Transcript Details

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The Future of Precision Medicine in COPD Care: Biomarkers, AI, and Multimodal Data

ReachMD Announcer:
You're listening to *On the Frontlines of COPD* on ReachMD. On this episode, we'll learn about emerging approaches to precision medicine in COPD care with Dr. Matthew Moll. He's an Assistant Professor of Medicine at the Channing Division of Network Medicine and an associate physician in the Division of Pulmonary and Critical Care Medicine at both Brigham and Women's Hospital and Harvard Medical School. Let's hear from Dr. Moll now.

Dr. Moll:
In some ways, we're very close to using precision medicine approaches in practice, and I would argue that we are already to some degree, and in some ways we're very far away. So, the ways that we're close—the best example is dupilumab and eosinophilic COPD. The elevated eosinophils are this surrogate marker—this biomarker for type 2 inflammation, which has a lot of different kinds of changes, pathways, and signaling—but eosinophils give us a marker. Now, within eosinophilic COPD, here's a lot of heterogeneity. We're not as precise as we can be, but the fact that we now have a way that we can treat people based on some kind of blood-based biomarker is precision medicine, and it's the first big step. It's one of the first big steps in the right direction.

From a clinical algorithm standpoint, we're using things like the BODE Index to predict mortality and prioritize people for lung transplant, so there are concrete examples of precision medicine approaches that we use already. But we want to go further, right? We don't want to just give all eosinophilic COPD the same drugs because not everyone responds. We're talking about drugs that cost tens of thousands of dollars for one treatment course, so a non-responder is a really big deal. What's better is if we can actually have biomarkers that are really specific to the pathways. We can target those pathways directly, and we know that it's really going to work almost all of the time. Then we're going to minimize the side effects as well.

One of the things that really excites me is starting to integrate more data types so we can understand what COPD patients look like more with imaging than we ever could. With AI, we can quantify things that we can't see with our eyes. With things like genetics and omics, mRNA, protein, and metabolites, we can really start to understand the biology of not just COPD patients, but individual patients. And we can understand which drugs are going to target which pathways in which patient. So I envision this future where with AI and machine learning, we now have a way to start integrating multimodal data, imaging, clinical data, genetics, and other biological measures, and we're able to start doing personalized medicine in a way that I don't think—without that computational advantage of machine learning and AI—we could do just on our own with traditional methods. That's what excites me—to see how we can actually pull together all of the data and find personalized, effective therapies for individuals.

ReachMD Announcer:
That was Dr. Matthew Moll talking about emerging approaches to precision medicine in COPD care. To access this and other episodes in our series, visit *On the Frontlines of COPD* on ReachMD.com, where you can Be Part of the Knowledge. Thanks for listening!