affects the throat and airways, resulting in paroxysmal coughing, vomiting and even death.
- Pertussis is spread via respiratory droplets, i.e. coughing or sneezing.
- The incubation period is 6-20 days.
- The illness can last for up to 3 months, causing great suffering to the child.
- Antibiotic treatment may prevent infection spreading to others but will not reduce the length of the illness or the cough.
- Death is most common in babies under a year and especially in those under 6 months.
- Serious complications include convulsions, lung damage, pneumonia, and brain damage.

PNEUMOCOCCAL DISEASE

- Pneumococcal disease is caused by a bacterium, *Streptococcus pneumoniae*, that can affect the lungs, resulting in pneumonia or lead to systemic (invasive) infections, including bacteraemic pneumonia, septicaemia and meningitis.
- The incubation period is 1-3 days.
- Pneumococcus is the second most commonly reported cause of bacterial septicaemia and meningitis in the UK after meningococcal group B.
- Complications are most common in children under 2 years of age and in the elderly.
- Invasive pneumococcal disease is a major cause of morbidity and mortality.
- An increase in pneumococcal antibiotic resistance has been reported worldwide, increasing the importance of vaccination.
- The current policy is that all 'at-risk' children between the ages of 2 months and 5 years should receive the pneumococcal conjugate vaccine, followed by pneumococcal polysaccharide vaccine from 2 years. Examples of clinical risk groups include those with cochlear implants, CSF shunts, dysfunction of the spleen, chronic respiratory disease (including asthma), diabetes and chronic heart disease.

POLIOMYELITIS *(polio)*

- Polio is caused by a virus which may attack the nerves which carry impulses to the muscles.
- It is a disease spread by contamination of hands, food or water from the faeces, or via respiratory droplets from an infected person.
- The incubation period is 3-21 days.
- It can cause temporary or permanent paralysis, generally of the lower limbs or respiratory muscles, which may result in death. It can also cause viral meningitis.
- The WHO aim is to eradicate polio worldwide and campaigns are in place to target the remaining countries where polio still exists.
- The WHO has not set a date for the cessation of polio immunisation, but it is anticipated to be at least 10 years after global polio eradication.

RUBELLA *(German measles)*

- Rubella is caused by a virus and is usually a mild infectious disease.
- Rubella is spread via respiratory droplets, i.e. coughing or sneezing.
- The incubation period is 14-21 days.
- If contracted in early pregnancy, rubella causes severe fetal damage in up to 90% of cases. Babies may be stillborn or suffer one or multiple defects including blindness, cataracts, deafness or impaired hearing, heart damage, intrauterine growth retardation, mental retardation and inflammatory lesions of the brain, liver, lungs and bone marrow.

TETANUS *(lockjaw)*

- Tetanus is caused by an anaerobic bacterium, *Clostridium tetani*, which exists as spores in soil or manure.
- Tetanus can be contracted through a small wound such as a scratch, puncture wound or burn through which the organism can get into the body.
- The incubation period is 4-21 days.
- The bacteria, once in favourable conditions within a wound, produce a toxin, causing painful muscle spasms, which can result in death.
- Vaccinations can help to prevent tetanus in the individual; there is no cure.

TUBERCULOSIS (TB)

- TB is caused by mycobacteria, mainly *Mycobacterium tuberculosis,* that usually affects the respiratory tract, although it can affect other parts of the body.
- It is acquired through airborne droplet transmission from an infected person, often from a member of the same household.
- Symptoms may occur several weeks after infection or after many years.
- Later complications may include infections of the lymph nodes, bronchiectasis and emphysema, and, more rarely, tuberculous meningitis, tuberculous peritonitis, tuberculous bones and joints and renal tuberculosis.
- The rate of TB is higher in immigrants from certain countries (**www.who.int/vaccines**).
- Multi-resistant TB (MRTB) is an increasing problem worldwide.

VARICELLA *(chickenpox)*

- Chickenpox is caused by the varicella-zoster virus, which is part of the herpes virus family. The disease is acute and highly infectious.
- The disease is spread via respiratory droplets, i.e. coughing or sneezing, or by contact with fluid from the chickenpox blisters.
- Symptoms include fever, headache and swollen glands. The characteristic blister-like spots usually appear 10-20 days after infection.
- Once somebody has had chickenpox, the virus stays in the nerve tissue and can be reactivated at any time to cause shingles.
- Infection is most common in children under 10, in whom it usually causes mild disease, however severe complications and death can occur.
- In adults, pregnant women and immunocompromised individuals, the disease can more frequently give rise to severe complications and death.
- Chickenpox can also pose risks to the fetus and new born babies.
- Varicella vaccine is not recommended for routine use in children. However, it is recommended for healthy susceptible contacts of immunocompromised patients where continuing contact is unavoidable.

SECTION 2: VACCINE DEVELOPMENT

- What is a vaccine?
- Development of vaccines
- Key historical events
- Vaccine production
- Cold chain
- Licensing and regulation of vaccines
- Surveillance
- Black triangle (▽) vaccines
- Benefit and risk

WHAT IS A VACCINE?

A vaccine is a substance which contains weakened or inactivated parts of a disease-causing organism or toxin. It stimulates the immune system to produce antibodies to a specific disease without the person having to become infected with the 'wild-type' disease.

A dose of vaccine may also contain:

- An adjuvant e.g. aluminium phosphate, to improve the body's immune response.
- A suspending fluid to carry the vaccine into the body.
- Preservatives and stabilisers so the vaccine can be stored safely.

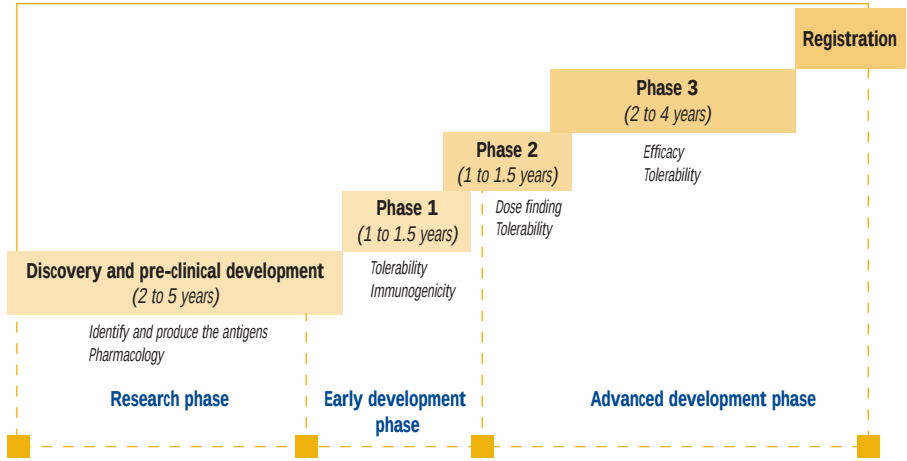
DEVELOPMENT OF VACCINES

- The development of new vaccines is a long and arduous process. It involves a number of phases, from research into the organism which causes the disease of interest, to the final registration of the vaccine by health authorities.

Any new vaccine has to be thoroughly tested to ensure it is acceptably safe and effective. This is done via clinical trials, which are conducted in 4 phases:

- **Phase I**: The vaccine is given to a small number of healthy adult volunteers to ensure that it is generally safe and well tolerated.
- **Phase II**: Trials in a sample group (100-200) of people for whom the vaccine is intended. These trials demonstrate that the vaccine is generally safe and contains the correct dose of antigen required to elicit an appropriate immune response.
- **Phase III**: More extensive trials using larger numbers of patients looking at the safety and efficacy of the vaccine, in the population for which they are intended.
- **Phase IV**: More detailed studies to monitor the long-term effectiveness and safety of the vaccine, following licensing. These trials may be designed to investigate a specific pharmacological effect, establish the incidence of adverse reactions or demonstrate the relative effectiveness of the vaccine compared to other vaccines on the market.

8 to 12 year development period

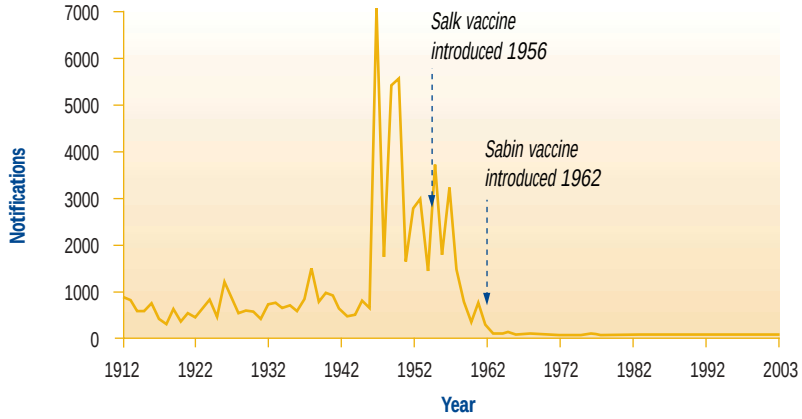


KEY HISTORICAL EVENTS

Key historical events	
Jenner's **smallpox** experiment	1796
Pasteur immunises child against **rabies**	1885
Discovery of **diphtheria** and **tetanus** antibodies	1901
Koch identifies bacteria causing **cholera** and **TB**	1908
Diphtheria vaccination programme introduced in the UK	1940
Compulsory **smallpox** vaccination ended in the UK	1948
Theiler identifies **yellow fever** virus and develops vaccine	1951
TB vaccination programme introduced in the UK	1953
Pertussis vaccination programme introduced in the UK	mid 1950s
Polio (Salk) IPV vaccination programme introduced	1956
Tetanus vaccination programme introduced	1961 (nationally)
Polio (Sabin) OPV vaccination programme introduced	1962
Measles vaccination programme introduced	1968
Rubella vaccination programme introduced	1970
Routine **smallpox** vaccination ended in the UK	1971
Smallpox eradication declared worldwide	1980
MMR vaccination programme introduced	October 1988
Accelerated primary schedule introduced (2, 3, 4 months)	1990
Hib vaccination programme introduced	October 1992
Td vaccination programme introduced	October 1994
MMR second dose introduced	October 1996
Men C conjugate vaccination programme introduced	November 1999
Acellular pertussis booster (3-5 years)	November 2001
Introduction of **IPV** combination vaccines	September 2004

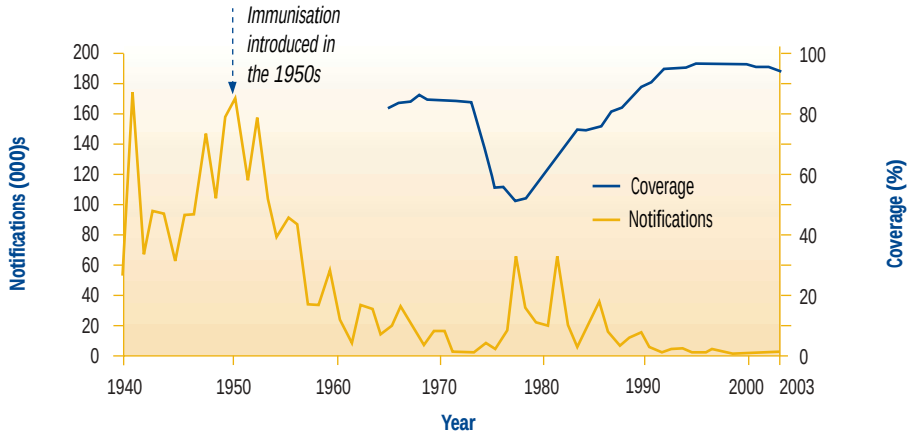
The introduction of immunisation has significantly reduced the incidence of many infectious diseases. The following graphs show the effect of vaccination on the incidence of polio, pertussis and measles in the UK.

Polio notifications for England and Wales (1912-2003).



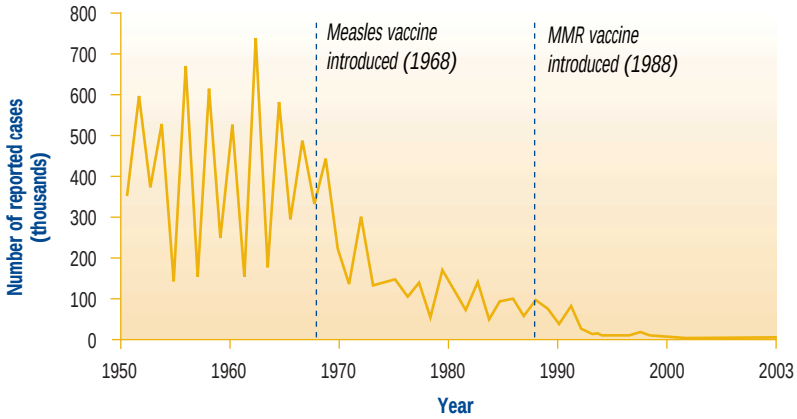
Source: Health Protection Agency, Department of Health

Pertussis notifications and vaccine coverage for children by their second birthday, England and Wales (1940–2003).



Source: Health Protection Agency, Department of Health

Incidence of measles in the UK



Source: MMR - the facts booklet, Department of Health

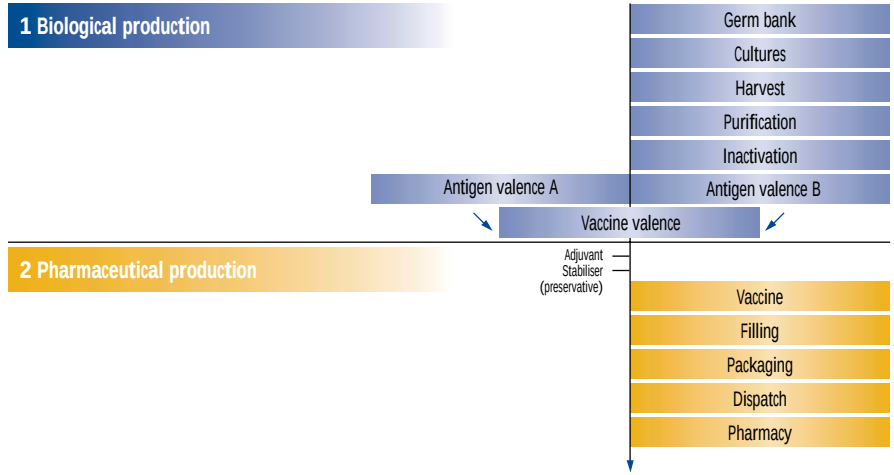
VACCINE PRODUCTION

There are 2 main stages to vaccine production:

- The biological stage, involving the preparation of the antigens.
- The pharmaceutical stage, which results in a final ready-to-use product.

Each batch of vaccine manufactured follows a production cycle which varies in length, depending on the vaccine. Combining several antigens in order to help protect against several diseases is a complicated process and requires supplementary procedures to verify the stability and potency of these combination vaccines.

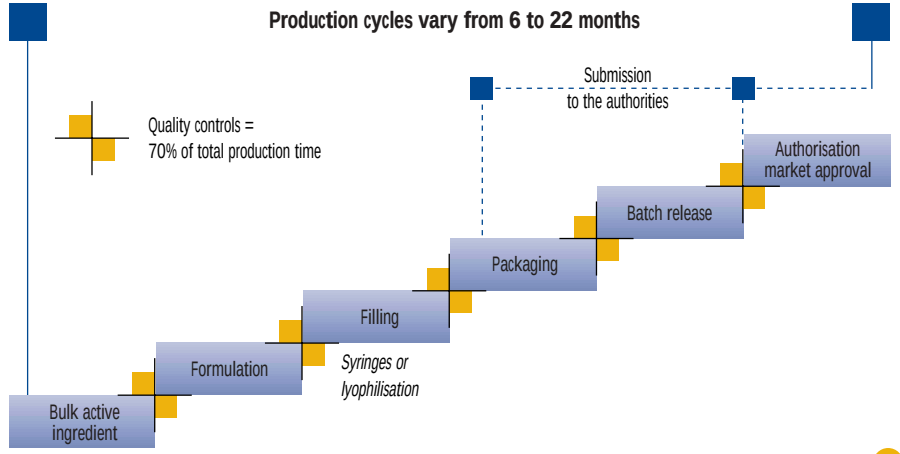
Biological and pharmaceutical production of a vaccine



Producing vaccines requires considerable expertise and quality assurance. Vaccines are biopharmaceutical products, manufactured using both biological and pharmaceutical production methods. The aim is to produce a standard product, despite the intrinsic variability of biological products. In order to meet this quality objective, multiple control procedures ensure that each batch meets the required standard.

Production cycles are much longer than for chemical medicines, for example, it takes 9-10 months to produce tetanus vaccine and 11 months to produce diphtheria vaccine.

Vaccine production cycles and quality controls



Manufacturing processes meet the most demanding standards and comply with standards set by the Medicines and Healthcare products Regulatory Agency (MHRA) and the European Medicines Agency (EMEA). Any modification to the manufacturing process is therefore very lengthy, taking several years to implement.

Administrative control and release procedures must be added to the duration of the production and internal release cycle: every batch of vaccine produced and marketed in Europe must be checked by the Control Laboratory of the European Health Authorities concerned. An official control certificate must be issued before the vaccine can be released on the market, a procedure that generally takes 2 months.

COLD CHAIN

Vaccines must be kept at a certain temperature, generally between +2°C and +8°C.

LICENSING AND REGULATION OF VACCINES

- Vaccines can only be licensed after completing the rigorous production and testing processes.
- The issuing of a licence in the UK demonstrates that it is acceptably safe and effective and has been assessed by the MHRA. Other countries have similar procedures.
- Samples of each new batch of vaccine are independently tested for quality.
- The licence governs:
  - Whom the vaccine is intended for.
  - Dosage and administration.
  - Any special precautions/contraindications that may apply. (e.g. BCG vaccine is not suitable for HIV-positive patients).
- All vaccines are 'prescription-only medicines' (POMs).

SURVEILLANCE

Many of the diseases we vaccinate against are monitored closely; surveillance ensures we know all we can about the characteristics of a disease in the community. Surveillance does not stop once a vaccine goes into routine use, and involves both the disease and the vaccine.

Surveillance is ongoing and its aims are:

- To ensure that the vaccine is effective.
- To detect less common reactions or problems which may be associated with a vaccine.
- To determine whether an adverse event is a result of a vaccine. To establish this, it is essential to compare a group of children who have had the vaccine with a similar group of children who have not, and assess the frequency of the particular problem in both groups.

BLACK TRIANGLE (▼) VACCINES

New drugs carry a black triangle (▼) which denotes that they are new to the UK market. Black triangle vaccines are stringently monitored by the MHRA for 18-24 months after they are introduced. Healthcare professionals administering vaccines should ensure they report any suspected adverse drug reactions (ADRs) observed with a black triangle vaccine via the yellow card scheme.

BENEFIT AND RISK

Healthcare professionals need to empathise with parents faced with making a decision on whether to get their baby vaccinated. Parents need to be aware that the benefits gained from vaccination are greater than any possible risk of the vaccine causing serious side-effects.

SECTION 3: BASIC PRINCIPLES BEHIND IMMUNISATION

- Principles behind immunisation
- Why immunise?
- Passive immunity
- Active immunity
- Who is routinely immunised?

PRINCIPLES BEHIND IMMUNISATION

Immunisation is a way of helping to protect people against serious illness. Once immunised, the body is able to fight disease if it later comes into contact with it. An immunisation programme vaccinates people against a specific disease or diseases. This is to reduce the number of people getting the disease in a population or to prevent it from being passed on. In some cases, such as smallpox or polio, which exist only in humans, it is possible to eradicate the disease completely.

Herd immunity occurs when sufficient numbers of the population are immunised. As a result the infective organism will not be able to find enough hosts to circulate, meaning that outbreaks and epidemics are prevented. The proportion of the population required to achieve herd immunity will vary depending on various factors, including the disease, country, infectivity, environmental factors and the proportion of vaccinated people who obtain immunity.

WHY IMMUNISE?

- Immunisation is a positive health benefit for children as it can help to prevent many of the serious infectious diseases that kill and handicap children.
- For many of the diseases we immunise against, there is no cure – either from the disease itself or the long-term side effects.
- Prevention is better than cure and avoids unnecessary suffering to the individual child and the family.
- It can prevent outbreaks and epidemics of infectious diseases.
- It can eradicate or eliminate certain diseases, e.g. smallpox and polio.
- Vaccination is the single most cost-effective health intervention.

PASSIVE IMMUNITY

This is provided when the body is given ready-formed antibodies:

- As an injection of immunoglobulin e.g. rabies or tetanus immunoglobulin.
- From mother to child via the placenta e.g. measles, mumps and rubella.

Passive immunity only lasts for a few weeks or months. However, in the case of measles, mumps and rubella it may last up to 1 year of age. Since any remaining maternal antibody negates any protective effect of the vaccine, the MMR vaccine is not given until the second year of life in the UK.

ACTIVE IMMUNITY

Active immunity is gained from the disease or from vaccination. Vaccines contain weakened or inactivated parts of the disease-causing organism. Vaccines trigger the immune system to produce antibodies against the disease, as though the body had been infected with the disease itself. This teaches the body's immune system how to recognise and respond rapidly to any further infection, producing appropriate antibodies. If the vaccinated person then comes into contact with the disease itself, the immune system will recognise the bacterium or virus and rapidly produce the specific antibodies needed to combat it.

Specifically, B-lymphocytes and T-lymphocytes recognise antigenic material to which they have become primed and thus initiate an immunogenic response; this is known as immune memory.

The antigen used to stimulate active immunity varies depending on the organism being vaccinated against. Examples of the various antigenic forms are given below:

- Killed organism e.g. whole cell pertussis vaccine
- Purified toxoid e.g. tetanus, diphtheria vaccine
- Organism capsule e.g. Hib (*Haemophilus influenzae* type b) conjugate vaccine
- Inactivated selected antigens of organism e.g. acellular pertussis vaccine
- Live attenuated (weakened) strain of organism e.g. MMR, BCG, varicella vaccine
- Polysaccharide as capsular vaccines e.g. pneumococcal polysaccharide vaccine

WHO IS ROUTINELY IMMUNISED?

The Children's Vaccine Program (CVP), launched by the Program for Appropriate Technology in Health (PATH), works in partnership with the WHO. The aim of the initiative is to ensure that the benefits of vaccination reach all the world's children. Currently 80% of the world's children are offered immunisation against 6 target diseases:

- Diphtheria
- Tetanus
- Whooping cough (pertussis)
- Polio
- Tuberculosis
- Measles

In addition, some countries, including the UK, also offer protection against:

- Hib
- Mumps
- Rubella
- Influenza (high-risk children)
- Invasive pneumococcal disease (high-risk children)
- Meningococcal group C disease

The WHO recommends that all countries should include hepatitis B vaccination as part of the childhood immunisation programme. In the UK, the Department of Health recommends pregnant women are screened for hepatitis B and immunisation is recommended for babies born to infected mothers. The Department of Health also recommends hepatitis B immunisation for individuals who are at increased risk of hepatitis B due to their lifestyle, occupation or close contact with a case or carrier.

SECTION 4: CURRENT PRACTICE

- Changes to the vaccines used in the childhood programme
- Premature babies
- Vaccinating children arriving in the UK from overseas or outside the routine UK schedule
- Providing information and obtaining consent
- Assessment of child before immunisation

In accordance with the WHO recommendations, the UK offers immunisation against the following 6 target diseases:

- Diphtheria
- Tetanus
- Whooping cough (pertussis)
- Polio
- Tuberculosis
- Measles

In addition, in the UK, immunisation is also offered against:

- Hib
- Mumps
- Rubella
- Meningococcal group C

Selective vaccination is offered for high-risk groups against hepatitis B, influenza and invasive pneumococcal disease

CHANGES TO THE VACCINES USED IN THE CHILDHOOD PROGRAMME

The Department of Health introduced changes to the childhood programme in September 2004.

The changes include the switch from OPV to IPV and from whole cell pertussis vaccine (wP) to acellular pertussis vaccine (aP) for the primary immunisation schedule at 2, 3 and 4 months. Pre-school and adolescent vaccines also switched from OPV to IPV.

The vaccines used in the childhood programme are outlined in the table on page 35.

Why change from OPV to IPV?

Since 1988, the WHO has been striving to achieve global polio eradication through its Global Polio Eradication Initiative. In June 2002, Europe was declared polio free. The WHO goal is for the remaining polio-endemic countries to be declared polio free. Polio vaccination is anticipated to be required for at least 10 years after global eradication is achieved. Up-to-date information on the WHO global eradication programme is available at **www.polioeradication.org**

OPV has been successfully used to vaccinate people in the UK and worldwide as part of the eradication programme. However, there is a very small risk that the attenuated form of the OPV vaccine will revert to the virulent form, resulting in Vaccine Associated Paralytic Poliomyelitis (VAPP). Therefore, IPV is now used in many countries where polio has been eradicated, and is the vaccine of choice in countries that have been certified polio free.

Why change from whole cell pertussis (wP) to acellular pertussis (aP) vaccine?

There are 2 types of pertussis vaccine – whole cell (wP) and acellular (aP). These vaccines differ in the way that they are prepared: whole cell pertussis vaccine, as the name implies, uses the whole cell and contains around 3000 antigens; and acellular pertussis vaccine is comprised of only a small number of purified immunogenic particles.

The incidence of local and systemic reactions is lower with acellular pertussis vaccines than whole cell pertussis vaccines.

UK vaccination schedule

When to immunise	What is given
2, 3, 4 months	Diphtheria, tetanus, acellular pertussis, inactivated polio and Hib (DTaP/IPV/Hib) Meningococcal group C
Around 13 months	Measles, mumps and rubella (MMR)
3 years & 4 months to 5 years	Diphtheria, tetanus, acellular pertussis and inactivated polio (dTaP/IPV or DTaP/IPV) Measles, mumps and rubella (MMR)
10-14 years old (and sometimes shortly after birth)	BCG (against tuberculosis)
13-18 years old	Tetanus, diphtheria and inactivated polio (Td/IPV)

Hepatitis B, pneumococcal and influenza vaccines are also offered to clinical risk groups.

PREMATURE BABIES

Babies who were born early should receive their immunisation at the appropriate chronological age, according to the schedule. There is no evidence that premature babies are at an increased risk of adverse reactions from vaccines.

VACCINATING CHILDREN ARRIVING IN THE UK FROM OVERSEAS OR OUTSIDE OF THE ROUTINE UK SCHEDULE

Different countries have different immunisation schedules and different vaccines to the UK. In general, the following should apply:

- Unless there is a reliable history of previous immunisation, children arriving from overseas and staying in the UK should be assumed to be unimmunised and vaccinated according to the UK schedule (refer to the table on page 35).
- On occasion a child arriving in the UK from abroad may have received an additional fourth dose of diphtheria, tetanus, pertussis or polio around the age of 18-24 months. The routine UK schedule should be applied regardless of this additional dose.
- If a person attends for a booster dose and has a history of receiving a vaccine following a tetanus-prone wound, try to identify which vaccine was given. If it was given at an appropriate time for the required booster, and included the same antigens as the currently required vaccine, there is no need to give additional vaccines. If not, vaccinate as recommended in the UK vaccination schedule.
- Children immunised against measles before their first birthday may still have maternal antibodies and therefore should be re-immunised with MMR and offered a second dose at the relevant age.

Further information regarding the vaccination schedules of other countries can be obtained from the WHO website
www.who.int/vaccines/GlobalSummary/Immunization/ScheduleSelect.cfm

PROVIDING INFORMATION AND OBTAINING CONSENT

In the UK, vaccinations are not compulsory. Before carrying out any procedure or treatment on a child, the nurse must first obtain a valid consent, which can be either written or verbal.

As outlined in the Nursing and Midwifery Council's Code of Professional Conduct, the responsible healthcare professional is accountable and liable to obtain informed consent for all the vaccines that they administer.

Consent must be given voluntarily and freely. The individual must be informed about the process, benefits and risks of immunisation and be able to communicate their decision.

Information given should be relevant to the individual patient, properly explained and questions answered truthfully. Where English is not the first language, translations and properly qualified interpreters should be used.

Consent obtained before the occasion upon which a child is brought for immunisation is only an agreement for the child to be included in the immunisation programme and does not mean that consent is in place for each future immunisation. Consent should still be sought on the occasion of each immunisation visit.

Consent remains valid unless it is withdrawn by the individual who gave it. If there is any new information between the time consent was given and when the immunisation is offered, it may be necessary to inform the patient and for them to re-confirm their consent. This includes new evidence of risk, new immunisations becoming available or where there is a significant change in the individual's condition, such as treatment for cancer.

Individuals, or those giving consent on their behalf, must be given adequate information before they can give consent. This should include information about the process and the benefits and risks of the immunisation(s). Health professionals should ensure that the individual (or those giving consent on their behalf) fully understands which immunisation(s) are to be administered; the disease(s) against which they will help protect; the risks of not proceeding; the side effects that may occur and how these should be dealt with; and any follow up action required.

For young children not competent to give consent, such consent can be given by a person with parental responsibility, provided that person is capable of consenting to the immunisation in question and able to communicate their decision. Where this person brings the child in response to an invitation for immunisation, and, following an appropriate consultation presents the child for that immunisation, these actions may be considered evidence of consent.

The person with parental responsibility does not necessarily need to be present at the time the immunisation is given. Although a person may not abdicate or transfer parental responsibility, they may arrange for some or all of it to be met by one or more persons acting on their behalf (section 2(9) Children Act 1989). There is no requirement for such arrangements to be made in writing. Children may be brought for immunisation by a person without parental responsibility, for example a grandparent, child-minder or unmarried father. In this situation, the health professional would need to be satisfied that the circumstances indicate that that person has the necessary authority.

Although the consent of one person with parental responsibility for a child is usually sufficient for immunisation of a child (see section 2(7) Children Act 1989), if it appears that one parent agrees to immunisation but the other disagrees, further advice should be sought before proceeding.

Further information about how to find out more about consent is given in Section 7, Information Sources.

ASSESSMENT OF CHILD BEFORE IMMUNISATION

The assessment of a child's fitness and suitability for vaccination must be made on the day of proposed vaccination based on the following:

- The child's health on the day.
- Any recent illness or relevant clinical history.
- Any previous reaction to a vaccine.

If the child's suitability or fitness is in doubt, a GP should be consulted and immunisation deferred until the child has been further assessed and is deemed fit for immunisation. Any period of deferral should be kept to a minimum, as deferral leaves the child unprotected.

SECTION 5: WORKING WITH PARENTS

- Concordance
- Counselling parents
- Negotiation and listening skills
- Adverse events

SECTION 5: WORKING WITH PARENTS

Parents are generally experts in the care of their own child. Their concerns and anxieties should be respected in their quest for the best and safest protection for their child.

It is in the interest of every child to be protected against infectious diseases, only a minority of children cannot be immunised, for example, if they are immunosuppressed either through disease or treatment they should not receive live vaccines. The healthcare professional should ensure that all parents are given accurate information about the importance of immunisation and explain the small number of real immunisation risks in the context of greater risk from illness.

CONCORDANCE

It is important that any concerns parents may have are specifically addressed. Parents are more likely to have their child immunised if they have a thorough understanding of why immunisation is necessary.

It is the responsibility of the healthcare professional to ensure the parent is given appropriate information and is made to feel involved and supported in their decision to have their child vaccinated.

COUNSELLING PARENTS

The policy in the UK regarding immunisation is that parents should be able to make an informed decision about their choice to immunise. Healthcare professionals have a responsibility:

- To promote immunisation as the most important of all medical interventions.
- To be reliably informed.
- To provide not only the facts but also their informed opinion and support for immunisation.
- To respect the questions of concerned parents.
- To give honest and open answers. If they do not know the answer, to say so and seek further advice and information.
- To use language that can be understood – few lay people understand medical terminology and consideration must be made of parent's/carer's levels of understanding.
- To communicate in the parent's/carer's chosen language, using health advocates/interpreters where appropriate.
- To respect the informed parent's decision.

1 2 3 4 5 6 7 8 9

NEGOTIATION AND LISTENING SKILLS

- Find a private, quiet place to discuss the issues – a noisy corridor at the end of a busy clinic is not suitable!
- Allow time to listen to parents' questions and worries.
- Listen attentively, remembering eye contact and body language are as important as what is said.
- Use open questions to enable discussion.
- Reflect back to the parents what they have said as this often helps to clear their minds about the issues, e.g. "You seem to be saying...."
- Offer to see them again for further discussion when they have looked at any information that has been given to them.

ADVERSE EVENTS

Most children are perfectly well following their immunisation. However, some may have a mild reaction within 48 hours of their primary vaccination (e.g. diphtheria, tetanus, pertussis, Hib, MenC and IPV)

- Redness and soreness around the injection site.
- A small hard lump at the injection site.
- Slight fever and irritability.

These are not reasons to stop immunising.

There are a few circumstances where further doses of vaccination should be deferred. These are detailed in the Summary of Product Characteristics for the respective vaccines. Further guidance can be found in the Green Book.

Following MMR vaccination, some children may develop side effects, for example:

- 6-10 days after immunisation, some children may become feverish. Some develop a measles-like rash and go off their food as the measles part of the vaccine starts to work.
- About 1 in every 1000 children immunised may have a fit caused by the fever. This is called a 'febrile convulsion'. However, if a child has not been immunised and gets measles, they are 5 times more likely to have a fit.
- Rarely children may get mumps-like symptoms (fever and swollen glands) about 3 weeks after their immunisation as the mumps part of the vaccine starts to work.
- Very rarely children may develop a rash of small bruise-like spots in the 6 weeks after their immunisation, this is usually caused by the measles or rubella part of the vaccine. If this rash is seen, the parents should be advised to contact their healthcare professional.
- Fewer than 1 child in a million develops encephalitis (inflamation of the brain) after the MMR vaccine, and there is very little evidence that it is the vaccine that causes encephalitis. If a child were to catch measles, the chance of developing encephalitis is between 1 in 200 and 1in 5000.

The child is not infectious and nobody can catch measles, mumps or rubella from him/her.

How to manage a fever:

- Keep the child as cool as possible, remove excess layers of clothing and give plenty of cool drinks.
- Administer junior paracetamol or ibuprofen to manage the fever, using the correct dosage for the child's age.
- Seek medical help if the temperature does not come down or if concerned.

SECTION 6:

WORKING WITH ADOLESCENTS

- Vaccinations for school leavers/students
- Consent
- Information sources for parents

VACCINATION SCHEDULE FOR SCHOOL LEAVERS/STUDENTS

The current UK vaccination schedule for those over 10 years old is as follows:

When to immunise	What is given
10-14 years old (and sometimes shortly after birth)	BCG
13-18 years old	Tetanus, low-dose diphtheria and inactivated polio (Td/IPV)

When the adolescent presents for immunisation, the healthcare professional should check that they have received all their immunisations in accordance with the UK schedule. Adolescents and young adults up to the age of 24 can be offered a single dose of meningococcal group C conjugate vaccine, if they haven't previously received it.

CONSENT

The adolescent will usually receive a consent form and information explaining what the vaccination is, its benefits and side effects, from their school.

A child under 16 years of age may give consent (and sign the forms themselves) provided 'he or she fully understands the benefits and risks involved'. If they refuse immunisation, their wishes should be respected. However, the child should be encouraged to involve their parent/guardian in the decision if possible.

For further information on consent, please see Section 4 'Current Practice'.

INFORMATION SOURCES FOR PARENTS

There are various resources available to support parents, guardians and teachers. Useful resources include:

- Teenage immunisations leaflet
  http://80.168.38.66/files/teenage.pdf
- Age 24 or under? Get the meningitis message leaflet
  http://80.168.38.66/files/age24menc.pdf
- Look out for your mate flyer
  http://80.168.38.66/files/loymleaflet.pdf

SECTION 7: INFORMATION SOURCES

- Putting statistics and risks into perspective
- Internet – how to use it
- Key government departments
- Suggested internet sites
- Resources for healthcare professionals
- Translations of resources for parents
- Resources and references for healthcare professionals
- Useful references

PUTTING STATISTICS AND RISKS INTO PERSPECTIVE

All medical procedures have an element of risk associated with them.

The issue of risk is poorly understood. Some people believe that the best way to communicate risk is to compare it with risks of daily activities. In addition, other techniques may help improve the way you communicate numbers:

- Standardised vocabulary e.g. very common, common, uncommon, rare, very rare.
- Consistent denominator e.g. use 40 out of 1000 and 5 out of 1000 rather than 1 in 25 and 1 in 200.
- Use both positive and negative outcomes e.g. 97 out of 100 chance of cure is more positive than 3 out of 100 chance of dying.
- Avoid relative risk e.g. 3 times more people were cured using A vs. B; use absolute numbers instead.
- Use visual aids e.g. a pie chart or graphic showing 1000 people from which the number affected can be highlighted.
- Make sure consent is 'informed' (see Chapter 4, Current practice for more information on consent) and is based on information not just data.

Putting the risk of a particular activity into perspective involves consideration of:

- The probability of something going wrong.
- How often the activity is done.

When evaluating risk, people may regard the benefits of the activity outweigh the risks involved (e.g. those participating in high-risk sports). Simple comparisons often give a clearer and more helpful perspective on the risk of vaccination.

It is also important to remember that risk is subject to fashion. For example, we worry about developing new variant CJD which carries a present risk of 1:2,000,000. Other risk 'fashions' have come and gone, without any noticeable change in risk such as those from necrotising fasciitis or listeria.

INTERNET - HOW TO USE IT

There are many sources of information on the Internet, for use when communicating with healthcare professionals and parents/guardians.

The Internet is a valuable source of up-to-date information, but care must be taken to evaluate the validity and timeliness of the information provided.

Parents may present with sheaves of paper printed from Internet sites providing variably accurate information, which may often be presented in an authoritative fashion. The healthcare professional must be able to explain how or why certain information may not be as accurate as it may seem and to enable the parent to make an informed decision to give consent to immunisation (if appropriate).

Some general points to bear in mind include:

- Anyone can set up a website and call themselves an expert
- General searches generate many 'hits', from good, bad and indifferent sites, with a serious risk of incorrect advice.
- The information may not be current. Check when it was first written and updated.

KEY GOVERNMENT DEPARTMENTS

Immunisation Programme, Department of Health
Room 602A, Skipton House
80 London Road
London SE1 6LH
Website: **www.immunisation.nhs.uk**
Provides information for parents and healthcare professionals on vaccination and has downloadable factsheets on all of the recommended vaccines in the childhood schedule.

Health Protection Agency
Central Office
Floor 11, The Adelphi Building
John Adam Street
The Strand
London WC2N 6HT
Tel: 020 7339 1300

The Health Promotion Agency for Northern Ireland
18 Ormeau Avenue
Belfast BT2 8HF
Tel: 028 9031 1611

Health Education Board Scotland
Woodburn House
Canaan Lane
Edinburgh EH10 4SG
Tel: 0131 536 5500

National Public Health Service for Wales
www.wales.nhs.uk/sites/page.cfm?orgid=368&pid=4017

Scottish Centre for Infection and Environmental Health
www.show.scot.nhs.uk/scieh

Department of Health, Social Services and Public Safety, Northern Ireland
www.dhsspsni.gov.uk

SUGGESTED INTERNET SITES WITH RESOURCES FOR HEALTHCARE PROFESSIONALS AND PARENTS

www.immunisation.nhs.uk
www.dh.gov.uk
www.hebs.scot.nhs.uk
www.nhsdirect.nhs.uk
www.hpa.org.uk
www.who.int/en
www.mrc.ac.uk
www.amicus-cphva.org
www.rcn.org.uk
www.apmsd.co.uk
www.uvig.org
www.concordance.org
www.inmed.co.uk
www.healthpromotionagency.org.uk
www.meningitis.org
www.meningitis-trust.org
www.mmrthefacts.nhs.uk
www.polioeradication.org/history.asp
www.medinfo.co.uk
www.cafamily.org.uk/immunisa.html

RESOURCES FOR HEALTHCARE PROFESSIONALS FOR USE WITH PARENTS/GUARDIANS

Some useful resources are listed below. Please check websites regularly for new material.

Downloadable leaflets from England and Wales Department of Health **www.immunisation.nhs.uk** include:

- A guide to immunisation for babies up to 15 months of age
- A guide to pre-school immunisation for 3-5 year-olds
- Teenage immunisation (school years 8-13, ages 13-18)
- Age 24 and under? Get the meningitis C message
- BCG and Tuberculosis (school years)
- BCG and your baby
- Rubella – questions and answers
- MMR – The facts

Downloadable leaflets from Northern Ireland Department of Health **www.dhsspsni.gov.uk/phealth/childimmunisation.asp** include:

- Protect Your Child – A guide for parents
- BCG and Tuberculosis
- Young People and Immunisation

A list of publications available from Health Scotland **www.hebs.org.uk** can be seen at **www.hebs.org.uk/services/pubs/pdf/PubCat0304.pdf** Relevant publications available include:

- **MMR discussion pack** (for health professionals to help to provide the basis for informed decision-making; also available in audio tape, Braille, Cantonese, Gaelic, Gujarati, Hindi, Punjabi, Turkish and Urdu)
- **A guide to immunisation for 3-5 year-olds** (for parents; also available in Cantonese, Gaelic, Gujarati, Hindi, Japanese, Punjabi, Turkish and Urdu)
- **A new guide to childhood immunisations for babies up to 15 months** (for parents; Cantonese, Gaelic, Gujarati, Hindi, Japanese, Punjabi, Turkish and Urdu)
- **Starting college or university? Heard about meningitis? Get immunised** (for students)
- **Men C vaccine; Meningitis C 16/17; Aged 20-24? Get immunised with Men C** (flyers for students of various ages)

TRANSLATIONS OF RESOURCES FOR PARENTS

The Department of Health has commissioned a variety of leaflets in various languages (e.g. Albanian, Arabic, Bengali, Chinese, Greek, Somali, Spanish etc.). These are available at **www.immunisation.nhs.uk** and can be downloaded as a pdf from **http://80.168.38.66/article.php?id=372**

RESOURCES AND REFERENCES FOR HEALTHCARE PROFESSIONALS

- Salisbury DM, Begg NT (eds). Immunisation against Infectious Disease (The Green Book). London: The Stationery Office, 1996 **(www.dh.gov.uk/PublicationsAndStatistics/Publications/PublicationsPolicyAndGuidance/PublicationsPolicyAndGuidanceArticle/fs/en?CONTENT_ID=4072977&chk=87uz6M).**
- Bedford H, Elliman D. Childhood Immunisation – A Review for Parents and Carers. London: Health Education Authority, 1998; ISBN: 075210859X.
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- Veltman M, Salisbury D (eds). Childhood immunisation in England: issues from the research. London: HEA, 1998.
- **www.rcpch.ac.uk/publications/recent_publications/Immunocomp.pdf** RCPCH Best Practice statement regarding immunisation of the immunocompromised child.

USEFUL REFERENCES

- Salisbury DM, Begg NT (eds). Immunisation against Infectious Disease (The Green Book). London: The Stationery Office, 1996 **(www.dh.gov.uk/PublicationsAndStatistics/Publications/PublicationsPolicyAndGuidance/PublicationsPolicyAndGuidanceArticle/fs/en?CONTENT_ID=4072977&chk=87uz6M).**
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SECTION 8: FREQUENTLY ASKED QUESTIONS

For further background information, see also Section 9: Glossary.

This section includes a list of questions that parents or guardians may ask before having their child vaccinated. Below each question is an answer which could be of help to you. You will need to present this answer in a way that is appropriate for the individual concerned.

How does immunisation work?

By stimulating the immune system to produce antibodies to a specific disease, without the person having to become infected with the 'wild-type' disease.

What is diphtheria?

Diphtheria is caused by a bacterium, *Corynebacterium diphtheriae* which produces a toxin that affects the heart and nerves. Growth of the bacteria and damage to the tissues can cause the formation of a membranous pharyngitis. This membrane can block the airways, resulting in breathing difficulties and may lead to death by suffocation.

What is Hib?

Hib disease is caused by a bacterium, *Haemophilus influenzae* type b. It can manifest in a number of ways, such as meningitis, septicaemia or epiglotitis. Before the conjugate vaccine was introduced, Hib was the most common cause of bacterial meningitis in the UK, sometimes resulting in death or serious complications such as deafness or brain damage.

What is hepatitis B?

Hepatitis B is a blood-borne viral infection, which presents as jaundice and fever. Hepatitis B can cause chronic infection and ultimately may result in liver damage or liver cancer.

What is influenza?

Influenza is caused by a virus that attacks the respiratory tract. The disease is characterised by the sudden onset of fever, chills, headache, myalgia and extreme fatigue. Complications include bronchitis and pneumonia.

What is measles?

Measles is caused by a highly infectious virus. The disease is usually manifested as a rash and fever. 1 in 15 children will have complications of the disease, which can include fits, chest infections or brain damage.

What is meningococcal group C?

Meningococcal group C disease is caused by a bacterium, *Neisseria meningitidis,* that is carried in the throats of many people. At any one time only a small percentage of people get the disease. When disease occurs urgent medical attention is required. Symptoms include neck stiffness, drowsiness, confusion or a severe headache. In some cases the disease leads to septicaemia and non-blanching red or purple spots may be seen. Survivors may suffer permanent brain damage, need to have limbs amputated or suffer from seizures or hearing loss.

What is mumps?

Mumps is caused by a virus and is characterised by painful swollen glands in the neck region. It may cause deafness, meningitis and inflammation of the brain. In boys it can cause painful swelling of the testes and in girls, swelling of the ovaries.

What is pertussis?

Pertussis, also known as whooping cough, is caused by the bacterium *Bordetella pertussis*. The disease causes long bouts of coughing. It typically lasts for 6-12 weeks and is a severe disease in young children.

What is pneumococcal disease?

Pneumococcal disease is caused by a bacterium, *Streptococcus pneumoniae*, that can cause pneumonia, or systemic (invasive) infections, including bacteraemic pneumonia, bacteraemia and meningitis. Complications are most common in children under 2 years of age and in the elderly. Invasive pneumococcal disease is a major cause of morbidity and mortality.

What is polio?

Polio, or 'poliomyelitis', is caused by a virus which may attack nerves which carry impulses to the muscles. Polio is a very serious disease which can cause permanent paralysis, generally of the lower limbs or breathing muscles which may result in death.

What is rubella?

Rubella, or German measles, is caused by a virus. Symptoms are usually mild but if caught by a pregnant woman early into her pregnancy it can cause serious defects in the unborn child. It can harm the baby's sight, hearing, brain, liver, lungs and bone marrow (congenital rubella syndrome).

What is tetanus?

Tetanus is caused by a toxin-producing anaerobic bacterium called *Clostridium tetani*, which exists as spores in soil and manure. The toxin affects the motor nerves, causing painful muscle spasms which can potentially lead to breathing problems and death.

What is varicella?

Varicella, or chickenpox, is caused by the varicella-zoster virus. The disease is highly contagious and is characterised by blister-like spots, which are often itchy. Once somebody has had chickenpox, the virus stays in the nerve tissue where is can be reactivated to cause shingles. Chickenpox can pose risks to a fetus or newborn baby, depending on when the mother is infected.

Does my child still need these injections if these diseases aren't around anymore?

These diseases are still potentially a problem. Unfortunately, if not enough children are vaccinated, the diseases will re-emerge and put your child at risk.

Can't I make sure my child doesn't get infected?

It is very difficult, if not impossible to protect unvaccinated children from infectious diseases. It is not always obvious who is carrying or incubating certain illnesses and many infectious diseases are contagious before any symptoms appear. In addition, close contact is not always necessary in order to catch the disease, as is the case with measles, which is highly infectious. With tetanus, the spores are present in soil everywhere, which puts children at risk when they get cuts or grazes.

Wouldn't it be better for children to have the natural diseases to give them longer-term immunity?

The risk of complications from the infection is much greater than the small risk of an adverse effect from a vaccine. Not all diseases give long-term immunity (e.g. pertussis), therefore vaccination is still necessary.

Why do children need pre-school boosters?

Immunity from vaccinations given to babies can reduce over time. Pre-school vaccinations top up the child's level of antibodies in order to help keep them protected during their school years.

We moved house and my child missed an appointment for a vaccination. Will we have to start at the beginning again?

There is no need to start from the beginning again, it is never too late to complete the course of primary immunisations.

We never hear of diphtheria these days. Is the immunisation still necessary?

Due to immunisation, diphtheria is rare in the UK, but if children are not immunised the incidence of the disease could increase. Diphtheria is still present in Europe and other countries worldwide.

Are there any side effects to any of the vaccines in the childhood schedule?

Side effects are possible but are usually mild. There may be a little redness or swelling at the injection site, but this will disappear. Some children become a little feverish. This can be treated with the appropriate dose of paracetamol and repeated 4 to 6 hours later if necessary. If the fever persists for longer than 6 hours, then consult your doctor.

What is MMR?

MMR is the combined vaccine against measles, mumps and rubella. It is the best way to help protect children against these diseases.

Are there any side effects to the MMR vaccination?

Reactions may possibly include fever and high temperature. Occasionally, the child may develop a rash 7-10 days following the injection. The parotid gland, just below and in front of the ear, may become swollen.

I heard that the MMR vaccine is made from eggs. My child was sick after eating eggs. Should the vaccine be withheld?

Some of the constituents of the MMR vaccine are grown in eggs. If your child has a severe allergy, experiencing rashes, swelling of mouth or breathing problems after eating eggs, special arrangements may need to be made for your child's vaccination.

Why are 2 doses of MMR given?

2 doses are given to improve immunity. Some children will not develop strong immunity to all 3 diseases with one dose and may therefore still be at risk of contracting disease.

Would it be better to have separate measles, mumps and rubella vaccines?

The MMR vaccine has been rigorously tested and has a good safety profile. Having separate vaccinations is not recommended by the Department of Health or the World Health Organisation, as it leaves your child at risk at a vulnerable age for a longer length of time. No other country in the world recommends that children should be immunised against measles, mumps and rubella in 3 separate vaccines.

Note: For other questions about MMR please refer to the Department of Health website: ***www.mmrthefacts.nhs.uk***

ABOUT THE IPV CHILDHOOD VACCINATION PROGRAMME

Why have the childhood vaccines been changed?

The UK programme has changed to support the switch from Oral Polio Vaccine (OPV) to Inactivated Polio Vaccine (IPV), in line with the WHO recommendation, as we move closer to eradicating polio worldwide. IPV does not carry any risk of causing vaccine associated paralytic polio that occurs very rarely with OPV.

In addition, the primary immunisation programme now incorporates the use of acellular pertussis vaccines. Acellular pertussis vaccines tend to cause fewer adverse reactions than whole cell pertussis vaccines.

Does this mean the OPV vaccine is unsuitable?

OPV has an excellent safety record and has been highly effective in controlling naturally occurring polio outbreaks. However OPV contains a live virus and, in extremely rare cases, it can cause symptoms similar to the 'wild-type' virus. Switching to the use of IPV eliminates this risk and is an appropriate step towards eradicating polio worldwide.

What if my child has already had the OPV vaccine?

Your child may receive the IPV combination vaccine even if they have had OPV previously.

Won't having 5 vaccines at the same time overload my child's immune system?

There is no evidence to suggest that having a number of vaccines at any one time will overload the immune system. A child's immune system is constantly challenged by numerous different antigens in the day-to-day battle against infection, so there is no reason to think that those in a vaccine will overload the system. In addition, acellular pertussis vaccine contains only up to 5 purified antigens compared to whole cell pertussis vaccine which contains around 3,000 antigens.

If polio is eradicated in Europe, why do I need to have my child vaccinated?

Due to the success of the immunisation programme, polio is no longer a problem in the UK. However, there is still a risk that polio could be imported into the UK. Without vaccination the disease would quickly spread and your child could be at risk.

What is the difference between acellular pertussis vaccine and whole cell pertussis vaccine?

These vaccines differ in how they are prepared. Whole cell pertussis vaccine, as its name implies, uses the whole cell and contains around 3000 antigens. Acellular pertussis vaccine is comprised of only a small number of purified immunogenic particles.

Will my child have fewer reactions to the acellular pertussis vaccine?

The acellular pertussis vaccine reduces the risk of local and systemic reactions.

Is the acellular pertussis vaccine as effective as the whole cell pertussis vaccine?

The acellular pertussis vaccine introduced into the schedule has been shown to have a similar efficacy as the whole cell pertussis vaccine.

Do the IPV childhood vaccines contain thiomersal?

No. Regulatory authorities requested that vaccine manufacturers phase out the use of thiomersal. They acknowledged that there is no evidence of any harm caused by the low levels of thiomersal in vaccines and any risks were only theoretical. None of the childhood vaccines routinely used in the UK contain thiomersal.

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acellular
Without cells. An acellular vaccine doesn't contain whole cells but purified parts of that organism, which can elicit an immune response in the person receiving the vaccine.

active immunity
Active immunity is generated by the body when the immune system is triggered to produce antibodies, either by immunisation or by the disease (natural infection).

adjuvant
A substance used in a vaccine to increase the body's immune response.

adverse event
A side-effect that occurs after the administration of a vaccine, that may or may not have been caused by the vaccine.

anaphylaxis
A severe and potentially life threatening allergic reaction.

antibodies
Proteins produced by the body to help the immune system neutralise or destroy toxins and disease-causing organisms.

antigen
A substance which triggers an immune response.

attenuated
Weakened. Pathogens (organisms that produce disease, e.g. a virus) are attenuated to make them suitable for use in a vaccine.

bacterium / bacteria
Single cell micro-organisms, some of which cause disease. Others are essential for our bodies to work properly.

booster
Extra dose of vaccine that builds up immunity to the disease the vaccine helps protect against.

clinical trials
Part of the process of testing new vaccines and drugs for safety and effectiveness. In clinical trials the product is administered to individuals under carefully monitored conditions.

Committee on the Safety of Medicines (CSM)
Statutory independent committee responsible for advising on the licensing and safety of human medicines.

congenital
Any condition that's present at birth and may be inherited.

conjugate vaccine
Conjugate vaccines combine part of the disease-causing organism with a protein (e.g. tetanus or diphtheria). In young children polysaccharide antigens are not well recognised by the immune system. Joining the antigen to a protein increases the immune response. The conjugate vaccines in the childhood immunisation schedule are Hib and Men C.

contraindication
A reason why a vaccine should not be given.

efficacy
Vaccine efficacy is a measure of how good a vaccine is at preventing disease. It is a comparison of the risk of infection in the vaccinated group compared to individuals who are not vaccinated.

encephalitis
Inflammation of the tissues of the brain which can cause lasting brain damage.

encephalopathy
Term for any diffuse disease of the brain which alters brain structure or function.

epidemic
An outbreak of disease which affects more individuals than a previously determined threshold. A pandemic is an epidemic over a vast area – it usually refers to an outbreak that affects several countries e.g. flu.

Heaf test
The Heaf test is a skin test which must be carried out on all individuals aged 3 months and over before they have BCG vaccine. The reason for this is that if they have been in contact with tuberculosis (TB), the skin test will show positive and a BCG will not be needed.

herd immunity
The phenomenon by which members of a community who are not immune to a disease are still protected from it, provided that sufficient numbers of people in that community are themselves immune. This is because when enough people are immune to a certain disease, it has little opportunity to spread and so find a non-immune person. Herd immunity only applies to pathogens with humans as their only reservoir.

immune system
The body's system for fighting infectious disease.

inactivated vaccine
These vaccines are manufactured either from the killed organism or from the toxin, or using parts of the organism either as component vaccines or as conjugate vaccines.

Joint Committee on Vaccination and Immunisation (JCVI)
Statutory independent committee which advises UK health ministers on immunisation policy.

killed vaccine
See inactivated vaccine.

live attenuated vaccine
This is a vaccine made from the live virus or bacteria, which has been altered to make it less harmful. The live vaccines in the childhood immunisation schedule are MMR and BCG. Other live vaccines include yellow fever and varicella vaccine.

Medicines and Healthcare products Regulatory Agency (MHRA)
The Executive Agency of the Department of Health protecting and promoting public health and patient safety by ensuring that medicines, healthcare products and medical equipment meet appropriate standards of safety, quality, performance and effectiveness.

oral vaccine
A vaccine taken by mouth.

passive immunity
Passive immunity is generated when the body is given antibodies, instead of making them itself. Passive immunity can be acquired by transfer of maternal antibodies via the placenta or by injecting pre-formed antibodies as immunoglobulins. Protection from passive immunity diminishes in a relatively short time.

pathogen
The organism that produces disease; a virus or bacteria for example.

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polysaccharide vaccines
Polysaccharide vaccines contain part of the sugar coat of the disease-causing organism.

preservatives
Substances that prevent microbial contamination of the vaccine e.g. thiomersal.

stabilisers
Substances that stop the contents of a vaccine breaking down into its component parts.

subacute sclerosing panencephalitis (SSPE)
A rare degenerative neurological condition, which progressively destroys nerve cells in the brain leading to mental deterioration and death. It occurs some years after measles disease (average interval around 8 years). Those children affected by the disease at a young age are at particular risk.

suspending fluid
The substance that carries the vaccine into the body.

thiomersal
Thiomersal (also known as thimerosal) is a mercury-based preservative that has been used in some vaccines to prevent microbial contamination for over 60 years. None of the vaccines routinely used in the UK childhood schedule contain thiomersal. (For more details on thiomersal refer to **http://80.168.38.66/files/thiomersal fsht.pdf**).

toxin
A poison produced by a bacterium.

toxoid vaccine
These vaccines are made from the toxin (poison) which has been inactivated. Diphtheria and tetanus are toxoid vaccines.

vaccine
A vaccine is either a suspension of attenuated or killed microorganisms (bacteria, viruses or rickettsiae), or components of those organisms, administered for the prevention or treatment of infectious diseases.

valency
The number of antigens within the vaccine.

virus
An organism that needs to live inside a cell in order to multiply. Viruses cause many types of disease e.g. measles, mumps, polio.

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