Improving Indoor Air Quality (IAQ) in the Workplace

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Indoor Air Quality **(IAQ)** plays a critical role in our health, safety, and well-being, especially in workplaces where we spend a significant amount of time. Improved IAQ is not merely about comfort—it's a crucial strategy in mitigating the spread of airborne diseases such as COVID-19 and other pathogens.

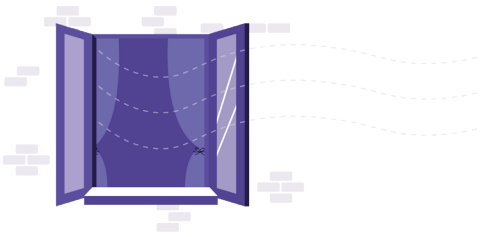
This quick guide combines takeaways from the CLEAN Lessons Learned sessions, produced by the Integrated Bioscience and Built Environment Consortium **(IBEC)** and sponsored by the American Industrial Hygiene Association **(AIHA)**. This guide aims to equip employers, employees, and facility managers with actionable strategies by synthesizing the best advice from these discussions.

Understanding Airborne Disease Transmission

Viruses that transmit as airborne particles, such as the viruses that cause COVID-19, flu, and measles, pose such a significant risk as they can squeeze into small places, nearly 10,000 times smaller than a human hair, travel long distances, up to 20 to 30 feet, and stay active in the air for at least 4 hours.

When you think about viral aerosols or viruses that transmit as airborne particles, think of them as water moving in a stream. Like the water, they will find the easiest path from one point to the next. With a rock or log in a stream, the water in the stream will find a path around it.

General Strategies for Improving IAQ



Ventilation Improvements

Proper ventilation is crucial for diluting and displacing potentially harmful airborne particles, thus reducing disease transmission risks. Effective ventilation is not just about comfort but a critical public health intervention.

PRACTICAL STEPS

1. **Optimize HVAC Systems**

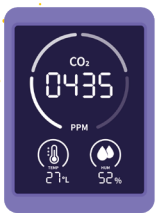
   Regularly assess and upgrade HVAC systems to ensure they can handle air quality efficiently, focusing on adjustments that minimize pathogen transmission.

2. **Use Air Purifiers**

   In areas where HVAC adjustments are not feasible, portable air purifiers with HEPA filters can effectively supplement existing systems, especially in poorly ventilated spaces.

3. **Conduct Regular Maintenance**

   Implement a routine maintenance schedule for all air handling units to maintain optimal performance, including timely filter replacements and system inspections.



Monitoring IAQ

Carbon dioxide levels in indoor spaces can indicate ventilation quality, with high levels often suggesting inadequate ventilation, which could increase pathogen concentration.

IMPLEMENTATION AND INTERPRETATION

1. **Install CO2 Monitors**

   Place CO2 monitors strategically throughout the workplace to continuously evaluate air quality, identifying areas requiring ventilation improvements.

2. **Train Staff on Data Interpretation**

   Ensure that staff understands what the CO2 readings mean for air quality and are prepared to take action if levels exceed safe thresholds.

Filtration Techniques

Incorporating High-efficiency Particulate Air (HEPA) filters into air purification systems is essential for trapping particles that may carry viruses and other pathogens.

CUSTOMIZATION FOR SPECIFIC ENVIRONMENTS

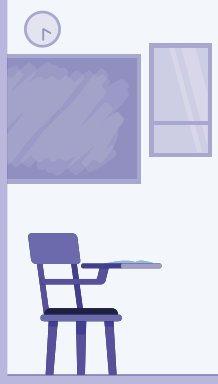
1. **Evaluate Filtration Needs**

   Conduct assessments to determine the specific filtration requirements of different workplace areas based on their particular air quality challenges and pathogen exposure risks.

2. **Tailor Solutions**

   Suitable filters can be integrated into the existing HVAC system or used as standalone air purifiers in strategic locations to enhance their air-cleaning efficacy.

General Strategies for Improving IAQ

	IAQ CHALLENGES	IAQ SOLUTIONS
Schools 	Schools are dynamic environments with varying occupancy densities and activities that can affect IAQ, such as physical education, science experiments, and daily cafeteria gatherings.	☐ Increase the intake of outdoor air through existing HVAC systems ☐ Open windows where possible to boost natural ventilation ☐ Implement CO2 monitoring in classrooms as a proxy for adequate ventilation ☐ Use portable air purifiers with HEPA filters in classrooms that lack adequate ventilation

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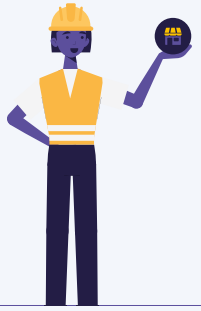
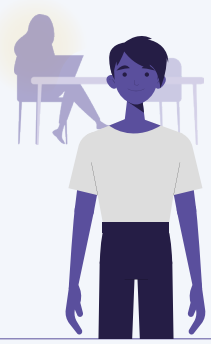
	IAQ CHALLENGES	IAQ SOLUTIONS
Construction Sites 	Construction sites are exposed to a wide range of particulates and chemicals and often lack the infrastructure for traditional HVAC systems.	☐ Employ portable air cleaning systems that can handle high levels of dust and particulate matter ☐ Use particulate sensors to monitor air quality actively ☐ Train workers on the importance of wearing personal protective equipment (PPE)
General Offices 	General office environments often involve a mix of shared spaces, individual workstations, and high-touch communal facilities. Maintaining consistent IAQ across varied spaces with different activities and occupancy levels can be challenging.	☐ Utilize HEPA filters and maintain robust HVAC systems to manage airflow and filter out pathogens effectively ☐ Implement Ultraviolet Germicidal Irradiation (UVGI) systems to disinfect air in critical areas such as operating rooms and isolation wards ☐ Ensure that all air handling and filtration systems are regularly inspected and maintained to function at peak efficiency
Healthcare Settings 	Healthcare facilities are high-risk environments due to patient vulnerability and potential exposure to infectious diseases.	☐ Increase the outdoor air intake through HVAC systems to enhance ventilation and dilute indoor pollutants ☐ Replace standard HVAC filters with HEPA filters or the highest efficiency your system can accommodate ☐ Install sensors that monitor not only CO2 levels but also particulate matter (PM2.5 and PM10), volatile organic compounds (VOCs), and humidity ☐ Provide portable air purifiers at densely populated or poorly ventilated workstations ☐ Conduct regular training sessions and distribute informational materials to educate staff on the importance of IAQ

Extended Insights for IAQ Excellence

To truly excel in improving Indoor Air Quality (IAQ) within the workplace, it's essential to consider a broader spectrum of strategies that encompass policy, economic impact, and community engagement. Here are key insights that extend beyond basic IAQ improvements:

1

Understand Economic Impacts:

Recognize that poor IAQ can have severe economic repercussions, including decreased productivity and increased health-related absences.

2

Emphasize Community and Empathy:

Foster a workplace culture that values empathy and community well-being.

3

Promote Clear Communication and Education:

Ensure that all employees are informed about the importance of IAQ and the measures being implemented to improve it.

4

Collaborate Across Disciplines:

Engage and collaborate with experts from the health, engineering, safety, or similar fields to address any unique IAQ challenges and share strategic advice.

5

Implement Flexible Policies

Develop and enforce IAQ policies that are adaptable to changing health data and scientific guidance.

6

Community Involvement:

Encourage input and feedback from all workplace stakeholders in the IAQ improvement process, including management and staff.

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