

[Understanding Vision](#) 16 Oct 2017

Blinking, crying and seeing stars

What makes our eyes so special

We blink, cry and see 'stars' – but what makes our eyes react like that? Why do we blink? What role does our retina play? What makes our eyes shed tears? How do tears of sorrow differ from tears of pain? And did you know that experts can diagnose diseases simply by looking into your eyes? BETTER VISION looks at what makes our eyes so special.

The retina – our visual sensor and a mirror of our health

The retina performs various key functions – and it also holds the answer to why we sometimes see 'stars' after standing up too quickly or sneezing hard.

So what happens when we see 'stars' – and why? The most frequent cause is a sudden drop in blood pressure. Any sudden movement such as quickly standing up or sneezing heavily sends blood rushing from your head to the rest of your body. Until your blood pressure stabilizes, your brain and eyes are briefly deprived of blood and oxygen. That stops the retina from functioning normally – and it relays that information to the brain. That's why you start to see the tell-tale flashes of light or 'stars.' If the lack of oxygen persists, then your body shifts to the next stage in which the photoreceptor cells in the retina stop sending information to the brain. That's the stage at which everything goes black. Normally your vision is quickly restored because the symptoms disappear as soon as your blood starts flowing normally again.

> [Our eyes](#) contain many other important components apart from the retina.

Still on the subject of blood flow, the annoying "red eye" effect that you see on photographs shows just how much blood is typically flowing through the retina. The red eye effect is caused by the > [camera flash lighting up the blood in the retina](#) and making it visible. It happens whenever the flash is reflected straight back from the retina to the camera lens.

Did you know...? The structure of the blood vessels in our eyes can help eye care professionals

spot the early signs of certain diseases during an eye examination. > [More information...](#)

Important: If you frequently see 'stars' or experience any other form of impaired vision, please make sure to have the symptoms checked out by an eye care professional to rule out anything serious. In some cases these symptoms can be caused by a disease or by side-effects of drugs.

Why do we blink?

Blinking has a very simple and practical purpose. To stop the cornea at the front of the eye from drying out, our eyelid spreads tear fluid on the eye surface to keep it moist whenever we blink – something we typically do approximately 15 to 20 times a minute.

Did you know...? The amount we blink differs from one person to the next. A newborn baby only blinks about twice a minute, while somebody who is flustered or tense might blink up to 50 times a minute. Our blink frequency also changes when we read or watch television, dropping to a rate of around seven times a minute.

Interesting fact: Did you know that when we blink our brain blocks visual perception for just a fraction of a second? That enables us to avoid noticing any irritating gaps in vision and gives our brains a break!

The many benefits of crying

People shed tears of fear, sorrow, anger, joy, sympathy, desperation, pain, or simply because they have something in their eye – in short, for all sorts of other reasons apart from being sad. But why did our body develop this function? Researchers aren't quite sure.

One thing they do agree on is that 'reflex tears' – the ones we shed when we get something in our eye – clearly have a cleansing function. The tear fluid is designed to remove the irritant from our eye as quickly as possible, and once it's gone then the tears stop.

Things get more complicated when it comes to emotional tears, the ones we cry when we're experiencing emotions such as sorrow or joy. Human beings are the only living creatures that exhibit this form of crying. Scientists are still not entirely sure what purpose it has, though there are two main theories. The first is that crying is the body's way of protecting itself by releasing stress and expelling harmful substances through tear fluid. In this context psychologists refer to a cathartic effect (from the Greek meaning 'cleansing'). The second theory sees crying as a form of communication and social behaviour which we use to efficiently express our feelings to other people. Ultimately we can communicate emotions far more intensely if they are expressed not only through words but also through tears. We are essentially signalling that we need help. This triggers sympathy in the people around us and increases our chance of receiving assistance and support.

Did you know...? Tears brought about by emotions actually have a different chemical make-up than that of reflex tears. Emotional tears contain significantly more protein, manganese, calcium and potassium as well as serotonin, a "feel-good" hormone. Moreover, women's tears often include prolactin, a hormone responsible for milk production. And that's not the only difference between men and women: women also cry more often, up to 64 times a year, while men typically cry up to 17 times a year.

Tear fluid also performs a wide range of different functions:

- it supplies our eyes with oxygen.
- It prevents our eyes from drying out and acts as a kind of lubricant' for our eyelids.
- It rinses irritants and foreign particles out of our eyes.
- It contains antibodies (immunoglobulins) which fight pathogens that enter the eye.
- It contains the antibacterial substance lysozyme (as does our saliva).
- It nourishes the cornea.

Can you spot early signs of diseases by examining

people's eyes?

Yes! Red or swollen eyes, sudden deterioration in vision, and small nodules on your eyelid are just some examples of signals given by your eyes that may indicate an underlying illness. No other part of your body allows a doctor to view your blood vessels so directly. That's why the first signs of diseases such as rheumatism, diabetes and multiple sclerosis often appear in our eyes in the form of bleeding or vascular disorders.

And there are certain distinctive features of other ailments which can be spotted in our eyes.

- For example, small yellow nodules on your eyelid are harmless, but they may well be a sign of high cholesterol and should always be checked by a doctor.
- If someone's vision deteriorates very quickly, this may be a symptom of multiple sclerosis (MS). In people suffering from MS, the immune system attacks the nerve fibres of the eye. This often results in an inflamed optic nerve which can subsequently lead to impaired vision and poor colour perception as well as visual field loss.
- Sudden onset of a very pronounced deterioration in vision could, in very rare cases, be caused by a tumour in the eye.
A patient who exhibits bulging eyes and difficulty in moving the eyes may be suffering from Graves' disease, an autoimmune thyroid disease.
- Red or bloodshot eyes are typically just the result of a harmless inflammation or irritation. They can, however, also indicate a rheumatic disorder. If red eyes are accompanied by tears, impaired vision or pain, then it's important to consult a doctor.
- If the eye area often becomes swollen, this may point to a problem with kidney function.
- Yellow conjunctiva could in some cases be an indication of hepatitis. This is where the liver is no longer able to process bilirubin, leading to discolouration of the conjunctiva.

Eye floaters in your field of vision – are they normal?

Eye floaters are particularly noticeable when you look at a bright background such as blue sky or a white wall. These small moving spots which appear to follow the direction of your gaze are technically referred to as vitreous detachments. They tend to be more noticeable at some times of the day, and less noticeable at others. Almost everyone will experience them at some point in their life, and in most cases they are not sight-threatening. They are caused by age-related changes in the vitreous of the eye which separates and shrinks from the retina as we get older. People who are near-sighted typically experience floaters more frequently and earlier in life because their eyeball is longer .

Anyone who experiences a rain of large black spots moving slowly upwards should visit an eye care professional because in some cases this could indicate bleeding into the vitreous (vitreous haemorrhage) which is a serious condition.

Expert advice and treatment should also be sought immediately if you experience any other form of impaired vision such as cloudy vision, blurred contours, poor contrast, grey or black spots in your central field of vision, jagged or distorted lines, or increased sensitivity to glare.

What is the 'blind spot' in our eyes? And what causes it?

Both our right and our left eye have a blind spot which is the part of our field of vision which is not perceived. This is the place in the visual field where there are no light-detecting photoreceptor cells. The reason that we can nevertheless see everything and do not perceive any kind of 'gap' is that our brain compensates for the blind spot by using information from the other eye.

[> Find out more...](#)

Why do our eyelids sometimes twitch?

Twitching or spasms of the eyelid can last for hours or days, potentially causing distress and interfering with people's quality of life. Most eye twitching is completely harmless and generally

caused by factors such as stress, eye fatigue, or lack of sleep. These temporary spasms usually go away on their own. If the twitching continues then it can sometimes help to relax your eye by covering it with a flannel soaked in warm water or closing the eye and gently massaging the eyelid.

Important: In rare cases – for example if the twitching continues even after taking steps to relax the eye – this condition may indicate a mineral deficiency, infection or disease. Please seek advice from an eye care professional if you have any doubts.

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