ALL ABOUT FEAR
Everything you wanted to know but were afraid to ask
By HIRAN RATNAYAKE
Even though you're sitting on your couch and nursing popcorn, your heart starts palpitating during the shower scene in "Psycho."

Hearing that your boss needs to have a meeting with you causes sweat beads to break out on your forehead.

Goosebumps appear on your arms as the plane you're sitting in rises into the air, even though the lifetime odds of dying in an air or space transport accident is 1 in 7,000, according to the National Safety Council.

That's because fear - no matter the source - causes a physiological response in our body. Children get thrills seeing friends in scary costumes during Halloween. But for many, fear also is equal parts a trick and a treat.

Fear triggers the body's "fight-or-flight-or-freeze" response, said professor Jeffrey B. Rosen, who researches the physiological, neuroanatomical and molecular bases of fear and anxiety at the University of Delaware.

"People like to experience these emotions," he said. "A lot of people experience fear as exhilaration. ... Your heart rate goes crazy, you're wide awake and you're aroused."

The "fight-or-flight-or-freeze" response - also known as the acute stress response - is due to the body's reaction to a perceived threat or danger. As people experience this response, the hypothalamus - a tiny region in the base of the brain - sets off an alarm that prompts the adrenal glands at the top of the kidneys to release the hormones adrenaline and cortisol. Several changes occur in the body due to those hormones. For example, digestion will slow down while the heart rate will speed up. Additionally, blood flow will be routed to the major muscle groups to give the body a burst of energy and strength.

"The brain is sending a message to the adrenal glands that says 'Start putting out some steroids to help the fight or flight,'" said professor Joseph Tecce of Boston College, who specializes in psychophysiology and has been studying the body's response to fear for decades. "Steroids are getting dumped into the blood, and now the heart rate will get higher, the blood pressure gets higher, skin conduction gets higher. Now the organism is ready to rumble to save its life."

People will choose to engage in fear - by watching horror flicks or bungee jumping - because of the adrenaline rush, he said.

"It's the same energy and same rush and same motivation that occurs with super pleasant states," he said. "When that adrenaline buzzes, we know we are alive and pumping."

The experience of fear also causes a physiological reaction in the muscles that control eyelids, meaning people will blink more frequently. Blinking then produces a release in tension.

"Blinking is like tapping a pipe or cracking knuckles or biting fingernails," Tecce said.

Pulley dilation occurs as the eyeballs respond to fear by absorbing more information that will help the person survive. And all senses of the body are heightened during a fearful situation.

"If there's a guy with a gun in front of you, your visual sense is going to be more heightened than your auditory sense," Tecce said. "And if you're walking through a cemetery alone at 1 a.m. and it's not a nice area and all you can see is black, your auditory sense is going to be very, very sensitive."

The California Science Center developed an exhibit known as "Goose Bumps! The Science of Fear" to give people an interactive way to understand what occurs to their body and brain when they are frightened. The exhibit features numerous activities where people are forced to face their fears. The exhibit will eventually be at The Franklin Institute in Philadelphia, said curator David Bibas.

"We wanted to show innate fears like the fear of falling and the fear of loud noises and fears that were easily acquired, like snakes, and more recent fears that have to do with technology, like the fear of being electrocuted," he said.
**Healthy fears**

Fear drives us to show up on time to work so we won’t get fired. Fear propels us to wear our seat belt when we enter our car.

Fear encourages us to exercise caution as we cross a busy intersection. Some fear is healthy, Tecce said. “To an extent, fear allows us to avoid dangerous situations so we’re going to live long,” he said. “You’re going to be dealing with your fear in a useful way.”

Fear is a prime motivator in making us productive. With too little fear, a person may not avoid danger such as a child who walks too close to a fire or an adult who drives drunk, Tecce said. At the same time, too much fear can lead to irrational judgments and unhealthy physiologic responses like heart palpitations. “A little fear is not very good and too much fear is bad,” Tecce said. “Everything in moderation’ is applied.”

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**Halloween costumes go for the gore**

People have been dressing up to celebrate Halloween in the U.S. for more than 100 years, but only since the late 1970s has Halloween been transformed into a fear-themed holiday.

The watershed moment occurred when the movie “Halloween” – about a psychiatric hospital escapee known as Michael Myers – debuted Oct. 25, 1978. Originally titled “The Babysitter Murders,” the movie became the first in a long line of slasher films and grossed more than $60 million worldwide at the box office.

Today, Halloween is still a family-friendly holiday, but it also has become much more associated with horror and fear, said Lesley Bannatyne, who has written five books on the holiday. “The movie ‘Halloween’ was a real game-changer and a really sneaky hit,” said Bannatyne, whose most recent book, “Halloween Nation,” was released in April. “It used Halloween as the metaphor.”

Hollywood also influenced the change from cute ghost, witch and hobo costumes to the ghoulish outfits that people don for Halloween today. “Costumes didn’t get scary until Hollywood started unleashing really, really scary movies,” Bannatyne said. “There’s a really tight connection between Hollywood, Halloween and horror, and that’s why you’ll see a Freddy Krueger mask or a bleeding mask of doom.” Costumes – whether in movies or in real life – can also be scary because they’re unrecognizable, researcher Joseph Tecce said. “The strangeness of what you see is very frightening,” he said. “Like that little girl in The Exorcist, you think, ‘I’ve never seen a girl look like that before.’”