

# MEASLES

## Case Management

### Look for these symptoms:

- Fever
- Maculo-papular rashes
- Conjunctivitis
- Coryza
- Cough



### Key Facts

- Suspected measles case definition: A patient with fever and maculopapular (non-vesicular) rash, or in whom a health care worker suspects measles.
- It is highly contagious disease with incubation period of 7-21 day
- Rashes arises approximately 2-4 days after onset of fever, it consists of an erythematous, maculopapular, blanching rash, which classically begins on the face and spreads cephalocaudally (characteristic of measles) and centrifugally to involve the neck, upper trunk, lower trunk, and extremities
- The period of contagiousness is from four days before the appearance of rash to four days afterward.
- Complications associated with measles most commonly involve the respiratory and/or digestive tracts: otitis media, pneumonia, laryngotracheobronchitis (croup), diarrhea and stomatitis.
- Measles spread by contact with infected nasal or throat secretions (coughing or sneezing).
- Respiratory droplets can remain airborne for up to 2 hours.
- It can affect all age group but is common among children.

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Laboratory confirmation	Clinical Samples to be collected	Method	Time of collection	Remarks
	5 ml blood sample >1 year of age 1ml of blood <1 year of age	Serology/ELISA	<b>3-28 days of rash onset/first contact</b>	In outbreak condition, serum collected after 4 days of rash onset
	throat swab, urine	Virology/RT-PCR	<b>Within 3-5days of rash onset</b>	Only taken at the time of suspected outbreak, the Sample should reach to National Public Health Laboratory (NPHL within 24 hours of collection)
Note: The sample must be stored and transported maintaining proper cold chain (2 – 8°C).				
Treatment	<ul style="list-style-type: none"> <li>• No specific anti-viral therapy.</li> <li>• Symptomatic treatment for prevention of complications</li> <li>• Treatment is supportive- antipyretics, fluids, and treatment of superinfection like pneumonia and otitis media.</li> <li>• Immediate administration of Vitamin A</li> </ul> <p><b>In children</b></p> <ul style="list-style-type: none"> <li>○ &lt; 6 months- 50,000 IU</li> <li>○ 6-11 months- 100,000 IU, and</li> <li>○ ≥ 12 months- 200,000 IU</li> </ul>			
Prevention	<ul style="list-style-type: none"> <li>• IPC intervention is the first step while handling a suspected measles case.</li> <li>• Immediately place patients with known or clinically suspected measles in a separate area until examined or in an airborne infection isolation room (AIIR), where available.</li> <li>• Vaccination is the most effective way to prevent measles.</li> <li>• Two doses of the MR vaccines are given at 9 months and 15 months of age as per the immunization schedule of the National Immunization Program.</li> <li>• While treating measles, where isolation rooms are not available, a separate area or structure for clinically suspected measles patients should be used.</li> <li>• Isolation should continue until the case is discharged, or for 4 days after rash onset, whichever is later.</li> <li>• Provide patients with confirmed or clinically suspected measles with a medical-surgical facemask and separate these individuals from non-measles patients prior to or as soon as possible upon entering a healthcare facility.</li> <li>• Limit transport of patients with clinically suspected and confirmed measles cases, if transportation is unavoidable provide surgical/medical mask to patient, cover patients body with full sleeves gown.</li> <li>• Encourage patients for proper respiratory hygiene and hand hygiene.</li> <li>• Use disposable patient care equipment if possible.</li> <li>• Cleaning and disinfection of patient care equipment and linen used by patients.</li> </ul>			

Note: Fever and Rash case must be reported to Health office or WHO-IPD Surveillance Medical Officer



# TETANUS

## Case Management

Look for these symptoms:

- Spasm of the muscles of the jaw or “lockjaw
- Stiff neck
- Opisthotonus (rigid and arches their back, with their head thrown backward)
- Risus sardonicus (sardonic smile)
- Board-like rigid abdomen
- Periods of apnea and/or upper airway obstruction due contraction of the thoracic muscles and/or glottal or pharyngeal muscle contraction, respectively
- Dysphagia

### Key Facts

- Tetanus occurs when spores of *Clostridium tetani*, an anerobic bacterium found in soil gains access to damaged human tissue.
- The bacteria produce tetanus toxin- tetanospasmin which causes muscle spasms.
- Tetanus is endemic in resource-limited settings, and the incidence often increases following natural disasters such as earthquakes.
- Unvaccinated or inadequately vaccinated individuals with penetrating injury with inoculation of spores of *C. tetani*, devitalized tissue, a foreign body, or local ischemia are at risk for tetanus.
- Incubation period- approximately 8 days (3-21 days)
- Clinical forms- generalized, localized and cephalic. Clinical features of generalized tetanus are due to tonic contraction of their skeletal muscles and intermittent intense muscular spasms which may be triggered by loud noises, physical contact, or light.

### Laboratory diagnosis

Tetanus can be diagnosed based on the clinical presentation, examining someone for certain signs and symptoms and inquiring about recent history of cuts, scrapes, punctures, and trauma. **There are no hospital lab tests that can confirm tetanus.**

### Treatment

- Tetanus is a medical emergency requiring hospitalization in ICU for early airway management.
- Control muscle spasm with benzodiazepines (e.g., diazepam)
- Aggressive wound care- wound debridement to eradicate spores and necrotic tissue
- Immediate treatment with human tetanus immunoglobulin (HTIG)- a single dose of 500 units intramuscularly
- Antibiotics- intravenous metronidazole 500 mg 3 times daily for 7-10 days.

#### Guidelines for tetanus prophylaxis with TIG in routine wound management

Vaccination status	Clean, minor wound		All other wounds	
	Tetanus toxoid	HTIG	Tetanus toxoid	HTIG
Unknown or < 3 vaccines	Yes	No	Yes	Yes (250 IU for prophylaxis)
≥ 3 vaccines	No*	No	No**	No

\* Yes if ≥ 10 years of last TT, \*\* yes if ≥ 5 years of last TT

### Prevention

Tetanus can be prevented through immunization with tetanus-toxoid-containing vaccines (TTCV). There are many kinds of vaccines used to protect against tetanus:

- diphtheria and tetanus (DT) vaccines
- diphtheria, tetanus, and pertussis (whooping cough) (DTaP) vaccines
- tetanus and diphtheria (Td) vaccines
- tetanus, diphtheria, and pertussis (Tdap) vaccines.

To be protected throughout life, WHO recommends that an individual receives 6 doses (3 primary plus 3 booster doses) of TTCV.

- The 3-dose primary series should begin as early as 6 weeks of age, with subsequent doses given with a minimum interval of 4 weeks between doses.
- The 3 booster doses should preferably be given during the
  - ✓ second year of life (12–23 months),
  - ✓ at 4–7 years of age, and
  - ✓ at 9–15 years of age.

Ideally, there should be at least 4 years between booster doses.

Proper wound care or surgical procedure.

Immunizing pregnant lady/ women of reproductive age, clean delivery, and cord care to prevent neonatal tetanus.





# Acute Watery Diarrhea

## Case Management

### Look for these symptoms:

- Loose stools, typically at least three times in a 24-hour period.
  - \* *Watery diarrhea is characteristically non-bloody, a "rice-water" appearance of stool flecked with mucous is suggestive of cholera whereas diarrhea with visible blood is dysentery*
- Associated features- abdominal cramping, vomiting, tenesmus and fever
- Signs of dehydration

### Key Facts

- Diarrhea is defined as the passage of three or more loose or liquid stools per day (or more frequent passage than is normal for the individual).
- Diarrheal diseases are due to an infection in the intestinal tract, which can be caused by bacterial, viral and parasitic organisms.

### Causative organisms:

- Diarrhea may also occur in other systemic infections, such as influenza, dengue fever, scrub typhus and malaria.
- Acute diarrhea can occur at any age, but children are more commonly affected
- Rota virus, Entamoeba histolytica, cholera and E.coli are the common causative organisms in Nepal.

### Assessment of severity of dehydration among patients with acute watery diarrhea

	Examination	No signs of dehydration	Some dehydration	Severe dehydration
<b>Look</b>	Mental status	Alert	Restless, irritable	Lethargic, unconscious
	Eyes/anterior fontanelle in infant	Normal	Sunken	Very sunken
	Tears	Present	Absent	Absent
	Mouth/tongue	Moist/slightly dry	Dry	Very dry
	Thirst	Increased thirst	Thirsty, drinks eagerly	Drinks poorly or unable to drink
	Urine output	Normal or mildly reduced	Markedly reduced	Anuria
<b>Feel</b>	Skin pinch	Goes back rapidly	Goes back slowly	Tenting
	Pulse	Normal	Rapid, weak	Very weak or unpalpable
	Estimated fluid loss	< 50 ml/kg	50-100 ml/kg	>100 ml/kg

Laboratory Tests	Clinical Sample to be collected	Method	Assay	Facility
	Stool	Stool microscopy	Culture	Reference Laboratory/Tertiary level/Secondary level
Stool dipsticks for cholera		RDT	All level	
Other laboratory findings	<ul style="list-style-type: none"> <li>Leukocytosis with thrombocytopenia is common. Liver enzymes- SGPT and SGOT may be elevated.</li> <li>Urea and creatinine may be elevated.</li> </ul>			
Treatment	<ul style="list-style-type: none"> <li><b>Supportive care:</b> Easily treatable with inexpensive antibiotics with dramatic results and <b>needs to be started on clinical suspicion.</b></li> <li>Rehydrate with oral rehydration solution. Patients with severe dehydration and persistent vomiting require intravenous fluid- normal saline or ringer lactate</li> <li>Zinc supplement 10 mg/day for 14 days for children</li> <li>Antimicrobials                             <ul style="list-style-type: none"> <li>Severe diarrhea cholera outbreak setting– doxycycline 300 mg (4-6 mg/kg for children) single dose</li> <li>Blood mixed diarrhea (Shigellosis)- ciprofloxacin 500 mg (children 10 mg/kg 12 hourly) for 3 days.</li> <li>E. histolytica- metronidazole (400 mg 8 hourly for 5 days)</li> </ul> </li> <li>Nutrient-rich food- boiled starches, and cereals (potatoes, noodles, rice, wheat and oats) with salts are recommended</li> </ul>			
Prevention	<ul style="list-style-type: none"> <li>Encourage to drink safe (purified) drinking-water.</li> <li>Use of improved sanitation.</li> <li>Hand washing with soap and water.</li> <li>Good personal and food hygiene;</li> <li>Health education about how infections spread; and</li> <li>rotavirus vaccination.</li> </ul> <p># exclusive breastfeeding for the infant up to first six months of life;</p>			



# INFLUENZA

## Case Management

### Look for these symptoms:

- high fever (greater than or equal to 38°C/101° F)
- Sore throat and coryza (runny nose)
- Cough (Dry; no production of sputum)
- Muscle ache/ Lethargy
- Eye infection/ Conjunctivitis

**High risk population-** Age ≥65 years, people with certain chronic medical conditions (such as asthma, diabetes, or heart disease), pregnant people and children ≤5 years may develop complications (such as pneumonia) which can be life-threatening, people.

### Key Facts

- Humans can be infected with avian influenza viruses, such as avian influenza virus subtypes A(H5N1), A(H7N9), and A(H9N2).
- Influenza infections in humans may cause disease ranging from mild conjunctivitis to severe pneumonia and even death.
- The majority of human cases of A(H5N1) and A(H7N9) infection have been associated with direct or indirect contact with infected live or dead poultry. Controlling the disease in the animal source is critical to decrease risk to humans.
- Influenza viruses, with the vast silent reservoir in aquatic birds, are impossible to eradicate. Zoonotic influenza infection in humans can continue to occur. To minimize public health risk, quality surveillance in both animal and human populations, thorough investigation of every human infection and risk-based pandemic planning are essential.
- To reduce transmission of influenza, hand hygiene should be done before and after patient contact and always wearing a mask when in patient care areas.

Warning Signs	Children		Adults	
	Temperature 104°F not controlled by antipyretics		Difficulty breathing	
	Fast breathing or trouble breathing, Indrawing of ribs		Persistent chest pain	
	Bluish lips or face		Persistent dizziness, confusion	
	Child refuses to walk due to muscle pain		Severe muscle weakness	
	Dry mouth, no tears when crying, No urine for 8 hours		Signs of dehydration- decreased urine output	
	Not interacting when awake		Worsening of chronic medical conditions	
Seizures		Seizures		
Laboratory confirmation	Clinical Sample to be collected	Method	Assay	Facility
	Nasopharyngeal swab	Molecular	RT-PCR	Reference Laboratory/Tertiary level/Secondary level
Treatment	<ul style="list-style-type: none"> <li>• Supportive- antipyretics and oral fluids</li> <li>• Antiviral drug (oseltamivir) is usually given to high-risk population. <i>The standard recommended dosage for chemoprophylaxis against avian influenza is 75mg of oseltamivir, once daily (OD) for each day that exposure occurs. This should be continued for 10 days after the last exposure to the incident. Dose adjustment may be required for those with co-morbidities such as renal impairment.</i> <i>In a person with suspected or confirmed influenza virus infection or at risk of severe illness (i.e. including seasonal influenza, pandemic influenza and zoonotic influenza), we suggest administering oseltamivir <b>as soon as possible</b> (vs not administering oseltamivir) (conditional recommendation, low-quality evidence)</i></li> </ul>			
Vaccine	<ul style="list-style-type: none"> <li>• Available as flu shot (inactivated influenza vaccine).</li> <li>• The vaccination is only for prophylactic purpose Flu vaccination can reduce flu illnesses, doctor visits, and missed work and school due to flu, as well as prevent flu-related hospitalizations and deaths.</li> <li>• Vaccination is a must for people suffering from respiratory diseases (Bronchial Asthma, COPD, etc.)</li> <li>• Vaccines are available in two different forms               <ol style="list-style-type: none"> <li>Trivalent vaccines protect against two influenza A viruses (an H1N1 and an H3N2) and an influenza B virus.</li> <li>Quadrivalent vaccines protect against two influenza A viruses and two influenza B viruses.</li> </ol> </li> </ul>			
Prevention	<p>Health care workers are at high risk of acquiring influenza virus infection during patient care. Preventive measures are as follows.</p> <ol style="list-style-type: none"> <li>Please wear mask while providing care.</li> <li>Regular hand hygiene and proper respiratory hygiene.</li> <li>Proper cleaning and disinfection of personal care equipment</li> <li>Disposal of waste contaminated with patient's respiratory secretion</li> </ol>			





# SCRUB TYPHUS

## Case Management

### Look for these symptoms:

- High grade fever (>104°F)
- Severe headache and Myalgia
- Profuse sweating and chills
- Painless black eschar (scab) in site of bite (seen in 40% of cases)

- Cough
- Rashes
- Red eye
- Diarrhea
- Enlargement of Lymph node



Eschar

### Key Facts

- Scrub typhus is an acute, febrile, infectious illness that is caused by *bacteria Orientis* (formerly *Rickettsia tsutsugamushi*).
- Humans are accidental hosts in this zoonotic disease.
- Scrub typhus is transmitted to humans and rodents by some species of trombiculid mites (“chiggers”, *Leptotrombidium delicense*)
- Humans acquire the disease from the bite of an infected larval stage of the mite (chigger). The bite of the mite leaves a characteristic ‘eschar’ that is useful for making the diagnosis
- Scrub typhus is generally seen in people whose occupational or recreational activities bring them into contact with habitat of chiggers such as vegetation- consisting of low-lying trees and bushes in banks of rivers, rice fields, poorly maintained kitchen gardens, grassy lawns.
- It occurs more frequently before and after the rainy season. Outbreaks of Scrub Typhus were reported across the country after the Nepal earthquake 2015.
- The disease is difficult to recognize and diagnose because the symptoms and signs of the illness are often non-specific.
- The incubation period of scrub typhus is about 5 to 20 days (mean 10-12 days) after the initial bite.
- A study on the etiology of febrile illness among adults in Patan hospital showed that 3.2% patients (N=876) were serologically positive to scrub typhus.
- For contaminated clothing, ensure proper management by containment and washing clothing/linens in hot water >60 degrees or chlorinated bleach solution (0.5% bleach)

Laboratory diagnosis	Clinical Sample to be collected	Method	Assay	Facility
	2-4 ml blood sample in a plain vacutainer	Serology	ELISA	Reference Laboratory/Tertiary level/Secondary level
		Serology	RDT	All level
Treatment	<ul style="list-style-type: none"> <li>• Treatment should be initiated early on clinical suspicion as morbidity and mortality increases rapidly with delay in the treatment. Patient with mild illness without organ dysfunction can be managed with antipyretics (e.g. paracetamol) and antibiotics.</li> <li>• <u>Antibiotics</u> <ul style="list-style-type: none"> <li>• Doxycycline (Drug of choice) 100 mg twice daily for individuals above 45 kg (10 mg/Kg in 2 divided doses for children below 45 Kg) for 7 days. Capsule should be swallowed with a glass of water in sitting or standing position. OR</li> <li>• Azithromycin 500 mg (10 mg/Kg in children) once daily orally for 5 days.</li> <li>• <i>Azithromycin or chloramphenicol is useful for treating infection in children and pregnant woman. When patient cannot swallow or is critically ill, intravenous therapy of doxycycline or azithromycin preferred until condition improves. Total duration is 10-15 days.</i></li> </ul> </li> </ul> <p><b>*No vaccines are available till date for Scrub Typhus.</b></p>			
Prevention	<ul style="list-style-type: none"> <li>• Avoiding contact with infected chiggers.</li> <li>• In the areas with lots of vegetation and bush where chiggers may be found wear protective clothing, use insect repellents or insecticides treated clothing.</li> <li>• Chigger control by removal of bush/vegetation and residual spraying of vegetation.</li> </ul>			

