PRIORITIES IN CHILD HEALTH

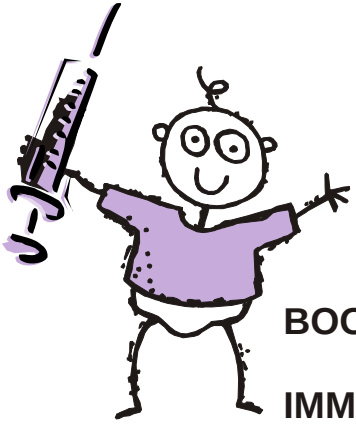
Easily digestible information for health workers on managing the young child

BOOKLET 2 IMMUNISATION

PRIORITIES IN CHILD HEALTH

Easily digestible information for health workers on managing the young child

The EQUITY Project, South Africa Nursing Council Building
3rd Floor, 602 Pretorius Street, Arcadia, Pretoria
PO Box 40394, Arcadia, 0007, South Africa
Telephone: +27 (0) 344 6117
Facsimile: +27 (0) 12 344 6115
Email: publications@equityproject.co.za
Website: www.equityproject.co.za



BOOKLET 2

IMMUNISATION

FOREWORD

This series of booklets is a course of self-based learning on the comprehensive management of the sick infant and young child. It is intended for use by first level health workers who, in South Africa, are generally nurses. The principles used are based on the World Health Organisation strategy "Integrated Management of Childhood Illness (IMCI)". For those who have not yet benefitted from full IMCI training, the booklets provide specific information on important elements of child health care that each nurse should know and use. As her knowledge and experience expands, she will increasingly approach each child in the comprehensive manner promoted in this series. The booklets are not intended as a substitute for existing training programmes, but rather as an adjunct to such learning.

Short case studies are employed to illustrate problems to be discussed in each section.

Introduction to comprehensive management

Booklet 1	*Underlying principles*
	The Road to Health Chart
	Nutrition
	Maternal well-being
Booklet 2	*Immunisation*

Management of the sick child under 5 years

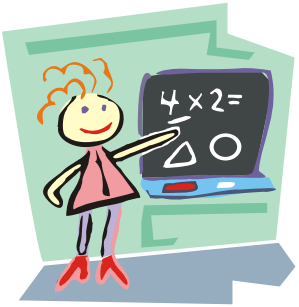
Booklet 3	*Acute respiratory infection*
Booklet 4	*Diarrhoeal disease*
Booklet 5	*Promoting healthy growth*

CONTENTS

After reading this booklet the learner should :

- ☑ Understand the concept of the Expanded Programme of Immunisation
- ☑ Know the National Immunisation Schedule
- ☑ Be aware of the common vaccines not included in the National Programme
- ☑ Be able to answer commonly asked questions about immunisation
- ☑ Recognise false and true contraindications to immunisation

Before you start, why not test your knowledge by answering the following questions!



QUESTIONS ON BOOKLET 2

Are the following statements true or false? If false, correct them!

1. BCG vaccine is a live attenuated virus.
2. Pertussis vaccine is a purified toxoid.
3. DPT vaccine and Hepatitis B vaccine are normally given at the same time.
4. Measles and polio vaccines can be given at the same time.
5. Influenza vaccine should be given to all children.
6. DPT is given by subcutaneous injection.
7. Premature babies can be immunised at the usual time.
8. Mothers should be warned to expect some reaction to DPT 6-12 hours after the injection.
9. An HIV positive infant who is otherwise well should receive all the routine immunisations.
10. Polio vaccine is best stored in a deep freeze.
11. A child with cerebral palsy should receive DPT immunisation.
12. An allergic child should not be given measles vaccine because it contains egg protein.
13. BCG vaccine prevents a child from developing tuberculosis.
14. HiB is a virus that causes meningitis.
15. Measles vaccine may be given to babies of 6 weeks when there is an epidemic.
16. Measles vaccine is usually given subcutaneously.
17. At school entry a child should receive a booster immunisation against diphtheria, tetanus and pertussis.
18. A convulsion after a DPT immunisation means that the child should not receive this again.
19. Meningitis is a complication of mumps.
20. Tetanus and rubella immunisations are contraindicated during pregnancy.

Answers on page 23

IMMUNISATION

VUSI

Vusi is recovering from a severe lower respiratory infection following an attack of measles. His weight has dropped to below the 3rd percentile. The skin on his arms and legs is peeling. He is 10 months of age. His Road to Health Chart shows that he received :

- *BCG vaccination and polio drops at birth*
- *DPT and polio drops at 6 and 10 weeks*

WHAT IMMUNISATION WOULD YOU RECOMMEND? WRITE THEM DOWN NOW.

INFECTIOUS DISEASES

Infectious diseases are the root cause of death, ill health and disability in millions of children each year. Some of these infections can be prevented or made milder by immunisation. Immunisation is the process of artificially producing resistance to infectious diseases by introducing mild or harmless doses of germs of the disease into the body.

The EXPANDED PROGRAMME OF IMMUNISATION, or EPI for short, is an integral part of our national health policy. It aims to provide free immunisation to all infants, children and women against eight important infections.

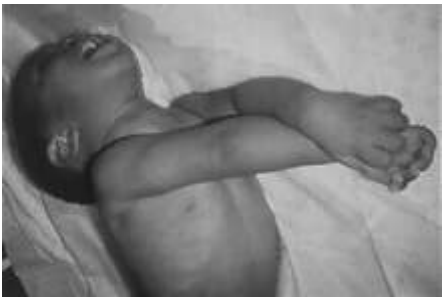
DO YOU KNOW WHAT THESE INFECTIONS ARE?

They are measles, diphtheria, whooping cough, tetanus, poliomyelitis, tuberculosis, hepatitis B and infections due to Haemophilus influenzae, type B.

The aim is not just controlling but eliminating these vaccine-preventable conditions. Eradication has already been achieved world-wide in the case of smallpox. Polio has been eradicated from South, Central, and North America. South Africa has endorsed the measles and polio eradication campaigns, and both these diseases are today far less common than they were, thanks to a successful immunisation programme.

GIVE A BRIEF DESCRIPTION OF THESE EIGHT INFECTIONS

Tuberculosis (TB) is a chronic disease due to *Mycobacterium tuberculosis*. It primarily affects the lungs and glands in the chest, but can spread to almost any part of the body. The most dangerous complication is TB of the brain and meninges. This is a kind of TB which is prevented by BCG vaccination.

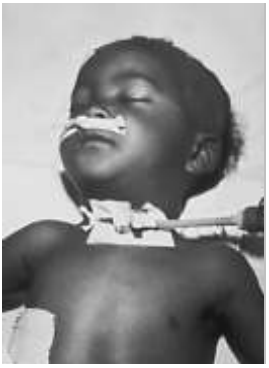


This child is affected by TB of the brain - the back and limbs have become spastic.

This child's left leg is shorter and smaller than her right one due to polio some years ago.

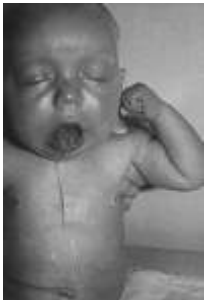
Poliomyelitis is a viral infection which enters the body through the intestine. Most infections are completely undetected; sometimes there are symptoms of meningitis. Paralysis of muscles of varying degree occurs in only a few of those infected. If the child survives, weakness improves, but some permanent paralysis is often left.

Diphtheria is caused by a bacterium called *Corynebacterium diphtheriae*. In its most severe form it causes a spreading infection of the throat which can obstruct breathing. It can also cause indolent skin sores. Certain strains of *C*. d*iphtheriae* produce toxins which can poison the heart and nerves.



This child could not breath due to obstruction by diphtheria in the throat, so a tube had to be placed directly into her trachea.

Pertussis (whooping cough) is caused by the bacterium *Bordatella pertussis*. Spasms of uncontrollable coughing, end in vomiting or a long crowing inspiration (a whoop). The tendency to these coughing spells can last for many weeks. The infection is most dangerous in young infants, in whom a whoop may not be present. They may stop breathing or choke during a coughing spell or develop a severe pneumonia.



This child is coughing so long and so hard, she often vomits. That is why she has become so thin.

This infant shows grimacing of the face due to muscle spasm of tetanus.

Tetanus is caused by the bacillus *Clostridium tetani*. It produces spores which can live for long periods in dirt or soil. The germ enters through contaminated wounds and produces a powerful toxin which causes severe muscle spasms. In the very dangerous neonatal tetanus, infection is via the umbilical stump.

Measles is a viral infection that causes fever and a characteristic rash. It is a serious disease, especially in infancy, with the possibility of complications such as diarrhoea, croup, pneumonia, and immune suppression.

This child is recovering from measles. Her skin is peeling off as the rash heals.

Hepatitis B virus causes jaundice with a wide range of severity, and also a variety of other symptoms. When babies are infected perinatally as many as 90% will have persistence of infection. Chronically infected children run an increased risk of developing chronic liver disease or hepatocellular carcinoma in later life.

Haemophilus influenzae type B is one of the commonest causes of meningitis in young children (below 2 years). It can also cause bacteraemia, pneumonia, otitis, epiglottitis, cellulitis and bone infection. Since the introduction of the vaccine in Western countries, illnesses due to this organism have nearly disappeared.

SOUTH AFRICAN NATIONAL IMMUNISATION SCHEDULE

AGE	VACCINES	SITE
AT BIRTH	BCG	Right arm
	POLIO 0	Oral
6 WEEKS	POLIO 1	Oral
	DTPHiB 1	Left thigh
	Hep B 1	Right thigh
10 WEEKS	POLIO 2	Oral
	DTPHiB 2	Left thigh
	Hep B 2	Right thigh
14 WEEKS	POLIO 3	Oral
	DTPHiB 3	Left thigh
	Hep B 3	Right thigh
6 MONTHS	(MEASLES IN HIGH RISK SITUATIONS)	
9 MONTHS	MEASLES 1	Right thigh
18 MONTHS	BOOSTERS :	
	POLIO 4	Oral
	DTP 4	Left arm
	MEASLES 2	Right arm
5 YEARS	BOOSTERS :	
	POLIO 5	Oral
	DT 1	Left arm

IN ADDITION, TETANUS TOXOID IS GIVEN TO WOMEN DURING PREGNANCY IN AREAS CONSIDERED TO BE AT HIGH RISK OF NEONATAL TETANUS. IT IS GIVEN 3 TIMES A MONTH APART OR ONCE ONLY IF PREVIOUSLY IMMUNISED FULLY WITH DPT, DT OR TT.

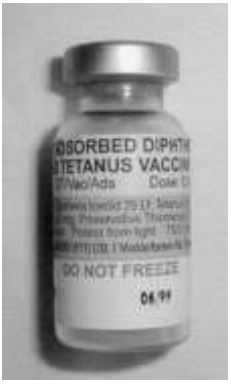
DO YOU KNOW WHAT THESE ABBREVIATIONS MEAN?

DPT = Combined diphtheria, tetanus and pertussis (whooping cough) vaccine.

- The diphtheria and tetanus parts are pure toxins which have been rendered harmless (toxoids)
- Pertussis vaccine is a suspension of the killed whole cells
- All are suspended in a mixture with aluminium hydroxide/phosphate
- It is given by intramuscular injection (0.5 ml)

HiB = Haemophilus influenzae B vaccine

- HiB consists of a small part of the bacterial nucleus anchored on a carrier protein. It can be given in conjunction with DPT, often included in the same vial as DPTHiB vaccine. Children aged less than 6 months require three primary doses, given with the DPT immunisation. A booster dose is given after 15 months.



DT and TT = Diphtheria and tetanus toxoids (DT) or tetanus toxoid alone (TT) without pertussis.

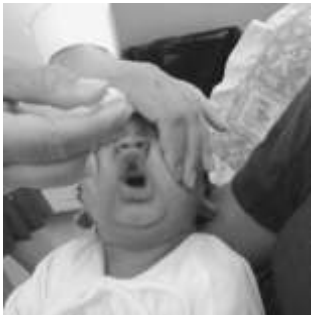
- It is given by intramuscular injection (0.5 ml)

Measles = This is a live attenuated strain of measles virus.

- It is given by subcutaneous injection (0.5 ml)
- Morbilvax is one of several measles vaccines available

Hepatitis B = It contains only part of the virus - the HepB surface antigen.

- It is a fluid mixture with aluminium hydroxide/phosphate
- It is given intramuscularly (0.5 ml)



Polio - Poliomyelitis. This is the live, SABIN vaccine and contains the three common strains of poliovirus, rendered harmless (attenuated).

- It is given by mouth (two drops)

BCG = Bacillus Calmette-Guerin. This is a live attenuated strain derived from Mycobacterium bovis, closely related to the human TB bacillus.

- It is given by multiple puncture through the skin at present. This method will soon be changed to an intradermal method (injection into the skin - 0.1 ml)

The make of these vaccines may change from time to time depending on tender.

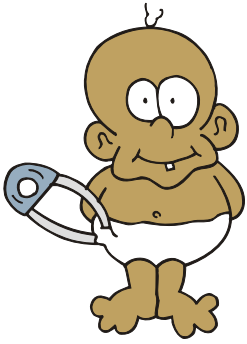
COMMON QUESTIONS ABOUT IMMUNISATION

WHAT IS THE DIFFERENCE BETWEEN VACCINATION AND IMMUNISATION?

- 'Vaccination" is derived from Vaccinia, the cow-pox virus used to eradicate smallpox
- "Immunisation" means to make immune

TODAY THESE TERMS ARE USED INTERCHANGEABLY

WHEN IS MEASLES IMMUNISATION GIVEN AT SIX MONTHS?



When there is an outbreak in a community, immunisation of all infants is brought forward to six months from nine months. This is in order to protect as many infants as possible from getting measles at an early age when it is most dangerous. However, since a small number of children will not get measles immunity when given the vaccine at 6 months of age, the second dose of measles at 18 months is of particular importance for these children. Unfortunately, immunisation does not protect when given to babies younger than six months because they still have antibody from the mother which makes the immunisation ineffective.

All sick children entering a hospital or health centre should receive measles immunisation if six months or older because they are at especially high risk of getting measles. In this way **Vusi** could have been protected. He was 10 months old and should have been immunised at nine months anyhow - so **two** opportunities were missed!

UPDATING THE IMMUNISATION STATUS OF EVERY CHILD SEEN AT A HEALTH FACILITY (HOSPITAL, HEALTH FACILITY OR COMMUNITY HEALTH CENTRE) IS PART OF INTEGRATED CHILD CARE.

WHY IS TETANUS TOXOID GIVEN TO PREGNANT WOMEN?

Tetanus toxoid (TT) is given to prevent neonatal tetanus, which is still prevalent in some parts of South Africa. It is especially important in mothers living in rural areas, who may be delivered at home. If mother is immune she passes the immunity to her fetus. This is good for the baby for the first few weeks of life only. Then the infant must be immunised with DPT.

In these areas a women should receive at least two and preferably three TT immunisations more than four weeks apart during the first pregnancy. In subsequent pregnancies only one TT immunisation is required.

If she has documented evidence of full immunisation during infancy and childhood (the 'T' of DPT), only one TT immunisation during pregnancy is required.

WHY IS PERTUSSIS IMMUNISATION OMITTED OVER THE AGE OF TWO YEARS?

Pertussis is omitted because :

- There are more side-effects from the vaccine in older children
- Pertussis is still bad, but is not as serious a disease as it is in infants

WHAT TYPE OF ILLNESS DOES HAEMOPHILUS INFLUENZAE TYPE B CAUSE?

It is one of the commonest causes of meningitis in young children (below two years). It can also cause bacteraemia, pneumonia, epiglottitis, cellulitis and bone infection. Since the widespread use of this vaccine in Western countries, these serious illnesses have nearly disappeared.

WHAT OTHER VACCINES ARE AVAILABLE?

MMR (Combined Measles, Mumps and Rubella Vaccine), is a live attenuated vaccine. It is effective and safe. MMR can be given instead of measles vaccine after the age of one year. It is also recommended for non-immune women of child-bearing age, but pregnancy must be avoided for three months thereafter.

WHY IS IMMUNISATION AGAINST RUBELLA IMPORTANT?

Rubella is a mild viral infection causing a rash, swelling of lymph glands, and sometimes sore joints, for some weeks afterwards. Its main importance is that it can cause serious damage to the developing baby if the mother has an infection early in her pregnancy. Children who are immunised at 15 to 18 months will have lifelong immunity. They will avoid the illness and girls will be protected during later pregnancy.

WHAT ABOUT MUMPS?

Mumps is generally a mild viral disease in which there is inflammation of one or more of the salivary glands, most commonly the parotids. However, there may be complications such as meningo-encephalitis, and permanent deafness can result. Older boys and men may develop orchitis (inflammation of the testicles) sometimes leading to sterility. The vaccine is given to young children to protect them against these later complications. The vaccine is safe and effective, and has thus been added to the combined MMR vaccine.

DO YOU KNOW OF ANY MORE VACCINES?

Influenza virus vaccine must not be confused with HiB. Flu virus strains change every year, and the currently prevalent strain is updated regularly. The vaccine should only be given to children with chronic illnesses, such as heart disease, diabetes mellitus, chronic lung disease and HIV infection. Ideally it should be administered in March/April to provide protection during the winter months.

Polyvalent pneumococcal vaccine contains antigens from 23 strains of pneumococcus which cause most pneumococcal disease in adults. It is only effective in children over two years of age. It is indicated in children with chronic diseases just mentioned and also in those with absence or dysfunction of the spleen.

Hepatitis A vaccine is a new vaccine against the commonest form of viral hepatitis. It has been licensed for use in South Africa as Havrix ®. It protects from the common form of jaundice spread by unclean water and poor sanitation.

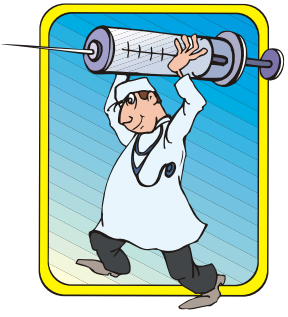
Varicella (chicken pox) vaccine is safe and effective and has been introduced for routine use in some countries. It is needed especially to protect immune compromised children such as those with malignancies, in whom chicken pox can be a fatal disease. It is not yet licensed for use in Southern Africa.

Yellow fever vaccine. Children over the age of six months travelling to and from areas where yellow fever exists should be immunised with a single dose. This is a requirement for international travel.

Rabies vaccine. It is given to people who have been exposed to possible rabies through an animal bite (especially a dog) or close contact with a patient with rabies. This is termed post-exposure prophylaxis. It is also given as a pre-exposure prophylaxis to individuals at high risk, such as vets, animal handlers, or children/adults living in areas where rabies is a constant threat. The human diploid cell vaccine (HDCV) and the rhesus diploid cell vaccine (RVA) have relatively few side effects, unlike the vaccines used in former years. Dosage : 1ml given intramuscularly (deltoid) on days 0, 3, 7, 14 and 28 (post-exposure) or on day 0, 7, 21, and 28 (pre-exposure).

HOW ARE THE VACCINES GIVEN?

- BCG - percutaneous (THROUGH THE SKIN), with multiple puncture tool, or intradermally
- Polio - oral drops
- DPT - intramuscular injection
- HiB - intramuscular injection
- Measles - subcutaneous injection
- Hepatitis B - intramuscular injection
- MMR - subcutaneous injection
- Influenza - intramuscular injection
- Pneumococcal - subcutaneous or intramuscular injection
- Yellow fever - subcutaneous injection



- Rabies - intramuscular injection

WHERE ARE THEY GIVEN?

Intramuscular immunisations :

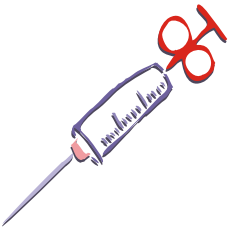
Infants under 12 months :

- Middle of outer part of thigh
- Use a 22-25 gauge needle, minimum length 25mm

The needle should be directed towards the knee, and not towards the groin.

Older children :

- Deltoid (upper arm) if muscle bulk adequate
- Otherwise as for infants
- Use 22-25 gauge needle, minimum length 32 mm



Subcutaneous immunisations :

- Thigh in infants and upper arm in older children

IMPORTANT! Use different sites for each injection if more than one given at the same time.

WHICH VACCINES CAN BE GIVEN AT THE SAME TIME?

In an older child who has never been immunised, polio, hepatitis B, DPTHiB, and measles can all be given at the same time. BCG is no longer given after the neonatal period.

Children over 2 years are not usually given pertussis vaccine - give DT.

A lapse in the immunisation schedule does **not** mean you must restart the whole schedule. The remaining dose or doses should be given as though the prolonged break had not occurred.

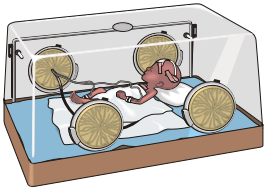
QUESTIONS FREQUENTLY ASKED BY PARENTS ABOUT IMMUNISATION

WHY IMMUNISE?

Immunisation is a simple effective way of protecting children against dangerous conditions. By itself, the human body cannot make itself immune to infections without actually contracting the illness. However, by taking particular vaccines (by injection or orally), the body develops immunity to those infections. There is a second important reason why all children should be immunised, and at the correct time. If the level of immunity in the community ("herd immunity") is high enough, then the infection cannot be transmitted from one person to another.

MY BABY WAS PREMATURE; IS SHE TOO DELICATE TO BE IMMUNISED?

Premature infants are just as capable of responding to immunisation as mature babies and should be immunised at the same time intervals after delivery.



CAN I EXPECT ANY REACTIONS AFTER IMMUNISATION?

Mild fever and irritability are common, particularly after DPT, measles and MMR immunisations. In the case of DPT it occurs 6-12 hours after the injection. With measles and MMR slight fever can be expected about seven days after giving the vaccine. 10-20% of infants will develop a slight rash or other measles-like symptoms.

IF A CHILD HAS SHOWN A SEVERE REACTION TO A VACCINE THIS VACCINE SHOULD NOT BE GIVEN AGAIN - REFER TO HOSPITAL DOCTOR

WHAT ABOUT BCG VACCINATION?

Following an intradermal vaccination a papule appears at the site within 2-3 weeks. This reaches a maximum size in 4-6 weeks and may ulcerate. This small lesion will heal spontaneously and leave a small flat scar 3-6 months after vaccination. It is also normal for a lymph gland in the axilla or neck to be slightly enlarged (less than 1 cm). **NO TREATMENT IS REQUIRED FOR THESE CHANGES. THEY SHOW THAT THE VACCINE IS WORKING.**

An abscess may form in the arm or in the axilla. This is usually because the BCG was given subcutaneously rather than intradermally. Serious or long term complications are very rare, the incidence varying from country to country.

MY BABY IS ALLERGIC. COULD IMMUNISING HIM BE DANGEROUS?

An allergic tendency is in no way a contraindication to immunisation. Most of the genuine concerns regarding allergy centre around measles and mumps vaccines, as these live attenuated viruses are grown on chick embryos. The danger of a reaction to egg protein in the vaccine has been exaggerated. Only in children who have shown severe allergy to egg, such as immediate swelling of the lips, difficulty with breathing, or rash, should measles immunisation be omitted. In fact some such children have been vaccinated inadvertently, and shown no reaction! VERY RARELY a child may be allergic to the neomycin in measles vaccine or MMR, or to the vehicle in DPT.

If in doubt you should contact your local EPI manager or a paediatrician.

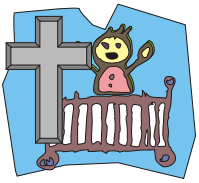
DOES IMMUNISATION CAUSE CONVULSIONS?

Such fears usually refer to the combined Diphtheria-Pertussis-Tetanus(DPT) vaccine. The diphtheria and tetanus components are highly purified deactivated toxins, but the whooping cough component is (at the moment) a relatively crude suspension of killed Bordetella pertussis. Being a complex mixture of chemicals adsorbed onto alum, this vaccine regularly causes some reaction, coming on within a few hours of the injection. There is redness, swelling and tenderness at the injection site, and irritability and fever which are mild and transient. Side-effects can be lessened by giving three doses of paracetamol at the recommended dosage at four hourly intervals.

In about one in a thousand immunisations an infant will show high prolonged fever, have a convulsion or develop extreme irritability and a shrill cry. These side effects are attributable to the whooping cough component, **ANY SUCH SEVERE REACTION MEANS THAT THE INFANT SHOULD NOT RECEIVE PERTUSSIS ANTIGEN AGAIN.** Only the Diphtheria and Tetanus components should be given to complete the schedule.

Despite these side effects the combined DPT vaccine is very effective, and should be continued, for the benefits far out-weigh the risks. If the precautions outlined above are taken, permanent brain damage due to DPT should rarely if ever happen. A new, safer acellular whooping cough vaccine is used in the West and will soon be available in South Africa.

DOES IMMUNISATION CAUSE COT DEATHS?



Extensive research has excluded any role for immunisation in the causation of cot deaths.

CAN POLIO DROPS CAUSE PARALYSIS?

This is a genuine, though minutely small risk. The oral Sabin polio vaccine contains live attenuated viral particles which multiply in the gut, are excreted, and can then infect others, thus spreading the immunity to polio around the community. Very rarely the child himself, or one of his contacts is paralysed by the vaccine virus just as in genuine (wild) polio. In the USA 8-10 such cases happen each year out of three million or so protected by the vaccine! With the virtual disappearance of wild polio, these risks, though small, are unacceptable, and the USA has re-introduced the inactivated injectable vaccine (Salk strain). In the meantime in Africa we continue with the Sabin drops, as they are cheaper and spread immunity in the community.

WHAT ABOUT THE CHILD WHO IS HIV POSITIVE?

These children are especially in need of protection. A child who is HIV positive should receive the regular schedule of immunisations. Only BCG is contra-indicated in children in an advanced stage (AIDS), but AIDS is only encountered in older infants and children, when BCG is no longer given anyway.

DOES MY CHILD REALLY NEED HEPATITIS B VACCINE?

Hepatitis B is endemic in less advantaged communities in many parts of the country. In these communities mothers can transmit the infection to their infants during or after pregnancy or the children can acquire it later. But all individuals run a life-time risk of becoming infected with Hepatitis B and should be protected. The vaccine is effective, cheap and extraordinarily safe. All infants should receive it.

MY NEIGHBOUR'S CHILD HAS JUST BEEN GIVEN "H. FLU" VACCINE. IS IT NECESSARY?

Haemophilus influenzae bacteria type B (no relation to the influenza virus) causes severe infections in young children, particularly bacteraemia, meningitis and epiglottitis. The vaccine is effective and safe, but unfortunately expensive. However, HiB is made available to all children as part of the National EPI Programme.

WHAT ABOUT MUMPS AND RUBELLA?

MMR is a combined live attenuated measles/mumps/rubella vaccine which has been available for many years. Again, it is very effective and safe, but expensive. In many countries it has replaced the single measles vaccine, but costs at present preclude its use in South Africa in the free National schedule. Measles vaccine, the life-saving part, is free! MMR is sold through private pharmacies and dispensaries. *As with all live vaccines, special care must be given to maintaining the cold chain to avoid inactivation.*

IF BCG PREVENTS TUBERCULOSIS, WHY IS THERE STILL SO MUCH TB AROUND?

Unfortunately, no vaccine has yet been perfected which will prevent tuberculosis. BCG vaccine, which has been in use for more than 70 years, reduces the risk of disseminated TB like meningitis, found mostly in very young children. BCG does not prevent the tubercle bacillus establishing itself in the lungs, so pulmonary TB remains common.

IS IMMUNISATION PERMANENT OR SHOULD THEY BE REPEATED?

- Diphtheria vaccine boosters should, in theory, be repeated every 10 years.
- A tetanus booster should be given during pregnancy in areas where tetanus of the newborn is prevalent, and to individuals with contaminated lacerations.
- Immunity following polio vaccination is, as far as we know, permanent.
- Experts have had a re-think about measles/mumps/rubella; there is some evidence that immunity against these three wanes in later childhood. A booster vaccination at school entry is therefore recommended in the case of both the measles and the MMR vaccines. *However; this is not yet EPI policy.*

SHOULD YOU IMMUNISE IF THE CHILD HAS ALREADY HAD THE ILLNESS IN QUESTION?

It does no harm in any case !

- Children who have had whooping cough should receive at least DT. Some recommend giving pertussis toxoid as well, because it is not certain how lasting immunity will be.
- Active immunisation against tetanus should always be given during convalescence from tetanus because this disease usually does not confer immunity.
- If a child is known definitely to have had measles, further vaccination is unnecessary (though it will do no harm).

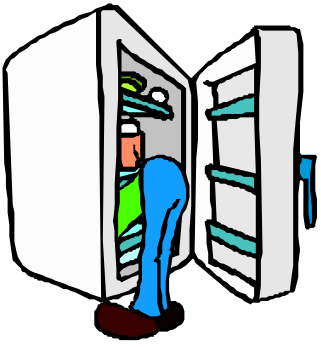
SOME PRACTICAL POINTS

THE COLD CHAIN

Vaccines can rapidly lose their effectiveness if they are not stored in the most suitable conditions, particularly at the right temperature and away from light. From the time they are manufactured until the moment they are given to the person to be vaccinated they must be kept in such a way that their potency is not lost. The system through which they travel is referred to as the 'cold chain' .
A typical 'cold chain' has 5 stages, plus the travelling in between them:

Factory -> Central store -> Regional store or pharmacy -> Health Centre, clinic or doctor's office -> Vaccination point

At all these points, and during transport, the vaccines must be kept at the right temperature, and each vaccine has a specified temperature range. This means constant refrigeration, often difficult to maintain in rural areas.



As a general rule,

- live vaccines (measles, polio, BCG) are sensitive to heat

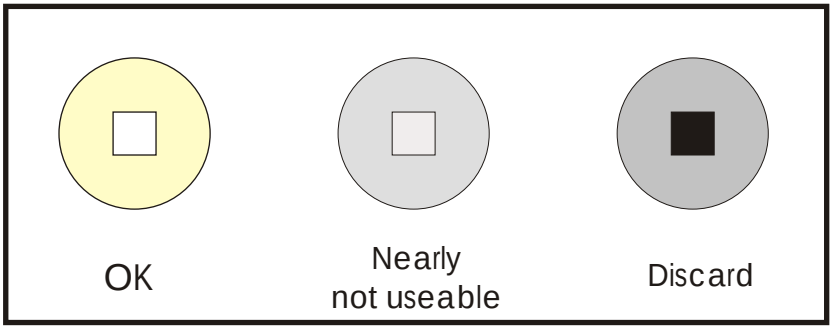
- non-live vaccines - DPT, HepB, HiB, Pneumococcal Polyvalent and Influenza - are inactivated by temperatures below freezing.

Live vaccines can also be damaged by refreezing.

In the clinic, both live and non-live vaccines should be kept at a constant temperature just above freezing (2-8 ° C).

Much research has gone into the various aspects of refrigeration of vaccines.

Vaccine Vial Monitors (VVM) - Polio vaccine is now provided with a heat sensitive colour dot on each vial. The dot, initially white, changes colour at the same rate as the vaccine goes bad (usually due to exposure to temperatures above 4 °C) When the dot is the colour of the surrounding circle, or darker, it must **NOT** be used as it is no longer effective. Similar heat sensitive monitors are under development for other types of vaccines.



Expiry dates - all vaccines are labelled with an expiry date. They must **NOT** be used after that date - but properly discarded. Arrange vaccine in the refrigerator so that those vials that will expire soonest are used first.

Further information and guidelines on the cold chain are available from The Department of Health, or World Health Organisation Expanded Programme of Immunisation. The cold chain status. Geneva, WHO 1984.

CONTRAINDICATIONS

There are a few contraindications to immunising a child with the EPI vaccines. Let's see if you know them.

DOES A MINOR ILLNESS, SUCH AS AN UPPER RESPIRATORY INFECTION, OR DIARRHOEA, WITH OR WITHOUT SLIGHT FEVER MEAN YOU SHOULDN'T IMMUNISE?

No. The child SHOULD be immunised. He or she may not return and the opportunity to immunise has then been lost. DPT should however be omitted if there is a high fever (above 38.5 °C) because the immunisation itself may cause some elevation of temperature 6-12 hours after administration. On the other hand, measles vaccine can safely be given even to ill, feverish children, because the (usually mild) reaction to the vaccine comes on only about 7 days later.

DO ALLERGIES, SUCH AS ASTHMA, OR HAY FEVER MEAN YOU SHOULDN'T IMMUNISE?

Not at all. These children can safely be immunised. An allergic tendency is in no way a contraindication to immunisation. Only in children who have shown severe allergy to egg, such as immediate swelling of the lips, difficulty with breathing, or rash, should measles immunisation be omitted.

SHOULD YOU IMMUNISE A MALNOURISHED CHILD?

Yes. These children urgently need protection, particularly against measles. Even though malnourished, they are able to mount an adequate immune response to the vaccines.

WHICH OF THE FOLLOWING ARE CONTRA-INDICATIONS TO IMMUNISATION?

- A family history of convulsions
- Treatment with antibiotics, or low dose corticosteroids, taken by mouth, topically or by inhalation

- Eczema or localised skin infections
- Chronic diseases of the heart, lung, kidney and liver
- Stable neurological conditions, such as cerebral palsy and Down's syndrome

NONE OF THEM. ALL SUCH CHILDREN SHOULD BE IMMUNISED.

HERE ARE THE TRUE CONTRAINDICATIONS TO CERTAIN VACCINES

Live vaccines should not be given to individuals who are immuno-suppressed due to malignant disease, radiation- or immuno-suppressive therapy. However both measles and polio vaccines should be given to children with HIV/AIDS.

Most severe reported reactions follow DPT immunisation, and the pertussis component is the assumed culprit. Absolute contraindications to giving further pertussis toxoid are the following reactions to a DPT injection:

- Severe persistant central nervous system disorder (encephalopathy) within 7 days of injection unexplained by another cause
- A convulsion with or without fever within three days of DPT immunisation
- Persistant inconsolable crying for three or more hours within 48 hours of the injection
- Collapse or shock-like state
- Fever of 40.5°C or higher within 48 hours of injection unexplained by another cause

ONLY DT SHOULD BE GIVEN TO ANY CHILD WITH THESE REACTIONS

Anaphylaxis after a dose of any vaccine is a true contraindication to further immunisation with that vaccine.

FURTHER TRUE CONTRAINDICATIONS TO IMMUNISATION

Infants with any evolving neurological disease, such as severe epilepsy or a progressive encephalopathy should not receive the pertussis component of DTP.

(A new, less reactive pertussis vaccine is available in Western countries and has now been licensed for use in Southern Africa)

As we said elsewhere, measles and MMR can usually be given to allergic individuals even to those allergic to egg - unless there has been an anaphylactic reaction to the previous dose.

Persons with symptomatic AIDS should not receive BCG vaccine.

Pumi aged 18 months, and Michelle, 9 months are brought to the health facility by their mother because they have mild diarrhoea. The family has just arrived from Mozambique. Pumi's Road to Health Chart shows that he received only BCG and DTP. Michelle, has no Road to Health Chart and the mother does not think she was ever been immunised. You assess them as fit to be managed at home, and advise mother accordingly. Should you immunise them, and if so, what would you give?

Definitely.

Pumi should be given :

DTP (2),Polio(I),HBV(I), measles
And should return in 4 weeks for DTP (3) and rest of schedule

Michelle should be given :

BCG, Polio(I) DTP(I), Hib (1) HBV(I), measles
And should also return in 4 weeks for rest of schedule

There should be close follow-up to be sure they return.

WE ARE NOW READY TO DISCUSS THE MANAGEMENT OF THE SICK CHILD

FURTHER READING

Kibel MA and Wagstaff LA (eds). Child Health for All: A Manual for Southern Africa. 2nd Edition. Oxford University Press. Cape Town. 1996.

World Health Organisation. Expanded Programme of Immunisation. The Cold Chain Status. Geneva, WHO 1984.

1997 Red Book. Report of the Committee on Infectious Diseases. 24th Ed. American Academy of Pediatrics.

This booklet was developed in consultation with :

BEFORE THE CHILD GOES HOME FROM THE CLINIC, MAKE SURE THAT :

- ☑ *HE OR SHE IS FULLY IMMUNISED*
- ☑ *THE MOTHER HAS RECEIVED NUTRITIONAL ADVICE*
- ☑ *THE MOTHER CAN REPEAT THE INSTRUCTIONS IN HER OWN LANGUAGE*
- ☑ *THE MOTHER KNOWS WHEN TO COME BACK*

ANSWERS

1 - F

2 - F

3 - T

4 - T

5 - F

6 - F

7 - T

8 - T

9 - T

10. - F

11. - T

12. - F

13. - F

14. - F

15. - F

16. - T

17. - F

18. - F

19. - T

20. - F

MAIN CONTRIBUTORS:

Child Health Unit:
Maurice Kibel
Michael Hendricks
Greg Hussey
George Swingler
Heather Zar
MSH/EQUITY:
Jon Rohde

CONSULTANTS:

Child Health Unit
Marian Jacobs
Jawaya Small
James Irlam
MSH/EQUITY
John Bennett
Eta Banda
EASTERN CAPE HEALTH DEPARTMENT
Gerry Boon
Zoe Kati
Joyce Matebese
Gloria Nchukana
WESTERN CAPE HEALTH DEPARTMENT
Fawzia Desai
Leana Olivier
NORTHERN CAPE
Pieter Jooste
Carvie Madikane
Florrie Richards
NATIONAL DEPARTMENT OF HEALTH (MCWH)
Walter Loening

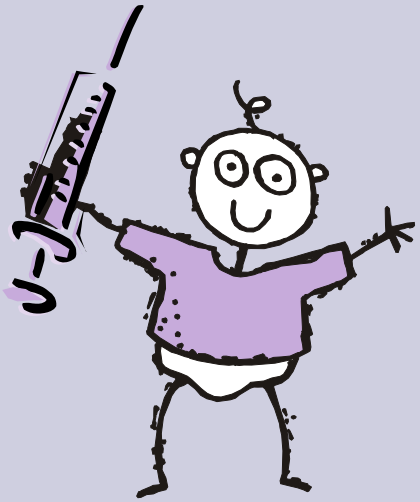
EDITORS:

Maurice Kibel (main author)
Michael Hendricks
Jon Rohde

ACKNOWLEDGEMENT AND DISCLAIMER

This Report was made possible through support provided by the US Agency for International Development (USAID)/South Africa under the terms of contract 674-0320-C-00-7010-00. The opinions expressed herein are those of the author(s) and do not necessarily reflect the views of the USAID or Management Sciences for Health (MSH).

Design & layout : Cathleen Fourie at the EQUITY Project



Coral Print cc Tel 043 743 5573 JN22486ER