

3 GLOBAL TRENDS TRANSFORMING HOSPITAL DESIGN & IMPROVING SAFETY STANDARDS

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INTRODUCTION

The Critical Connection Between Hospital Architecture & Patient Safety

Safety standards in healthcare environments are constantly evolving. With every new-found health issue and hazard, healthcare facilities must quickly adapt to best treat patients while ensuring the safety of staff, patients, and visitors. Agility and adaptability are especially necessary during times of a pandemic or a rapidly spreading virus. During these periods, hospitals are forced to prepare and adjust for new safety precautions and accommodate an influx of patients in impossibly tight time frames.

To continue making hospitals and medical care facilities a safe space for treatment and healing, hospital designers, architects and builders are turning to smart materials and innovative [evidence based design](#) (EBD). But what materials do leading hospital designers and architects typically consider when safety is top-of-mind? What dangerous pathogen-harboring fabrics and textiles do they steer clear of? And most importantly, what game-changing innovations in material science and smart materials are they incorporating to future proof these vital spaces?

This ebook explores the connection between hospital design and safety. It provides in-depth analysis into three of the biggest considerations in this field; encouraging agility by creating open spaces, ensuring patient safety and minimizing exposure to new harmful pathogens, and improving patient well-being and the recovery process. There are numerous ways to address these factors, from dynamically converting existing treatment spaces, to building pop-up facilities in emergency situations. But hospital designers, architects and builders should first consider the surfaces in the building, both in terms of what materials are used and how to reduce the amount of surfaces that patients and healthcare workers come into contact with.



PART I – PLANNING AHEAD

Switchable Glass Partitions Improve Infection Control in Healthcare Facilities

Hospital designers and architects consider a variety of factors when planning a new healthcare facility, from fire safety to building material selection. But one of the most critical aspects for consideration is the infrastructure-based measures that support infection control to create a healthy and sanitary environment. Medical facilities are a public space that require a combination of openness and agility, which inherently makes limiting the potential spread of infection a challenge.

The Need for a Hygienic Solution

We are being exposed to disease-causing pathogens more than ever before – from those picked up beyond borders during travel to those living on the local bus route. When a person is admitted to a hospital or healthcare facility, they can be a host to any number of contaminants. These pathogens can easily spread to other patients, staff, and visitors, resulting in Hospital Acquired Infections (HAI) if cleanliness and careful infrastructural planning are not considered. In US-based hospitals alone, the [Centers for Disease Control and Prevention \(CDC\)](#) estimates that HAIs account for “1.7 million infections and 99,000 associated deaths each year”.

Figure 1- Prevalence of health care-associated infection in high-income countries, 1995-2010, [World Health Organization](#)

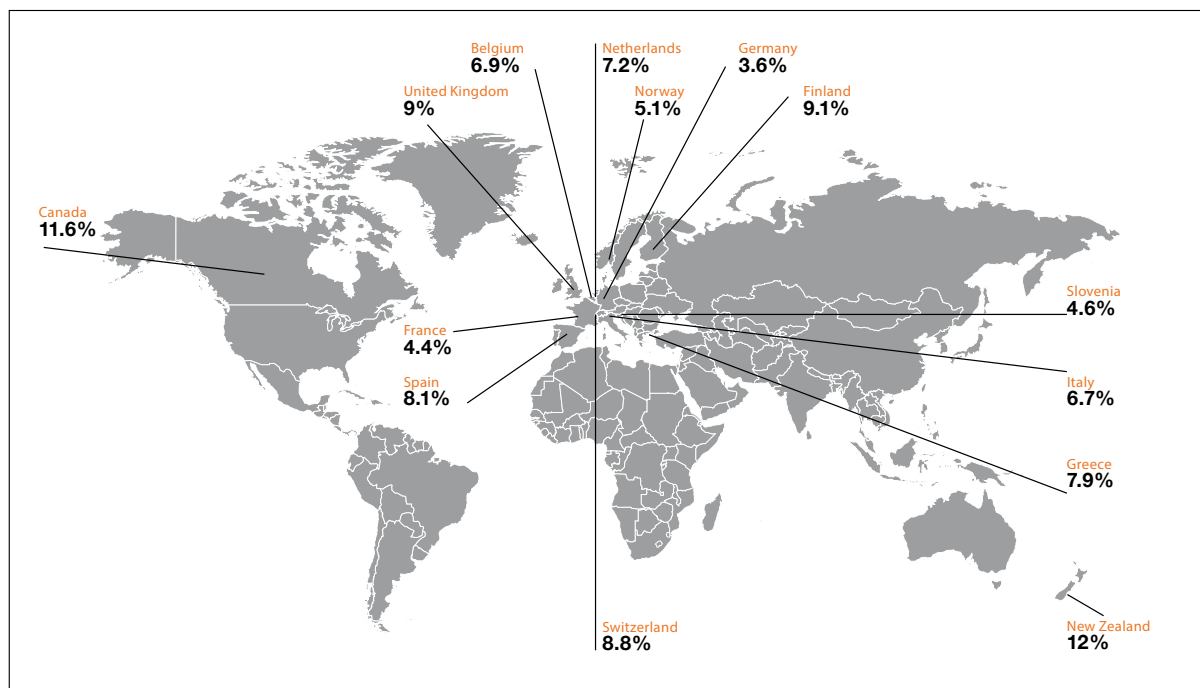


Figure 1 shows patients admitted to hospitals who were subject to Health Care Associated Infections (HCAI). A [study](#) at the Cleveland Veterans Affairs Medical Center found hospital curtains were a significant cause of infectious disease transmission. **Over 42% of privacy curtains tested were contaminated with bacteria.**



Smart Glass in Hospital Design for Infection Control

Technologies in the switchable glass space, including [Liquid Crystal](#) films and [SPD](#) (suspended particle device), are changing hospital design as we know it and improving healthcare standards. Smart glass, also known as [LCG®](#) (light control glass), changes transparency on demand, supporting a clear window or a solid opaque partition that creates a private or shaded space. It can be turned on and off in a variety of ways from a button, to an application or voice/motion control. Switchable smart glass partitions are a key feature in facilities with high infection control infrastructure, easily integrating into corridor partitions, doors, and room dividers and offering a multifunctional solution.

1. High Sanitation

Glass is the easiest material to clean and disinfect. Like regular glass, switchable glass is cleaned with a simple antibacterial solution. On the other hand, curtains used for privacy in hospitals are either disposable (increase waste and create a recurring cost) or are washable fabric that is hard to clean so they are left unattended. Smart glass supports general hospital hygiene – a key factor in reducing HAIs. According to [The Journal of Hospital Infection](#), disinfectants with 62-71% ethanol, 0.5% hydrogen peroxide or 0.1% sodium hypochlorite (bleach) can "efficiently" inactivate coronaviruses within a minute. These cleaning agents can't be used on carpets, curtains and fabric covered furniture, but can be used on regular or switchable glass.

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2. Patient Isolation

Private patient rooms are proven to provide a better healing environment, and they can also quickly be converted into isolated areas in case of a pandemic or rapidly spreading virus. With switchable glass partitions, staff can monitor patients without entering a room, and depending on conditions, have instant privacy for security or treatment purposes. For example, [LCG® switchable privacy glass](#) partitions allow staff to observe patients from afar, provide privacy as required, improve sound isolation and are easy to decontaminate. It can be used to darken ultrasound rooms and shade interiors.

3. Minimal Material Handling

When glass partitions are paired with fabric curtains, personnel frequently touch fabric which creates cross contamination of dangerous pathogens. Switchable glass technology requires minimal interaction and material handling as it can be controlled through various interfaces. It can be voice-activated, remote control powered, or turned on and off through a smart office application.

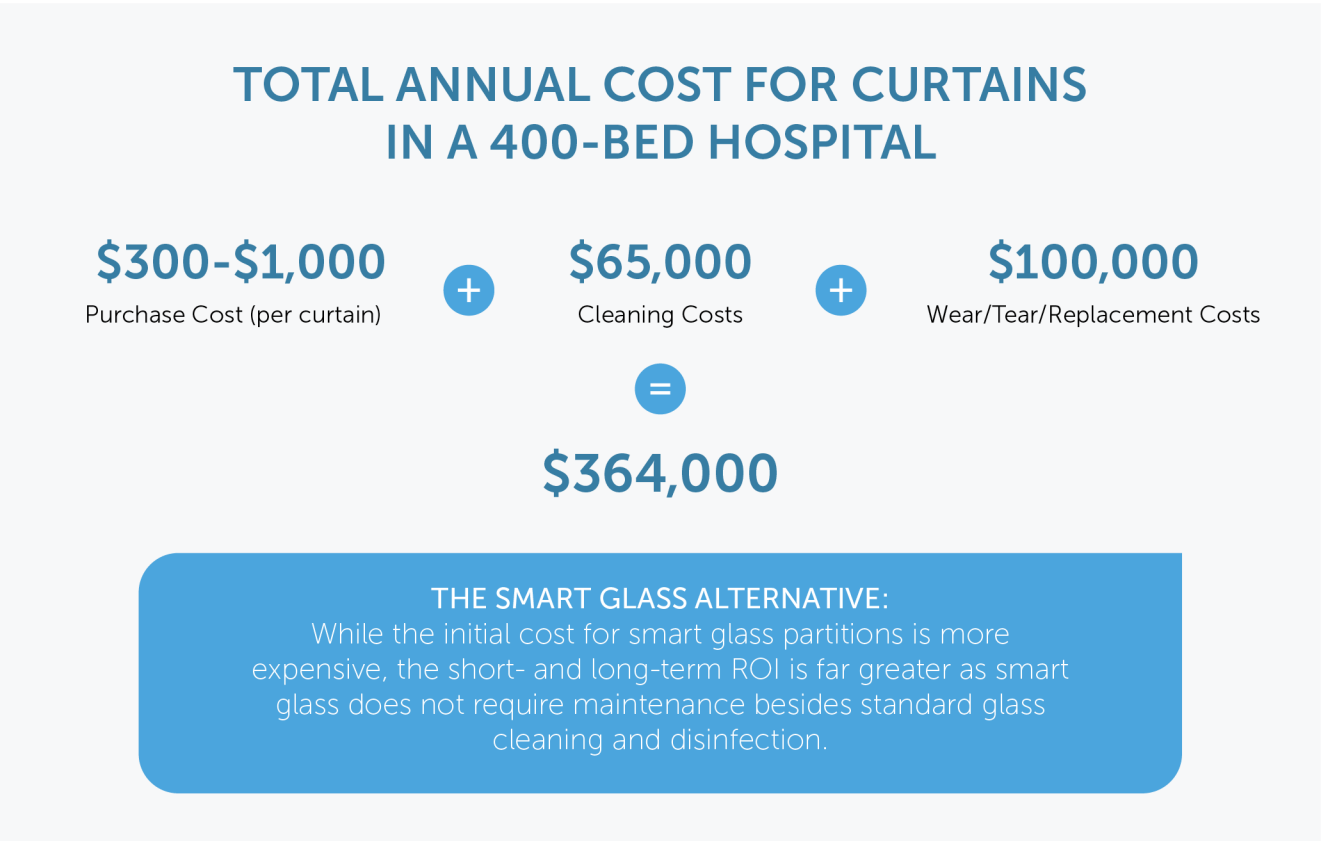


Figure 2 - Glass Or Curtains? Which is more cost-effective? [Soriant Healthcare](#)

PART II – THE END OF FABRIC CURTAINS

A Healthier Solution for Hospital Room Partitions

Fabric curtain systems in healthcare facilities are designed to give patients privacy. But studies say they may be providing much more than that. According to the [University of Michigan Medical Center](#), fabric hospital room partitions host hazardous drug-resistant pathogens that can survive on bedside curtains undetected and live for months at a time.

The results of this study show that up to **28% of curtains sampled in six of the top healthcare facilities in Michigan contained bacteria resistant to powerful antibiotics.**

The researchers also found that these bacteria are not simply living on the curtains; they are responsible for spreading illnesses to patients—many of which have vulnerable immune systems—and to the staff members who care for them.

To mitigate the negative impact of fabric curtains, they would need to be removed and washed between patients, which is simply an unrealistic standard for the high volume turnover in hospitals and emergency rooms. Alternative solutions like antimicrobial curtains, or disinfectant fabric sprays, are not proven to significantly reduce the spread of infection-causing pathogens.

During a pandemic when hospitals can be overcrowded, the cons of curtains are only intensified. [According](#) to Bryan Langlands, designer and infection control expert at the architecture firm [NBBJ](#), most hospital formats have prep and recovery areas for patients undergoing surgery, with individual bays (or rooms) divided by thin cubicle curtains. But patients with highly contagious viruses should ideally be placed in private rooms in case they require intensive care and ventilation. “If you have the foresight, budget and space, you should design all private enclosed rooms as opposed to open bays...” Langlands says.

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If you have the foresight, budget and space, you should design all private enclosed rooms as opposed to open bays.

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- Bryan Langlands

Designer & Infection Control Expert at NBBJ



Healthcare Architects Maintain Privacy with Switchable Glass

Many healthcare architects who specialize in how a hospital floor plan affects health outcomes are increasingly choosing modern solutions like switchable privacy glass over curtain dividers and fabric-based partitions.

[LCG® switchable privacy glass](#) uses a technology that allows glass to change from transparent to varying levels of opaque for instant privacy. It is easily integrated into any partitioning system including IGU units, and allows staff to check on patients without disturbing them. Most importantly, it is easy to clean, ensuring areas are disinfected during and after a patient's stay.

PART III – HEALING DESIGN

Smart Glass in Healthcare Facilities Improve the Patient Recovery Process

Not only does smart glass significantly outweigh the benefits of curtains and improve patient safety, it dramatically enhances the patient recovery process. Throughout the 20th century, hospitals were designed with healthcare providers in mind, not the patients. As a result, the functionality of the physical space within a hospital was of far more importance than how a patient actually felt in the space.

EBD has become especially important in evidence-based medicine, where research has shown that healthcare interior design can affect patient outcomes. EBD and [medical studies](#) prove that a patient's well-being and recovery process is directly related to healing architecture, and faster recovery is hinged on:

Single Rooms or Private Spaces

Having a private space to recover reduces stress, allows for better rest and supports well-being. Using glass partitions in wards helps to section off spaces and create private rooms but also leaves a transparent window to easily check on patients. Rather than using fabric curtains to create a private space, smart glass provides instant privacy with the flip of a switch, for either the patient when they want to rest or the staff during treatment.

Reduced Noise

[Research](#) has shown that noise plays a negative role in healing. Decreasing noise in patient care areas aids in healing processes and helps facilitate speedier recoveries. Noise creates stress (as exhibited by elevated blood pressure) and makes it harder to sleep, which are both detrimental to a speedy recovery. Laminated smart glass installed into an acoustic partition significantly decreases noise, making for a quieter healing space.

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Exposure to Light

The [positive effects](#) of natural light are well known and indisputable. A [study](#) conducted over 15 years in various healthcare facilities shows that patients who had a bed near a window with natural light stayed in the facilities for less time than those who did not. Windows in patient rooms allow natural light to fill the space, and glass partitions allow that light to transfer beyond the bedside and into the corridors.

But when a patient wants to sleep, or the sun is shining too bright, architectural grade SPD switchable smart glass provides a shading solution that is hygienic and easy to clean, eliminating the need for bacteria-hosting fabric curtains. [LCG® smart glass](#) with Gauzy's SPD technology blocks up to 99.5% of light with custom shading control, making spaces shaded in seconds, for comfort, without blocking the view.

Architecture That Heals

The design and atmosphere of a patient's surroundings have a major connection to how they feel, and in turn, heal. [Gauzy LCG® smart glass](#) technology provides a level of control in a situation where so much may be out of a patient's control. LCG® supports a quiet, private, and hygienic space that patients need, while helping hospital designers and builders create environments in line with EBD findings.



USE CASE

How Switchable Privacy Glass Transformed the ICU Unit at Dana Children's Hospital

Gauzy's innovative LCG® smart glass solutions are used in hospitals around the world, offering privacy, which reduces overhead costs and energy consumption. It's an ideal curtain replacement, privacy partition, and it is great for windows and doors. Switchable privacy glass now complements hospitals' [prophylactic approach](#) to sterility, offering excellent ROI for its multiple uses, while also upgrading and preserving sleek and modern interior design styles. From the hospital entrance, to patient rooms and wards, switchable smart glass is an asset to healthcare facilities that take pride in cleaner, safer and more adaptable spaces.



[Learn More](#)

CONCLUSION

LCG® as a Safer Choice in Healthcare Facilities

The reality is that life-threatening viruses aren't going away - and healthcare facilities are on the frontline. The world is now more accessible than ever due to international travel, which means diseases can spread across the globe at exponential rates. Whether pandemics, epidemics, or a localized disease, the need for hospital designers and architects to critically consider the building materials and interior fitouts they use is clear.

It's time to say goodbye to contaminated curtains, and welcome in a new era of smart material founded in material science. LCG® (light control glass) technology allows for the design of healthcare spaces that better consider the needs of both patients and medical providers. The building and construction industry must do its part to help foster a safer future for hospitals and healthcare facilities by considering the following crucial findings:

1

The time to act is now

In America alone, the CDC estimates that HAIs account for 1.7 million infections and 99,000 associated deaths each year.

2

Critically rethink building surfaces

Smarter building materials such as smart glass partitions minimize the spread of infection and help prevent the risks of hospital and healthcare acquired infections.

3

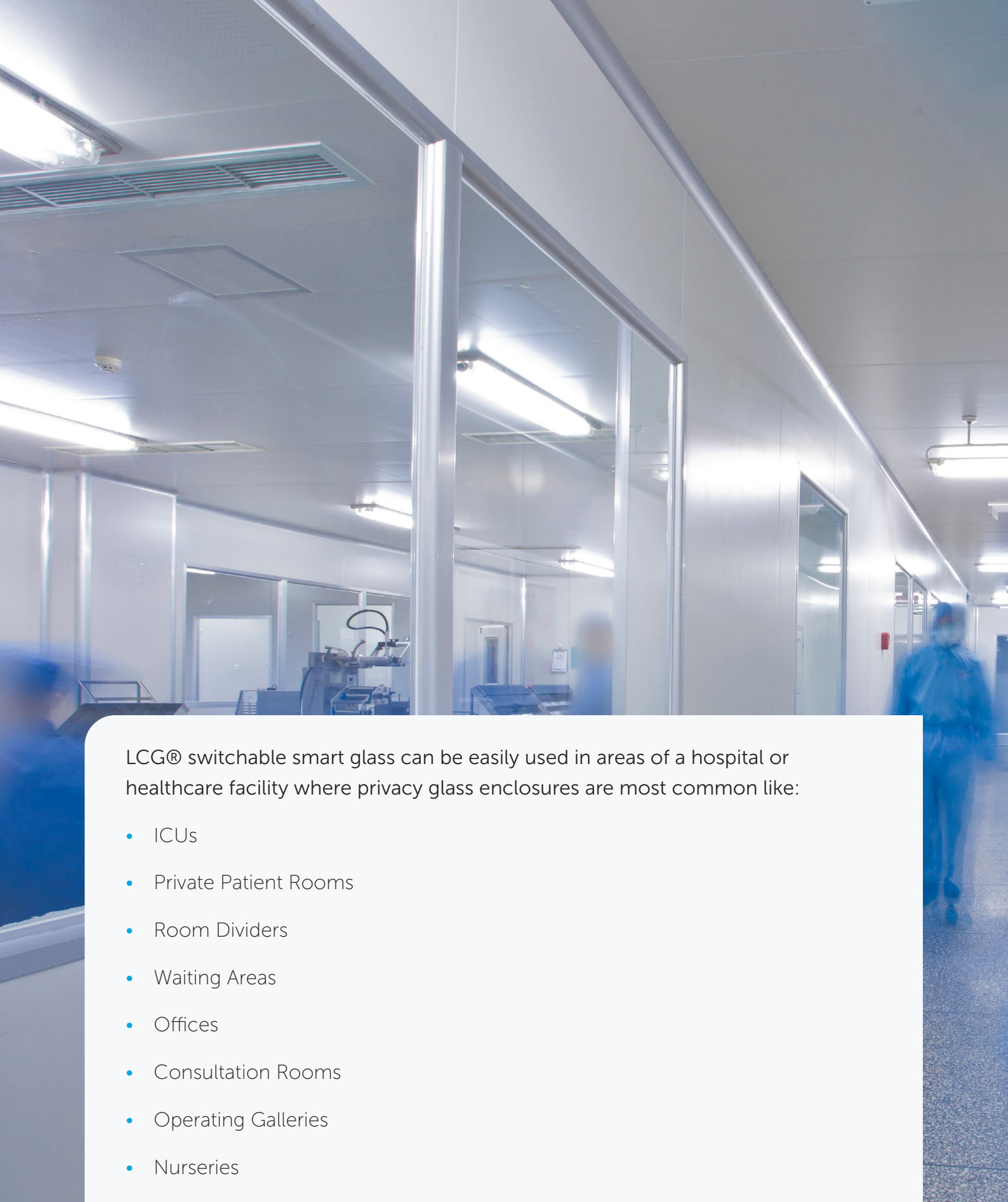
Curtains are a virus hotbed

Fabric hospital room partitions host hazardous drug-resistant pathogens that can survive on bedside curtains undetected and live for months at a time.

4

The impossible is already possible

Gauzy LCG® glass partitions have all the sanitary benefits of regular glass plus offer privacy for patients. This improves patient well-being and the entire healing process, while creating more open and agile environments.



LCG® switchable smart glass can be easily used in areas of a hospital or healthcare facility where privacy glass enclosures are most common like:

- ICUs
- Private Patient Rooms
- Room Dividers
- Waiting Areas
- Offices
- Consultation Rooms
- Operating Galleries
- Nurseries

Switchable smart glass by Gauzy is available as a laminated glass for new construction or can be provided as an adhesive film for already existing glass.

[Click here to learn more](#)

Interested in LCG® for
your next project?
Contact sales@gauzy.com
for a quote today.

