


DIARRHEA
CLINICAL CONSIDERATIONS

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OBJECTIVES

- Assess patients with both acute and chronic diarrhoea
- Understand the management of patients with varying levels of dehydration
- List common causative pathogens of diarrhoea in tropical countries
- Understand potential complications of diarrhoeal diseases in adults and children
- Demonstrate insight into the socio-economic impact of diarrhoeal diseases worldwide

DEFINITIONS

- ≥ **3 loose watery bowel motions** in **24 hours**
- Motions that assume shape of collecting container
- Chronic: > 2 weeks
- Chronic (immunocompromised) : > 3 weeks

World Health Organization

Integrated Management of Childhood Illnesses (IMCI)

Fig. 1. **Original HIV algorithm**

If the answer was "yes" to any HIV-related question[a] asked during the assessment ***consider symptomatic HIV infection***

Ask	Then look and feel
■ Has the child had a chest infection requiring hospital admission in the past 3 months?	■ Is the child's weight below the third centile?
■ Has the child had two or more episodes of diarrhoea in the past 3 months?	■ Does the child have poor weight gain according to history or the "Road to health card"?[b]
■ Has the child had any episode of persistent diarrhoea (lasting 14 days) in the past 3 months?	■ Any enlarged lymph glands in more than one of the following sites : neck, axillae, or groin?
■ Has the child had fever for one month or more?	■ Is there oral thrush that extends to the back of the mouth or throat?
■ Does the child have a poor appetite?	
■ Does the child have a chronic ear infection (ear discharge 14 days)?	
■ Does the child have a history or evidence of past or present herpes zoster?	
■ Is there a history or evidence of severe seborrhoeic dermatitis?	
■ Does the child have a history of past or present tuberculosis?	
■ Is a parent or sibling known to have tuberculosis?	
■ Is a parent or sibling known to be HIV-positive?	

→ Classify as ***suspected symptomatic HIV infection*** if three positive findings

[a] "Screening questions" asked during the routine assessment of every child.
[b] "Road to health card" showing weight for age.

WHO 03.203

‘Tell me about the diarrhoea…’

- Frequency of stools per day
- Number of days
- Description of stool (colour, consistency)
- Blood (bright/dark) or mucus
- Tenesmus

History: Direct questioning

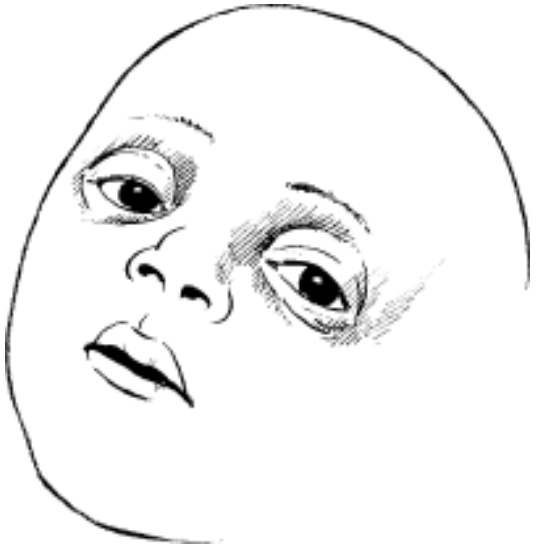
- Household / neighbourhood contacts
- Village or community health
- Water source
- Diet (current and prior to illness)
- General state of health e.g. weight loss
- Associated symptoms e.g. abdo pain, fever, vomiting, cough
- Immunisation
- Treatments (e.g. antibiotics, traditional healers)
- Non-infective causes (e.g. screaming with pallor)
- Risk factors for HIV

Examination

1. Signs of **Dehydration**
2. Signs of **Malnutrition**
3. Signs of **Systemic Illness** e.g. immunodeficiency

1. Dehydration

General Condition



- Well and alert?
- Restless or irritable?
- Lethargic or unconscious?
- Eyes normal or sunken?

1. Dehydration

- **Skin Pinch Test (Skin Turgor)**

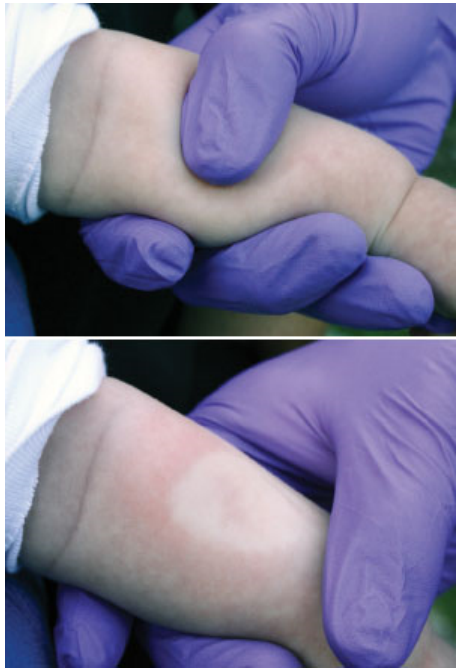
Use thigh or abdominal skin in infants

Does it go back quickly/slowly/very slowly (> 2sec)?

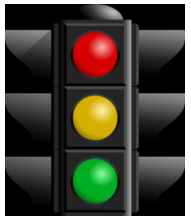
- Dry mucous membranes
- Absence of tears when crying
- Sunken fontanelle (infants)
- Pulse (rate, volume)
- Urine output

Capillary Refill Time (CRT)

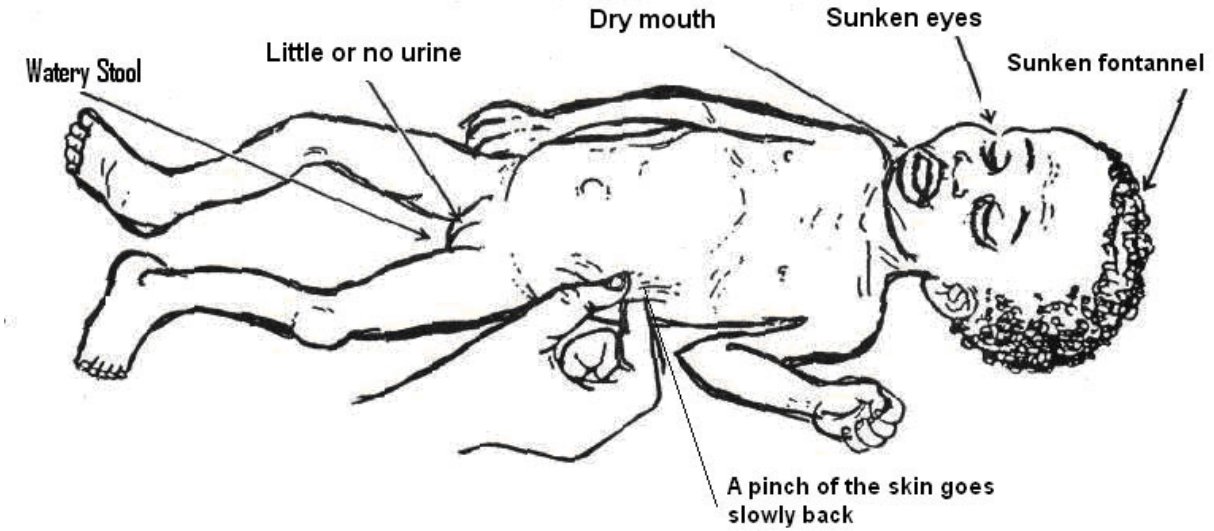
- Common measure of dehydration and perfusion
- Can be highly variable between patients
- Affected by temperature (cold and fever)
- Press on sternum for 5 seconds and release
- Normal CRT is < 2 seconds.
- Do not use in isolation



1. Level of Dehydration



1. Mild
2. Moderate
3. Severe



Mild Dehydration (IMCI)

Signs or symptoms	Treatment
Two or more of the following signs: -restlessness, irritability -sunken eyes -drinks eagerly, thirsty -skin pinch goes back slowly	•Give fluid and food to treat diarrhoea at home •Advise carer on when to return immediately •Follow up in 5 days if not improving

Severe Dehydration (IMCI)

Signs or symptoms	Treatment
Two or more of the following signs: -lethargy/unconsciousness -sunken eyes -unable to drink or drinks poorly -skin pinch goes back **very** slowly (> 2 secs)	•Give fluid for severe dehydration in health care facility/hospital •Nasogastric / Intravenous •**Always push oral route**

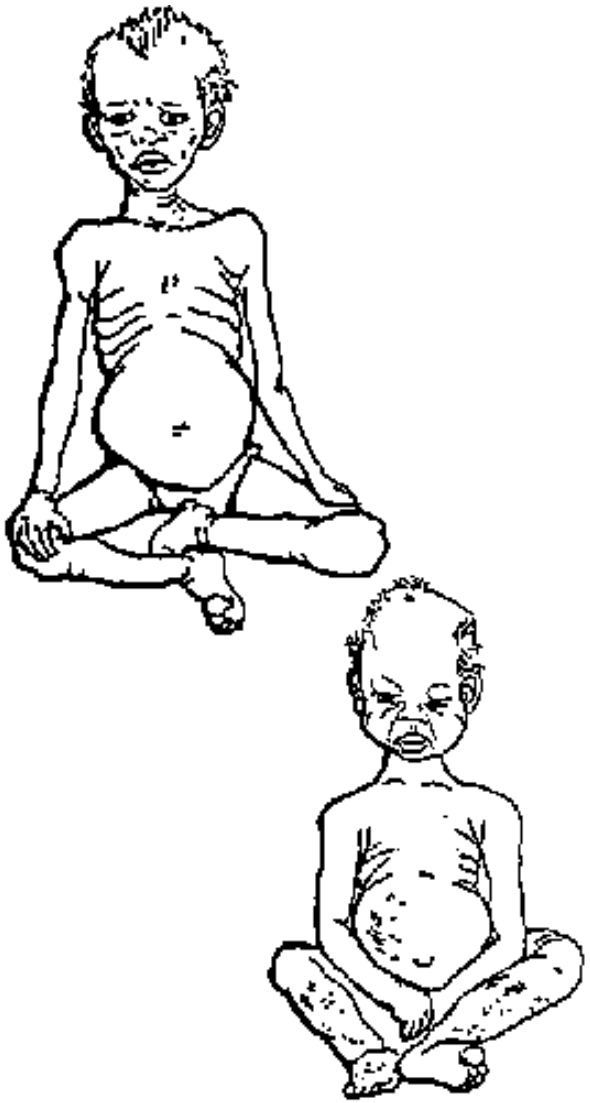
2. Malnutrition

Marasmus

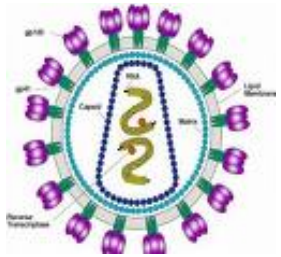
- Old person's face
- Irritable, fretful
- Extreme wasting and low weight
- 'Pot belly'
- Hungry

Kwashiorkor

- Misery and apathy
- Poor appetite
- Oedema of legs, arms, face
- Pale, spare hair, weak roots
- Moon face
- Pale, thin, peeling skin
- Hepatomegaly



3. Systemic Illness



- Failure to thrive / Faltering growth in children
- Opportunistic infections (e.g. Candidiasis)
- Weight loss (>10% of body weight)
- Prolonged fever / PUO > 1 month
- Persistent generalized lymphadenopathy
- Mucocutaneous lesions e.g. ulceration,
- Chronic anaemia - ?parasitic (worms/malaria)
- Severe bacterial infections / extrapulmonary TB

ESSENTIAL MANAGEMENT

1. **Rehydration** therapy
2. **Zinc** supplementation
3. Continued **feeding**
4. Maternal / carer knowledge of **when to return**

Rehydration

- Loss of water
- Loss of electrolytes (sodium, potassium)
- Loss of bicarbonate

- Dehydration occurs when **replacement of losses is inadequate**

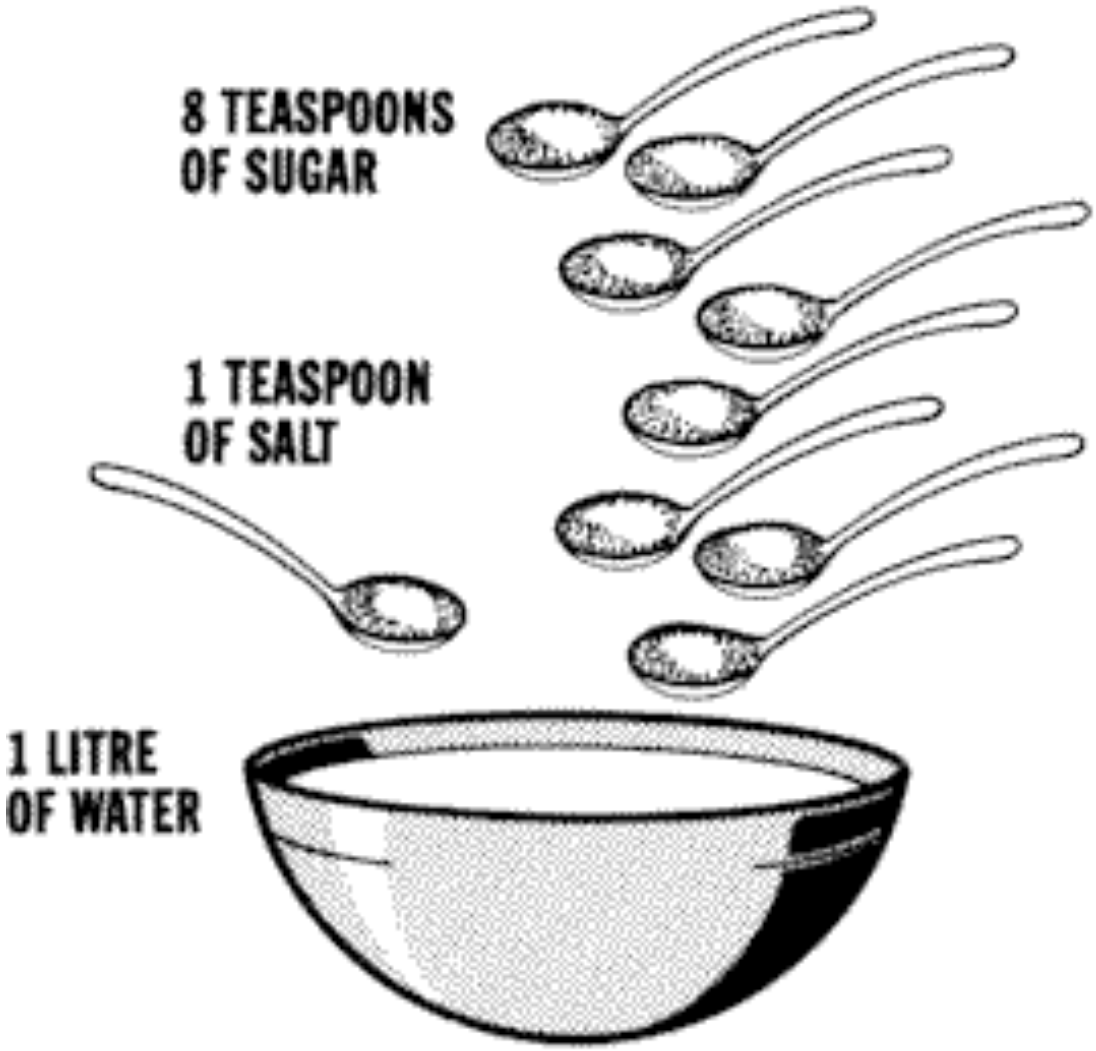
Breast feeding

- Breast feed frequently
- Feed for longer at each feed
- ORS and clean water can be given in addition

Oral Rehydration Solution (ORS)

- **Show carer how to use and make ORS**
- Frequent small sips from a cup or syringe
- Continue even if vomiting
- Continue breast feeding

Homemade **O**ral **R**ehydration **S**olution



Rehydration

ReSoMal = modified ORS

"Rehydration Solution for Malnourished"

- Less Sodium
- More Potassium
- More Sugar
- Also contains CMV
  (Combined Mineral and Vitamin Mix)

Zinc Supplementation

WHO and UNICEF now recommend that children under five years with diarrhoea receive zinc for 10–14 days

Children less than 6 months of age should receive ½ tablet (**10mg**) once a day for 10/14 days.

Children 6 months and older receive 1 tablet (**20mg**) per day for 10/14 days.

Continued Feeding

- Decreased food intake during illness
- Decreased nutrient absorption
- Increased nutrient requirement for immune response
- Causes weight loss and growth failure
- **Must give nutrient-rich foods during and after diarrhoeal illness**

When to return?

- Starts to pass many watery stools
- Repeated vomiting
- Becomes even more thirsty
- Eating or drinking poorly
- Develops a high fever
- Blood in the stool
- Does not improve in three days

Home tips

- Hand washing

- Clean water source – boil water
- Avoid faecal contamination

(play areas, food preparation areas)

- Avoid storing food and milk at room temperature

Cultural Attitudes

- Antibiotics?
- Food or no food?
- Fluids – how much, how often?

- Natural history of illness – carer expectation
- Treat rest of the family – ORS is nourishment

ESSENTIAL MANAGEMENT

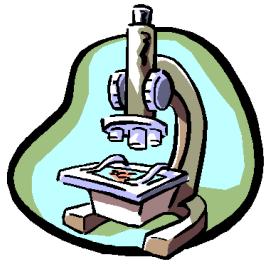
1. **Rehydration** therapy
2. **Zinc** supplementation
3. Continued **feeding**
4. Maternal / carer knowledge of **when to return**

Cautions in Children

- Anti-spasmodics
- Anti-motility agents
- Antibiotics - unless clinically indicated
- Live bacterial cultures e.g. lactobacillus

Level of dehydration is a **clinical judgement**

Investigations



- High threshold for investigations
- Majority resolve without tests or treatment
- Stool culture and microscopy – few centres have diagnostic tests, especially in parasitology
- Mixed infections common
- Results come back too late to affect management
- Outbreak management, disease surveillance, research

Causes of Diarrhoea

Viruses	Bacteria	Parasites
Non-Infectious Poisoning	Chronic Disease Malnutrition	Surgical / Constipation

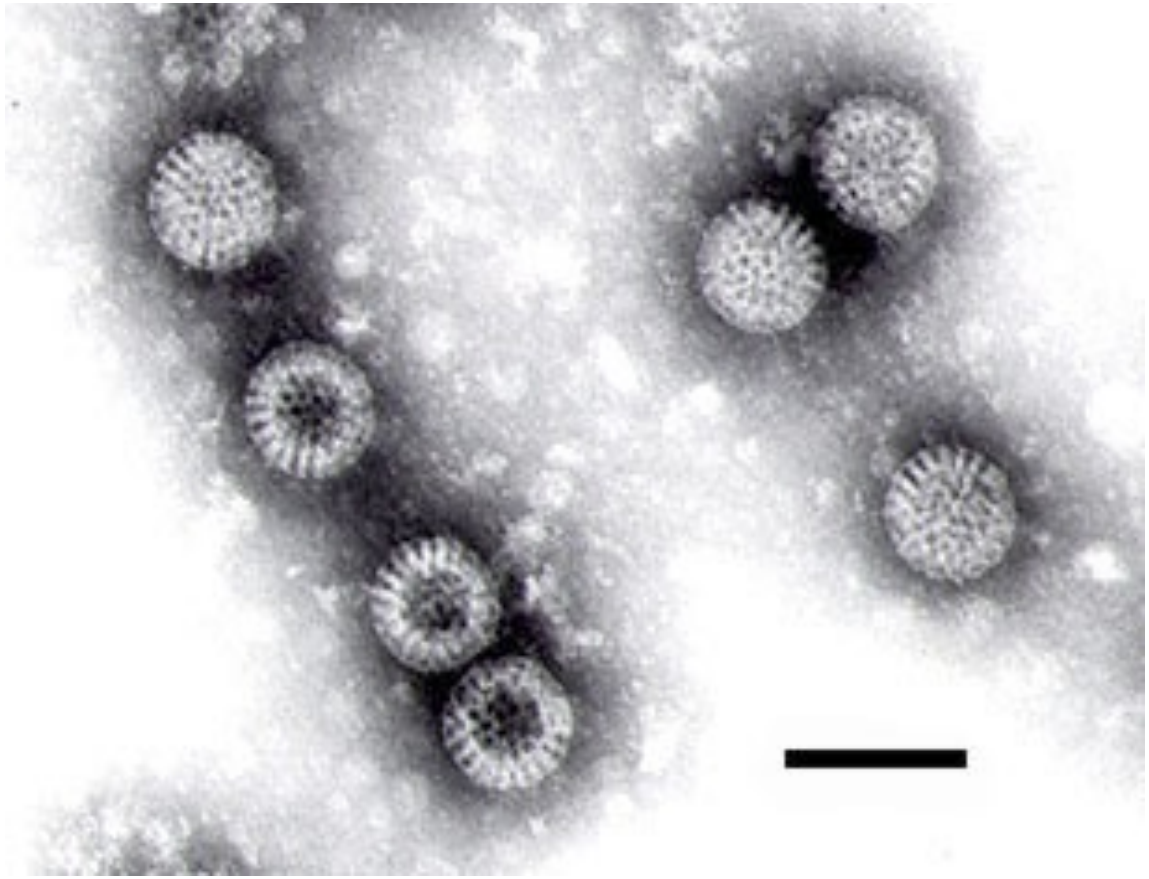
Aracaju, Brazil

- 6 year old female
- Watery diarrhoea for two days
- 1-2 episodes of vomiting
- Low-grade fever
- Infant sibling same
- Continues to drink
- Flatus ++
- Gaseous abdomen

Acute Watery Diarrhoea

- Most common
- Abrupt onset, usually infectious
- Causes dehydration and weight loss
- High concentration of organism in excrement
- Highly contagious
- Self-limiting
- Requires no treatment

Rotavirus



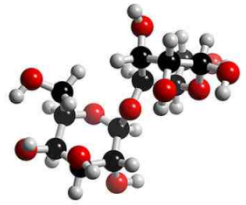
Socio-Economic Impact

- Viral infection every month
- 4-5 children per family
- Employment
- Domestic duties of both adults and children
- Role of vaccines
- Health promotion

Persistent Diarrhoea...

- 6 month old sibling
- Similar symptoms
- 2 weeks later – still mucusy stools +++
- Otherwise well
- Continues to feed

Secondary Lactose Intolerance



- Small bowel injury
- Acute gastroenteritis most common
- More common in infancy
- Loss of lactase-containing epithelial cells
- Epithelial cells function at tips of villi
- May not be clinically significant
- Consider parasitic infections of the gut
- Treatment depends on resource and setting

Kamazi, Ghana

- 2 year old male
- 4 day history – initially watery
- Blood-streaked diarrhoea for 1 day
- Abdominal pain
- Cramping
- Vomiting
- Attended village wedding prior to symptoms
- Elder sibling similar

Acute Diarrhoea with Blood

- **Dysentery** = presence of blood in diarrhoea
- Usually signifies ulceration of large bowel
- Campylobacter
- Shigella
- EHEC
- Bacillary or Amoebic?
- Antibiotics?

E.Coli

- Enterohaemorrhagic *E. Coli* (EHEC)
- Closely related to Shigella, especially toxins
- Most common form *E.coli* 0157
- Causes an inflammatory, haemorrhagic colitis
- Meat products and cross-contamination

Complication of treated dysentery

- Mild dehydration
- ORS and management at home
- Take-home ciprofloxacin at health-care centre

1 week later elder sibling presents even more unwell:

- Pallor
- Bruising
- More bleeding per rectum
- Drowsy and lethargic
- Abdominal pain

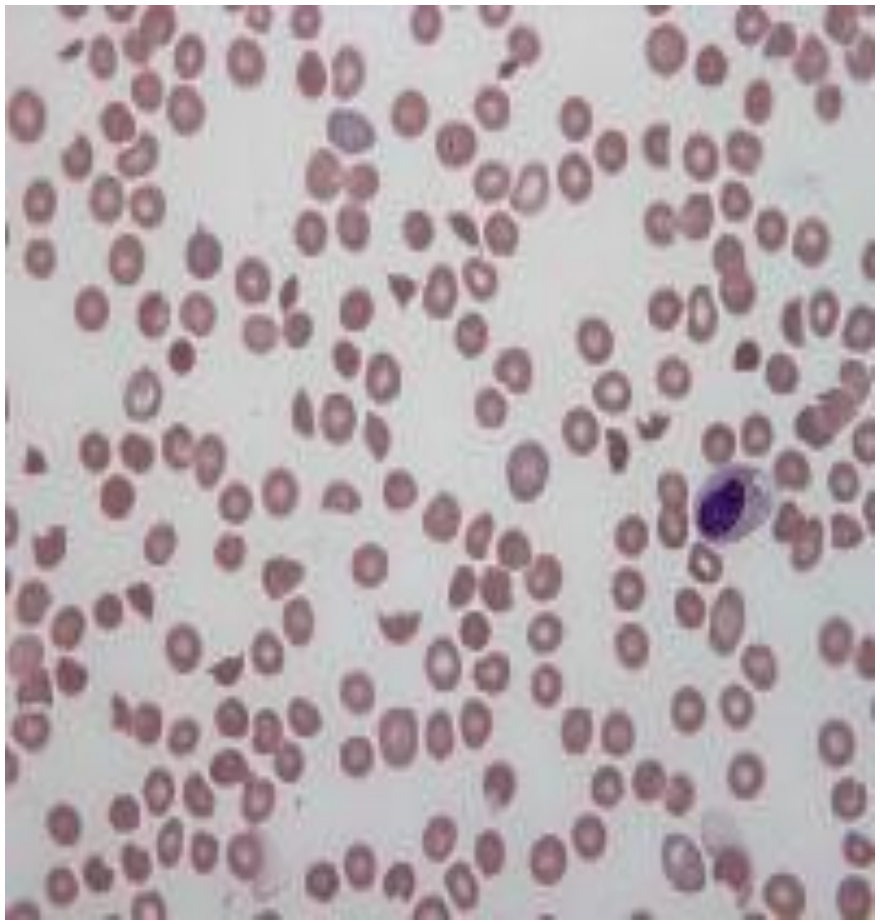
Haemolytic-Uraemic Syndrome (HUS)

1. Haemolytic Anaemia
2. Thrombocytopaenia
3. Acute Renal Failure

Supportive treatment

Stop antibiotics

Rehydration

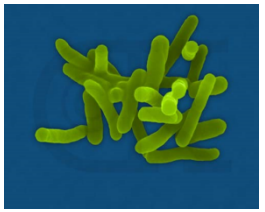


Lilongwe, Malawi

- 3 days
- Initial watery diarrhoea
- Tenesmus
- Bloody diarrhoea 2 days
- Frequent stools +++

- Lethargic
- Dehydrated
- Malnourished

Shigella



- *S. sonneii, dysenteriae, flexneri, boydii*
- Contaminated water and food
- Spread by direct person-to-person contact
- Exacerbated by malnutrition and chronic disease

Seizure

- Electrolyte Disturbance e.g. Hyponatraemia
- Hypoglycaemia (losses, malaria, poor intake)
- Fever (diarrhoeal illness or CNS infection)
- Other parasitic infection

Arequipa, Peru

- Adult patient
- 3 months pale, mucousy stool
- Weight loss
- Lethargy
- Glossitis and anaemia

Tropical Sprue

- a.k.a. Post-infective malabsorption / tropical enteropathy
- Chronic condition
- Aetiology uncertain
- ?response to acute infective diarrhoea
- Abnormal jejunal morphology
- Partial villous atrophy
- Treat bacterial overgrowth for 2 weeks
- Folate supplements
- Pain relief and anti-spasmodics

Kampong Thom, Cambodia

- 10 month old male
- Rice-eating community
- Impoverished parents
- Breast-fed
- Watery stools for 4 weeks
- Tachycardic
- Emaciated
- Cardiomegaly

Diarrhoea with Severe Malnutrition

- Systemic infection
- Dehydration
- Heart failure
- Vitamin and mineral deficiency
- Gut parasitic infections

Nutritional Deficiency: Thiamin

- Beri-Beri
- Vitamin B1
- Rice-eating communities (polished) – Asia
- Muscle weakness
- Neurological deterioration
- Cardiac failure in infants
- **Look at the mother and siblings**

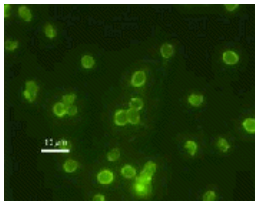
Masaka, Uganda

- 30 year old female
- General malaise
- 1 month of watery stool
- Mild abdominal pain
- Moderate weight loss with muscle wasting
- Low grade fever
- Oral candidiasis

Immunodeficiency and Diarrhoea

- Non-typhoidal Salmonella
- Shigella
- Cryptosporidium
- Abdominal TB
- Clostridium difficile
- Isospora
- Microsporidium

Cryptosporidium



- Protozoan
- Common parasitic infection in HIV positive patients
- Contaminated water
- Persistent, but mild diarrhoea

- Faecal detection of oocysts
- No direct treatment
- Wider use of HAART has reduced severity of cases

References

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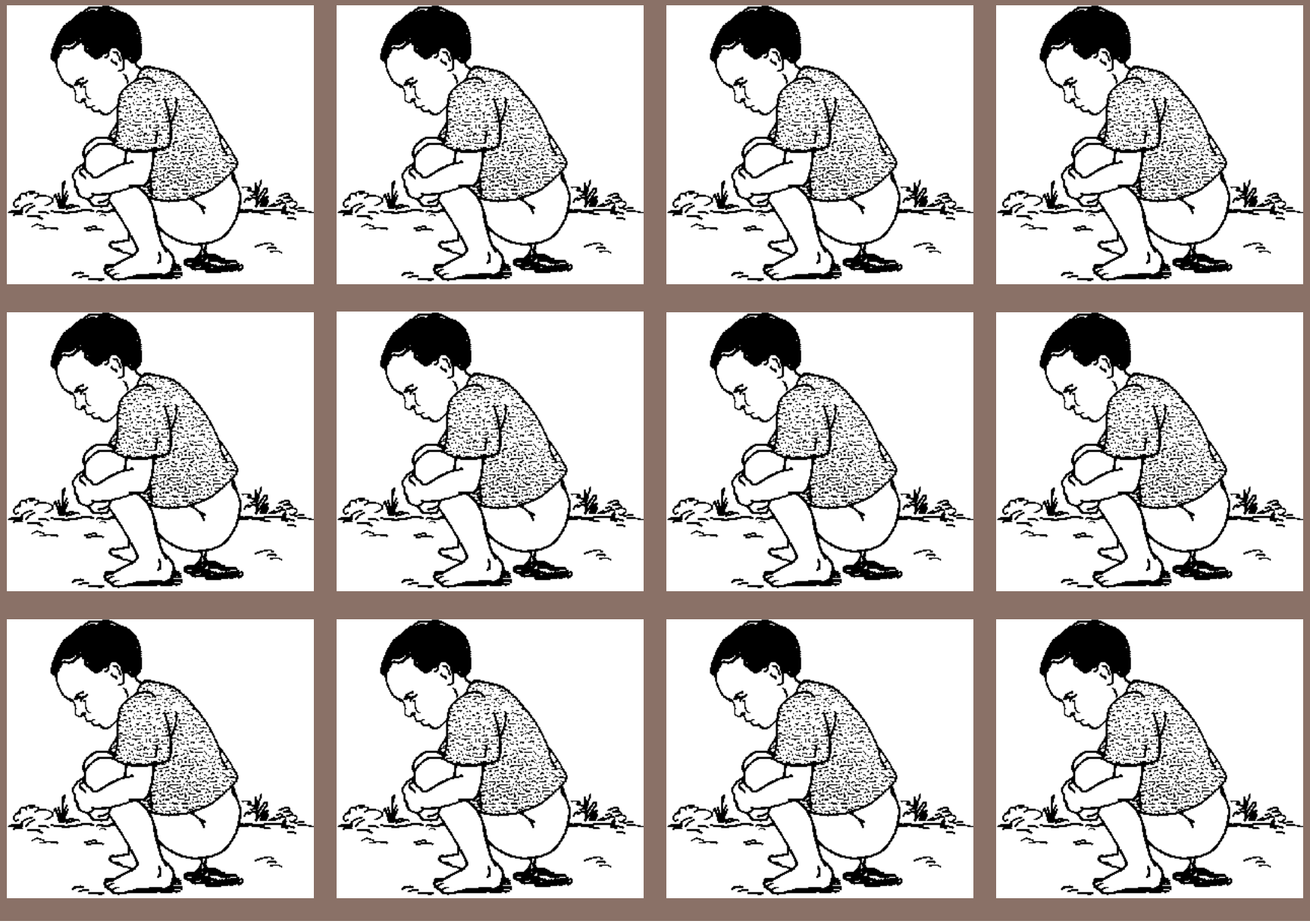

THAT'S ENOUGH DIARRHOEA FOR TODAY