

## Severe Occupational Lung Disease from Exposure to Flavoring Chemicals

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When it comes to occupational lung disease, most physicians are familiar with well-known risks such as long-term exposure to asbestos or coal dust. However, occupational exposures may be responsible for approximately 15 percent of chronic obstructive pulmonary disease and adult asthma cases.<sup>1</sup> In addition, new occupational risks continue to emerge as industry develops new products and uses new chemicals and production processes.

Bronchiolitis obliterans in workers with inhalation exposure to butter flavoring chemicals is an example of the new type of hazard.<sup>2-4</sup> Since 2000, workers at many microwave popcorn plants and flavoring manufacturing plants have been seriously affected.<sup>5,6</sup> Butter flavorings are used in many other foods, such as snack cakes, cookies, pretzels, candy, and dairy products. Restaurant cooks use butter-flavored vegetable oil products to prepare meals.

The magnitude of the risk to workers exposed in these settings is currently unknown. Butter flavoring chemicals such as diacetyl are also found in other flavorings (e.g., vanilla). Flavoring chemicals are assessed for safety to consume in small amounts in food, but most have not been assessed for safety to inhale in the workplace.

Bronchiolitis obliterans from workplace exposure to flavoring chemicals is a progressive condition that has shown little or no response to treatment. Affected workers are typically young or middle-aged individuals who developed cough, wheezing, and dyspnea on exertion after working in areas where butter flavorings were used or manufactured.<sup>7,8</sup> The most consistent and striking finding has been severe airway obstruction on spirometry that is fixed (i.e., unresponsive to bronchodilator administration). Some workers have developed severe fixed airway obstruction less than one year after working in microwave popcorn production or flavoring manufacturing; several affected workers have been placed on lung transplantation lists.<sup>7,8</sup> Additional details on the natural history of disease and evaluation findings in affected workers can be found in a case series and a review.<sup>7,8</sup>

Physicians should consider the possibility of work-related lung disease in patients exposed to flavoring

chemicals who present with respiratory symptoms. Airway obstruction detected on spirometry should be considered as possibly flavoring-related unless another etiology is apparent or identified. This is especially important in nonsmokers, younger smokers, and older smokers who do not have an extensive smoking history.

Preventing or limiting patients' exposure to the chemicals should be a priority in the treatment plan. Affected workers should be relocated to areas where exposure potential is minimal. Plant management should be notified of the need to evaluate and control exposures to protect other workers. All exposed workers should undergo spirometry screening and periodic follow-up tests to identify excessive declines in lung function or abnormal lung function that might be work related.

Identification by a physician of a possible job-related illness at the worksite can facilitate prevention efforts. The National Institute for Occupational Safety and Health (NIOSH) Web site on flavoring-related lung disease (<http://www.cdc.gov/niosh/topics/flavorings/>) has information for physicians, workers, and company managers. Physicians may also e-mail [Flavorings@cdc.gov](mailto:Flavorings@cdc.gov) to request or provide information to NIOSH staff who conduct investigations and research in this area.

No statement in this article should be construed as an official position of the National Institute for Occupational Safety and Health.

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## REFERENCES

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**Memorandum**

Date: January 29, 2008

From: Medical Officer, FSB, DRDS

Subject: Reprint of Publication

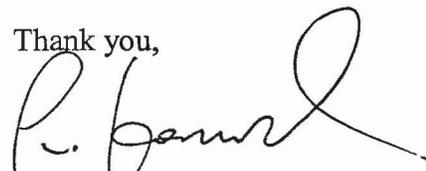
To: Deputy Director, DRDS  
Thru: Chief, FSB   
Team Leader, FSB 

Attached is a reprint of an editorial I wrote that recently appeared in *American Family Physician*. The DRDS clearance number is 2008-045M. Severe Occupational Lung Disease form Exposure to Flavoring Chemicals. It is provided for your retention.

REFERENCE:

Richard Kanwal, MD, MPH [2009] Severe Occupational Lung Disease form Exposure to Flavoring Chemicals.

Thank you,



Rich Kanwal, MD MPH

Attachment:

cc:  
Director, DRDS (3)  
Director, EID (3)  
Librarian, ALOSH (2)  
Chief, FSB,DRDS (1)  
Chief, LRB,DRDS (1)  
Chief, SB,DRDS (1)