

Executive summary: Problems with cell phone signals getting to my new iPhone 7 provide an analogy for one of the primary sensory defects vision therapy can deal with, suppression and intermittent central suppression in particular.

In a world where Millennials sometimes seem unable to spend a moment in silence looking in awe at the colors of a sunset without taking a picture and tweeting the picture to social network “friends,” I have to admit I have a new iPhone 7. I really don’t try to keep up with the latest, preferring to position myself as a troglodyte. However, the brains of my iPhone 5 somehow got fried or developed digital-dementia. Since my cell phone is my emergency phone line, my iPhone 5 had to be replaced before the death-spiral was fully accomplished. When my wife and I got to the phone store, and the customer service associate looked at our cellular plan and how ancient my wife’s phone was (no, not clear back to a flip-phone, but an iPhone 4), it was an easy decision to upgrade both cell phones to new iPhone 7s. Once his laughing had subsided.

My new iPhone 7 is smart and fast. My new iPhone 7 is thin, svelte, downright hip. And, my new iPhone 7 has 128 gigabytes of memory. My aging laptop computer “only” has 250 gigabytes of memory. I could easily get Apollo 13 back to earth with the computational strength of my new iPhone 7. And, I’m pretty sure that the 128 gigabytes of memory in my new iPhone 7 is more memory storage than all of NASA had at that time - including file cabinets. My new iPhone 7 is a technological marvel.

But, we live down near a small river, in an area surrounded closely by tree-covered hills. We dealt with this long ago, well 20-some years ago, when we first moved in. Cable was required if we wanted to see more than the one television station the antenna could grab (Millennials,

please google “pictures of ‘rabbit ears’ television antennas”). And when they built my new iPhone 7 - well, most importantly, when they built my wife’s new iPhone 7 - when they shoved all these brains and memory into that svelte, thin package, Apple changed the new iPhone 7’s antenna a little. Suddenly, with her new iPhone 7, calls started dropping out. They had occasionally dropped out before, as I suspect happens sometime with all cell phones, but not this much. This was a new phenomenon. Phone calls are one thing, but if this interferes somehow with Candy Crush or Sudoku, we will get first-hand experience with the breakage insurance on her new iPhone 7.

What’s the point? Just this: We have really smart phones, our new iPhone 7s. But the brains can’t do the foundational function of a cell phone - complete a phone call - because the message isn’t getting to the phones’ brains. The afferent cellular signals theoretically headed through the air to the brains of our cell phones are not getting to those brains. Similarly, when we as optometrists deal with what may well be an afferent drop-out of central visual sensation,^{1,2} intermittent central suppression (ICS), the human brain doesn’t have the information it needs for maximal learning, visual memory,^{3,4} and decision making. Almost 70 years ago, Louis Jaques⁵ said the first order of business in treating disorders of binocular vision was to treat the suppression; the idea was to assure to the best of our abilities that the human brain receives the maximum, most consistent, most stable visual information available from the inceptive input to the eyes. It’s probably worth trying to do as much for a human child’s brain as I’m trying to do for my new iPhone 7: Trying to get the cell signal to the phone’s brain.

There are some other similarities between suppression and problems with my new iPhone 7. Intermittent central suppression takes time and effort by the doctor to identify and diagnose. You actually have to look for it. It’s true that it doesn’t take much to figure out the call to my

new iPhone 7 got dropped, but diagnosing the problem takes time: Is it a defective new iPhone 7, or an insufficient signal?

Intermittent central suppression is a repetitive loss and re-gaining of visual sensation over a time-course of seconds. The visual sensation varies over time, so sensation must be tested over time. Single one-quick-look tests such as stereopsis (as typically tested to just get to the highest score) are surprisingly low-yield tests for ICS.⁶ Better to look for changes in visual sensation with vectographic targets, and observe patient responses to those targets over time. Or even just ask if that stereo target “always sticks out.” Similarly, with my new iPhone 7, the phone will ring. So sometimes a signal of sorts gets through. But, over time, the call gets dropped. “Hello? Hello? Still there?” After periodic initial success, my new iPhone 7s brain just loses its afferent input. Sustaining the signal strength over time is the problem.

The risk in treating intermittent central suppression is low. Further, the good news about the afferent sensory defect of intermittent central suppression as well as the likely partially afferent defect in other forms of suppression (e.g. amblyopia), is it is treatable and treatment changes people for the better.^{7,8} So, the risk-benefit ratio with a treatment that improves lives with little risk to the patient is very, very good.

The answer to the question of treatment and risk-benefit ratios for treating the problems with my new iPhone 7 may not be quite as direct. I tried aluminum foil like we did with the old “rabbit ears.” Didn’t work and was a bit cumbersome. A network extender was a pretty complete failure. We could move to higher ground. Well, not gonna happen, at least prior to being sent to “the home.” For now, we work with call forwarding and I don’t ask questions about Candy Crush. But... thinking bigger... hmmm... a cell tower... in the far corner of the property... hmmm... who do I call??

I think I'll probably use a landline to make that call.

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