

COMMUNICABLE DISEASE TOOLKIT

IRAQ CRISIS

7. CASE MANAGEMENT OF EPIDEMIC-PRONE DISEASES

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WORLD HEALTH ORGANIZATION

CONTENTS

| | | |
|-----------|---|-----------|
| 1. | Bacillary dysentery (shigellosis) | 3 |
| 2. | Cholera | 5 |
| 3. | Typhoid fever | 7 |
| 4. | Measles | 8 |
| 5. | Diphtheria | 10 |
| 6. | Meningitis | 12 |
| 7. | Crimean-Congo haemorrhagic fever | 15 |
| 8. | Annex: Assessment and treatment of diarrhoea | 16 |

1. BACILLARY DYSENTERY (SHIGELLOSIS)

Basic facts

- an acute bacterial disease involving the large and small intestine
- the most important cause of acute bloody diarrhoea
- two thirds of cases and most deaths are in children under 10 years
- of the four *Shigella* serogroups (*S. dysenteriae*, *S. flexneri*, *S. sonnei* and *S. boydii*), *S. dysenteriae* type 1 (Sd1) causes the most severe disease and is the only cause of large scale epidemics

Shigella dysenteriae type 1:

- most severe in young children, the elderly and malnourished
- displaced populations are at high risk in situations of overcrowding and poor sanitation/water
- transmission is by faecal-oral route from person-to-person and through contaminated food and water
- is highly contagious - 10-100 bacteria has caused disease in volunteers
- treatment is by antimicrobials which decreases severity and reduces duration of illness
- is not usually associated with marked loss of fluid and electrolytes
- case fatality rate without prompt effective treatment can be as high as 10%
- as infectious dose is low, shigellosis is associated with high secondary attack rates

Clinical features

- causes bloody diarrhoea often associated with fever, abdominal cramps and rectal pain
- incubation period usually 1-3 days, but may be up to one week
- complications include sepsis, rectal prolapse haemolytic uraemic syndrome, seizures
- is diagnosed by observing blood in a fresh stool specimen or asking the patient or mother of a child whether the stools are bloody.

Diagnosis

- Collect specimens from case with current bloody diarrhoea and onset of illness < 4 days who have not received antimicrobials for this illness
- Fresh stools in sterile container to be kept at temperature 4 Celsius, samples must reach laboratory within 2 hours
- For longer duration of transport - Cary-Blair transport media must be used
- Transport container should be well insulated with frozen refrigerant packs or wet ice, transport must not last > 2 days

Case management

Clinical case definition: Acute bloody diarrhoea

Laboratory criteria: Isolation of *Shigella dysenteriae* types 1 (Sd1) from the stools

Table 1 High risk patients

- | |
|--|
| <ul style="list-style-type: none"> • children less than 5 years - but especially infants, severely malnourished children and children who have had measles in the past six weeks • older children and adults who are obviously malnourished • a patient who is severely dehydrated, has had a convulsion, or is seriously ill when first seen • adults of 50 years of age or older |
|--|

The standard treatment regimens are:**A . Rehydrate with ORS or IV solution depending on the severity and monitor the hydration status frequently (see annex for assessment and treatment of diarrhoea and dehydration)**

- refer seriously ill or severely malnourished patients to hospital immediately

B. Give antibiotics

- Antibiotics are essential and should be decided on the basis of susceptibility testing of the organisms grown from patients affected by the disease. The drug must be effective against at least 80% of local Sd1 strains.
- Clinical improvement should be noted within 48 hours if using effective antimicrobial. If no improvement, treat with second-line drug for 5 days if available, otherwise continue full 5 day course of first line drug. Use only one of the following antibiotics:

| Antibiotics | Doses | Children | | | Adults |
|-----------------------|---|---------------------------------|---------------------------------|---------------------------------|---|
| | | less than 1 year | 1 –5 years | 5-15 years | |
| Nalidixic acid 250 mg | 30mg /kg divided 4 times /day | ¼ tab 4 times /day 5 days | ½ tab 4 times /day 5 days | 1 tab 4 times /day 5 days | |
| Nalidixic acid 500mg | 5 days | | | | 2 tab 4 times /day 5 days |
| Ciprofloxacin 500mg | 30mg /kg divided 2 times /day 3 days | ¼ tab 2 times /day 3 days | ½ tab 2 times /day 3 days | 1 tab 2 times /day 3 days | <i>Doses :1g/day</i> 1 tab 2 times /day 3 days |

Note: do not give antimicrobials known to be ineffective. When the supply of an effective antimicrobial is limited, priority should be given to high risk patients (see table 1).

Do not forget

- In health facilities
 - strengthening sanitary and hygiene measures in general
 - implementation of disinfection measures in wards
- In affected areas
 - Ensure the access to safe water (quality and quantity)
 - Strengthening of health education on hygiene and disinfection measures
 - Set up surveillance for early detection of cases and monitoring of the outbreak

See *Guidelines for outbreak control* in this toolkit for organization of a treatment centre (figure 1), essential hygiene rules in a treatment centre (table 4), preparation and use of disinfectants (table 5) and calculation of treatment supply needs for dysentery (table 7).

This section was developed by WHO Global Task Force on Cholera Control.

CHOLERA

Basic facts

- an acute bacterial enteric disease with profuse watery stool
- caused by a gram-negative bacillus *Vibrio cholera* which produces a powerful enterotoxin that causes copious secretory diarrhoea
- Transmission is by faecal-oral route. Infection results from ingestion of organisms in food and water, or indirect contamination from person-to-person (unwashed hands).
- acute carriers, including those with asymptomatic or mild disease are important in the maintenance and transmission of cholera.
- asymptomatic in more than 90% of infected cases
- attack rates in displaced populations can be as high as 10-15% whereas in normal situations, it is estimated at 1-2%
- case fatality rates are usually around 5% but have reached 40% in large outbreaks in refugee camps
- with appropriate treatment, with ORS in most cases, CFR can be reduced to 1%

Clinical features

- incubation period is 1 to 5 days
- symptoms begin with abrupt onset of copious watery diarrhoea, classic *rice-water* stool with or without vomiting
- fluid loss can lead to rapid and profound dehydration, low serum potassium and acidosis
- fever is unusual, except in children
- vomiting without associated nausea may develop, usually after the onset of diarrhoea
- severe dehydration leads to loss of skin turgor, malaise, tachypnea and hypotension

Early detection of cholera cases is important to ensure prompt treatment and reduction of environmental contamination. Cholera should be suspected when:

- a patient over 5 years develops severe dehydration from acute watery diarrhoea (usually with vomiting) or
- any patient over 2 years has acute watery diarrhoea in an area where there is an outbreak of cholera

Diagnosis

- Fresh stools in sterile container if transport time < 2 hours
- In alkaline peptone water if transport time < 24 hours
- Cary-Blair transport media
- Media previously cooled for 1 hour
- Transport container well insulated
- Transport possible for 7-14 days

Case management

Clinical case definition: acute watery diarrhoea with or without vomiting, with or without severe dehydration.

Laboratory criteria: Isolation of *Vibrio cholerae* O1 or O139 from stools

The prevention and treatment of dehydration is the mainstay in the management of cholera

- STEP 1 assess for dehydration (see annex)
- STEP 2 rehydrate and monitor frequently
- STEP 3 maintain hydration: replace ongoing fluid losses until diarrhoea stops
- STEP 4 give oral antibiotics to patients with severe dehydration
- STEP 5 feed the patient

The standard treatment regimens are:**A. Rehydrate with ORS or IV solution depending on the severity and monitor the hydration status frequently (see annex for assessment and treatment of diarrhoea and dehydration)**

- For severe dehydration, give IV fluid immediately to replace fluid deficit. Use Ringer's lactate solution (Hartmann's solution) or if not available, normal saline solution. *Plain glucose solutions are ineffective and should not be used.*

B. Give antibiotics for severe cholera cases only

| Antibiotics | Dose | Children | | | Adults | Pregnant women |
|--------------------|---|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| | | less than 1 year | 1 –5 years | 5-15 years | | |
| Erythromycin 250mg | 30mg /kg divided in 4 times /day 3 days | ¼ tab 4 times /day 3 days | ½ tab 4 times /day 3 days | 1 tab 4 times /day 3 days | 2 tab 4 times /day 3 days | 2 tab 4 times /day 3 days |
| Doxycycline | 300 mg Single dose | | | | 3 tablets | |

- **Antibiotherapy is not essential** to the management of cholera. **Effective rehydration therapy is life saving.** In emergencies, systematic administration of antimicrobials is justified only for severe cases, and in situations where bed occupancy, patient turnover or stocks of intravenous fluids are expected to reach critical levels in respect of case management capacity.
- A sensitivity profile (antibiogramme) of the outbreak strain must be available as soon as possible to decide on the possible choice of antibiotic. Oral antimicrobials only must be given, and after the patient has been rehydrated (usually in 4–6 hours) and vomiting has stopped.

Do not forget

- In health facilities
 - strengthening sanitary and hygiene measures in general
 - implementation of disinfection measures in cholera wards
 - Implementation of special funeral practices
- In affected areas
 - Ensure the access to safe water (quality and quantity)
 - Strengthening of health education on hygiene, disinfection measures and food safety
 - Set up of surveillance for early detection of cholera cases and monitoring of the outbreak
- Chemoprophylaxis and quarantine measures are not effective to contain the spread of cholera

See *Guidelines for outbreak control* in this toolkit for organization of a treatment centre (figure 1), essential hygiene rules in a cholera treatment centre (table 4), preparation and use of disinfectants (table 5) and calculation of treatment supply needs for cholera (table 6).

This section was developed by WHO Global Task Force on Cholera Control.

TYPHOID FEVER

Basic facts

- Typhoid fever is a serious systemic infection caused by the enteric bacillus *Salmonella typhi*
- Transmission is via faecal-oral route, mainly from ingestion of organisms in food and water contaminated by faeces and urine of patients and carriers, or indirectly from person-to-person (unwashed hands).
- 2% to 5% of infected cases remain carriers for several months, and are greatly involved in the spread of the disease
- case fatality rate is high (10-20%) in the absence of a proper treatment
- with appropriate antibiotic therapy CFR can be reduced to 1%
- relapses occur in 3% to 4% of cases
- some strains of *Salmonella typhi* are resistant to antibiotics
- mass immunization may be a valuable adjunct for the control of typhoid fever during a sustained, high incidence epidemic
- a parenteral vaccine containing the polysaccharide Vi antigen is the vaccine of choice amongst displaced populations; effective protection is afforded by a single injection and adverse reactions are minimal

Clinical features

- incubation period is usually 8-14 days, but may be from 3 days to up to one month
- mild or inapparent forms are common, especially in endemic areas, and present with low-grade fever and malaise
- severe symptoms begin with the sudden onset of sustained fever, severe headache, nausea and loss of appetite; sometimes accompanied by hoarse cough and constipation or diarrhoea
- complications of intestinal ulceration can include intestinal perforation or haemorrhage

Diagnosis

- isolation of *S. typhi* from blood culture early after disease onset, or from stool culture after the first week
- because of limited specificity and sensitivity, serological tests are generally of little diagnostic value

Case Management

Clinical case definition. Acute or insidious onset of sustained fever, headache, malaise, anorexia, relative bradycardia, constipation or diarrhoea and non-productive cough. (However, many mild and atypical infections occur.)

Laboratory criteria: Isolation of relevant serovars of *Salmonella enterica* from stool or blood of patient.

The standard treatment regimens are:

A. Rehydrate with ORS or IV solution depending on the severity

(see annex for assessment and treatment of diarrhoea and dehydration)

B. Give antibiotics

Antibiotics are essential and should be decided on the basis of susceptibility testing of the organisms grown from patients affected by the disease. Use only one of the following antibiotics.

| Effective drugs | | | |
|----------------------|-----------------|--------------------|---------|
| Susceptibility | Antibiotic | Daily dose mg / kg | Days |
| Fully sensitive | Chloramphenicol | 50 – 75 mg | 14 – 21 |
| | Amoxycillin | 75 – 100 mg | 14 |
| | Cotrimoxazole | 8 – 40 mg | 14 |
| Multidrug resistance | Cefixime | 15-20 mg | 7 – 14 |
| | Azithromycin | 8-10 mg | 7 |

Treatment of complications

Therapy for the complications may include rest, diuretics, ionotropes, and anti-arrhythmic drugs for the myocarditis, replacement blood components for bone marrow suppression and blood transfusion for the haemorrhagic problems.

Surgery is necessary in case of intestinal perforation

Vaccination

Vaccination against typhoid fever during an outbreak should be considered: Please contacts WHO Global Task force on Cholera Control (Email cholera@who.int)

Do not forget

1. In health facilities
 - strengthening sanitary and hygiene measures in general
 - implementation of disinfection measures in wards
 - implementation of special funeral practices
2. In affected areas
 - Ensure the access to safe water (quality and quantity)
 - Strengthening of health education on hygiene and disinfection measures
 - Set up surveillance for early detection of cases and monitoring of the outbreak.

See *Guidelines for outbreak control* in this toolkit for organization of a treatment centre (figure 1), essential hygiene rules in a treatment centre (table 4), preparation and use of disinfectants (table 5) and calculation of treatment supply needs for typhoid (table 8).

This section was developed by WHO Global Task Force on Cholera Control.

MEASLES

Basic facts

- a highly communicable viral infection transmitted through airborne spread of respiratory droplets from person to person; or direct contact with nasal and throat secretions of infected persons or via objects that have been in close contact with an infected person.
- a severe disease caused by the rubeola virus which damages epithelial surfaces and the immune system.
- can increase susceptibility to other infections such as pneumococcus and gram negative bacteria
- can lead to or exacerbate vitamin A deficiency increasing susceptibility to xerophthalmia, blindness and premature death
- the most vulnerable age groups are children between the age of 9 months - 5 years in developing countries but this depends on the immunisation coverage rates
- deaths are mostly due to complications such as pneumonia, croup and diarrhoea and are frequently associated with malnutrition.

Note: While this section details the diagnosis and case management of measles, immunisation remains the most important strategy for measles control. Measles immunisation campaigns are one of the highest priorities in displaced populations.

Natural history

- incubation period is usually 10 days from exposure to onset of fever
- initial symptoms and signs are high fever, runny nose, coryza, cough, red eyes and Koplick spots (small white spots on the buccal mucosa)
- characteristic erythematous (red) maculopapular (blotchy) rash appears on the third to seventh day commencing behind the ears and on the hairline and then spreading to the rest of the body.
- temperature subsides after 3-4 days and the rash fades after 5-6 days.
- measles is highly infectious from the start of the prodromal period until approximately 4-5 days after the rash appears.
- case fatality rates estimated to be 3-5% in developing countries but rates may reach as high as 10-30% in displaced populations.

Complications

- 5- 10% of cases develop complications of measles
- complications occurring in the first week of illness such as croup, diarrhoea and pneumonia are usually due to effects of the measles virus and are rarely life threatening.
- later complications are usually due to secondary viral or bacterial infections - post measles pneumonia, diarrhoea and croup are the most common life threatening complications.
- Pneumonia: usually severe, gram negative or staphylococcus
- Diarrhoea: either due to virus or from a secondary infection e.g. shigella
- Malnutrition: precipitated by anorexia, stomatitis, fever, vomiting, diarrhoea and other complications
- Stomatitis: comprises sucking and eating
- Vitamin A deficiency: keratoconjunctivitis. Measles increases the need for vitamin A and often precipitates xerophthalmia
- Encephalitis: caused by the measles virus itself, occurs on about the 5th day of the rash.
- Otitis media, Croup
- Blindness due to scarring, as a result of vitamin A deficiency and/or conjunctivitis

Case Management

- Take a history from the mother and examine the child for the following:

| Symptoms | Signs |
|---------------------------------|--|
| Ability to take feeds of fluids | Nutritional status |
| Cough and difficult breathing | Breathing rate, chest indrawing, stridor |

| | |
|------------------------------|---|
| Diarrhoea or blood in stools | Dehydration and fever |
| Sore mouth, eyes or ears | Mouth ulcers, sore and discharging ears and eyes, white spots on eyes, Level of consciousness |

Case management of uncomplicated measles - health centre

Most children will have uncomplicated measles and require supportive care as an outpatient. Good supportive care can improve a child's outcome. Isolation of patients with measles is not indicated in emergency situations. All children with measles in these settings should have their nutritional status monitored and be enrolled in a feeding programme if necessary.

nurse the child in a shaded and well ventilated area as it is generally more comfortable for the child. Sunlight can be painful on their eyes and a cool environment can keep their temperature down

- control the fever by tepid sponging and paracetamol
- keep well hydrated: treat diarrhoea with ORS
- observe closely for complications
- give prophylaxis against xerophthalmia: vitamin A on day 1 and day 2

| | Day 1 | Day 2 |
|----------------------|------------|------------|
| Infants < 6 months | 50,000 IU | 50,000 IU |
| Infants 6-11 months | 100,000 IU | 100,000 IU |
| Children > 11 months | 200,000 IU | 200,000 IU |

- maintain adequate protein-calorie intake: inform mothers to give frequent small meals
- continue breast feeding
- provide supplementary feeding if available, the diet must be soft with a high calorie density, so small portions go a long way, protein content unless in the form of egg is unlikely to be eaten (*remember the child has a sore mouth and poor appetite*)
- do not admit to *general* feeding centres until after infectious period.
- if there are high numbers of cases, it may be necessary to set up a small unit for measles children as these children and their mothers need a lot of supportive care.
- use antimicrobials only when indicated
- active case-finding during epidemic if practical (home visits)

Case management of complicated measles - hospital

- control fever, provide nutritional support and vitamin A therapy as for uncomplicated measles.
- antimicrobials should only be given if there is a specific indication such as pneumonia, otitis media or dysentery
- children at significant risk of secondary bacterial infection should have prophylactic antimicrobials such as children with severe malnutrition, HIV infection or xerophthalmia. A broad spectrum antibiotic such as ampicillin or co-trimoxazole should be used.
- Pneumonia: cough and rapid breathing (40 breaths/min or more if over 1 year old; 50 breaths/min if less than 1 year old): give an antibiotic such as ampicillin or amoxycillin or cotrimoxazole. If the child's condition does not improve after 24-48 hours, change the antibiotic to an anti-staphylococcal drug such as cloxacillin or chloramphenicol.
- Diarrhoea: three or more loose or watery stools in 24 hours. Assess if there is associated dehydration. If there is blood in the stool, the child has dysentery. The commonest cause of dysentery is shigella (see shigella for case management).
- Eye problems: the major eye problems in measles are due to measles conjunctivitis or keratitis, and corneal damage due to vitamin A deficiency.
- Red and watery eyes is conjunctivitis (inflammation of the conjunctiva): no treatment necessary
- Sticky eyes or pus in the eyes is secondary bacterial infection: clean the eye at least three times a day with cooled boiled water using cotton wool or a clean cloth. Use tetracycline ointment three times a day for 7 days. NEVER use steroid eye ointments. Ensure that vitamin A has been given. If there is vitamin A eye disease, a third dose must be given 4 weeks later.

5. DIPHTHERIA

Basic facts

- an acute bacterial disease of the tonsils, pharynx, larynx, nose, skin and sometimes the conjunctiva or genitalia
- caused by an aerobic gram-positive rod *Corynebacterium diphtheriae*
- transmission is by contact (usually direct, rarely indirect) with the respiratory droplets of a case or carrier, mainly from the nose and throat
- case fatality rates have changed little in 50 years, at 5%-10%
- spread can be extensive, for example, a massive outbreak of diphtheria began in the Russian Federation in 1990 and spread to all countries of the former Soviet Union. It was responsible for more than 150 000 reported cases and 5 000 deaths. All ages groups were affected
- Diphtheria toxoid-containing vaccine (preferably Td) is available and should be given to population at risk as soon as possible during an epidemic

Clinical features

- incubation period is usually 2-5 days, occasionally longer
- untreated patients are infectious for 2-3 weeks; antibiotic treatment usually renders patients non-infectious within 24 hours
- classical respiratory diphtheria is characterised by insidious onset and membranous pharyngitis with low-grade fever
- although not always present, the membrane is typically grey or white in colour, smooth, thick, fibrinous and firmly adherent

It is essential that *all* cases of diphtheria are rapidly identified and properly investigated. Diphtheria should be suspected when a patient develops an upper respiratory tract illness with laryngitis or pharyngitis or tonsillitis **plus** adherent membranes of tonsils or nasopharynx.

A probable case definition is a suspected case plus **one** of the following:

- Recent (<2 weeks) contact with a confirmed case
- Diphtheria epidemic currently in the area
- Stridor
- Swelling/oedema of neck
- Submucosal or skin petechial haemorrhages
- Toxic circulatory collapse
- Acute renal insufficiency
- Myocarditis and/or motor paralysis one to six weeks after onset

Diagnosis

- Throat and nasopharyngeal swabs should be taken **before** antibiotic treatment is started
- Use Dacron swab, and withdraw from posterior pharynx without touching cheek, teeth or gums
- Insert into a screw cap containing transport medium

Case Management

- If diphtheria is strongly suspected, specific treatment with antitoxin and antibiotics should be initiated immediately
- **Do not wait for laboratory results before initiating treatment**
- i.m. antitoxin is the mainstay of treatment: 20 000 to 100 000 units in a single dose, immediately after throat swabs have been taken.
- antibiotics are necessary to eliminate the organism and prevent spread; they are not a substitute for antitoxin treatment

- recommended dose regimens are:
 - procaine penicillin i.m. (25 000 to 50 000 units/kg/day for children; 600 000 units/kg/day for adults in 2 divided doses) **or** parenteral erythromycin (40-50 mg/kg/day) with a maximum of 2 g/d until the patient can swallow
- then**
 - oral penicillin V (125-250 mg) in 4 doses a day **or** erythromycin (40-50 mg/kg/day in 4 divided doses)
- Antibiotic treatment should be continued for 14 days

Note: Clinical diphtheria does not necessarily confer natural immunity, and patients should therefore be vaccinated before discharge from a health facility

Management of close contacts

- Close contacts include household members and other persons with a history of direct contact with a case, as well as health care staff exposed to oral or respiratory secretions of a case
- All should be clinically assessed for symptoms and signs of diphtheria and kept under daily surveillance for 7 days from last contact with the case
- Adult contacts must avoid contact with children and must not be allowed to undertake food handling until proven not to be carriers
- All must receive a single dose of benzathine penicillin G i.m. (600 000 units for children < 6; 1.2 million units for 6 or older). If culture is positive, give antibiotics as for patients above

6. MENINGITIS

Basic facts

- an acute inflammation of the meninges which can be caused by bacteria or viruses
- transmission is through direct contact with respiratory droplets.
- large outbreaks of meningitis are mainly due to meningococcus (*Neisseria meningitidis* serogroups A, B and C)
- *N. meningitidis* also causes meningococcal septicaemia - a severe disease with acute fever, purpura and shock - less common but highly fatal
- *N. meningitidis*, *Streptococcus pneumonia* and *Haemophilus influenza* account for 80% of all cases of bacterial meningitis
- viral meningitis is rarely serious and may be due a number of viruses such as coxsackie virus or enterovirus
- displaced populations and displaced persons are at increased risk of meningitis due to overcrowding, poor hygiene and poor access to health care
- epidemics in refugee camps have mainly been due to *N. meningitidis* serogroup A
- 80% of cases of meningococcal meningitis occur in those below 30 years old
- in meningococcal meningitis, case fatality rates (CFR) without appropriate treatment can be as high as 50%, with treatment CFR can be reduced to 5 - 15%
- vaccines are available against meningococcus serogroups A, C, Y and W135, which are very effective in controlling epidemics. When used in rapid mass campaigns, vaccination can contain an outbreak within 2-3 weeks. The vaccine efficacy rate is 90% one week after injection for over 2 year olds.

Diagnosis

- Ask about: sudden onset of intense headache, fever, nausea, vomiting, photophobia, stiff neck
- Examine for:
 - meningeal rigidity i.e. neck stiffness
 - lethargy, delirium, coma
 - purpura - characteristic sign of meningococcal septicaemia
 - symptoms of shock - low blood pressure
- In child >1 year, classic signs are rare, look for:
 - fever, diarrhoea, vomiting, drowsiness
 - convulsions
 - bulging fontanelle

Lumbar puncture is necessary to determine if acute meningitis is bacterial and should be done as soon as meningitis is suspected prior to starting antimicrobials

In bacterial meningitis, CSF is usually cloudy or purulent (but may be clear or bloody), basic lab examination consists of white cell count (WCC), protein and gram stain.

Bacterial meningitis if:

WCC measurement: >1000 cells/mm³ (<3 in normal CSF) with >60% polymorphs

Protein: >0.80g/l (<0.60g/l in normal CSF)

Gram stain: Gram negative diplococci in 80% of cases not previously treated

Differential diagnosis of bacterial meningitis

Viral meningitis: do lumbar puncture (LP) and examine CSF

Case management

- bacterial meningitis particularly meningococcal meningitis is potentially fatal and is a medical emergency
- viral meningitis is rarely serious and requires supportive care but a lumbar puncture is necessary to differentiate from bacterial meningitis

- admit all suspected meningitis cases to hospital for diagnosis and case management
- do lumbar puncture and give antimicrobials immediately without waiting for results
- do not delay treatment with antimicrobials if LP cannot be done

Table 4 Initial empiric antimicrobial therapy for presumed bacterial meningitis

| Age group | Probable pathogens | Antimicrobial therapy First choice | Alternative |
|---|---|---|---|
| In epidemic situations All age groups | <i>N. meningitidis</i> | Penicillin G or oily chloramphenicol | Ampicillin Ceftriaxone or Cefotaxime Cotrimoxazole |
| In non epidemic situations Adults Children >5 years | <i>N. meningitidis</i> <i>S. pneumoniae</i> | Penicillin G or oily chloramphenicol | Ampicillin Ceftriaxone or Cefotaxime Cotrimoxazole |
| Children 1 month - 5 years | <i>H. influenza</i> <i>S. pneumoniae</i> <i>N. meningitidis</i> | Ampicillin or Amoxycillin Chloramphenicol | Ceftriaxone or Cefotaxime |
| Neonates | Gram negative bacteria Group B streptococci Listeria | Ampicillin and Gentamycin | Ceftriaxone or Cefotaxime Chloramphenicol |

- IV administration of penicillin G, ampicillin, ceftriaxone or cefotaxime is recommended for bacterial meningitis, however ceftriaxone or cefotaxime are very expensive
- in patients where the IM or IV route is not possible, oral administration is acceptable but higher doses are necessary
- during large epidemics in refugee/displaced populations, a single dose of oily chloramphenicol IM has been used
- in meningococcal septicaemia with purpura and shock, treat shock by restoring blood volume, give dexamethasone IV to reduce cerebral oedema
- chemoprophylaxis of contacts is not recommended in emergency situations
- supportive therapy: maintain hydration and adequate nutrition
- treat convulsions with diazepam IV or rectally
- Nurse in a shaded and well-ventilated area. The unconscious or semiconscious patient should be nursed on his/her side. Turning every 2 -3 hours can prevent pressure sores.

Table 5 Antimicrobials to treat bacterial meningitis

| Agent | Route | Daily Dose adults | Daily Dose children | Duration days | Cost¹ |
|------------------------------------|--------------|------------------------------|--------------------------------|--------------------------|-------------------------|
| Penicillin G | IV | 3-4 MU four/six times | 400,000U/kg | >4 | low |
| Ampicillin/ Amoxycillin | IV | 2-3g twice | 250mg/kg | >4 | moderate |
| Amoxycillin | Oral | 2-3g twice | 250mg/kg | >4 | high |
| Chloramphenicol | IV | 1g twice/three times | 100mg/kg | >4 | moderate |
| Chloramphenicol (oily) | IM | 3g single dose | 100mg/kg | 1-2 | low |
| Cefotaxime | IV | 2g twice | 250mg/kg | >4 | very high |
| Ceftriaxone | IV | 1-2g once/twice | 50-80mg/kg | >4 | very high |
| Ceftriaxone | IM | 1-2g single dose | 50-80mg/kg | 1-2 | high |
| Cotrimoxazole | IV/IM | 2g SMZ twice | 100mg/kg | >4 | moderate |
| Cotrimoxazole | Oral | 2g SMZ twice | 100mg/kg | >4 | low |
| Sulfadiazine | IV | 1g six times | 200mg/kg | >4 | low |

¹ Cost of full treatment: Low <USD10; Medium USD 10-50; High USD 50-250

7. CRIMEAN-CONGO HAEMORRHAGIC FEVER

Basic facts

- an acute viral illness, transmitted by ticks of *Hyalomma* genus; by direct contact with blood / tissue of infected people; and by butchering of infected animals
- it is highly infectious in the hospital setting and nosocomial infections are common after exposure to blood and secretions
- isolation, barrier nursing techniques, and strict observation of universal precautions to prevent contact with infected blood are fundamental principles of epidemic control
- reported case fatality rates range from 2% to 50%

Clinical features

- incubation period is usually 1 to 3 days, with a maximum of 9 days
- following contact with infected blood or tissues, incubation is usually 5 to 6 days, with a documented maximum of 13 days
- symptoms begin with sudden onset of fever, myalgia, abdominal pain, lumbosacral pain, headache and backache, neck pain, sore eyes and photophobia, sore throat, nausea and vomiting, and tachycardia. Flush on face and/or bust, conjunctival injection develop early
- severity increases over 3-5 days, with the appearance of spontaneous haemorrhages within the first 5 days of illness in the absence of known predisposing factors
- Haemorrhagic enanthem of soft palate, uvula and pharynx, and a fine petechial rash spreading from the chest and abdomen to the rest of the body are generally associated with the disease.
- There may be bleeding from gums, nose, lungs, uterus and intestine, but only in serious or fatal cases, associated with severe liver damage.

Diagnosis

- Serum samples are testing using ELISA or EIA techniques
- IgG and IgM antibodies is usually detected from about day 6 after onset of illness
- Alternatively virus detection in blood/tissue samples can be used

Case Management

- General supportive therapy is the mainstay of patient management in CCHF. Intensive monitoring to guide volume and blood component replacement is required.
- The antiviral drug ribavirin has been used in treatment of established CCHF infection with apparent benefit. Both oral and intravenous formulations seem to be effective.

Intravenous Ribavirin therapy:

Adults

1. Loading dose* of 17 mg/kg intravenously (IV) (max 1g per dose)
 2. Followed by 17 mg/kg intravenously IV (max 1g per dose) every 6 hours for 4 days.
 3. Followed by 8 mg/kg IV (maximum 500 mg per dose) every 8 hours for 6 days.
- (* if there is some delay in beginning the treatment, a loading dose of 30 mg/kg (IV) - max 2g - might be necessary).

Pregnant women

Same as for adults. Ribavirin is contraindicated in pregnancy, however in the context of VHF, the benefit appears likely to outweigh any fetal risk of ribavirin therapy, and ribavirin is therefore recommended. The associated mortality of VHF tends to be higher in pregnancy.

Children

Same as for adults, dosed according to weight.

Oral ribavirin therapy:

Oral therapy can be used where IV therapy is not feasible (intravenous ribavirin therapy require hospital infrastructure that may not be available in every health care centre or in the field). During the course of CCHF patients have nausea, vomiting, gut bleeding, haematemesis and melaena and hence the uptake of oral Ribavirin may be poor.

Adults

1. Loading dose of 2000 mg orally once,
2. Followed by 1000 mg orally every 6 hours for 4 days,
3. Followed by 500 mg orally every 6 hours for 6 days.

Pregnant women

Same as for adults

Children

1. Loading dose of 30 mg/kg orally once,
2. Followed by 15 mg/kg every 6 hours for 4 days,
3. Followed by 7 mg/kg every 6 hours for 6 days.

ANNEX: ASSESSMENT AND TREATMENT OF DIARRHOEA

Table A1. Assessment of diarrhoeal patients for dehydration

| First assess your patient for dehydration | | | |
|--|--|---|---|
| | PLAN A | PLAN B | PLAN C |
| 1. Look at: General condition | Well, alert | *Restless, irritable* | *Lethargic or unconscious; floppy* |
| Eyes ^a | Normal | Sunken | Very sunken and dry |
| Tears | Present | Absent | Absent |
| Mouth and tongue ^b | Moist | Dry | Very dry |
| Thirst | Drinks normally, not thirsty | *Thirsty, drinks eagerly* | *Drinks poorly or not able to drink* |
| 2. Feel: Skin pinch ^c | Goes back quickly | *Goes back slowly* | *Goes back very slowly* |
| 3. Decide: | The patient has <i>no signs of dehydration</i> | If the patient has two or more signs, including at least one *sign* there is <i>some dehydration</i> | If the patient has two or more signs, including at least one *sign* there is <i>severe dehydration</i> |
| 4. Treat: | Use Treatment Plan A | Weigh the patient if possible and use Treatment Plan B | Weigh the patient and use Treatment Plan C URGENTLY |

^a In some infants and children the eyes normally appear somewhat sunken. It is helpful to ask the mother if the child's eyes are normal or more sunken than usual.

^b Dryness of the mouth and tongue can also be palpated with a clean finger. The mouth may always be dry in a child who habitually breathes through the mouth. The mouth may be wet in a dehydrated patient owing to recent vomiting or drinking.

^c The skin pinch is less useful in infants or children with marasmus (wasting) or kwashiorkor (severe malnutrition with oedema) or in obese children.

Source: *The treatment of diarrhoea, a manual for physicians and other senior health workers*. Geneva, World Health Organization, 1995 (document WHO/CDR/95.3).

Treatment plan A: to treat diarrhoea at home

Use this plan to teach the mother to:

- continue to treat at home her child's current episode of diarrhoea; and
- give early treatment for future episodes of diarrhoea.

Explain the three rules for treating diarrhoea at home

1. Give the child more fluids than usual to prevent dehydration

- Use recommended home fluids. These include ORS solution, food-based fluids (such as soup, rice water and yoghurt drinks) and plain water. Use ORS solution as described in the box below.

(Note: if the child is under 6 months of age and not yet taking solid food, give ORS solution or water rather than food-based fluid.)

- Give as much of these fluids as the child will take. Use the amounts shown below for ORS as a guide.
- Continue giving these fluids until the diarrhoea stops.

2. Give the child plenty of food to prevent malnutrition

- Continue to breastfeed frequently.
- If the child is not breastfed, give the usual milk.
- If the child is 6 months or older, or already taking solid food:
 - also give cereal or another starchy food mixed, if possible, with pulses, vegetables and meat or fish; add one or two teaspoonfuls of vegetable oil to each serving;
 - give fresh fruit juice or mashed banana to provide potassium;
 - give freshly prepared foods; cook and mash or grind food well;
 - encourage the child to eat: offer food at least six times a day; and
 - give the same food after diarrhoea stops, and give an extra meal each day for 2 weeks.

3. Take the child to the health worker if he/she does not get better in 3 days or develops any of the following:

- many watery stools
- repeated vomiting
- marked thirst
- eating or drinking poorly
- fever
- blood in the stool

Children should be given ORS solutions at home if:

- they have been on Treatment Plan B or C;
- they cannot return to the health worker if the diarrhoea gets worse; or
- if it is national policy to give ORS to all children who see a health worker for diarrhoea.

If the child is to be given ORS solution at home, show the mother how much ORS to give after each loose stool and give her enough packets for 2 days.

| Age | Amount of ORS to be given after each loose stool | Amount of ORS to provide for use at home |
|------------------|---|---|
| Under 24 months | 50–100 ml (1/4 – ½ cup) | 500 ml/day |
| 2–10 years | 100–200 ml (½ – 1 cup) | 1000 ml/day |
| 10 years or more | as much as wanted | 2000 ml/day |

- Describe and show the amount to be given after each stool, using a local measure.

Show the mother how to mix and to give ORS

- Give a teaspoonful every 1–2 minutes for a child under 2 years.
- Give frequent sips from a cup for older children.
- If the child vomits, wait 10 minutes. Then give the solution more slowly (for example, a spoonful every 2–3 minutes).
- If diarrhoea continues after the ORS packets are used up, tell the mother to give other fluids as described in the first rule above or return for more ORS.

Treatment plan B: to treat dehydration

Table A2. Approximate amount of ORS solution to give in the first 4 hours

| | Age ^a | | | | | |
|---------------|------------------|-------------|--------------|------------|------------|------------|
| | < 4 months | 4–11 months | 12–23 months | 2–4 years | 5–14 years | 15 years + |
| Weight | 0 – < 5 kg | 5–7.9 kg | 8–10.9 kg | 11–15.9 kg | 16–29.9 kg | 30 kg + |
| In ml | 200–400 | 400–600 | 600–800 | 800–1200 | 1200–2200 | 2200–4000 |

^a Use the patient'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 patient's weight (in grams) times 0.075.

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

Observe the child carefully and help the mother give ORS solution.

- Show her how much solution to give the child.
- Show her how to give it – a teaspoonful every 1–2 minutes for a child under 2 years, frequent sips from a cup for an older child.
- Check from time to time to see if there are problems.
- If the child vomits, wait 10 minutes and then continue giving ORS, but more slowly, for example, a spoonful every 2–3 minutes.
- If the child's eyelids become puffy, stop the ORS and give plain water or breast-milk. Give ORS according to Plan A when the puffiness is gone.

After 4 hours, reassess the child using the assessment chart, then select Plan A, B or C to continue treatment

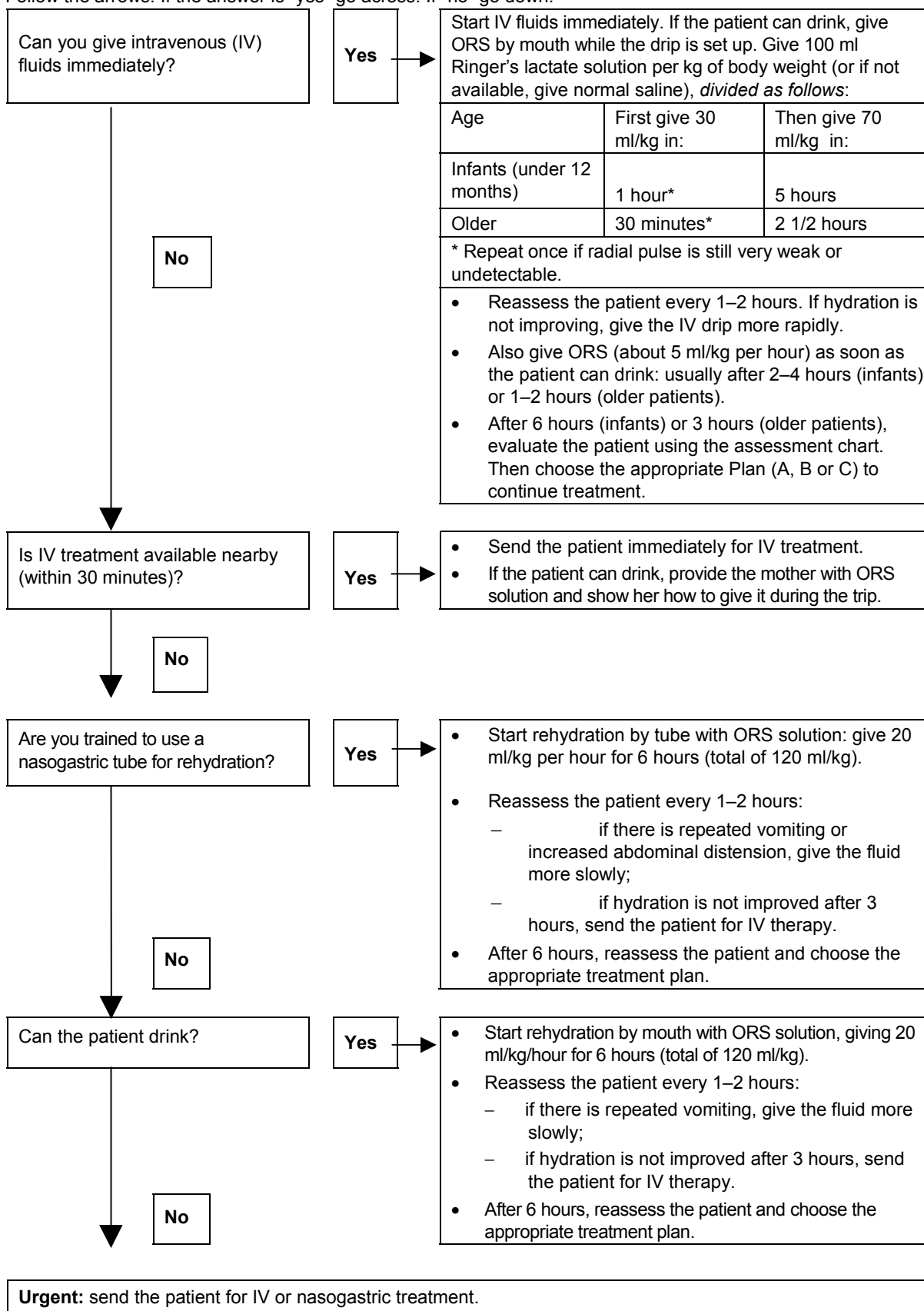
- If there are no signs of dehydration, shift to Plan A. When dehydration has been corrected, the child usually passes urine and may also be tired and fall asleep.
- If signs indicating some dehydration are still present, repeat Plan B but start to offer food, milk and juice as described in Plan A.
- If signs indicating severe dehydration have appeared, shift to Plan C.

If the mother must leave before completing Treatment Plan B:

- show her how much ORS to give to finish the 4-hour treatment at home;
- give her enough ORS packets to complete rehydration, and for 2 more days as shown in Plan A;
- show her how to prepare ORS solution; and
- explain to her the three rules in Plan A for treating her child at home:
 - to give ORS or other fluids until diarrhoea stops
 - to feed the child
 - to bring the child back to the health worker, if necessary.

Treatment plan C: to treat severe dehydration quickly

Follow the arrows. If the answer is "yes" go across. If "no" go down.



If possible, observe the patient for at least 6 hours after rehydration to be sure the mother can maintain hydration giving ORS solution by mouth. If the patient is older than 2 years and there is cholera in the area, give an appropriate oral antibiotic after the patient has become alert.