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www.reachmd.com  
info@reachmd.com  
(866) 423-7849

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## Optimizing Inhaled Therapy in Uncontrolled Asthma

### Announcer:

You're listening to *On the Frontlines of Asthma* on ReachMD. And now, here's your host, Dr. Steve Jackson.

### Dr. Jackson:

Welcome to *On the Frontlines of Asthma* on ReachMD. I'm Dr. Steve Jackson, and today I'm joined by Dr. Jonathan Bernstein to explore how particle size and inhaled therapies could influence outcomes among patients with uncontrolled asthma. He's a Professor of Medicine in the Division of Rheumatology, Allergy, and Immunology at the University of Cincinnati College of Medicine

Dr. Bernstein, thanks for being here today.

### Dr. Bernstein:

My pleasure.

### Dr. Jackson:

To start us off, Dr. Bernstein, can you explain why particle size matters in inhaled therapies, particularly in uncontrolled asthma?

### Dr. Bernstein:

Particle size is important because it depends on where the medicine gets to. In the lungs, we have large, intermediate, and small airways, and it's easier to get medicines that we commonly use into the large and intermediate airways. But it's sometimes very difficult to get down into the small airways, and that has to do with particle size. Some people have significant small airway disease that's the predominant part of their disease. It's affecting the small airways, and these individuals are symptomatic despite using particles that get into the large and intermediate airways. And so that's why certain formulations of inhaled steroids have been developed to try to reach those small airways.

### Dr. Jackson:

And what exactly is mass median aerodynamic diameter?

### Dr. Bernstein:

That really deals with the size of the particle and how it can penetrate into these very small airways. And I think we know, for instance, largely, the reason we developed some of these small particles came about with the concerns about chlorofluorocarbons, which were banned from metered-dose inhalers.

And now there's mostly these hydrofluoroalkane propellants, and these actually have been helpful because we could adjust particle size easier. There's been several of these inhalers that now have very small particle size that can get deeper into the small airways. So that's been very helpful.

### Dr. Jackson:

So building on that, how important is small airway involvement in asthma, and what challenges does it present for achieving control?

### Dr. Bernstein:

Small airways are really important because again, this can lead to persistent symptoms that aren't addressed by conventional inhalers. And patients get a lot of shortness of breath, chest tightness, and coughing, and there's mucus that is trapped in these smaller airways because of the narrow apertures and their constricted airways. And so they get a lot of the buildup of mucus, and they're trying to clear this out of their lungs, which is very difficult

So it's extremely impactful on patients who have moderate-to-severe asthma, and even mild asthma, I would say, because some people just have involvement in their small airways and don't have a significant amount of large airway or intermediate airway obstruction.

**Dr. Jackson:**

Compared to traditional inhaled therapies, how do extra-fine particle formulations influence lung deposition? And what does the evidence suggest about their impact on asthma control and outcomes?

**Dr. Bernstein:**

There have been studies looking at how these particles move and how they penetrate into very small apertures. And so those studies do show that there's improvement in small airway disease compared to conventional-sized particles in inhaled steroids. So I think other than clinical trials and showing improvement, there's also improvements in lung function and small airways. These are all important ways that these therapies have been evaluated.

**Dr. Jackson:**

For those just tuning in, you're listening to *On the Frontlines of Asthma* on ReachMD. I'm Dr. Steve Jackson, and I'm speaking with Dr. Jonathan Bernstein about particle size and inhaled therapies for uncontrolled asthma

If we bring this into real world practice, Dr. Bernstein, are there particular patient populations where optimizing particle size may be especially helpful?

**Dr. Bernstein:**

I think patients who have predominantly just small airway disease, and you can see that on spirometry where they have normal lung function, but their FEV<sub>1</sub> is 50 percent, their FEF<sub>25-75%</sub>—which measures small airways—is 40 or 50 percent, and there's reversibility after bronchodilators. Those people likely have mostly small airway disease, and they're bothered by it even though they have good lung function. It certainly is impactful on their daily activities. It can cause significant respiratory problems, shortness of breath, coughing, and sometimes wheezing. And as I mentioned, mucus can get trapped in the airways, and that can be a big problem. It sometimes can even lead to more susceptibility to infection and so forth. So I think it plays a big role in small airway disease, and having therapies that can be small enough to reach down to those small airways is extremely important.

**Dr. Jackson:**

How do you weigh particle size alongside other factors like device type adherence and patient preferences?

**Dr. Bernstein:**

I think that, at the end of the day, it's how patients feel, and if they feel like the drug is getting there and they're now not having this deep sensation of chest tightness that they often experience, they're very happy with these therapies. How they're used really depends on the severity of their lung disease and whether they are used in combination with long-acting bronchodilators or as an adjunct to a combination long-acting bronchodilator and inhaled corticosteroid. Patients need to be followed clinically to see how their lung function's improving and how they're doing clinically. So it has a big impact.

**Dr. Jackson:**

Lastly, as we think about the future of asthma management, where does optimizing drug delivery—including particle size—fit into the bigger picture?

**Dr. Bernstein:**

I think it's important, as we look at guidelines for asthma, we want to make sure patients are not symptomatic and that their lung function's well preserved. This is what we think about asthma control, and it's not interfering with their daily activities, their sleep, and so forth. Having this ability to get medicines deep into the small airways is really important for a subset of patients with asthma who really have predominantly small airway disease. So I think it's made a big impact on the management of asthma for these individuals.

**Dr. Jackson:**

With those insights in mind, I want to thank my guest, Dr. Jonathan Bernstein, for joining me to discuss the role of particle size in treatment decisions for uncontrolled asthma. Dr. Bernstein, thank you so much for being here.

**Dr. Bernstein:**

My pleasure. Thank you.

**Announcer:**

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