The Expanded Program on Immunization (EPI)

Most of the vaccines used currently were introduced in the 1960s. However even during the late 1970s children under the age of five years were still dying due to vaccine preventable diseases, and vaccine coverage rates were low. The reason for this was that it was left to the parents to bring their children for vaccination. During the early 1980s the EPI was introduced in most countries.

Aim: To immunize all children in the world against the most killer (preventable) diseases. ↓↓ morbidity and mortality from these diseases.

Diseases include: Polio, TB, Diphtheria, Pertussis, Tetanus, Measles, and HBV added and introduced (1992)

The up to date National Immunization Schedule in Iraq

Age/Population Group	**Vaccine**
First day after birth	BCG, $TOPV_0$, HBV_1
End of the 2nd month	$(DPT + HIb + HBV_2)_1$, $TOPV_1$, Rota $virus_1$ خماسي جرعة اولى
End of the 4th month	$(DPT + HIb)_1$, $TOPV_2$, Rota $virus_2$ رباعي جرعة اولى
End of the 6th month	$(DPT + HIb + HBV_3)_2$, $TOPV_3$, Rota $virus_3$ خماسي جرعة ثانية
End of the 9th month	Measles , vitamin A 200,000 I.U
End of the 15th month	MMR_1 حصبة مختلطة جرعة اولى
Boosters	
End of the 18th month	$(DPT + HIb)_2$, TOPV(1st booster), vitamin A 200.000 I.U رباعي جرعة ثانية
School entry age (4-6 years)	DPT , TOPV (2nd booster) ,MMR_2

	ثلاثي منشطة

Key: TOPV (Trivalent Oral Poliomyelitis Vaccine), MMR (Mumps, Measles & Rubella), DPT (Diphtheria, Pertusis & Tetanus), Td (Tetanus & Diphtheria), HBV (Hepatitis B Virus vaccine), TT (Tetanus Toxoid). HIb: haemophillus influenza vaccine

Basic Data on EPI Vaccines*:*

Vaccine against	Nature	Form	Dose	Route	Heat Stability	Type of Immunity
Diphtheria	Toxoid	Fluid	0.5ml	i.m. *	High	IgG
Tetanus	Toxoid	Fluid	0.5ml	i.m. *	High	IgG
Hepatitis B	HBs AG**	Fluid	0.5ml	i.m.	High	IgG
Pertusis	Whole killed Bacteria	Fluid	0.5ml	i.m.*	Medium	IgG ,A,M
Measles	Attenuated live Virus	Freeze Dried	0.5ml	s.c.	High for Dried Low for Reconstituted.	IgG ,A,M
T.B.	Attenuated live BCG	Freeze Dried	0.1ml	i.d.	Medium for Dried Low for reconstituted	T-cell Mediated
Polio-myelitis	Attenuated live Virus Killed virus	Fluid Fluid	3 drops	Oral i.m.	Low Medium	IgG, A,M Intestinal + circulating Same, only circulating
Rubella	Attenuated live Virus	Freeze Dried	0.5ml	s.c.	High/low	IgG ,A,M

*i.m or deep s.c. in other countries according to the policy of that country.
**Either from the plasma of infected people after inactivating it which is expensive or by the DNA recombinant method which is a lot cheaper.

If we attain 90-95% vaccine coverage of children against a certain disease we are virtually attaining a 100% protection of children, & this is the concept of "**Herd immunity**" which means that those who are vaccinated will protect those who are not through cutting the cycle of transmission.

Contraindications to Killed Vaccines & Toxoids:

- Diphtheria: full dose to children over 6 years of age
- Pertusis
  - Any abnormality of the CNS e.g. Spina bifida
  - Acute febrile illness
  - Severe local or general reaction to a previous dose (give DT)
  - History of convulsions in a child
  - Family history of convulsions (controversial)

Contraindications to Live Vaccines:

- **General**
  - Within 3 weeks of another live vaccine (not absolute)
  - Pregnancy
  - Acute febrile illness
  - Immunological dysfunction e.g. hypo-gamma-globulinaemia
  - Malignant disease, e.g. Leukaemia, Hodgkin's disease
  - Steriod therapy, immuno-suppressants & radiotherapy
- **Specific**
  - Oral Poliomyelitis: diarrhoea & vomiting
  - Measles: Active TB, allergy to polymyxin & neomycin, family history of convulsions.
  - BCG: Local septic condition, premature & LBW baby, chronic skin disease
  - Rubella: pregnancy, allergy to neomycin & polymyxin, thrombocytopenia.

The Cold Chain:

Vaccines are effective only if maintained at the recommended temperatures throughout their journey from the manufacturer to the

consumer. Exposure to high temperatures will lead to the damage of these vaccines. To keep them cold we need equipment (freezer, refrigerator, cool boxes, vaccine carriers, thermometers & cold rooms) & people who know how to keep the vaccines at the recommended temperature.

Cold chain is defined as all the people and all the equipments necessary to keep vaccines safe throughout their journey from the manufacture to the needed child

Eradication of Polio Virus:

Global eradication of poliomyelitis is possible because the virus can only survive in humans. The principle for eradication is that we need 3 years to pass by from the last case registration in order to announce eradication. The last case reported in Iraq was on the 28th of January 2000.

Strategies

1. Routine Immunization: We must have a coverage rate of at least 90% at both national & district level.
2. Polio National Immunization Days (NIDs): Two round of vaccination (one month apart) are done nationwide during the low transmission season (spring and autumn)
3. The aim is to interrupt the circulation of poliovirus by immunizing every child. A child can take up to 15 doses of OPV without side effects. These campaigns can be implemented at the same time in neighbouring countries (cross-border), so that virus transmission is cut between countries.
4. Acute Flaccid Paralysis (AFP) Surveillance: Any case with Acute & Flaccid paralysis in children under the age of 15 years must be reported & checked by taking two stool samples to detect the presence of the wild polio virus in the stool. The case is followed up for 60

days (if the child dies, lost for follow up or remains paralyzed for more than 60 days then this is assumed to be a case of Poliomyelitis). There should be at least one case detected per 100,000 children under the age of 15 years to ensure good and reliable surveillance.