



IAQ RADIO+

Show Number: 745 Blog

Elliott Horner, PhD, FAAAAI

Nicholas Nassikas, MD

**Paradigms and perspectives
Indoor air: Guidelines, policies, and regulation**

Good day and welcome to IAQ Radio+ episode 745 blog. This week we welcomed Elliott Horner, PhD and Nicholas Nassikas, MD for a discussion about Indoor air: Guidelines, policies, and regulation from their Paradigms and perspectives article in the Journal of Allergy and Clinical Immunology (JACI).

Nicholas Nassikas, MD is an attending physician in the Division of Pulmonary, Critical Care, and Sleep Medicine at BIDMC and an Assistant Professor of Medicine at Harvard Medical School. His research focuses on how weather and air quality affect the respiratory health of children and adults.

Dr. Elliott Horner, Lead Scientist at UL Solutions has worked in the IAQ field for over 30 years, conducting research and field investigations, providing training, disaster response and litigation support and was director of an IAQ laboratory. He is a recognized expert on fungal allergens and the impact of moisture in buildings, and has published over 50 research papers and book chapters. He has served on committees for ASTM, the American Academy of Allergy, Asthma and Immunology, AIHA, and USGBC and served on the Board of IAQA. He is past chair of the ASHRAE Environmental Health Committee, and is currently on Standard 62.1 and 241 committees. He also holds a Healthcare Construction Certificate from ASHE, is a LEED AP, and is a Fellow of the Academy of Allergy.

Quick recap

The show discussed the importance of indoor air quality, its impact on health, and the need for better education and dissemination of information about it. The guests and hosts also discussed the challenges of dealing with volatile organic compounds (VOCs) in research and their potential impact on human health, as well as the need for more federal guidelines and standards to improve indoor air quality. The conversation ended with a discussion on the progress made in reducing indoor smoking in public buildings across the US.

Next steps

- Highlighted the need for better education and dissemination of information about the importance of IAQ to the general public and the medical community.
 - Clinicians and patients to engage with organizations and professional societies by writing letters, providing testimony, and advocating for policies related to indoor air quality.
 - Researchers to continue studying interventions that can reduce indoor air pollution and improve health outcomes.
 - State legislators to consider adopting parts or all of the Johns Hopkins Center for Health Security's model State Indoor Air Quality Act.
 - Public health officials to educate the public on the importance of using kitchen exhaust fans while cooking.
 - Architects, engineers, and contractors to focus on prevention measures in building design, construction, and operation to improve indoor air quality.
 - Voters to advocate for more attention to indoor air quality issues at local, state, and federal levels.
 - ASHRAE to consider requiring range hoods to exhaust to the exterior of buildings in residential air quality standards.
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Summary

Indoor Air Quality Guidelines Discussed

The show featured Dr. Elliot Horner and Dr. Nicholas Nassikas discussing indoor air quality guidelines, policies, and regulations. The discussion also touched on the implementation of advanced indoor air quality guidance in buildings, the response to Covid-19, and the potential for more bridges between the medical and industrial hygiene communities.

Mold, Dampness, VOCs, and Asthma Impact

The discussion revolved around the impact of mold, dampness, and volatile organic compounds (VOCs) on asthma. The consensus in the medical community is that mold and dampness can both trigger and cause asthma, with exposure to these factors potentially leading to lower lung function, hospitalization, and even death. The connection between mold and asthma was widely accepted in the medical community, with research showing that early infancy exposure to mold can predispose individuals to developing asthma. The impact of VOCs on asthma is less clear, with some evidence suggesting they can trigger asthma symptoms and potentially increase the risk of developing asthma, but the evidence is not as strong as it is for mold and dampness. The importance of avoiding triggers and controlling asthma was emphasized, with the understanding that this can be challenging. The

discussion also touched on the potential impact of indoor air quality on overall health, with the need for guidelines, policies, and recommendations to ensure safe indoor environments.

VOCs, Health, and Mold Challenges

The show focused on the challenges of dealing with volatile organic compounds (VOCs) in research and their impact on human health. Elliott highlighted the difficulty in comparing VOC measurements due to different methods of sampling and analysis. He also discussed the importance of identifying specific VOCs rather than just looking at them in aggregate. The discussion also touched on the issue of phthalates, which are considered semi-VOCs, and their potential impact on health. The meeting also covered the topic of mold growth and its relation to other biological contaminants, emphasizing that people can react to their environment even if they are not allergic to mold. The conversation ended with a discussion on the quality of allergen extracts used for testing and immunotherapy, and the cross-reactivity of fungal allergens.

Indoor Air Quality and Education

The show discussed the importance of indoor air quality (IAQ) and its impact on health. The speakers, Dr. Elliot Horner and Dr. Nicholas Nassikas, highlighted the need for better education and dissemination of information about IAQ to the general public and the medical community. They noted that while there has been progress in understanding the effects of indoor air pollutants, there is still a need for improvement in translating this science to the medical community. The speakers also discussed the challenges of getting accurate information about IAQ out to the public, with many sources using misleading headlines. The conversation ended with a discussion on the need for better communication and education about IAQ.

Improving Indoor Air Quality Discussion

In the show, the team discussed the importance of improving indoor air quality and the need for more federal guidelines and standards. They also discussed the potential for state and local governments to take action on this issue. The team mentioned the Johns Hopkins Center for Health Security Model State Clean Indoor Air Act, which was published in 2023 and could be a useful tool for states to adopt. They also discussed the need for education on indoor air quality, particularly in relation to the use of exhaust fans in kitchens. The team also touched on the challenges faced by healthcare providers in focusing on prevention rather than cure. The conversation ended with a discussion on the progress made in reducing indoor smoking in public buildings across the US.

Nuggets and references mined from today's episode:

Indoor air: Guidelines, policies, and regulation Nicholas J. Nassikas, MD,^a Elliott Horner, PhD,^b and Mary B. Rice, MD MPH^a

[https://www.jacionline.org/article/S0091-6749\(24\)00671-7/pdf](https://www.jacionline.org/article/S0091-6749(24)00671-7/pdf)

Welcome Dr. Nassikas please tell our audience a little about your position at the medical school and how you got interested in indoor air quality?

Dr. Nassikas is a pulmonary physician who treats patients, conducts research and teaches at Harvard Medical School. It's generally accepted that bad outdoor air is bad for health. With that in mind, it's logical that bad indoor air is also bad for health.

Drs. Nassikas and Horner, the Industrial Hygiene Field feels slighted that they were ignored by the medical community when it came to respiratory protection, what say you?

Dr. Nassikas- Excluding the Industrial Hygienists or other allied fields was not intentional. During the full-on crisis of Covid in ER rooms and hospitals our focus was saving lives and keeping people alive while concerned about self-protecting.

Dr. Horner- Physicians and industrial hygienists look at respiratory protection differently. Doctors heal and industrial hygienists protect. Physicians' concern is about stuff getting out while industrial hygienists' concern is about stuff getting in.

Dr. Horner we last had you on with Tina Brueckner and Don Weekes in early 2024 for a show about ASHRAE Guideline 42-2023 Enhanced Indoor Air Quality in Commercial and Institutional Buildings. How is acceptance of that Guideline working out now that it's been around for a year?

While most standards are minimum standards, the ASHRAE Guideline 42-2023 is about how to do better and exceed minimum standards. Acceptance of this Guideline is hard to determine, as he didn't know how many copies of the Guideline were sold. <https://www.iagradio.com/tina-brueckner-elliott-horner-phd-don-weekes-cih-csp-enhanced-indoor-air-quality-in-commercial-and-institutional-buildings-ashrae-guideline-42-2023/>

We have been following mold and dampness related issues for all of our 17 years on the air and we have been involved in IAQ issues for much longer. I noticed this statement in the paper "Mold and fungal growth result from dampness and are triggers of asthma symptoms and exacerbation".

Dr. Nassikas- It's accepted that fungi can cause asthma, trigger asthma or both. The human body is an interconnected system, long term asthma can affect multiple

systems. We have good ways to treat asthma: avoiding triggers and effective medications. The goal is to get asthma under control; steroids can wreak havoc on the organs.

Identifying asthma triggers in homes is a problem. Occupational related asthma is also a challenge if/when an employee can't avoid job related triggers.

Another statement in the paper is "Exposures to VOCs are associated with increased risk of childhood asthma, respiratory symptoms, missed school days, and cancer". Is this also now seen as consensus in the medical community particularly that VOC's are associated with increased risk of childhood asthma?

Is this statement related to VOC's in general or specific VOC's?

Dr. Nassikas on VOCs- There are good systematic reviews that VOCs increase cancer risk and can trigger asthma. Phthalates pose the greatest risk of asthma. Mold is more of a problem than VOCs.

Dr. Horner on VOCs- VOC sampling and analysis methods are diverse and inconsistent. Few measurements in the papers are consistent. We cannot compare test results that use different methods. Is it one VOC or the aggregate of VOCs? Phthalates are most often particle bound, which creates greater uncertainty.

The Indoor Air Quality Guide, which was released in 2010 by multiple professional groups and the EPA, presents best practices during design, construction, and operation of buildings to improve IAQ. This 2010 guide was updated by ASHRAE guideline 42 (2023), which was titled Enhanced Indoor Air Quality in Commercial and Institutional Buildings.

Dr. Horner- The Indoor Air Quality Guide is a summary of a much larger document which is designed to help exceed the ASHRAE 42 Standard.

<https://www.ashrae.org/technical-resources/bookstore/indoor-air-quality-guide>

Dr. Horner, Can you comment on fungal allergen research?

Research into fungal allergens has been hindered by these factors: the poor quality of fungal extracts, fungal allergens are cross reactive and Non IGE factors.

In 2023, the Johns Hopkins Center for Health Security published a model state IAQ act that addresses IAQ comprehensively and provides a legal framework for states to adopt wholly or in part.

<https://centerforhealthsecurity.org/our-work/research-projects/indoor-air-quality/model-clean-indoor-air-act>

<https://www.iaqradio.com/gigi-kwik-gronvall-phd-richard-bruns-phd-johns-hopkins-model-state-indoor-air-quality-act/>

- Nitrogen dioxide, a pollutant found indoors causes asthma. Kitchen vent hoods should be vented outdoors.

About Nitrogen Dioxide and Asthma

Nitrogen dioxide (NO₂) is an odorless gas that can irritate your eyes, nose and throat and cause shortness of breath. Indoor NO₂ can come from using appliances that burn fuels such as gas, kerosene and wood.

In people with asthma, exposure to low levels of NO₂ may cause increased bronchial reactivity and make young children more susceptible to respiratory infections. Long-term exposure to high levels of NO₂ can lead to chronic bronchitis. Studies show a connection between breathing elevated short-term NO₂ concentrations, and increased visits to emergency departments and hospital admissions for respiratory issues, especially asthma.

Actions You Can Take

Make sure all fuel-burning appliances are properly installed, used, and maintained following all manufacturer's instructions. If possible, use fuel-burning appliances that are vented to the outside.

- **Gas cooking stoves:** Install and use an exhaust fan vented to outdoors over gas stoves. Never use the stove to keep you warm or heat your house.
- **Unvented heaters:** Use the proper fuel and keep the heater adjusted the right way. Open a window when you are using the heater.

<https://www.epa.gov/asthma/asthma-triggers-gain-control#nitro>

ROUND-UP

Dr. Nassikas-

- The Journal of Allergy and Clinical Immunology recently dedicated an entire issue to Indoor Air Quality <https://www.jacionline.org/>
- Prevention is better than a cure. Clinicians have very limited time to spend with patients. What's the disease, How to get better? Here are the drugs.
- The glass is half full.
- Seeks more ways to collaborate.

Dr. Horner

- Call out the Environmental Law Institute for their knowledge of specific and narrow rules and regulations. <https://www.eli.org/> The Environmental Law Institute (ELI) makes law work for people, places, and the planet.

Z-Man signing off

Trivia:

In what year was the Clean Air Act established?

Answered by: Kurt Johnson, Fresh Air Ventilation, Gray, Maine