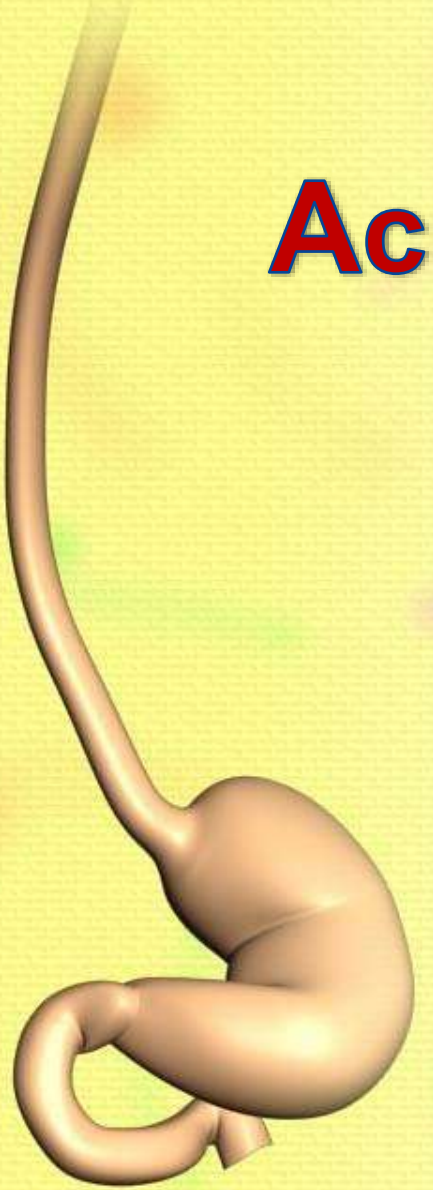
نحوه مدیریت و دارو درمانی ،
مشکلات شایع گوارشی در اطفال

دکترمنیژه خلیلی
فوق تخصص گوارش وکبد کودکان
دانشگاه علوم پزشکی زاهدان
مرکز تحقیقات سلامت کودکان و نوجوانان
1400 تیر ماه

Acute Gastroenteritis In Children



Acute Gastroenteritis In Children

An infection or inflammation of the digestive tract, particularly the stomach < intestines

Diarrhea (Gastro- Entritis)

Sudden onset of ↑ stool fluid

↓consistency

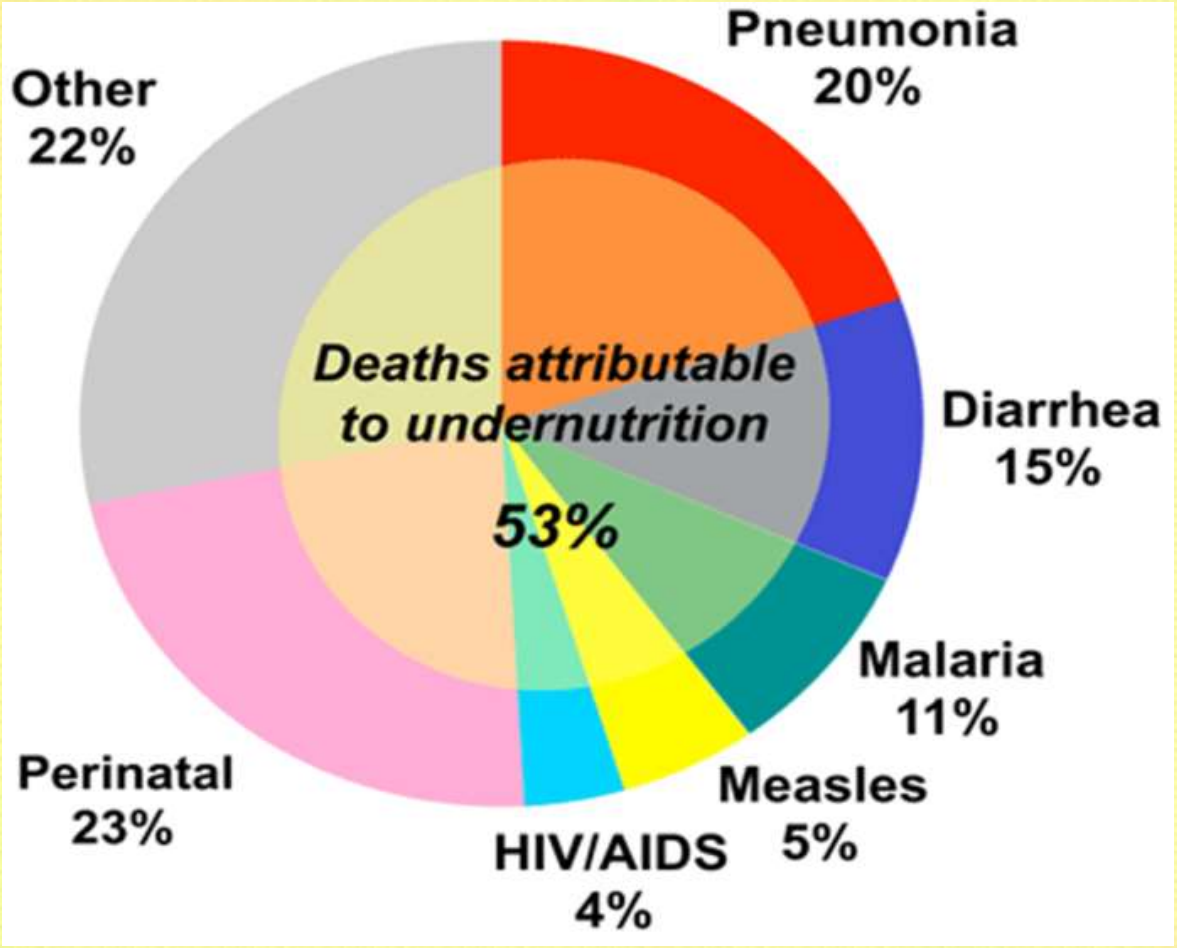
↑ Bowel movement ≥ 3 / day

Clinical Manifestation

Frequency # Diarrhea

Newborn breastfed = Loose& Pasty

Introduction



600.000 death /y/<5y→160.000

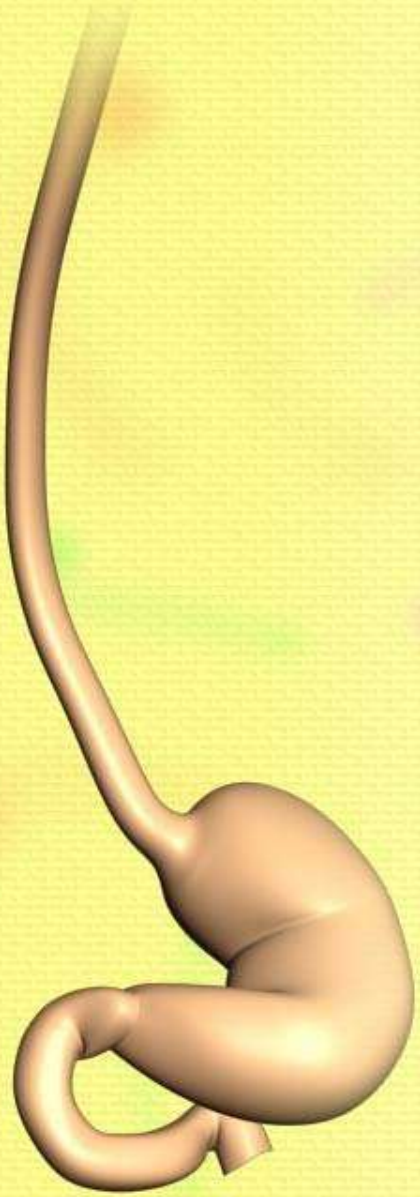
Epidemiology

Resource limited countries

Mortality ↓
Morbidity ↓
Prevalence →

Epidemiology

Economic
Endemic
Foodborne Transmission
Outbreak
Nosocomial
Zoonotic transmission
Seasonality



Immunization status
Residence
Drinkable water
Maternal knowledge
Chronicity of disease

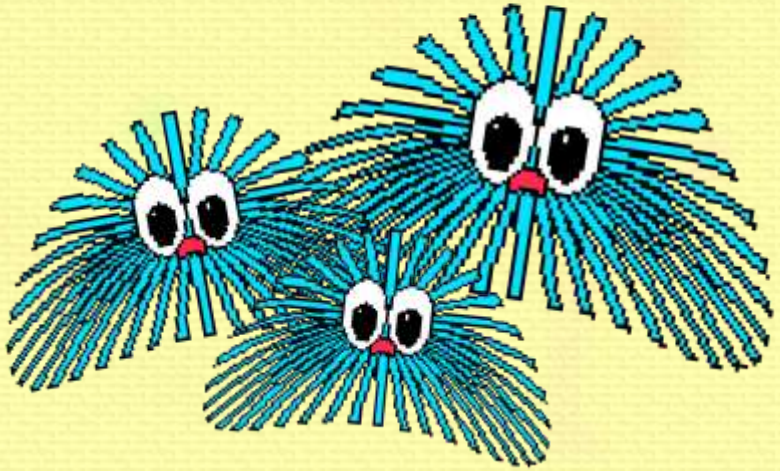
Viruses

Caliciviruses
Rotaviruses
Astroviruses
Adenoviruses
Norovirus

Covid 19

Bacteria

Shigella
Salmonela &Non SalmonelaThyphi(NTS)
Yersinia
***Campylobacter* bacterium**
Vibrio Cholera (Eltor)
Ecoli



Protozoa

Entamoeba histolytica,
Giardia lamblia
Cryptosporidium

Pathogen

Size of inoculum
Incubation Period
Patient immune system
Nutritional status
Socio economic status

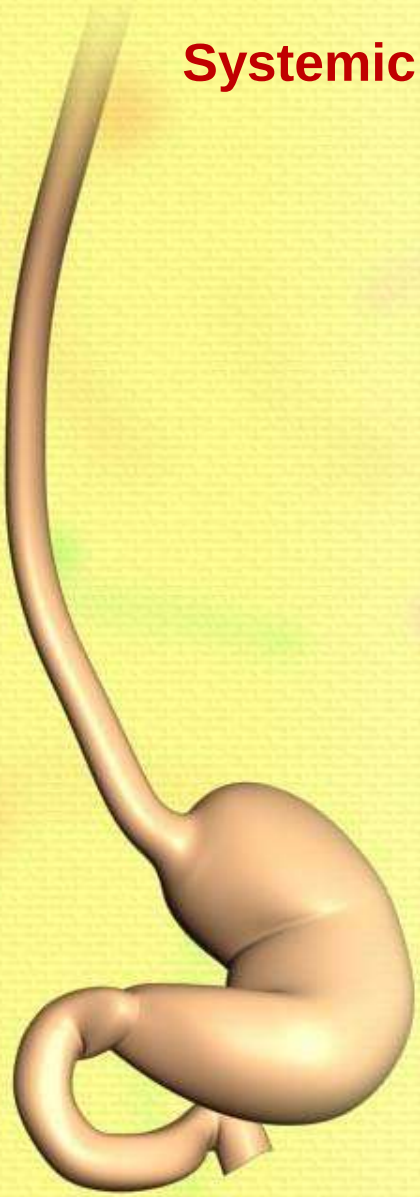
Pathogenesis

PARAMETER	TYPE OF INFECTION I	II	III
Mechanism	Noninflammatory (enterotoxin or adherence/superficial invasion)	Inflammatory, epithelial destruction (invasion, cytotoxin)	Penetrating
Location	Proximal small bowel	Colon	Distal small bowel
Illness	Watery diarrhea	Dysentery	Enteric fever
Stool examination	No fecal leukocytes Mild or no ↑ lactoferrin	Fecal polymorphonuclear leukocytes ↑↑ Lactoferrin	Fecal mononuclear leuko
Examples	*Vibrio cholerae* ETEC *Clostridium perfringens* *Bacillus cereus* *Staphylococcus aureus* Also†: *Giardia intestinalis* *Rotavirus* Noroviruses *Cryptosporidium* spp. EPEC, EAEC *Cyclospora cayetanensis*	*Shigella* EIEC STEC NTS *Vibrio parahaemolyticus* *Clostridium difficile* *Campylobacter jejuni* *Entamoeba histolytica**	*Yersinia enterocolitica* *Salmonella* Typhi, *S.* Paratyhpi, and occasion NTS, *Campylobacter*, ar *Yersinia*

- ☑ Acute watery diarrhea
- ☑ Persistent diarrhea
- ☑Invasive (bloody) diarrhea
- ☑Vibrio cholera induced diarrhea

●●●

Clinical Manifestation (Symptoms)

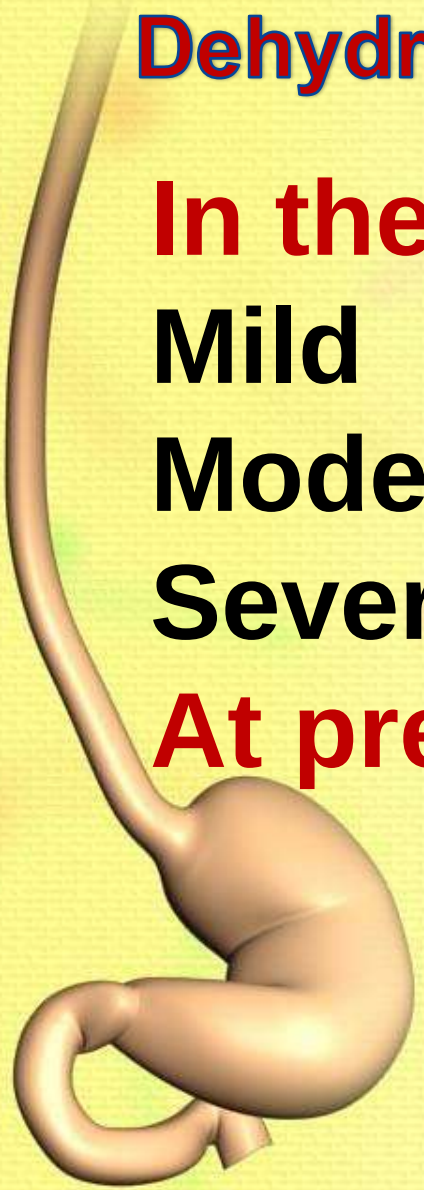


Systemic Findings:

- Nausea /Vomiting
- Fever
- Loss of appetite
- Crampy abdominal pain
- Watery/Bloody/Greasy/Mucus
- Frequency accompanied cramp
- Tenesmus
- Abdominal distention
- Irritability
- Illness
- Loss of consciousness
- Post infectious arthritis
- Rash
- Convulsion

Clinical Manifestation (Sign)

Dehydration



In the past

Mild 3-5%

Moderate 6-9%

Severe >10%

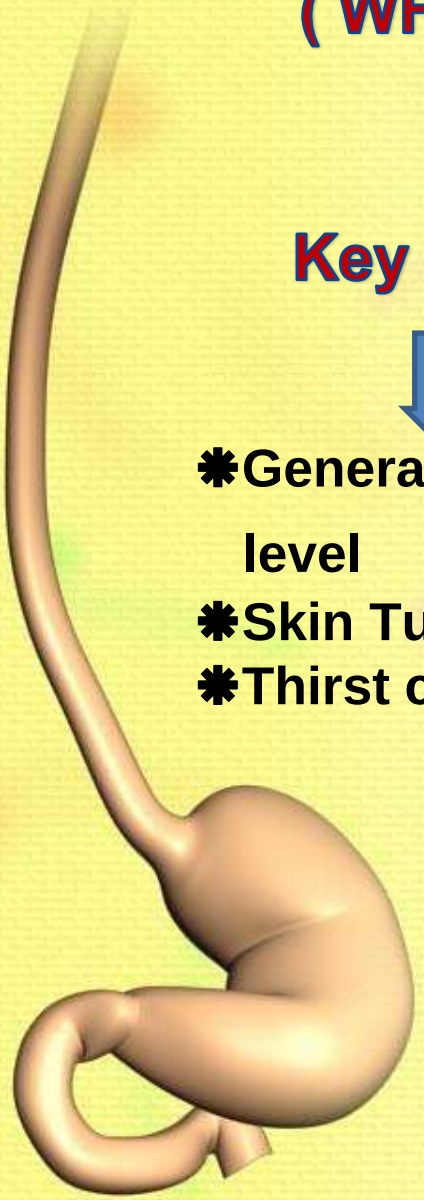
At present:⬇

No sign of Dehydration

Some Dehydration

Severe Dehydration

Clinical Manifestation Dehydration
(WHO protocol: IMCI= MANA)

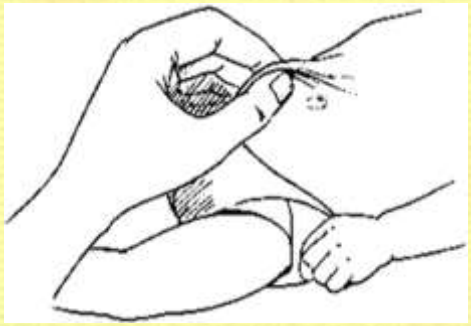


Key Signs

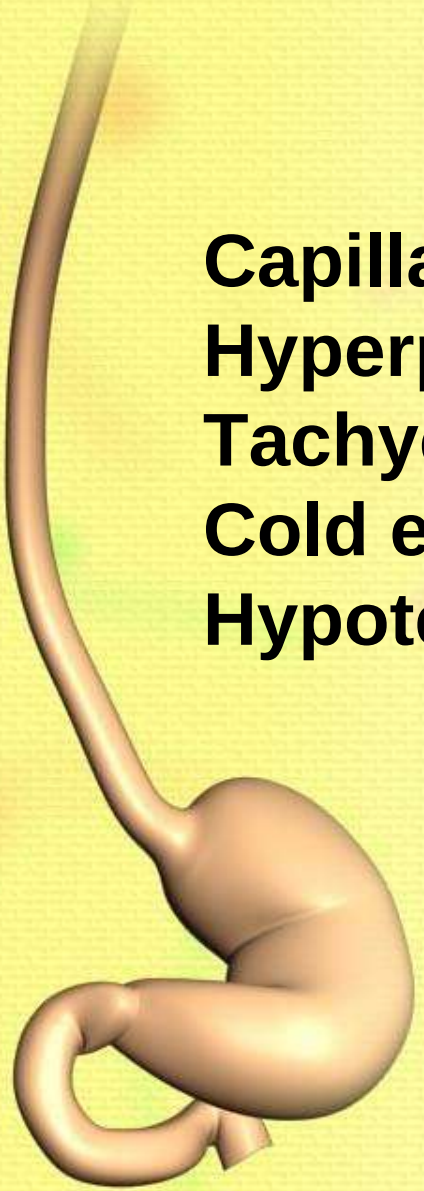
- ❋General Appearance& Consciousness &Activity level
- ❋Skin Turgor
- ❋Thirst condition

Non Key:

- ➔Dry Mucous membranes
- ➔Tearing level
- ➔Sunken Eyes



Dehydration → cont



Capillary refill time
Hyperpnoea (Deep & Rapid)
Tachycardia
Cold extremity
Hypotension

Laboratory Diagnosis

The majority of patients No need Stool/E

(Mucus/Blood/Neutrophil/ Lactoferrin)

Lactoferrin is (Entamoba/STEC/Breastfed)

Virology ⟶ Outbreak

(Noro/Rota/Adeno in US available / no Astrovirus)

Laboratory Diagnosis

Stool/C

Moderate to Severe

All bloody stool(Ecoli o157/H7)

Epidemic condition

Immunocompromised

HUS

Laboratory Diagnosis

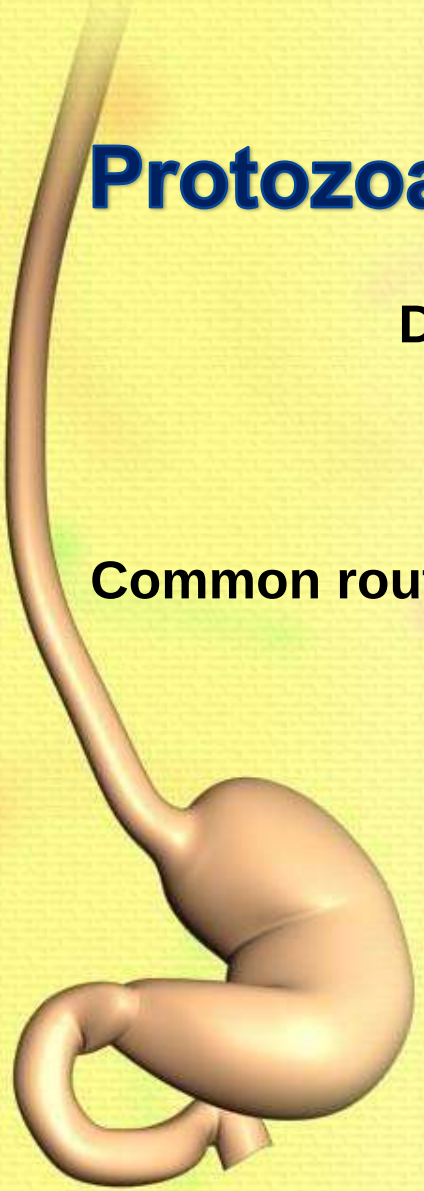
Infants>2year & AB use ⟶ C-Difficile

Nosocomial ⟶ Rare

Parasitology:

- ☑Recent travel to an endemic area
- ☑ Use of untreated water
- ☑Suggestive symptom

Laboratory Diagnosis



Protozoa Tests

Direct Microscopy (Cyst/Trophozoite x 3 times)

Common route : **Enzyme assay & Immunofluorescence Ab**
Nucleic Acid Amplification Test(NAAT)

Multiplex PCR

Laboratory Diagnosis

Electrolytes (Isonatremic) No necassary

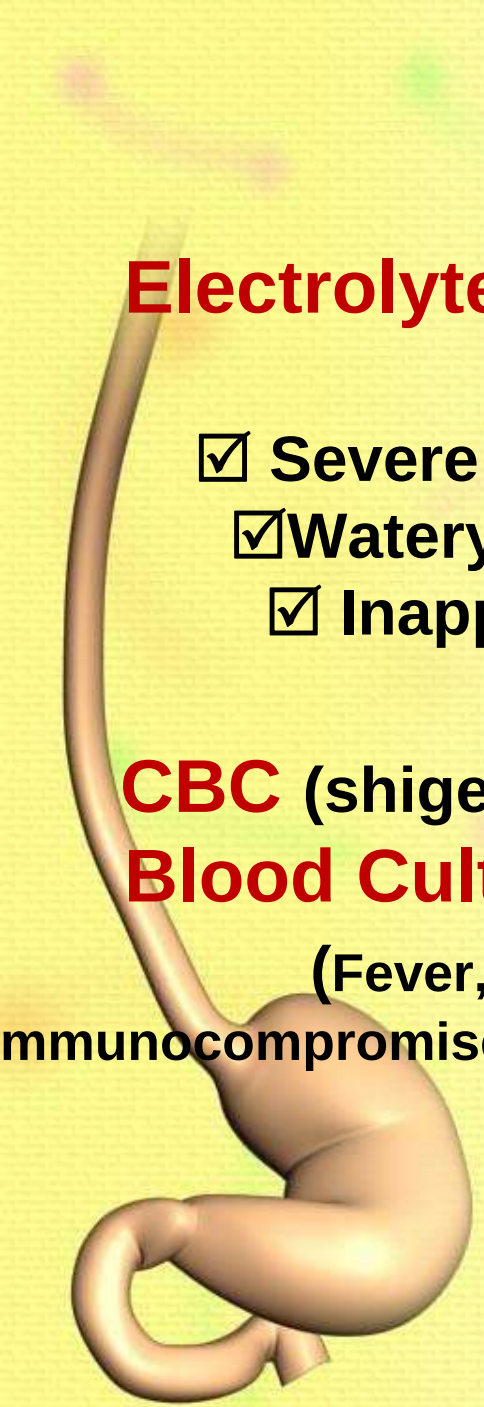
- ☑ Severe Dehydration
- ☑Watery & Frequent Diarrhea with Normal turgor
- ☑ Inappropriate rehydration at home

CBC (shigella → Bactermia, leukemoid reaction)

Blood Culture

(Fever,Bloody stool , Hemolytic anemia , Less than 3 mo

mmunocompromised



Laboratory Diagnosis (Specefic)

HUS:

CBC
PBS
Electrolytes
Renal Function Tests

Chronic ⟹ Colonoscopy (IBD)
Sweat Test

ASSOCIATED CONDITIONS

Systemic infections :

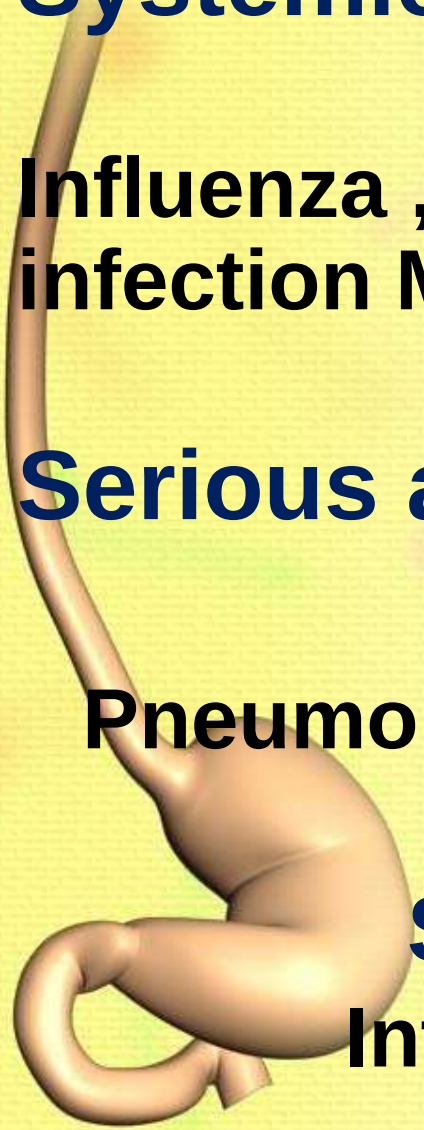
Influenza ,Measles , Dengue fever, HIV infection Malaria

Serious associated infections

Pneumonia, UTI , Meningitis and Sepsis

Surgical emergencies:

Intussusception or appendicitis



Treatment

Assessment of nutritional status

Weight, length, W/L, arm circumference , BMI with standard charts

Assessment of Co-morbid conditions

No sign of Dehydration

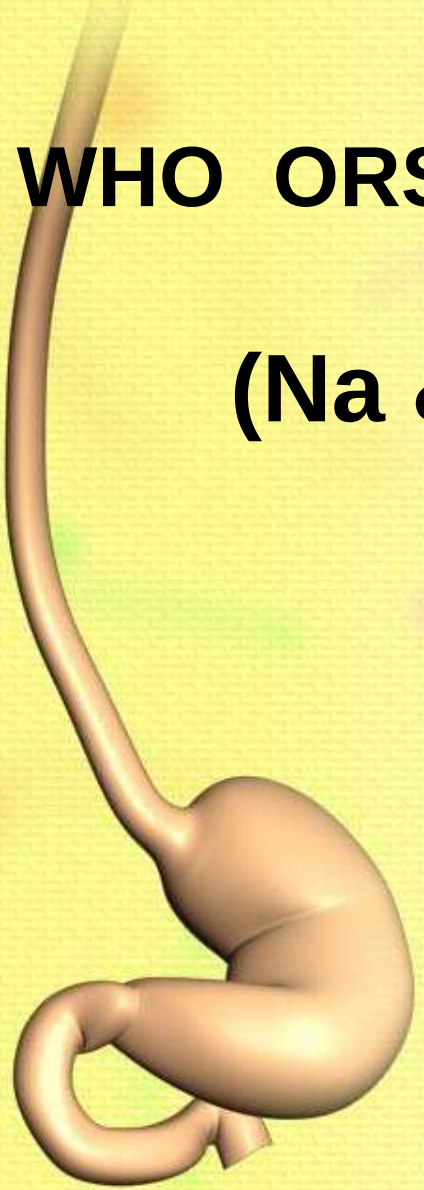
In the early stages of dehydration, due to negligible loss of body water content , there are no signs, nor symptoms

Some Dehydration

As dehydration increases, signs and symptoms develop. Initially these include:

- Thirst
- Restless or irritable behaviour
- Decreased skin turgor
- Sunken eyes

Oral Rehydration



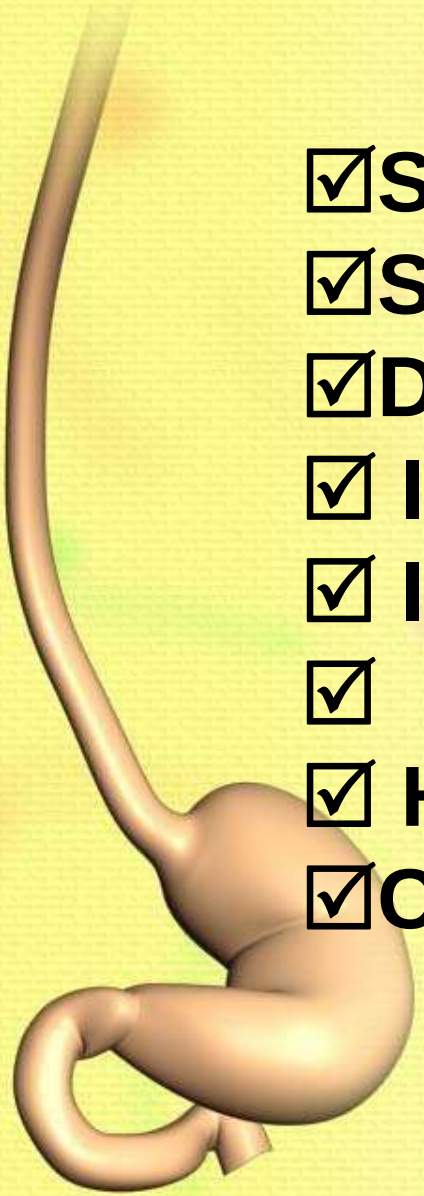
WHO ORS = 275 mOsm/L

(Na & Glucose =75 / Cl=64 / k=20

No:

Soda beverages
Fruit juice
Tea

No Oral Rehydration



- ☑Severe dehydration
- ☑Shock
- ☑Decreased level of conciousness
- ☑ Ileus
- ☑ Intussusception
- ☑ Recurrent Emesis
- ☑ Highoutput>10cc/kg/Hr
- ☑Carbohydrate intulerance(Rare)

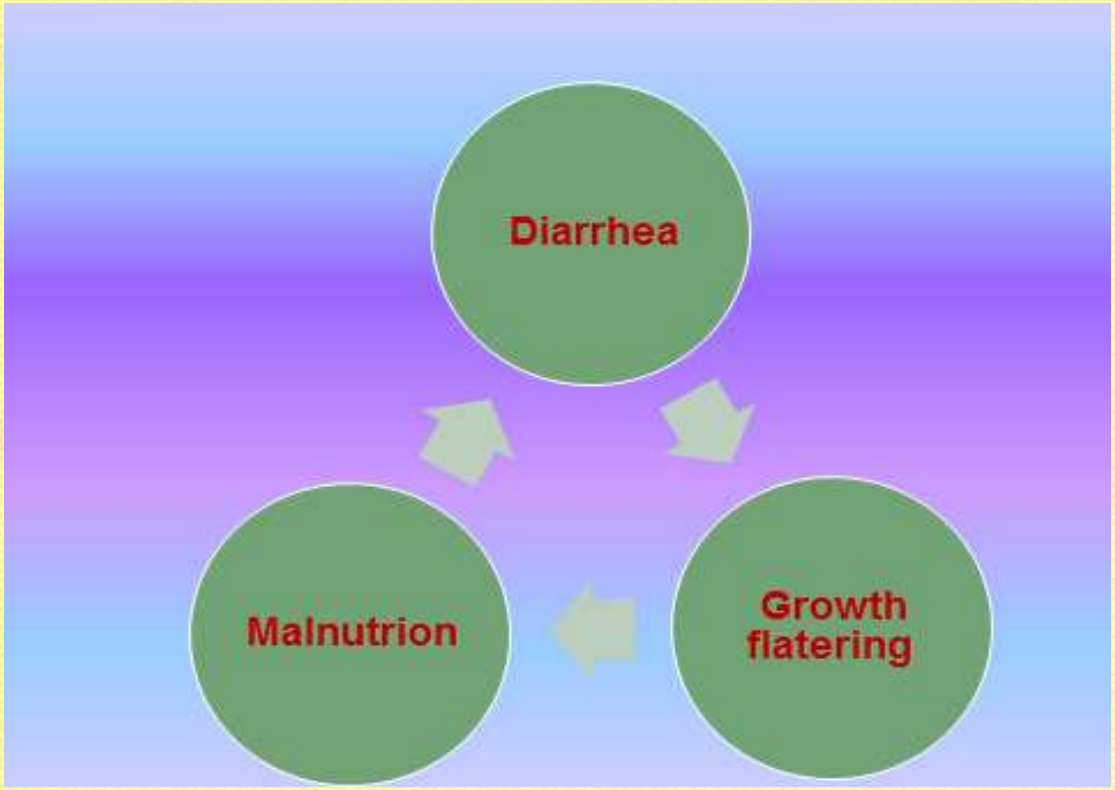
Severe dehydration

Hypovolemic shock
Diminished consciousness
Lack of urine output
Cool moist extremities
Rapid and feeble pulse
Low or undetectable blood pressure
Peripheral cyanosis

MGT + ORS
IV therapy

Symptom	Minimal or no Dehydration (<5%)	Mild to Moderate (5%-10%)	Severe (>10%)
Mental Status	Alert	Normal, restless, irritable	Lethargic, unconscious
Thirst	Normal PO or refuses	Thirsty	Drinks poorly or unable
Heart Rate	Normal	Normal to increased	Tachycardia
Quality of pulses	Normal	Normal to decreased	Weak or impalpable
Breathing	Normal	Normal to fast	Deep
Eyes	Normal	Slightly sunken	Deeply sunken
Tears	Present	Decreased	Absent
Oral mucosa	Moist	Dry	Parched
Skin fold	Instant recoil	Recoil in ~ 2 sec	Recoil > 2sec
Capillary refill	Normal	Prolonged	Prolonged; minimal
Extremities	Warm	Cool	Cool, mottled, cyanotic
Urine output	Normal to decrease	Decreased	Minimal

Nutrition



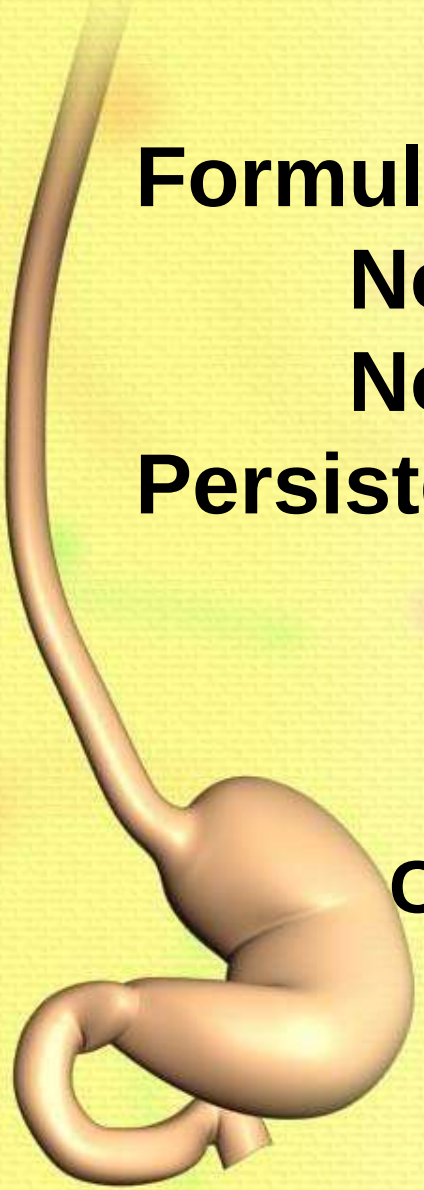
Entral feeding & Diet selection

Breastfeeding

Complex Carbohydrate:

Rice+Pasta
Wheat
Bread
Potato
Cereal
Fresh fruit
Meat
Yogurt
Vegetable **ORS**

Entral feeding & Diet selection



Formula feeding:

No dilution

No change to Lactose free

Persistent →

Milk--->Yogurt

Milk+Cereal

Lactose free formula

Cow's MPS → Pr Hydrolyzed

Diet avoidance

Fatty food

Simple Sugar:

Juices

Carbonate soda

Suitable Diet

1 kcal/g 100kcal/kg/Day 2-3g/kgPr

Additional Therapy …

Probiotic
Prebiotic
Synbiotic

Lactobacillus / Bifidobacterium

Saccharomyces boulardii

Is effective Ab associated /C-Difficile

Lactobacillus rhamnosus GG

Rotavirus GE

Additional Therapy

Antimotility:

~~**Loperamide**~~

~~**Diphenoxylate**~~

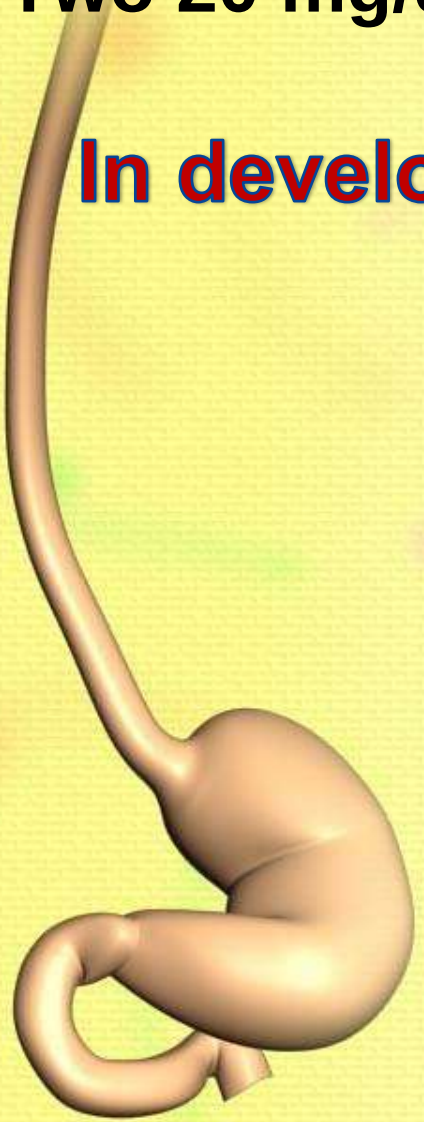
Antiemesis : Ondansetron

Single sublingual dose

~~**Methoclopramid**~~

Zinc supplementation

Two 20 mg/day 10-14 Days



In developing country

Reduced duration
Reduced severity
Reduced recurrence
Reduced mortality
Reduced hospitalization
Reduced use of Antibiotic
Induced use of ORS
Induced improvement

Antibiotic

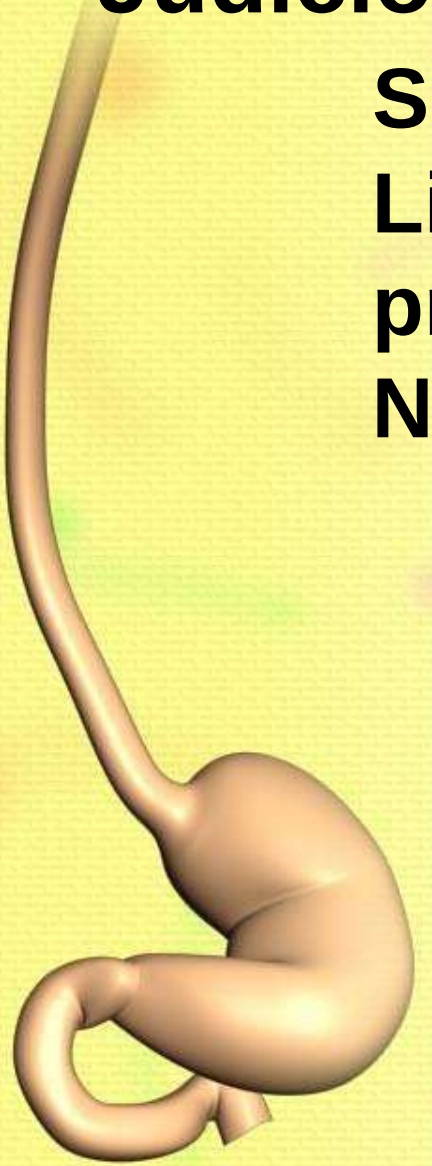
Judicious Ab Therapy:

Severe infection

Limitation of spread infection

prevent complication

Not necessary (HUS/STEC)



Reduced duration

Reduces severity

Prevent

Antibiotic

Microorganism Detection

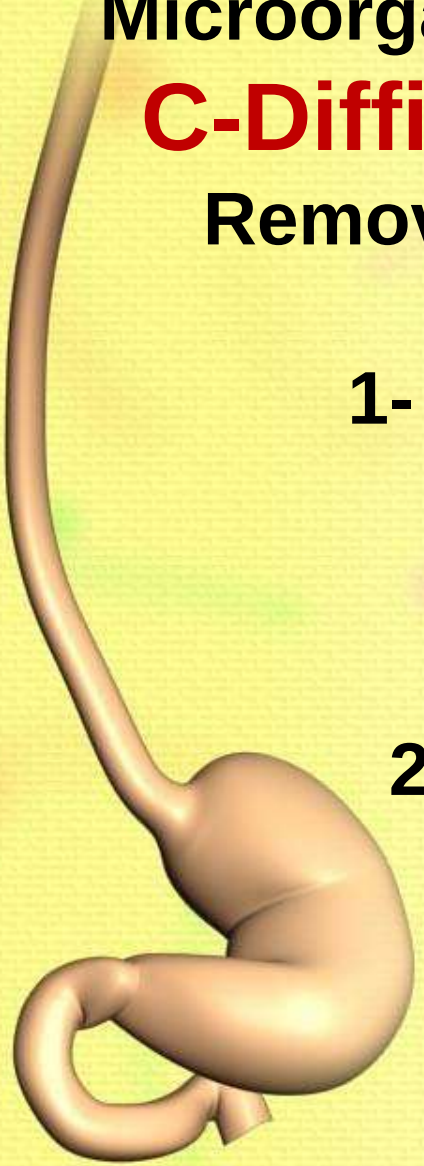
C-Difficile

Removal offending Ab

1- Metro Double dose of G Or
Vanco 40 mg /kg/Day

10 days

2- Vanco 40 mg /kg/Day Or
Ileus:Vanco500mg/100 N/S
Retention enema ± Metro IV



Shigllosis

1-Ciprofloxcacin 15mg/kg/d PO X 3 days

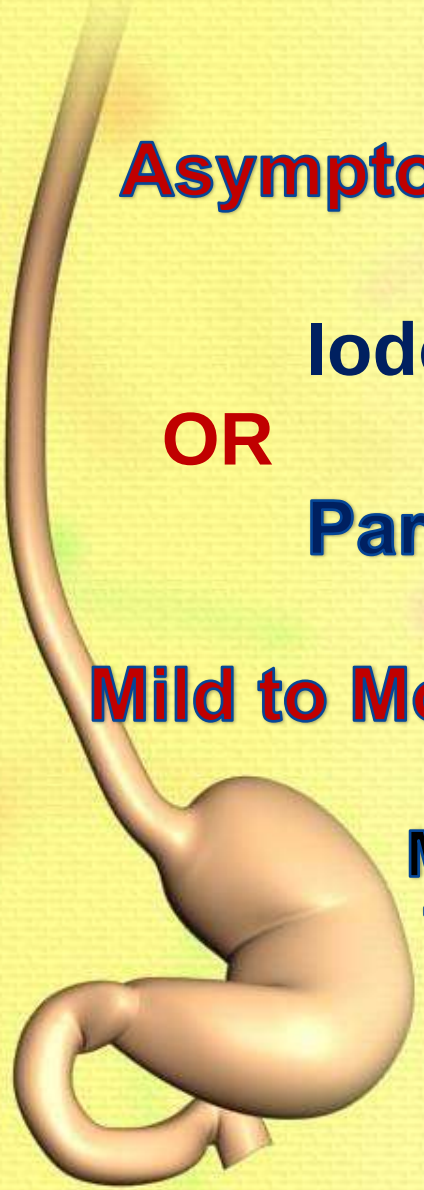
Ceftriaxone 50-100mg/kg/d Im or Iv x 3d

Azithromycin12mg/kg/day then6mg/kg/dayx4d

2-Cefixime 8mg/kg/d x 3 Days OR

Co- trimoxazol 4m/kg/d BID x 5 days

Entamoba H



Asymptomatic Cyst Passer

Iodoquinol 30-40mg/kg PO TID x 20 Days

OR

Parmomycin 25-35 mg/kg/d PO TIDx7 days

Mild to Moderate(Intestinal and or extraintestinal)

Metronidazole 30-40mg/kg/d Po TID x7-10 Days

Tinidazole 50 mg/kg single > 3years x 3 Days

OR 5 Days (Severe) .....

Entamoba H

Prevent relapse

Iodoquinol 30-40mg/kg PO TID x 20 Days

OR

Parmomycin 25-35 mg/kg/d PO TIDx7 days

Giardia Intestinalis

Tinidazole 50mg/kg Po single > 3years

Nitazoxanide x3Days

1-3y 100mg BID x 3 Days

4-11 y 200mg BID x 3 Days

>11 y 500mg BID x 3 Days

OR

Metronidazole30- 40mg/kg/D pox7Days

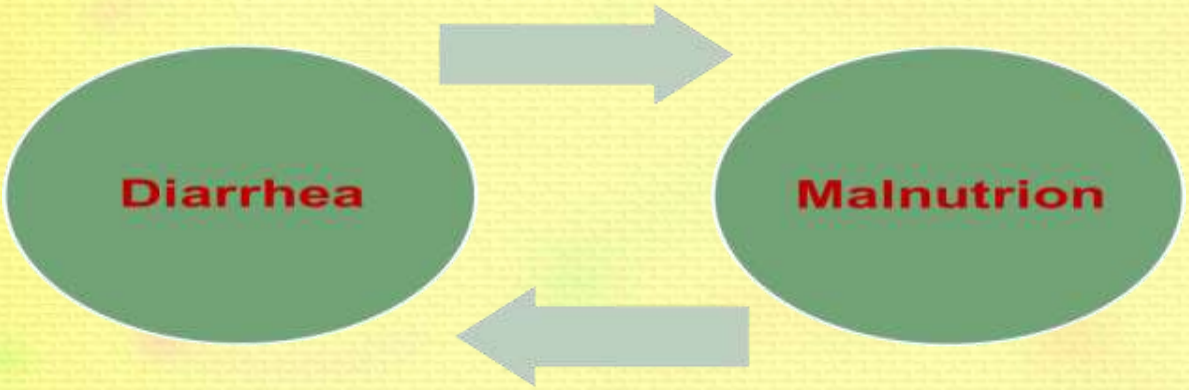
Complication

- **Early**
  - **Shock**
  - **Electrolytes Imbalance**
  - **Ileus**
  - **Abdominal Distention**

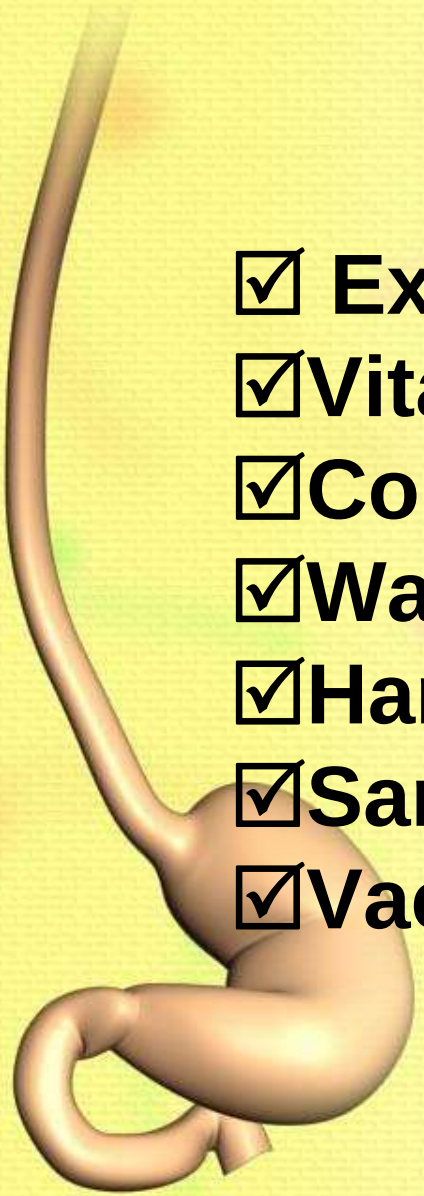
Complication

- **Late**
  - **Persistent**
  - **Intussusception**
  - **Anemia**
  - **HUS**
  - **Guilin Barre**
  - **Rectal Prolapse**
  - **Carbohydrate Intolerance**
  - **Mesenteric Lymphadenitis**

Very Late complications



Prevention



- ☑ Exclusive Breastfeeding
- ☑Vitamin A
- ☑Complementary Diet
- ☑Water treatment
- ☑Hand washing
- ☑Sanitary landfill
- ☑Vaccination(Rotavirus/Measles)

Improvement Sanitation

Improvement Sanitation

Improvement Sanitation


Thank
you!