

Virtual Mentor

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Sketching the Role of Medical Illustrators: An Interview with JAMA's Cassio Lynn

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Cassio Lynn is the medical illustrator for the *Journal of the American Medical Association* in Chicago, Illinois. He is a graduate of the Medical and Biological Illustration master's program in the Department of Art as Applied to Medicine, at the Johns Hopkins University School of Medicine in Baltimore, Maryland. Cassio is currently a member of the Association of Medical Illustrators and a member of the Guild of Natural Science Illustrators.

This figure, "Mechanism of Action of Botulinum Toxin," from the February 28, 2001 issue of JAMA, accompanies the fourth article in a series of consensus statements from the Working Group on Civilian Biodefense. The article discusses medical and public health management following the use of botulinum toxin as a bioweapon. The figure illustrates the basis of the potency of botulinum toxin. The toxin is a zinc proteinase that cleaves 1 or more of the fusion proteins by which neuronal vesicles release acetylcholine into the neuromuscular junction.

"When you look at an image and get the message immediately, then it works," says Cassio Lynn, medical illustrator at *JAMA*, who was recently interviewed for *Virtual Mentor*. He gives the example of a billboard, noting that if you have to struggle to understand what it's trying to convey, it is not communicating with you effectively. In the world of medical publishing, readers scan the figures that accompany scientific articles as though they were "medical billboards," grasping their meaning so quickly that they seldom stop to acknowledge their presence or their origin.

Illustrations like the one featured here abound in medical publications and mainstream periodicals—they enable audiences to understand anatomical structures or physiological processes on different scales. Despite seeing these images often, we know little about the medical illustrators who create them. Lynn seems keenly aware of this, stating: "I can't speak for everyone in medical illustration, but in many ways I feel that we take a backseat role." In defining his role, he really emphasizes the notion of "behind the scene." "We are the transmitter, the tool to communicate, the middle way between, on the one hand, those who are extremely learned in a field and, on the other, their colleagues, the people in related but separate fields, and the lay public."

There is almost a paradox between medical illustrators' behind the scene work and the integral role they play in getting an author's message across. In Cassio Lym's experience at *JAMA*, once an article has been accepted, he is assigned to work on it if there is a need for illustration. "If there's a figure that needs to be done for a scientific article, we get one of several things: (1) the author's quick sketches and intended ideas for the figure; (2) whatever references the author has seen illustration-wise that almost capture what is wanted, but that don't suit the content of the message (for example, an image of the right anatomical area that is too broad or too specific); or (3) a recommendation to create an illustration for a text heavy section." From there, he draws sketches, presents them to the author, and engages in a back and forth process until they have a well-conceptualized illustration that captures the intended message and meets aesthetic expectations. The author, then, is instrumental to the medical illustration process too—"they couldn't not be, because the image has to be specific to what they want." During this time, the author also provides input on the copy-editing of the manuscript and the revision of legends that accompany figures. The efforts of the author and the editorial staff come together in the end to produce the article as it appears to the journal's readers.

Lym refers to medical illustrators as "visual editors." "Oftentimes, illustration can be more effective than a photograph or text if it can convey the message more succinctly and more cleanly." He explains how illustration, for example, can omit visual distractions that occur in reality, in an effort to focus on the more pressing subjects. "In the representation of a surgical procedure, you can eliminate the visual distraction of surrounding instrumentation or other structures within the area that don't have any relevance to the operation." It would not be possible to do this with a photograph; a textual description alone is often inadequate.

The depiction of "Mechanism of Action of Botulinum Toxin" captures how illustration allows what Lym calls the "essentialization" of target structures. Rather than depict every last detail about the cell, the illustration outlines its general shape to call to mind a smooth muscle cell. It focuses on a process that takes place in the "landmark," a specific section that has been pinpointed for the audience. Techniques such as introducing transparency to overlapping layers, or presenting the information in stages and leaving out steps that are irrelevant can enhance a message and its clarity—the ultimate goal of the illustrator, whose duty is to convey an accurate message in the most objective way possible.

"You can aim to be objective, but at some point you have to sit down and ask: (1) Who is your audience? (2) What do they really need to know? (3) How is the best way to convey that message with a sensitive hand?" Lym clarifies how the need to balance accuracy and artistic license is handled in actuality: "In most cases you have a good deal of artistic license, but that's all relative because for the illustration to work as a communication tool, you have to convey the meaning."

Medical illustrators probably have the most creative license when doing situational or editorial drawings—a drawing capturing the experience of an illness, for

example—where they provide commentary or some interpretation, rather than strictly represent factual information. These sorts of images might accompany an article on an abstract or very broad concept; they might figure on the cover of a mainstream publication running a feature story on a scientific topic. The intended effect is to appeal to people's experiences and emotions as well as to their reason. With interpretive images, illustrators try to move beyond their role of transmitting information. An effort is made to provoke a reaction in the viewer. Who will see this? How do you want to touch them? These are the questions that need to be pondered.

In addition to audience and the author's and illustrator's purposes, at least two other factors play important roles in what illustrations look like: the direction in which medicine is going and the technology available to the illustrator. About the first, Lynn states: "Illustration is changing based on what new therapies are being developed and the level at which they are administered." Molecular visualization is an area that he anticipates will receive more attention with the current emphasis on genetics. In relation to the second, he comments: "We're still defining who we are because of how much media we have at our disposal." Along with traditional media like pen and ink, paintbrush, airbrush, carbon dust, illustrators also have access to digital media. Interactive, three-dimensional, or animated illustrations are some of the multi-media alternatives that technology has made possible. "Medical illustration may not be the right term in five years—we don't really know where it's going to go as a field; that depends on where medicine goes and what media are available to us. In the future, you may be a medical animator or a medical web designer."

For now, relying on text, artistic techniques, and a variety of media, and influenced by new directions in science and close interplay with the authors of the stories they illustrate, medical illustrators are advancing our understanding by enhancing the messages we receive.

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