وقاية

هيئة الصحة العامة
PUBLIC HEALTH AUTHORITY

Dengue Fever Disease:

Guidance for Surveillance, Case Diagnosis, and Management

V.1.3– EIDTION – 2023. KSA

ACKNOWLEDGMENTS

Many people have enhanced our professional experiences. We have had a distinct honor and opportunity to work with the Mistry of Health, Ministry of Environment Water and Agriculture, and Ministry of Municipal & Rural Affairs for years in the national health programs.

This manual is a collaboration among some people and would not be in your hands today without their assistance. Thank you to those we may not have mentioned here but have learned from over the years.

عزز الكثير من الناس خبراتنا المهنية. لقد كان لدينا شرف وفرصة مميزة للعمل مع وزارة الصحة ووزارة البيئة والمياه والزراعة ووزارة الشؤون البلدية والقروية لسنوات في البرامج الصحية الوطنية.

هذا الدليل هو تعاون بين بعض الأشخاص ولن يكون بين يديك اليوم بدون مساعدتهم.
شكراً لأولئك الذين ربما لم نذكرهم هنا، ولكننا تعلمنا منهم على مر السنين.

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1. ABBREVIATIONS

TERM	DEFINITION
RT- PCR	Real Time Polymerase Chain Reaction
Ns1	Nonstructural Protein 1 (NS1) antigen by immunoassay.
IgM	immunoglobulin M
IgG	immunoglobulin M
CDC	Centers for Diseases Prevention and Control
WHO	World Health Organization

2. DOCUMENT OVERVIEW

A. Introduction:

Dengue is a vector-borne arboviral infection common in warm, tropical areas. Dengue virus spread to humans through the bite of an infected female Aedes species (Ae. aegypti or Ae. albopictus) mosquito. Zika, chikungunya, and other viruses can also be transmitted through mosquitoes. The dengue viruses belong to the Flavivirus genus and the Flaviviridae family. Its genetic material is composed of single-strand RNA and has four distinct serotypes of dengue virus (DENV 1-4). An individual can be infected with a dengue virus more than four times in their lifetime. Dengue fever is caused by any one of four closely related dengue viruses (serotypes). These can lead to a broad spectrum of symptoms, including some extremely mild (unnoticeable) to those that may require medical intervention and hospitalization. In severe cases, fatalities can occur.

The global incidence of dengue has grown dramatically, with about half of the world's population at risk. Although an estimated 100-400 million infections occur yearly, over 80% are generally mild and asymptomatic. There is no specific treatment for dengue fever; they treat it according to symptoms.

Dengue was first reported in KSA in 1994 in Jeddah with serotype two in the Kingdom of Saudi Arabia (KSA). In 1994, dengue virus serotype 2 (DENV-2) was recorded for the first time, and was responsible for a significant epidemic in Jeddah, KSA, with 289 confirmed cases reported. Since then, dengue cases have been reported in other geographical locations of KSA.

Many patients infected with the dengue virus remain asymptomatic. Others, after an incubation period of typically 5-7 (range 3-14) days, develop a febrile illness with one of the following clinical phases:

Clinical Phases of Dengue Infection

a. Febrile Phase

- Usually, last 2-7 days
- Mild hemorrhagic manifestations such as petechiae and mucosal membrane bleeding (e.g., nose and gums) may be seen.
- Monitoring warning signs is crucial to recognize its progression to the critical phase.

b. Critical Phase

• A phase when the patient can either improve or worsen.

• Defervescence occurs between 3 to 7 days of illness. Defervescence is when the body temperature (fever) drops to almost normal (between 37.5 to 38°C).

• Those who improve after defervescence will be categorized as Dengue without Warning Signs. At the same time, those who will deteriorate will manifest warning signs and be classified as Dengue with Warning Signs, or some may progress to Severe Dengue.

• When warning signs occur, severe dengue may follow near the time of defervescence, which usually happens between 24 to 48 hours.

c. Recovery Phase

• It happens in the next 48 to 72 hours, when the body fluids return to normal.

• Patients' general well-being improves.

• Some patients may have a classical rash of "isles of white in the sea of red."

• The White Blood Cell (WBC) usually rises soon after defervescence, but the normalization of platelet counts typically happens later than that of WBC.

B. Goal:

- To provide up-to-date information about dengue fever that healthcare providers in Saudi Arabia can utilize.

3. SURVEILLANCE

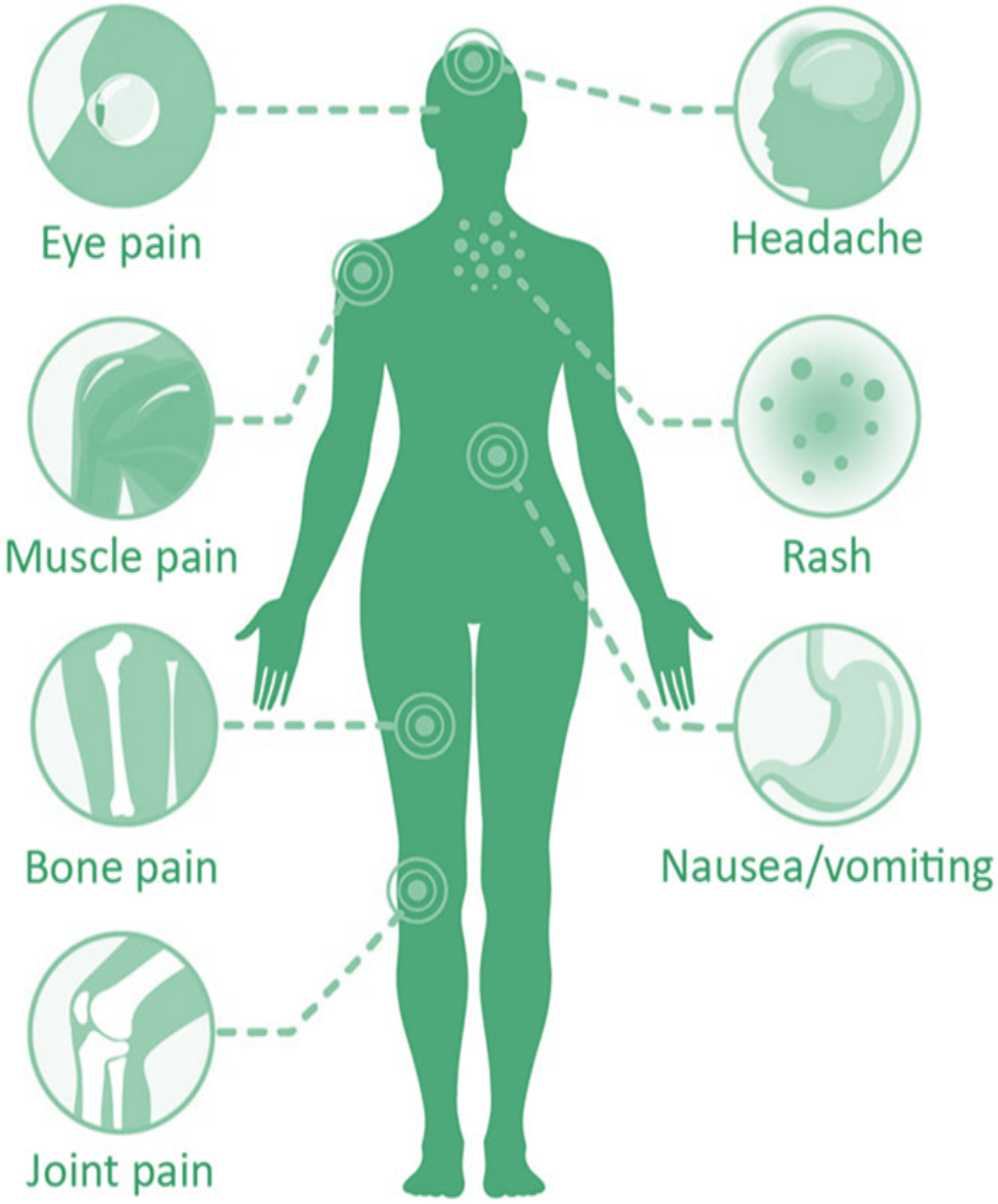
A. Case Definition:

Case Classifications	Case Definitions
Suspected Case	A person who meets the following clinical picture: - High fever >38.5 with one or more of the following symptoms: • Headache • Joint and muscle pains • Retro-orbital pain • nausea • vomiting • swollen glands • rash
Probable Case	A person who meets the above-suspected case criteria *with* epidemiological links like: 1- Present the entomological index at the case place (e.g., home or work). 2- Live or travel to an endemic case in the last 15 days.
Confirmed Case	A person who meets the above-suspected case criteria with at least one of the following tests: 1- RT-PCR 2- Ns1 3- IgM[1] **Note:** IgG detection by ELISA in a single serum sample is not helpful for diagnostic testing because it remains detectable for life after a dengue virus infection. Except if it has been done to check the secondary infection, two samples must be taken 2-4 weeks part and increased four-folds.
Not a Case	A person who has all[2] the following tests negative/ not detected: 1- RT-PCR 2- Ns1 3- IgM

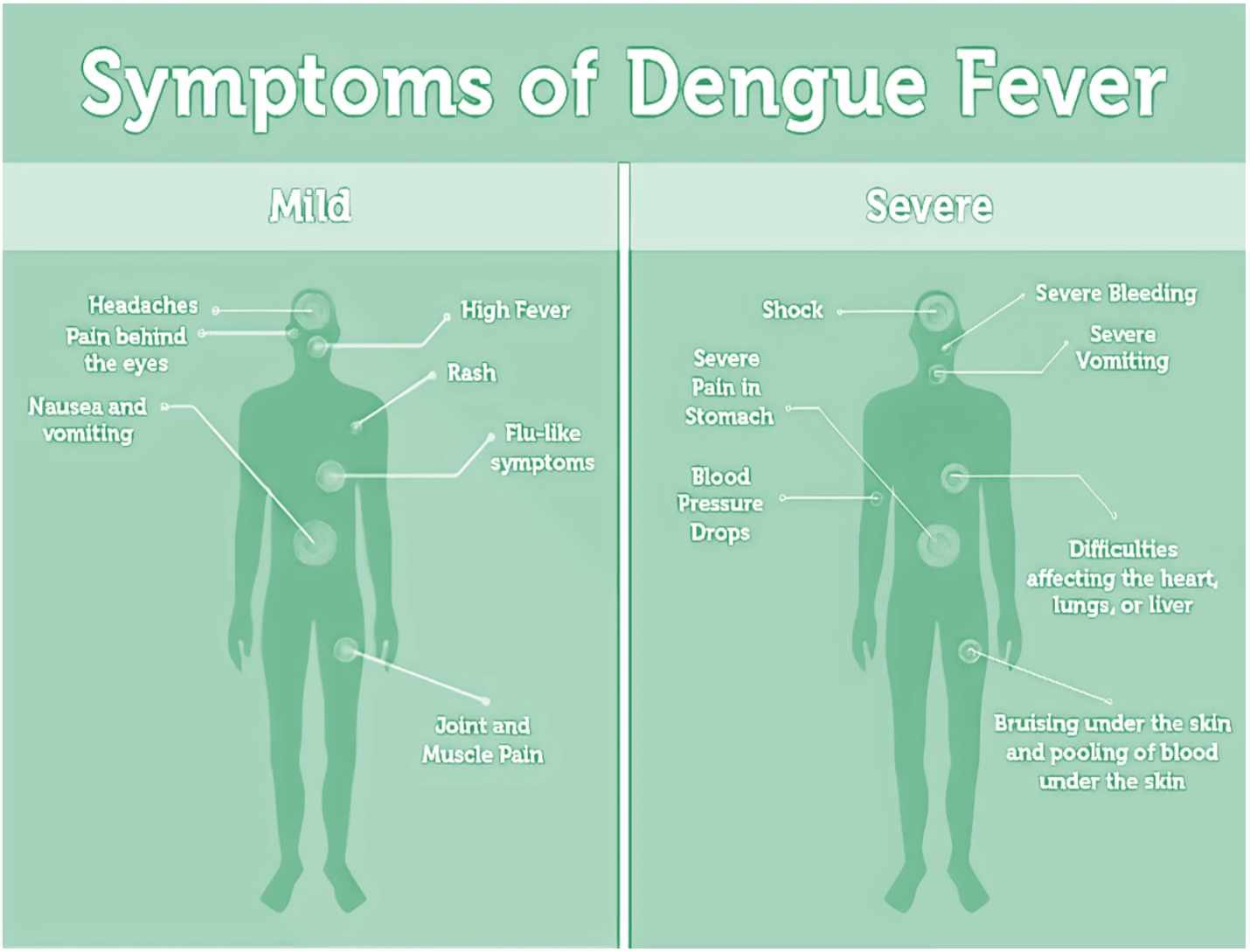
[1] Cross-reactivity is common among other flaviviruses (such as Zika, West Nile, yellow fever, HCV, alkhurma, Rift Valley, and Japanese Encephalitis viruses) in serology tests (IgM). Therefore, all confirmed specimens (IgM, Ns1, RT-PCR) must be sent to the public health lab for further advanced technology.

[2] The health care provider must run all the diagnostic tests. In case all negative/ not detected test, then must do screen 25% of the not a case samples to rule out other viral hemorrhagic fever VHF presence as yellow fever, chikungunya, Khumra, West Nile, Rift Valley, Zika, etc.

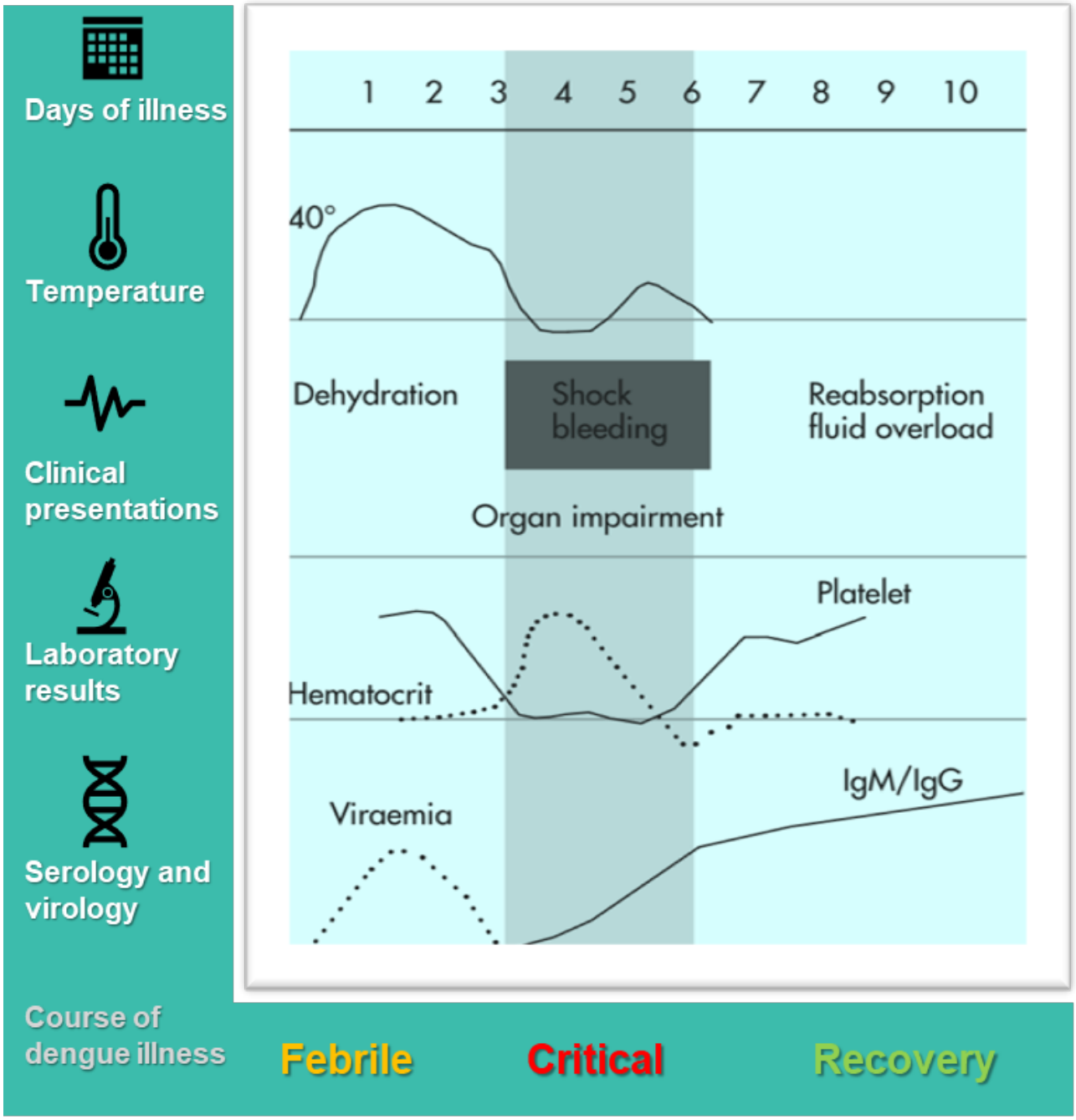
B. Signs & Symptoms:



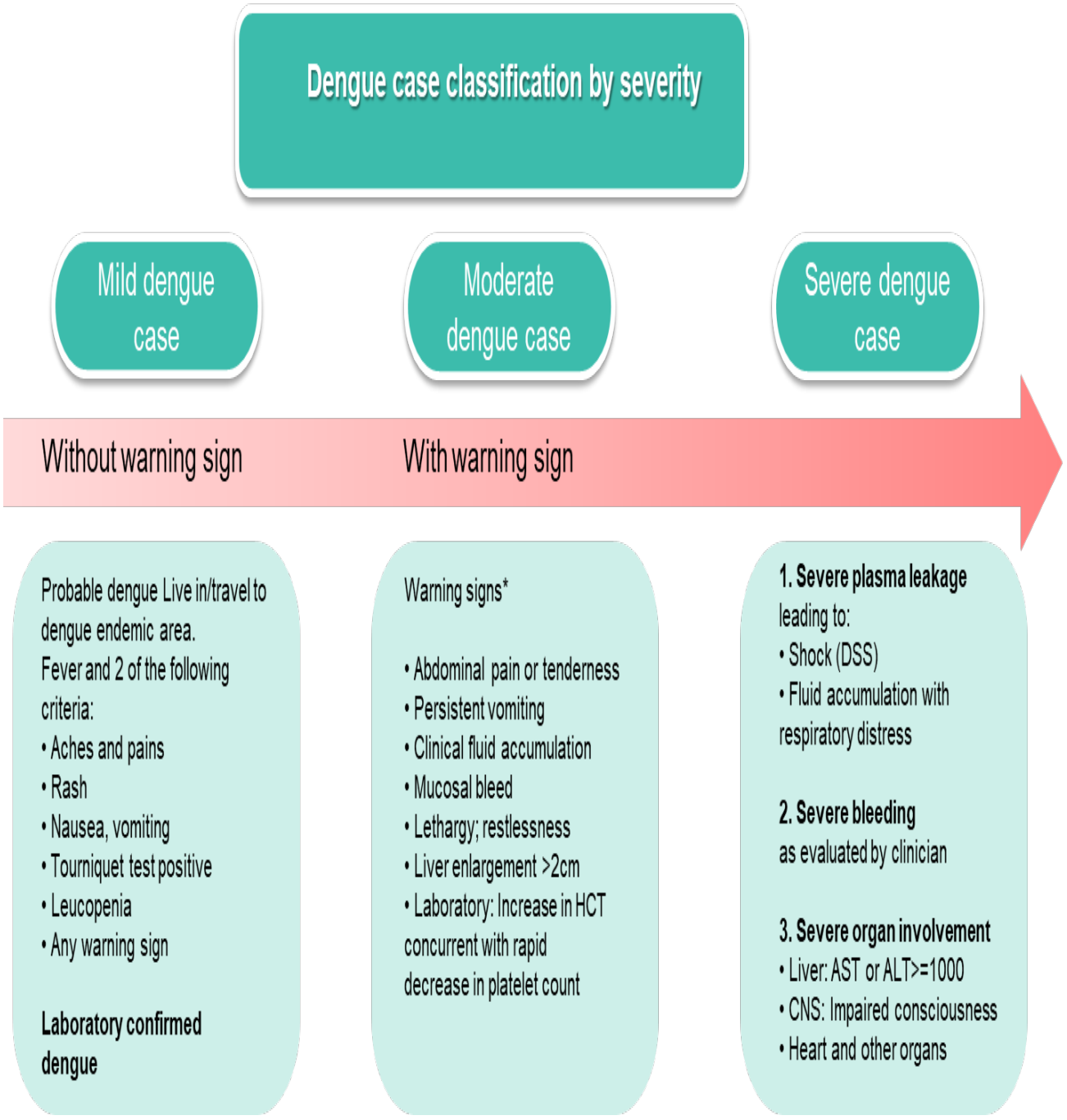
Mild vs Server Symptoms:



C. Screening and Diagnosis:



Classifications of Dengue Fever:



Laboratory Diagnosis:

- The purposes of dengue laboratory diagnosis are:

  (i) To confirm the patient clinical diagnosis.

  (ii) To provide information for epidemiological surveillance.

- Laboratory diagnosis of dengue is made by detecting the virus and/or any of its components (infective virus, virus genome, dengue antigen) or by investigating the serological responses present after infection (specifically IgM and IgG levels)
- Many methods can be used for the diagnosis of dengue infection. Depending on the time of patient presentation, the application of different diagnostic procedures may be appropriate.
- Patient samples collected during the first week of illness should be tested by both methods below:

1- Molecular test

The virus may be isolated from the blood during the first few days of infection. Various reverse transcriptase–polymerase chain reaction (RT–PCR) methods are available and are considered the gold standard. However, they require specialized equipment and training for staff to perform these tests.

2- Serological tests

Serological methods, such as enzyme-linked immunosorbent assays (ELISA), can confirm the presence of a recent or past infection with the detection of anti-dengue antibodies. IgM antibodies are detectable ~1 week after infection and remain detectable for about three months. The presence of IgM is indicative of a recent DENV infection. IgG antibody levels take longer to develop and stay in the body for years. The presence of IgG is indicative of a past condition.

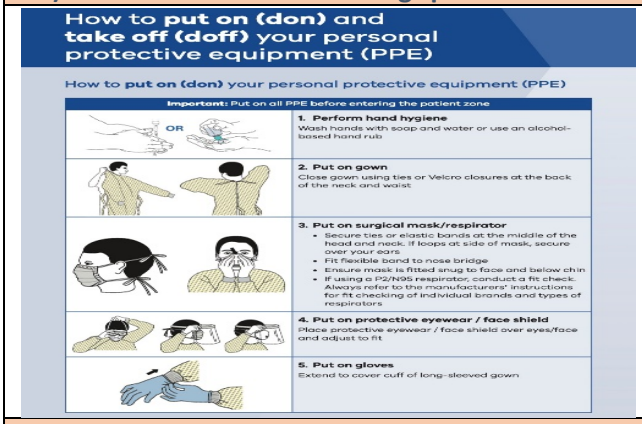
The virus may also be detected by testing for a virus-produced protein called Ns1 antigen by immunoassay.

Laboratory Tests:

Test	Description
Dengue Ns1	• Requested between 1-5 days of illness and remain positive up to 12 days after illness. • Use to detect dengue virus antigen during the early phase of acute dengue infection.
Dengue IgM/IgG	• Requested after the illness onset five days of illness and remain detectable for approximately 12 weeks. • Use to detect dengue antibodies during the acute late stage of dengue infection (IgM) and to determine the previous condition (IgG) • May give false positive results due to antibodies induced by the dengue vaccine.
Real Time-Polymerase Chain Reaction (RT-PCR)	• the gold standard laboratory test confirms the dengue early and specific detection of the dengue virus genome in human serum samples. • It can be made from a single acute-phase serum specimen obtained early (≤7 days after fever onset) in the illness.

Specimens Collection, Packaging, and Transport protocol for Specimen Requirements for Real-Time Reverse-Transcriptase Polymerase Chain Reaction **(RT-PCR) And ELISA IgM/IgG** for Dengue in Clinical Samples

Requirements for Clinical Samples Collection, Packaging and Transport		
1. Blood drawing tools and Samples Tube 	2. Hand-Frozen Gel Packs 	3. Icebox 

Procedure for Specimen packaging and Transport		
1) Use PPE While Handling specimen		
		
2) Step of Draw Blood		
a. Clean Arm 	b. Drawing Blood 	
3) Transport		
a. Put sample inside biohazard bag (each tube single bag) 	b. Using Ice bag 	c. Using Ice Box 

STEPS of Specimens Collection, Packaging, and Transport protocol for Specimen Requirements for Real-Time Reverse-Transcriptase Polymerase Chain Reaction **(RT-PCR) And ELISA IgM/IgG** for Dengue in Clinical Samples

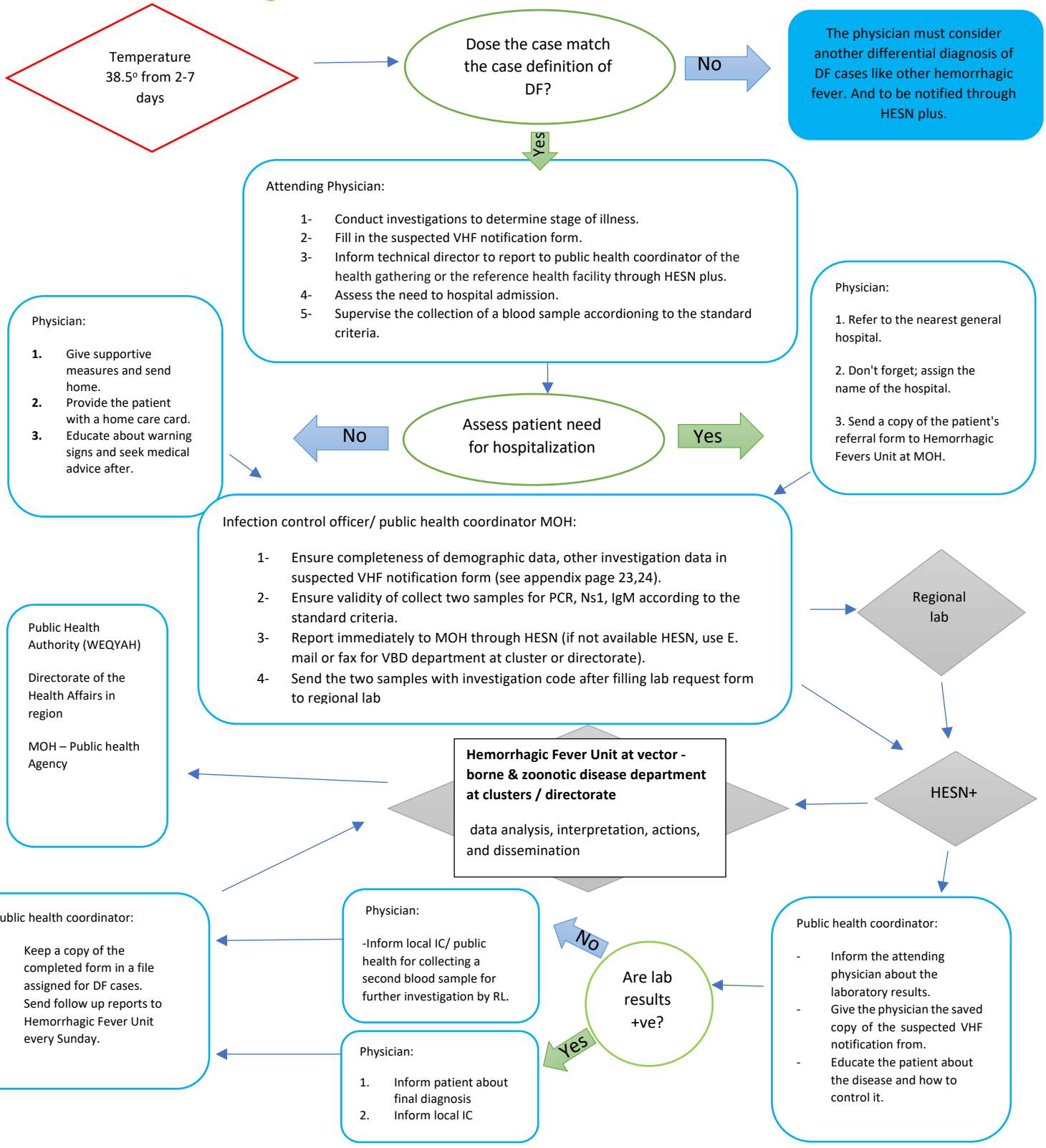
1. Two Separate serum/plasma samples **within (2) hours** of blood collection.
2. Refrigerate serum specimens (two samples) at a temperature of 2-8°C.
3. And during shipping specimens (two samples) to the laboratory, stored them at a temperature of 4°C on ice packs within **24 hours**.
4. Any **anticipated delay** of more than **48 hours** before testing must store them at a freezing temperature of -20°C.
5. And then ship the specimens (two samples) **on dry ice if frozen.**
6. Avoid any repeated freezing and thawing.

Criteria for Screening Other Viral Hemorrhagic Fever (VHF):

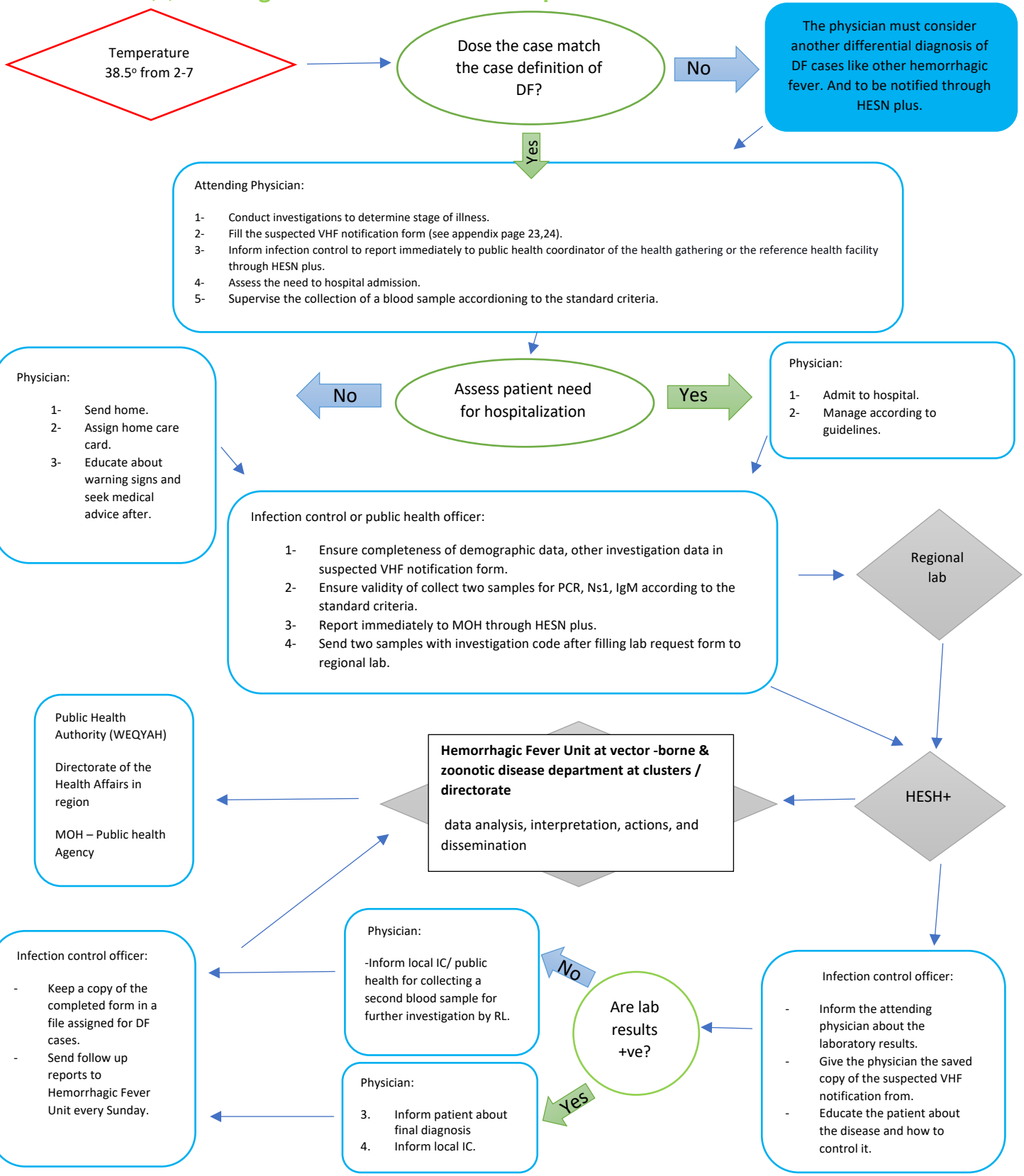
CONDITIONS	TYPE OF TESTS FOR VHF	FREQUENCY	QUANTITY
- **Not a case** of dengue **with no** symptoms and signs (Page.7)	- Chikungunya Disease - Yellow Fever Disease - West Nile Fever Disease - Zika Disease - Alkhurma Disease - Rift Valley Fever - Japanese Encephalitis - Tick-borne Encephalitis - Kyasanur Forest Disease - Crimean-Congo Disease - Ebola/ Marburg Disease - Hantavirus	**Weekly** (Base on Epi-week)	- **25%** of the total not a case of dengue **with no** symptoms and signs
- **Not a case** of dengue **with moderate** symptoms and signs (Page.7, 11)	- Chikungunya Disease - Yellow Fever Disease - West Nile Fever Disease - Zika Disease - Alkhurma Disease - Rift Valley Fever - Japanese Encephalitis - Tick-borne Encephalitis - Kyasanur Forest Disease - Crimean-Congo Disease - Ebola/ Marburg Disease - Hantavirus	**Weekly** (Base on Epi-week)	- **100%** of the total of not a case of dengue **with moderate** signs and symptoms
- **Confirmed case** of dengue by serology **(IgM) only** [1] (Page.7) 1 to rule out the cross reactivity of flaviviruses only	- Chikungunya Disease - Yellow Fever Disease - West Nile Fever Disease - Zika Disease - Alkhurma Disease - Rift Valley Fever - Japanese Encephalitis - Tick-borne Encephalitis - Kyasanur Forest Disease -	**Weekly** (Base on Epi-week)	- **100%** of the total confirmed cases of dengue **by IgM only**
- **Confirmed case** of dengue by **more or equal** to **one** test with **sever** signs and symptoms (**critical case**)[2] (Page.7, 11) 2 To rule out the coinfection of VHF	- Chikungunya Disease - Yellow Fever Disease - West Nile Fever Disease - Zika Disease - Alkhurma Disease - Rift Valley Fever - Japanese Encephalitis - Tick-borne Encephalitis - Kyasanur Forest Disease - Crimean-Congo Disease - Ebola/ Marburg Disease - Hantavirus	**Weekly** (Base on Epi-week)	- **100%** of the total confirmed cases of dengue by **more or equal to one test with serve** signs and symptoms (critical case)

D. Reporting (Notification Mechanism):

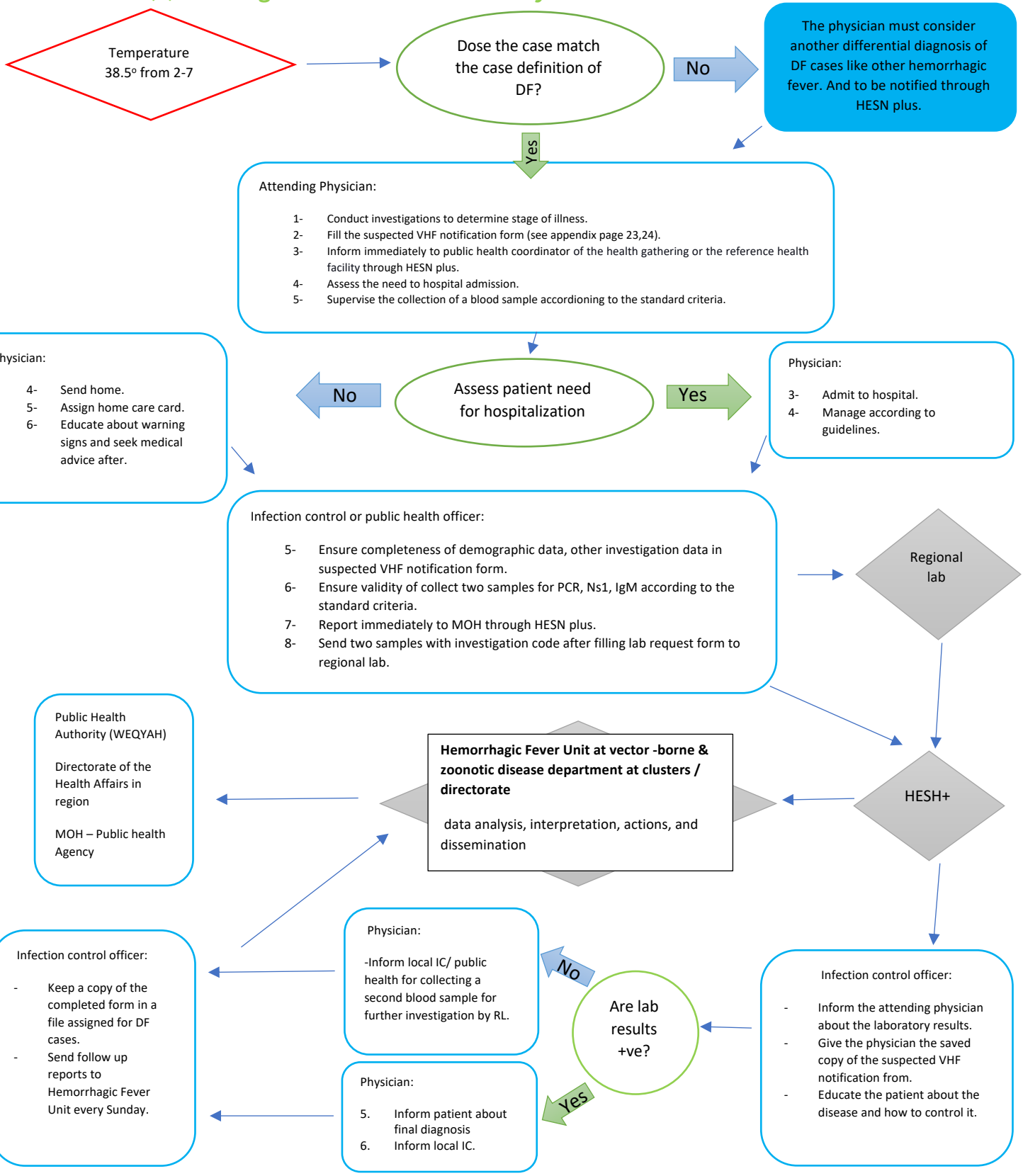
Flow Chart (1): for Dengue Fever Notification at PHC Centers:



Flow Chart (2): for Dengue Fever Notification at Hospital:



Flow Chart (3): for Dengue Fever Notification at Polyclinics and Private Clinics:



Impact of Immediate Notification:

1. Speed of response and implementation of preventive measures.
2. Preventing outbreaks.
3. Helping in early diagnosis and treatment of cases before they progress and develop.

Reporting System Description:

- **Health centers (governmental and non-governmental):** the suspected case is registered on the HESN Plus platform, filled out the notification form of viral hemorrhagic fever and attached to the platform, and immediately reported to the technical director of the health center, who informs the public health coordinator of the health gathering or the reference health facility that falls within their scope immediately according to the existing organizational structure region.

- **Governmental and private hospitals:** the suspected case is registered on the HESN Plus platform, filled out the viral hemorrhagic fever notification form, and attached to the platform. And report immediately to the infection control officer in the hospital (public health coordinator), who informs the public health coordinator of the health gathering or the reference health facility that falls within their scope immediately according to the existing organizational structure region.

- **Polyclinics and private clinics:** The suspected case is registered on the HESN plus platform, filled out the viral hemorrhagic fever notification form, and attached to the platform. And report immediately to the public health coordinator of the health gathering or the reference health facility that falls within their scope immediately according to the existing organizational structure region.

- **Laboratories:** In the case of independent laboratories, such as independent private laboratories, the confirmed case is recorded in the HESN Plus system and immediately reported to the health gathering or the reference health facility that falls within their scope immediately according to the existing organizational structure region.

Role and Responsibilities in Notification:

Attending physician:

1. Knowing the case definition (suspected case and confirmed case).
2. Reporting as mentioned in the previous reporting paragraph and flowcharts. Providing treatment services to the patient.

Health care provider/ infection control officer:

1. Entering data on the HESN Plus platform and ensuring its completeness and quality.
2. Reporting as discussed above.
3. Providing support and assistance in implementing preventive measures in cooperation with the department of vector-borne & zoonotic Diseases at MOH clusters/ directorate.

Public Health Coordinator in the Health Cluster:

1- Collects the reports under their work scope, ensures that cases are registered on the HESN Plus platform, and informs the department of vectors- borne & zoonotic diseases of Health Affairs in the region immediately.
2- Ensure the diagnosis and treatment of the cases.
3- Providing support and backstopping regarding preventive measures in cooperation with the department of vectors- borne & zoonotic diseases.

Dengue Coordinator in the department of vector-borne & zoonotic diseases:

1- Collects incoming reports and check and review the data.
2- Ensure the completeness of all data on the HESN Plus platform.
3- Communicate with the suspected case to coordinate the field visit investigation by a joint team (MOH, MOMRA, MEWA) within 24 hours from reporting.
4- Coordinate with MEWA or MOMRA to send their representatives to the joint team for fieldwork investigation and provide them with all the needs required to implement the preventive measures.
5- Implement the preventive measures such as:
    - Health education (by MOH).
    - Vector inspection (by MOMRA or MEWA).
    - Vector control (by MOMRA or MEWA).
6- Collecting and analyzing data and making use of it in formulating operational plans according to WEQYAH strategies and sending periodic reports to WEQYAH.
7- Gather the data, fill out the unified national forms released from WEQYAH and send it to the national operations at Public Health Authority (WEQYAH).
8- To be a link between the health gatherings within the region and to refer to communications between other health gatherings to refer to the registered cases from outside the region through reporting and direct contact with counterparts in the concerned directorates of health affairs.
9- Works to apply and implement preventive measures to prevent the spread of disease and coordinate with health gatherings whenever the need arises.
10- Supervision and follow-up.

The Dengue Coordinator at the General Department of Disease Vectors and Common Diseases at the Ministry of Health:

1- Preparing operational plans.
2- Data analysis: to identify the possibility of an epidemic outbreak and take measures to prevent or stop its spread.
3- Supervising the epidemiological surveillance system, following up on reports on the HESN Bliss platform, and ensuring the data is complete and correct.
4- Supervising and following up on the work of the Directorate of Health Affairs regarding the suspected case and providing support when needed.
5- Coordination with the concerned government agencies.
6- Training of cadres, the scope of which is to provide the necessary technical advice.
7- Preparing reports and submitting them to the authorized owners.

National Operational at Public Health Authority (WEQYAH):

1- Monitor and evaluate the integrated surveillance system for all responsible authorities such as MOH, MEWA, MOMRA, etc.
2- Issue periodic KPI reports for all responsible authorities as MOH, MEWA, MOMRA, etc.
3- Coordinate with all responsible authorities, such as MOH, MEWA, and MOMRA, for any further actions like proper plans, fieldwork, allocating resources, etc.
4- Prepare a preparedness and response plan for any outbreaks with collaboration between other entities.
5- Develop the policies, plans, programs, and initiatives in public health-related and revise, assess, and supervise the execution.
6- Propose a scientific solution for any public health issue.
7- Set the standards of preventive measures, protocols, practices, skills, and knowledge for all responsible authorities, such as MOH, MEWA, and MOMRA.
8- Revise, approve and give feedback on all proposed plans, actions, and protocols from all responsible authorities, such as MOH, MEWA, and MOMRA.

E. Mode of Transmission:

C. Through mosquito bite:

- The most common mode of transmission.
- The virus is transmitted to humans through the bites of infected female mosquitoes, commonly the *Aedes aegypti* species.

D. Human-to-mosquito transmission

- It can occur up to 2 days before the patient shows symptoms of the illness Mosquitoes can become infected by people who are viremic with dengue. This can be someone who has a symptomatic dengue infection or someone who is yet to have a symptomatic disease (they are pre-symptomatic). Still, people who show no signs of illness (they are asymptomatic), up to two days after the fever has resolved.

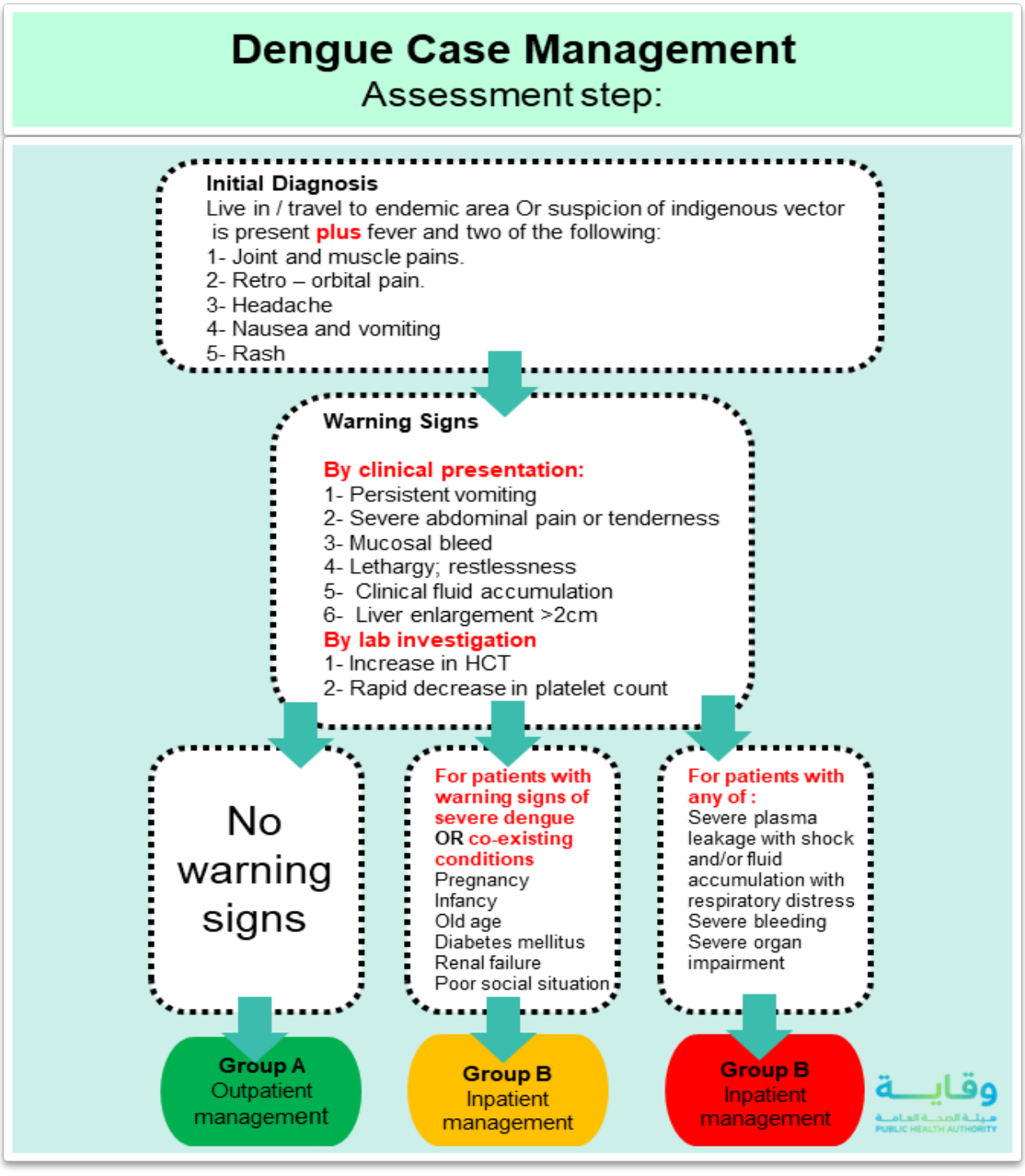
E. Mother-to-child transmission

- The primary mode of transmission of dengue between humans involves mosquito vectors. There is evidence, however, of the possibility of maternal transmission (from a pregnant mother to her baby).

F. Through infected blood, laboratory, or healthcare setting exposures

- Rare transmission via blood products, organ donation, and transfusions have been recorded. Similarly, the virus's transovarial transmission within mosquitoes has also been recorded.

F. Prophylaxis & Treatments:



Group A – Mild case **HOME CARE**

Group criteria
Patients who do not have warning signs AND who are able:
- to tolerate adequate volumes of oral fluids
- to pass urine at least once every 6 hours

Assessment
Daily review for disease progression:
- decreasing white blood cell count (WBC)
- defervescence
- warning signs (until out of critical period).

Advice for immediate return to hospital if development of any warning signs, and
- written advice for management (e.g. home care card for dengue).

Laboratory tests
- Full blood count (FBC)
- Haematocrit (HCT)

Treatment
Advice for:
- adequate bed rest
- adequate fluid intake
- Paracetamol, 4 gram maximum per day in adults and accordingly in children.

Patients with stable HCT can be sent home.

Group B - Moderate case **In-hospital care**

Group criteria
Patients with any of the following features:
• co-existing conditions such as pregnancy, infancy, old age, diabetes mellitus, renal failure
• social circumstances such as living alone, living far from hospital

OR: Existing warning signs

Assessment
• temperature pattern
• volume of fluid intake and losses
• urine output (volume and frequency)
• warning signs
• HCT, white blood cell and platelet counts.

Assessment:
• vital signs and peripheral perfusion (1–4 h until patient is out of critical phase
• urine output (4–6 hourly)
• HCT (before and after fluid replacement, then 6–12 h
• blood glucose
• other organ functions (renal profile, liver profile, coagulation profile, as indicated).

Laboratory tests
• full blood count (FBC)
• haematocrit (HCT

Laboratory tests
• full blood count (FBC)
• haematocrit (HCT

Treatment
• Encouragement for oral fluids. If not tolerated, start intravenous fluid therapy 0,9% saline or Ringer's Lactate at maintenance rate.

Treatment
Obtain reference HCT before fluid therapy.
Give isotonic solutions such as 0.9 % saline, Ringer's Lactate.
Start with 5–7 ml/kg/hr for 1–2 hours, then reduce to 3–5 ml/kg/hr for 2–4 hr, and then reduce to 2–3 ml/kg/hr or less according to clinical response.
Reassess clinical status and repeat HCT:
• if HCT remains the same or rises only minimally -> continue with 2–3 ml/kg/hr for another 2–4 hours;
• if worsening of vital signs and rapidly rising HCT -> increase rate to 5–10 ml/kg/hr for 1–2 hours.
Reassess clinical status, repeat HCT and review fluid infusion rates accordingly:
• reduce intravenous fluids gradually when the rate of plasma leakage decreases towards the end of the critical phase.

Group C – Severe case **Hospitalization**

Group criteria

Patients with any of the following features:

- severe plasma leakage with shock and/or fluid accumulation with respiratory distress
- severe bleeding
- severe organ impairment

Laboratory tests

- Full blood count (FBC)
- Haematocrit (HCT)

Treatment of compensated shock:

o Start I.V. fluid resuscitation with isotonic crystalloid solutions at 5-10 ml/kg/hr over 1 hr
o Reassess patient's condition,
If patient improves:
o I . V. fluids should be reduced gradually to 5-7 ml/kg/hr for 1-2 hr, then to 3-5 ml/kg/hr for 2-4 hr, then to 2-3 ml/kg/hr for 2-4 hr and then reduced further depending on haemodynamic status
o I . V. fluids can be maintained for up to 24 - 48 hours
If patient still unstable:
o Check Hct after first bolus
o If Hct increases/ still high (>50%), repeat a second bolus of crystalloid solution at 10-20 ml/kg/hr for 1 hr.
o If improvement after second bolus, reduce rate to 7-10 ml/kg/hr for 1-2 hr, continue to reduce as above.
o If Hct decreases, this indicates bleeding and need to cross-match and transfuse blood as soon as possible

Treatment of hypotensive shock

o Initiate I.V. fluid resuscitation with crystalloid or colloid solution at 20 ml/kg as a bolus for 15 min
If patient improve :
o Give a crystalloid / colloid solution of 10 ml/kg/hr for 1 hr, then reduce gradually as above
If patient still unstable
o Review the Hct taken before the first bolus
o If Hct was low (<40% in children and adult females, < 45% in adult males) this indicates bleeding, the need to crossmatch and transfuse (see above)
o If HCT was high compared to the baseline value, change to I.V. colloids at10-20 ml/kg as a second bolus over to 1 hour; reassess after second bolus
o If improving reduce the rate to 7-10 ml/kgt/hr for 1-2 hours, then back to I.V. crystalloids and reduce rates as above
o If condition still unstable, repeat Hct after second bolus
o If Hct decreases, this indicates bleeding, see above
o If Hct increases/ remains high (> 50%), continue colloid infusion at 10-20 ml/kg as third bolus over 1 hr, then reduce to 7-10 ml/kg /hr for 1-2 hours, then change back to crystalloid solution and reduce rate as above

Treatment of haemorrhagic complications:

o Give 5-10 ml/kg of fresh packed red cells or 10-20 ml/kg fresh whole blood

Recovery Criteria:

- Stable pulse, blood pressure and breathing rate.
- Normal temperature.
- No evidence of external or internal bleeding.
- Return of appetite.
- No vomiting, no abdominal pain.
- Good urinary output.
- Stable hematocrit at the baseline level.
- Convalescent confluent petechiae rash or itching, especially on the extremities.

Patient Discharge Criteria:

- Absence of fever for at least 24 hours without anti-fever therapy.
- Return of appetite.
- Visible clinical improvement.
- Satisfactory urine output.
- A minimum of 2–3 days have elapsed after recovery from shock.
- No respiratory distress from pleural effusion and no ascites.
- Platelet count of more than 50 000/mm^3. If not, patients can be recommended to avoid traumatic activities for at least 1–2 weeks for the platelet count to become normal. In most uncomplicated cases, platelet rises to normal within 3–5 days.

Vaccination:

- The first dengue vaccine, Dengvaxia® (CYD-TDV), developed by Sanofi Pasteur, was licensed in December 2015 and has now been approved by regulatory authorities in approximately 20 countries.
- In November 2017, additional analysis results about determining serostatus retrospectively at the time of vaccination. The subset trial of seronegative participants at the first vaccination had a higher risk of severe dengue and hospitalizations than unvaccinated participants.
- The CYD-TDV vaccine targets persons living in endemic areas, 9-45 years of age, who have had at least one episode of dengue virus infection in the past.
- Several additional dengue vaccine candidates are under evaluation.
- Dengue vaccine is not approved yet in KSA.

4. PREVENTION & CONTROL

Prevention of Mosquito Breeding:

1- Preventing mosquitoes from accessing egg-laying habitats by environmental management and modification.
2- Disposing of solid waste properly and removing artificial man-made habitats that can hold water.
3- Covering, emptying, and cleaning domestic water storage containers every week.
4- Applying appropriate insecticides to water storage outdoor containers.
5- Personal protection from mosquito bites:
   A- Use of personal household protection measures, such as window screens, repellents, coils, and vaporizers. These measures must be observed during the day, both inside and outside the home (e.g., at work/school), because the primary mosquito vectors bite throughout the day.
   B- Wearing clothing that minimizes skin exposure to mosquitoes is advised.
6- Community engagement:
   A. Educating the community on the risks of mosquito-borne diseases.
   B. Engaging with the community to improve participation and mobilization for sustained vector control.
7- Active mosquito and virus surveillance:
   A. Active monitoring and surveillance of vector abundance and species composition should be carried out to determine the effectiveness of control interventions.
   B. Prospectively monitor the prevalence of the virus in the mosquito population with an active screening of sentinel mosquito collections.
   C. Vector surveillance can be combined with clinical and environmental surveillance.

Infection Control During Care:

Healthcare providers should adhere to standard precautions when providing care to patients.

Note: The responsible body (The maintenance and cleaning company) for pest control inside the health facility must be fully aware of the procedures taken in the presence of the breeding area of mosquitoes. And how to combat them after reporting them to the infection control officer. Also, its task is inspecting, controlling insects, and reporting to the national operation at Public Health Authority through the infection control officer.

For more inquiries, please find the national operation- PHA email. KSA.

e-mail: vaz-operation@cdc.gov.sa

contact no.: 0556555059

5. APPINDEIXES

A. Forms:

وقاية
هيئة الصحة العامة
PUBLIC HEALTH AUTHORITY

وزارة الصحة
Ministry of Health

NOTIFICATION FORM FOR VIRAL HAEMORRHAGIC FEVERS استمارة بلاغ عن حالة اشتباه حمى نزيفيه

Demographics - البيانات الشخصية	
Name:	الاسم
Medical Record No.:	رقم الملف
Nationality:	الجنسية
Sex: M / F (Pregnancy): Y \ N	الجنس
Civil card number/Iqama number:	السجل المدني أو رقم الإقامة
Address: district: Street:	العنوان: الحي: الشارع:
A milestone near the home:	معلم بارز قرب السكن:
Home Office/ Tel: Mobile:	هاتف: منزل /عمل: جوال:
Relevant phone number:	رقم جوال أحد الأقارب:
Occupation address	عنوان العمل:
Date of onset of patient's presenting illness:	تاريخ بداية ظهور الأعراض:
Date of presentation to the hospital:	تاريخ مراجعة المستشفى:
Is the patient hospitalized Yes No Date of admission:	هل تم تنويم المريض: تاريخ الدخول:
Date of patient discharge	تاريخ الخروج:
Vital signs at presentation	العلامات الحيوية
T: P: BP: R: التنفس الضغط: النبض:	الحرارة:

	Manifestation	Y	N	U	Comments
	Fever (> 38.0 OC)				Highest temp:
	Skin rash				Describe the rash:
	Respiratory distress				
General Manifest.	Chills				
	Malaise				
	Headache				
	Retro-ocular pain				
	Myalgia				
	Arthralgia				
	Backache				
Bleeding Manifestations	Epistaxis				
	Gingival bleeding				
	Bleeding from puncture sites				
	Petechiae				
	Ecchymosis				
	Purpura				
	Hematemesis				
	Melena				
	Fresh blood per rectum				
	Menorrhagia				
	Positive tourniquet test				
	Other bleeding sites				
	Visual loss				
	Abortion:				

		Y	N	U
GIT Manifest.	Anorexia			
	Nausea			
	Vomiting			
	Diarrhea			
	Abdominal pain			
	Jaundice			
Leakey Bl. V.	Pleural effusion			
	Ascites			
	Peripheral edema			
CNS manifestations	Vertigo			
	Confusion			
	Disorientation			
	Hallucinations			
	Coma			
	Convulsions			
	Neck stiffness			
	Photophobia			
	Hemiparesis			
	Shock			
Other warning signs symptoms	Persistent vomiting			
	Severe abdominal pain			
	Severe lethargy			
	Enlarged liver >2cm			

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وقاية
هيئة الصحة العامة
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3- Laboratory investigations (the most abnormal value)							
Lab test	Result	Lab test	Result	Lab test	Result	Lab test	Result
WBC		Total protein		AsT		LDH	
Hemoglobin		Albumin		AlT		CPK	
Hematochrit		PT (INR)		AlP		Creatinine	
Platelets		PTT		T. bilirubin		Other	

	4- Specific Laboratory Test: 4 - فحوصات مخبريه نوعيه									
Disease	Sample serial no. (1st, 2nd, 3rd)	Sample no: رقم العينة	Date تاريخ سحب العينة	Results (Positive, Negative, or Not done)						
				RDT	Igm	IgG	Antigen	Culture	PCR	Date of result
DENGUE F										
Rift Valley F										
AlKhurma F										
CCHF										
Others										

5- Contact with suspected or confirmed case 5- مخالطة حالة مشتبهة أو مؤكدة
Contact with a patient has the similar symptoms or disease هل تمت مخالطة مريض لديه نفس الأعراض ☐ Yes ☐ No

6- Final Patient Status 6-الحالة النهائية للمريض					
ICU admission		Date of ICU Admission		Date of ICU discharge	
Recovered		Transferred to other hospital		Died	

Name of person filling out this form: ---------- Job Title ----------

Workplace: ---------- Phone number----------

Name of attending physician ---------- Phone number: ----------

Date of filling out the form: / /

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B. Glossary:

TERM	DEFINITION
HCW	Health Care Worker
MOH	Ministry of Health
MOMRA	Ministry of Municipal & Rural Affairs, And Housing
MEWA	Ministry of Environment Water and Agriculture,
RL	Regional Lab
VHF	Viral Hemorrhagic Fever
DF	Dengue Fever
HESN +	Health Ecteronic Surveillance Network Plus
IC	Infection Control
VBD	Vector-Borne Diseases
PHA	Public Health Authority

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