

Why You Should Not Believe Everything You Hear— No Matter How Often You Hear It



Julie Frantsve-Hawley
Editor-in-Chief

A few years ago, a movie called *Lucy*¹ was a summer blockbuster. The premise of the movie was based off of the belief that most humans use only 10% of their brain; the main character, Lucy, becomes superhuman when she is able to use 100%. The statement that we only use 10% of our brain seems to be common knowledge. Other fun factoids that we frequently hear include: the Great Wall of China can be seen from the moon, poinsettias are poisonous to animals and children, rubber tires protect passengers in a car from lightning strikes, nails and hair continue to grow after someone passes away, and the US Food and Drug Administration (FDA) allows insect parts and rodent hair in food. These are common urban legends that many of us have likely heard before. But among this list, only one is true. Can you guess which one?

I recently read an amazing book by Dr Daniel Kahneman called *Thinking, Fast and Slow*.² Dr Kahneman, who describes himself as a mathematical psychologist in the book, was awarded the Nobel Prize in Economics due to his contributions in creating the field of behavior economics.³ He describes the mechanisms of how we think and documents the common errors and flaws in our thinking processes—for instance, how repetition can impact our perception of truth. He states, “A reliable way to make people believe in falsehoods is frequent repetition, because familiarity is not easily distinguished from truth.”² This statement, like everything in his book, is supported by science and sound evidence, and he goes on to explain that this skill—or flaw—has its foundations in evolution and survival. In a world filled with good things and bad things, we need a way to distinguish the good from the bad, the safe from the harmful. Familiar environments (home) and social settings (with family or colleagues) are comfortable; unfamiliar environments, items, or social situations often put us on edge. So, in general, familiarity is associated with all things good and safe. Although this system typically helps to protect us from harm, it can be flawed when we start to believe information simply because it is familiar and when we skip the critical thinking step to determine if it is actually true.

We likely see erroneous beliefs based on familiarity in misinformation among our patients (ie, concerns about fluoride or vaccines despite overwhelming evidence that both are extremely safe and effective). But we must realize that the same faulty reasoning may lie within ourselves, too. Examples include the commonly held beliefs that most patients should have a dental checkup every 6 months and should floss every day. We have heard these many times, but we need to question whether these commonly held beliefs are actually true and supported by scientific evidence.

Some of you may be familiar with the urban legend frequently reported on the internet that the origin of the 6-month dental recall stems back to a toothpaste advertisement from the 1920s,⁴ but the earliest recommendation for the biannual interval can actually be found from the American

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Academy of Dental Science in 1879.⁵ Similar recommendations were also made by the American Medical Association in 1890,⁶ and by the organization now known as the American Dental Association in 1909.⁷ More recently, the Cochrane Collaboration published a systematic review indicating that there is insufficient evidence to support or refute 6-month dental checkups.⁸ We simply do not have evidence to support this commonly held belief. This lack of evidence does not mean that regular oral health checkups are not necessary! It just means that we do not have a scientific basis to determine the optimal frequency. In the absence of evidence we still need to make decisions, and of course these decisions should be individualized based on the individual patient's needs, conditions, risk factors, and preferences.

Additionally, there have been multiple recent systematic reviews questioning the effectiveness of self-flossing.^{9–13} These systematic reviews reveal how limited the evidence is to support this mechanism for interdental oral hygiene. In comparison, there is evidence that interdental brushes or woodsticks are effective for cleaning interproximal areas.^{9,12,14–17} Again, decisions and recommendations need to be individualized, based on the patient's needs, conditions, risk factors, and preferences.

A key part of becoming a critical thinker, and an effective evidence-based practitioner, is to avoid complete dependence on what you have heard or learned before, to question dogma, and to be willing to change your opinion based on knowledge.

And for those of you wondering which of the urban legends listed above is true, here's the evidence:

- We use 100% of our brain.¹⁸
- The Great Wall of China cannot be seen from the moon.¹⁹
- Poinsettias are not poisonous to animals and children.^{20–22}
- Rubber tires do not protect passengers in cars from lightning strikes.²³ A car does provide protection, but not due to the rubber tires. The metal frame of the car acts as a Faraday Cage and allows the energy from the lightning to go around the passenger area and into the ground.²⁴
- Nails and hair do not continue to grow after someone passes away.¹⁸

This means that, as surprising and disgusting as it may be, the FDA does allow insect parts and rodent hair in your food.^{25,26}

Julie Frantsve-Hawley, RDH, PhD
Editor-in-Chief

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