Grayson Armstrong, MD, MPH, on telehealth and its future in eye care

AMA's Moving Medicine video series amplifies physician voices and highlights developments and achievements throughout medicine.

Featured topic and speakers

In today's episode of Moving Medicine, an in-depth discussion with Grayson W. Armstrong, MD, MPH, an ophthalmologist at Massachusetts Eye and Ear in Boston, about telehealth's impact on—and other digital and technological advances emerging in—ophthalmology.

Speaker

- Grayson W. Armstrong, MD, MPH, ophthalmologist, Massachusetts Eye and Ear

Transcript

Unger: Hello, this is the American Medical Association's Moving Medicine video and podcast. Today we're talking to Dr. Grayson Armstrong, an ophthalmologist at Massachusetts Eye and Ear in Boston and a former AMA trustee, about technological advances in ophthalmology. I'm Todd Unger, AMA's chief experience officer in Chicago. Dr. Armstrong, thanks for joining us today. We saw telemedicine exponentially increase across a number of different specialties with the onset of the pandemic. And I'm curious, just for starters, kind of where does ophthalmology fit into that curve on telemedicine?

Dr. Armstrong: Well, thanks for having me, Todd. It's exciting to be here and that's a great question because of all the fields of medicine that implemented telemedicine, ophthalmology was the laggard in those fields. So we didn't do so well, unfortunately.

Unger: Well, I'm curious, probably that some of it seems obvious, but why is that?

Dr. Armstrong: Ophthalmology is an exam-heavy specialty and we really rely on all the clinical clues
that we capture either at the slit lamp, or looking at the retina or checking people's vision and their eye
movements and those things don't readily replicate into a telemedicine environment. Historically,
we've done really well with new technologies. We were ahead of the curve when it came to
telemecine early on because we were able to take pictures of the back of patient's eyes and detect
things like diabetic retinopathy, and that did a great job at improving access to care for our patients
but we weren't ready for the synchronous exams that were being done via telemedicine like you and I
talking now. It's really hard via a Zoom platform or FaceTime to capture the information that we
needed.

Unger: I know even among other specialties, there's been a lot of innovation here in terms of
providing patients, for instance, with different kinds of equipment to aid in a telemedicine exam. When
you were talking about ophthalmology in general, can you start to outline what we're starting to see in
terms of kind of new programs to keep up with this technology?

Dr. Armstrong: Absolutely. Early on, we had pictures of the back of the eye available to us. And so
that's what we used. We just were early beneficiaries of that but we really don't have all the aspects of
the eye exam digitized just yet. And so we commonly use a machine called a slit lamp and a slit lamp
is basically a fancy microscope for the eye. We use it on pretty much 100% of patients but it's not
digitized. And so that's something that we're trying to automate and digitize. I'm working with a team
at MIT to do that myself.

In terms of models of care for telemedicine, early on we had this asynchronous model of care where
we were able to take a picture of the back of the eye, send it to an ophthalmologist for review and
asynchronously send a report back but I said, we weren't good at the synchronous model like we're
doing now. Instead, what we're doing is we're creating something called hybrid telemedicine, where
patients can go into any number of eye exam offices, get their testing or imaging done and go home.

After it's done, the ophthalmologist will review that test, come up with a treatment plan, call the patient
either on video or audio, go over those results, even show the patient the results of their testing and
then come up with a plan and a follow-up plan too. So that's called hybrid telemedicine. I think it's the
future for our field and potentially other fields too, where we basically get all of the clinical information
that we need, but we are able to do so in a telemedical fashion.

Unger: That sounds pretty intuitive. Just with my own primary care physician or I might go and have
my blood pressure tested and other kinds of testing and get that kind of done and delivered to the
physician, and then we can have an intelligent conversation by telemedicine. Can you talk about other
benefits of this hybrid model?

Dr. Armstrong: Yeah. Other benefits of the hybrid model are that we can improve access to care for
patients that don't otherwise have it. We are exploring whether we can put these same testing devices
into the patient's community instead of having them come to the eye doctor's office.
Imagine you go into an underserved community, they may already have a community health center that they're familiar with and they go to often. If you put those tools right into the heart of the town where they live, instead of forcing them to come all the way to us, those patients all of a sudden have access to eyecare and they may not have before. And so in some ways you can improve access to care health equity in this way. You can also reduce the patient's wait time and their visit time by cutting down the amount of time they have to spend in the office. Ultimately, I've been able to see patients while they're at work or with their families or on trips and it doesn't take them away from their life to come into the office to see me. And so overall it's more convenient for everybody. I think again, it's overall a benefit to the patients. We just have to get there as a system to be ready to implement this on a broad scale.

**Unger:** That access to care point that you made sounds pretty important. I have to imagine a lot of this equipment is expensive and certain amounts of training involved. When you talk about putting it kind of closer into the community, where does this go and how do you ensure that folks are trained to use it?

**Dr. Armstrong:** Yeah, good question. Well, it's kind of a build it and they will come to some degree. If you can partner with community health centers or what we're doing is partnering with community health centers, we're putting these expensive tools into those clinics and we're training either the providers or the technicians in those facilities, even nurses, to take the images and the testing that we need and then those results are automatically relayed to the doctor for review.

We found that there's ready uptake of this by the patients and they love it. We found that the providers are really excited about this too, especially for some of the metrics that they need, like diabetic retinopathy screening. And so overall it's a win-win for everybody. It's more convenient for the patients, the providers and this expensive technology is like, you said, very expensive, but ultimately if we can find ways to subsidize it with grants or we can show that it's a sustainable model of care, I think it does actually not pan out that it's better for patients and it can make some money.

**Unger:** Do you think that this hybrid model is kind of where we're evolving to beyond ophthalmology and into many other different kinds of specialties?

**Dr. Armstrong:** I do. I think that any exam or any specialty that relies heavily on a clinical exam that can be digitized, can benefit from this and some of them are already doing so. Radiology was an early adopter of telemedicine in some ways, and radiologists don't even have to be on site to look at the images that they receive. Dermatology is the same way. They're used to getting pictures of their skin lesions sent to them for advice or for monitoring and tracking. And so that's pretty easy.

Newer technologies are on the way that are enabling this for other fields. For example, there's digitized handheld stethoscopes that can record the sound of what the stethoscope hears and send that to a cardiologist for review. You've got to imagine that things like echocardiograms and
ultrasounds can do the same in the future too. And so I think that this is basically just a frame shift of thinking where you're basically getting all the clinical exam techniques and skills that you would normally have in person just relayed to you remotely, and you get the same kind of quality care ultimately.

**Unger:** Back in the height of the pandemic, my wife had a detached retina, which is a pretty scary incident. And so I was really interested in the work that you're doing to look at how emergency departments, in particular, could benefit from teleophthalmology. Can you talk about some of the takeaways from this research?

**Dr. Armstrong:** Yep, absolutely. We've looked at whether we can do telemedicine in emergency settings. At our hospital, we're lucky to have an eye specific emergency room. And so early in the pandemic, we found that there was a drastic decline in the number of patients that came into our emergency room but that doesn't mean that the emergencies really stopped. It's that they got scared during the pandemic to come in. And so there's this big backlog of people that are really scared to get care. And so at our hospital, we really did try to give them new avenues to be connected to us. We set up a hotline where patients could call in and set up a real-time telemedicine visit with an eye provider and go through their symptoms, and they could triage themselves whether they could stay at home and be treated remotely or whether they needed to come in for emergency care.

In addition to that, we've really done a lot of research into what happens if a patient goes into a non-ophthalmic ED, which is more common, if you go to your local ED. More often than not, there's not an ophthalmologist on call that's going to come see you. We found that if patients go into a non-ophthalmic emergency room, the quality of care that they receive is sometimes quite different than what they would get in an ophthalmologist's office.

And so we're trying to work with providers on the ground, whether it's the doctor or the nurses to relay the information they need to us, so they can check the vision, they can check the eye pressure. If they have the tools, they can take of the eye and send that to us as well. With that information, it's the same thing we were talking about with hybrid telemedicine. If we can get the information we need, we can perform high-quality care and if at the very least we can tell them whether they need to come see us in person or not. And so I think we can provide higher quality with this model of telemedicine and we're testing this out now. I think that ultimately it's going to improve access to care.
Unger: Yeah. I mean, it sounds incredibly promising. As a patient on the other end of that, it must be a much better experience for what could be a scary incident or a great incident of concern. Like with any kinds of things with telemedicine, there are the issues around kind of infrastructure and technology. There's the systems and kind of processes and, with this, I see there's a whole other layer of kind of embedding the opportunity into different venues of care. You mentioned emergency, EDs, other kinds of local community things. What are the other kind of big hurdles to makingsomething like this work?

Dr. Armstrong: Yeah. Well, like I mentioned early on, one of the biggest barriers to telemedicine in our field was the fact that the clinical exam is so important but not everything's digitized. New technologies really do need to be created to make sure that we can get high quality information at the point of care.

There is a move towards making things more handheld in the home or in the community, instead of forcing patients to come use our $100,000 camera to take a picture of the back of their eye. If something's handheld and $20, then maybe everyone could afford to go to the local Walgreens or CVS and get their picture taken.

There are more systemic things that are problems too. Like you mentioned, we have to have an infrastructure that supports this. One of the big things we're worried about right now is reimbursement. During the pandemic, during the public health emergency, insurance providers, whether it was federal or private, were kind of mandated to provide payment for telemedicine that was on par with in-person care. And so for the first time you saw providers jumped to this, not only because it was the only option for their patients but also because for the first time they were getting paid to do it. And that reimbursement does have a risk of drying up once the public health emergency ends and if federal and state and private insurers don't continue to pay for it, then there's a lot of uncertainty and I'll get to that uncertainty in a second.

The second thing is flexibility. During the pandemic, I could FaceTime my patient. I could use Skype to call my patient but those aren't necessarily HIPAA compliant. And so when the public health emergency ends, it may be more difficult to contact our patients, to use technologies that the patient's not familiar with. So we need to think ahead and plan for that.

The third thing that people don't often think about is that in ophthalmology, especially, patients have a hard time seeing. A lot of insurers want telemedicine to take place via video, like you and me talking right now but if a patient can't see, then how are they going to hop on a video? Or why is that useful?

For those patients or even for elderly patients, we take care of a lot of elderly patients in ophthalmology. They have a harder time hopping on Zoom or FaceTime or Skype. And so for those patients, we commonly use telephone during the pandemic to talk to them. We find that it's just as effective for the outcomes of care as a video but we need to make sure that we protect those audio-only visits and make sure that that continues to be reimbursed and that insurance companies allow
for that.

Ultimately, what's happening is that there's a ton of uncertainty in this space. We're not sure what's going to happen with reimbursement. We're not sure what's going to happen with the modalities of care to communicate. We're not sure if telephone is going to continue and that uncertainty is making it so that hospitals like mine aren't sure how much or where to invest in our technology for telemedicine. We're not sure what's going to continue and what's not. And so if we can give some stability to it and fight with groups like the AMA and specialty societies with legislators, with advocates, with the CDC, with HHS, if we can tell them how important this is, what our priorities are, then hopefully we can get some certainty, some stability in this field and we can continue to invest to improve the care for our patients.

**Unger:** Dr. Armstrong, one of the other kind of key things that must be a big factor in making this work is training. How are you training residents on the changing technology?

**Dr. Armstrong:** Great question and thanks for asking. I think at our hospital, we've created a telemedicine curriculum for our ophthalmology residents, where we take them from soup to nuts. We train them how to do the clinical exam via Skype or Zoom like this. We teach them what's appropriate to wear or not, what the background should look like. We tell them how to choose the appropriate patients, when not to allow telemedicine to occur. We talk about ethical and professionalism issues that can arise. For example, if you do telemedicine with the patient but they're so far away from a local eye doctor that they can't get care if it's an emergency, that's inappropriate and you need to really make sure that they can get plugged into care if they need to.

Lastly, we talk about billing and health disparities. There is a big gap in preparedness for physicians practicing telemedicine. During the pandemic, a lot of physicians were thrown into it for the very first time and they just had to figure it out on the fly. And so now retrospectively over a year later, we can look back and find the best practices or we can do research future looking to actually determine what the best practices are and these things can be incorporated into future curriculum. Whether it's medical students or residents or practicing physicians, I think that we have a huge space for medical education. I know the AMA is thinking about that as well.

**Unger:** Absolutely. It's incredible because it's like an entire new field of study for medicine when you think about training, both at the medical student level, at the resident level and for physicians, it's a big change and one that kind of came at 100 miles an hour. Well, speaking of that and kind of last question here, where do you see the greatest opportunities for future developments in ophthalmology?
Dr. Armstrong: Yep. Well, in our field and beyond, I think that there's a lot of new technologies coming our way. And whether that's imaging devices or testing devices like I talk about, whether it's an ultrasound handheld that a patient can use on themselves or whether it's a home echocardiogram or a home EKG, those things are coming. Within ophthalmology, a lot of this stuff is moving handheld and into the community, like I said, and that's awesome.

AI though, we haven't talked about it a lot, and AI is not the same thing as telemedicine but AI can help with telemedicine. In AI, these machine algorithms can find patterns in data that humans do a really bad job at finding. An example is like a fundus photograph. If I look at a picture of the back of the eye, I can tell you that it's an eyeball. I can tell you sometimes if there's disease or not but a machine looking at that same picture can tell you what their kidney function is, whether they're male or female, if they have diabetes, if they're a smoker, what age they are, they can tell you if they have a risk for autism spectrum disorder or Alzheimer's disease. I can't do that.

We're lucky to be living in an age where these new technologies are coming fast and coming often. And so we really need to be ready to implement these because the tools and ophthalmology may very well be able to help other fields beyond ophthalmology too, just like I said, with renal function or neurologic disease. I know that AMA is working on this but many people need to realize that these things are starting to be reimbursed as well.

And so if you use these AI algorithms in a clinic to detect something like diabetic retinopathy, the primary care doctor gets paid for the first time for doing so. It offloads the work of some ophthalmologists that would otherwise just do a lot of routine screenings and it lets them practice at the highest level for them. They can do more surgeries, not be bogged down with the routine standard eye exams. Ultimately, it's an overall win for the health system, brings down costs, improves access. I think we have a lot to look forward to.

Unger: I think so too. Despite the challenges and consequences of the pandemic, it certainly seems to have ushered in a pretty exciting new phase here in medicine. Dr. Armstrong, I really appreciate you sharing your perspective. I learned a lot today. Thanks for being here and we'll be back soon with another Moving Medicine video and podcast. You can enjoy future episodes of Moving Medicine by subscribing at ama-assn.org/podcasts. Thanks for joining us. Take care.

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