

TEARS TEARS EVERYWHERE

(1) Have you ever cried even though you weren't sad? Perhaps you were happy, or frustrated or maybe you were chopping onions and all of a sudden tears began to roll down your face. Not all tears come from the same source.

(2) Not only can tears be elicited by different feelings, sensations and emotions, they also have different chemical compositions depending on what causes the tears to form. Though all tears contain oils, antibodies and enzymes dissolved in salt water, they also have other unique components depending on the type of tears. There are three major types of tears: basal tears, reflex tears and psychic tears.

(3) Basal tears are the type of tears that are continuously produced daily throughout someone's life. Even if someone rarely cries, they still produce 5 to 8 ounces of tears a day for several important reasons. The tears help lubricate the eye, delivering fresh nutrients and oxygen to the eye and flushing out waste and dust. Tears also help our vision by coating the eyeball with a smooth layer that corrects for the irregularities found on the surface of the cornea. This helps form a clearer image on the retina after light passes through the cornea. Lastly, tears also contain antibodies and enzymes that help us combat microorganisms that might land in our eyes. Lysozymes in tears break down the outer peptidoglycan coating of bacteria to kill them. Continuous blinking throughout the day helps spread the tears evenly on the eye to reach the entire surface.

(4) Reflex tears form when the eye encounters irritants like tear gas, pepper spray and onion vapors. When you cut onions, the broken onion cells release an airborne chemical called syn-propanethial S-oxide which stimulates the



tear producing gland in the eye called the lacrimal gland. Tears are lacrimal gland secretions that form to help flush out the irritant.

(5) Psychic tears are produced by strong emotions of upset, elation, fear and pain. Compared to basal and reflex tears, psychic tears contain more hormones like prolactin, adrenocorticotrophic hormone and enkephalin (a painkiller). These hormones are the types that we produce when we are under stress. Some scientists think that these tears function as a communication system to let others know our emotional state. If you've ever tried to stop yourself from crying in front of someone else, it's probably because you want to hide how you're feeling. You don't want your feelings to be communicated to others. However, studies have shown that crying psychic tears can provide a huge catharsis – an emotional release – that makes us feel better after we cry, whether or not we do it around others. When we allow ourselves to cry, it helps us acknowledge our emotions instead of suppressing them and this often helps us deal with them better. All terrestrial vertebrates produce basal tears and some produce reflex tears, but scientists are unsure if they produce psychic tears, though it has often been reported that elephants will cry in response to the death of family members.

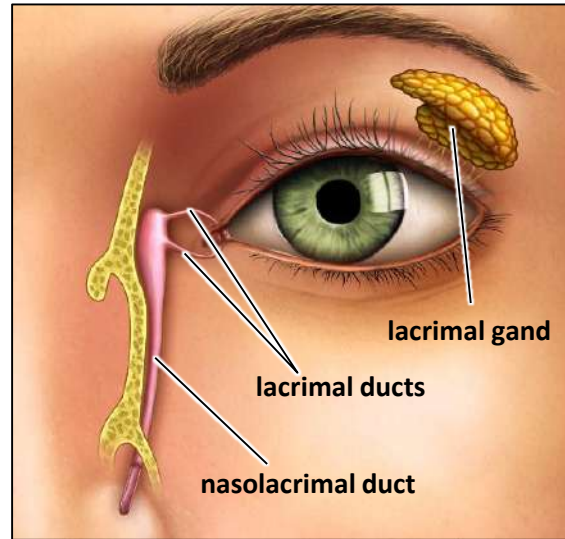
(6) Why does your nose sometimes cry? Have you ever noticed that big cries can cause your nose to produce liquid too? Each eye has a nasolacrimal duct that connects to the nasal passages. When there is an excessive amount of tear production, the surplus tears drain into these ducts causing your nose to “cry”.



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(7) Women cry more often than men. This is because many cultures are more accepting of women expressing certain emotions than men, but there are also biochemical and anatomical reasons for the difference in visible tear production. At the inner corner of your eye, closest to your nose, are the lacrimal ducts. These are tear drainage ducts that connect to the nasolacrimal duct in the nasal passages. In women, the lacrimal ducts are significantly smaller than in men. This means that the same amount of tears that would form drops on a woman's cheek can be more easily blinked away by a man because he can drain the tears away faster. His eyes might glisten, but no tears will be seen rolling down his cheek.



Article Questions

- 1) _____ produce tears and _____ drain away tears. The three major types of tears are the _____ tear, the _____ tear and the _____ tear.
- 2) What is one function of basal tears and how much of this type of tear do we make daily?
- 3) What is the function of reflex tears?
- 4) What causes psychic tears to be produced?
- 5) How is the composition of psychic tears different from basal or reflex tears?
- 6) What explains why your nose sometimes runs when you're crying?
- 7) How do differences in eye structure contribute to women producing more visible tears than men?