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brain [2] wonder [3]



It’s credit to your cranial nerves that you can see, smell, hear and taste.The symmetry of your smile (or scowl) and the exquisite sensitivity of the skin on your face, to something as soft as “butterfly kisses” from another’s eyelashes, stem from these noteworthy nerves, as do breathing, blood pressure and swallowing. In intensive care, cranial nerve tests help doctors distinguish between deep coma and death.

Cranial nerves' names and numbers

Bringing information directly to or from your brain [4], (unlike 31 other nerve pairs, which send signals to your spine), are 12 pairs of cranial nerves.

These are numbered, in Roman, from I to XII, with the first pair being closest to your forehead and the rest emerging in sequence—the 12th pair being near the back of the brain.

Their names include the obvious (the optic) and the obscure (the trochlear and the abducens).

Medics use mnemonics to recall each cranial nerve pairing, with one of the more respectable being “Only One Of The Two Athletes Felt Very Good Victorious And Healthy”.

This represents, in turn, the olfactory, optic, oculomotor, trochlear, trigeminal, abducens, facial, vestibulocochlear, glossopharyngeal, vagus, accessory and hypoglossal nerves.

Spelling out, in plain English, their roles and responsibilities, makes more sense for most of us.

What cranial nerves correspond to the different senses?

Whether it’s sight, smell, sound or taste, (your so-called “special senses”), your cranial nerves have got it

covered.

The first pair of nerves serve the sense of smell; second are those for sight; eighth are for hearing [5], whilst seventh and ninth transmit taste sensations from the tongue [6].

Allowing your eyeballs to move effortlessly, extravagantly and with exquisite precision together are three pairs of cranial nerves (namely III, IV and VI).

Your eyelids, and essential eye-parts such as the pupil and lens, are also controlled by your cranial nerves, as are more general senses in the face and neck, including touch [7], temperature [8], pressure, pain [9] and vibration.

Cranial nerves give us our facial expressions

Described by Dr Gavin Francis as “fragile delicate fronds of salmon pink laced through buttery subcutaneous fat” in his book *Adventures in Human Being* [10], your facial muscles, innervated by the facial nerve, and arranged around the eyelids, lips, nose and ear [11], allow an expression of emotion superior to that seen in any other species.

Unlike humans, apes, apparently, are unable to shed tears of sadness—or show feelings of anger [12], fear and surprise.

One key question is why facial expressions take the specific forms that they do.

Professor Mariska Kret [13] from Leiden University wonders, for example, why humans show their teeth and contract the muscles in their cheeks (smiling) instead of frowning and sticking out their tongue when they want to signal benign intent? Is there a biological basis and explanation?

Why are cranial nerves important for speech?

Spoken words, eye contact, facial expression and active listening [14] are essential elements of effective communication. Cranial nerves that connect to your tongue, your eyes, your facial muscles and the cochlea of your inner ear are key.

That an entire pair of cranial nerves (the 12th), is devoted to control of the tongue is a reminder of the damage that an uncontrolled tongue can do through gossip [15] and slander.

If you’re having difficulty speaking, the doctor will ask you to say “aaah”, stick out your tongue and move it from side to side, clench your teeth, purse your lips and whistle.

In doing this, your cranial nerves are being examined for damage, which can affect speech production.

What cranial nerves help with chewing, swallowing and breathing?

The tenth cranial nerves are the longest of them all and are named “vagus”, derived from the Latin for “wanderer”, since they travel throughout the body, from the brain to the colon, via the heart [16], lungs [17] and abdominal organs.

Important in control of heart rate [18], blood pressure and breathing, they work alongside other cranial nerves to coordinate swallowing, and they also signal to the stomach to contract and send food into your small intestine.

Digestion also depends on the tearing and crushing of food by teeth, its squashing and compaction by the tongue, and its mixing in the mouth with saliva. Your cranial nerves drive this motion and also supply the salivary glands.

How cranial nerves give us the shrug

“It’s spoken with a shoulder shrug, a side-to-side of the head, and roll of the eyes,” says actor and comedian Kevin Hart. “It means: ‘I can’t even fathom your reality, but I’ve decided to accept it and move on’."

In his description of indifference, Hart is here giving insight into the role of the 11th cranial nerve, used for head rotation and shrugging of the shoulders, through its action on neck and shoulder muscles.

Rolling of the eyes is controlled by three pairs of cranial nerves. Interestingly, eye rolling has not always signalled irritation or contempt. William Shakespeare [19] used eye rolling to communicate lust and aggressive passion.

What cranial nerve makes you blink?

Reflexes protect your body from things that could cause harm. Cranial reflexes, involving the cranial nerves, include the blinking reflex and the light reflex.

Blinking moves tear fluid across the eye, keeping the eyeball moist, and free from dust and debris.

In the light reflex, the pupil of the eye can change in diameter from 8mm to 1.5mm, letting just enough light in, but not too much—and also helping to bring blurred objects into focus.

In another cranial reflex, cranial nerves contract the tiny muscles in the middle ear in response to a loud sound, stiffening the tiny chain of bones to which they link, reducing the impact of the sound on the fragile inner ear.

A sudden explosion can, however, still cause damage because the reflex contraction of the muscles is not quick enough.

What damage to the cranial nerves tells us

Singer Justin Bieber recently revealed paralysis of one side of his face, caused by a virus affecting the seventh (or facial) cranial nerve. Damage to cranial nerves can also arise through head injury, brain tumour, infection, inflammation, surgery or stroke [20].

Signs of damage reflect the many roles of the cranial nerves when working well, and include dizziness [21], deafness [22], double vision, a disordered sense of smell, paralysis [23] and pain in the face, and difficulties in speaking and swallowing.

A life as told by cranial nerves

Cranial nerves, used repeatedly throughout life to contract your facial muscles, help create a record, after death, of the type of life you’ve lived and the emotions you’ve experienced, writes Dr Gavin Francis.

Viewed during medical school dissection for the purpose of teaching anatomy, thick and well-defined cheek muscles, involved in making you smile, suggest a life filled with laughter [24].

When they are withered and shrivelled to little strings, it’s a sign that your smiles were scarce and that life was sad, or miserable.

Frowning muscles in the forehead, or those that create “crow’s feet” (or “laughter lines”) near the eyes, develop differently over time, depending on the burdens you bear.

Source URL:https://www.helencowan.co.uk/everything-you-need-know-about-your-cranial-nerves

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