



A HEALTHIER FUTURE STARTS INDOORS: HEALTHCARE

As the front lines of the COVID-19 pandemic, healthcare facilities have faced critical challenges in caring for larger numbers of patients while ensuring safety and minimizing spread of the disease. Throughout the U.S. and many countries, outbreaks of COVID-19 in hospitals continue to devastate patients and healthcare workers alike.

Against this backdrop, it's become clearer than ever that the need to minimize disease transmission impacts every aspect of the built environment. That's where healthy building strategies come in. By focusing on creating healthy indoor environments, today's healthcare facilities can help improve infection control in the short term, and enhance patient experiences and outcomes, staff productivity and building efficiency moving forward.

HEALTHCARE PRIORITIES



THE SCIENCE OF HEALTHY INDOOR ENVIRONMENTS

While the current urgency around healthy indoor environments in hospitals revolves largely around stopping the spread of COVID-19, research has shown the potential impact of healthy environments to be much greater.



Heating, ventilating and air conditioning alone can:

- Enhance patients' recovery process
- Reduce length of hospital stay
- Lessen medical errors and infection rates
- Improve the indoor air quality (IAQ)
- Minimize hospital-acquired infections

Shajahan A, Culp C, Williamson B. 2018. Effects of Indoor Environmental Parameters Related to Building Heating, Ventilation and Air Conditioning Systems on Patients' Medical Outcomes: A Review of Scientific Research on Hospital Buildings. Indoor Air DOI: 10.1111/ina.12531



In addition, the [COGfx Study](#) has shown that healthy buildings can significantly improve cognitive function, while the [HEALTHfx Study](#) revealed the benefits of healthy buildings on societal health and climate. All in all, we're seeing that healthy buildings can impact the patient experience and the bottom line for healthcare facilities.





**WE SPEND
90%
OF OUR TIME
INDOORS**

We can use healthy building environments to:

IMPROVE COGNITIVE FUNCTION

in enhanced green buildings

Crisis response scores  **131% HIGHER**

Information usage scores  **299% HIGHER**

Strategy scores  **288% HIGHER**

IMPROVE PERSONAL HEALTH

in high-performing, green-certified buildings vs. high-performing, non-certified buildings

Sick building symptoms  **30% FEWER &** better environmental perceptions

Sleep quality scores  **6.4% HIGHER**

IMPROVE SOCIETAL HEALTH

Compared to "conventional commercial buildings," the green-certified buildings studied saved

\$7.5B in energy costs 

\$5.8B in combined health and climate benefits

Total benefit of \$13.3B for 2000-2016

\$1.4B from averting negative impacts of climate change 

\$4.4B from reductions in air pollution resulting in fewer deaths, hospital visits, lost days of work and school, and more 

Primary support for the study came from Carrier. MacNaughton P, Allen J, Satish U, Laurent J, Flanigan S, Vallarino J, Coull B, Spengler J. 2016. The Impact of Working in a Green Certified Building on Cognitive Function and Health. Building and Environment DOI: 10.1016/j.buildenv.2016.11.041

Primary support for the study came from Carrier. MacNaughton P, Cao X, Buonocore J, Cedeno-Laurent J, Spengler J, Bernstein A, and Allen J. Energy Savings, Emission Reductions, and Health Co-Benefits of the Green Building Movement. 30 January 2018. Journal of Exposure Science and Environmental Epidemiology.

CARRIER HEALTHY BUILDINGS PROGRAM

As the inventors of modern air conditioning and a world leader in HVAC, refrigeration, and fire & security solutions, Carrier has a legacy of creating safe and comfortable buildings. Now we're building on that legacy through the launch of our Healthy Buildings Program. Our experts have in-depth knowledge and experience in healthcare and a holistic suite of healthy building technologies and services to address the immediate pandemic concerns and long into the future.

HEALTHY BUILDINGS ASSESSMENTS FOR HEALTHCARE

At Carrier, we understand that many of our healthcare customers are facing uncertainty with how to move forward in developing a healthy building strategy. Our experts are here to help – starting with assessments across various aspects of your facility.



SAFE START SERVICES

Ensure building is ready for occupancy

Rigorous recommissioning of HVAC equipment

Implement best practices (possibly remotely)



EMERGENCY ASSETS

HVAC equipment on demand to reopen quickly and safely

Detailed site evaluations

Ensure system is able to meet your new ventilation and IAQ requirements



IAQ ASSESSMENT

Test air quality

Develop and implement upgrades for optimal filtration, ventilation, airflow, controls, etc.

Develop corporate-wide IAQ engineering standards



VENTILATION UPGRADE

Increases ventilation rate to reduce indoor pollutants

Increases effective dilution ventilation per person

Improves IAQ and occupant comfort



SECURITY ASSESSMENT

Provide security solutions and upgrades

Contactless access management, body temp screening and video analytics

Remote monitoring and diagnostics

HEALTHY BUILDINGS SOLUTIONS FOR HEALTHCARE

Carrier offers a full suite of products and services designed to help create safe and healthy environments for patients and staff. The following are just a few highlights of our offering.



CARRIER HEALTHY BUILDINGS TECHNOLOGIES

Carrier's Healthy Buildings Program offers customers comprehensive, building-wide technology solutions for today's reimagined environments. In addition to Carrier's comprehensive HVAC, fire, security and controls product offering, the Healthy Buildings offering includes:



OptiClean™ Air Scrubber and Negative Air Machine helps clean contaminated air and prevent it from spreading to different sections of a building, which is critical for infection control.



BlueDiamond™ Touchless Access eliminates a significant number of access touch points through industry-leading mobile credentialing technology.



Advanced Airside Equipment offers air-handling units and fan coil units equipped with advanced filtration designs and germicidal UVC light that provide excellent microbial control and enhanced IAQ features, presenting the perfect balance between a safe and healthy environment, performance and eco-efficiency.



MyWay™ Building Services Mobile Platform integrates HVAC, lighting, elevator and other system controls, touchless access, indoor location and other services for a safer and personalized occupant experience.



Air Purifiers are filtration technologies including various HEPA filters for particulate matter, activated carbon filters for removal of bad odors and volatile organic compounds, photocatalyst filters and UV lamps (with an elimination rate of $\geq 99.999\%$ for pathogens such as E. coli and influenza, tested in Kitasato Institute, Medical Environment Research Center, Japan) to target viruses and bacteria and improve IAQ for an area of up to 4,500 square feet.



DirectKey™ Mobile Access Solution has empowered millions of hotel guests to safely access their hotel rooms without contact by bypassing the front desk check-in and eliminating many traditional touch points in the process.

HEALTHY BUILDINGS SERVICES FOR HEALTHCARE

Healthy buildings are about more than design and solutions. Ongoing management and operation are essential to optimizing indoor environments for patient health and safety, staff productivity and building efficiency. Here are a few examples of Carrier remote services available to help.



REMOTE AIRSIDE MANAGEMENT

- Manage IAQ and ventilation in line with best practices
- Make changes and fix issues remotely
- Optimize maintenance and operational costs
- 24x7 command center



REMOTE ENERGY MANAGEMENT

- Provide advanced cloud-based analytics
- Optimize energy efficiency, equipment uptime, occupant comfort and operational productivity
- Actionable insights by CORTIX™ building IoT platform
- Optimize autonomously or through a mobile application



REMOTE HVAC SERVICES

- Maximize performance and efficiency
- Increase uptime
- Improve budgeting and scheduling
- Fault detection and diagnostics



GET STARTED WITH AN EXPERT

From improving infection control to helping facilitate faster healing, a healthier future starts indoors. Let's work together to safely unlock the full potential of healthy hospitals. Visit us at carrier.com/healthybuildings to learn more about our Healthy Buildings Program and connect with one of our experts.



HEALTHYBUILDINGS

©2020 Carrier. All Rights Reserved.