



Adult and Childhood Immunisation

An Update from ICN





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Preface

Immunisation is one of the most successful and cost-effective public health interventions. Thanks to modern vaccines crippling childhood diseases have been brought under control and some like smallpox have been eradicated saving the lives of millions. Immunisation is key to the achievement of Millennium Development Goal 4 on reducing under-five mortality by two thirds by 2015. Many of these deaths occur from diseases that can be prevented with vaccines. Immunisation is also a key strategy to ensure global health security and for responding to the threat of emerging infections. Despite the success of immunisation, parents sometimes fail to have their children fully vaccinated due to misinformation and unfounded rumours about possible adverse events. Failure to protect children through vaccination far outweighs any likelihood of adverse events following immunisation.

Nurses have possibly the most important role to play of any health care professional in the immunisation process. As the largest professional group that has presence in all health settings, nurses are most likely to advise and inform parents on vaccination, as well as actually administer vaccines. Nurses are also well placed to act as role models to achieve national goals and targets for immunisation coverage.

This publication aims to provide up-to-date information to nurses and other health professionals. It is divided into three topic areas. The first, on vaccines, describes how vaccines work and the value, safety and cost-effectiveness of vaccination. It focuses on the role of immunisation throughout life and the role of nurses in vaccination. In addition, it explores the underuse of vaccines and the development of new vaccines. The second section covers adverse events following immunisation, exploring common errors which can lead to AEFI and how to report and minimise AEFI. The final section of this paper is on safe immunisation practices, covering auto-disable syringes; counterfeits, cold chain management and waste management.

Chapter 1: Vaccines



How vaccines work

Vaccination is one of the most important and successful public health measures ever invented, and about 80% of the world's children are routinely vaccinated. Due to the success of immunisation, crippling childhood diseases such as poliomyelitis are nearing eradication and some like smallpox have been completely eradicated.

Vaccines are preventive medicines that protect against disease by inducing immunity. Vaccines achieve this by introducing to the immune system substances (termed antigens) derived from the disease-causing agents, such as viruses or bacteria. The antigens consist of parts of the bacterium or virus, such as components of its surface, the whole organism in a weakened or killed state, or sometimes a non-toxic form of a toxin produced by a bacterium. The immune system recognizes these antigens as foreign substances, and reacts to them by developing an immune response that includes the production of antibodies. These antibodies are designed to attach precisely to the antigen.

Following vaccination, if the true infectious agent is encountered, antibodies are produced rapidly, which block the virus or bacteria. In addition, the antibodies make it easier for other parts of the immune system to recognize and attack the invading agent, thereby preventing the development of one or more associated diseases.

With the constant advance of science, the scope of vaccines has expanded. Initially, vaccines were targeted at preventing infectious diseases. Now, there are a number of vaccines in development that aim to treat rather than prevent diseases, such as cancer. While these vaccines are not yet available for use, they aim to harness the power of the immune system, and focus it on attacking established disease rather than protecting against future infection.

Vaccination against diseases is essential to reaching the Millennium Development Goal 4 on reducing under-five mortality by two thirds by 2015. Many of these deaths are caused by diseases that can be prevented with vaccines. Immunisation is also a key strategy to ensure global health security and for responding to the threat of emerging infections.¹

¹WHO (2008). WHO immunization work: 2006-07 highlights. World Health Organization, Geneva.

The value, safety and cost-effectiveness of vaccination

Vaccination is widely regarded as one of the most successful and cost-effective health interventions available. The World Health Organization (WHO) states the lives of well over two million children are saved annually through immunisation, and with sustained effort and sufficient financial resources that figure could reach four to five million by 2015.²

Vaccines used in routine immunisation are highly effective at preventing disease, although, as with most medicines, they do not achieve 100% effectiveness and may have some side-effects. However, vaccines are generally safe, and most side-effects are minor, with only the rare occurrence of serious complications. In addition to the direct protection offered to individuals by vaccines, widespread immunisation can further reduce the spread of infection, even to those who are not vaccinated, through 'herd immunity'. Herd immunity occurs when the proportion of the population protected by vaccination is sufficient to block transmission of an infection, thereby extending protection to the unvaccinated.

Vaccines are also one of the most cost-effective health investments available, with many health economic studies demonstrating direct net health savings as well as benefits to wider society. As a consequence, immunisation is not only an important public health tool, but can also promote economic development.

The role of immunisation throughout life

While many vaccines are traditionally given to infants and young children (such as those against tuberculosis, polio, diphtheria, tetanus, pertussis, hepatitis B, *Haemophilus influenzae type b* (Hib), measles, mumps and rubella), it is important to recognize that immunisation has a role to play throughout life. Booster doses of some vaccines are needed for protection throughout the life cycle. In addition, influenza and pneumococcal immunisations, for example, are offered not only to children who are the traditional target group for vaccines, but also to the elderly to protect against these potentially fatal illnesses. Hepatitis B vaccine is also

²WHO (2008). Ibid.

important for those at increased risk due to their occupation, such as health care workers, and rabies vaccine is essential for those potentially exposed to infection in their work or to rabid animals.

While immunisation rates in children are as high as 80%, vaccines for adolescents and adults remain underused because of lack of infrastructure to deliver the vaccines and lack of programmes to pay for immunisation in these populations. As new vaccines are developed, for instance to protect against cervical cancer caused by human papillomavirus, immunisation throughout a lifetime, going beyond the traditional vaccination during childhood, is likely to become increasingly necessary and common.

The role of nurses in vaccination

Nurses have possibly the most important role to play of any health care professional in the immunisation process. As the largest professional group that has a presence in all health settings, nurses are most likely to advise and inform individuals on vaccination, as well as actually administer vaccines. Nurses are also well positioned to act as role models to achieve national goals and targets for immunisation coverage.

Several factors can influence parents' and caregivers' decision when considering vaccination of their children. The most important factor is a strong recommendation from a trusted health care provider, such as nurses. In 2008, for the seventh year in a row, nurses ranked the highest in the annual Gallup "Honesty and Ethics of Professions" survey in the USA and were considered by the public to have either 'high' or 'very high' honesty and ethical standards.³

In addition to science-based evidence, emotional and societal pressures also affect the decision-making process about immunisation. Ironically decisions can also be influenced by the success of immunisation, namely a decline in vaccine-preventable diseases. This can lead to complacency as parents and caregivers are less likely to appreciate the consequences of infectious and vaccine-preventable diseases. Research also shows that trust in health professionals is fundamental. Consequently, nurses have an important role to play in addressing parents' and caregivers' wider concerns as well as providing evidence-based health advice.

In addition to their role as trusted advisors, nurses can assist the efficient up-take of vaccines by using health visits as an opportunity to promote vaccination. Research shows that effective record keeping, such as the use of flow sheets, can prompt professionals to discuss vaccines with parents and caregivers or patients and accurately record their administration, thereby reducing missed vaccination opportunities. In addition, a clear understanding of absolute, relative and inappropriate contra-indications for vaccination can also ensure that vaccines are given safely and in a timely fashion.

In short, nurses are an invaluable part of the immunisation process, which is one of the world's most important public health interventions.

Underused vaccines

Vaccine coverage has grown substantially since the introduction of WHO's Expanded Programme on Immunization in 1974. Routine vaccination against measles, polio, diphtheria, tetanus, pertussis, and tuberculosis (BCG) is available in all developing countries.⁴ In recent years, WHO has recommended several additional vaccines, and others are available but are underused. These include vaccines against hepatitis B, *Haemophilus influenzae type b* (Hib), yellow fever, rubella, mumps, influenza, pneumococcus, rabies, cholera and Japanese encephalitis.

While these vaccines offer important public health benefits in the regions impacted by the diseases that they prevent, in some countries there may be misconceptions about their value or difficulties in accessing these vaccines due to cost or weak health systems that are not strong enough to sustain their use. However, to provide a solution to these barriers, several organisations, such as the GAVI Alliance (www.gavialliance.org), are focusing on increasing vaccine use and access around the world to provide a solution to these barriers.

³ Gallup (2008), Nurses Shine, Bankers Slump in Ethics Ratings. Annual Honesty and Ethics poll rates nurses best of 21 professions. www.gallup.com/poll/112264/Nurses_Shine_While_Bankers_Slump_Ethics_Ratings.aspx

⁴ WHO website. Immunization. www.who.int/topics/immunization/en

The main underused vaccines include the following:**■ Hepatitis B vaccine**

Hepatitis B is a viral disease that can lead to acute hepatitis, liver cirrhosis, cancer and death, in those chronically infected.

Approximately 350 million people have chronic hepatitis B infections. WHO recommends routine hepatitis B vaccination for infants as part of the standard vaccination schedule⁵ and more than 80% of countries now give this vaccine to children routinely. In addition, immunisation is important for health care workers who are, or may be, exposed to contaminated body fluids such as blood. Hepatitis B immunisation policy for health care workers and adults is determined by national health authorities.

■ Haemophilus influenzae type b (Hib) vaccine

Hib infection can lead to meningitis and pneumonia. This micro-organism was responsible for an estimated two to three million cases of serious disease and nearly 400,000 deaths in young children in 2002. Hib conjugate vaccine is available (often as a component in combination vaccines) and WHO recognizes the importance of vaccination against the disease, and advocates its use in all routine infant immunisation programmes.

■ Yellow fever vaccine

Yellow fever is a potentially fatal viral disease, transmitted via mosquitoes in tropical areas, particularly equatorial Africa and South America. Of the estimated 200,000 cases per year, 30,000 are fatal. WHO recommends routine immunisation and periodic campaigns as needed, in endemic equatorial African and South American countries.

■ Rubella and mumps vaccines

Rubella infection early in pregnancy can lead to congenital rubella syndrome (CRS), which is an important cause of severe birth defects, and may result in the death of the foetus. Mumps is also a viral disease, which is often mild but in rare cases can lead to encephalitis and meningitis. Effective vaccines against rubella and mumps are available, and are generally given in combination with measles vaccine.

■ Influenza vaccines

Several countries recommend and provide influenza vaccine to those at risk, including the elderly. Seasonal epidemics of influenza result in three to five million cases of severe illness and between 250,000 to 500,000 fatalities each year. This is despite the fact that effective vaccines are available against the disease. WHO recommends consideration of annual influenza vaccination for residents of long-term care facilities for the elderly and disabled; the elderly; those with chronic heart, lung, metabolic or renal diseases or immunodeficiencies; pregnant women; contacts of high-risk individuals; children aged 6-23 months; and many health care workers to prevent them from spreading the disease to the high-risk populations. Given the various strains of influenza, annual vaccination is recommended due to the rapidly changing nature of the influenza virus.

■ Pneumococcal polysaccharide vaccines

Polysaccharide vaccines against pneumococcal infection are available for at risk individuals older than two years of age. A pneumococcal conjugate vaccine is also available to broaden the scope of serotype coverage in children. The vaccines are usually offered in several countries around the world to those at risk. WHO recommends vaccination against pneumococcal infection for the elderly and those older than two years who are at high risk. Most countries that recommend this vaccine to the elderly recommend it should be given at either 60 or 65 years of age.

■ Rabies vaccine

Rabies is a viral infection transmitted through the saliva of infected animals. Following the onset of symptoms the disease is fatal. Effective vaccines are available, but despite approximately 10 million people receiving post-exposure prophylaxis each year, rabies still causes over 50,000 deaths annually. WHO recommends the promotion of pre-exposure immunisation for children living in highly endemic regions.

⁵ WHO (2008). Fact Sheet N° 204. Hepatitis B. www.who.int/mediacentre/factsheets/fs204/en/

■ Cholera vaccine

Cholera is an acute bacterial infection of the gastrointestinal tract, which can lead to severe diarrhoea, dehydration and death if untreated. Cholera is spread via contaminated food and water, and can result in sudden large outbreaks. An effective oral cholera vaccine (OCV) is available, and WHO recommends its use in certain endemic and epidemic situations. Oral cholera vaccines (OCV) are safe and offer good protection (over 70%) for an acceptable period of time (at least one year).⁶

■ Japanese encephalitis vaccine

Japanese encephalitis is a viral disease transmitted by mosquitoes and is endemic in parts of Asia. The disease has a high fatality rate with many survivors suffering permanent neuropsychiatric damage. Several vaccines are available and are used locally in a number of countries, and improved vaccines are under development.

Recently developed vaccines

The search for new vaccines provides hope to prevention of many serious conditions that currently result in much preventable disease, disability and death. Scientific advances over the last few years have led to the development of several new vaccines, which have recently received licences or are in the final stages of testing in many countries. Introducing new vaccines will help prevent some of the 1.1 million deaths of children under the age of five.⁷ Notably, these include vaccines against human papillomavirus, varicella, zoster, rotavirus, pneumococcus and meningococcal bacteria.

■ Human papillomavirus (HPV) vaccine

HPV is the major cause of cervical cancer, which is responsible for 240,000 deaths per annum and affects 500,000 women each year, 80% of whom are in the developing world. The vaccines currently licensed in many countries contain the major serotypes, HPV 16 and 18, that cause 70% of cervical cancer, as well as other anogenital cancers. One of the licensed vaccines also contains HPV serotypes 6 and 11, major causes of anogenital warts.

■ Varicella zoster virus vaccine

The varicella zoster virus (VZV), or 'chickenpox' as it is more commonly called, is responsible for a highly contagious viral disease which is very prevalent among children. Latent infection with this virus is the cause of shingles (see below). Chickenpox is typically mild during its course, which usually runs from 14 to 16 days, but can become severe in adults and immunocompromised individuals, such as those with HIV. According to WHO, almost every child or young adult has been exposed to the virus. Due to its highly infectious nature, nearly 90% of all susceptible household members will contract the disease once exposed. VZV vaccine is used in many industrialised countries.

■ Zoster vaccine

Zoster or shingles is a painful skin rash caused by the varicella zoster virus - the same virus that is responsible for chickenpox. After recovery from chickenpox, the virus remains in certain nerve cells in the spinal cord and can cause shingles in later life, most commonly in those over the age of 50 years. Shingles is reasonably common with an estimated one million cases annually in the USA alone. The disease can be extremely painful, and more than half of cases in the elderly result in post herpetic neuralgia (PHN), a very painful condition that can last from months to years after the rash has resolved. Recently, a vaccine specifically designed to protect against shingles rather than chickenpox received a licence. Testing in thousands of adults showed that the vaccine can reduce the incidence of zoster by approximately half, and the pain (neuralgia) that sometimes remains after the rash has resolved was reduced by two-thirds.

■ Rotavirus vaccine

Rotavirus is an important cause of acute diarrhoea, particularly in children, and was responsible for the deaths of over 500,000 children under five years old in 2004, the majority of whom were in the developing world. Two vaccines against this devastating virus are now available and used in a number of countries, with trials progressing to explore their efficacy in Africa and Asia. The vaccines have undergone major clinical testing to establish their safety, following rare but serious

⁶ Joint WHO/UNICEF statement for cholera vaccine use in tsunami-affected areas. www.who.int/cholera/tsunami_cholera_vaccine/en/print.html
⁷ WHO(2008). WHO immunization work: 2006-07 highlights. Geneva.

complications, called intussusceptions, with an earlier unrelated rotavirus vaccine. The WHO Strategic Advisory Group of Experts on Immunisation and the Global Advisory Committee on Vaccine Safety reviewed the safety of currently licensed rotavirus vaccines and concluded there was no reason for concern.⁸

■ Pneumococcal conjugate vaccine

Pneumococcal disease is responsible for approximately 1.6 million deaths worldwide each year, many of which occur in young children, particularly in the developing world. The first pneumococcal vaccine to be developed was based on bacterial capsular polysaccharides. This is given to older, at high risk children and adults as it is not efficacious in those under two years old. Subsequently, pneumococcal conjugate vaccines have been developed for use in children under 2 to offer protection to this important age group which carries a large proportion of the disease burden. As a result of the availability of the conjugate vaccine, and the high incidence of pneumococcal disease in young children, WHO recommends this vaccine as part of routine national immunisation programmes, particularly in countries where pneumococcal-related mortality among children less than five years is >50/1000 live births or where more than 50,000 children die annually.

■ Meningococcal conjugate vaccine

Infection with meningococcal bacteria can lead to bacteraemia and meningitis. Of those infected, between 10% and 20% die and one-fifth of survivors have a permanent disability, such as paralysis, mental retardation and hearing loss. Serotype A is prevalent in the African 'meningitis belt', below the Sahara, and is the cause of frequent epidemics. Existing polysaccharide vaccines are used during these outbreaks, but their usefulness is limited because they are not particularly effective in young children and do not result in long-lasting immunity. To provide more efficient protection, several licensed conjugate vaccines are available and in development (either alone or as part of combination vaccines). A meningococcus vaccine is now also available in some industrialised countries covering four serogroups of that account for many cases of disease in that region.

Vaccines under development

In addition to these new vaccines, several others are in early stages of development. These include vaccines against HIV, dengue fever, malaria and tuberculosis.

■ HIV vaccine

To date HIV has infected over 60 million people, and AIDS has been responsible for 20 million deaths. Of the 14,000 new infections each day the vast majority occur in the developing world. AIDS is now one of the leading causes of death in Africa, and ranks as number four worldwide. Despite the great progress made with the introduction of effective drug treatments, these do not effect a cure, and vaccines remain an important unmet need. Over the past years, scientists have focused significant research on the development of safe and effective vaccines for both preventive and therapeutic purposes. Several trials are ongoing, and continuing research and development is supported by a number of international agencies, such as IAVI (International AIDS Vaccine Initiative), and national governments.

■ Dengue vaccine

Dengue fever is caused by a virus that is transmitted via mosquitoes. Over recent years, the prevalence of the virus has expanded dramatically, and it represents a major public health concern. The disease, which may affect as many as 50 million people each year, occurs mainly in tropical and sub-tropical areas of Latin America and Asia, which are home to two-fifths of the world's population. Dengue fever is a severe flu-like illness, which is rarely fatal. However, dengue haemorrhagic fever is a potentially fatal complication. There is no specific treatment for dengue fever, and an effective vaccine is urgently needed. Currently, several vaccine candidates are in development targeting all four serotypes of the virus that are responsible for disease.

⁸ WHO (2008). WHO immunization work: 2006-07 highlights. Geneva.

■ Malaria vaccine

Malaria is the world's most important tropical parasitic disease, accounting for 300-500 million cases and at least one million deaths each year, of which 90% occur in sub-Saharan Africa. Malaria, which is transmitted via mosquitoes, occurs in tropical and sub-tropical regions, and approximately 40% of the world's population is at risk of contracting the disease. Significant programmes are underway to combat malaria and its devastating impact, such as the Roll Back Malaria global partnership, which promotes control and prevention measures. With the complexity of the malaria parasite, and its transition through numerous life stages, development of an effective vaccine has proved challenging. However, scientists believe that an effective vaccine is possible, and research and development is ongoing with several trials underway.

■ Tuberculosis vaccine

In 1993 WHO declared tuberculosis (TB) a global emergency. Similarly in 2007 the countries in the WHO Africa region declared TB as an emergency. Estimates suggest that approximately two billion people are infected with TB each year, of whom eight million develop clinical disease and 1.6 million die. These figures exclude TB-related mortality in those with HIV, for whom it is the leading cause of death worldwide. TB is highly infectious, and with the rise of multi-drug resistant strains new effective vaccines are needed urgently. The existing BCG vaccine was developed 80 years ago, and while it is widely used and can prevent potentially fatal forms of the disease in infants and young children, its broader efficacy may vary. Consequently, several new vaccines are in development, aiming to achieve higher levels of effectiveness.

Chapter 2: Adverse events following immunisation (AEFI)

What are AEFI?

Vaccines are designed to stimulate the immune system, consequently initiating an immune response within the body. Medical events that occur after vaccination have been termed adverse events following immunisation (AEFI), and include true vaccine reactions as well as events that are temporally, but not necessarily causally, related to the vaccine or vaccination.

AEFI can happen for various reasons and are divided into five major categories: vaccine reactions; programmatic errors; coincidental; injection reactions; and unknown.⁹

1. Vaccine reactions

True vaccine reactions are caused by some component of the vaccine, i.e. from the intrinsic properties of the vaccine.

2. Programmatic errors (see box opposite)

These are the result of errors made in the storage, handling, reconstitution (or other preparation) and administration of the vaccine.

3. Coincidental

Coincidental AEFI are events that are temporally related to vaccination, but are not caused by it.

4. Injection reactions

These are events arising from anxiety about the vaccine injection.

5. Unknown

The cause of the AEFI cannot be identified.

Vaccine reactions are usually mild (e.g. injection-site swelling, fever and rash, fever, malaise) and rarely cause serious illnesses (e.g. anaphylaxis, seizures, thrombocytopenia). In extremely rare cases, they can be potentially life-threatening. However, the majority of AEFIs are minor and self-limiting.

⁹ WHO (2002). Mass measles Immunization campaigns: Reporting and Investigating Adverse Events Following Immunization. www.who.int/immunization_safety/publications/aefi/en/AEFI_measles_campaigns.pdf

Common programmatic errors that can lead to AEFI¹⁰

- **Non-sterile injection:**
 - reuse of disposable syringe or needle
 - improperly sterilized syringe or needle
 - contaminated vaccine or diluent
 - reuse of reconstituted vaccine at subsequent session
- **Vaccine prepared incorrectly:**
 - vaccine reconstituted with incorrect diluent
 - drugs substituted for vaccine or diluent
- **Immunization injected in wrong site:**
 - subcutaneous instead of intradermal for BCG
 - too superficial for toxoid vaccine (DPT/DT/TT)
 - buttocks
- **Vaccine transported/stored incorrectly**
- **Contraindications ignored**

Communicating potential mild side-effects and AEFI to parents and caregivers

AEFI can impact the effectiveness of immunisation programmes and must be addressed effectively. Nurses play an important role in addressing AEFI for parents and caregivers. By explaining what AEFI are, parents and caregivers will better understand the process of vaccination and be equipped to monitor AEFI and seek appropriate help as needed. For instance, common AEFI can include pain or swelling at the injection site, fever, rashes, wheezing, etc.

Reporting AEFI

Many countries have national surveillance systems for reporting AEFI to local and national health authorities. Reporting is very important as it allows national regulatory authorities and governments to identify the probable causes of AEFI and to recognize and respond to any changes in

¹⁰ WHO (1999). Immunization Safety Surveillance: Guidelines for Managers of Immunization Programmes on Reporting and Investigating Adverse Events Following Immunization. www.who.int/immunization_safety/publications/aefi/en/AEFI_WPRO.pdf

their rates of occurrence (e.g. increased reporting rates of AEFI due to programmatic errors may indicate a need for corrective action, and increased reporting of vaccine reactions may in some cases indicate a potential vaccine quality problem).

Minimising AEFI

AEFI can be prevented or reduced through several strategies¹¹:

- Reconstitute measles and BCG vaccines only with the diluent supplied by the manufacturer.
- Discard reconstituted vaccines at the end of each immunisation session.
- No other drugs and substances should be stored in the refrigerator of the immunisation centre beside vaccines.
- Train and provide close supervision of immunisation workers to ensure that proper procedures are being followed, to prevent deaths or injury following immunisation.
- Participate in investigation of adverse events following immunisation to pinpoint the cause of the incident and to correct it.

Ensuring immunisations and related safety is a powerful public health tool in disease control and eradication. Working with their national immunisation programmes and others, nurses are key stakeholders in immunisation efforts and in safety from adverse effects of immunisation.

¹¹ WHO (2000). Report of the Second Steering Committee on Immunisation Safety. Geneva.

Chapter 3: Safe immunisation practices



WHO estimates that some 12 billion injections are administered worldwide each year. The vast majority (90-95%) of these are given for therapeutic purposes. Immunisation accounts for 5 to 10% of all injections.¹²

At least 30% of vaccine injections administered in developing countries are currently thought to be unsafe.¹³ Globally, the overuse of injections and unsafe injection practices results in millions of cases of Hepatitis B and C infections and an estimated 250,000 cases of HIV each year.¹⁴ Unsafe injection practices also lead to other types of infections, such as abscesses at the injection site and septicaemia. Vaccination programmes are considered safe when they cause no injury or disease to the recipient, do not expose health care providers to risks of infection and do not result in waste that is dangerous for the community.

Recognition of the risks associated with unsafe injections has led to improvements in infection-control practices, sufficient supplies and appropriate waste disposal strategies. In some countries, however, the introduction of disposable equipment without adequate education, supplies and waste management has caused a widespread re-use of injection equipment without sterilisation. Unauthorised repackaging of needles and syringes for re-sale is also common. While the purpose of all vaccination programmes is to prevent disease, re-use of needles and syringes is the cause of most immunisation-related infections and diseases. The use of auto-disable syringes during routine immunisation is an effective way of preventing injury, infection and the spread of disease.

Safe immunisation practices are those that do not result in injury or harm to the person being vaccinated, the health care worker administering the vaccine and the community. These best practices help create an effective and safe vaccination programme.

■ Auto-Disable syringes

1.3 million premature deaths are estimated to be caused by unsafe injection practices, associated predominantly with therapeutic injections. Use of Auto-Disable (AD) syringes can help to lower the risk of infection and disease AD syringes are single use with a mechanism that disables or locks the plunger immediately after use. The locked plunger prohibits the syringe from being reused to administer additional vaccine.

¹² WHO (2002). Vaccines, Immunization and Biologicals. www.who.int/vaccines-access/injection.

¹³ Drain P, Ralavaivao J and Carnell M (2001). Introducing auto-disable syringes into a developing country's immunization program. Abstract from the the 129th Annual Meeting of the American Public Health Association (APHA). www.apha.confex.com/apha/129am/techprogram/paper_20251.htm

¹⁴ Safe Injection Global Network (2002). Injection Safety. www.uqconnect.net/signfiles/Files/InjectionSafety-11-2002.pdf

■ Recognising counterfeits

Counterfeit medicines and vaccines are described as those without any or with decreased amounts of the active ingredient. Counterfeiting is a global threat to health and can result in serious harm. It is estimated by the Federal Service for Health Sphere Supervision (FSHSS) that 10% of the medicines on the market in Russia are counterfeits. The United States of America also credits internet sales as being a major source of counterfeit medicines.

The ability to recognize a counterfeit vaccine or medicine is very important. Noticing differences in packaging, recognising the manufacturer and increasing health care workers' and parents' and caregivers' awareness are just some of the ways in which counterfeits can be identified. Any suspected counterfeit medicine or vaccine should be reported immediately to the appropriate local health authority.

■ Cold chain management

Cold chain management is the process of transporting and storing vaccines and diluents within the manufacturer-recommended correct temperature range before use. This process includes the steps used to deliver vaccines to health clinics, and once there, storing them until administered. Both heat and freezing can impair the active components of a vaccine, thereby reducing its effectiveness, and potentially rendering it ineffective. Consequently, recommendations for storage are listed on the vial label or packaging for each vaccine. Most vaccines are recommended to be stored between 2 to 8°C.

Many vaccines now have Vaccine Vial Monitors (VVM) on their labels to indicate cumulative over-exposure to heat. The VVM is made of heat-sensitive material and is comprised of a circle with a square on the inside. The square changes irreversibly from light to dark when the vaccine has been over-exposed to heat. Once this inner square is as dark as the outer reference circle, the vaccine's efficacy is likely to have been reduced and it must be discarded without being used.

The temperature of storage refrigerators and freezers should be checked and recorded twice daily. If there is any break in the cold chain, the affected vaccines may need to be discarded, depending on the severity and length of improper temperature exposure and VVM status.

■ Waste management

Proper waste management is a concern for all nurses and health care workers. Improper disposal of medical waste can result in the spread of infectious material, the inappropriate reuse of needles and syringes and increased risk of needlestick injuries.

According to WHO, 10-25% of the health care waste generated is considered to be infectious waste. Needles should not be recapped and AD syringes and needles should be properly disposed of in safety boxes and/or according to country policy. Sorting sharps (needles etc.), infectious waste and general waste into three separate bins or containers is an effective first step in reducing the risk to nurses, parents, caregivers and the environment.

Some countries have health care waste management services that collect and properly destroy the waste at dedicated facilities while others lack this. National guidelines and policies guide local health facilities and authorities regarding appropriate waste management and disposal methods.¹⁵

Immunisation schedules

With many vaccines available against a range of diseases, following the recommended immunisation schedule is an effective method of optimising protection.

Many countries publish recommendations on vaccination schedules for infants, children and adults. These are compiled based on local epidemiological features, available vaccines and often on the recommendations of national technical advisory committees on immunisation. In addition, WHO collates schedules categorised by region, country and antigen, and also provides a useful online reference tool on its website: www.who.int/vaccines/globalsummary/immunization/scheduleselect.cfm.

WHO recommendations on specific vaccines, including recommended schedules, are contained in vaccine position papers available online; www.who.int/immunization/documents/positionpapers/en/index.html

Nurses and other health care workers should refer to their national or local health authority for information on relevant schedules. Compliance with the specific recommended vaccination schedule is important.

However, some flexibility must be allowed for the management of missed appointments and interruptions to a series of immunisations.

It is important that nurses and other health care workers also provide appropriate information and counselling during vaccination sessions. Parents and caregivers of infants being vaccinated should be informed on several key points:

- The benefits of vaccinations
- Where and when to come for the next vaccination
- Potential side effects and how to deal with them
- The importance of keeping and referring to the vaccination card
- Which disease(s) can be prevented by the vaccination(s) being given

Vaccination information should be promptly entered onto the vaccination card and into the appropriate recording system for tracking the child. The vaccination registries should also be updated during or immediately following the vaccination session.

¹⁵ For more information, see ICN monograph on *Health Care Waste Management*

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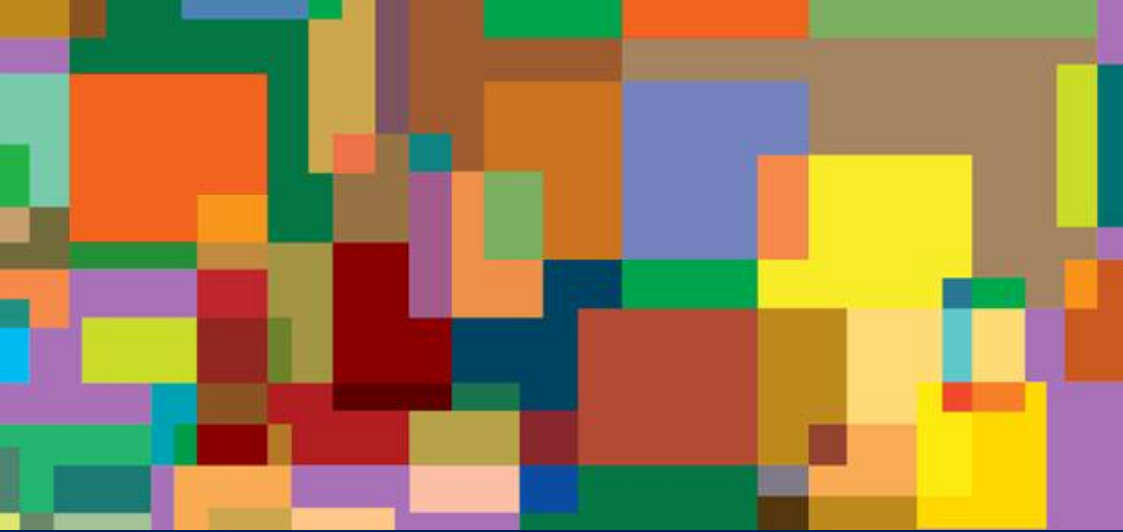
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