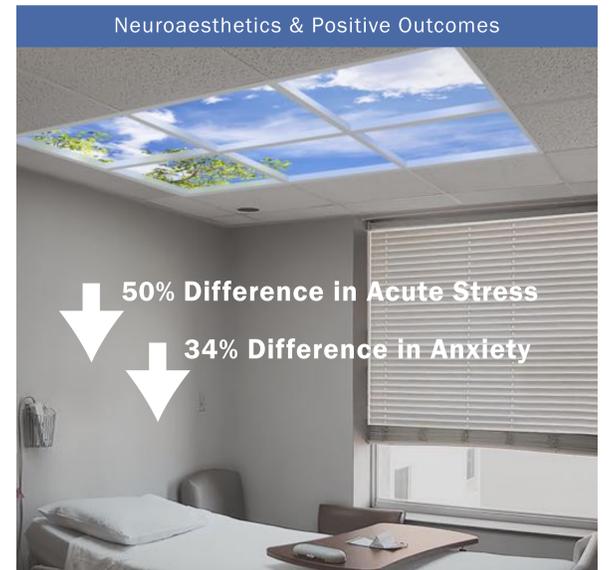
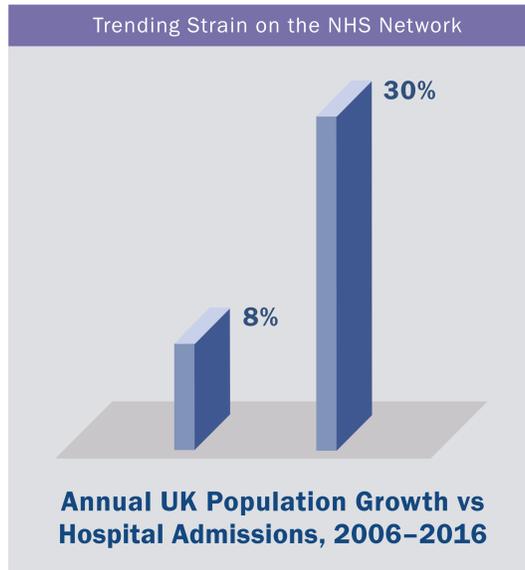


COGNITIVE DESIGN: ADAPTIVE BIOPHILIA FOR OLDER HOSPITALS

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1 RETROFIT SOLUTIONS FOR BETTER PUBLIC HEALTH

The meaningful re-adaptation of existing hospitals, which is essential to develop a circular economy, centers on maximizing energy efficiency, lowering the carbon footprint, and upgrading the digital infrastructure, sometimes at the expense of human-centric design. The SARS-CoV-2 pandemic has revealed the strain on legacy healthcare facilities.

Older hospitals, particularly the larger metropolitan ones that serve high density populations, feature conventional layouts with isolated spaces near the core where therapeutic and diagnostic areas are often located. Staff working in these spaces do not reap the benefits of access to daylight or views to green spaces—biophilic design’s most effective wellness feature.

2 TRENDING STRAIN ON THE NHS NETWORK

Hospitals without access to a natural environment result in lower productivity, increased stress and fatigue, all of which contribute to staff errors. According to NHS Digital, hospital admissions in the U.K. have more than tripled (30%) the country’s population growth (8%) over the past decade (2006-2016 figures). The strain on current facilities is not expected to abate as ageing populations spread across Europe and much of the developed world.

3 NEW HOSPITAL DESIGN & STAFF BURNOUT

Furthermore, *The Journal of Hospital Administration* (2015), has found evidence that there’s similar dissatisfaction among medical staff laboring in LEED Platinum-designed hospitals (BREEAM guidelines face similar limitations) versus conventional facilities. Both designs share the same structural shortcomings when it comes to enclosed interiors: a lack of meaningful connection to nature.

Due to the inconvenient location of many clinical areas near the building core, BREEAM even grants exceptions for meeting the requirements for A View Out, 5.0 *Health and Well-being* section, for key spaces like nurse stations. Unfortunately, these are the very environments where staff need restorative environmental features the most.



4 STAFF WELLNESS LINKED TO PATIENT SATISFACTION

In the U.S., a *Health Affairs* study (2014) comparing patient satisfaction scores with *Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS)* surveys of almost 100,000 nurses showed a better nurse work environment was associated with higher scores on every patient satisfaction survey question. In this light, while the push for adaptive buildings is vital, deploying design technologies that can address deficient spaces immediately, rather than through costly renovations to the core structure, can secure positive outcomes within weeks.

5 COGNITIVE BIOPHILIA FOR ENCLOSED INTERIORS

Among the most effective evidence-based design strategies to deal with the deleterious effect of enclosed interiors is the use of bi-sensory *illusions of nature*. These optical illusions use photographic *Open Sky Compositions* whose image capture, compositional elements, and staging within a virtual skylight framework, engage areas of the brain involved in processing spatial, as well as visual cues, triggering depth perception and spatial cognition.

6 NEUROAESTHETICS & POSITIVE OUTCOMES

Published fMRI research in the *Health Environments Research & Design Journal* (HERD) validates the positive effect of evidence-based design illusions of nature. Such interventions in patient environments found a difference in acute stress by over 50% and anxiety by over 34%. These effects also benefit staff who are the ones who spend the most time in these highly stressful and compressed environments. A circular economy should also entail that older hospital design also enhances human wellness.

Virtual Skylight Layout, Experimental Setting

