I’ve been hearing a lot of retro music lately, as my teenage daughter practices songs for her role as a leather-jacketed, switchblade-wielding Mercutio in a musical adaptation of Shakespeare’s *Romeo & Juliet* set in the 1960’s. One of these songs—the Byrds’ classic “*Turn* *Turn* *Turn*” with its Biblically inspired lyrics, “To everything, there is a season, and a time for every purpose under heaven”—seems eminently applicable to the current world of aesthetics. If there is indeed a season for everything, then this must surely be the season of Botox-bashing. First came a petition to the FDA in January from Ralph Nader’s watchdog consumer group Public Citizen claiming that Botox has caused deaths from both medical and cosmetic use. The petition contains the telling words, “Additional limits to our data include: causality cannot be proved,” and the FDA has clarified that its investigation focuses on the pediatric use of Botox for medical conditions. Despite this, the petition has given rise to a plethora of sensationalist media headlines warning consumers against relaxing their wrinkles. These headlines include the gem, “Death by Botox? The Hidden Toll of the Quest for Beauty.”

Then this past April, a *Newsweek* article entitled “A New Reason To Frown” again called into question the safety of cosmetic Botox treatment. It reported the results of an Italian study, published in *Journal of Neuroscience*, that claims to have...
found evidence of neurotoxin activity in rat brains after the rodents’ whiskers were injected with botulinum toxin A, and concluded that this is “new evidence that Botox can spread to the brain.” However, the *Newsweek* article does not point out that this single study in rats is inconsistent with nearly 20 years of rigorous research into Botox. Furthermore, the rat study didn’t even use Botox, and the study methods are unproven. *Newsweek* and the various other media sources that are now reporting the same story appear to have obtained their information from a press release distributed by the Society of Neuroscience in advance of the study’s publication in its eponymous journal. The press release references Botox and other brands of botulinum toxin A approved for human use worldwide and states that the study demonstrates migration within the brain of “active forms of botulinum neurotoxin.” This contradicts statements in both the press release and the study itself that the researchers actually detected fragments of a protein that they believe to have been cleaved by botulinum toxin, rather than any portion of the toxin itself.

It’s a sad fact of life that even serious mainstream media seem to be backed up against a financial wall and forced for business reasons to sensationalize simply to move copies and to attract advertisers. It appears now that this strategy is not limited to lay publications but extends even to a basic science journal, presum-
Reporting on Botox

ably to up its public profile and to attract better submissions. Why else would a scientific society compose a press release laden with marketing buzz-words—“new” alone appears three times in the first five lines—that is clearly aimed at garnering maximum exposure in the lay media for a research paper before it is even published? There was public outrage when a golf magazine featured a noose on its front cover last January when reporting on a racism controversy. That ill-conceived marketing move ultimately cost *Golfweek’s* editor his job. I believe the implications are as serious where misleading health reporting is concerned.

The inaccuracies in the *Newsweek* article lead me to question whether those who wrote it fully read or comprehended the study about which they wrote. The article contains not one interview with a scientist or physician and only a second-hand quote from the study’s lead researcher Matteo Caleo. The puns and word-play in the article’s title and text lend it a frivolous tone that seems out of keeping with the doom-laden message that it strives to convey. Ironically, a contemporaneous article in *Allure* authored by Editor-at-Large Joan Kron, demonstrates a better understanding of the study and seems more balanced. Ms. Kron concisely summarizes the history of Botox’s development and therapeutic use and appears to have had no difficulty tracking down Caleo for direct commentary. He tells her, “I don’t think fear is warranted,” and, “I would not recommend that someone stop [Botox] treatment.” He adds that his area of expertise—and the purpose of his study—is not Botox safety. The *Allure* article concludes with a statement from a Harvard-affiliated ophthalmologist with no ties to Allergan, the manufacturers of Botox: “This study has been blown out of proportion and may scare people unnecessarily.”

What is the public to think, and what can they believe in, when a magazine known for its fashion updates seems to have more stringent standards of health reporting than a trusted and well-respected current events publication?

Several online comments posted on the *Newsweek* website point out the flaws in the rat study and in the articles it has spawned. One of these comments is evidently from a dermatologist, who writes, “This is a classic case of bad science and irresponsible reporting.” This has been met with the response from another poster: “I assume you make money off of Botox. Only one who has money to gain would defend the c***p.” While I appreciate that some members of the public may suspect the motives of doctors who defend the treatments they use to treat their patients, I’d like to point out a couple of facts in this regard. First, none of us has a vested interest in continuing to treat patients with Botox unless we truly feel it’s safe. The moral and medico-legal implications of doing so are too severe. Besides, we all have many other methods of skin rejuvenation at our disposal. If Botox were not available to my patients, I expect that they would simply opt to have more filler injections, laser surgery, and chemical peels. So the argument that a doctor who uses Botox has a financial motive in pointing out the flaws in this study is invalid. Second, the majority of cosmetic surgeons who treat their patients with Botox have had the treatment themselves and have treated their family members with it, too. This reflects their confidence in the safety of Botox. In contrast, think of tobacco company executives, many of whom marketed a dangerous product (cigarettes) to consumers while blatantly abstaining from smoking themselves!

Practice Pearls: Five facts about the Italian rat study

As the daughter of two biochemists, I spent my formative years amid dinner table talk focusing on science and medicine. One of the most important lessons my father taught me was to be wary of what he termed “funding in search of a study”—that is, the situation whereby a study of dubious scientific merit is devised with the intent of justifying a research grant—as opposed to the more usual “study in search of funding.” An approach of pragmatism laced with a little cynicism has guided me since childhood in my appraisal of scientific studies and the health reports they generate. Later in life, married to a fellow physician and passing through successive cocoons of medical school, residency, and fellowship, I was far the most part unaware of the profound influence that health reporting in the lay press has upon the general public. I’ve been afforded fuller comprehension through my work providing responses to online questions posed by the public to *The Health Central Network* (www.healthcentral.com/skin-care/). Some of these questions, such as a recent inquiry about “a herbal salve for basal cell cancer,” vividly illustrate how shockingly vulnerable the public is to misinformation regarding health issues. Here are five facts that are largely absent from media reports of the Italian rat study and that may be of interest to you and your patients.

1. The study didn’t use Botox.
   The study used a laboratory-made research grade botulinum toxin A, rather than Botox or any other botulinum toxin A currently approved worldwide for human use. Conclusions about Botox cannot be drawn from this single rat study that did not use Botox.

2. The study was in rats, not humans.
   Why does this matter? Because Botox was shown to be safe and effective when it was approved by the FDA for medical use 19 years ago. There have been many further studies since then, resulting in thousands of scientific papers. It is not surprising that the results of a single rat study with a different botulinum
What saddens me most about this media debacle is that it has deepened public mistrust of the medical establishment and further damaged the physician-patient relationship, which has already become somewhat precarious in recent years. When patients doubt their doctors, they are more likely to turn to unreliable sources of information, such as sensationalist print and online media reporting. This, in turn, leads to further mistrust of physicians. And so the vicious cycle repeats itself, with patients inexorably falling victim to more and more misinformation. As I’ve written previously, cosmetic surgery is an easy media target. The simultaneous fascination and revulsion that it arouses in our culture result in emotional conflict, hostility, and voyeurism. And Botox is the easiest target of all. It has now surpassed Viagra as the most publicly recognized medical therapy, and it has even entered common usage as a verb. Research will, and must, continue to confirm the safety of cosmetic Botox treatment; it’s essential that any elective therapy be held to continuous, unwavering safety standards. However, it appears that the mention of Botox in many a media article these days is motivated less by what’s in the public interest and more by what will assure the article and its writer of a high profile and Internet longevity.

As physicians, we are bound by oath and honor to set aside sensationalism and to prioritize the best interests of our patients. The pharmaceutical companies that develop and manufacture the treatments we use also have a code of ethics. But there seem to be no formal moral guidelines for those who perform bioscience research or for those who interpret study results in the media and extrapolate them to real-life situations. In an era when a press release can circumnavigate the globe in a matter of minutes, I believe it’s essential that this ethical gap be bridged. Whether they realize it or not, health reporters are increasingly the middlemen who interface between us and our patients. They should be held to higher standards of journalism and fact-checking than their colleagues who dish on the latest celebrity scandal or formulate the latest “top restaurants” list. And scientists whose research has medical relevance should follow the same dictum to “first do no harm” to which physicians are beholden.

It’s taken centuries of exhaustive, and at times convoluted, research for botulinum toxin and myriad other poisons to be understood, appreciated, and harnessed for the medical benefit of mankind and for the public to trust in physicians to wield these therapeutic weapons wisely. Though current paradigms of medical research and therapy represent an imperfect road of progress, that is all we have for the moment. To paraphrase the Beatles’ song that symbolized for many the end of the 60’s and the end of innocence, it’s unlikely that this long and winding road will disappear—at least not for some time to come. Public responsibility is a pre-requisite for all who tread this road…and all those who have the power to block it.

Dr. Sundaram serves as the Aesthetic Medicine & Skincare Advisor for The Health Central Network online. Dr. Sundaram is a speaker for Allergan, Inc. She has no stocks, shares or other financial interests in this company.