Fever and Vomiting

At one time or another, everyone has experienced a fever or has vomited. These two occurrences are not always pleasant, but they do serve their purpose. Even though they make you feel miserable, this is actually your body’s way of keeping you healthy and safe. How, do you ask? Let’s take a look.

What is fever?

Having a fever means that your body temperature is higher than normal. Something inside your body, such as an infection, has caused your temperature to go up.

A part of the brain called the hypothalamus controls your body temperature. It acts like a thermostat for your body. Just like an air conditioner, it tries to keep you body at a specific temperature.

Normally, the hypothalamus keeps your temperature at around 37ºC (98.6ºF). This can vary depending on the time of day - your temperature is usually lowest in the early hours of the morning and highest in mid afternoon. But generally, it stays around 36.5 and 37ºC.

When you have a fever, your body temperature rises above 38ºC (100.4ºF). This usually means there is something wrong somewhere.

If your fever lasts for more than a day, it is very important to let your doctor know. It may be nothing, but it could be a sign of an infection. It is very important to find out what is causing the fever so that it can be treated quickly and in the best possible way.
Why We get a Fever

A person’s temperature might rise for many reasons. Fever occurs when the body’s immune response is triggered by pyrogens. A pyrogen is anything that causes a fever. Pyrogens usually come from a source outside the body such as viruses, bacteria, fungi, drugs, and toxins. Examples of illnesses caused by pyrogens are, colds, the flu, tonsillitis, ear infections, bronchitis, and tetanus.

The 3 phases of fever

Even though having a fever is uncomfortable, it is not a bad thing. It is your body’s way of letting you know something is wrong. In a way, the fever is helping to fight off your infection. This happens in 3 phases:

1. **Your body reacts and heats up** - Your blood and lymphatic system make white blood cells, which fight infection. When you have an infection your body makes more of these cells. They fight infection by finding and destroying what’s making you sick. The increase in these white blood cells affects the part of your brain that controls your body temperature (the hypothalamus). When the hypothalamus senses an increase in white blood cells, it tells your body to increase your temperature. This makes your body heat up, causing a fever.
   In the early stages of a fever you often feel cold and start to shiver. This is your body’s response to a rising temperature - the blood vessels in your skin tighten up (constrict), forcing blood from the outer layer of your skin to inside your body where it is easier to keep the heat in. The outer skin layer then becomes cool and your muscles start to contract. This makes you shiver. Shivering produces more heat and raises your temperature even more. The high temperatures kill most pyrogens.

2. **The fever levels off** - In the second phase of a fever, the amount of heat you make and lose is the same. So the shivering stops and your body remains at its new high temperature.

3. **Cooling down** - Your body starts to try and cool down so that your temperature can return to normal. The blood vessels in the skin open again, so blood moves back to these areas. You may sweat, as this helps to cool down the body.

**Low Grade Fever** – 99°F to 100.8°F

**Mild Fever** - 101°F to 102°F

**Moderate Fever** – 102°F to 103°F

**High Fever** – anything over 104°F

Fever and Vomiting
Who is most at risk of having complications from a fever?
The very young and elderly are more likely to get complications from a fever. In the elderly, the part of the brain that regulates temperature (the hypothalamus) does not work as well as it does in the young. The body temperature can rise too much, causing heart problems and confusion.

Children under six may have a seizure if their temperature gets too high. But in most people, the cause of the fever – such as infection – is more likely to cause problems than the fever itself.

Overview

Even though you might feel bad when you vomit or have a fever, your body is actually trying to help you get better. Most pathogens cannot handle higher than normal body temperatures. A fever helps to destroy pathogens.
Vomiting

Vomiting is the forceful expulsion of the contents of the stomach through the mouth. Vomiting may result from many causes, ranging from gastritis or infection, to brain tumors, or head trauma. The feeling that one is about to vomit is called nausea. It usually precedes vomiting, but it does not always lead to vomiting. Severe vomiting over a period of time can lead to dehydration.

What controls vomiting?

Vomiting is controlled in the medulla area of the brain. Receptors (sensory nerves) on the floor of the brain trigger area which when stimulated can cause vomiting. The chemoreceptor zone lies outside the blood-brain barrier, and can therefore be stimulated by blood-borne drugs that can stimulate vomiting, or inhibit it.

What happens when we vomit?

The vomiting act encompasses three types of outputs initiated by the medulla: Motor, parasympathetic nervous system (PNS) and sympathetic nervous system (SNS). Collectively, they are as follows:

- Increased salivation to protect the enamel of teeth from stomach acids
- Small intestine contents go into the stomach, starting from the middle of the small intestine, sweeping up the contents of the digestive tract into the stomach, through the relaxed pyloric sphincter.
- Increase in abdominal pressure as the abdominal muscles contract, propels stomach contents into the esophagus. The lower esophageal sphincter relaxes. This is part of the motor output, and it is also important to note that the stomach itself does not contract in the process of vomiting.
- Vomiting also causes both sweating and increased heart rate.

What is vomit made of?

Vomit is soggy, half-digested food, stomach mucus, saliva, stomach acids and other chemicals that quickly exit up your throat and out of your mouth.

The content of the vomit may be of medical interest. Fresh blood in the vomit is termed hematemesis (“blood vomiting”). Old blood looks like coffee grounds (as the iron in the blood is
oxidized), and is called "coffee ground vomiting". Bile can enter the vomit if the stomach is empty or if dry heaving occurs. Fecal vomiting is often a consequence of intestinal obstruction, and is treated as a warning sign of this potentially serious problem; such vomiting is sometimes called "miserere".

**What can go wrong?**

Vomiting can be very dangerous if the gastric content gets into the respiratory tract. Under normal circumstances the gag reflex and coughing will prevent this from occurring. The individual may choke and suffocate or suffer aspiration pneumonia.

Prolonged and excessive vomiting will deplete the body of water (dehydration) and may alter the electrolyte status.

**What causes vomiting?**

Vomiting may be due to a large number of causes. Food poisoning, illness, feeling nervous or scared, eating too much, pregnancy, a concussion or brain trauma, and motion sickness are all common causes of vomiting. When you experience one of these factors, a warning signal is sent to an area of your brain called the emetic center. The emetic center sends a signal to your stomach to get rid of whatever is in it quickly.

**Group vomiting**

It is quite common that when one person vomits, others nearby will become nauseated, particularly when smelling the vomit of others, often to the point of vomiting themselves. It is believed that this is an evolved trait among primates. Many primates in the wild will tend to browse for food in small groups. Should one member of the party react adversely to some ingested food it may be advantageous (in a survival sense) for other members of the party also to vomit.

**Other names**

Slang terms for the act of vomiting include: "hurling", "throwing up", "upchucking", "booting", "puking", "ralphing", "barfing", "keeling", "chucking up", "sicking up", "tossing your cookies", "shouting groceries", "spewing", "spewing chunks", and "chundering".
Fever and Vomiting

Directions:
Answer the following questions using the “Fever and Vomiting” article.

**Fever**

What is fever?

1. Definition of fever.__________________________________________________

2. What role does the hypothalamus play?_______________________________

3. What is the average body temperature?_______________________________

Why we get fever?

4. What is the main cause of fever?____________________________________

5. What are some examples of pyrogens?_______________________________

How does a fever happen?

6. What is responsible for raising your body temperature?________________

7. Why does shivering occur?___________________________________________

8. Can pathogens handle above normal body temperatures?_______________

9. Ranges of body temperature:
   - Low-grade fever – _________________
Vomit

What is vomit?

10 Different names for vomit: __________________________________________
__________________________________________

11. What is vomit made of?__________________________________________

Why we vomit?

12. What are some reasons for vomiting?________________________________
__________________________________________

13. How does your brain play a role in vomiting?________________________
__________________________________________

A person develops an elevated body temperature from a bacterial infection. The fever is a response from the body to help fight the infection by -

A slowing the growth of the bacterial infection

B increasing the energy level of the body

C increasing the body’s heart rate

D stopping additional bacteria from entering the body

The presence of a harmful material in the stomach will probably cause:

A the absorption of water in the stomach

B vomiting

C the absorption of food in the small intestine

D the stomach to stop churning