LEUKEMIA

- Leukemia is the general term used to describe a group of **malignant** disorders affecting the blood & blood forming tissues of the ***bone marrow, lymph system & spleen***
- Occur in all age groups
- Fatal if untreated & often thought as disease of children

Etiology

- Combination of genetic & environmental factors
  - Genetic – chromosomal changes
  - Chemical agents –e.g. benzene
  - Chemotherapeutic agents – alkylating agents
  - Virus, radiation & immulogical deficiencies

Classification

- The leukemias are commonly classified according to the stem cell line involved, either **lymphoid** or **myeloid**.
- They are also classified as either **acute** or **chronic**, based on the time it takes for symptoms to evolve and the phase of cell development that is halted (i.e. with few leukocytes differentiating beyond that phase)

Classification

1. **Acute leukemia: -**

- onset of symptoms is abrupt, often occurring within a few weeks.
- Leukocyte development is halted at the blast phase, so that most leukocytes are undifferentiated cells or are blasts.
- Acute leukemia progresses very rapidly; death occurs within weeks to months without aggressive treatment.

I. ***Acute Myelogenous leukemia (AML)***
II. ***Acute lymphocytic leukemia (ALL)***

Cont. ….

2. Chronic leukemia: -

- Symptoms evolve over a period of months to years, and the majority of leukocytes produced are mature.
- Chronic leukemia progresses more slowly; the disease trajectory can extend for years.

I. ***Chronic myelogenous leukemia (CML)***

II. ***Chronic lymphocytic leukemia (CLL)***

A. Acute myelogenous leukemia (AML)

- Defect in the hematopoietic stem cell that differentiates into all **myeloid cells**: monocytes, granulocytes (eg, neutrophils, basophils, eosinophils), erythrocytes, and platelets.
- Increase in incidence with advancing age (peak b/n 60-70yrs)

- Makes up approximately 85% of acute leukemia in adults

C/M – Fatigue & weakness

- Headache, mouth sores
- Minimal hepatomegally & lymphadenopathy

Cont. …

- Anemia, bleeding, fever, infection
- Sternal tenderness

Diagnosis

- RBC – low (Hgb/Hct)
- WBC – low to high
- Platelet - low
- Bone marrow: myelyoblasty

B. Acute Lymphocytic Leukemia (ALL)

- Occur before 14 yr of age (peak incidence b/n 2-9yrs)
- C/m – fever, pallor, bleeding, anorexia
- Fatigue & weakness
- Bone, joint & abdominal pain
- Generalized lymphadenopathy

Cont. …

- Hepato spleenomegally
- Headache, mouth sores
- CNS manifestation (intracranial pressure)

Diagnosis

- RBC (Hgb, HCT) – low
- Bone marrow with lymphoblast
- Platelet count – low
- CSF – lymphoblast
- WBC count- low to high

C. Chronic Myelogenous leukemia (CML)

- Occur in 25- 60 yrs of age; peak incidence is around 45yrs of age

C/m –

- Fatigue & weakness
- Fever, sternal tenderness, weight loss joint pain bone pain
- Massive spleenomegally, Profuse sweating

Cont. ….

Diagnosis

- RBC count – low
- Platelet – low
- Increase neutrophils & low monocytes

D. Chronic lymphocytic leukemia (CLL)

- Occur In 50-70 Yrs of age rare blow 30yrs of age
- Predominant in males

C/m –

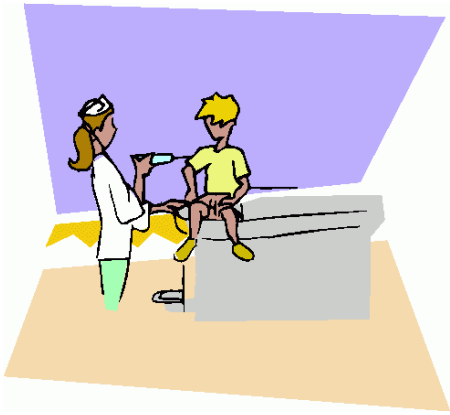
- Asymptomatic
- Chronic fatigue, anorexia, spleenomegally & lymphadenopathy, hepatomegally
- **Dx** – Lymphocyte increase (peripherally & in bone marrow)

Managements

1. Cytotoxic chemotherapy
2. Bone marrow transplant
3. Radiation therapy
4. Blood transfusion

Expanded Program on Immunization (EPI)

- Vaccination is the administration of a vaccine to stimulate a protective immune response that will prevent disease in the vaccinated person if contact with the corresponding infectious agent occurs subsequently.



- *Immunization* is the process whereby a person is made immune or resistant to an infection, typically by the administration of a vaccine

Immunity

- is the ability of the human body to tolerate the presence of material indigenous to the body (“self”), and to eliminate foreign (“non-self”) material.
- This discriminatory ability provides protection from infectious disease, since most microbes are identified as foreign by the immune system.

Cont…

- Immunity to a microbe is usually indicated by the presence of antibody to that organism.
- Immunity is generally very specific to a single organism or group of closely related organisms.
- There are two basic mechanisms for acquiring immunity; active and passive.

1. Active immunity

- Is acquired when a person's own immune system is stimulated to produce antigen specific antibodies and immune cells.
- This type of immunity often lasts for many years and it may be permanent.
- Active immunity can be divided into natural active immunity and artificial active immunity

a) Natural Active Immunity

- This is the immunity acquired after an individual has survived an infection with the disease causing form of the organism
- For example, if a child has had measles and recovered, the child's lymphocytes produce antibodies any time the child encounters the measles virus throughout the child's life.

b) Artificial Active Immunity

- This is the type of immunity given through vaccine administration.
- For example if a child gets the oral polio vaccine (attenuated live polio virus), the child's body will produce antibodies against poliovirus and hence will be protected against poliomyelitis without having been sick.

2. Passive immunity

- Results when antibodies are transferred from one person or animal to another.
- Passive immunity disappears over time and usually within weeks or months.
- It is divided into natural passive immunity and artificial passive immunity.

a) Natural Passive Immunity

- Passively acquired antibodies are responsible for the protection of newborns and young infants against certain diseases.
- The transfer of antibodies from mother to foetus across the placenta during the last 2-3 months of pregnancy provides the newborn with a portion of the mother's immunological experience.
- Examples of passive transfer occur when: TT, measles etc of mother

b) Artificial Passive Immunity

- “Borrowed” antibodies can also protect one temporarily.
- These borrowed and prepared antibodies are from serum (antiserum) of person or animal that has been exposed to an antigen and has produced antibodies which are purified and are directly injected to the person at the site of infection to immediately counteract the offending antigen.
- Sources of passive artificial immunity include blood and blood products, immune or hyper-immune globulin, and animal antitoxins

Introduction

- The Expanded Program on Immunization started in Ethiopia in 1980 with 6 tradional antigens(BCG, Measle, D.P.T &OPV) with the aim of reducing mortality and morbidity of children and mothers from vaccine preventable diseases.
- During the inception of EPI the objective was to increase immunization coverage by 10 % annually but this target has not been realized even after three decades.

- Target group

1) <1year(10 vaccines and vitamin A)
2) 15-49 years women(TT)

Schedule

At birth

BCG and OPV0…OPV 0 is given only up to 14 days then appoint the mother after 45 days.

- At 45 days
- OPV1,Pentavalent 1,PCV1,rota virus1
- At 45 for mother

-family planning

-balanced diet

-hygiene

-immunization

-any danger sign

Then appoint the mother every month

N.B

- Sessions
- It might be 2x/week. Why?
- BCG---after diluted(20 children).
- Every vaccine should be discarded after 6 hrs.

vaccines

- 10
- A) BCG-prevent TB
- B) OPV-paralysis
- C) Pentavalent(5 vaccines in fixed dose)
- D)rota virus-prevent diarrhea due to rotavirus.
- E)PCV-prevent pneumonia
- Vitamin A_(prevent blindness,cell generation)

The objectives were:

- ✓ To achieve 100% coverage with all EPI vaccines.
- ✓ Eradication of polio to maintain polio free status.
- ✓ Elimination of measles.
- ✓ Reduce sero prevalence of (HBAg) to <1% among under five.
- ✓ Elimination of Neonatal Tetanus.
- ✓ To maintain zero level of diphtheria.
- ✓ Prevention of severe forms of TB (TB meningitis).
- ✓ To reduce the incidence of whooping cough.
- ✓ Reduce the incidence of Bacterial Meningitis due to haemophelus influenza.
- ✓ To prepare for introduction of new vaccines.

Cont…

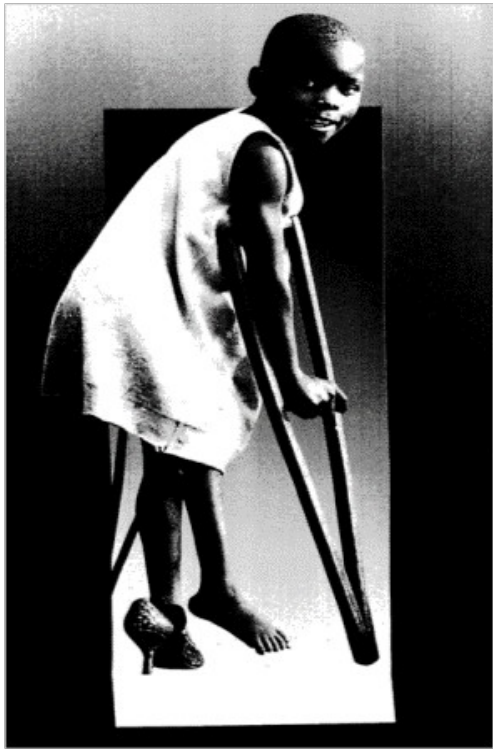
- Vaccines of Pentavalent in 2007, PCV in 2011 & Rota in 2013 were introduced in our country.
- Ethiopia was polio -free almost for three years prior to the importation of wild polio virus from Sudan in dec.2004.
- Again it has interrupted this polio transmission & validated by external evaluator conducted from Jan.8-12,2015
- By the end of 2015, IPV implementation started

Polio Eradication strategies

- Global polio Eradication Initiative with four core strategies was launched in 1n 1998

Strategies

- **High infant immunization coverage with** at least 4 doses
- **Supplementary doses** of OPV for the < 5 year children
- **Surveillance** for wild polio virus through reporting and laboratory testing of **all cases of AFP in < 15yrs**
- Targeted **"mop –up" campaigns** once wild polio virus transmission is limited to a specific focal area





Global Measles Control strategies

Global accelerated Measles control strategies

1. Increase **routine measles coverage**
2. **Secondary opportunity** (routine or campaign)
3. Measles **surveillance**
4. Improved **case management**





Global Maternal and Neonatal Tetanus Elimination strategies

- **To reduce the incidence of case to <1: 1000 per live birth year in every district.**



- Strategies
  - **Increase TT coverage**
  - **TT Campaign in high risk areas**
  - **Promote clean delivery**
  - **Improve surveillance & reporting of neonatal tetanus**

- As the bacteria also survives in the environment, eradication is **not feasible** and vaccination has to continue after the goal.

To maintain zero level of diphtheria.





Prevention of severe forms of TB (TB meningitis &military TB).





To reduce the incidence of whooping cough







To prepare for introduction of new vaccines



Type of Vaccines

- **Live attenuated**
  - Virus: E.g. Oral Polio Vaccine (OPV), Measles, Yellow fever
  - Bacteria: E.g. BCG
- **Inactivated:**
  - **Whole cell:**
    - **Virus:** Inactivated polio vaccine (IPV)
    - **Bacteria**: whole cell pertussis
  - **Fractional:**
    - Protein based
      - **Subunit:** accelular pertussis
      - **Toxoid:** Tetanus, dephtheria
    - **Polysaccharide based:**
      - Pure-meningococcal
      - **Conjugated** Haemophilus influenza type b (Hib), Pneumoccocal conjugate vaccine (PCV), MenAfric
- **Recombinant:** Hepatitis b.

➢ *Target diseases of EPI in Ethiopia*

- ✓ Tuberculosis Caused by M. Tuberculosis
- ✓ Poliomyelitis Caused by Polio virus
- ✓ Diphtheria Caused by Corny bacterium diphtheria toxin
- ✓ Pertusis Caused by Bordetlla pertusis
- ✓ Tetanus Caused by Clostridium tetani toxin
- ✓ Influenza Caused by Hemophilus influenza type B
- ✓ Hepatitis B Caused by Hepatitis B virus (Hepanda)
- ✓ Measles Caused by Measles virus (Paramyxo)
- ✓ Rotavirus Diarrheal disease
- ✓ Pneumococcal disease

Specific Immunizations

1. *BCG* - (Bacillus calmet Guarien)

- Live attenuated vaccine which prevents severe forms of tuberculosis.
- Efficacy is from 0-80%
- Route of administration- Intradermal (ID) at Right deltoid, 0.05ml preferably at birth.

Form-Dried powder form with reconstituent 10 – 20 doses.

- Has to be given on the right deltoid area intradermal with its own needle.
- The vaccine should not be given for a child with **full blown AIDS.**
- The vaccine is heat and light sensitive.

Table 1.1. BCG administration guidelines

	Recommendation	Comment
Age	Birth	If not given at birth, as soon as possible after birth
Dose size	0.05ml	See the manufacturer's instructions. If the child is over 1 year old give 0.1ml
Number of doses	One	If the child is over 1 year old give 0.1ml
Injection site	Outer Upper right arm /shoulder	Do not rub or apply anything to injection site
Injection type	Intradermal	

Side-effects

- **Normal reaction**
- When BCG vaccine is injected, a small raised lump appears at the injection site. This usually disappears within 30 minutes.
- After approximately two weeks, a red sore develops which is 10mm in diameter (the size of the end of an unsharpened pencil).
- The sore remains for another two weeks and then heals.
- A small scar about 5mm across, resulting from the sore, remains for life. This is a sign that the child has been effectively immunized.

Side effects which needs treatment

- *Glands in a child's armpit or near the elbow swell up after injection with BCG vaccine, or he / she may develop an abscess because:*
- A non-sterile needle or syringe was used
- Too much vaccine was injected
- The vaccine was injected under the skin instead of in its top layer

Inactivated Polio Vaccine(IPV)

- ***Formulation:*** Liquid vaccine suspension providing protection against all 3 types of poliovirus, Does not require reconstitution
- ***Route of administration:*** IM injection
- ***Schedule:*** 1 doses
- ***Dosage:*** 0.5ml
- ***Storage:*** +2° to +8°C, Do not freeze, Protect from light!
- ***VVM type:*** VVM7,
- ***MDVP:*** Keep & use for subsequ
- ***Presentations:*** 10-dose vial in boxes of 10: 2.46cm3/dose ((vvm



IPV has high heat sensitivity -1

- IPV loses potency when **exposed to <u>heat</u>**
  - Store at +2°C to +8°C
- IPV has greater susceptibility to heat than most existing heat sensitive vaccines
- VVM on IPV may change color faster than most other vaccines

IPV has high heat sensitivity - 2

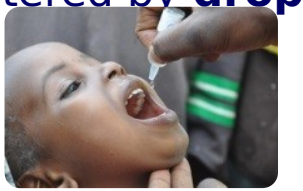
- Proper temperature monitoring and stock management is required to avoid wasting IPV vials with VVM reaching the discard point

- While the “earliest expiry, first out” principles usually applies in vaccine stock management, the status of a VVM overrules this, whereby any batch showing a darker VVM should be used sooner, regardless of a later expiry date

Comparison of OPV and IPV?

Oral polio vaccine (OPV)

- Live, attenuated (weakened) virus
- Administered by **drops**



- Highly successful in reducing transmission in developing countries as part of eradication strategy
- Inexpensive
- Easy to administer
- Provides mucosal/gut immunity
- Protects close contacts who are unvaccinated

Inactivated polio vaccine (IPV)

- Killed virus
- Administered by **injecti**



- Highly effective
- Used commonly in developed countries

- More expensive than OPV
- Requires trained health workers
- Provides immunity through blood
- Carries no risk of VDPV



Both vaccines are needed to fully eradicate polio!

Checking the Vaccine Vial Monitor (VVM)

- **IPV vial has a VVM7**
- **The VVM registers cumulative heat exposure, and changes from light to dark**
- **Check the VVM on each vaccine vial**
- **If inside square is the same color, or darker than the circle (stage 3 or 4), do not use the vaccine**

✔ Stage 1: Vaccine OK

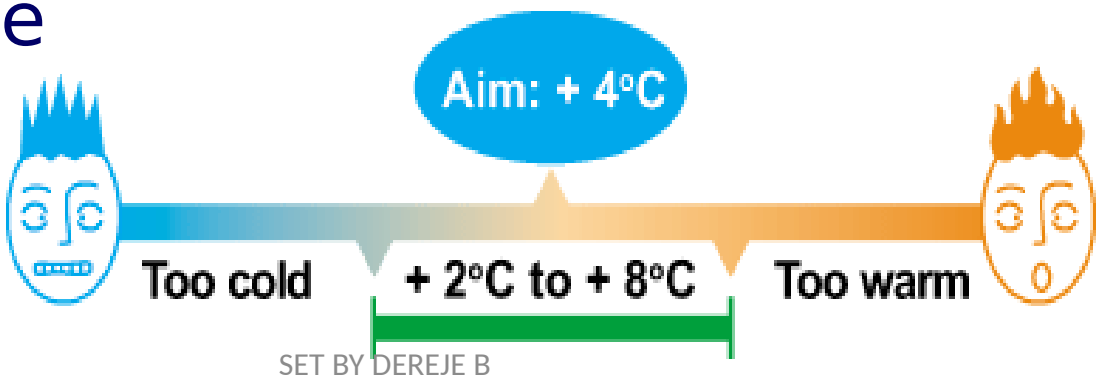
✔ Stage 2: Vaccine OK but use first

✘ Stage 3: Do not use the vaccine

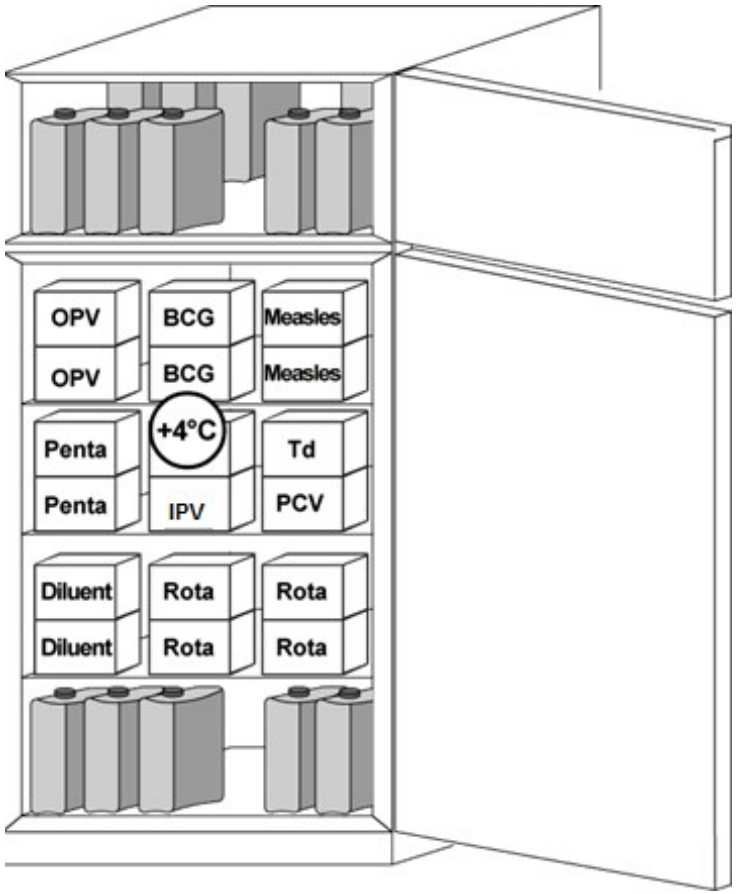
✘ Stage 4: Do not use the

IPV is freeze sensitive

- **IPV is freeze sensitive (unlike OPV)**
  - The “shake test” does not work on IPV
  - Therefore it is very important that if there is <u>any</u> suspicion that IPV has been frozen, the vial <u>must</u> be discarded
  - Do not use if vaccine has a cloudy appearance



Where do you store the vaccine?



- Store IPV in a refrigerator, between +2^{o}C and +8^{o}C
- Do not open the door frequently
- Monitor fridge temperature regularly
- Do not put IPV in the freezer
- Put IPV in the middle compartment of standing front openning refrigerator

Storing Principles

- Maintain the cartons in a neat row
- Store similar vaccines in the same area to facilitate easy identification
- Keep ~2 cm of space between rows for circulation of air
- Record the period of time the vaccine stays in storage without being used

Storing Principles cont…

- In top-opening refrigerators, store IPV and other freeze-sensitive vaccines on top.
- In front-opening refrigerators store IPV and other freeze-sensitive vaccines on the lower/middle shelves
- For cold boxes and carriers, IPV may be freeze damaged if placed in close contact with icepacks.

Multi-dose vials of IPV

According to WHO's revised MDVP: OPV, IPV and TT vaccines (for Ethiopia) may be preserved and used for immunization up to 28 days on condition that they:

- have not expired
- have not been contaminated (aseptic rules observed when removing doses)
- have not been exposed to excessive cold or heat
- have not been immersed in water
- VVM has not reached the discard point

Record date of opened for IPV, OPV&TT and time for BCG, Measles & PCV

Factors associated with vaccine wastage

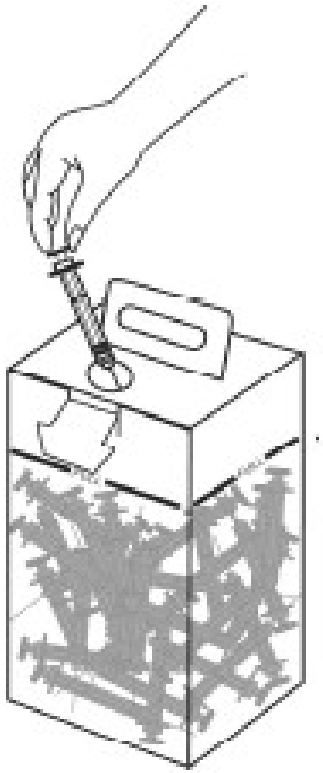
- **Poor stock management**
  - Over-supply
  - Vaccine reaches expiry before use
  - Lost, broken, stolen vials

- **Cold chain failure**
  - Loss of potency (high temperatures)
  - Inactivated vaccine (freezing)

- **Poor vaccination technique**
  - Administration of more than recommended 0.5 ml for each injection

Ensuring Safe Disposal of Injection Equipment

- After injection, insert syringe into a safety box
- When safety box is (75%) full, close tab to ensure box is closed
- Dispose of safety box appropriately (incineration, burning, burial)



Key messages



- IPV is a liquid, injectable formulation
- Vaccine comes in 10 dose vials
- Store vaccines between +2^{0}C and +8^{0}C, never freeze
- “Shake Test” is ineffective in determining whether IPV has been frozen
- Keep vaccines with early expiration dates and VVM at or near stage 2 in front of the refrigerator and use first

IPV summary

Type of vaccine-IPV	Inactivated viral
Total number of doses	3-4. See the schedule
Schedule-**IPV-only**	3-dose primary series starting at 2 months of age, with intervals of 4-8 weeks between doses
Booster;**IPV-**onlyschedule	If IPV1 is given before 2 months of age, IPV4 (booster dose) should be given >6 months after IPV3
Contraindications	Known hypersensitivity or anaphylaxis to a prior dose
Adverse events-IPV	Serious: none known Mild: injection site reactions
Special precautions	May need to postpone for severe acute illness (for example, fever >39 °C
Dosage-IPV	0.5 ml
Injection site-IPV	Anterolateral (outer) mid-thigh i n infants and children
Injection type-IPV	Intramuscular
Storage-OPV	Between +2 °C and +8 °C, Do not freeze

2. ***Oral polio*** vaccine (***OPV***)

- Live attenuated vaccine which prevents from poliomyelitis.
- Efficacy is around 95%
- Route of administration -Oral, 2 drop at a time, 4 times (OPV0-OPV3) with 4 weeks apart.
- The vaccine is **heat** and **light** sensitive.
- **It is found in suspension form of 10-20 doses.**
- Has to be given orally 2 drops at a time.
- There is no contraindication.

Schedule and Administration of OPV Characteristics

Type of vaccine	Live oral polio vaccine (OPV)
Number of doses	Four in endemic countries (including birth dose)
Schedule	At birth*, 6, 10, 14 weeks
Booster	Supplementary doses given during polio eradication activities
Contraindications	None
Adverse reactions	VAPP** very rarely (approximately 2 to 4 cases per million children vaccinated)
Dosage	2 drops
Storage	Store between 2°C–8°C (may be frozen for long-term storage)

Diphtheria-Pertussis-Tetanus-Hepatitis, Haemophilus Influenza type b (DPT-HepB-Hib) combined vaccine

Diphtheria-pertussis-tetanus-hepatitis-haemophilus influenza type b (DPT-HepB-Hib) vaccine is made from:

- **D**iphtheria toxoid
- **P**ertussis vaccine
- **T**etanus toxoid
- **H**epatitis toxoid
- **H**aemophilus influenza type b vaccine

- This vaccine is a pentavalent vaccine (DPT-HepB-Hib)
- DPT-HepB-Hib combined vaccine is available as a single dose.

STORAGE

- pentavalent vaccines should be stored at a temperature between +2^{0}C and +8^{0}C.
- The diphtheria, tetanus toxoid and hepatitis parts of DPT-HepB of the vaccine are freeze sensitive.
- DO NOT FREEZE pentavalent VACCINES.

Cont…

- After freezing the vaccine is no longer a uniform cloudy liquid, but tends to form flakes that gradually settle to the bottom after the vial has been shaken.
- Sedimentation occurs faster in a vaccine vial that has been frozen than in a vaccine vial from the same manufacturer that has never been frozen.
- If you suspect the vaccine may have frozen in the past, perform the “shake test”.

- The interval between doses must be at least 4 weeks.
- DPT-HepB-Hib vaccine should **NOT** be given to children over 5 years of age or to children who have suffered a severe reaction to a previous dose of this vaccine.
- Instead, a combination of diphtheria, tetanus, hepatitis toxoids and Haemophilus influenza type b vaccines (DT-HepB-Hib) should be given if available.

DPT-HepB-Hib Administration Guidelines

	Recommendation	Comment
Age	At 6 ,10 and 14 weeks	- If a child is not given at 6 weeks, give it as soon as possible thereafter. - Wait 4 weeks between doses. - Complete all 3 doses
Dose size	0.5ml for each dose	See the manufacturer's instructions
Injection site	Left outer mid-thigh	
Injection type	Intramuscular	
Number of doses	Three	
Contraindication	Convulsion and hypersensitivity reaction after previous dose	
Storage	Store between 2°C–8°C. Never freeze	

SUMMARY OF DPT-HepB-Hib

1. *Diphtheria* vaccine

- Inactivated toxin vaccine prevents from Diphtheria.
- Efficacy is around 95%
- Route of administration- Intramuscular (IM), 0.5cc at a time, 3 doses (3 times) with 4 weeks a part.

2. *Pertusis* vaccine

- Killed vaccine prevents from pertusis (whooping cough)
- Efficacy around 85%
- Route of administration - Intramuscular O.5cc at a time, 3 doses with 4 weeks a part.

Cont…

3. *Tetanus* vaccine

- Inactivated toxin, prevents Neonatal Tetanus and Generalized tetanus
- It is administered intramuscularly 0.5cc at a time 3 doses with four weeks a part
- Efficacy is around 99%

4. H. ***Influenza*** vaccine (***Hib***)

- Killed H. influenza type B vaccine polysaccharide_
- Administered intramuscularly, 0.5cc at a time 3 doses with four weeks apart.
- Efficacy estimated at 95-100% after 2-3 doses.

Cont…

5. Hepatitis B (***Hep B***) vaccine

- Plasma derived antigen gives protection against Hepatitis B.
- The route of administration is intramuscular, 0.5cc at a time 3doses with four weeks a part
- Efficacy is around 80-100% after full dose.

8. Measles Vaccine

- It is attenuated virus vaccine & protects from measles.
- The route of administration is Subcutaneous (SC), 0.5cc stat dose (once) in Left upper arm.
- Efficacy is around 85%

found in powder form of 10 doses with reconstituent in a vial.

- It has to be given **subcutaneously** over the **left upper arm.**
- The vaccine is heat and light sensitive

Measles vaccine administration guidelines

	Recommendation	Comment
Age	9 months(at entry of 10 months and 1 year and 3 months)	If a child is not immunized at 9 months, immunize as soon as possible thereafter. All children 9 months of age should receive measles vaccine regardless of whether or not they have had measles before. All children between 6 and 9 months of age who are admitted to hospital should be given a dose of measles vaccine. This should not be marked on their immunization cards. Another dose should be given at 9 months of age. The doses must be at least 4 weeks apart.
Dose size	0.5 ml	See the manufacturer's instructions.
Number of doses	two	A second dose through routine or campaign approaches is safe and effective for measles control.
Injection site	left upper arm	Press the site gently with cotton wool after injection.
Injection Type	Subcutaneous	

Side-effects

- A mild fever and rash lasting one to three days may occur approximately a week after immunization. It is not infectious.
- **Treatment of side-effects (Measles vaccine)**

Vaccine	Side-effects	Treatment	Remarks
Measles	¬ʌMild temperature ¬ʌSlight rash may appear	Give Paracetamol No treatment	Will go away in 1-3 days

Case definition of measles

- Any person with Fever and muculo-papular rash with cough, coryza, and conjunctivitis is suspected to have measles.
- At the community level the definition is fever and rash, and report to the nearest health facility for immediate investigation

9. Pneumococcal polysaccharide conjugate vaccines

- Pneumococcal Conjugated Vaccine (PCV) can prevent pneumococcal diseases,
  - ✓Pneumococcal pneumonia,
  - ✓pneumococcal meningitis,
  - ✓other Invasive Pneumococcal diseases (Pneumococcal bacteremia and septicemia)
  - ✓mild pneumococcal infection such as otitis media.

Cont…

- Ethiopia has introduced PCV 10 a liquid vaccine that is given in three doses with similar schedule with pentavalent vaccine at 6, 10, and 14 weeks of age.
- The route of administration is intramuscular, 0.5cc at a time 3doses with four weeks a part

Cont…

Efficacy

- Protection against IPD caused by vaccine serotypes may exceed 90%
- Protection against Otitis media caused by vaccine serotypes is reported to be 57%.
- The vaccine reduces radiologically confirmed pneumonia by about 20-25%.

Pneumococcal vaccine administration

	Recommendation	Comment
Age	PCV1 - 6weeks PCV2 -10 weeks PCV3 -14 weeks	¬ If a child is not given PCV1 vaccine at 6 weeks, give it as soon as possible thereafter. ¬ Wait 4 weeks between doses. ¬ It is recommended that a child complete all 3 doses before 6 months of age for early protection.
Dose size	0.5 ml for each dose	See the manufacturer's instructions.
Number of doses	3	
Injection site	Right outermid-thigh	Never immunize in the buttocks.
Injection type	Intramuscular	

10. Rotavirus vaccine

- Two new live, oral, attenuated rotavirus vaccines ;monovalent human rotavirus vaccine (Rotarix™) and the pentavalent bovine–human, reassortant vaccine (RotaTeq™).
- Prevents rota virus diarrheal disease
- Efficacy -90–100% protection against severe rotavirus disease

Monovalent Human Rotavirus Vaccine (**MVHRV)**
(Rotarix TM)-

- **Rotarix™** vaccine is a liquid vaccine for oral use.
- It comes in a tube specially designed for direct oral administration.

- Has to be given orally 2 drops at a time of 2 doses.
- breast milk need not be restricted before or after the administration of the vaccine.

- The vaccine is light sensitive.

Pentavalent Bovine–human, Reassortant Vaccine

(**PVBHRV)**(RotaTeq™)

-is a ready to use liquid vaccine administered orally.

- Has to be given orally 2 drops at a time of 3 doses.
- breast milk need not be restricted before or after the administration of the vaccine.

- The vaccine is light sensitive.

Side effects of MVHRV and PVBHRV

- Reported hypersensitivity following previous administration of the same vaccine, or reported hypersensitivity to any of the vaccine components will be a contraindication.
- Previous history of intussusceptions
- Subjects with uncorrected malformation of GI tract that would predispose to intussusceptions

Dosage and schedule

Type of vaccine	Live, attenuated
Number of doses	Two
Schedule	6 and 10 weeks of age
Contraindications	Hypersensitivity after previous administration of Rota virus vaccines Previous history of intussusceptions
Adverse reactions	Children may be more irritable and have loss of appetite. Some children may also experience fever, fatigue, diarrhea, and vomiting
Dosage	1 tube (1.5ml), Only for oral use
Storage	Store between 2°C–8°C. Do NOT freeze

- **The following precautions are necessary:**

- Temperature >40 ℃ within 48 hours of prior dose
- Shock like state
- Convulsion within 3 days after previous dose
- Persistent or inconsolable cry (> 3hrs), with in 48 hr of prior dose

N.B: Don’t skin use antiseptic (alcohol) at the site of injection for live attenuated vaccines.



BCG Interdemal Vaccination

OPV -At 6 *weeks (45 days)*, 10 *weeks, and* 14 *weeks*

- **OPV live attenuated, drops ,Oral**





Multi-dose vials of IPV







Small child receiving penta vaccine in to the muscles of the thigh.

Measles

- At 9 months
- Live attenuated
- 0.5 ml, SC Left Upper Arm



- ***Checking Immunization status***
  - ✓ BCG scar, and
  - ✓ Immunization card

National Immunization Schedule for Infants and women of child bearing age summary

Vaccine	When to give	Dose	Route	Site
BCG	At birth or as early as possible till one year of age	0.05ml	Intra-dermal	Right Upper Arm
Measles	9 completed months	0.5 ml	Sub-continuous	Left Upper Arm
Pentavalent1,2,3	At 6 weeks, 10 weeks & 14 weeks	0.5 ml	Intra-muscular	Antero-lateral side of left mid-thigh
OPV0	At birth or as early as possible within the first 14 days	2 drops	Mouth	
OPV1,2,3	At 6 weeks, 10 weeks & 14 weeks	2 drops	Mouth	
PCV 1,2,3	At 6 weeks, 10 weeks & 14 weeks	0.5 ml	Intra- muscular	Antero-lateral side of right mid-thigh
Rotarix 1, 2	At 6 weeks and 10 weeks	1.5 ml	Mouth	
TT 1,2,3,4,5	At first contact, 4 weeks after TT1, 6 months after TT2, one year after TT3 and one year after TT4	0.5 ml	Intra- muscular	Left Upper Arm

The strategies of EPI

- Routine immunization
  - Static immunization..at facility level
  - Out reach immunization…campaign
- Mopping up immunization (House to house immunization)
- National immunization days
- Out break response immunization

I) The static immunization strategy:

- **Advantages of integration of immunization services through MCH:**

1-Available resources.

2- Cold Chain maintenance.

3- Save time, effort and money.



(II) Outreach immunization:





(III) Mopping up Immunization:

- It is ***house-to-house*** immunization with OPV in high risk districts.

➢ High risk districts are those:

- ❖ Where the polio virus is still circulating

  (polio case in the last 36 months) .

- ❖ With low immunization coverage.

- ❖ Transient population, with overcrowding poor sanitary environment and low access to health services.


IMC
LR 3087


POLIO


CROIX-ROUGE
HAITIENNE

(IV) The National Immunization Days (NIDs):

- It is **periodic** immunization of all the **eligible targets** in a **defined group** over a **large geographic** areas within **a short period of time**.
- It is one of the strategy for polio eradication and tetanus elimination.

➢**What is the difference between the NIDs and the out reach Strategy?**

❖ The outreach is carried for **routine immunization that is compusory** for the targets in certain areas where:

- immunization services are **not accessible.**

- vaccination coverage is **Low.**

❖**The outreach is carried during any time without specific duration.**

Limitations:

(i) Expensive

(ii) Cold chain failure.

(iii) Difficulty to arrange the immunization schedule.

Missed opportunity

- It occurs when a child or a woman in child bearing period comes to the health facility or outreach site and does not receive any of the vaccine doses for which he or she is eligible.

The reasons for missed opportunity are:

- Health workers` practices.
- Logistical problems.
- Failure to administer simultaneously all the vaccines for which the child is eligible.
- False contraindications to immunization.

The cold chain

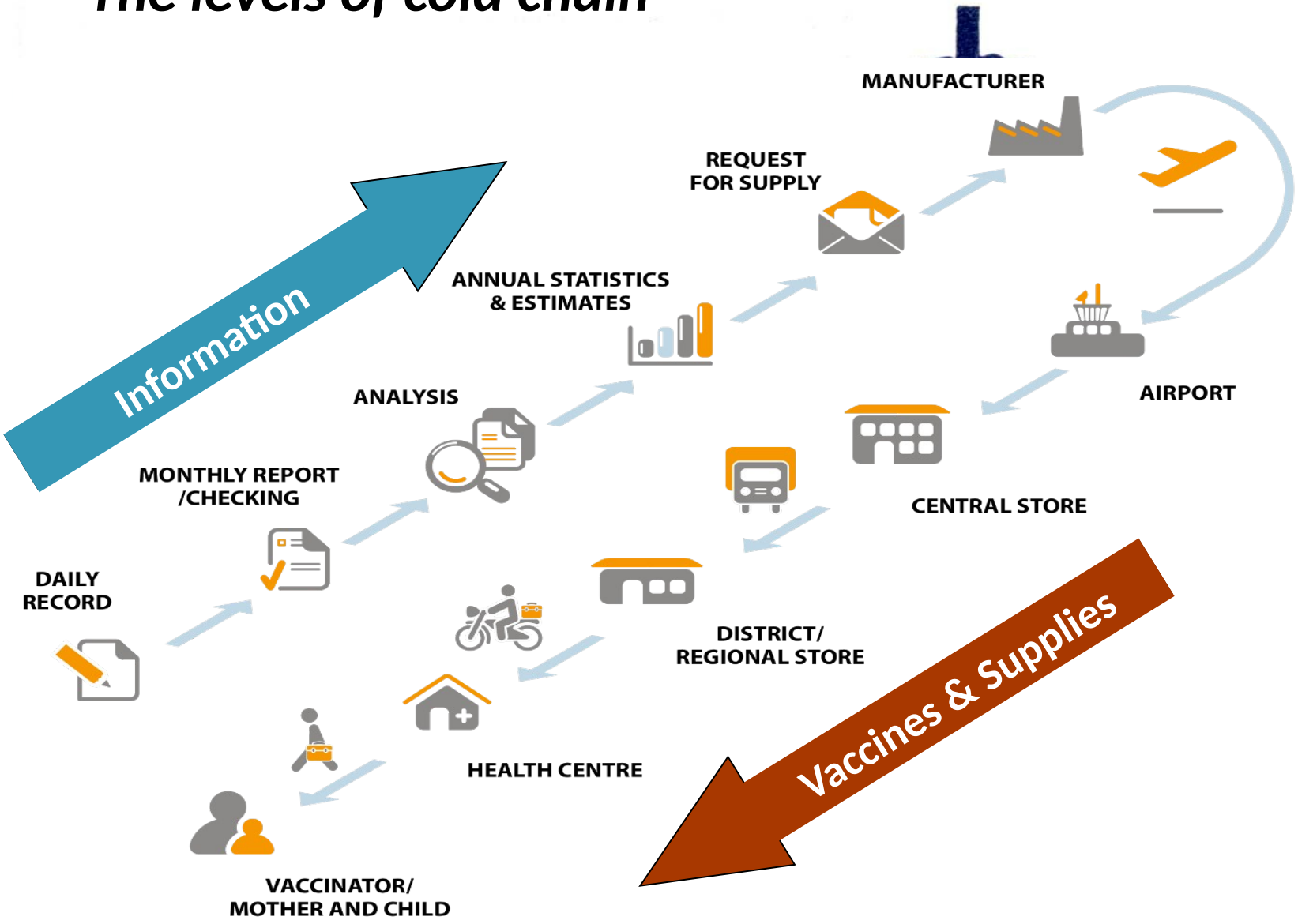
- Vaccines are temperature and freezing sensitive biological product.

Cold chain is the system that used to storing and distributing vaccines in good condition to end users.

It consists of a series of storage and transport links, all designed to keep vaccines within an acceptable range until it reaches to the end user.

It maintain vaccine in WHO recommended temperature range from manufacturer to end users.

The levels of cold chain



At peripheral level the following points are critical to maintain vaccine in reliable cold chain system:

- Store vaccines and diluents in WHO recommended temperature range.
- Pack and transport vaccine to and from outreach site as per WHO recommendation.
- Keep vaccines and diluents within recommended CC condition.
- *Opened vials of vaccines without preservative are at high risk of contamination, to minimize this risk opened vials must kept cool.*

Sensitivity to heat

Range	Vaccines
Most sensitive  **Less sensitive**	OPV
	Measles, MR, MMR
	DTP, DTP-HepB, DTP-Hib, DTP-HepB+Hib, YF, **Rota**
	BCG
	Hib, DT
	Td, TT, HepB, **PCV**

Cautions:

- ✓ **Use indications of the VVMs**
- ✓ **Avoid the use of ice during transport**
- ✓ **Avoid storage at temperatures closed to zero and sub-zero.**

Sensitivity to freezing

Range	Vaccines
Most sensitive	HepB
	Hib (liquid)
	DTP, DTP-HepB, DTP-Hib, DTP-HepB+Hib
Less sensitive	TT, Hib lyophilized



Cautions:

- ✓ **Never freeze**
- ✓ **Avoid the use of ice for transport**
- ✓ **Avoid storage at temperatures closed to zero and sub-zero.**

Sensitivity to light

Sensitive to Ultraviolet, Fluorescents



- **BCG**
- **Measles, Rubella**
- **MR, MMR**

Cautions:

- ✓ **Avoid fluorescence in the storage and packaging areas**

… always check the date of expiration

The Cold Chain at Health Facility Level

At Health facility level HWs can protect vaccine by doing the following:

- Keep vaccines in appropriate vaccine refrigeration equipment.
- Use temperature monitoring device to ensure the temperature range is 2C° to 8 C°.
- Transport vaccine to and from immunization session using vaccine carrier and using coolant
- fit a foam pad at the top of the vaccine carrier

- It could be classified based the energy source

1. Electric also called compression unit.

   Eg. Ice-lined Refrigerator

2. Solar also called photovoltaic unit

   Eg. SDD Refrigerator

3. Kerosene also called absorption unit

Eg. Sibir – V110EK, V170EK

Dometic - RCW 50 EK, RCW 42EK

❖ **Do not use domestic refrigerators**

- Ice lined refrigerators

Eg:- Vest Fro







SDD REFRIGERATOR

Cold Box and vaccine carrier



- The Cold Life of a cold box is the maximum length of time that a closed cold box can maintain temperatures below +10°C if lined with frozen ice-packs.
- Cool life of Cold box is the maximum length of time the closed cold box can maintain temperatures below +2C° if lined with cool water-packs.
- The maximum cold life of a cold box is 2 to 7 days in 43C°.
- The maximum cool life of a cold box is 12 hour to 2 days in 43C°.



Water packs can be used in one of these ways:

- Frozen ice packs
- Conditioned ice packs
- Cool water packs

To take account of cold box opening and transport delays, double the estimated cold/warm life requirement.

Coolant packs

- 0.3 - 0.4 liter to be used with vaccine carriers
- 0.4 - 0.6 liter to be used with cold boxes.
- Two sets of coolant packs should be provided for each cold box or vaccine carrier – one set to be chilled/frozen while the other is being used.

Foam Pads

- It is a piece of soft sponge-like material that fits precisely on top of the water packs.



- Used to securely hold opened vials, while protecting unopened vials in the cool chamber
- It protect heat-sensitive opened vials vaccines

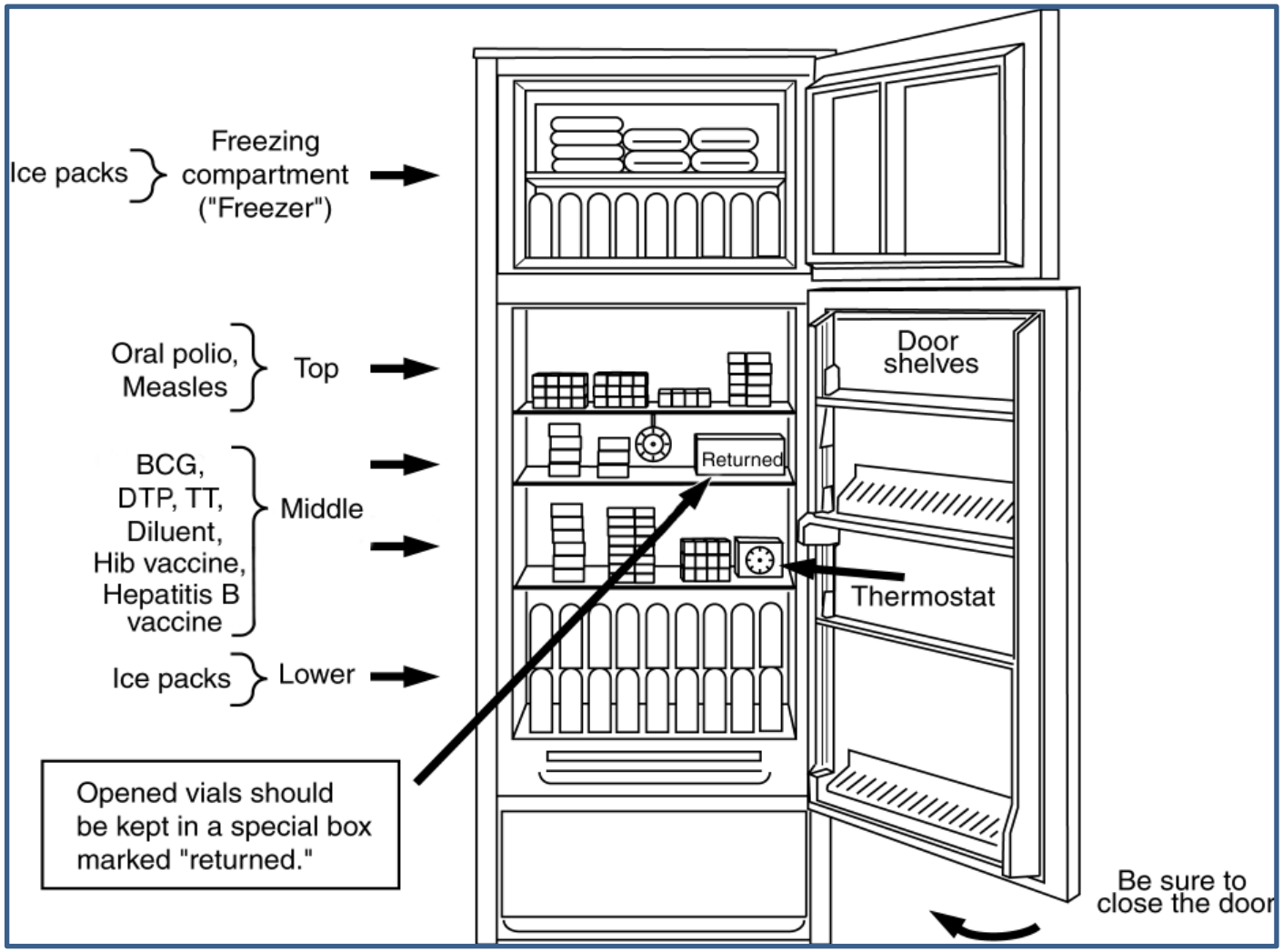
The refrigerator :

- Placed in the coolest place of the health centers away from sunlight
- Kept locked and open only when necessary.
- Ice packs are kept in the freezer and Its temperature is recorded twice daily.
- Both the monitor and thermometer are placed in the refrigerator.
- The temperature chart is stuck on the door outside the refrigerator.
- The diluents should be kept on the lowest shelf.

Arranging Vaccine - 1

Good warehousing practice

Correct use of upright refrigerators



Tools for monitoring the cold chain:

- There are four ways of monitoring the cold chain:

1. **Cold Chain Refrigerator Graph-** regularly monitoring the storage which should always be kept between ***2 and 8 degrees of celicius.***

   - A chart should be affixed to the front of the refrigerator and should be recorded at least twice in a day.

2. **Shake test-** determine whether or not the vaccine has been ***frozen*** (for Penta & TT vaccine).
3. Using ***VVM*** *(Vaccine Vial Monitoring)*
4. **Using the cold chain monitor** (freeze watch indicator)

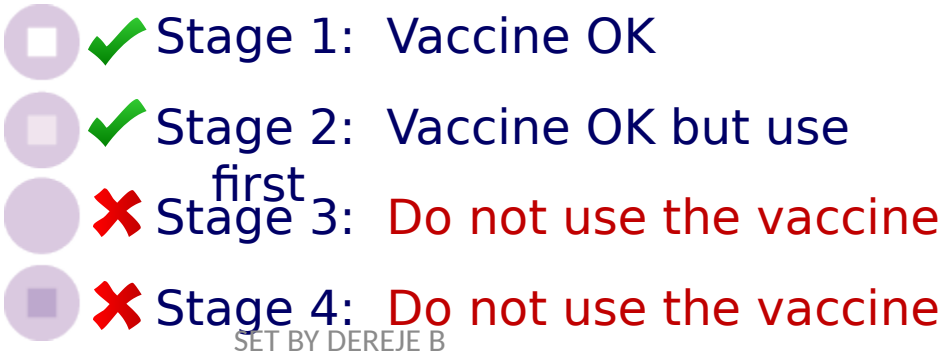
Vaccine vial monitors (VVM):

- Every vial is also shipped with a temperature-sensitive label, that health workers monitor during vaccination sessions.



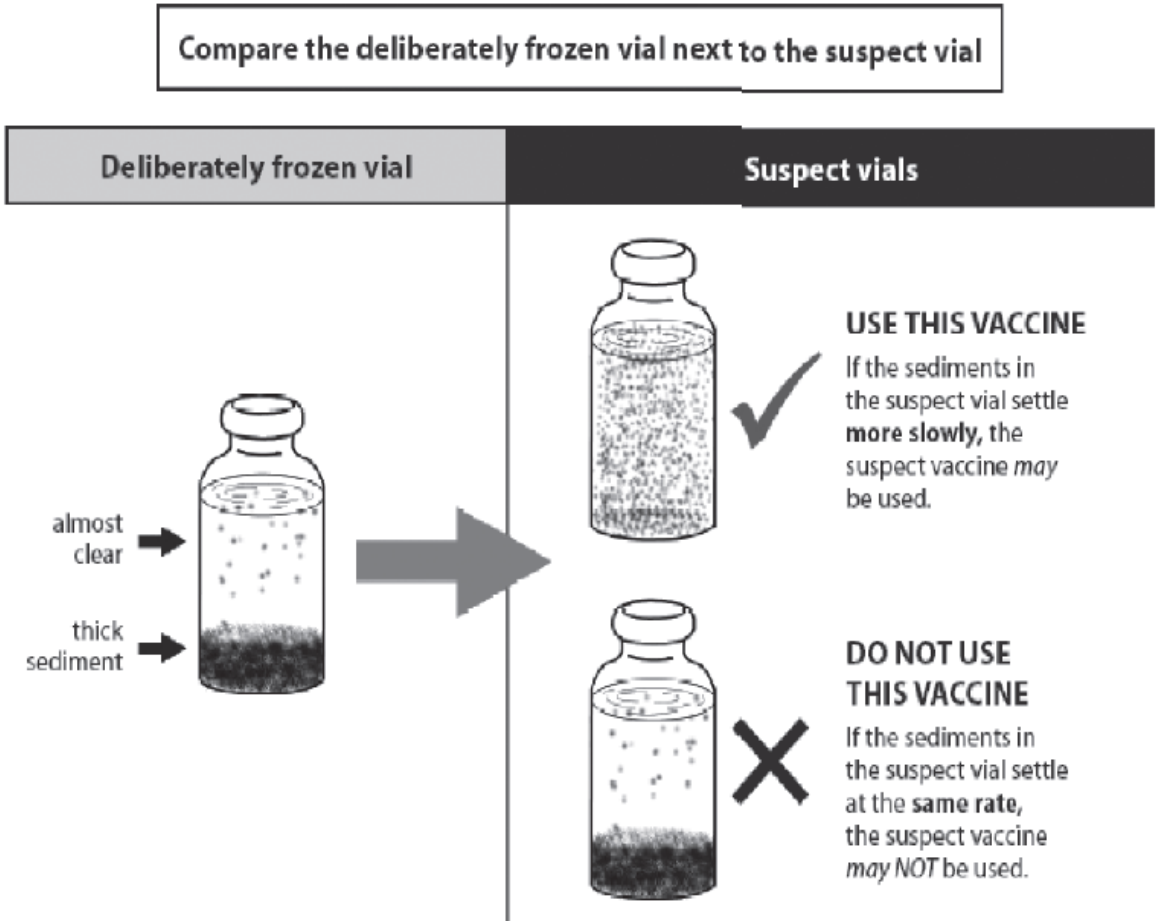
Checking the Vaccine Vial Monitor (VVM)

- The VVM registers **cumulative heat exposure**, and changes from light to dark
- Check the VVM on each vaccine vial
- If inside square is the same color, or darker than the circle (stage 3 or 4), **do not use** the vaccine



Shake test for vaccine suspected to be frozen

1. Prepare a frozen control sample
2. Choose a test sample
3. Shake the control and test samples
4. Allow to rest
5. Compare the vials
6. Take decision



Storage of the vaccine

- The vaccine should not kept frozen or exposed to freezing
- Store at 2° to 8°C
- Shake vial vigorously before withdrawal and use.
- Do not use if resuspension does not occur with vigorous shaking.
- The vaccine should be administered shortly after withdrawal from the vial.

What damage the Vaccines?

1. Any defect in the cold chain.
2. Out date expiry.
3. Using skin antiseptic at the site of injection (e.g. BCG).
4. Using the reconstituted vaccine (measles, BCG) after the recommended period (6 hours).
5. Exposure of the vaccine to unacceptable temperature during the immunization session.
6. Exposure of the vaccine to direct sunlight (BCG)

INTEGRATED MANAGEMENT OF NEW BORN AND CHILDHOOD ILLNESS

OUTLINES:

I. Introduction

II. Assessment, classification and treatment of the sick young infant **(***from birth up to 2months***)**

III. Assessment and classification of the sick child age 2 months up to 5 years

I. Introduction

- About 9 million children in developing countries die under 5yrs of age every yr.
- In Ethiopia, more than 321,000 children under the age of five die every year.
  - >70% of the deaths are due to:-
    - pneumonia,
    - diarrhea,
    - malaria,

Cont…

- measles and
- malnutrition, and often to a combination of these conditions.

- Children usually present with more than one problems.
  - An integrated approach is needed to manage a child in a **holistic** manner.
  - led to the dev't of IMNCI strategy.

Cont…

- **IMNCI** aims to:-
  - reduce death, illness and disability, and
  - promote improved growth and dev't among children under five years of age.

II. ASSESS,CLASSIFY AND TREAT THE SICK YOUNG INFANT *[From birth up to 2months]*

1.CHECK FOR POSSIBLE BACTERIAL INFECTION AND JAUNDICE:

Classify all young infants:

SIGNS	CLASSIFY AS	TREATMENT/urgent pre-referral treatments are in bold print/
•Not feeding well or •Convulsions/convulsing now or •Fast breathing[> or=60br/min] or •Severe chest indrawing or •Grunting or •Fever [>or=38d.c or feels hot] or •LBT[<35.5d.c or feels cold] or •Movement only w/n stimulated or no mov't even w/n stimulated	**POSSIBLE SERIOUS BACTERIAL INFECTION**	➢**Give firs dose of IM Ampicillin and Gentamycin** ➢**Treat to prevent low blood sugar** ➢**Warm the young infant by skin to skin contact if temperature is less than 36.5 d.c[feels cold to touch] while arranging referral** ➢**Advise mother how to keep the young infant warm on the way to the Hospital** ➢**Refer URGENTLY to hospital**

Classification cont…

SIGNS CONT…	CLASSIFY AS CONT…	TREATMENT/urgent pre-referral treatments are in bold print/ CONT…
•Red umbilicus or •Skin pustules	**LOCAL BACTERIAL INFECTION**	➢**Give cotri. Or Amoxicillin for 5days** ➢Teach mother to treat local infections at home ➢Advise mother when to return immediately ➢F/up in 2 days
•None of the signs of possible serious bacterial infection or local bacterial infection	**BACTERIAL INFECTION UNLIKELY**	➢Advise mother to give home care for the young infant

And if temperature is b/n 35.5-36.4:

SIGNS CONT…	CLASSIFY AS CONT…	TREATMENT/urgent pre-referral treatments are in bold print/ CONT…
•Temperature b/n 35.5-36.4 d.c[both values inclusive]	**LOW BODY TEMPERATURE**	➢Treat to prevent low blood sugar ➢**Warm the young infant using skin – to- skin contact for one hour and re-assess. If temperature remains same or worse, refer** ➢Advise mother w/n to return immediately ➢F/up in 2 days

And if the infant has jaundice:

SIGNS CONT…	CLASSIFY AS CONT…	TREATMENT/urgent pre-referral treatments are in bold print/ CONT…
•Palms and/or soles yellow OR •Age <24 hrs OR •Age 14 days or more	**SEVERE JAUNDICE**	➢**Treat to prevent low blood sugar** ➢**Warm the young infant by skin to skin contact if temperature is less than 36.5 d.c[feels cold to touch] while arranging referral** ➢**Advise mother how to keep the young infant warm on the way to the Hospital** ➢**Refer URGENTLY to hospital**
•Only skin or eyes yellow	**JAUNDICE**	➢Advise mother to give home care for the young infant ➢Advise mother w/n to return immediately ➢F/up in 2 days

Cont…

2.THEN ASK:

Does the Young Infant Have Diarrhea?

SIGNS	CLASSIFY AS	TREATMENT [Urgent pre-referral Treatments are in bold print]
Two of the following signs: **¬ Movement only when stimulated or no movement even when stimulated** **¬ Sunken eyes** **¬ Skin pinch goes back very slowly**	**SEVERE DEHYDR -ATION**	**➢ Give first dose of IM Ampicillin and Gentamycin** **➢ If infant has another severe classification :** **¬ Refer URGENTLY to hospital with mother giving frequent sips of ORS on the way** **¬ Advise mother to continue breastfeeding more frequently** **¬ Advise mother how to keep the young infant warm on the way to hospital OR** **➢ If infant does not have Low weight or any other severe classification, give fluid for severe dehydration[Plan C] and refer to hospital after rehydration**

Cont…

SIGNS	CLASSIFY AS	TREATMENT [Urgent pre-referral Treatments are in bold print]
Two of the following signs: ¬ Restless ,irritable ¬ Sunken eyes ¬ Skin pinch goes back slowly	**S0ME DEHYD-RATION**	➢ **If infant has another severe classification : Refer URGENTLY to hospital with mother giving frequent sips of ORS on the way** **Advise mother to continue breastfeeding more frequently** **Advise mother how to keep the young infant warm on the way to hospital OR** **If infant does not have Low weight or any other severe classification, give fluid for some dehydration[Plan B]** **Advise mother when to return immediately** **Follow up in two days**

Cont…

SIGNS	CLASSIFY AS	TREATMENT [Urgent pre-referral Treatments are in bold print]
Not enough sign to classify as some or severe dehydration	**NO DEHYDR-ATION**	➢ Advise mother when to return immediately ➢ Follow up in 5days if not improving ➢ Give fluid to treat diarrhea at home[Plan A]
Diarrhea lasting 14days or more	**SEVERE PERSIST-ENT DIARRH-EA**	➢ Give first dose of IM Ampiillin and Gentamycin ➢ Treat to prevent Low blood sugar ➢ Advise how to keep infant warm on the way to hospital ➢ Refer to hospital
Blood in stool	**DYSENTE RY**	➢ Give first dose of IM Ampicillin and Gentamycin ➢ Treat to prevent Low blood sugar ➢ Advise how to keep infant warm on the way to hospital ➢ Refer to hospital

3.ASSESS FOR HIV INFECTION:

SIGN	CLASSIFY AS	TREATMENT
Positive PCR test in the young infant	**CONFIRMED HIV INFECTION**	➢Give CTM prophylaxis from 6weeks of age ➢Refer for ART ➢Assess feeding and counsel as necessary ➢Advice the mother on home care ➢F/up in 14 days
•Mother HIV positive OR •Child has positive HIV antibody test	**POSSIBLE HIV INFECTION(HIV EXPOSED)**	➢Assess feeding and counsel as necessary ➢Give CTM prophylaxis from 6weeks of age ➢Confirm HIV status as soon as possible using PCR ➢F/up in 14 days

Assess for HIV infection cont…

SIGN	CLASSIFY AS	TREATMENT
•Negative HIV test in the mother or the child	**HIV INFECTION UNLIKELY**	➢Advice mother to give home care for the young infant

4.THEN CHECK FOR:
Feeding problem or low weight:

SIGN	CLASSIFY AS	TREATMENT
If any of the following signs: •Not well positioned or • Not well attached to breast or •Not suckling effectively or •Less than 8 breastfeeds in 24hrs or •Switching the breast frequently or	**FEE-DING**	➢Advise the mother to breastfeed as often and for as long as the infant wants, day and night. *If not well attached or not suckling effectively, teach correct positioning and attachment . *If breastfeeding less than 8 times in 24 hrs, advise to increase frequency of feeding.

SIGN Cont…	CLASSIFY AS Cont…	TREATMENT Cont…
•Not increasing frequency of breastfeeding during illness or •Receives other foods or drinks or the mother not breastfeeding at all or	**feeding PROBLEM OR**	*Empty one breast completely before switching to the other *Increase frequency of feeding during and after illness. ➢If receiving other foods or drinks, counsel mother about breastfeeding more, reducing other foods or drinks, and using a cup. ➢If not breastfeeding at all: -breastfeeding counseling and possible relactation.

SIGN Cont…	CLASSIFY AS Cont…	TREATMENT Cont…
•Low weight for age or •Thrush(ulcers or white patches in mouth)	**LOW WEI-GHT**	-Advise about correctly preparing breast milk substitutes and using a cup. ➢If thrush, teach the mother to treat thrush at home ➢Advise mother to give home care for the young infant ➢F/up any feeding problem or thrush in 2 days ➢F/up low weight for age in 14 days

SIGN Cont…	CLASSIFY AS Cont…	TREATMENT Cont…
Not low weight for age and no other sign of inadequate feeding	**NO FEEDI-NG PROB-LEM**	➢Advise mother to give home care for the young infant ➢Praise the mother for feeding the infant well

---

- Good positioning is recognized by the following signs:
- ⊣ Infant's neck is straight or bent slightly back
- ⊣ Infant's body is turned towards the mother
- ⊣ Infant's body is close to the mother, and
- ⊣ Infant's whole body is supported.
- Poor positioning is recognized by any of the following signs:
- ⊣ Infant's neck is twisted or bent forward
- ⊣ Infant's body is turned away from mother
- ⊣ Infant's body is not close to mother, or
- ⊣ Only the infant's head and neck are supported

5.THEN CHECK FOR:
Feeding problem or low weight
(when HIV +ve mother has decided not to breastfeed):

SIGN	CLASSIFY AS	TREATMENT
If any of the following signs: • Milk incorrectly or unhygienically prepared or • Giving inappropriate replacement milk or other foods/fluids or • Giving insufficient replacement feeds or	FEED-ING PRO-BLEM	➢Counsel about feeding and reinforce mothers choice ➢Explain the guidelines for optimal replacement feeding ➢Identify concerns of the mother and the family about feeding. Help the mother gradually withdraw other foods or fluids

SIGN Cont…	CLASSIFY AS Cont…	TREATMENT Cont…
•Mother mixing breast milk and other feeds or •Using a feeding bottle or •Low weight for age or •Thrush(ulcers or white patches in mouth)	OR LOW WEI-GHT	➢If mother is using a bottle, teach cup feeding. ➢If thrush, teach the mother to treat thrush at home ➢Advise mother to give home care for the young infant ➢F/up any feeding problem or thrush in 2 days ➢F/up low weight for age in 14 days

SIGN Cont…	CLASSIFY AS Cont…	TREATMENT Cont…
Not low weight for age and no other sign of inadequate feeding	**NO FEEDING PROBLEM**	➢Advise mother to give home care for the young infant ➢Praise the mother for feeding the infant well

6.THEN CHECK:
The young infant's immunization status:

Sch-	AGE	VACCINE	
edu-	0-14 days	BCG	OPV-0
le:	6 weeks	Penta1	OPV-1

7.ASSESS OTHER PROBLEMS

8.COUNSEL THE MOTHER ABOUT HER OWN HEALTH

Cont…

- For the details of treating the young infant and counseling the mother:-
  - **PLEASE** refer IMNCI chart booklet for health workers, prepared in 2008

III. ASSESS AND CLASSIFY THE SICK CHILD AGE 2 MONTHS UP TO 5 YEARS

- ASK THE MOTHER WHAT THE CHILD'S PROBLEMS ARE:

Determine if this is an initial or f/up visit for this problem

-If f/up visit, use the f/up instructions on TREAT THE CHILD chart.

-If initial visit, assess the child as follows:

Cont…

1.CHECK FOR GENERAL DANGER SIGNS

- The general danger signs:-
  - are signs of serious illness that are seen in children aged 2 mon-5 yrs.
  - need immediate action.

ASK:- Is the child able to drink or breastfeed?

- Does the child vomit everything?
- Has the child had convulsions?

Cont…

LOOK:- to see if the child is lethargic or unconscious

* A lethargic child- is drowsy and does not show interest in what is happening around him
* An unconscious child- cannot be wakened.

-He does not respond when he is touched, shaken or spoken to.

-to see if the child is convulsing now

Cont…

*If the child is convulsing now, manage the airways and treat the child with Diazepam.

- ✓ ***A child with any general danger sign needs URGENT attention; complete the assessment and any pre-referral treatment immediately so that referral is not delayed.***

Quiz

1. List at least 2 disease which are not classified under IMNCI.
2. What is IMNCI mean?
3. What are age categories for IMNCI?
4. List color code for IMNCI with their meaning.
5. list types of adherences

Cont…

2.ASK ABOUT MAIN SYMPTOMS:

2.1.Does the child have cough or difficult breathing?

IFYES, - ASK: For how long?

-COUNT the breaths in one minute

- LOOK for chest in-drawing

- LISTEN for stridor

Cont…

If the child is:	The child has fast breathing if you count:
2 months up to 12 months	50 breaths per minute or more
12 months up to 5 years	40 breaths per minute or more

SIGNS	CLASSIFY AS	IDENTIFY TREATMENT (Urgent pre-referral treatments are in bold print)
• Any general danger sign or • Chest indrawing or • Stridor in calm child	**SEVERE PNEUMONIA OR VERY SEVERE DISEASE**	▸ **Give first dose of Cotrimoxazole** ▸ **Refer URGENTLY to hospital**
• Fast breathing	**PNEUMONIA**	▸ **Give Cotrimoxazole for 5 days.** ▸ Soothe the throat and relieve the cough with a safe remedy. ▸ Advise mother when to return immediately. ▸ Follow-up in 2 days.
• No signs of pneumonia or very severe disease.	**NO PNEUMONIA: COUGH OR COLD**	▸ If coughing more than 21 days, refer for assessment. ▸ Soothe the throat and relieve the cough with a safe remedy ▸ Advise mother when to return immediately. ▸ Follow-up in 5 days if not improving.

Cont…

*Use Amoxicillin as first line drug for Pneumonia if the child has been on cotromoxazole prophylaxis for PcP.

Antibiotic dosage for pneumonia:

	COTRIMOXAZOLE (Trimethoprim + Sulphamethoxazole) Give two times daily for five days				**AMOXICILLIN Give three times daily for five days**
AGE or WEIGHT	ADULT TABLET 80 mg Trimethoprim + 400 mg Sulphamethoxazole	PAEDIATRIC TABLET 20mg Trimethoprim + 100 mg Sulphamethoxazole	SYRUP 40 mg Trimethoprim + 200 mg Sulphamethoxazole per 5 ml	TABLET 250 mg	SYRUP 125 mg per 5 ml
2 months up to 12 months (4-10 kg)	½	2	5ml	½	5ml
12 months up to 5 years (10-19 kg)	1	3	7.5ml	1	10ml

Cont…

2.2.Does the child have diarrhea?

IF YES,ASK: -for how long?

-is there blood in the stool?

LOOK:- is the child:

*lethargic or unconscious?

* restless and irritable?

-for sunken eyes

Cont…

OFFER the child fluid. Is the child:

- Not able to drink or drinking poorly?

-Drinking eagerly, thirsty?

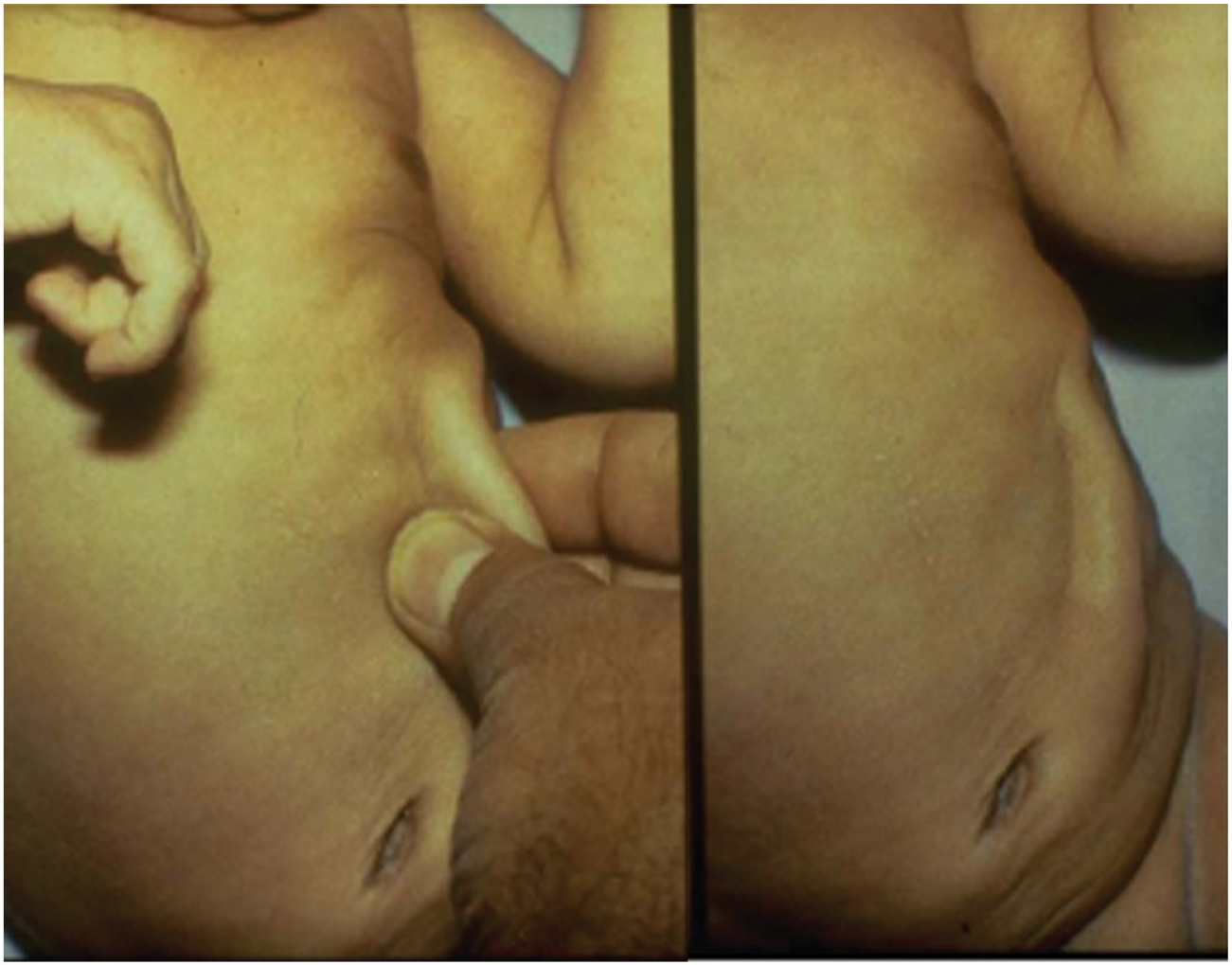
PINCH the skin of the abdomen.

Does it go back:

- very slowly[longer than 2 seconds]?

- slowly?

Cont…



skin pinch

skin pinch which goes back very slowly

Classification of diarrhea:

✓For dehydration:

SIGNS	CLASSIFY AS	Rx[**urgent pre-referral treatments are in bold** print]
Two of the following signs: •Lethargic or unconscious •Sunken eyes •Not able to drink or drinking poorly •Skin pinch goes back very slowly	**SEVERE DEHYDRATION**	If child has no other severe classification -Give fluid for severe dehydration[plan C] OR **If child also has another severe classification:** **Refer URGENTLY to hospital with mother giving frequent sips of ORS on the way.** **Advise the mother to continue breastfeeding** ➢**If child is 2 yrs or older, and there is cholera in your area, give antibiotic for cholera**

Classification for **dehydration** cont…

SIGNS	CLASSIFY AS	Rx[**urgent pre-referral treatments are in bold** print]
Two of the following signs: •Restless, irritable •Sunken eyes •Drinks eagerly, thirsty •Skin pinch goes back slowly	**SOME DEHYDRATION**	➢Give fluid, zinc supplements and food for some dehydration[plan B] **If child also has a severe classification: -Refer URGENTLY to hospital with mother giving frequent sips of ORS on the way.** **Advise the mother to continue breastfeeding.** ➢Advise mother when to return immediately ➢F/up in 5 days if not improving ➢If confirmed/suspected symptomatic HIV, f/up in 2 days if not improving

Classification for **dehydration** cont…

SIGNS	CLASSIFY AS	TREATMENT
Not enough sign to classify as some or severe dehydration	**NO DEHYDRATION**	➢Give fluid, zinc supplements and food to treat diarrhea at home[plan A] ➢Advise mother when to return immediately ➢F/up in 5 days if not improving ➢If confirmed/suspected symptomatic HIV, f/up in 2 days if not improving

Classification cont…

✓ If diarrhea 14 days or more:

SIGNS	CLASSIFY AS	TREATMENT
•Dehydration present	**SEVERE PERSISTENT DIARRHEA**	➢**Treat dehydration before referral unless the child has another severe classification.** ➢**Give vitamin A** ➢**Refer to hospital**
•No dehydration	**PERSISTENT DIARRHEA**	➢Advise the mother on feeding recommendation for a child who has PERSISTENT DIARRHEA ➢**Give vitamin A, therapeutic dose** ➢Advise mother w/n to return immediately ➢F/up in 5 days

Classification cont…

✓ If blood in stool:

SIGNS	CLASSIFY AS	TREATMENT
Blood in the stool	**DYSENTERY**	➢Treat for 5 days with cotrimoxazole. ➢Advise mother when to return immediately. ➢F/up in 2 days.

Cont…

2.3.Does the child have fever?

[By history or feels hot or has axillary temperature of 37.5℃ or above].

IF YES:

Decide malaria risk: high or low or no.

If ‘low or no’ malaria risk, then ask:

- Has the child travelled outside this area during the previous 15 days?
- If yes, has he/she been to a malarious area?

Cont…

*If malaria risk is high or low or travel to malarious area, then do blood film or RDT[rapid diagnostic test],if possible.

THEN ASK:

- For how long has the child had fever?
- If more than seven days, has the fever been present every day?
- Has the child had measles within the last three months?

Cont…

LOOK AND FEEL:

- Look or feel for stiff neck
- Look or feel for bulging fontanelles (under one year old)
- Look for runny nose
- Look for signs of MEASLES
- Generalized rash and one of these: cough, runny nose, red eyes

Cont…

If the child has measles now or within the last three months:

- Look for mouth ulcers

Are they deep and extensive?

- Look for pus draining from the eye
- Look for clouding of the cornea

If MEASLES now or within the last 3 months, classify

SIGN	CLASSIFY	TREATMENT
•Any general danger sign or •Clouding of cornea or •Deep or extensive mouth ulcers	**SEVERE COMPLICATED MEASLES**	➢**Give vitamin A, first dose** ➢**Give first dose of CAF** ➢**If clouding of the cornea or pus draining from the eye, apply TTC eye ointment** ➢**Refer URGENTLY to hospital**

Cont…

SIGN cont…	CLASSIFY cont…	TREATMENT cont…
•Pus draining from the eye or •Mouth ulcers	MEASLES WITH EYE OR MOUTH COMPLICATIONS	➢Give vitamin A, therapeutic dose ➢If pus draining from the eye, treat eye infection with TTC eye ointment ➢If mouth ulcers treat with gentian violet ➢Advise mother w/n to return immediately ➢F/up in 2 days
•Measles now or within the last 3 months	MEASLES	Give vitamin A, therapeutic dose Advise mother w/n to return immediately

If high malaria risk:

SIGN	CLASSIFY AS	TREATMENT
•Any general danger sign or •Stiff neck or •Bulging fontanels	**VERY SEVERE FEBRILE DISEASE**	➢**Give quinine for severe malaria[first dose]** ➢**Give first dose of CAF** ➢**Treat the child to prevent low blood sugar** ➢**Give one dose of paracetamol in clinic for high fever[38.5°C or above]** ➢**Refer URGENTLY to hospital**

If high malaria risk cont…

SIGN cont…	CLASSIFY AS cont…	TREATMENT cont…
•Positive blood film/RDT or •Blood film/RDT not available, fever[by history or feels hot or temperature 37.5℃ or above]	**MALARIA**	➢**Treat with coartem** ➢**Give one dose of paracetamol in clinic for high fever[38.5℃ or above]** ➢Advise mother w/n to return immediately ➢F/up in 2 days if fever persists ➢If fever is present every day for more than 7 days, refer for assessment

If low malaria risk:

SIGN	CLASSIFY AS	TREATMENT
•Any general danger sign or •Stiff neck or •Bulging fontanels	**VERY SEVERE FEBRILE DISEASE**	➢**Give quinine for severe malaria[first dose]** ➢**Give first dose of CAF** ➢**Treat the child to prevent low blood sugar** ➢**Give one dose of paracetamol in clinic for high fever[38.5℃ or above]** ➢**Refer URGENTLY to hospital**

If low malaria risk cont…

SIGN cont…	CLASSIFY AS cont…	TREATMENT cont…
•Positive blood film/RDT or •If blood film/RDT not available, -No runny nose and -No measles and -No other cause of fever	**MALARIA**	➢**Treat with coartem** ➢**Give one dose of paracetamol in clinic for high fever[38.5℃ or above]** ➢Advise mother w/n to return immediately ➢F/up in 2 days if fever persists ➢If fever is present every day for more than 7 days, refer for assessment

If low malaria risk cont…

SIGN cont…	CLASSIFY AS cont…	TREATMENT cont…
•Negative blood film/RDT or •If blood film/RDT not available, -Runny nose PRESENT or - Measles PRESENT or - Other cause of fever PRESENT	**FEVER MALARIA UNLIKELY**	➢**Give one dose of paracetamol in clinic for high fever[38.5°C or above]** ➢**Treat other obvious causes of fever** ➢Advise mother w/n to return immediately ➢F/up in 2 days if fever persists ➢If fever is present every day for more than 7 days, refer for assessment

If no malaria risk:

SIGN	CLASSIFY AS	TREATMENT
•Any general danger sign or •Stiff neck or •Bulging fontanels	**VERY SEVERE FEBRILE DISEASE**	➢ **Give first dose of CAF** ➢**Treat the child to prevent low blood sugar** ➢**Give one dose of paracetamol for high fever[38.5℃ or above]** ➢**Refer URGENTLY to hospital**

If no malaria risk cont…

SIGN cont…	CLASSIFY AS cont…	TREATMENT cont…
•Any fever	**FEVER [NO MALARIA]**	➢**Give one dose of paracetamol for high fever[38.5℃ or above]** ➢**Treat other obvious causes of fever** ➢F/up in 2 days if fever persists ➢If fever is present every day for more than 7 days, refer for assessment

2.4.Does the Child Have an Ear problem?

IF YES, ASK:

- Is there ear pain?
- Is there ear discharge?

If yes, for how long?

LOOK:

- for pus draining from the ear.

FEEL:

- for tender swelling behind the ear.

Cont…

Classification for ear problem:

SIGN	CLASSIFY AS	TREATMENT
•Tender swelling behind the ear	**MASTOIDITIS**	➢**Give first dose of Cotrimoxazole** ➢**Give first dose of Paracetamol for pain** ➢**Refer URGENTLY to hospital**
•Pus is seen draining from the ear and discharge is reported for less than 14 days, or •Ear pain	**ACUTE EAR INFECTION**	➢**Give Cotrimoxazole for 5 days** ➢**Give paracetamol for pain.** ➢Dry the ear by wicking. ➢Follow-up in 5 days.

Cont…

SIGN cont…	CLASSIFY AS cont…	TREATMENT cont…
•Pus is seen draining from the ear and discharge is reported for 14days or more	**CHRONIC EAR INFECTION**	➢Dry the ear by wicking. ➢Treat with topical quinolone eardrops for 2 weeks ➢Follow-up in 5 days
•No ear pain and •No pus seen draining from the ear.	**NO EAR INFECTION**	➢No treatment

Cont…

3.THEN CHECK FOR MALNUTRITION AND ANAEMIA:

❖**Malnutrition**

- For all children:
  - Feel for edema of both feet
  - Determine weight for age
- For children up to 6 months:
  -Look for visible severe wasting
- For children ≥ 6 months(Lt/Ht 65-110):
  -Determine if MUAC is < 110mm
  -Assess appetite(if MUAC <110mm or edema of both feet

--

- Severe malnutrition develops when the child is not getting enough nutrients from his food to meet his nutritional needs.
- frequent illnesses can also develop severe malnutrition.
- When the child has under nutrition:
  * The child may become severely wasted
  * The child may develop edema
  * The child may not grow well and become stunted.

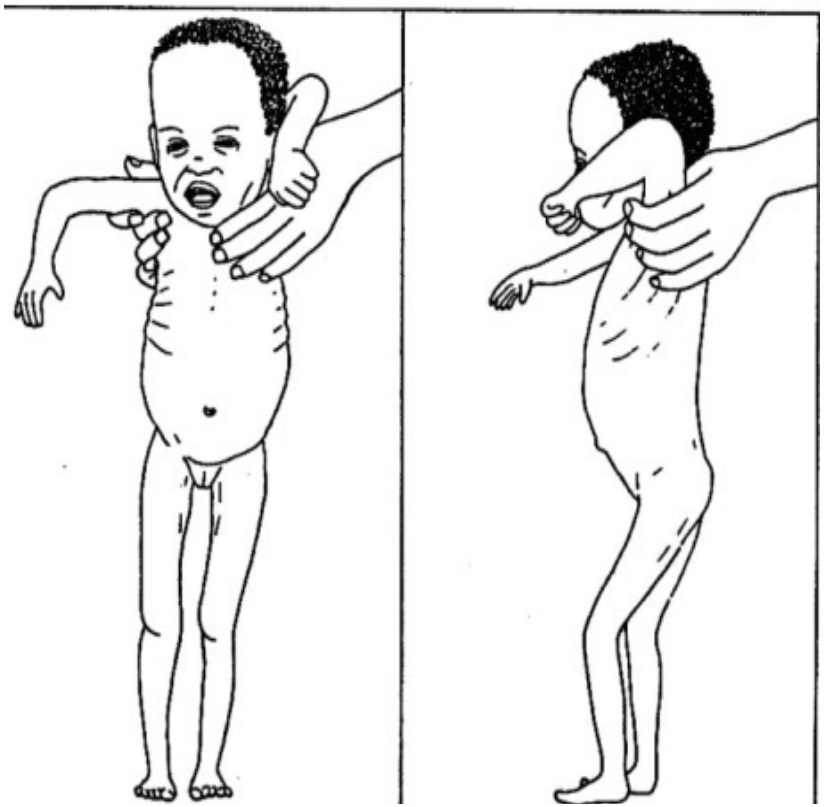
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- Not eating foods that contain Vitamin A can result in Vitamin A deficiency.
- A child with Vitamin A deficiency is at increased risk of death or blindness.
- Not eating foods rich in iron can lead to iron deficiency anemia.
- A child can also develop anemia as a result of:
  - Infections
  - Parasites such as hookworm or whipworm. They can cause blood loss from the gut and lead to anemia.
  - Malaria. Often anemia is a result of a combination of malnutrition and malaria.

Grades of edema:

Grade		Description
+	Mild	Edema of both feet and below the ankle
++	Moderate	Edema of both feet plus lower legs (below knees) and lower arms (below the elbow)
+++	Severe	Generalized edema including both feet, legs, hands, arms and the face

Sever wasting



CLASSIFY NUTRITIONAL STATUS

- There are three classifications for an infant less than 6 months and four classifications for
- children 6 months and above.
- They are:
- For infants less than 6 months;
- ¬ Complicated severe acute malnutrition
- ¬ Moderate acute malnutrition
- ¬ No acute malnutrition
- For children 6 months or above
- ¬ Severe complicated acute malnutrition
- ¬ Severe uncomplicated acute malnutrition
- ¬ Moderate acute malnutrition
- ¬ No acute malnutrition

Clas.AM for <6 months

PRESENTATION	CLASSIFY AS	TREATMENT
Pitting edema of both feet, OR • Visible severe wasting, OR • WFL < -3Z, or WFL <70% of median	**COMPLICATED SEVERE ACUTE MALNUTRITION or**	**Give 1st dose of Ampicillin and Gentamycin IM** **ᴍ Treat the child to prevent low blood sugar** **ᴍ Advise mother on the need of referral** **ᴍ Refer Urgently to Hospital**

signs	classification	rx
o pitting edema of both feet, AND • No visible severe wasting, AND • WFL ≥ -3Z to < -2Z, or WFL ≥ 70% to <80% of median	MODERATE ACUTE MALNUTRITION OR	Assess feeding and advise the mother on feeding ⊣ Follow up in 5 days if feeding problem ⊣ Follow up in 30 days
No pitting edema of both feet, AND • No visible severe wasting, AND • WFL ≥ -2Z, or WFL ≥ 80% of median	NO ACUTE MALNUTRITION	Assess feeding and advise the mother on feeding -If feeding problem—follow up in 5days ⊣ If no feeding problem—praise the mother

Clas.AM age 6months—59months

Pitting edema of both feet, or WFH <-3 Z or WFH <70%, or MUAC <11cm; AND Any of the following: • Any general danger sign, • Any medical complication • +++ Dermatosis • Failed appetite test OR • +++ Edema,OR • Marasmic kwashiorkor (Edema of both feet with WFH< -3 Z, or with WFH<70% or with MUAC<11cm	COMPLICATED SEVERE ACUTE MALNUTRITION OR	Give 1st dose of Ampicillin and Gentamycin IM ⊣ Treat the child to prevent low blood sugar ⊣ Advise the mother to feed and keep the child warm ⊣ Advise mother on the need of referral ⊣ Refer Urgently to Hospital or admit to inpatient care

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Pitting edema of both feet (+, ++), or WFH <-3 Z or WFH <70%, or MUAC <11cm; AND • No general danger sign, and • No medical complication, and • Passed appetite test	UNCOMPLICATED SEVERE ACUTE MALNUTRITION OR	If Outpatient Treatment Program (OTP) is available, manage as follows: • Give RUTF for 7 days, • Give oral amoxicillin for 7 days • Give single dose of 5mg folic acid for those with anemia • Counsel on how to feed RUTF to the child • Advise the mother when to return immediately • Follow-up in 7 days ⊣|

--

No pitting edema of both feet, AND • WFH ≥ –3 Z to < -2 Z, or WFH 70% to < 80%, or MUAC 11 to < 12cm	MODERATE ACUTE MALNUTRITION	Refer to Supplementary Feeding Program if available ⊣ Asses for feeding and counsel the mother accordingly ⊣ If feeding problem, follow up in 5 days ⊣ Follow up in 30 days
No pitting edema of both feet, AND • WFH ≥ -2 Z,or WFH ≥ 80%, or MUAC ≥ 12cm	NO ACUTE MALNUTRITION	Assess feeding and advise the mother on feeding ⊣ If feeding problem—follow up in 5 days ⊣ If no feeding problem—praise the mother

Cont…

❖ **Anemia**

Look for palmar pallor. Is it:

-Severe palmar pallor?

-Some palmar pallor?

Cont…

PRESENTATION	CLASSIFY AS	TREATMENT
•Severe palmar pallor	**SEVERE ANAEMIA**	➢**Refer URGENTLY to hospital**
•Some palmar pallor	**ANAEMIA**	➢Assess the child's feeding and counsel the mother on feeding according to the food box on the COUNSEL THE MOTHER chart ➢Give iron ➢Give oral antimalarial if high malaria risk ➢Give mebendazole or Albendazole if child is 1 year or older and has not had a dose in the previous six months ➢Advise mother when to return immediately ➢Follow up in 14 days

Cont…

PRESENTATION cont…	CLASSIFY AS cont…	TREATMENT cont…
No palmar pallor	**NO ANAEMIA**	No treatment

4.THEN ASSESS FOR HIV INFECTION:

PRESENTATION	CLASSIFY AS	TREATMENT
•Positive HIV antibody test in the child 18 months and above, or, positive PCR test at any age AND •Two or more of the following HIV related conditions: -Pneumonia/severe pneumonia -Persistent diarrhea/severe persistent diarrhea -Ear discharge -very low weight/severe malnutrition -Oral thrush -Enlarged palpable lymph nodes in two or more sites[neck, axilla, or groin] -Bilateral parotid enlargement for 14 days or more	**CONFIRMED SYMPTOMATIC HIV INFECTION**	➢Give CTM prophylaxis ➢Treat HIV-related conditions if present(eg. Oral thrush) ➢Give multivit. supplements ➢Assess the child's feeding and counsel as necessary ➢HCT for the mother ➢Advise the mother on home care ➢Refer for ARV

Cont…

PRESENTATION cont…	CLASSIFY AS cont…	TREATMENT cont…
•Positive HIV antibody test in the child 18 months and above, or, positive PCR test at any age AND •Less than two HIV related conditions:	**CONFIRMED HIV INFECTION**	➢Give CTM prophylaxis ➢Treat HIV-related conditions if present(eg. Oral thrush) ➢Give multivit. supplements ➢Assess the child's feeding and counsel as necessary ➢Advise the mother on home care ➢HCT for the mother ➢Refer for ARV

Cont…

PRESENTATION cont…	CLASSIFY AS cont…	TREATMENT cont…
•Positive HIV antibody test in a child under 18 months , OR, no HIV test result in a child AND •Two or more HIV-related conditions	**SUSPECTED SYMTOMATIC HIV INFECTION**	➢Give CTM prophylaxis ➢Treat HIV-related conditions if present(eg. Oral thrush) ➢Give multivit. supplements ➢Assess the child's feeding and counsel as necessary ➢HCT for the mother and child ➢Advise the mother on home care ➢Follow- up in 14 days

Cont…

PRESENTATION cont…	CLASSIFY AS cont…	TREATMENT cont…
•Positive HIV antibody test in a child under 18 months OR •Mother HIV positive	**POSSIBLE HIV INFECTION or (HIV EXPOSED)**	➢Give appropriate feeding advice ➢Treat HIV-related conditions if present(eg. Oral thrush) ➢Give CTM prophylaxis and test for HIV at 18 months(if child still breastfeed repeat HIV testing 3 months after stopping breastfeeding) ➢Assess child's feeding and counsel as necessary ➢Follow-up in 14 days

Cont…

PRESENTATION cont…	CLASSIFY AS cont…	TREATMENT cont…
•Not enough signs to classify as symptomatic or possible HIV infection	**HIV INFECTION UNLIKELY**	➢No specific action for HIV

5.THEN CHECK :
The child's immunization and vitamin A status:

Sch-	AGE	VACCINE	
edu-	0-14 days	BCG	OPV-0
le:	6 weeks	Penta1	OPV-1
	10 weeks	Penta2	OPV-2
	14 weeks	Penta3	OPV-3
	9 months	Measles	Vitamin A

Cont…

VITAMIN A SUPPLEMENTATION

- Give Vitamin A every 6 months from 6 months of age up to the age of 5 years

ROUTINE WORM TREATMENT

- Give mebendazole or Albendazole if child is 1 year or older and has not had a dose in the previous six months

Cont…

6. ASSESS OTHER PROBLEMS
7. COUNSEL THE MOTHER ABOUT HER OWN HEALTH

Cont…

ORAL ANTIBIOTIC

- FOR PNEUMONIA,ACUTE EAR INFECTION OR VERY SEVERE DISEASE:

  First line-Cotrimoxazole

  Second line-Amoxacilline

  - Use Amoxacillin as first line drug for Pneumonia if the child has been on CTM prophylaxis for PcP.

Cont…

- FOR DYSENTERY:

  First line-Cotrimoxazole

  Second line-Ciprofloxacin

- FOR CHOLERA:

  First line-TTC

  Second line-CTM

Cont…

ORAL ANTIMALARIA

First line-Coartem

[Quinine for infants<5KG body weight]

Second line-Quinine

Chloroquine-for Vivax malaria

ZINC SUPPLIMENTATION

-For all children with diarrhea

-Once daily for 10 days

Cont…

CTM Prophylaxis

- For possible HIV infection or HIV exposed:

  -give once daily from the age of 6 wks until HIV infection is ruled out and

  -the mother is no longer breastfeeding

- For suspected symptomatic HIV or confirmed HIV infection

  -Once daily indefinitely where ART is not yet available

Cont…

-For those taking ART, CTM may only be stopped if:

*restoration of the immune system is confirmed for 6 months or more

- Do not give CTM for those aged <6 wks

Cont…

VITAMIN A

- For Measles, Measles with eye/mouth complications and Persistent diarrhea, give three doses

  -First dose in clinic

  -Two doses in the clinic on days 2 and 15

- For child with severe Malnutrition, severe complicated measles or severe persistent diarrhea:

  -give one dose in clinic and then refer

Cont…

- For a routine vitamin A supplementation, for children aged 6months-5yrs:-

  -give one dose in clinic if the child has not received a dose within the last 6months.

TREATMENT FOR DEHYDRATION

Plan A :-sets out home treatment for children with diarrhea but no dehydration.

-to prevent dehydration occurring

-States the 4 Rules of Home Treatment

1. Give extra fluids (as much as the child will take)

Tell the mother:

-To breastfeed frequently and for longer at each feed

Plan A cont…

-If the child is exclusively breastfed, give ORS in addition to breastmilk.

- If the child is not exclusively breastfed, give one or more of the following:ORS solution, food-based fluids (such as soup, rice water and yoghurt drinks), or clean water.

Plan A cont…

It is especially important to give ORS at home when:

– The child has been treated with Plan B or Plan C during this visit.

– The child cannot return to a clinic if the diarrhoea gets worse.

- Teach the mother how to mix and give ORS.
- Give the mother 2 packets of ORS to use at home.
- Show the mother how much fluid to give in addition to the usual fluid intake:

Plan A cont…

*Up to 2 years 50 to 100 ml after each loose stool

*2 years or more 100 to 200 ml after each loose stool.

Tell the mother to:

– Give frequent small sips from a cup.

– If the child vomits, wait 10 minutes. Then continue, but more slowly.

– Continue giving extra fluid until the diarrhoea stops.

Plan A cont…

2. **Give zinc supplements:**

● Tell the mother how much zinc to give:

Up to 6 months	1/2 tablet for 10 days
6 months or more	1 tablet for 10 days

● Show the mother how to give Zinc supplements

– Infants — dissolve tablet in a small amount of expressed breastmilk, ORS or clean water in a cup;

– Older children — tablets can be chewed or dissolved in a small amount of clean water in a cup.

Plan A cont…

3**. Continue feeding**

4 **.Tell her when to return**

Rx for dehydration cont…

Plan B: Treat Some Dehydration with ORS

Give in clinic recommended amount of ORS over 4-hour period

DETERMINE AMOUNT OF ORS TO GIVE DURING FIRST 4 HOURS

Plan B cont…

AGE	Up to 4 months	4monthsup to 12 months	12 months up to 2 yrs	2yrs up to 5 yrs
Weight in KG	<6 KG	6-10 KG	10-12 KG	12-19 KG
ORS in ml	200-400	400-700	700-900	900-1400

✓Use the child's age only when you do not know the weight. The approximate amount of ORS required (in ml) can also be calculated by **multiplying the child's weight (in kg) times 75**.

Plan B cont…

- If the child wants more ORS than shown, give more.
- For infants under 6 months who are not breastfed, also give 100–200 ml clean water during this period.

SHOW THE MOTHER HOW TO GIVE ORS SOLUTION.

- Give frequent small sips from a cup or cup and spoon (one spoon every 1–2 minutes).
- If the child vomits, wait 10 minutes. Then continue, but more slowly.
- Continue breastfeeding whenever the child wants

Plan B cont…

AFTER 4 HOURS:

- Reassess the child and classify the child for dehydration.
- Select the appropriate plan to continue treatment.
- Begin feeding the child in clinic.

Plan B cont…

IF THE MOTHER MUST LEAVE BEFORECOMPLETING

TREATMENT:

- Show her how to prepare ORS solution at home.
- Show her how much ORS to give to finish 4-hour treatment at home.
- Give her enough ORS packets to complete rehydration. Also give her 2 packets of ORS as recommended in Plan A.

Cont…

- Explain the 4 Rules of Home Treatment:
  1 .GIVE EXTRA FLUIDS
  2. GIVE ZINC SUPPLEMENTS
  3 .CONTINUE FEEDING
  4 .WHEN TO RETURN

Rx of dehydration cont…

Plan C: Treat Severe Dehydration Quickly

- Start iv fluid immediately.
- If child can drink, give ORS by mouth while the drip is set up.Give100ml/KG Ringer’s lactate solution[or, if not available, normal saline], divided as follows:

Plan C cont…

AGE	First give 30ml/KG in:	Then give 70ml/KG in:
Infants [under 12 months]	1 hr*	5 hrs
Children [12 months up to 5 yrs]	30 minutes*	2 ½ hrs

Plan C cont…

- Repeat once if radial pulse is still very weak or not detectable
- Re-assess the child every 1-2 hrs. If hydration status is not improving, give the IV drips more rapidly
- Also give ORS [about 5 ml/KG/hr] as soon as the child can drink, usually after 3-4 hrs[infants] or 1-2 hrs[children]
- Re-assess an infant after 6 hrs and a child after 3 hrs. Classify dehydration. Then choose the appropriate plan[A,B or C]to continue Rx.

- **For the details** of treatment of the sick child aged 2 months up to 5 years:-
  - **PLEASE** refer IMNCI chart booklet for health workers, prepared in 2008

Exercise

1. Fasil is a 4-year-old boy who has diarrhea. He has no general danger signs. He was classified as having diarrhea with NO DEHYDRATION and NO ANAEMIA AND NO ACUTE MALNUTRITION. He will be treated according to Plan A.

a. What are the *four* rules of home treatment of diarrhea?

Exercise ....

2. Yasmin is 9 months old boy and weighs 8 kg. His length is 69 cm. Her mother brought her to the clinic with diarrhoea. The health worker classifies Yasmin as SOME DEHYDRATION and NO ANAEMIA AND NO ACUTE MALNUTRITION. The health worker chooses Plan B. He asks if Yasmin still breastfeeds. Her mother says that she breastfeeds several times each day. She also eats 3 meals each day of rice along with vegetables, pulses, and sometimes bits of meat.

a. Approximately how much ORS solution should Yasmin's mother give her during the first 4 hours?

b. After 4 hours of treatment, the health worker reassesses Yasmin. She is still classified as SOME DEHYDRATION. What is the appropriate plan to continue her treatment?

Exercise …

- Assume Seifu came to your clinic with age of 36 months, weight 15kg,temperature of 39 degree celcius, he is initial visit, when nurse assess he has no danger sign, he had cough for 4 days and RR is 44. He had also diarrhea 3 days back, eager to drink, skin pinch goes back slowly and irritable. he is from malaria high risk area.
- He had clouding of cornea, HIV status of antibody test or PCR of mother or baby is unknown. Had ear discharge for three days and also ear pain. Based on the above scenario fill IMNCI chart and classify accordingly.

Exercise …

Assume child Tola is 3 years old and comes to your pediatric ward. He developed shock and need resuscitation. If tola's weight is 20kg at the time of admission.

- a) Calculate the amount of fluid needed for resuscitation during the first 20-30 minutes.
- b) Calculate the maintenance fluid of child Tola.

Exercise…

- Discuss option A, B and C separately.

- ***Write a referral note for the mother to take with her to the hospital. Tell her to give it***
- ***to the health worker there.*** Write:
- * the name and age of the child
- * the date and time of referral
- * description of the child's problems
- * the reason for referral (symptoms and signs leading to severe classification)
- * treatments that you have given
- * any other information that the health worker at the hospital needs to know in order
- to care for the child, such as earlier treatment of the illness or immunizations needed
- * your name and the name of your clinic.

Fluid mgt

1. The first 10kg=100ml/kg
2. The 2nd 10kg=50ml/kg
3. >11kg=20ml/kg

1-3=will be given over 24 hrs

a. resuscitation=20ml/kg over 30-1hrs
b. Of 100%=85% fluid(1/3 NS+2/3 DNS)

=15% , 40% Glucose

1ampules of 40%=20ml