

# Dengue Haemorrhagic Fever: early recognition, diagnosis and hospital management

**An audiovisual guide for health-care  
workers responding to outbreaks**

**TRANSCRIPT**



**World Health  
Organization**

EPIDEMIC AND PANDEMIC  
ALERT AND RESPONSE

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Designed by minimum graphics

## Preface

Epidemic dengue/dengue haemorrhagic fever (DHF) is a major public health problem in tropical and sub-tropical countries in South-East Asia, Western Pacific, Latin and Central America. An estimated 500 000 cases of DHF require hospitalization each year, of whom a very large proportion are children. Without proper treatment, DHF case-fatality rates can exceed 20% but with modern intensive supportive therapy, such rates can be reduced to less than 1%.

This CD-ROM<sup>1</sup> has been developed to train health-care workers to recognize the clinical features and early warning signs of DHF, to initiate prompt referral, and to follow the principles of advanced hospital supportive care in order to reduce case-fatality rates.

Of crucial importance is the recognition and management of capillary leak for which conventional paediatric resuscitation protocols are often inadequate or potentially harmful. The film emphasizes not just “what to do” but also “what not to do” as well as “warning signs to look for, and when”. In January 2005, Timor Leste faced an outbreak of DHF when the case-fatality rate peaked at around 14%. In Timor Leste, these management measures helped local staff successfully reduce the high case-fatality rate.

This booklet contains the transcript and timing of the film narrative to facilitate translation into other languages.

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<sup>1</sup> The film was taken at the National Government hospital (NHGV) in Dili during the WHO coordinated GOARN response. GOARN: Global Alert and Response Network.





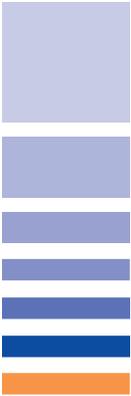
## Acknowledgements

Video footage for the CD-ROM was obtained with the cooperation of the DHF patients, their families and the staff of the National Government Hospital (NHGV) in Dili during the WHO coordinated GOARN response to the 2005 dengue haemorrhagic fever (DHF) outbreak in Timor Leste. This CD-ROM and transcript have been developed by experts from the WHO Collaborating Centre for Case Management of Dengue/DHF in Bangkok, Thailand, the WHO Country Office in Dili, Timor Leste, the WHO Regional Office for South-East Asia, New Delhi, India and the WHO Department of Epidemic and Pandemic Alert and Response in Geneva, Switzerland.

# Transcript of the DHF training film

AUDIO	VIDEO
<p>This child is suffering from dengue haemorrhagic fever (DHF). His capillaries are leaking fluid and he has a tendency to bleed. This is what distinguishes DHF from dengue. It is a painful disease which can cause severe bleeding, and if not treated properly and timely, often results in death.</p> <p>But the problem of treating DHF does not start here on the ward, it starts much earlier wherever patients are first seen.</p> <p>All health-care workers need to know how they might suspect a diagnosis of dengue and know how they and the parents can treat mild symptoms and be on the lookout for signs of DHF, especially the signs signifying the need for admission and careful treatment.</p>	<p><b>00:12</b> Child showing signs of DHF</p> <p><b>00:35</b> View of paediatric and emergency wards</p> <p><b>00:45</b></p>
<p>If you are in a dengue-affected area you should suspect dengue fever if you recognize one or more of the following symptoms:</p> <ul style="list-style-type: none"><li>• Fever pattern: an abrupt onset, high fever, and sometimes a saddleback fever, a fever that does not completely respond to paracetamol syrup.</li><li>• Symptoms of headache, retro orbital pain, muscle pain, and joint pain.</li></ul>	<p><b>01:07</b> Map of dengue affected areas</p> <p><b>01:19</b> Child with fever</p> <p><b>01:30</b> Child in pain</p>





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## AUDIO

- A child may appear physically tired or have other altered behavior, for example irritability or vomiting.
- Skin may show signs of a flushed face or there may be erythema or maculopapular rash on the head and trunk region of the body.

If you suspect dengue, then the next step is to look for risk factors or features of DHF.

Increase in size and the tenderness of the liver might also suggest DHF.

Distinguish the symptoms from other common illnesses such as measles or malaria.

Laboratory tests compatible with DHF are:

- decrease in white cell count;
- decrease in platelet count; and
- increase in haematocrit.

A blood film may also show atypical lymphocytes.

A specific test for DHF is the tourniquet test. This is done by first measuring the blood pressure. Remember to use a blood pressure cuff the right size for that child.

Then inflate the cuff to a pressure exactly half way between systolic and diastolic pressures.

## VIDEO

**01:40**

A quiet child

**01:50**

Pictures of various children with these symptoms

**02:11**

Doctor examining child

**02:21**

Doctor questioning mother

**02:31**

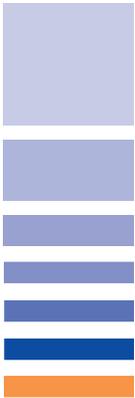
Health-care worker making a blood film and performing the haematocrit test

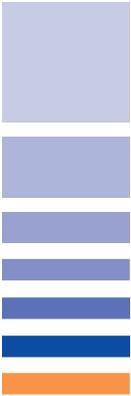
**02:51**

Nurse performing the tourniquet test

**03:04**

AUDIO	VIDEO
<p>Now keep the pressure inflated for 5 minutes.</p> <p>After releasing the cuff look carefully for small red or purple bleeding points in the skin known as petechiae. These might be tiny, the size of a pinhead. If there are 10 or more bleeding points in 1 square inch area, then the test is positive.</p> <p>But remember, the tourniquet test can be negative especially early in the disease or in obese patients or in patients with shock.</p>	<p><b>03:11</b></p> <p><b>03:15</b></p> <p><b>03:39</b> Graphic with list</p>
<p>So, if there is any suspicion of dengue or DHF here is:</p> <p><b>What to do</b></p> <p><b>What not to do</b></p> <p><b>The warning signs to look for and when</b></p>	<p><b>03:49</b> Graphic with list</p>
<p><b>What to do</b></p> <p>Bring the temperature down. Whatever the cause of fever, a very high temperature can be dangerous and can cause fits known as febrile convulsions. To bring down high fever to below 39 °C, gently sponge the child with cloth soaked in water and give paracetamol.</p> <p>Maintain hydration and electrolyte balance using oral fluids. Thirst is common but many children need help to drink. Avoid giving only water as this will not replace lost electrolytes. Continue breast feeding if possible.</p>	<p><b>04:02</b> Child being sponged to bring down the fever</p> <p><b>04:24</b> Child drinking avidly from a bottle</p>





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## AUDIO

Keep mosquitoes away, for example using nets, to stop spread of the disease from a person with dengue. Remember unlike malaria, the mosquitoes that spread dengue will usually bite during the day.

### What not to do

Avoid certain drugs, for example, aspirin, NSAIs (non steroidal inflammatory drugs such as ibuprofen) which in this child leads to bleeding.

Avoid inappropriate intravenous (IV) fluids. Always use oral fluids if the child is able to drink.

In DHF, if IV fluids are given when not necessary or too quickly, the extra fluid can pour out of the leaky capillaries into the tissues.

You may see this as puffiness around the eyes, or even abdominal distension due to fluid in the peritoneal cavity.

But most importantly fluid easily leaks into the pleural space causing pleural effusions and by pressing on the lungs this makes breathing difficult.

Here is a chest X-ray of a child with pleural effusions. Because the child was lying down when the X-ray was taken most of the fluid just shows up as diffuse hazy shadowing behind the lungs, but the arrows show where the fluid is also pressing on the sides of the lung.

## VIDEO

### 04:42

Child under a mosquito net in the paediatric ward

### 04:59

Child with aspirin related epistaxis in the emergency ward

### 05:12

Child drinking

### 05:19

IV Drip

### 05:29

Child with puffy eyes

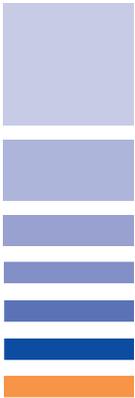
### 05:37

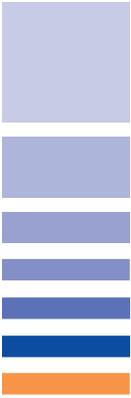
Child breathing fast

### 05:48

Chest X-ray

AUDIO	VIDEO
<p>The wrong kind of fluid, for example, too much 5% dextrose on its own without any balanced salt solution, can also cause problems such as convulsions due to brain edema or swelling.</p>	<p><b>06:10</b> IV Drip</p>
<p><b>The warning signs of what to look for and when</b></p> <p>Parents as well as health-care workers need to know these as most of them signify the child needs admission to hospital. It is important to remember that the risk period is especially high in the first 1–2 days after the fever subsides. This is known as the critical period.</p> <p>The warning signs include:</p> <ul style="list-style-type: none"> <li>• Refusing to accept oral fluids or vomiting.</li> <li>• Sleepy or restless child.</li> <li>• Bleeding, especially gastro-intestinal bleeding with fresh or old blood in the vomit or stool. Old blood in the vomit looks like coffee grounds; in the stool it may resemble thick black coal tar.</li> <li>• A child suffering from abdominal pain.</li> <li>• Skin mottling, cold sweaty skin or cold hands and feet.</li> <li>• Absence of urine in the last 6 hours.</li> </ul>	<p><b>06:28</b> Mother holding child</p> <p><b>06:53</b> Children with the different warning signs of DHF</p>





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## AUDIO

In addition to the above, doctors or nurses should also measure:

- Capillary refill time (CRT)
- Heart rate
- Respiratory rate
- Blood pressure

Of all these a capillary refill time of more than 2 seconds, as shown here, is especially easy to detect.

If all the points we just talked about are absent the child may be sent home with careful advice to parents to remember:

- What to do
- What not to do
- The warning signs to look for and when

If there are any concerns or if the parents are unable to comply with these instructions, then consider admitting the child.

Early signs of shock or significant bleeding need urgent referral to hospital. In DHF, although a child may appear to initially survive a period of prolonged shock, haemorrhage will often become severe and other complications such as renal failure can develop. It may also be difficult to reverse.

A paediatric ward provides frequent and skilled observation and immediate expert management of these complications.

## VIDEO

**07:55**

Graphic with list

**08:10**

Doctor checking CRT

**08:20**

Child leaving with parent

**08:34**

Hospital entrance

**08:43**

Child with haemorrhage

**09:07**

Doctor examining child

**AUDIO**

Remember that the risk period is especially high during the first 1–2 days after the fever subsides. This is known as critical period. It is during this phase that capillary leak can be severe. Plasma leakage is the most important feature of DHF and often precedes bleeding. This is a feature that needs special monitoring.

A centrifuge and capillary blood tubes provide the most essential and frequently performed test with immediate results. As the capillaries start to leak plasma, the remaining red cells become more concentrated. DHF frequently shows a rise in haematocrit of 20%, that would be a change in haematocrit for example from 35% to 42%.

Here is a visual demonstration of what happens when the haematocrit changes.

As the plasma level falls the haematocrit rises sharply as there is not enough fluid demonstration in proportion to the red cell.

Remember if IV fluids are given when not necessary or too quickly, the extra fluid can pour out of the leaky capillaries into the tissues.

You may see this as puffiness around the eyes, or even abdominal distension due to fluid in the peritoneal cavity.

**VIDEO****09:14**

Child in critical stage

Chest X-ray

**09:39**

Nurse using centrifuge for haematocrit

**10:11**

Graphic

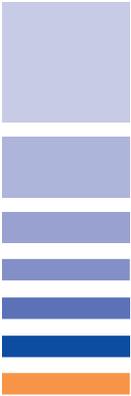
**10:23**

Visual demonstration

**10:37**

Child with puffy eyes





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AUDIO	VIDEO
<p>But most importantly, fluid easily leaks into the pleural space causing pleural effusions, and by pressing on the lungs this makes breathing more difficult.</p>	<p>Child breathing fast. Chest X-ray</p>
<p>During the capillary leak phase just enough fluid must be given to prevent circulatory shock. The paediatricians will refer to published guidelines or wall charts to give exactly the right amount of fluid at this critical stage.</p>	<p><b>11:05</b> Visual demonstration continued</p>
<p>A falling haematocrit could be a sign of bleeding. This is an important sign where bleeding is concealed. Sometimes bleeding into the gut may not be apparent, for example until it passes out in the stool or vomit. Remember this sort of bleeding can be associated with severe abdominal pain.</p>	<p><b>11:29</b> Child with haemorrhage</p>
<p>In children who are obviously recovering, fluid that leaked into the tissues, peritoneum or chest cavity will be reabsorbed and may also result in a fall in haematocrit.</p>	<p><b>11:52</b> Recovering child</p>

**VIDEO**

Remember nurses will still be observing children closely for any of the important warning signs

- A child refusing to accept oral fluids or vomiting
- Sleepy or restless
- A child suffering from abdominal pain
- Skin mottling
- Cold sweaty skin
- Cold hands or feet
- A reduced urine output

These are all signs of shock which may require immediate increase in IV fluid.

Bleeding which may be visible or concealed may require urgent blood transfusion if severe.

A child whose breathing is fast or requiring more effort may require oxygen therapy and immediate reduction in the IV fluid.

In addition to these observations doctors or nurses will also monitor:

- Capillary refill time (CRT)
- Heart rate
- Respiratory rate
- Blood pressure

In critically ill children, these observations might be necessary every half hour.

**AUDIO****12:07**

Review of children with the different DHF signs.

**12:51**

Child with haemorrhage

**13:01**

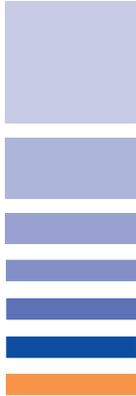
Child breathing fast

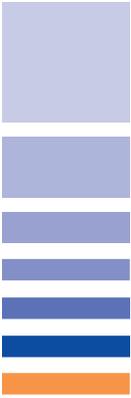
**13:13**

Graphic with list

**13:25**

Child in critical stage





AUDIO	VIDEO
<p>Features common in the recovery period which may support the clinical diagnosis of DHF are: a widespread itching rash often with white centres, slowing of the heart rate, but for definitive diagnosis, blood samples should be taken.</p>	<p><b>13:32</b> Recovering child</p>
<p>Reporting of all cases must also occur to ensure appropriate public health measures can be started. Any deaths public health reporting from DHF should be examined closely. They often reveal the need for more resources or training. With constant evaluation and feedback to all involved from community to specialist hospitals more children with DHF can be successfully treated and sent home.</p>	<p><b>13:53</b> Doctor and nurse doing paper work for public health reporting purpose</p> <p><b>14:14</b> Child goes home to her family</p>
<p>Production Team: Renu Dayal Drager Emma Fitzpatrick Siripen Kalayanarooj Simon Mardel Nikki Shindo Garrett Smyth</p> <p>This film was made during the 2005 DHF outbreak in cooperation with patients and staff of the National Hospital and the WHO Country Office in Dili, East Timor. GOARN and WHO logo <a href="http://www.who.int/csr">www.who.int/csr</a> WHO copyright text</p>	<p><b>14:26</b> Graphic with text</p>