



A CUP OF HEALTH WITH CDC ***Shepard Award Winners, Part 1: Dr. Vincent Castranova***

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[Announcer] This podcast is presented by the Centers for Disease Control and Prevention. CDC — safer, healthier people.

[Dr. Gaynes] Welcome to this special edition of *A Cup of Health with CDC*, a feature of the MMWR, the Morbidity and Mortality Weekly Report. I'm your host, Dr. Robert Gaynes.

This is the first in a short series of interviews with recipients of the prestigious Charles C. Shepard Award, which is presented annually to a CDC scientist in recognition of his or her work and the impact of that work on public health. We are privileged to be speaking by telephone with this year's winner of the Shepard Award for Lifetime Achievement, Dr. Vincent Castranova.

Dr. Castranova is the chief of CDC's Pathology and Physiology Research Branch in the National Institute of Occupational Safety and Health in Morgantown, West Virginia. Congratulations and welcome to the show, Vince.

[Dr. Castranova] Thank you very much, Bob.

[Dr. Gaynes] Vince, how long have you been with CDC?

[Dr. Castranova] I've been at NIOSH, CDC in Morgantown for 31 years now.

[Dr. Gaynes] How did you come to your work in the field of occupational health?

[Dr. Castranova] I received my Ph.D. from West Virginia University, which is right across the parking lot from the NIOSH building. And my dissertation work was in occupational safety and health, and that got me interested in the area.

[Dr. Gaynes] You've done some groundbreaking work on respiratory diseases caused by toxic agents in the workplace. What led you to research this problem?

[Dr. Castranova] Well, during my work at West Virginia University, I became aware that one of the major industries was coal mining, and a number of my friends and associates had relatives who actually suffered from black lung disease, which is a lung disease due to coal dust exposure. And so I became very interested in what I could do to resolve these issues.

[Dr. Gaynes] Well, can you briefly describe for us your research and findings in this area?

[Dr. Castranova] Our research varies from very basic mechanistic studies to very applied. Some of the mechanistic work that we've done is to understand signals that allow the cells in the lung to recognize particles, inflammatory cascades that lead to disease, and oxidant stress that leads to disease. We've been able to take this very basic mechanistic information and apply it to

workplace health issues to identify the causes of agent for the disease process and to identify ways to prevent that exposure.

[Dr. Gaynes] Can you give me an example?

[Dr. Castranova] Yes. There was an industry called the nylon flocking industry. What they did is they take nylon fibers and cut it into short lengths and glue that onto upholstery and you get a velvet-like upholstery material. Well, the industry had a high rate of lung disease, and there was no obvious cause. Going in to the study what was the hypothesis was that it wasn't the nylon 'cause the fibers were very thick and shouldn't be inhalable and nylon's a relatively inert material. What we found is that in the cutting process, one was able to generate nylon shreds, which were small enough to be inhaled, and that once in the lung, they were very inflammatory. When we showed these data to industry, they were able to change workplace practices and install engineering controls, which essentially eliminated the problem industry-wide.

[Dr. Gaynes] What's been your proudest or most satisfying accomplishment?

[Dr. Castranova] What I'm most proud of is being able to work with very outstanding collaborators within NIOSH and CDC. The mission is sort of a noble mission — protecting the health and safety of workers — and I'm blessed with having people who are very dedicated and very knowledgeable scientists. And that makes my day very nice.

[Dr. Gaynes] Can you give us some insight on your current work?

[Dr. Castranova] Right now, much of our work is in the area of nanotechnology. This is a[n] area where one engineers particles that are very small in size. When one engineers these small particles, they have unique physical and chemical properties that can be applied to all sorts of applications — from very strong, lightweight structural materials to electronic devices to medical imaging and targeted drug delivery in cancer treatment. Well, because these particles are very small and have unique physical and chemical properties, they may well have unique bioactivity. And so, while this industry is in the development stage, what we're trying to do is see if there are any adverse affects to exposure to these particles.

[Dr. Gaynes] And tell us, what are your future goals?

[Dr. Castranova] My future goals are to continue to look into this new area of nanotechnology and to try to understand what characteristics of the particles may be harmful and what characteristics of the particles may be helpful so that we can, before events occur in the workplace, we can protect the workers' health.

[Dr. Gaynes] Vincent, congratulations again on this great honor, and thanks for taking time to visit with us.

[Dr. Castranova] Well, thank you very much.

[Dr. Gaynes] That's it for this special edition of *A Cup of Health with CDC*. Be sure and join us each week for our regular podcasts. Until then, be well. This is Dr. Robert Gaynes for *A Cup of Health with CDC*.

[Announcer] For the most accurate health information, visit www.cdc.gov or call 1-800-CDC-INFO, 24/7.