

# Hangover

Hangover is medically and biochemically very interesting condition, which is a direct consequence of intake of a larger amount of alcohol. The following description including the best treatment relies on biochemical and metabolic pathways leading to hangover symptoms.

## Causes

Uncomfortable symptoms in hangover are caused by alcohol and by disruption of the internal environment of the organism. **Alcohol** (ethanol chemically) is in our body converted by an enzyme (alcohol dehydrogenase) to a substance called **acetaldehyde**. Acetaldehyde is further transformed by enzyme acetaldehyde dehydrogenase to **acetate**, which is an energy source. Alcohol and acetaldehyde have completely different effects on our body. Alcohol causes euphoria, loss of inhibitions and disturbance of consciousness. Acetaldehyde is a much more aggressive acidic substance that causes nausea, [vomiting](#) and [headache](#), i.e. the classic symptoms of a hangover.

In addition, the alcohol affects our hormonal system. It blocks the action of antidiuretic hormone (ADH), which is produced in the brain. Antidiuretic hormone acts in kidney tissue and it prevents excessive loss of fluids. Disruption of the ADH effect causes [dehydration](#). Have you ever wondered why there is such strong urge to pee after drinking few beers? This was the answer. The volume of ingested alcohol does not help and so even a person that drank 10 beers (few liters of fluid) will suffer from [dehydration](#) the morning after.

[Dehydration](#) leads to thickening of blood and the internal environment of the body. The concentration of most substances increases and technically this is called a hypertonic environment. However, the concentration of most important minerals (sodium, potassium, chloride) does not grow due to their losses by excessive urination.

Another aspect of a hangover is low blood sugar ([hypoglycemia](#)). The liver tissue is focused on eliminating the alcohol and does not have the capacity to release adequate amount of sugar to the blood.

The hangover therefore develops as a disruption of the internal environment due to toxic effects of acetaldehyde, hypertonic environment, [hypoglycemia](#) and [dehydration](#).

## Symptoms

The symptoms of a hangover include [headache](#), nausea, [vomiting](#), fatigue, intolerance to loud sounds and bright light, bad mood, general malaise, etc.

## Prevention

The best prevention is, of course, responsible drinking of alcohol.

## Treatment

The treatment is rather symptomatic as the symptoms slowly withdraw. The affected person needs mostly rest and adequate intake of fluids (non-alcoholic of course). Some [non-steroidal anti-inflammatory drugs](#) may also have effect. Theoretically, the best therapy is intravenous hydration including administration of glucose and. Glucose infusion with added minerals (NaCl and KCl solutions) is effective against the [hypoglycemia](#), brings missing fluid and minerals. Of course, this is just a theory as the hangover is not a condition that should be regularly treated by doctors.