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FEVER IS A FRIEND OR FOE

Normal body temperature is around 37°C (98.6°F). Fever is defined as equivalent rectal temperature of \geq 38 °C (100.4 °F) or axillary (armpit)temperatures of \geq 37.5 °C (99.5 °F). A temperature more than 40 C (104*F) is called hyperpyrexia.

Rectal temperature represents core temperature but is cumbersome, inconvenient, and always carries a risk of injury.

Axillary, ear, and forehead temperature measurements are easier to obtain than rectal or oral temperatures. Mostly axillary temperature is used in routine practice.

Digital thermometers, either under the arm or tongue are the easiest way of checking temperature at home. Oral thermometers are recommended to adults and kids above 5 years.

Mercury thermometers are not recommended and are not available now.

Tympanic thermometers (ear thermometers) are based on infrared radiation emission detectors.

Temperature gun is a Non-Contact Digital Infrared Thermometer device, mainly used for screening purposes.

They were widely used during COVID time.

Please remember to clean your thermometer before and after using cool, soapy water or rubbing alcohol. Ear thermometer tips can be swiped with alcohol.

There are different types of fever depending upon its severity, duration, and daily fever patterns. Biphasic fever indicates a single illness with 2 distinct periods (camelback fever pattern); classically seen in dengue fever.

Mechanism of fever

Fever represents a protective immune response of the host to various infectious or non-infectious challenges. Fever is a regulated rise in body temperature with an elevated thermoregulatory set point situated in hypothalamus (the part of the brain that regulates body temperature) in response to endogenous (produced within the body) or exogenous (produced outside the body) pyrogens

(substances that produce rise in body temperature). In hyperthermia, the thermoregulatory setpoint is unaltered, and the body temperature becomes elevated in an uncontrolled fashion due to exogenous heat exposure or endogenous heat production.

When bacteria or viruses invade the body and cause tissue injury, pyrogens are produced which are carried by the blood to the brain. These pyrogens stimulate the hypothalamic thermoregulatory center, where they induce production of prostaglandins E2(PGE2). They in turn initiate the febrile response by increasing the heat production and heat conservation through vasoconstriction (constriction of small blood vessels).

Common causes of fever

- 1. Common viral infections like common cold, Flu, Croup, etc.
- 2. Infections of ear , nose and throat, caused by viruses and bacteria
- 3. Bronchiolitis, whooping cough and other lower respiratory tract infections, pneumonias etc.- caused by viruses and bacteria.
- 4. Urinary tract infection (UTI),
- 5. Gastroenteritis,
- 6. Fever with rash roseola, chickenpox, measles etc.
- 7. Fever after insect bites- malaria, dengue, chikungunya
- 8. Infections of the brain- meningitis
- 9. Non-infectious causes -Dehydration, sunburn, sunstroke, skin conditions such as hives (urticaria), vaccinations, certain medicines, heat stroke, some kinds of cancer, and some autoimmune diseases.

Why fever is a friend?

A high fever is beneficial to us in 2 ways – firstly, the raised temperature helps in controlling the disease process, and secondly, it is an important sign which tells us that "All is not well" in the body.

Beneficial effects of fever

- Restricts the production of pathogens.- All microbes have an upper-temperature limit after which they can't replicate or survive. So fever is a host response to raise the body so that after certain degree of rise in temperature the harmful germs are not able to grow or replicate.
- 2. Decrease the duration of infections. If a fever can stop the production or replication of a virus or bacteria, then the duration of the infection is going to shorten.
- Mobilization of white blood cells (WBCs). These blood cells are the "first responders" that arrive right away to destroy pathogens. Fever induces the production, proliferation, and migration of these WBCs at the site of infection.
- 4. Enhanced phagocytosis. Phagocytosis means the immune cells essentially eat, or absorb, viruses, bacteria, and parasites, thereby effectively neutralizing them and get rid of them in the body.
- 5. Decreased endotoxin effect. When a pathogen invades the body and dies, it releases **endotoxins**. (harmful substances). Fever reduces its production as well as its efficacy.
- 6. Increased growth of T-cells. T-cells are like commanders that guide and coordinate the entire war against pathogens. They also help produce various antibodies (protein substances that protect against infections).

When fever is a foe?

There are certain situations where fever is really a cause of concern.

- Fever in an infant younger than 3 months, especially in a newborn in the first month of life as it carries a significant risk of serious infections.
- Fever in a child with a history of febrile convulsions
- Malnutrition
- Immune compromised children

- With chronic disease
- Prolonged and unexplained fever lasting longer than a week.
- Fever is associated with weight loss.

Red flags or warning signs in a child with fever

A. Degree of fever

- Under 3 months- temperature of 100.4°F or higher
- 3 to 6 months: If the child has a fever of 101°F or higher.
- Over 6 months: A fever of 103°F or higher, or a fever lower than this but lasting longer than 48 hours.

B. Appearance and behavior of a child

- Sick looking child or unusually lethargic or uncomfortable child even if they do not have a very high fever.
- Excessive sleepiness or fussiness, Irritability, or inconsolable crying.
- A child who is not waking up or interacting

C Important Clinical clues

- Severe headache or persistent vomiting.
- Child who is not eating or drinking and shows signs of dehydration (dry mouth, no tears when crying, less frequent urination)
- Rash, especially if it is a purplish rash, which could be a sign of a serious condition like meningococcal infection.
- Difficulty in breathing or rapid breathing.
- Stiff neck or pain when bending the neck forward.
- Convulsions or seizures.
- Swelling of a limb or joint, or pain in a limb or joint.

E. Other situations

• If the child has a chronic medical condition like heart disease, cancer, sickle-cell anemia, or an immune system problem.

- Fever with weight loss
- Long standing continuous or relapsing fever
- Epidemiological clue
- Unexplained death in close community due to fever
- Outbreak or similar cases in clusters.

Fever management

1. Antipyretics –Paracetamol is the first and by and large the only choice. It is to be used in a dose of 15 to 20 mg/kg per dose and not exceeding 60 mg/kg/day. The Toxic dose is 150 mg/kg/day. Pain relieving medicines like ibuprofen, mefenamic acid and/or their combinations with paracetamol do more harm than benefit and are not to be used without medical supervision.

2. Adequate Fluids and Electrolytes and Proper Nutrition

Fever will cause children to have higher fluid losses, so offer plenty of fluids to prevent dehydration. Children with fever may not feel hungry and it is not necessary to force them to eat. Instead offer fluids such as breastmilk, formula, milk plain water, ORS, buttermilk, lime water etc. Older children may eat soft easy to digest food.

3. Rest is very important as most children feel tired and achy. Rest hastens the recovery by reducing metabolic needs.

4.Unbundling- Remove the excessive clothing. Excess layers of clothes increase heat conservation.

5. Fanning/A.C.- Gives comfort and speeds up heat loss.

6. Sponging- Tepid sponging with water at room temperature can be done to reduce the temperature after medication is administered. Sponging should be done by continuous wiping of the body with tepid water from head to toe for 15–20 minutes.

Cold baths and ice packs may actually have an adverse effect on their fever—shivering can increase the body's metabolic rate and as a result raise the body's temperature higher. It is recommended in cases of heat stroke and hyperthermic emergencies .

1. Prevention of fever

- Wash Hands Properly
- Avoid Direct Contact with a Sick Person
- Prevent Mosquito Bites
- Cover Your Nose and Mouth
- Exclusive breast feeding unto 6 months and continue thereafter along with complimentary feeds
- Consume Warm and Healthy Food
- Get Appropriately Vaccinated
- Follow health advisories from the regulatory authorities from time to time.

Management and prevention of heat stroke

Management of heat stroke includes ensuring adequate airway protection, breathing, and circulation and rapid cooling. Cooling measures should be stopped once the temperature is 38 to 39 degrees Celsius.

Important steps are as below.

Lay the person in a cool place, under a shade. Loosen clothes for better ventilation.

Wipe her/him with a wet cloth/wash the body frequently.

Pour normal temperature water on the head.

Fan the person while misting with cool water.

Place ice packs or cool, wet towels on the neck, armpits, and groin.

Adequate rehydration is essential. If the person is conscious, offer chilled water, a drink containing electrolytes or another nonalcoholic beverage without caffeine.

Begin CPR if the person loses consciousness and shows no signs of circulation, such as breathing, coughing or movement.

Prevention

Not to overdress babies when the weather is hot. Dress them in light clothes- both in weight and color.

Keep children hydrated. Remind them to drink water regularly, all day long.'

Go outside in the morning and late afternoon or evening.

Emergency Kit

Water bottle Umbrella/ Hat or Cap / Head Cover Hand Towel Hand Fan Electrolyte / Glucose / Oral Rehydration

FAQs

1. My baby's forehead feels warm when touched. Is it fever?

Touching is a crude and unreliable method of temperature measurement. A digital thermometer is best for taking temperatures. Put the thermometer in the armpit for 5 minutes or till the beep is heard. Temperature more than 99.5F is considered as fever.

2. What should I do when my child develops a fever?

The main objective of treating fever is to reduce the discomfort of child, rather than to just reduce the temperature. Paracetamol (acetaminophen) is the safest drug for fever to be used in children. If given in correct dose (15 mg/kg body weight), it brings symptomatic relief.

3. My baby's fever does not come down to normal even after giving paracetamol. What should I do? Can I use stronger medicine?

Remember, the purpose of fever medicine is not to bring down the temperature to normal level, but to provide symptomatic relief to child by reducing pain and discomfort. If the initial fever was high, say 104°F, administration of paracetamol may bring it down to 101°F and not make the child afebrile. Avoid overdosing if the fever does not normalize. You can repeat the next dose after 4–6 hours if required. Other medicines (ibuprofen, mefenamic acid) are also available, and should be used only in consultation with your pediatrician.

4. My child is not taking orally and has vomiting also. What should I do?

In children who are unable to take orally, your doctor may decide to give paracetamol suppository through rectal route.

5. Can I send my child to school during fever?

Mild fever with no other symptoms is usually not a reason enough for a child to stay at home.

It is preferred to not send a child to school during fever if he feels weakness, looks uncomfortable and tired or is suffering from any infectious disease.

6. Should I give antibiotics for fever?

Fever in children is mostly caused by viral infections. Antibiotics are drugs used specifically against bacterial infections. They are not effective against viruses. your doctor will decide whether the child needs antibiotics,

7. When should I be worried about fever?

If your child is younger than 3 months old or has any of the following:

Extreme lethargy, drowsiness, excessive cry or irritability Vomiting everything and/or not able to accept feeds orally. Headache, neck stiffness or breathing difficulty Abnormal body movements or abnormal behavior Temperature above 104°F Fever persisting for more than 5 days.

8. Do I need to go for any blood test?

Usually, blood reports are not needed in day to day viral infections. Even if it is required it will be decided by your doctor about which tests are to be done on which day of the fever. There is absolutely no point in doing the blood tests upfront on day one without medical supervision or guidance.

- 9. Is it true that high fever can lead to seizures and brain damage in children? It does not occur in all cases, and it does not cause brain damage. These seizures usually occur in kids 6 months to 5 years old. Children are more likely to have a febrile seizure if they have a family history of the same, or if they have already had one in the past.
- 10. Doctor, during this summer vacation we are planning a tour of two weeks duration, what should we keep in mind if my child develops fever?

Advice for parents (and caregivers) about management of fever at home

Do

Don't

Do encourage the child to drink fluids regularly (breast milk is best for breast feeding children). **Do** make sure medication is given in the right dose at the right time. **Do** seek further medical advice if the fever does not get better within 48 h, or if the child's condition gets worse. **Don't** over-dress or under-dress the child, or wrap the child in heavy blankets.

Don't allow children to drink medicines straight from the bottle.

Don't administer another dose of antipyretic medication immediately if the temperature does not come down after one dose. Wait for the appropriate dosing interval to pass and only give another dose at the correct time.

Don't wake a sleeping child just to administer antipyretic medication.

Don't give antipyretic medicine to the child for longer than 2 days without consulting a doctor.

Tag lines

- 1. Fever is a friend and not foe
- 2. Fever is not antibiotic deficiency state
- 3. Antibiotics are not anti fever medication
- 4. Fever is a reflection of good immunity
- 5. Don't worry ever; fever is not going to be there forever
- 6. Fever is the fight against the germs.

PRESS NOTE; FEVER FRIEND OR FOE?

Fever, the most common symptom associated with most childhood diseases, accounts for 70% of presenting complaints to the pediatric departments. As per available evidence, under-five children in low- and middle-income countries had 2–9 febrile episodes in a year, with an average of 5.88 episodes. More than 80% of episodes of fever are mainly caused by infections like viruses, bacteria and parasites. In tropical countries like India heat illnesses are also not uncommon.

Parents or guardians often worry when their kids get fever; more so when there is a single child in a nuclear family or when both parents are working. Parents' anxiety about childhood fever is partly due to misconception with a strong belief that fever is a disease rather than a symptom of underlying illness.

It is not unusual for kids to fall ill and get fever every now and then. But parents should not worry about it. In fact, fever helps the body to fight the infection. Scientifically it is proved that temperature makes it harder for the germs to grow and thereby shortens the duration of illness. Additionally,, fever is an important symptom which tells us that "all is not well" in the body, and prompts us to take medical advice.

When you feel that your child is warm to touch and/or looks uncomfortable, tired, weak, and less playful the best thing is to confirm the presence of fever with the help of a digital thermometer. Temperature value greater than 99.5 F in armpit is described as fever. Even if a child has fever don't panic till the child is still playing, interacting well, and drinking normally and doesn't have pain, aches, or discomfort. Parents should remember that the purpose of fever medicine is to provide symptomatic relief to children by reducing pain and discomfort and not to bring down the temperature to normal level.. Paracetamol in a dose of 15 mg/kg body weight per dose is the safest drug for fever to be used in children and it can be repeated every 6 hours without any side effects. Avoid overdosing and consult your doctor if the fever continues to spike. It is advisable to carefully follow the instructions rendered by your health providers otherwise it can lead to paracetamol poisoning which is a very serious condition. Other medicines (ibuprofen, mefenamic acid) are also available, and should be used only in consultation with your pediatrician.

Most febrile illnesses are not serious. However, you should visit the pediatrician immediately if the temperature is above 104°F and/or fever persists for more than 4 days. Consult your doctor immediately (even if the fever is not that high), if your child is younger than 3 months old or has any of the warning sign like headache, neck stiffness ,breathing difficulty, abnormal body movements, abnormal behavior, extreme lethargy, drowsiness, excessive crying, vomiting everything and/or not able to accept feeds orally

Remember that your child should be hydrated with plenty of fluids like breast milk (younger children), plain water, lime water, buttermilk, oral rehydration solution etc. Ask them to take proper food for speedy recovery and adequate rest to reduce the aches and discomfort. Avoid overclothing and ask them to wear loose light cotton clothes.. Cold baths and cold icepacks do more harm than any benefit. Always use tepid water (28–30°C), if needed,

Global warming is an emerging challenge and India is not an exception to it. Heatwave deaths in India are common and children especially malnourished ones are most vulnerable. All these sufferings and deaths can be prevented by imparting proper health education regarding their hydration, nutrition, proper shelter, clothes, protective gadgets like cap, umbrella etc., and scheduling proper timing of their school and play activities.

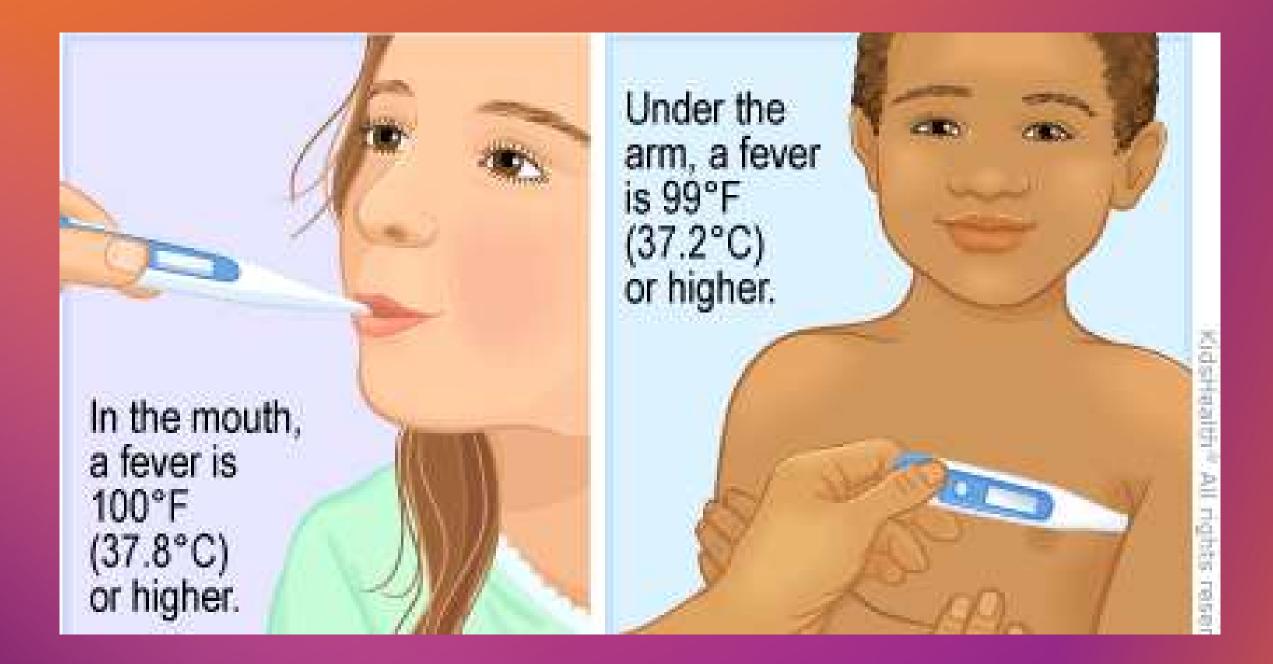
Indian Academy of Pediatrics, with its strength of more than 40000 Pediatricians is committed to contribute to address such child health related issues which will go a long way to bring down under 5 mortality in our country.

Fever : is it a friend or foe?

Abhay Shah-Convener Renu Boralkar Ravishankara M. K.Pavankumar Hunsigiri Manish Gupta

- Normal body temperature is around 37°C (98.6°F).
- Fever is defined as equivalent rectal temperature of ≥38 °C (100.4 °F) or axillary (armpit)temperatures of ≥ 37.5 °C (99.5 °F).
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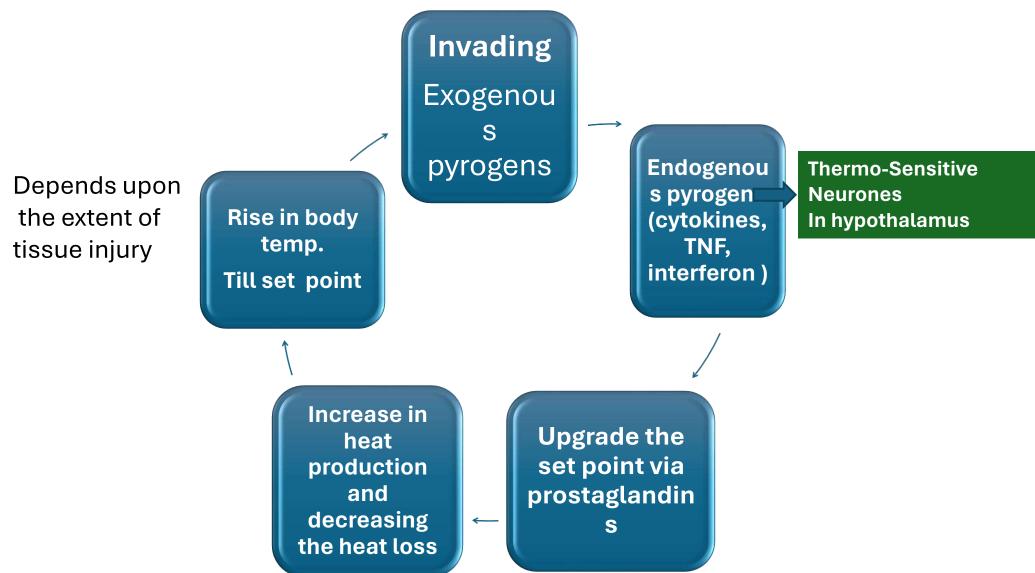
VARIOUS METHODS

CHART	FOR CHILDREN	
	Normal	Fever
Rectum	36.6°C - 38°C [973% - 100.4%]	+38.1°C [+100.5°F]
	$\nabla X X$	XNN)
Oral	35.5°C - 37.5°C (95.9°F - 99.5°F)	+37.6°C [+99.6°F]
Underarm	34.7°C - 37.3°C [94.5"F - 99.1"F]	+37.4°C [+99.2°F]
Ear/Forehead	35.8°C - 38°C [964°F-1004°F]	+38.1°C [+100.5°F]

Tympanic(Ear) thermometer



Mechanism of fever-A Febrile response



What is the difference between fever and hyperthermia (106 F)?

 Fever is regulated rise in temp.
 hypothalamic set point is elevated. Hyperthermia is unregulated elevated body temperature

hypothalamic set point is not involved.

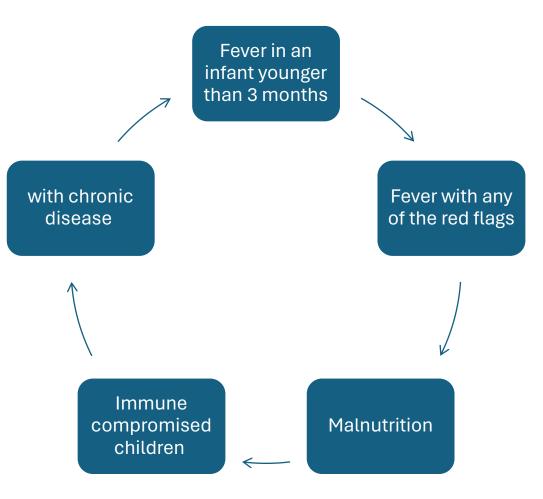
Fever is a friend- Why? Fever : an acute phase protective response

activates our immune system

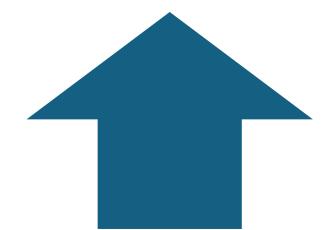
reduce the survival and proliferation of infectious germs

induces the production, proliferation, and migration of white blood cells (WBCs)- the first responders fighting against the germs.

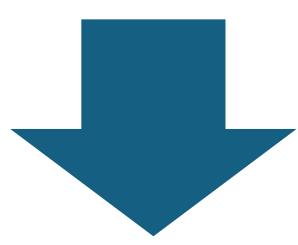
Should Fever Ever be a Concern?



Should Fever Ever be a Concern?



Prolonged and unexplained fever lasting longer than a week



Fever associated with weight loss

Common Symptoms Of Fever

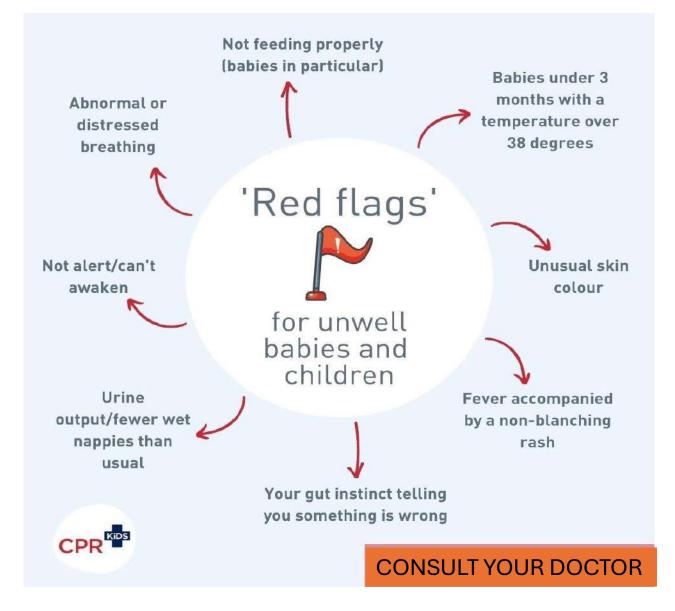


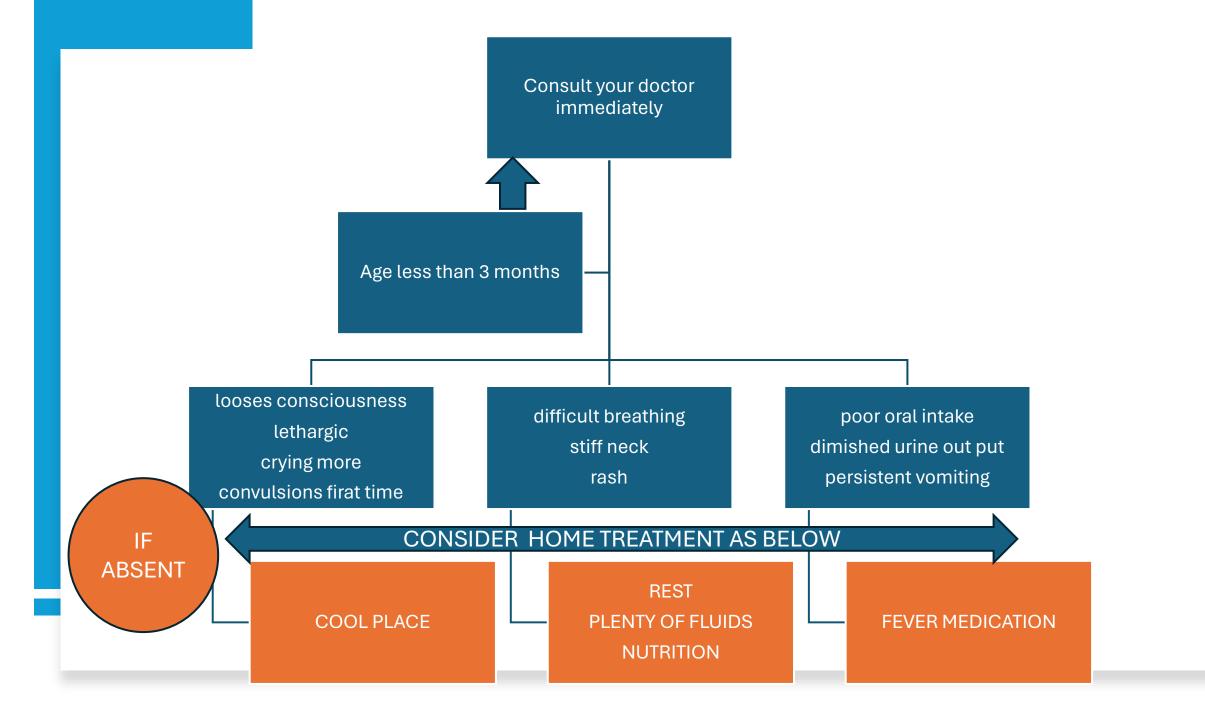
Which are associated symptoms?

When it's serious?

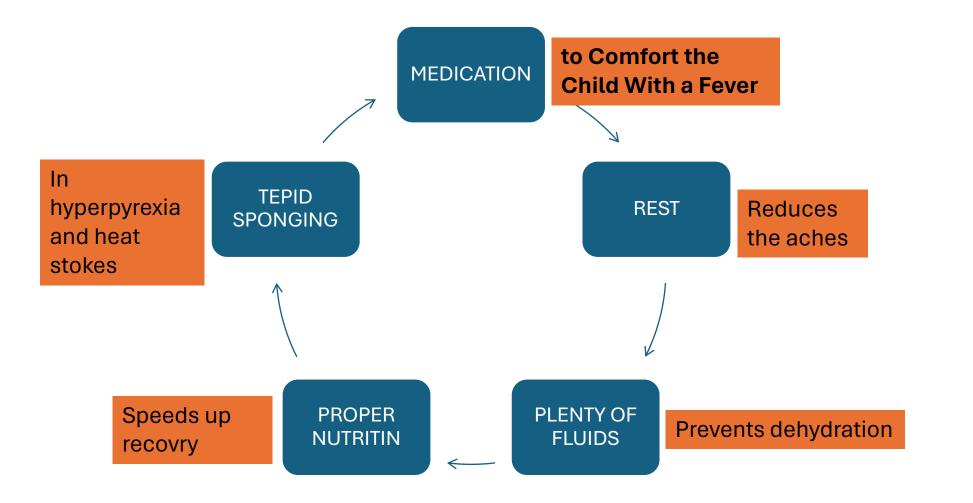
• Fever with any of the red flags







How should I treat it ?FEVER MANAGEMENT

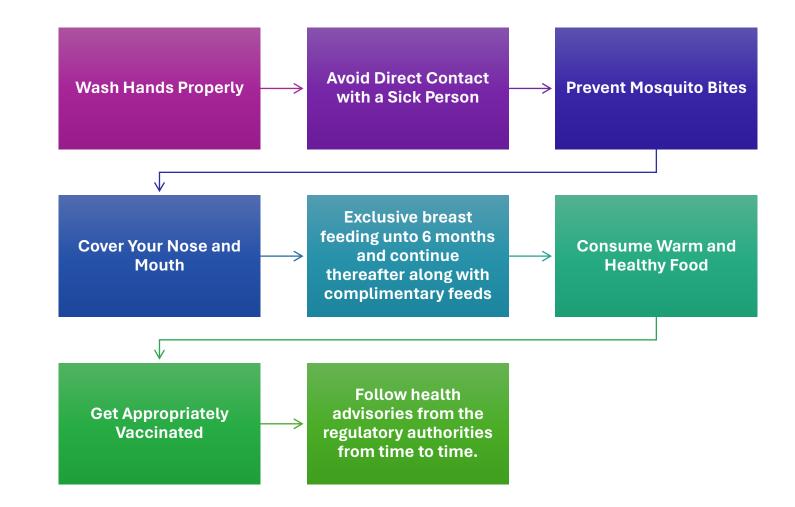


MANAGEMENT? : Ways to Comfort the Child With a Fever

- Antipyretics paracetamol
- ONLY for reducing aches and give comfort to child
 - NO NSAID/Fixed Drug Combination
 - Dose of PCM 15 mg/kg per dose and not exceeding 60 mg/kg/day*
 - Toxic dose 150 mg/kg/day
 - Do not overdose if fever continues to spike

• Consult your doctor soon.

WHAT SHOULD I DO TO PREVENT FEVER IN MY CHILD?



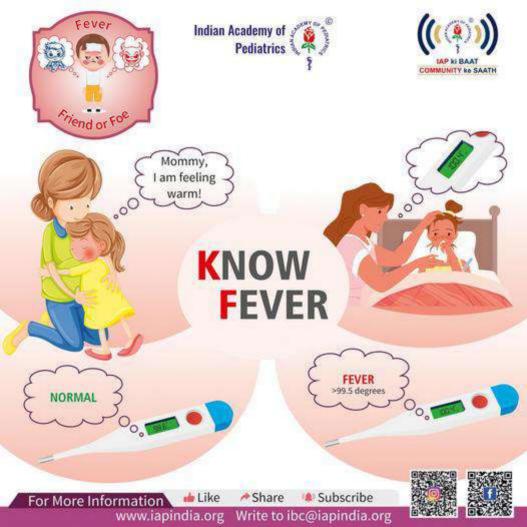
Dehydration fever in new borns

- Common in summer months
- Especially when mothers are not having adequate break milk and/or nipple or breast issues.
- Usually in first 15 days of life
- Significant weight loss (>10% of birth weight)
- Decreased urine output
- May have jaundice and electrolyte imbalance
- May have kidney damage
- Encourage expresses breast milk, may require top milk
- Consult your doctor soon- baby may need urgent hospitalization



CHILD TO BE TAKEN TO NEAREST HEALTH FACILITY AT THE EARLIEST

HEAT ILLNESSES IN CHILDREN





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SHOULD I GIVE ANTIBIOTICS FOR FEVER?

"Fever in children is mostly caused due to viral infections. Antibiotics are drugs used specifically against bacterial infections. They are not effective against viruses. Your doctor will decide if the child needs antibiotics."

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TAKING CARE OF YOUR CHILD DURING SUMMER

Prevention Tips



Dress babies in light, breathable clothing during hot weather.



Ensure that children stay hydrated by drinking water regularly throughout the day.

Emergency Kit



Water for hydration.



Hand towel and fan for cooling.



Electrolyte or oral re-hydration solution for replenishing lost fluids.



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WHEN SHOULD I BE WORRIED ABOUT FEVER?

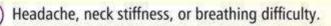
If your child is younger than 3 months old, or has any of the following symptoms:





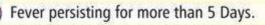
Extreme lethargy, drowsiness, excessive crying or irritability.

Vomiting and /or not able to accept feeds orally.





Abnormal behaviour, temperature above 104°F.















hessing

SIMPLE DO'S & DON'TS IN FEVER



- Don'ts
- Do encourage the child to drink fluids regularly
 Don't over-dress or under-dress the child. (Breast milk is great for children of breastfeeding age).
- Do make sure medication is given in the right dose at the right time.
- Do seek further medical advice if the fever does not get better within 48 Hrs, or if the child's condition gets worse.

- or wrap the child in heavy blankets.
- Don't administer another dose of antipyretic medication immediately if the temperature does not come down after one dose. Wait for the appropriate dosing interval to pass and give the next dose at the correct time.
- Don't wake a sleeping child just to administer antipyretic medication.

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FEVER FACTS: UNDERSTANDING THE MULTIFACETED CAUSES

Common viral infections like common cold, flu, croup, etc.

- Like

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- Infections of ear, nose and throat, caused by viruses and bacteria.
- Bronchiolitis, whooping cough and other lower respiratory tract infections, pneumonias etc, caused by viruses and bacteria.
- Urinary tract infection (UTI).
- Gastroenteritis.

For More Information









FEVER FACTS: UNDERSTANDING THE MULTIFACETED CAUSES

- Fever with rash roseola, chickenpox, measles, etc.
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