

A Prescription for Better Teaching, Stronger Doctors

James Morris

Department of Biology, Brandeis University

I went to medical school, but now spend most of my time in the classroom. I often think about what I learned in medical school and how it translates, or doesn't translate, to teaching.

Of course, there are the obvious connections. One of the classes I teach is comparative vertebrate anatomy, and I use what I learned about anatomy in medical school directly in my teaching.

But there are other lessons that don't apply. Doctors often use three-letter abbreviations in their notes. So HPI is the history of the present illness, the patient's narrative of what brought them to the doctor's office or hospital, as heard and interpreted by the physician. CAD is coronary artery disease. TIA is a transient ischemic attack, a "mini-stroke".

There is a saying I remember from medical school: Physicians are especially fond of TLA's ... three letter abbreviations.

I don't use many acronyms in my teaching. When I do this, I am inundated with emails and questions asking what they mean. For problem sets, I sometimes use "PS". For example, PS1 is due this Monday, and PS2 next Tuesday.

In medical school, mnemonics are also widely used to help aspiring physicians learn and remember all kinds of information. The 12 cranial nerves can be recalled using the mnemonic "On Old Olympus' Towering Top, A Finn And German Viewed Some Hops", where the first letter of each word of the saying is the first letter of each of the cranial nerves: olfactory, optic, oculomotor, trochlear, trigeminal, abducens, facial, auditory, glossopharyngeal, vagus, spinal accessory, and hypoglossal.

Or, for Harry Potter aficionados, there is "Only Owls Observe Them Traveling And Finding Voldemort Guarding Very Ambiguous Horcruxes." For this one to work, the 8th cranial nerve is the vestibulocochlear, not the auditory.

These are handy, but I learned so many mnemonics in medical school that I often had trouble remembering which mnemonic was used for what kind of information. Is that the mnemonic for the cranial nerves, or the bones in the wrist, or the femoral triangle, or the major branches of the aorta?

For this reason, I also shy away from using these in my teaching, except perhaps when I am teaching the cranial nerves.

But then there are sayings. It's these they have stuck with me and have surprising relevance day in and day out of the classroom.

When I went to medical school, the first two years were classroom-based, where we learned everything from anatomy to physiology, biochemistry to embryology, to genetics to neuroscience. The last two years were clinic-based, where we spent time in the hospital or doctor's office and began to learn clinical medicine: how to interact with patients, how to take a history, how to apply what we learned in the classroom to real people with real illnesses.

There was a saying I remember from my surgery rotation, one that is well known to physicians: "See one, do one, teach one."

What this means is that to learn anything new – say, how to do a physical exam, or stitch an open wound, or do an EKG – first watch someone else do it. Like an apprentice, the first step is to watch an expert carrying out the task at hand. Then, do one. You may feel shaky or unsure, but there is no substitute for doing something yourself. You probably start with someone watching and guiding your every move, but, as you gain confidence and expertise, you do it by yourself. Finally, teach what you learned to someone else.

This idea is directly relevant to teaching, and I remember it when I think about teaching something new. While lectures are sometimes frowned upon these days as being passive, I find them useful as one part of a larger plan. That is, a well-crafted lecture can give a perspective or overview that helps a student wrap their heads around a new or complex topic. This is the "see one".

The problem is not so much lectures, but relying only on lectures. The important thing, in my view, is not to stop there. "Do one," as the saying goes. Students need to construct their own knowledge, and it's unlikely they will internalize what is being taught if all they do is sit passively listening to someone else go through the mental gymnastics. By doing something themselves – a problem, a hands-on activity, a group project – they run into their own questions and obstacles and have a chance to develop deep, meaningful learning.

But the gold standard is teaching. When you can explain something to someone else, then you really understand it. I find that it actually takes teaching something for several years, several times, until I really have a good handle on a particular topic.

There is one more saying that is well known to physicians – "First do no harm." The Hippocratic Oath doesn't contain these exact words, but the idea is expressed there. When I went to medical school and worked at a hospital, this always seemed like a fairly low bar to me. That is, I went to medical school to care for people, to make them better, to cure disease. But the Hippocratic Oath does not mention any of these high ideals. Instead, it implores physicians to at least not make things worse.

And, I learned, there are many ways to make things worse: Leaving a patient waiting too long in the waiting room; making the wrong diagnosis; not treating patients with the care or empathy they deserve; prescribing the wrong medicine; not being aware of side effects or how different medicines interact. The list is long and worrisome.

In teaching, I also keep this mantra front and center. What sort of harm could come through teaching? Harm comes if I am not able to connect with a student; it comes if I cement a misconception rather than unseating it; and, it comes from not inspiring students, not conveying the wonder of the natural world.

In science, it also comes if I make science seem too difficult, or not applicable to student's lives, or simply as a list of terms and facts to memorize.

These are all forms of harm, perhaps not life-threatening, but nevertheless ones that are hard to recover from. How many times have I heard a student say that he or she is not a "science person"? We are all science people in that we ask questions, come up with explanations, test them, and use science to understand the world around us. But, somewhere along the road, harm was done.

Teachers, after all, can have a profound effect on students, on their attitudes about learning, on what careers they choose, about how they look at the world around them.

Consider what you do today or what you find interesting, and ask yourself – was there a teacher that inspired you? Sometimes, I think the best medicine in teaching is just a little TLC.

A version of this essay previously appeared on the CommonHealth blog of WBUR at:
<http://commonhealth.wbur.org/2014/12/better-teaching-stronger-doctors>