Infectio®

A quarterly Magazine
14th Edition, 1st Quarter 2023

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A quarterly Magazine

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Current News

COVID-19 the next phase and beyond

After living for more than 2 years with COVID-19—with over 6·2 million confirmed deaths (but probably many more, with an estimated 20 million excess deaths) and over 510 million confirmed cases-the world is at a critical point. The omicron wave, with its high transmissibility and milder course than previous variants, especially for people who are fully vaccinated and without comorbidities, is abating in many countries. Restrictions are being relaxed, and people are slowly returning to pre-pandemic activities, including gatherings, office-based working, and cultural events. Mask mandates are being lifted in many countries. Testing and surveillance have decreased and travelling is recommencing widely. People are understandably exhausted and want to forget about the pandemic.

First, the pandemic situation is not the same everywhere in the world. China, for example, continues to employ its so-called dynamic zero COVID strategy of mass testing, quarantining of those testing positive, and lockdown of districts or even whole cities. The problem is that older and vulnerable people are often not fully vaccinated, and the efficacy of the licensed vaccines is suboptimal.

Second, the global vaccination strategy is far from on track. Unacceptable vaccine inequity persists. WHO's goal of complete vaccination in at least 70% of people in every country is way out of reach. Although 59.7% of people globally have received two vaccine doses, in more than 40 countries fewer than 20% are completely vaccinated. Even in high-income countries, a sizeable proportion of the population continue to refuse vaccination. The emergence of a new SARS-CoV-2 variant is almost inevitable with continuous high transmission rates.

Third, vaccine inequity is mirrored by slow and delayed access to one of the few effective oral treatments for COVID-19-paxlovid. When taken early, paxlovid reduces the risk of hospitalization and death by 89%. Although high-income countries are ordering millions of doses from the manufacturer, Pfizer, mechanisms to make paxlovid available in low-income and middle- income countries via the Medicines Patent Pool are slow. An agreement has been reached with 35 generic manufacturers in 12 countries, but is not expected to deliver the drug before 2023.

Finally, now is the time to plan, learn from mistakes, and create strong resilient health systems, as well as national and international preparedness strategies with lasting funding. Capacities of health systems need to be strengthened, not only to be ready for future pandemics, but immediately to deal with the delays in treatment, diagnosis, and care for other diseases after the disruption of the past 2 years.

Now is not the time to turn away from COVID-19 or rewrite history. It is time to vigorously engage, redouble efforts to end the acute phase of the pandemic in 2022 for all, and lay strong sustainable foundations for a better future with clear accountabilities and honest acceptance of uncomfortable truths.

Reference: https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(22)00817-0/fulltext

Message of the Chairman Infectio®

Dear Readers,

Infectio® a quarterly publication, mainly focusing the updates about infectious diseases is overwhelmingly received by readers. The Editorial Board welcomes contribution in form of articles, short communication, & case studies relevant to Infectious Diseases.

Recent catastrophe of Flood in Pakistan resulted in increased number of Gastrointestinal Infections, Malaria & Dengue Fever. Therefore, this issue of Infectio® is focusing topics relevant to recent situation.

We feel honored to welcome our new board members i.e., **Prof Bushra Jamil (ID Specialist, AKU) & Dr. Mussarat Shanil (Consultant Dermatologist, Ziauddin Hospital)** to our valued Infectio® team.

I extend my warm wishes to all Infectio® editorial team & our readers on the publication of latest issue. I wish them to continue this journey on the road of excellence.

We are grateful to SAMI for their support in publication and distribution of this academic activity and acknowledge Prof. Bushra (President MMIDSP) for her input.

Prof. Dr. Ejaz Ahmed Vohra
Chairman Editorial Board
Dean Post graduate (Clinical)
Professor of Medicine
Dr. Ziauddin University – Karachi

Indicators of kidney diseases in children

Dr. Sadaf Asim
MBBS, DCH, MCPS, FCPS

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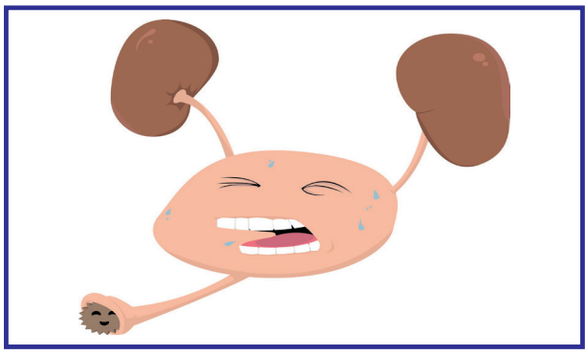
Kidney diseases come under the umbrella of non-communicable diseases. Kidney disease can be of short duration of onset most of the time which is reversible in children. On the contrary kidney diseases can be of longer duration called chronic kidney disease (CKD) and the disease process keep going on silently with very subtle signs and symptoms.

In our part of the globe, well child screening is not a luxury for majority of our children. Children with kidney disease present late when the disease gets advanced requiring dialysis to replace kidney functions. Growth failure can be the sole manifestation of underlying kidney disease. Child fails to gain weight and height appropriate for his or her age and gender.

Unexplained anemia that is reduced haemoglobin and for which no other cause can be identified is another indicator of a diseased kidney. It is very important to differentiate the nutritional cause of anemia from renal anemia as it needs further workup and management accordingly by a trained paediatric nephrologist. Bone disease resulting from kidney disease present with just bone pains or in the advanced form as bone deformities involving the lower limbs leading to bow legs and knock knees is another telltale sign of kidney disease.

Defects in the development of kidney and urinary tract by birth is the most important cause of kidney disease and kidney failure in children. Therefore, it is very important that antenatal ultrasound of mothers should be routinely done in pregnancy by experienced sonologists to detect the underlying defects in kidney development which should be addressed early after birth to prevent further kidney damage.

"Kidney stones are second important cause of kidney failure in children particularly in our region"



Hypertension which is considered to be an adult disease is not true. Children presenting with headache as a manifestation of high blood pressure is one of the presentation of kidney disease.

Therefore, it is recommended that any child above three years of age should have his or her blood pressure checked and verified by a Paediatric Nephrologist according to age and gender specific normal values.
Kidney stones are second important cause of kidney failure in children particularly in our region. Any child who has a family history of renal stones should be evaluated for underlying silent kidney stones leading to kidney impairment. Last but not the least repeated urinary tract infections, abnormal voiding patterns, dribbling, incontinence and bed wetting can be because of underlying urinary bladder disease which if remain unaddressed can become culprit of poor functioning kidneys.

It is very important to realize the importance of early detection & intervention of Kidney disease in children particularly where the expensive cost of dialysis, renal replacement therapy and kidney transplant is not an easy job. Our healthy children will turn to healthy productive members of society.

COVID-19 Vaccine

Interim COVID-19 Immunization Schedule for Persons 6 Months of Age and Older

Table 3. **COVID-19 Vaccine Products Summary**

Type	Product	Age Indications**	Diluent	Use For:††	Dose/Injection Amount
mRNA vaccine	**MONOVALENT Moderna:** Blue capped vial with magenta-bordered label	6 months through 5 years	NONE	Any dose in the primary series	25 µg/ 0.25 mL
	BIVALENT Moderna: Dark pink capped vial with yellow-bordered label	6 months through 5 years	NONE	Booster dose	10 µg/ 0.2 mL
	MONOVALENT Moderna: Blue capped vial with purple-bordered label	6 through 11 years	NONE	Any dose in the primary series	50 µg/0.5 mL
	BIVALENT Moderna: Blue capped vial with gray-bordered label	6 through 11 years	NONE	Booster dose	25 µg/0.25 mL
	MONOVALENT Moderna: Red capped vial with blue- bordered label	12 years and older	NONE	Any dose in the primary series	100 µg/ 0.5 mL
	BIVALENT Moderna: Blue capped vial with gray-bordered label	12 years and older	NONE	Booster dose	50 µg/0.5 mL
	MONOVALENT Pfizer-BioNTech: Maroon capped vial with maroon-bordered label	6 months through 4 years	2.2 mL 0.9% sodium chloride (normal saline, preservative-free)	Primary series Doses 1 and 2	3 µg/0.2 mL
	BIVALENT Pfizer-BioNTech: Maroon capped vial with maroon-bordered label	6 months through 4 years	2.2 mL 0.9% sodium chloride (normal saline, preservative-free)	Primary series Dose 3	3 µg/0.2 mL
	MONOVALENT Pfizer-BioNTech: Orange capped vial with orange-bordered label	5 through 11 years	1.3 mL 0.9% sodium chloride (normal saline, preservative-free)	Any dose in the primary series	10 µg/0.2 mL
	BIVALENT PFIZER-BIONTECH Orange capped vial with a orange-bordered label	5 through 11 years	1.3 mL 0.9% sodium chloride (normal saline, preservative-free)	Booster dose	10 µg/0.2 mL
	MONOVALENT Pfizer-BioNTech: Gray capped vial with a gray- bordered label	12 years and older	NONE	Any dose in the primary series	30 µg/0.3 mL
	BIVALENT Pfizer-BioNTech: Gray capped vial with gray-bordered label Single-dose Vials and Multidose Vials	12 years and older	NONE	Booster dose	30 µg/0.3 mL
Protein sub unit vaccine	**MONOVALENTNovavax:** Royal blue capped vial	12 years and older	NONE	Any dose in the primary series or as a single booster dose, in **limited situations**, for persons 18 years of age or older	5 µg rS and 50 µg of Matrix-M™ adjuvant/0.5 mL
Viral vector vaccine	**MONOVALENT Janssen:** Blue capped vial	18 years and older	NONE	Janssen COVID-19 vaccine is authorized for use in certain **limited situations** due to safety considerations‡‡	5×1010 viral particles/0.5 mL

** Administer the appropriate vaccine product based on the recipient's age and the vaccine product's indications.
†† COVID-19 vaccines may be administered on the same day as other routinely recommended vaccines, including influenza vaccine.
‡‡ For guidance on use of Janssen vaccine and retrospective record review, scheduling and administration see Interim Clinical Considerations for Use of COVID-19 Vaccines: Appendix A

What is Dengue?

Summerized by:
Editorial Board Members

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- Arboviral febrile Infection.
- 390 million cases worldwide 100 countries.
- Aedes aegypti mosquito vector is present in tropical and subtropical regions.
- 2.5% of people with severe dengue die
- In 2013, WHO estimated the total annual global cost of dengue at USD $8.9 billion
- NS antigen + in first three days serology on sixth days IGM + IGG quantitative > 1250mg diagnostic for recent infection.

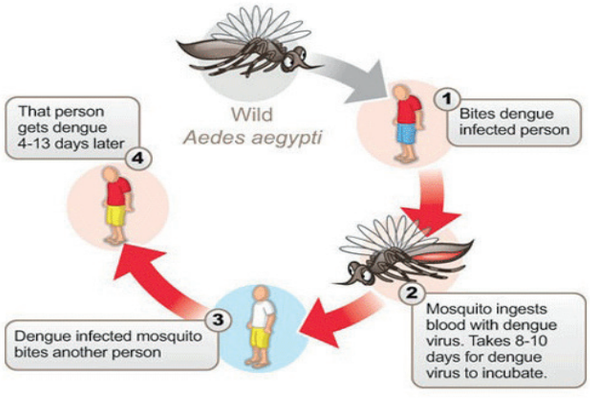
Dengue prevention strategy combines vector and vaccination

Vector Control

- Several methods
  - *Remove breeding sites*
  - *Mosquito Repellents*
  - *Fumigation*
  - *Wolbachia bacterium*
- Often in-effective
- Dengue outbreaks still occur

Vaccination is effective in person age > 9 years but serious reactions in sero-negative persons

How does Dengue spread?



WHO Dengue Case Classification

Dengue Without Warning Signs

Fever with any two of the following

- Nausea or Vomiting
- Rash
- Aches and Pain
- Tourniquet test-positive
- Leukopenia
- Lab confirmatory when no signs of plasma leakage

Dengue with Warning Signs

- Abdominal Pain or tenderness
- Persistent vomiting
- Fluid accumulation
- Mucosal bleeding
- Lethargy or restlessness
- Liver Enlargement
- Increased hematocrit with decreased platelet count

Can progress to

↓

Severe Dengue

- Severe plasma leakage, leading to shocks and or fluid accumulation with respiratory distress
- Severe Bleeding
- Severe organ impairment
  - Liver AST or ALT >= 1000
  - CNS Impaired consciousness
  - Heart and other organs

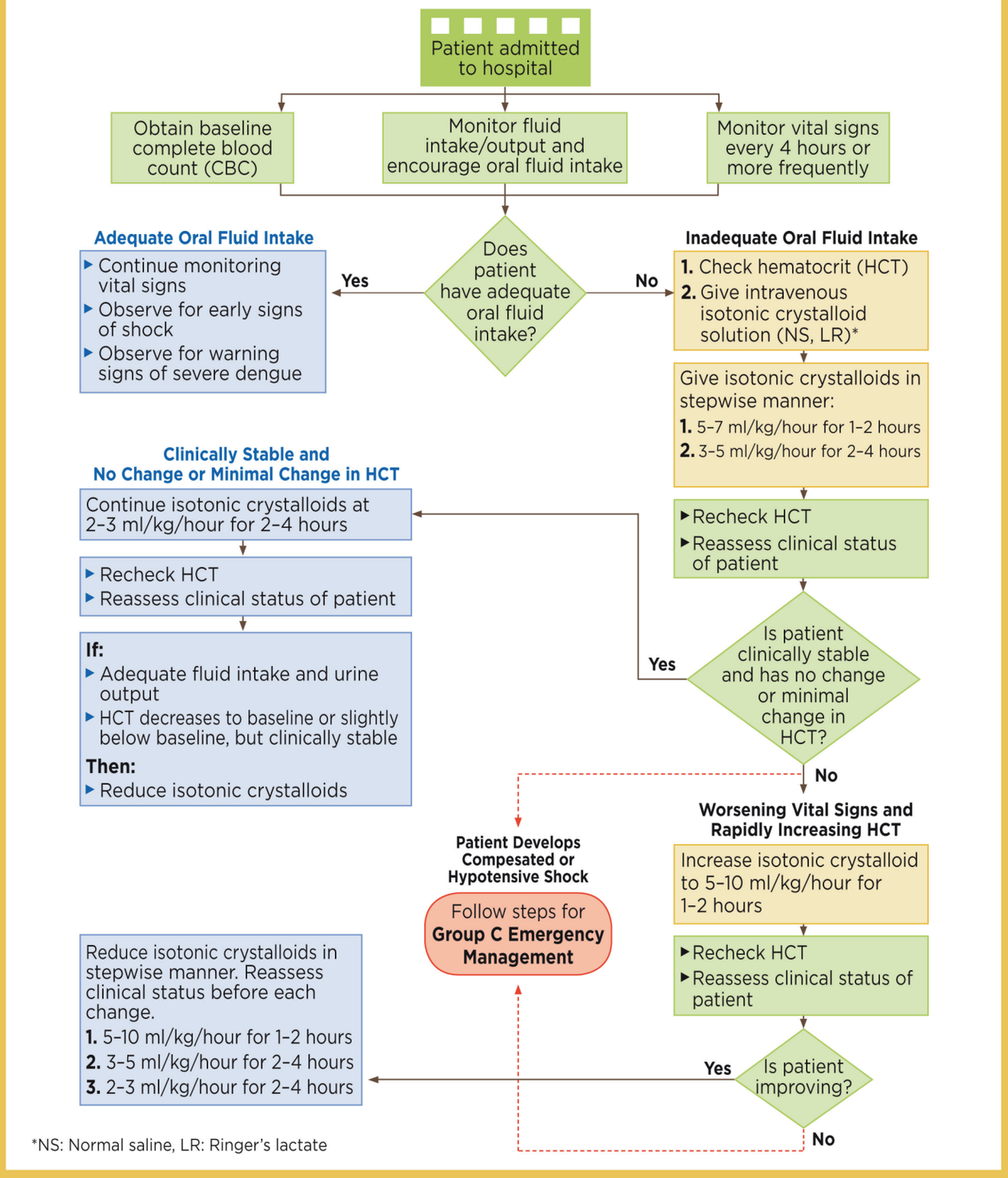
Dengue Treatment with warning signs

1. Administer lactated Ringer's Hartman of 0.9% solution at 10ml/kg for 1 hour
2. Re-evaluate: if warning signs persist and diuresis is < 1ml/kg/hr, repeat the charge once or twice again with an isotonic crystalloid.
3. Re-evaluate: if clinical improvement is observed and diuresis > 1ml/kg/hr, repeat reduce the drip to 5-7 ml/kg/hr, and continue for 2 to 4 hr, then continue the drip at 2-4 ml/kg/hr, for another hr, for another hr, depending on the patients' needs.
4. Repeat hemotocrit, it remains the same or uses slightly then continue the fluids at 2-4 ml/kg/hr, and adjust the infusion rate as per requirement.
5. If the patient deteriorates or there is repaid in hematocrit then treat the same as severe dengue.

Severe Dengue/Criteria for Dengue Shock Syndrome

1. Tachycardia, col extremities, delayed capillary refill, weak pulse, lethargy or restlessness which may be a sign of reduced brain perfusion.
2. Pulse pressure < 20mm Hg with increased diastolic pressure, e.g., 100/80 mmHg
3. Hypotension by age, defined as systolic pressure < 80mmHg for those aged < 5 years or 80 to 90 mmHg for older children and adults

Inpatient Management for Dengue Patients with **Warning Signs**



*NS: Normal saline, LR: Ringer's lactate

Centers for Disease Control and Prevention
National Center for Emerging and Zoonotic Infectious Diseases

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Dengue Management DO's and DON'Ts

- **DON'T use corticosteroids.** They are not indicated and can increase the risk of GI bleeding, hyperglycemia, and immunosuppression.
- **DON'T give platelet transfusions for a low platelet count.** Platelet transfusions do not decrease the risk of severe bleeding and may instead lead to fluid overload and prolonged hospitalization.
- **DON'T give half normal (0.45%) saline.** Half normal saline should not be given, even as a maintenance fluid, because it leaks into third spaces and may lead to worsening of ascites and pleural effusions.
- **DON'T assume that IV fluids are necessary.** First check if the patient can take fluids orally. Use only the minimum amount of IV fluid to keep the patient well-perfused. Decrease IV fluid rate as hemodynamic status improves or urine output increases.

- **DO tell outpatients when to return.** Teach them about warning signs and their timing, and the critical period that follows defervescence.
- **DO recognize the critical period.** The critical period begins with defervescence and lasts for 24–48 hours. During this period, some patients may rapidly deteriorate.
- **DO closely monitor fluid intake and output, vital signs, and hematocrit levels.** Ins and outs should be measured at least every shift and vitals at least every 4 hours. Hematocrits should be measured every 6–12 hours at minimum during the critical period.
- **DO recognize and treat early shock.** Early shock (also known as compensated or normotensive shock) is characterized by narrowing pulse pressure (systolic minus diastolic BP approaching 20 mmHg), increasing heart rate, and delayed capillary refill or cool extremities.
- **DO administer colloids (such as albumin) for refractory shock.** Patients who do not respond to 2–3 boluses of isotonic saline should be given colloids instead of more saline.
- **DO give PRBCs or whole blood for clinically significant bleeding.** If hematocrit is dropping with unstable vital signs or significant bleeding is apparent, immediately transfuse blood.

Centers for Disease Control and Prevention
National Center for Emerging and Zoonotic Infectious Diseases

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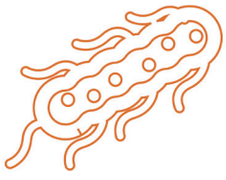
Typhoid fever

Information for the general public

Source of infection

Typhoid is a life-threatening systemic infection. It is transmitted through ingesting contaminated food or water.



Types of exposure & prevention

Poor sanitation and lack of clean drinking-water. Climate change has increased the burden of typhoid. Increased antibiotic resistance is making treatment a challenge. Prevention and vaccination are key.

Get vaccinated as typhoid is becoming resistant to antibiotics

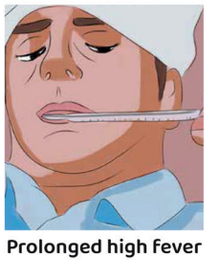
Wash hands with soap and clean water specially after using toilet and before eating food

Infected patients should avoid preparing or serving food to other people

Sanitation and clean drinking water must be ensured even if you are vaccinated

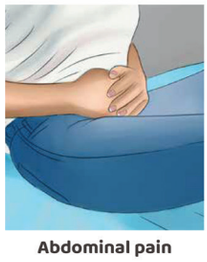
Signs & symptoms

In case of following symptoms, quickly see a doctor for treatment. Symptoms include:



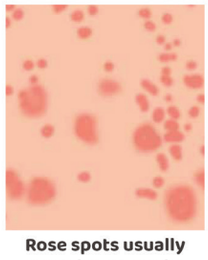
Prolonged high fever

Fatigue, headache and nausea

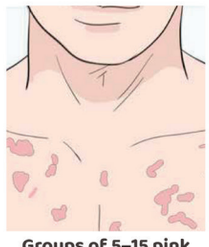


Abdominal pain

Constipation or diarrhoea



Rose spots usually occur between the second and fourth week of illness



Groups of 5–15 pink blanching papules (little bumps) appear on the anterior trunk

Actions to take in case of symptoms:

Seek immediate medical advice .

World Health Organization

Malaria

Summerized by:
Editorial Board Members

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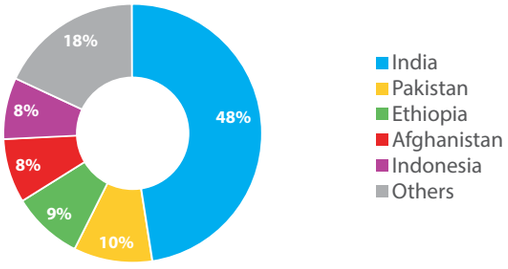
Humanity has but three great enemies, fever, famine and war of these by far the greatest, by far the most terrible, is fever. (William Osler)

- Malaria is life-threatening disease caused by Plasmodium parasites. The parasites are spread to people through the bites of infected female Anopheles mosquitoes, called “Malaria Vector”.
- There are 5 parasites species that cause malaria in humans, and 2 of these species- P. Falciparum and P. Vivax pose to greatest threat.
- It is preventable and curable
- In 2017, 219 million cases of malaria in 87 countries.
- Total malaria world death 435,000 in 2017

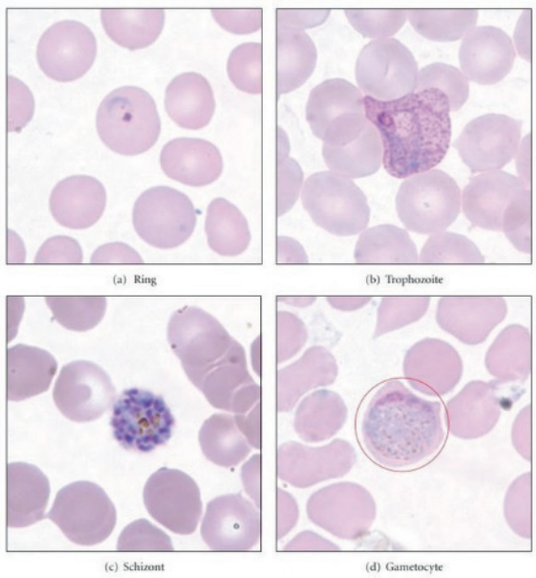


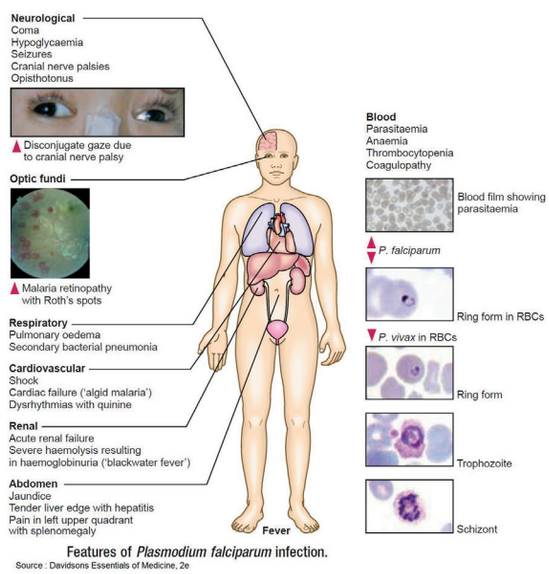
Malaria in Pakistan

- In EMRO region 30% of all cases of malaria occur in Pakistan
- 3.5 million people affected in 2017 & 50,000 deaths due to malaria. Mostly infants, children and pregnant women Vivax malaria more prevalent than falciparum malaria but in endemic areas increasing incidence of Falciparum
- Seasonal incidence peak during August to November.
- Province wise data from government health facilities across Pakistan 2017
- KP 30% (110,739), Sindh 26.5% (97,941), FATA 21.9% (80.924), Balochistan 20.5% (75,790). Punjab 1.1% (4,122)
- Insecticide-treated mosquito nets 1.19 million distributed

Symptoms & Diagnosis

- Fever
- Headache
- Chills, splenomegaly, jaundice
- In children disease can become severe
- In adults’ falciparum malaria can lead to severe life-threatening
- 61% (266,000) of all malaria deaths worldwide were in children under 5 years
- Blood film and rapid detection kits

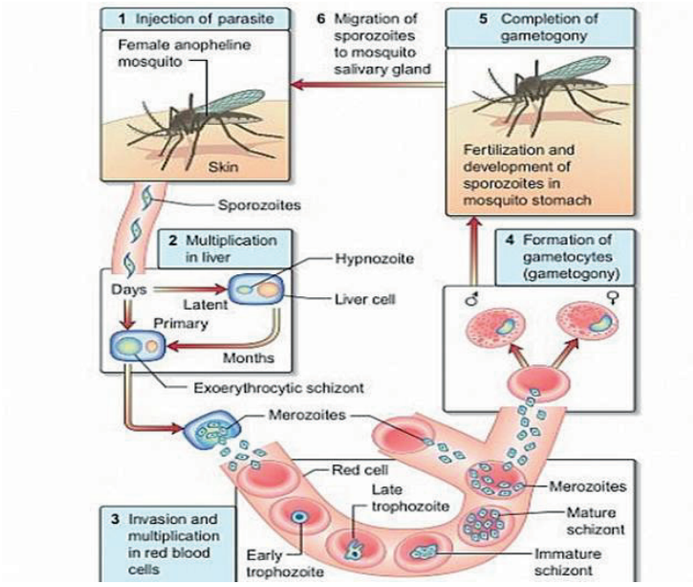




Features of *Plasmodium falciparum* infection.
Source : Davidsons Essentials of Medicine, 2e

Transmission

- Through bites of Female Anopheles mosquitoes between dusk and dawn
- Eggs are laid in collections of water and more in tropical rainy season



Prevention

- Spraying with residual insecticides
  Insecticide-treated mosquito nets
- Antimalarial drugs
  Malaria vaccine trials have started in three countries
- WHO and Pakistan Malaria Control Program

Treatment

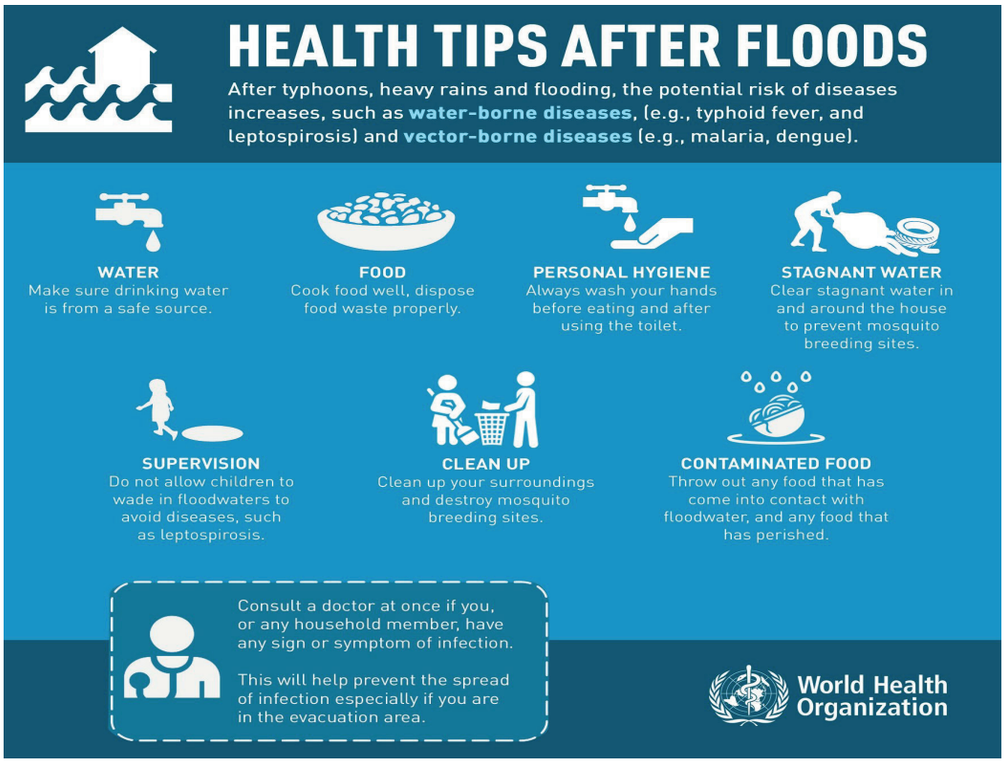
- Chloroquine for Vivax Infections
- Primaquine in G6 PD present for recurrent malaria
- For falciparum malaria artemether-lumefantrine combination

Malaria in Pregnancy

- Mosquito bite prevention by insect repellents and insecticide treated mosquito nets
- Chemoprophylaxis
- Treatment is safe except Primaquine

Malaria prevention in travelers to Pakistan

- Weekly Chloroquine one week before arrival
- Weekly Mefloquine two to three weeks before arrival.
- Daily prophylaxis with Doxycycline or Atovaquone-Proguanil one to two days before arrival.
- Should be continued for at least four weeks after return



Preventing Diarrheal Illness After A Disaster

Protect yourself and your family:

- **Drink and use safe water.**
- **Wash your hands often.**
- **Do not defecate in any body of water.**
- **Eat safe food. Boil it, cook it, peel it, or throw it away.**
- **Clean up safely.**
- **Avoid floodwater or contaminated water bodies.**

Drink and use safe water.

- Listen to local officials to find out if your water is safe.
- Use bottled water for drinking, washing and preparing food, making ice, and brushing your teeth.
- If you do not have bottled water, boil or disinfect your water to make it safe.

How to make your water safe by boiling or disinfecting:

- If boiling, bring your water to a complete boil and keep boiling for at least 1 minute.
- To disinfect your water, use unscented household liquid chlorine bleach. If your water is clear, add 8 drops to 1 gallon of water. If your water is cloudy, use 16 drops to 1 gallon of water. Wait 30 minutes before drinking.

Wash your hands often with soap and safe water.

- Before you eat or prepare food.
- Before feeding your children.
- Before and after treating wounds or taking care of someone who is sick.
- After going to the bathroom, changing diapers, or cleaning a child after they have gone to the bathroom.

If no soap is available, use an alcohol-based hand sanitizer that contains at least 60% alcohol.

Eat safe food.

- Boil it, cook it, peel it, or throw it away.
- Avoid meat and dairy products that have not been refrigerated.
- Cook food well. Eat it hot and keep it covered.
- Avoid raw foods other than fruits and vegetables you have peeled yourself.

Clean up safely.

- Clean food preparation areas and kitchenware with soap and safe water and let dry completely before reuse.
- Wash yourself, your children, diapers, and clothes 100 feet away away from drinking water sources.

Avoid flood water or contaminated water bodies.

- Wash your hands with soap and water after contact with flood waters.
- Do not allow children to play in flood water areas.
- Do not allow children to play with toys that have touched flood water and have not been disinfected.

Quiz

Choose the correct answer

Q1. According to guidance from the Infectious Diseases Society of America (IDSA), which of these is a preferred antibiotic for the treatment of infections outside of the urinary tract caused by extended-spectrum beta-lactamase-producing Enterobacterales (ESBL-E)?

A. Meropenem
B. Amoxicillin-clavulanate
C. Oral Fosfomycin
D. Doxycycline

https://reference.medscape.com/viewarticle/983201_6